Watershed Stewardship Program
Summary of Programs and Research 2011

Paul Smith's College
THE COLLEGE OF THE ADIRONDACKS

Adirondack Watershed Institute
Watershed Stewardship Program
Report # AWI 2012-01

Table of Contents

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Cover: Big Island, Raquette Lake.
This page: Stewards and reporter at Tupper Lake State Boat Launch.

Dedication

The Watershed Stewardship Program dedicates this report to the memory of Matthew Potel, who served as a Watershed Steward in the summer of 2011. Matthew was a friend, colleague, employee, and environmentalist who graced us all with his spirit, humor, intelligence, and professionalism this summer. Matt spent the summer educating and welcoming visitors to Adirondack lakes, inspecting boats, wading in the shallows to monitor and control purple loosestrife, avoiding submerged rocks with the college's motorboat, climbing the high peaks with friends, and never failing to bring all of us joy through laughter and a well-timed humorous remark. We will miss you and remember you, Matt!

Executive Summary and Introduction

By Eric Holmlund, Director

The Watershed Stewardship Program (WSP) is the education and outreach aspect of Paul Smith's College's Adirondack Watershed Institute (AWI), located in the Paolozzi-Spaulding Environmental Sciences and Education Center at Paul Smith's College. The WSP began in 2000 as a local watershed-focused effort to interpret the environment, perform environmental service work, monitor ecological conditions and prevent the introduction of aquatic invasive species (AIS) into the St. Regis Lake chain, which is adjacent to Paul Smith's College. That summer, eight stewards performed a variety of functions, from greeting visitors at a boat ramp and performing boat inspections to stewarding the summit of St. Regis Mountain, monitoring banded loons, surveying wetland vegetation, and maintaining public access trails and campsites. As word of the success of the program spread, together with the increasing threat of AIS introduction, other lake associations and regional funding sources became interested in the model. The WSP expanded each year thereafter, gradually serving more and more lakes across the Adirondack Park. The designation of specific lakes as sites for WSP stewards has varied as a function of the availability of local, state and federal funds. Throughout the twelve years of the program's existence, WSP staff has collaborated closely with The Nature Conservancy, the Adirondack Park Invasive Plant Program, the New York State Department of Environmental Conservation, the Lake Champlain Basin Program, the Lake George Association, numerous property owner associations, and scientists at Paul Smith's College to guide the evolution of a program that serves the needs of local human and biotic communities. As a result, the WSP now serves as a model across the state for AIS spread prevention and outreach.

Figure 1- Flooded boat ramp, Lake Flower, May, 2011.

The WSP experienced dramatic growth in 2011 due to the implementation of a large grant, awarded to the program by the United States Fish and Wildlife Service using Great Lakes Restoration Initiative funding. The purpose of this award was to initiate a coordinated boat-ramp steward program for watersheds draining into eastern Lake Ontario, which includes roughly the western half of the Adirondack Park. The WSP had initiated

steward programs in the region in 2008, in Raquette Lake and Long Lake, but this grant allowed the program to reprise its role at these two lakes and to expand to other lakes never before served by boat ramp stewards, including Fourth Lake, Seventh Lake, Limekiln Lake, Stillwater Reservoir, Eighth Lake, Cranberry Lake, the St. Regis Canoe Area, and Meacham Lake. When this large grant was augmented by substantial funding awarded to the WSP by the Lake Champlain Basin Program and the Nature Conservancy, the WSP was poised in 2011 for, by far, its largest summer of operations ever, with stewards in place across the entire Park, from Inlet to Lake Placid, and Meacham Lake to Saratoga Lake.

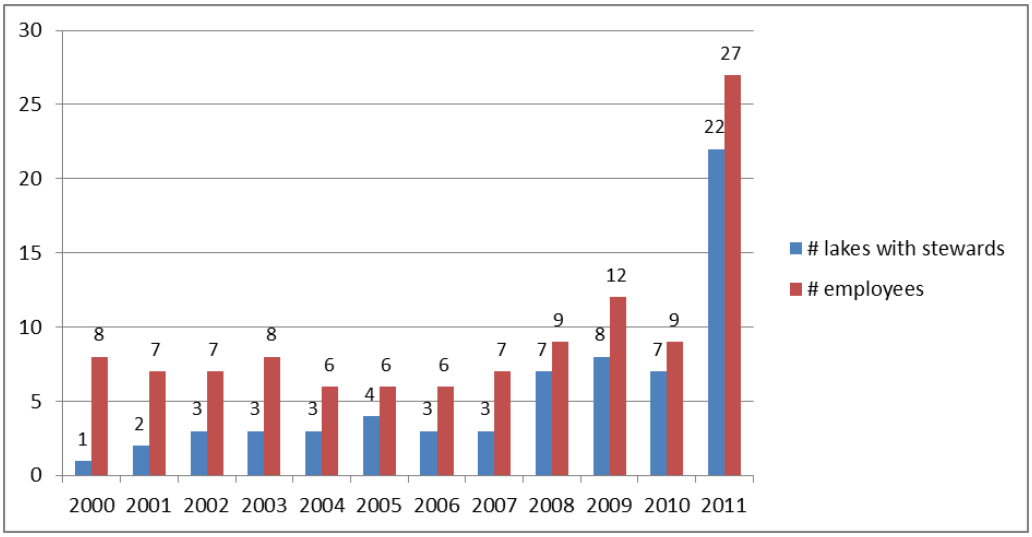

Figure 2- WSP growth, boat ramps and employees, 2000-2011.

For the fourth year, the WSP hosted a regional training for boat ramp stewards from the Lake George Association, our own WSP stewards, and stewards sponsored by individual lake associations across the Adirondack Park. In all, approximately 45 stewards from across the Adirondacks came to the Joan Weill Adirondack Library on the Paul Smith's College campus in May, 2011, for a multi-day training which addressed AIS identification and ecology, public interaction and education skills, and data collection procedures. The training featured presentations by representatives of the Adirondack Park Invasive Plant Program (APIPP), the Department of Environmental Conservation, the Lake George Association, the Adirondack Park Agency, Protect!, Dr. Nina Schoch of the Biodiversity Research Institute, and the WSP.

In 2011, stewards were stationed at 22 different boat launches across the Adirondack Park (Table 1).

Figure 3- Regional training for Adirondack Stewards, 2011.

Variations in coverage depended on funding resources allocated by lake associations and grant sources. In some instances, coverage was bolstered by volunteer steward coverage, as was the case with Rainbow Lake, Long Lake, Raquette Lake, and Osgood Pond. On June 24 and July 1, 2011, WSP and APIPP staff trained volunteers from all over the Adirondack Park at two separate workshops, located at the Adirondack Museum in Blue Mountain Lake and at Paul Smith's College.

Duty Post	Coverage
Burke's Marina/Raquette (11 days over summer)	as staff available
Cranberry Lake	4 days per week
Eighth Lake Campround (10 days over summer)	as staff available
Forked Lake Campground (1 day)	as staff available
Fourth Lake	5-6 days per week
Hollywood Hills - Private (1 day)	as staff available
Lake Flower	7 days per week
Lake Placid	7 days per week
Lake Placid Village	2 days per week
Limekiln Lake Campground (10 days over summer)	as staff available
Long Lake	7 days per week
Meacham Lake	2 days per week
Osgood Pond	2 days per week
Rainbow Lake	4 days per week
Raquette Lake	7 days per week
Saratoga Lake	7 days per week
Second Pond	7 days per week
Seventh Lake	3-5 days per week
St. Regis Canoe Area	4 days per week
Stillwater Reservoir (4 days over summer)	as staff available
Tupper Lake	4 days per week
Upper St Regis Lake	7 days per week

Table 1- Scope of boat ramp coverage, WSP 2011.

The WSP's 24 Watershed Stewards kept busy inspecting a total of over 20,000 boats and imparting an invasive species awareness message to almost 44,000 people across twenty-two sites (Table 2). Saratoga Lake was again the busiest site, representing over 4,000 boat inspections and over 9,000 members of the public contacted. Second Pond was the next busiest site, with over 3,400 boats inspected, followed by Lake Placid and Long Lake, each with approximately 1,800 boat inspections performed.

WSP Data Summary, 2011	Boat Type							total #	total #	organisms found	
Waterbody	M	PWC	S	C	K	B	R	boats	people	entering	leaving
Cranberry Lake	978	35	5	39	38	0	2	1097	2705	113	101
Fourth Lake	1026	211	20	15	70	1	3	1346	3364	159	57
Lake Flower	1228	118	1	116	134	0	6	1603	3782	102	225
Lake Placid	1049	2	22	198	569	14	19	1873	3932	59	20
Lake Placid Village	124	0	2	22	56	1	3	208	361	10	4
Long Lake	1027	87	4	444	237	1	7	1807	3854	84	41
Meacham Lake	125	24	4	22	23	0	23	221	589	8	12
Osgood Pond	16	0	0	59	69	0	2	146	220	2	2
Rainbow Lake	168	7	6	109	170	0	14	474	866	4	14
Raquette Lake	513	49	3	192	204	0	10	971	1963	110	122
Saratoga Lake	3542	255	31	58	220	3	12	4121	9264	52	4
Second Pond	1005	51	2	1109	1234	0	13	3414	6248	38	70
Seventh Lake	179	19	2	56	102	2	4	364	734	20	9
SRCA	3	0	0	351	119	0	1	474	791	4	2
St Regis	307	0	5	282	242	3	6	845	1400	27	5
Tupper Lake	927	41	26	140	80	0	2	1216	2658	50	78
Burkes Marina (11 days)	106	9	0	2	5	0	0	122	253	4	4
Eighth Lake Campround (10)	24	2	0	23	52	0	0	101	194	4	1
Forked Lake Campground (1)	3	0	0	5	0	0	0	8	23	1	2
Hollywood Hills - Private (1)	5	5	0	0	1	0	0	11	25	4	2
Limekiln Lake Campground (10)	26	6	0	11	51	0	2	96	181	10	6
Stillwater Reservoir (4)	70	5	0	17	24	0	0	116	302	8	4
totals	**12451**	**926**	**133**	**3270**	**3700**	**25**	**129**	**20634**	**43709**	**873**	**785**

Table 2- Comprehensive data summary, 2011; M = motorboat; K = kayak; C = canoe; B = construction barge; R = rowboat; S = sailboat; PWC = personal watercraft.

As a result of 19,431 boat inspections, stewards removed 1,658 organisms (invasive and non-invasive) from boats entering or leaving boat ramps, for an 8.5% organism transport rate over all 22 sites, and all watercraft types (Table 3). This is a small increase over the transport rate from 2010 (6.8% from seven sites). Organism transport rates for waterways staffed regularly ranged from highs in the 20% range (Raquette Lake- 27% and Cranberry Lake – 20%) to lows in the single percents (Saratoga Lake – 1%, Second Pond, Rainbow Lake, St. Regis Lake and Lake Placid – 4%). 190 fragments of Eurasian watermilfoil, 35 of variable-leaf milfoil, 14 zebra mussels and 5 fragments of water chestnut comprised the total invasive species removed over the summer. Overall, approximately 92% of boats visiting the waterways covered by the WSP can be expected to be "clean" or weed-free. However, the 8% of boats that are transporting materials presents a critical, cumulative threat to the integrity of Adirondack waterways.

WSP Data Summary, 2011	organism type								
Waterway	**EWM**	**BW**	**NM**	**GRS**	**WC**	**CLP**	**ZM**	**VLM**	**other**
Cranberry Lake	22	2	9	95	0	7	0	1	78
Fourth Lake	14	11	1	72	0	0	3	2	113
Lake Flower	56	23	17	161	0	5	1	10	54
Lake Placid	1	0	2	37	0	0	1	0	38
Lake Placid Village	1	0	0	7	0	0	0	1	5
Long Lake	11	4	4	47	2	0	4	5	48
Meacham Lake	0	0	0	12	0	0	0	0	8
Osgood Pond	0	0	0	3	0	0	0	0	1
Rainbow Lake	0	2	0	10	0	0	0	0	6
Raquette Lake	9	27	5	75	0	0	1	11	104
Saratoga Lake	19	0	3	24	0	0	2	0	8
Second Pond	49	0	5	33	1	1	0	0	19
Seventh Lake	0	3	0	16	0	0	0	0	10
SRCA	0	0	0	2	0	0	0	0	4
St Regis	1	1	3	14	0	0	0	0	13
Tupper Lake	2	4	0	92	2	0	0	4	24
Burkes Marina (11 days over summer)	1	1	1	0	0	0	0	0	5
Eighth Lake Campround (10)	0	0	0	4	0	0	0	0	1
Forked Lake Campground (1)	0	0	0	2	0	0	0	0	1
Hollywood Hills - Private (1)	0	0	0	2	0	0	0	0	4
Limekiln Lake Campground (10)	1	0	0	11	0	0	1	1	2
Stillwater Reservoir (4)	3	0	2	4	0	0	1	0	2
totals	**190**	**78**	**52**	**723**	**5**	**13**	**14**	**35**	**548**
	1.0%	0.4%	0.3%	3.7%	0.0%	0.1%	0.1%	0.2%	2.8%

Table 3-Summary of organisms removed and spread prevention measures taken by visitors, 2010; EWM = Eurasian watermilfoil; BW = bladderwort; NM = native milfoil; GRS = grass; WC= water chestnut; ZM = Zebra mussel; VLM = variable leaf milfoil.

Of the 1,658 organisms removed over the summer, 257 are considered aquatic invasive species by the APIPP, constituting 15.5% of organisms removed from watercraft. Stewards positively identified Eurasian watermilfoil from among organisms removed from watercraft 190 times over the summer, with the highest incidence of this invasive species at Lake Flower (56 samples), followed by Second Pond (49 times), Cranberry Lake (22), and Saratoga Lake (19) (Table 3). Eurasian watermilfoil was found very infrequently at the other sites. Zebra mussels were discovered 14 times, in greatest numbers at Long Lake and Fourth Lake. Curly leaf pondweed was found 13 times. Variable leaf milfoil was found most frequently at Raquette Lake and Lake Flower. Various grasses were most commonly found and removed, along with "other," a category reserved for miscellaneous and unknown organisms such as pine needles, spider webs, mud and badly degraded organics that hopefully pose little risk of introducing new AIS.

WSP Data Summary, 2011	# groups taking AIS spread prevention measures										# inspections	% boat-groups
Waterways	yes	I	WB	DB	BB	LW	Dis	Dry	didn't	# groups	by group	dirty
Cranberry Lake	518	123	245	152	7	27	1	108	0	970	1143	19%
Fourth Lake	736	301	592	184	8	7	29	107	26	1131	1382	16%
Lake Flower	1213	567	760	127	2	9	1	188	45	1526	1815	18%
Lake Placid	976	534	587	103	1	5	2	139	31	1426	1863	4%
Lake Placid Village	116	43	86	8	1	1	0	8	1	178	115	12%
Long Lake	789	294	564	72	13	19	14	111	6	1587	1569	8%
Meacham Lake	117	76	57	28	0	1	0	31	6	201	245	8%
Osgood Pond	55	47	28	1	0	0	0	7	0	99	147	3%
Rainbow Lake	199	78	118	14	0	1	0	65	11	358	435	4%
Raquette Lake	472	157	329	72	10	8	5	60	54	757	865	27%
Saratoga Lake	2934	839	1860	720	4	35	1	21	8	4029	4159	1%
Second Pond	1380	728	845	143	1	5	1	126	41	2173	2491	4%
Seventh Lake	222	64	142	14	0	1	0	40	4	346	435	7%
SRCA	164	87	79	15	1	0	0	24	7	271	300	2%
St Regis	478	222	325	17	0	3	1	105	28	610	762	4%
Tupper Lake	726	416	549	55	2	4	0	73	18	1069	1266	10%
Burkes Marina (11 days over summer)	61	14	52	6	0	0	0	2	1	118	132	6%
Eighth Lake Campround (10)	15	15	19	5	1	1	1	17	4	65	76	7%
Forked Lake Campground (1)	6	2	5	0	0	0	0	0	0	9	10	30%
Hollywood Hills - Private (1)	5	0	5	1	0	0	0	0	0	9	10	60%
Limekiln Lake Campground (10)	34	15	27	8	0	0	0	0	4	88	105	15%
Stillwater Reservoir (4)	61	23	45	2	0	0	0	1	0	104	106	11%
totals	**11277**	**4645**	**7319**	**1747**	**51**	**127**	**56**	**1233**	**295**	**17124**	**19431**	**9%**
	66%	27%	43%	10%	0%	1%	0%	7%	2%			

Table 4- I = inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = drained livewell; Dis = disposed of unused bait; Dry = dried boat.

Stewards at all 22 sites encountered a total of 17,124 groups of visitors, each of whom was asked about the AIS spread prevention measures they took prior to arriving at the boat ramp. 66% (78% in 2010) of all visitors reported taking some spread prevention measure; some of these visitors took more than one measure, so the total adds up to greater than 100%. 27% (62% in 2010) inspected their boats prior to launching, 43% (38%) washed them, and 17% (17%) drained the bilge or dried their boats. Safely disposing of unwanted bait remains an infrequently exercised AIS spread prevention measure (Figure 2).

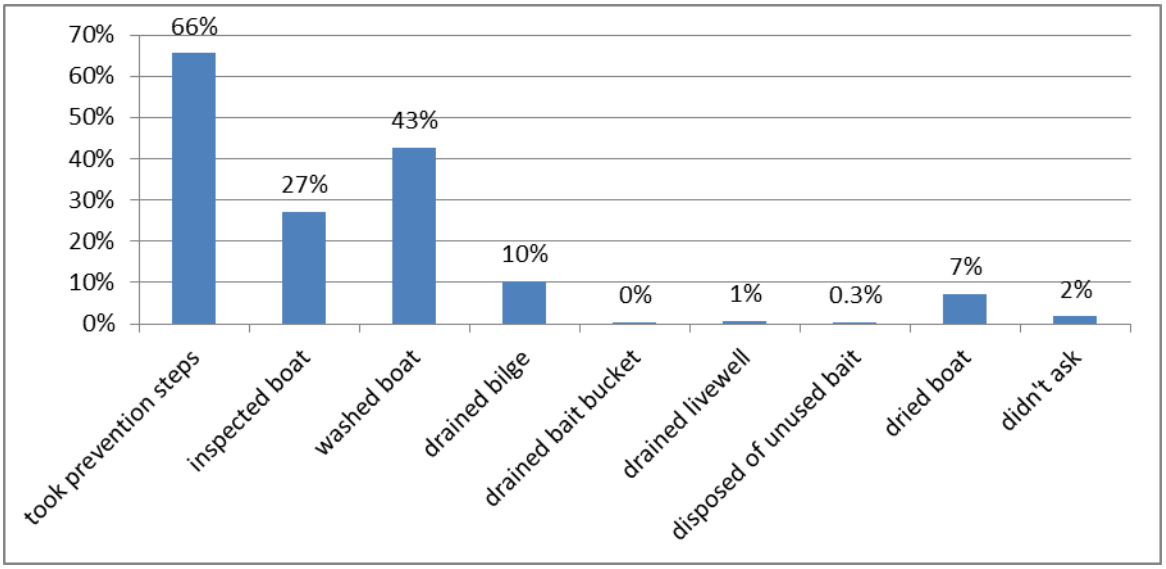

Figure 2- AIS spread prevention measures taken, all WSP sites, 2011.

WSP Data Summary, 2011	
Waterbody	**yes %**
Cranberry Lake	53%
Fourth Lake	65%
Lake Flower	79%
Lake Placid	68%
Lake Placid Village	65%
Long Lake	50%
Meacham Lake	58%
Osgood Pond	56%
Rainbow Lake	56%
Raquette Lake	62%
Saratoga Lake	73%
Second Pond	64%
Seventh Lake	64%
SRCA	59%
St Regis	78%
Tupper Lake	68%
Burkes Marina (11 days)	52%
Eighth Lake Campround (10)	23%
Forked Lake Campground (1)	67%
Hollywood Hills - Private (1)	56%
Limekiln Lake Campground (10)	39%
Stillwater Reservoir (4)	59%
totals	66%

Table 5- Percent of respondents adopting any AIS spread prevention measure, WSP boat ramps, 2011.

The total percentages of visitors taking any AIS spread prevention measures varied from lake to lake. The steward survey of visitors revealed high rates of visitors reporting spread prevention measures at Lake Flower (79% of visitors taking AIS spread prevention measures), Upper St. Regis Lake (78%), and Saratoga Lake (73%). The lowest rates occurred at Long Lake (50% of visitors taking spread prevention measures), Cranberry Lake (53%), Osgood Pond and Rainbow Lake (both 56%). This variability suggests differing values in discrete visitor groups, reflecting perhaps differences in conditions or visitor expectations at boat ramps.

Analysis of prior waterway visitation

Stewards ask each visitor group where their boat has been last in the prior two-week period. As one might imagine, the 17,124 groups in the survey reported a wide range of prior waterways they had visited. Visitors reported using their boats at 458 different waterways in the prior two-week period. These waterways were located all over the eastern United States and Canada, with a few from points more distant. An analysis of the top 50 responses, excluding same-lake responses (e.g., a visitor from Lake Placid listing “Lake Placid” as the prior lake visited), shows a range of responses. The most frequent response was “None” (36% of all visits) followed by the Saranac Lake Chain (3.5%), the

Prior waterway visited	Sum of # visits	% of total visits
None	5699	36.24%
Saranac Lake Chain	548	3.48%
Rental	380	2.42%
Fulton Chain of Lakes	179	1.14%
Lake Flower	156	0.99%
Lake Placid	153	0.97%
Lake Champlain	142	0.90%
Lake George	133	0.85%
Hudson River	103	0.66%
Lake Ontario	93	0.59%
Tupper Lake	93	0.59%
St. Lawrence River	90	0.57%
Mohawk River	87	0.55%
Raquette Lake	85	0.54%
Great Sacandaga Reservoir	78	0.50%
Buck Pond	74	0.47%
Mirror Lake	72	0.46%
Upper St Regis Lake	61	0.39%
Long Lake	59	0.38%
Fish Creek Ponds	50	0.32%
Little Clear Pond	49	0.31%
Schroon Lake	48	0.31%
Oneida Lake	46	0.29%
Raquette River	45	0.29%
Atlantic Ocean	41	0.26%
Chateaugay Lake	39	0.25%
Cranberry Lake	30	0.19%
Lake Bonaparte	30	0.19%
Rollins Pond	29	0.18%
Saratoga Lake	29	0.18%
Lake Colby	28	0.18%
Osgood Pond	28	0.18%
Rainbow Lake	28	0.18%
Connecticut River	25	0.16%
Canandaigua Lake	24	0.15%
Cossayuna Lake	24	0.15%
Saranac River	24	0.15%
Blue Mountain Lake	22	0.14%
Delta Lake	22	0.14%
Follensby Clear Pond	22	0.14%
Taylor Pond	22	0.14%
BALLSTON LAKE	21	0.13%
Kiwassa Lake	21	0.13%
Black Lake	20	0.13%
LAKE KUSHAQUA	20	0.13%
Moose Pond	20	0.13%
ROUND LAKE	20	0.13%
Floodwood Pond	19	0.12%
Hoel Pond	19	0.12%
Sacandaga Lake	19	0.12%

Table 6- 50 most-visited waterways in two-week prior period, all WSP lakes, 2011.

Fulton Chain of Lakes (1.1%), and descending to the fiftieth most common prior waterway, Sacandaga Lake (0.12%). Visitors were three times as likely to have visited the Saranac Lake Chain as they were to have visited the next most mentioned lake, the Fulton Chain. Overall, there was great variety in prior waterways mentioned by visitors, with most lakes well under 1% of total visits. 234 of the 458 waterbodies mentioned were cited only one time each, representing a total of 1.48% of total visits (234 of 15,725 waterbodies mentioned).

A large percentage of visitors, differing among the 22 boat ramps, reported having visited the same lake as the last lake they had visited in the prior two-week period. These "same-lake prior visits" represented 5,402 total responses or 34% of the total visits in the data set. In sum, two answers comprise 70% of the responses for the prior-waterway question: "none" (36%) and "same-lake" (34%), which total 70%. Both of these categories represent lower risk of transporting AIS; therefore, 70% of visiting boats in this study presented a lower risk of transporting new AIS to waterways.

However, the same-lake prior visit figures vary considerably among the 22 lakes in the study. 60% of visitors to Lake Placid cite it as the prior waterway, followed by Lake Placid Village (58%), Tupper Lake (57%), Meacham Lake (52%), and Saratoga Lake (52%). These lakes can be thought of as "repeat-visit" lakes, with over half of visitors using their watercraft on these lakes before. Over half of the boats visiting repeat-visit lakes can be considered "lower risk."

On the other end of the scale, several lakes can be thought of as "new-visit" lakes, with far greater percentages of visitors reporting a wide range of prior waterway visits. The lakes with the lowest same-lake prior visit figures ("new-visit" category) are Rainbow Lake (6% same-lake visits), Osgood Pond (11%), Cranberry Lake (12%), Fourth Lake (14%) and Second Pond (15%). Most of the visitors to these waterways can be considered

"higher risk" since they are much more likely than visitors to the repeat-visit category lakes to have visited another waterway, which might host AIS.

Lake	Same-lake prior visits, % of total visits	Total # waterbodies reported for prior visits	Shannon-Weiner Index of Diversity
Second Pond	15%	170	3.29
St Regis Canoe Area	n/a	59	2.74
Upper St. Regis Lake	29%	84	2.71
Rainbow Lake	6%	58	2.37
Raquette Lake	21%	68	2.33
Lake Flower	40%	97	2.24
Seventh Lake	26%	39	2.22
Lake Placid	60%	112	2.09
Meacham Lake	52%	27	2.00
Long Lake	21%	116	1.86
Tupper Lake	57%	78	1.81
Cranberry Lake	12%	68	1.76
Osgood Pond	11%	21	1.71
Fourth Lake	14%	74	1.65
Lake Placid Village	58%	27	1.59
Saratoga Lake	52%	76	1.31

Table 7- Same-lake and prior-lake diversity analysis, WSP lakes, 2011.

There was a range of diversity in terms of prior waterways reported at each of the 22 boat ramps. The range of different waterways was 170 (Second Pond) to 21 (Osgood Pond). The mean was 73, the median 71, and the standard deviation 38. The Shannon-Weiner Index, initially used in the fields of information theory and demographics, measures order or lack thereof in data sets.[1] Ecologists commonly use the Shannon-Weiner Index of Diversity to assess the biological (species) diversity of test sites. It involves calculating the percent frequency of the different responses (in this case prior-visited waterbodies) and multiplying this by the frequency's natural log. The sum of these products for each lake is a value representing diversity, labeled H'. This formula measures waterbody variance evenness and richness. That is, the Shannon-Weiner Index score is higher when the waterbodies are both *evenly distributed* (similar number of visits reported for each waterbody) and *richly varied* (greater number of possible waterbodies). By this metric, Second Pond is the most diverse and Saratoga Lake is the least, in terms of the evenness and richness of prior-visited waterbodies mentioned by respondents at each site. This indicates that Second Pond and the other lakes at the high end of the scale are the more "diverse" boat ramps and could thereby be considered higher risk in terms of being the focal points of *significant numbers of visits each* from a variety of waterways. While Long Lake has a comparatively high number of different waterbodies reported as prior visits (116) it has low *evenness*, that is, the visitor-reported prior waterbodies each have highly varied numbers of responses (most are 1, and several are in the teens and double digits; few are in the middle). It is important to note that the Shannon-Weiner diversity scores are on a logarithmic scale, that is, values increase

[1] (Raytheon Employees Wildlife Habitat Committee, 2000)

logarithmically, not arithmetically. The chart helps illustrate the comparative differences between the diversity index scores of each lake.

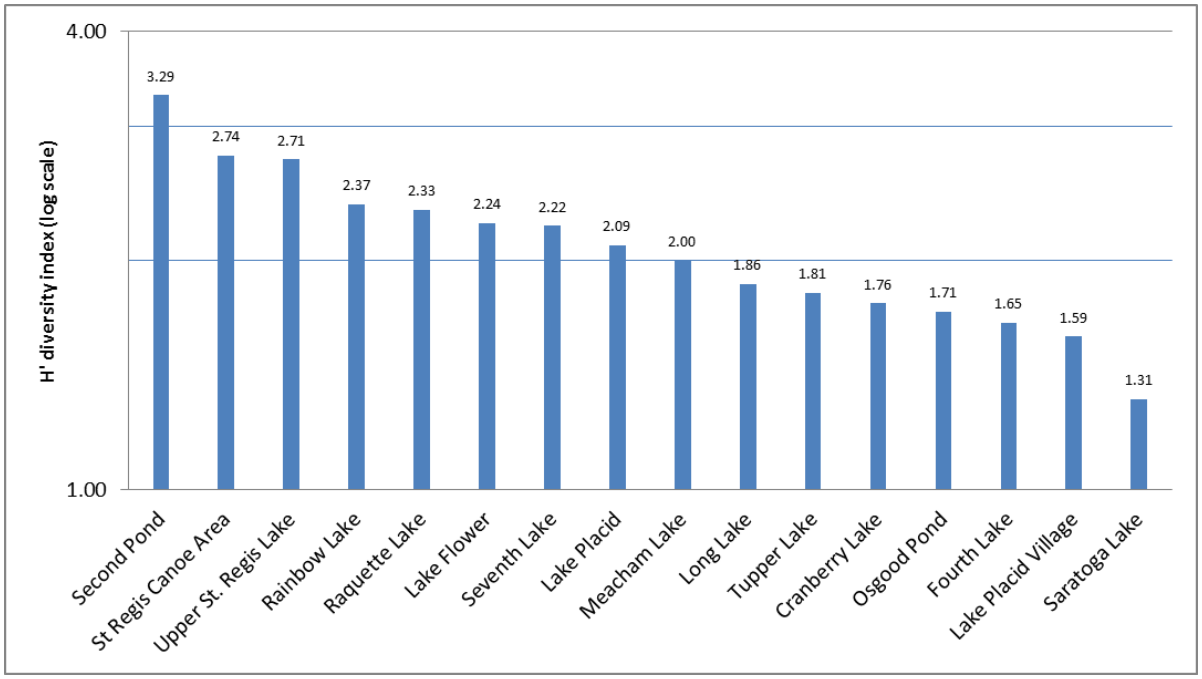

Figure 4- Shannon-Weiner diversity index scores, WSP lakes, 2011.

Multiple-Year perspective

Since 2000, the Watershed Stewardship Program has enjoyed steady growth in terms of the number of lakes served and numbers of boats inspected and people educated. With the increasing and changing array of lakes served by Watershed Stewards, the number of visitors educated by the program has increased dramatically as well. From the initial summer, which saw approximately 1,000 visitors contacted at Upper St. Regis Lake, stewards at 22 lakes contacted approximately 43,000 visitors in 2011 (Figure 6). 137,078 visitors were contacted in total over 12 years.

Figure 5- Steward Claire Baker at Second Pond.

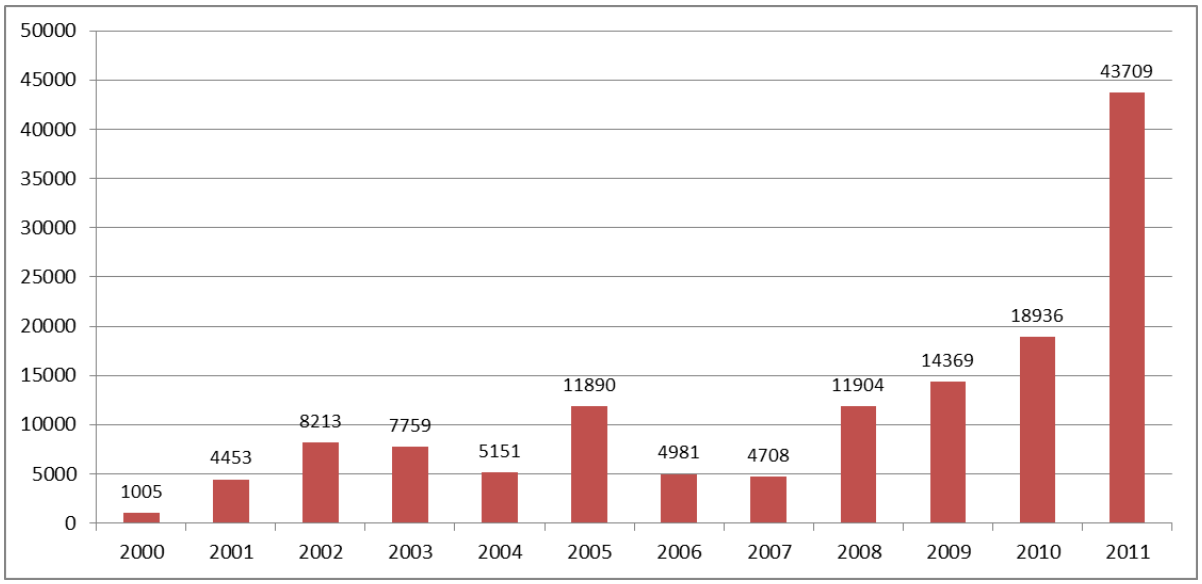

Figure 6- Number of visitors contacted by the Watershed Stewardship Program, 2000-2011.

Perhaps the most significant indicator of program growth is the number of boats inspected by stewards at each location over the last twelve years (Figure 7). Stewards inspected 489 boats in 2000, and 20,634 in 2011, a 40-fold increase. A grand total of 64,423 boats have been inspected over the twelve-year history of the Watershed Stewardship Program.

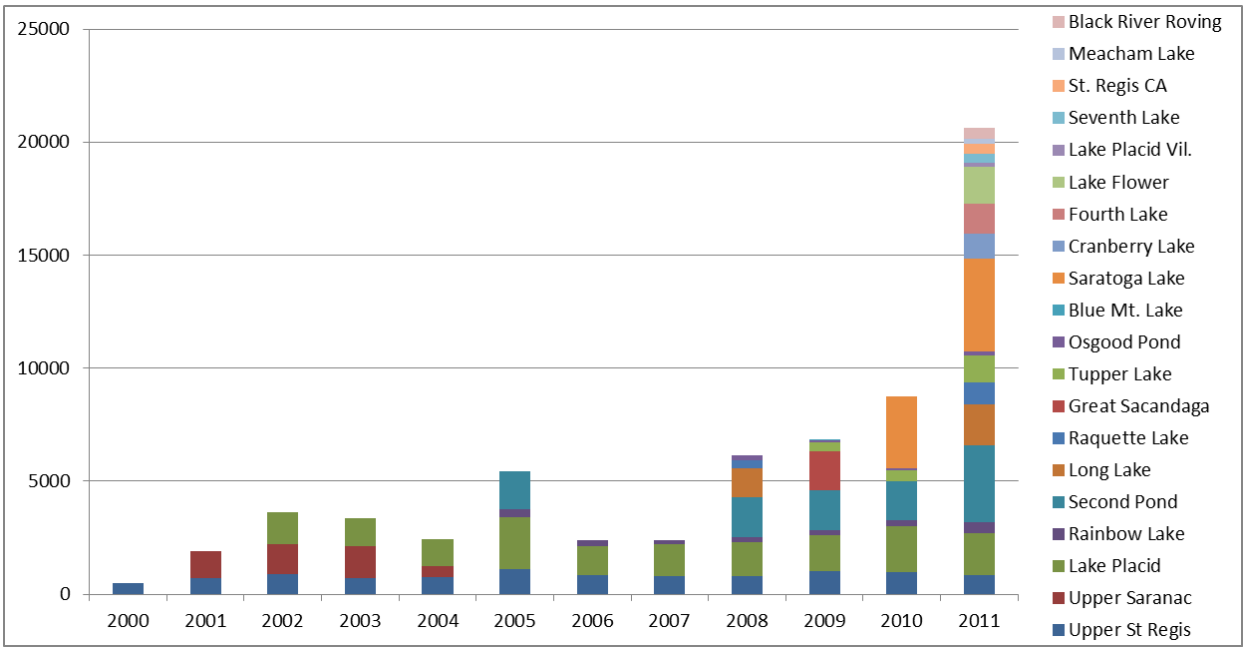

Figure 7- Number of watercraft inspected by Watershed Stewardship Program stewards, 2000-2011.

Research and Service Projects

In addition to the core duties of educating the public about AIS and inspecting boats to interdict invasive species, our stewards are involved in a variety of service and research functions designed to support the integrity of local ecosystems and to educate the public at large, away from the boat ramp. Inside this report you will learn about some of these functions and projects, ranging from purple loosestrife montoring and control on the St. Regis Lakes, banded loon monitoring, a study of odonates (dragonfly and damselflys), water quality monitoring and a continued study of the viability of Eurasian watermilfoil after drying. These projects are under the expert guidance and supervision of Dr. Celia Evans, a plant ecologist and professor at Paul Smith's College, who also functions in the summer as the WSP's Science Director and co-administrator. These projects are essential for extending the scope and range of the program and for offering additional challenges and variety to the stewards, who can become worn down by the rigor and routine of boat ramp duty. The milfoil study also takes advantage of our state of the art lab facilities in the ground floor of the Paolozzi Environmental Center at Paul Smith's College, which serves as the headquarters of the Adirondack Watershed Institute and the Watershed Stewardship Program.

Conclusion and acknowledgements

The WSP has enjoyed a twelfth summer of service to Adirondack waterways. This summer presented an unprecedented set of challenges as the program tripled in size in terms of employees and lakes covered. In order to meet the additional supervisory challenges, the WSP created a new position, Assistant Director for Western Adirondack Steward Programs, and hired Kathleen Wiley to fulfill the role. Kathleen has been an invaluable asset in our successful summer of program implementation over a greatly expanded geographic range. We would like to acknowledge the funding support of the United States Fish and Wildlife Service, the Great Lakes Restoration Initiative, the Lake Champlain Basin Program, the Nature Conservancy, the St. Regis Foundation, the Saratoga Lake Improvement District, and the Lake Placid Shore Owners' Association. As always, financial support is only part of the recipe for program success. The invaluable support and contributions of people at each of the previously mentioned agencies has injected creativity, enthusiasm and vision into what we do. The WSP is a synergistic effort that draws on the human resources of the Adirondack community, and seeks to contribute to them as an output of program activity.

Inquiries are welcome. Please contact Dr. Eric Holmlund, Director, Watershed Stewardship Program, Paul Smith's College, Box 265, Paul Smiths, New York, 12970. Telephone: (518) 327-6341. Email: eholmlund@paulsmiths.edu.

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West Central Adirondack Region Summary

By Kathleen Wiley, WSP Western Region Assistant Director

Through a grant from the U.S. Fish and Wildlife Service of Great Lakes Restoration Initiative money, Paul Smith's Watershed Stewardship Program (WSP) expanded coverage to the west-central Adirondacks. The WSP stationed stewards at lakes within the Black River and Oswegatchie watersheds, emptying into Lake Ontario, and the Raquette River watershed, emptying into the St. Lawrence River. Stewards were located full-time at Raquette Lake Village's private boat launch and the New York State (NYS) Boat Launch at Long Lake (Table 8). The NYS Boat Launches at Fourth and Seventh Lakes on the Fulton Chain of Lakes had part-time steward coverage. Stewards covered the boat launches at Burke's Marina on Raquette Lake, Eighth Lake Public Campground and Limekiln Lake Public Campground approximately once per week. Stewards visited Stillwater Reservoir, NYS Forked Lake Campground, and the Hollywood Hills boat launch on First Lake occasionally during the summer to increase AIS awareness and explore the idea of greater steward coverage at these locations in the future.

Duty Post	Coverage (Average)
Long Lake	7 days per week
Raquette Lake	7 days per week
Fourth Lake	5-6 days per week
Seventh Lake	3-5 days per week
Burkes Marina (11 days)	as staff available
Eighth Lake Campround (10 days)	as staff available
Limekiln Lake Campground (10)	as staff available
Stillwater Reservoir (4 days)	as staff available
Forked Lake Campground (1 day)	as staff available
Hollywood Hills - Private (1 day)	as staff available
Cranberry Lake	4 days per week
Meacham Lake	2 days per week
St. Regis Canoe Area	4 days per week
Tupper Lake	4 days per week

Table 8- Scope of boat ramp coverage, WSP Western Region 2011.

The federal government's largest investment in two decades in the Great Lakes region is the Great Lakes Restoration Initiative. It is composed of a task force of 11 federal agencies who have developed an action plan for the initiative. This action plan is for fiscal years 2010 through 2014 and addresses five issues including combating invasive species, tracking progress and working with strategic partners. There are four funded invasive species control projects in New York State including the Paul Smith's project, Eastern Lake Ontario Headwaters Watercraft Inspector Program. The three other projects are Lake Ontario Wetland Invasive Species Control and Restoration implemented by The Nature Conservancy, Aquatic Plant Control, conducted by the U.S. Army Corps of Engineers in conjunction with universities, and Implementation of the New York State Aquatic Nuisance Species Management Plan, which is funded through the U.S. Department of the Interior.

Preparation for placing stewards in a region where the WSP had had very little presence was accomplished during the spring of 2011 through research of what lakes would benefit most from WSP presence and logistics such as finding summer housing for the stewards. A preseason meeting was held at the Inlet Town Hall on April 6, 2011 with the Inlet Town Supervisor and representatives of the Fulton Chain of Lakes Association and Sixth and Seventh Lakes Improvement Association. At that time the WSP director and assistant director toured the possible boat launches. WSP staff made a follow up visit to the western area on May 19 to solidify duty locations and meet with further contacts. A wrap up meeting of the 2011 season and preplanning for the 2012 season was held at the Inlet Town Hall on November 7. In attendance, besides the WSP, were the Inlet Town Supervisor and a representative from the Raquette Lake Property Owners' Association. The WSP also gave a presentation to the Long Lake Town Board on December 14.

Between Memorial Day and Labor Day, the stewards inspected 7,950 boats with a total of 17,636 people at ten boat launches in the western region. 59% of the groups took some AIS prevention measures with 23% inspecting their boat, 40% washing their boat, 9% draining the bilge and/or drying their boat, and 1% each emptying bait buckets, draining livewells, and/or disposing of unused bait (Figure 8). 2% of boater groups were not asked. The percentages of compliant boaters may rise next summer as WSP stewards educate more boating parties in the region.

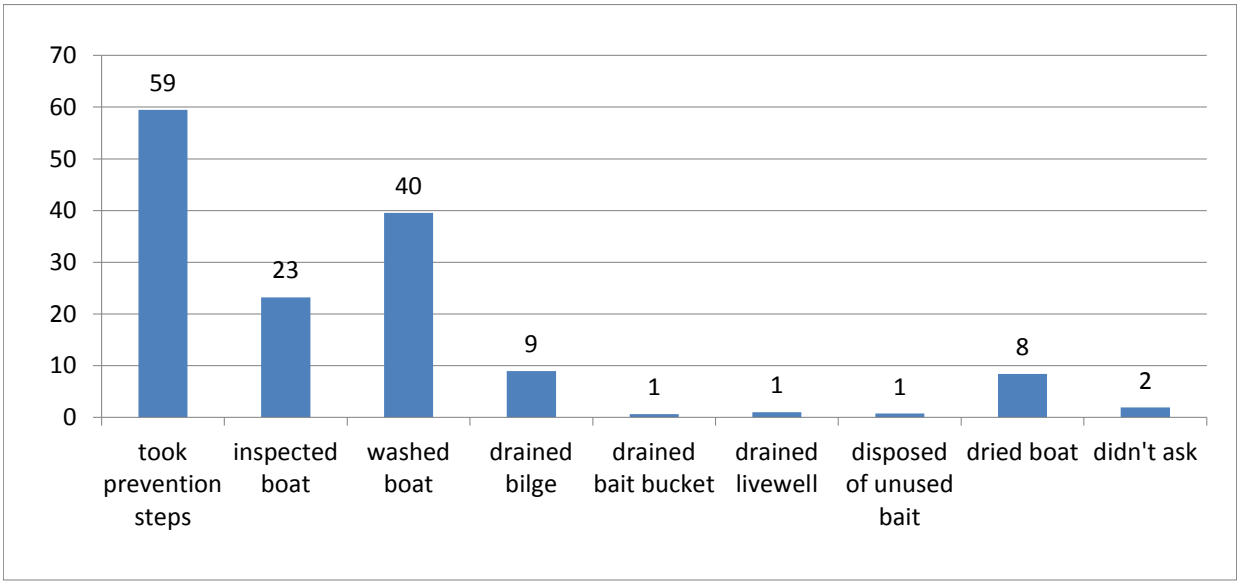


Figure 8- Percent of visitors taking AIS spread prevention measures at western WSP sites, 2011.

The organism transport rate at all fourteen sites in the western region was 13% or 1,005 organisms found over 7,644 inspections of both boats entering and leaving the body of water. Raquette Lake had a significantly higher transport rate at 27%. This may be due to weeds near the boat launch, which are contacted and transported as the boats are retrieved. Next is Cranberry Lake with an transport rate of 20% and Fourth Lake with at 14%. Tupper Lake is at 10%, Meacham Lake at 8%, both Long and Seventh Lake had a transport rate of 7%, and the St. Regis Canoe Area had an extremely low rate of 2%. The other lakes were not covered enough for accurate statistics. 101 invasive organisms were removed at all fourteen sites. 63 organisms were Eurasian watermilfoil, 24 were variable leaf milfoil, four were water chestnuts, and ten were zebra mussels.

Figure 9- WSP Western Region Stewards from firetower on Bald Mt., (G. Meade, 2011).

Research and Service Projects

The stewards spent one day during the work week working on a special project other than AIS prevention at the boat launches. These were not defined in the western region and so needed to be created according to the stewards' interest and what type of activity would benefit the region. One steward monitored loons on Big Moose Lake for the Biodiversity Research Institute. This was an established project in the eastern region so the contacts were already established. A Biodiversity Research Institute technician who was stationed in the area and a local volunteer for the project were able to assist the steward with start-up of the project. Two stewards modeled a continuing odonate study being conducted in the eastern region and also contributed to the All Taxa Biological Inventory, working through Paul Smith's College. It took time for the stewards to lay the ground work to work in a new field area, but the research was productive. It will be beneficial to continue this research project in 2012.

Two stewards participated in outreach for introducing the WSP to a new area. The stewards researched local newspapers, organization newsletters, distribution sites for the WSP newsletter, and lake association and other meetings that they could attend. All the stewards did a great job introducing the WSP to the west-central Adirondacks and raising the level of AIS awareness across the region. Over the summer the WSP found more contacts to be pursued in 2012 as well as continue with the relationships formed. A WSP Facebook page was created that needs to be maintained and the two monthly issues of the WSP newsletter require design and distribution. Another steward researched area local government transport laws for the purpose of assisting any group, local governments or lake associations, that wanted more information on this topic. Unless a specific need is expressed a different topic of research to assist the local community will be chosen in 2012.

Stewards also assisted with WSP material such as updating the staff manual to reflect the expansion of the WSP. This type of WSP upkeep proves beneficial for the ongoing WSP. The WSP stationed a steward on top of Bald Mt., north of Old Forge, twice this summer. Although this project did not continue through the summer it would be a great opportunity in the future to place a steward on Bald Mountain or Blue Mountain to educate hikers on their natural resource impacts. Another potential research project for 2012 is to continue the Eurasian watermilfoil desiccation project ongoing in the eastern region.

Conclusion

Expanding the WSP to the central and western portion of the Adirondack Park was overall successful and should prove easier in the future with critical groundwork laid. The local communities were exceedingly helpful in assisting with infrastructure that needed to be coordinated over a large geographic area, such as weekly meeting locations, photocopier use, and other office facilities so western unit WSP staff were not forced to drive to the Paul Smith's Campus weekly. Weekly WSP duties will flow more smoothly in 2012 due to the groundwork that has been laid by this stewarding season. Using Skype, or some other technology, to connect the two portions of the WSP for staff meetings may be helpful to increase communication throughout the WSP. Due to cell phone coverage limits between Old Forge and Long Lake it would be beneficial for the supervisor to have instant access to email via a smart phone or other device.

The west central Adirondacks can be remote for someone not accustomed to rural living. Lack of cell phone coverage, distances to shopping and banking, and being removed from family and friends proved to be a challenge for many of the stewards. Social activities such as the Adirondack Intern Mixer at The Wild Center and the WSP overnight at John Dillon Park, a facility run by Paul Smith's College just outside Tupper Lake, should be continued to promote connectivity among the WSP. It is a challenge to keep the steward position fresh and interesting as the summer season wears on. Another staffing challenge is stewards leaving in August for college and preparation for the fall semester. It should be well established at the beginning of the season what each stewards ending date will be. Possibly some part time high school students could be hired to cover the end of the season.

Acknowledgements go to the U.S. Fish and Wildlife Service for the Great Lakes Restoration Initiative Grant for the ability to expand the WSP to the west-central region of the Adirondacks. Town Supervisors John Frey, Inlet, and Clark Seaman, Long Lake, were supportive of AIS prevention. Mitch Edelstein, Raquette Lake District Clerk, and Louis Burke allowed the WSP use of the Raquette Lake Union Free School. All area lake associations including the Fulton Chain of Lake Association, Sixth and Seventh Lakes Improvement Association, Raquette Lake Property Owners' Association, Long Lake Association, Hollywood Hills Association, Big Moose Lake Association, and the White Lake Association assisted the WSP throughout the summer. Pat Deyle and Ken Hawks of the Raquette Lake Property Owners Association and Barbara Taylor and Jackie Mallery of the Long Lake Association were particularly

helpful over the summer. The New York State Department of Environmental Conservation was welcoming in allowing us at their boat launches, campgrounds and firetower summits throughout the region, particularly Ron Andersson. Jim Dillon and Burke's Marina allowed the WSP to cover their boat launches. NYS Department of Conservation Forest Rangers Jim Waters, Jason Scott, and Luke Evans were helpful to the WSP. Caitlin Stewart of the Hamilton County Soil & Water District, the Biodiversity Research Institute- particularly Michelle Brown, Mitch Lee and Gary Lee were all supportive of different aspects of the WSP's western division this summer.

Figure 10- View of Fulton Chain of Lakes from Bald Mt. (G. Meade, 2011).

WSP W-C Data Summary, 2011	Boat Type							total #	total #	organisms found	
Waterbody	M	PWC	S	C	K	B	R	boats	people	entering	leaving
Cranberry Lake	978	35	5	39	38	0	2	1097	2705	113	101
Fourth Lake	1026	211	20	15	70	1	3	1346	3364	159	57
Long Lake	1027	87	4	444	237	1	7	1807	3854	84	41
Meacham Lake	125	24	4	22	23	0	23	221	589	8	12
Raquette Lake	513	49	3	192	204	0	10	971	1963	110	122
Seventh Lake	179	19	2	56	102	2	4	364	734	21	9
SRCA	3	0	0	351	119	0	1	474	791	4	2
Tupper Lake	927	41	26	140	80	0	2	1216	2658	50	78
Burkes Marina (11 days)	106	9	0	2	5	0	0	122	253	4	4
Eighth Lake Campround (10)	24	2	0	23	52	0	0	101	194	4	1
Forked Lake Campground (1)	3	0	0	5	0	0	0	8	23	1	2
Hollywood Hills - Private (1)	5	5	0	0	1	0	0	11	25	4	2
Limekiln Lake Campground (10)	26	6	0	11	51	0	2	96	181	10	6
Stillwater Reservoir (4)	70	5	0	17	24	0	0	116	302	8	4
totals	**5012**	**493**	**64**	**1317**	**1006**	**4**	**54**	**7950**	**17636**	**580**	**441**

Table 9- Summary, 2011. M= motorboat; K= kayak; C= canoe; B= construction barge; R= rowboat; S=sailboat; PWC= personal watercraft.

WSP W-C Data Summary, 2011									
Waterbody	EWM	BW	NM	GRS	WC	CLP	ZM	VLM	other
Cranberry Lake	22	2	9	95	0	7	0	1	78
Fourth Lake	14	11	1	72	0	0	3	2	113
Long Lake	11	4	4	47	2	0	4	5	48
Meacham Lake	0	0	0	12	0	0	0	0	8
Raquette Lake	9	27	5	75	0	0	1	11	104
Seventh Lake	0	2	0	14	0	0	0	0	10
SRCA	0	0	0	2	0	0	0	0	4
Tupper Lake	2	4	0	92	2	0	0	4	24
Burkes Marina (11 days)	1	1	1	0	0	0	0	0	5
Eighth Lake Campround (10)	0	0	0	4	0	0	0	0	1
Forked Lake Campground (1)	0	0	0	2	0	0	0	0	1
Hollywood Hills - Private (1)	0	0	0	2	0	0	0	0	4
Limekiln Lake Campground (10)	1	0	0	11	0	0	1	1	2
Stillwater Reservoir (4)	3	0	2	4	0	0	1	0	2
totals	**63**	**51**	**22**	**432**	**4**	**7**	**10**	**24**	**404**
	0.8%	0.7%	0.3%	5.7%	0.1%	0.1%	0.1%	0.3%	5.3%

Table 10- EWM= Eurasian watermilfoil; BW= bladderwort; NM= native milfoil, GRS= grass; WC=water chestnut; ZM= Zebra mussel; VLM= variable leaf milfoil.

WSP W-C Data Summary, 2011	# groups taking AIS spread prevention measures										
Waterbody	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups	# inspections
Cranberry Lake	518	123	245	152	7	27	1	108	0	970	1143
Fourth Lake	736	301	592	184	8	7	29	107	26	1131	1382
Long Lake	789	294	564	72	13	19	14	111	6	1587	1569
Meacham Lake	117	76	57	28	0	1	0	31	6	201	245
Raquette Lake	472	157	329	72	10	8	5	60	54	757	865
Seventh Lake	222	64	142	14	0	1	0	40	4	346	435
SRCA	164	87	79	15	1	0	0	24	7	271	300
Tupper Lake	726	416	549	55	2	4	0	73	18	1069	1266
Burkes Marina (11 days)	61	14	52	6	0	0	0	2	1	118	132
Eighth Lake Campround (10)	15	15	19	5	1	1	1	17	4	65	76
Forked Lake Campground (1)	6	2	5	0	0	0	0	0	0	9	10
Hollywood Hills - Private (1)	5	0	5	1	0	0	0	0	0	9	10
Limekiln Lake Campground (10)	34	15	27	8	0	0	0	0	4	88	105
Stillwater Reservoir (4)	61	23	45	2	0	0	0	1	0	104	106
totals	**3926**	**1587**	**2710**	**614**	**42**	**68**	**50**	**574**	**130**	**6725**	**7644**
	58%	24%	40%	9%	1%	1%	0.7%	9%	2%		

Table 11- I= inspected boat; WB= washed boat; DB= drained bilge, BB= emptied bait bucket; LW= drained livewell; Dis= disposed of unused bait; Dry= dried boat.

Watershed Stewardship Program- Staff Profiles

Jaden Aronow, Watershed Steward
Jaden is a third year student at the Rochester Institute of Technology and he is pursuing a degree in Environmental Sustainability, Health, and Safety. This is Jaden's first experience in the Adirondacks, but it promises to be one to remember. His passion and dedication will go far to keep the waters of the Western Adirondacks clean this summer.

Claire Baker, Watershed Steward
Claire is originally from Western New York and is currently an Environmental Science major at Paul Smith's College. She enjoys climbing, hiking, and any other Adirondack adventure you can think of. She has been a great help to the Watershed Stewardship Program and other members of the team. She is always willing to help in any way she can and always with a smile on her face. The program would not have been the same without her passion and knowledge of the environment, as well as her general good nature.

Wesley Bates, Watershed Steward and Weekend Supervisor
Wesley is a recent graduate of the State University of New Hampshire with a bachelor's degree in Environmental Conservation. He spent last summer in Colorado interning at a National Park and plans on once again traveling out west upon the stewardship program's completion. Wesley grew up in New Hampshire where he fell in love with the White Mountains. Since coming to the Adirondacks, he has found a new love in the High Peaks. He aspires to continue to work in environmental conservation with possible side endeavors in Search and Rescue. You can find Wesley this summer stewarding around the Tri-Lakes area, as well as keeping up with other stewards as weekend supervisor.

Andrew Bull, Watershed Steward
Andrew is a graduate of Paul Smith's college with a bachelor's degree in Fisheries and Wildlife Science. He is also one of our veteran stewards, returning from last year and offering knowledge and experience to "rookie" stewards. He is a current resident of Saranac Lake and enjoys kayaking and other outdoor activities. Andrew is part of the loon monitoring and research special project in cooperation with the WSP. He travels various local waterways via kayak to locate and record nesting sites, as well as tag information. Andrew has also worked with milfoil desiccation project teams in the past. He hopes to continue work in related fields upon completion of the program.

Greg Cerne, Watershed Steward
Gregory Cerne is a student in the Ecological Forest Management program at Paul Smith's College. Hailing from southeastern Massachusetts, Greg was drawn to the Adirondacks by the beauty of the mountains and lakes, and also by the environmental awareness which is prevalent in the park. He was glad to meet many interesting people and help advance public education on invasive species.

Erin Corrigan, Watershed Steward
Erin is currently enrolled at Clarkson University where she is pursuing a degree in Environmental Science. On her time off from the WSP, she enjoys running, hiking, and paddling around the Adirondacks. She is frequently known for running marathons and taking multi-day hiking trips into the High Peaks. Erin has great positive energy and a passion for preserving our environment for future generations.

Seth Crevison, Watershed Steward
Seth is a senior Wildlife and Fisheries major at Paul Smith's College. He joined the watershed steward program to help keep the Adirondack lakes clean. In his spare time he likes to go mountain climbing, kayaking, canoeing, swimming, cooking, and watching movies.

Kimberly Forrest, Watershed Steward, Environmental Issues Educator
Kimberly Forrest is a sophomore at Paul Smiths College where she is majoring in Biology. Upon graduation in 2013 she would like to enter medical school. As a watershed steward Kimberly hopes to broaden her ecological knowledge and gain valuable experience in the field. As a boater herself, Kimberly feels that Watershed program is very important. "We all can do our own part in protecting our beloved waterways, and the more people that are active in doing so the stronger our network becomes."

Kirsten Goranowski, Watershed Steward
Kirsten is a senior at Paul Smith's College, pursuing a degree in Environmental Studies. The Adirondacks have been a favorite summer destination ever since her family owned a cottage on Fourth Lake. It has been a dream to live and work in the heart of the Adirondacks, and so far this has been the best summer yet. When she isn't informing the public on Invasive species, or Loon monitoring, she spends her time kayaking, hiking, fishing, and swimming. Becoming a steward for the Paul Smith's College Watershed Stewardship Program has been one of many opportunities she has been grateful to be a part of.

Mike Hall, Watershed Steward
Mike is currently a Paul Smith's College Student who will be graduating within the next year. He is a member of the Paul Smith's soccer team and enjoys camping along with many other outdoor activities. He has played a vital role in our Eurasian Water Milfoil Desiccation Study this year, spending many hours in the lab throughout the summer. His dedication to the Watershed Stewardship Program and working knowledge of priority invasive plants has been a tremendous help this summer.

Brian Hartle, Watershed Steward
Brian Hartle is a 2010 graduate of SUNY Geneseo with a B.A. in history and is currently a seventh grade social studies teacher in Stamford, CT. Brian has been coming up to the Adirondacks since he was born, as he has family that lives in Long Lake year round. His love of the region and desire to preserve its integrity compelled him to become a Watershed Steward. And he hopes all water enthusiasts become stewards of this beautiful region in due time through educational programs and increased awareness of environmental issues.

Kristen Haynes, Watershed Steward
Kristen is a junior at Cornell University studying Natural Resources. She grew up in Clinton, NY, but has spent every summer and countless weekends on Fourth Lake. Kristen welcomes the opportunity to work to protect the waters of the western and central Adirondacks; a place close to her heart.

Katelin Isaacson, Watershed Steward
Kate is a former Paul Smith's College student turned SUNY Potsdam Student. She is also a veteran steward, though of a different type. She spent last summer as a Summit Steward atop Arab Mountain outside Tupper Lake, so she is familiar with the ups and downs of the job. She provides knowledge and experience in the field to first year stewards. Kate has an outgoing personality and is as eager to learn as she is to educate.

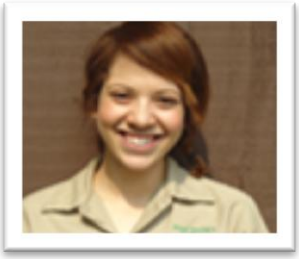
William Martin , Watershed Steward
Billy is a Junior at Paul Smith's College, majoring in Natural Resource Management and Policy. He plans to graduate in December of 2012. Billy has been a frequent visitor to the Adirondack Park since early childhood. He has family in Saranac Lake that have been very helpful in acclimating him to the Adirondack experience. He enjoys backpacking, day hikes, canoe trips, and just about every other outdoor activity available. The Watershed Stewardship Program has been a terrific fit for Billy in combination with his passion for the natural environmental and wide range of work experience.

Gillian Meade, Watershed Steward and Weekend Supervisor
Gillian is a 2011 graduate of Hobart and William Smith Colleges in Geneva, NY with a B.S. in Biology and a B.A. in Environmental Studies. She is new to the Adirondacks but enjoys the many opportunities to hike, bike and kayak. She got involved with the Watershed Steward Program because of its important implications for protecting the environment and educational outreach.

Corrie Mersereau, Senior Steward, Saratoga Lake
Corrie holds a bachelor's degree in Environmental Studies from St. Lawrence University, where she was active in campus sustainability and was an athlete on the crew team. Corrie grew up in Corinth, New York, near Saratoga Springs, and rowed on Saratoga Lake. Corrie worked with Cornell Cooperative Extension on an old growth maple tree aging study, and helped build a canoe while at St. Lawrence. She also has a minor in Peace Studies and knows basic Spanish and Swahili.

Kyle Milner, Watershed Steward
Kyle Milner is from the small town of Churchville, near Rochester, New York. Kyle volunteered with the U.S. Coast Guard and worked as a heating and cooling contractor on a N.A.T.O. base in Kandahar Afghanistan before moving to the Adirondacks, where he was struck by the beauty of the mountains. Kyle then decided that the best thing he could do is enrich his mind with knowledge, and immerse himself in nature, and received a degree in Forestry from Paul Smith's College. Kyle has learned about poetry and Native American culture with poet Maurice Kenney, and has studied the philosophy and practice of Permaculture. Kyle describes his summer as a Watershed Steward as the most rewarding job he has ever had.

Eric Paul, Watershed Steward, Cranberry Lake
Eric is a first year transfer student at Paul Smith's College. He has a bachelor's degree in Business and Technology Management from Clarkson University, and is pursuing a second bachelor in Natural Resources Management and Policy at Paul Smiths College. Eric enjoys hiking and paddling in the Adirondack High Peaks region and hopes to become involved with law enforcement upon graduation.



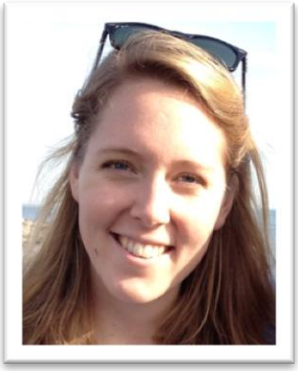
Stephanie Beatris Pena, Watershed Steward
Stephanie is originally from Long Lake N.Y. and attends Temple University as an International Affairs/Asian Studies major. The stewardship program appealed to her as a new and exciting experience to be working for the environment. She's looking forward to the summer ahead and is sure to take advantage of everything the area has to offer.

Matt Potel, Watershed Steward
Matt was a student at SUNY Binghamton. He brought a wide range of interpersonal skills to the Watershed Stewardship Program. Matt had a wealth of experience working with youth camps throughout New York State and brought out the best in everyone around him. He was an accomplished backpacker and hiker (one of the few Adirondack 46ers on staff). His passion for people and the environment played a crucial role in the success of the Watershed Stewardship Program this year. He is sorely missed.

Sarah Prince, Watershed Steward

Sarah is a recent Paul Smith's College Graduate, with a major in Environmental Science. This fall she plans to continue her education in graduate school at Antioch University in New Hampshire. She will be majoring in Global Climate Change and Sustainability. Sarah is an outdoor enthusiast who enjoys hiking, climbing, and paddling throughout the Adirondacks. She also enjoys farm work and raising chickens. Her experience and spirit has been of great value to the Watershed Stewardship Program this year.

Danielle Thompson, Watershed Steward
Dani is an Environmental Studies major at Dickinson College. She is originally from Boulder, Colorado, which is where she fell in love with the outdoor experience and the environment that makes it all possible. During the school semester she interns as an Eco-Rep Supervisor in Carlisle, Pennsylvania. She enjoys hiking, paddling, and any other Adirondack outdoor adventure you can think of.



Emily Russell, Watershed Steward
Emily grew up in Queensbury, NY, a small town on the southeastern edge of the Adirondacks. She attended the Berkshire School, a small boarding school in western Massachusetts, and graduated from Bates College in 2011 with a degree in Environmental Studies, where she wrote her senior thesis on the "Arctic Grail," better known as the Northwest Passage. Emily is currently living in Brooklyn, NY and working at US Squash, the national organizing committee for the sport of squash. In the next few years Emily hopes to get her masters in Northern Studies from an Arctic University and hopefully continue work her way farther North.

Tim Willson, Watershed Steward
Tim is entering his senior year at Paul Smith's College where he is studying Fisheries Sciences. Originally from Buffalo, NY, Tim has been frequenting the park for many years pursuing recreational backpacking, fishing and hiking. "I just like to go out in the woods...and walk around." Tim is a firm believer in conserving the natural state of our environment for future generations and hopes that his experience with the WSP will help guide him to a career in the Fisheries field.

Kathleen Wiley, Assistant Director, Western Steward Program
Kathleen is pursuing a doctorate in conservation biology at Antioch University in Keene, NH. She lives full-time in Keene Valley, NY with her cat and enjoys getting outside whenever she can. She is excited about expanding the Watershed Stewardship Program to the Western Adirondacks and hopes to see you at a boat launch this summer.

Celia Evans, Professor and Science Director
Celia has her Ph.D. in Ecology and Evolutionary Biology from Dartmouth College. Celia joined the faculty at Paul Smith's College in 2001 where she is an Associate Professor of Ecology in the Science Liberal Arts and Business Division specializing in biogeochemical cycling and plant / soil / herbivore interactions in forested ecosystems. Celia also conducts research in science education with particular emphasis on student / scientist partnerships and citizen science. Dr. Evans has published in the Canadian Journal of Forest Research (1998), American Biology Teacher (2001), and Plant and Soil (2001).

Eric Holmlund, Director
Eric is a Professor of Environmental Studies at Paul Smith's College as well as the Director of the Stewardship Program. He is co-author of a book, *The Camper's Guide to Outdoor Pursuits* and has been a full time faculty member at PSC since 1998. He and his wife Kim have a daughter, Dana, and twin boys, Will and John. He enjoys most outdoor activities, especially canoeing, xc skiing, and camping. Eric has a Ph.D. in Environmental Studies.

Recreation Use Study: Cranberry Lake State Boat Launch

By Eric Paul, Watershed Steward

Introduction

The summer of 2011 was the first time the Paul Smith's College Adirondack Watershed Institute posted a Watershed Steward at the state boat launch in Cranberry Lake. Cranberry Lake is the third largest lake in the Adirondack Park with a New York State Department of Environmental Conservation campground as well as 48 remote-access campsites. The lake receives significant traffic from Lake Ontario, Lake Bonaparte, and the St. Lawrence River, all of which are infested with various aquatic invasive species.

The steward was responsible for educating boaters about the risks invasive species pose as well as methods to mitigate their transportation from waterway to waterway. The steward would also inspect all incoming and outgoing watercraft for organic material in an attempt to detect invasive species.

Methods

Throughout the 15 week summer season a single steward was posted at the state boat launch at Cranberry Lake from Thursdays to Mondays from 7:00 am to 4:00 pm. The steward would conduct a brief interview with boaters gathering information such as the last used waterway within a two week period; whether or not they took any preventative measures such as a visual inspection, washing their boat and draining bilges and live wells. The steward would also record the horsepower and stroke of outboard engines as well as the state the boat was registered to. The steward would then proceed to inspect the boat for any organic material taking careful note of certain areas including the axle and license plates on trailers and the lower unit and transducer on the boat itself as these are more likely to pick up plant life.

Results

The steward encountered 1,097 boats and 2,705 visitors working from Thursday through Monday between May 28th and September. Peak use occurred during the weeks of June 17th-23rd with the opening of the Bass fishing season, the July 4th holiday, and August 19th through the 25th with a stretch of favorable weather.

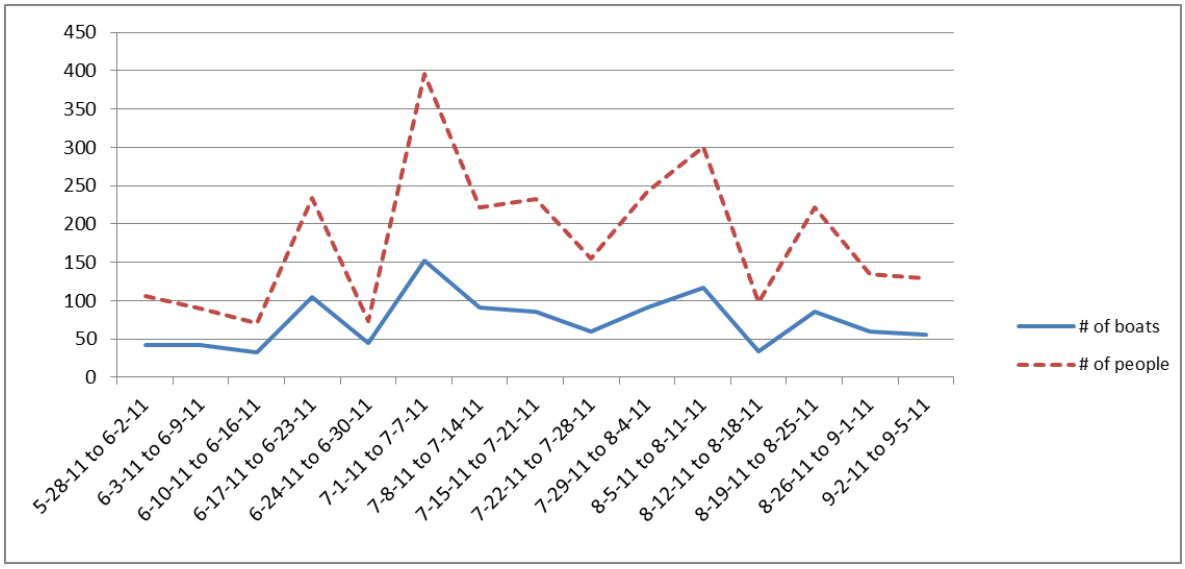


Figure 11- Boat ramp usage, Cranberry Lake 2011.

Motorboats were by far the most common vessel with 978 followed by 39 canoes, 38 kayaks, and 35 personal watercrafts. Far less frequent were sailboats and rowboats with 5 and 2 respectively. Of the 978 motorboats that were encountered, 270 of them had 4 stroke engines amounting to 27.6% of all motorboats.

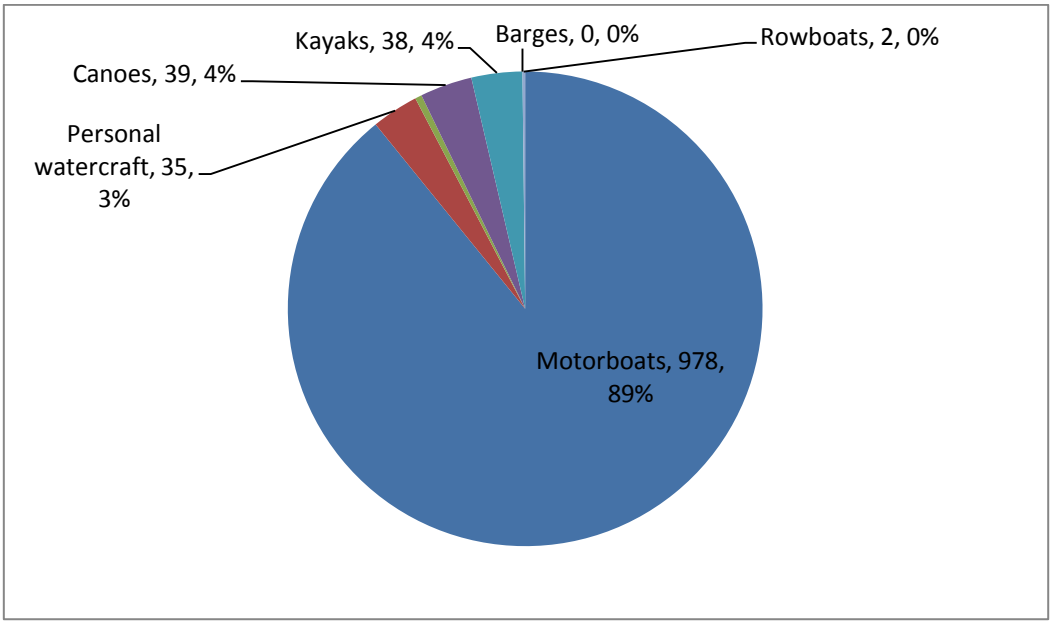


Figure 12- Watercraft observed, Cranberry Lake 2011.

State of Origin

As expected New York state boat registrations were the most represented at Cranberry Lake. Pennsylvania was the most represented state outside of New York with 29 visitors. Altogether, registrations from 14 different states were observed throughout the summer.

State	# boats
CT	7
DL	4
FL	2
MA	4
MD	8
NC	1
NH	7
NJ	12
NY	931
OH	2
PA	29
RI	2
SC	3
VT	1
Total	**1013**

Table 12- State of origin, watercraft launched, Cranberry Lake 2011.

Preventative Measures Taken

Stewards also ask boaters if they took any measures to prevent the transfer of invasives from one body of water to another. This question serves as a springboard into educating methods of prevention as well as a way another way to assess the likelihood of invasives being present on the boat. It was found that 518 (53% of 970 total groups encountered) of boaters had taken prevention steps before launching. 245 (25%) of boat owners had washed their boats before launching. The number of boaters who drained their bilge was 152 (16%), and 123 (13%) had inspected their boats before launching. 108 (11%) boaters dried their boats for at least two weeks before entering another waterway. Less common were the draining of livewells and bait buckets at 27 (3%), and 7 (1%) respectively.

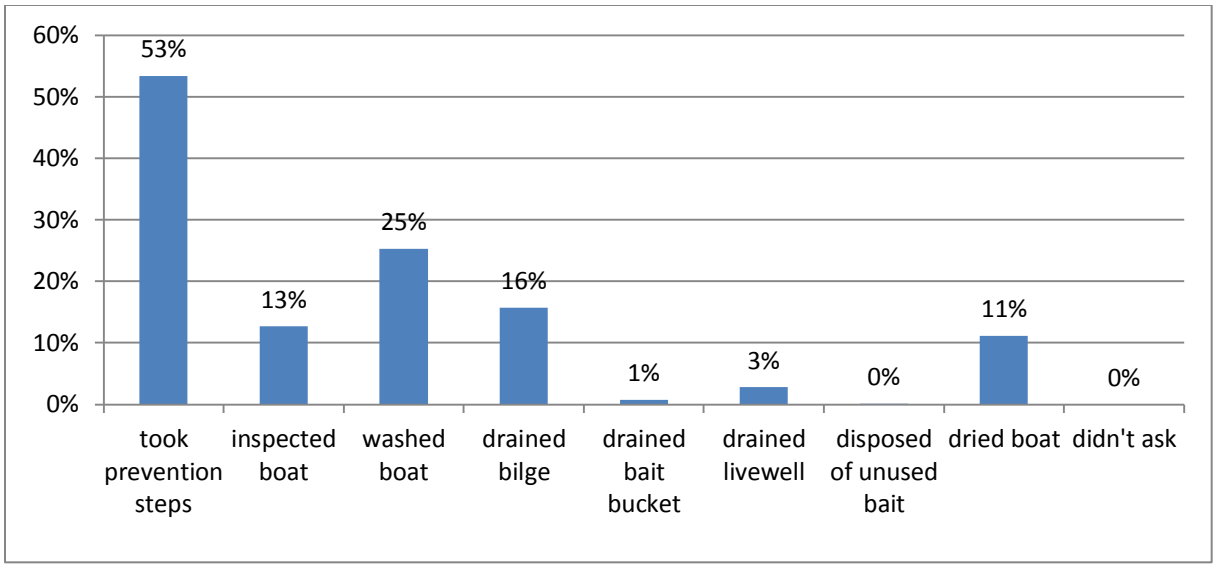


Figure 13- Aquatic invasive species spread prevention measures taken by visitors, Cranberry Lake, 2011.

During visual inspections the steward detected and removed organic materials from 113 incoming watercraft, as well as 101 outgoing watercraft. The watershed steward would then attempt to identify the organic material. Overall 214 organisms were detected on boats either being launched or retrieved from the lake. Three species of invasives were detected at the launch site including Eurasian watermilfoil with 22 cases, curly leaf pondweed with 7 and one case of variable leaf watermilfoil.

Species	# Found
Eurasian Watermilfoil	22
Bladderwort	2
Native Watermilfoil	9
Grass	95
Pine Needles	33
Curly Leaf Pondweed	7
Variable Leaf Watermilfoil	1
Other	45

Table 13- Organisms removed from watercraft, Cranberry Lake 2011.

In addition to the above data, the steward also conducted a courtesy inspection on a second-hand dock incoming from the St. Lawrence River. During inspection it was found that the dock was infested with a large number of zebra mussels. The steward assisted the owners in cleaning the dock by physically removing the hitchhikers, then washing the entire structure with bleach. To minimize the threat further, the steward asked the owners to wait as long as possible before installing the dock.

Previously Visited Water Bodies

Body of Water	Infected	#	Body of Water	Infected	#
Allens Falls Reservoir	Unknown	1	Lake Champlain	Yes	2
Otisco Lake	Unknown	1	Lake Erie	Yes	2
Atlantic Ocean	Yes	2	Lake Flower	Yes	2
Black Lake	Yes	11	Lake George	Yes	2
Black River	Yes	7	Lake Ontario	Yes	27
Blake Falls Reservoir	Yes	8	Lake Winola (PA)	Unknown	1
Butterfield Lake	Unknown	3	Long Lake	No	1
Canandaigua Lake	Yes	3	Lower Saranac Lake	Yes	6
Canadarago Lake	Unknown	1	Middle Saranac Lake	Yes	1
Conesus Lake	Yes	2	Millsite Lake	Unknown	1
Carry Falls Reservoir	Yes	5	Mohawk River	Yes	1
Cayuga Lake	Yes	3	Niagara River	Yes	1
Cazenovia Lake	Yes	2	Norwood Lake	Unknown	3
Cedar Lake	Unknown	1	Ohio River	Yes	1
Charleston Lake	Unknown	1	Oneida Lake	Yes	5
Chateaugay Lake	Yes	1	Oneida River	Yes	1
Chesapeake Bay	Yes	1	Oseetah Lake	Yes	1
Chittenden Lake	Unknown	1	Oswegatchie River	Yes	14
Connecticut River	Yes	1	Racquette River	Yes	4
Cranberry Lake	Yes	117	Red Lake	Unknown	2
Deruyter Lake	Yes	1	Redfield Reservoir	Unknown	2
Eaton Brook Reservoir	Unknown	1	Rollins Pond	Unknown	2
Fair Haven	Yes	1	Schroon Lake	Yes	1
Fish Creek	Yes	1	Seneca River	Unknown	1
Five Falls Reservoir	Yes	1	Silver Lake	Unknown	2
Forked Lake	Yes	2	Skaneatles Lake	Yes	5
Fulton Chain of Lakes	Yes	1	Soft Maple Reservoir	Unknown	1
Grasse River	Yes	2	St. Lawrence River	Yes	30
Great Sacandaga Lake	Yes	1	Star Lake	Unknown	3
Harris Lake	Unknown	1	Stillwater Reservoir	No	4
Higley Flow Reservoir	Yes	5	Trout Lake	Unknown	3
Hudson River	Yes	1	Tupper Lake	Yes	8
Kirkland Lake	Unknown	1	Upper Saranac Lake	Yes	1
Lake Bonaparte	Yes	24			

Table 14- Prior waterway visitation, 2 weeks prior to launch, Cranberry Lake, 2011.

As many aquatic invasive species can survive out of water for long periods of time, Watershed Stewards inquire about the most recent water body entered within a two week period. If the most recent water body is known to be infected, the boat may be inspected with more scrutiny.

Additional Duties

On one additional day, the steward was posted at two state boat launch sites on Carry Falls Reservoir on the Raquette River. In the morning he was posted at the Parmenter state launch site where he encountered eight boats. In the afternoon, he moved downstream to the launch site at the Carry Falls Dam where he only encountered one boat for the remainder of the day.

The steward also gave three presentations to varying groups throughout the course of the summer. The first presentation was to the Cranberry Lake Boat Club as an overview of how the program works at the beginning of the boating season. The methods the program would be using to detect and prevent invasive species from entering the waterway were discussed with a handful of members. The second presentation was a status update to the Cranberry Lake Boat Club members about halfway through the summer. The steward reported how many cases of invasives were detected on incoming boats, while giving an in depth explanation about the two most common offenders Eurasian Watermilfoil, and Curly Leaf Pondweed. The third and final presentation was an in depth power point presentation about invasive species, and the threats that they pose to waterways like Cranberry Lake. This presentation was given at the Clifton Community Center in Cranberry Lake near the end of the summer season with great success.

Conclusion

The Paul Smith's College Watershed Steward Program expanded into Cranberry Lake with a great degree of success. Through the various publications about the Watershed Steward Program, and the growing awareness of invasive species; many boaters the steward encountered had a measure of knowledge about the problems we face.

Of the 1,097 watercraft encountered this season, over 19% of boats were found to be harboring some form of organic matter, and nearly 3% of all boats were found to have an invasive species attached. Though seemingly benign to the naked eye, even noninvasive hitchhikers pose a risk as they may contain the eggs or seeds of an invasive species. Therefore the significant number of boats infested with organic materials is relatively concerning and warrants the continuation of the program at this location. However, additional seasons of study will be required to determine if this data remains consistent.

Cranberry Lake Recreation Study 2011												
	Boat Type							total #	Weekly Avg	Four	# of
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	people
5-28-11 to 6-2-11	39	1	0	1	1	0	0	42	64	28	106
6-3-11 to 6-9-11	41	1	0	0	0	0	0	42	60	23	90
6-10-11 to 6-16-11	30	0	0	0	3	0	0	33	62	17	71
6-17-11 to 6-23-11	97	0	3	2	2	0	0	104	68	49	234
6-24-11 to 6-30-11	41	3	0	0	1	0	0	45	59	16	74
7-1-11 to 7-7-11	140	6	0	3	2	0	1	152	63	31	396
7-8-11 to 7-14-11	83	3	0	4	1	0	0	91	82	17	222
7-15-11 to 7-21-11	77	4	0	2	2	0	0	85	65	18	232
7-22-11 to 7-28-11	55	2	0	1	2	0	0	60	53	13	155
7-29-11 to 8-4-11	74	6	1	4	6	0	0	91	60	11	242
8-5-11 to 8-11-11	97	1	0	10	9	0	0	117	65	13	300
8-12-11 to 8-18-11	28	1	0	3	2	0	0	34	44	5	98
8-19-11 to 8-25-11	68	3	1	8	4	0	1	85	54	10	222
8-26-11 to 9-1-11	56	0	0	1	3	0	0	60	72	12	134
9-2-11 to 9-5-11	52	4	0	0	0	0	0	56	66	7	129
totals	978	35	5	39	38	0	2	1097	Summer Avg = 57	270	2705
									Median HP = 40		

Table 15- Cranberry Lake use figures, 2011. Key: M = Motorboat; PWC = personal watercraft; S = sailboat; C = canoe; K = kayak; B = barge (construction); R = rowboat.

Cranberry Lake Recreation Study 2011														
	# groups	# groups	organisms found		organism type									
Week	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	Pine	CLP	VLM	other
5-28-11 to 6-2-11	38	7	4	1	0	0	0	1	0	0	4	0	0	0
6-3-11 to 6-9-11	31	16	3	6	0	0	0	5	0	0	3	0	0	1
6-10-11 to 6-16-11	22	12	2	3	0	0	0	0	0	0	3	1	0	1
6-17-11 to 6-23-11	70	47	6	14	0	0	1	9	0	0	3	0	0	7
6-24-11 to 6-30-11	29	14	5	2	1	0	0	4	0	0	1	0	0	1
7-1-11 to 7-7-11	121	53	14	10	2	0	1	12	0	0	1	3	0	5
7-8-11 to 7-14-11	7	46	1	13	1	0	2	6	0	0	1	0	0	4
7-15-11 to 7-21-11	59	31	12	9	2	0	2	6	0	0	1	2	0	8
7-22-11 to 7-28-11	39	28	5	2	0	1	1	4	0	0	1	0	0	0
7-29-11 to 8-4-11	63	36	18	9	2	0	1	13	0	0	3	0	1	7
8-5-11 to 8-11-11	76	46	17	12	5	0	0	17	0	0	6	0	0	1
8-12-11 to 8-18-11	23	13	7	3	1	0	0	5	0	0	2	0	0	2
8-19-11 to 8-25-11	54	36	14	8	6	0	1	8	0	0	4	1	0	2
8-26-11 to 9-1-11	32	32	1	4	0	0	0	1	0	0	0	0	0	4
9-2-11 to 9-5-11	35	27	4	5	2	1	0	4	0	0	0	0	0	2
totals	699	444	113	101	22	2	9	95	0	0	33	7	1	45

Table 16- Key: EWM = Eurasian Watermilfoil; BW = native bladderwort; NM = native milfoil; GRS = grass; WC = water chestnut; ZM = zebra mussel; VLM = variable leaf milfoil.

Cranberry Lake Recreation Study 2011									
	visitor prevention steps								
Week	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask
5-28-11 to 6-2-11	23	4	18	6	0	0	0	1	0
6-3-11 to 6-9-11	21	6	15	7	0	1	0	2	0
6-10-11 to 6-16-11	33	1	8	5	1	0	0	0	0
6-17-11 to 6-23-11	40	9	27	2	0	1	0	16	0
6-24-11 to 6-30-11	21	3	9	7	0	1	0	8	0
7-1-11 to 7-7-11	77	23	26	20	2	6	0	26	0
7-8-11 to 7-14-11	59	9	29	21	2	8	0	11	0
7-15-11 to 7-21-11	49	20	27	10	0	1	0	10	0
7-22-11 to 7-28-11	33	7	13	10	0	1	0	7	0
7-29-11 to 8-4-11	45	12	24	19	0	0	0	5	0
8-5-11 to 8-11-11	46	15	25	14	1	3	0	8	0
8-12-11 to 8-18-11	11	4	3	5	0	0	0	1	0
8-19-11 to 8-25-11	29	4	13	11	1	4	0	5	0
8-26-11 to 9-1-11	19	4	4	11	0	0	0	4	0
9-2-11 to 9-5-11	12	2	4	4	0	1	1	4	0
totals	518	123	245	152	7	27	1	108	0
	53%	13%	25%	16%	1%	3%	0%	11%	0%

Table 17- : I = Inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = drained livewell; Dis = discarded unused bait; Dry = dried boat.

Figure 14- Zebra mussels adhered to dock launched by visitor into Cranberry Lake.

Recreation Use Study: Fourth Lake State Boat Launch

By Kristen Haynes, Watershed Steward

Introduction

In the summer of 2011, thanks to a grant through the U.S. Fish and Wildlife Service using Great Lakes Restoration Initiative money, Paul Smith's Watershed Stewardship Program (WSP) expanded to cover lakes in the west-central Adirondacks. This area qualified for consideration in the Great Lakes Restoration Initiative because its lakes belong to the Black River and St. Lawrence River watersheds of New York State; the former emptying into Lake Ontario, and the latter into the St. Lawrence River. This summer, the western Adirondack stewards covered Fourth and Seventh Lakes of the Fulton Chain of Lakes, Raquette Lake, and Long Lake. Occasionally, stewards covered the boat launches at Eighth Lake and Limekiln Lake Campgrounds, and visited Stillwater Reservoir, Big Moose Lake, and the Hollywood Hills boat launch on First Lake once or twice to increase awareness. At all locations, boat launch stewards conducted boat inspections and provided public education to prevent the spread of aquatic invasive species (AIS).

Fourth Lake State Boat Launch was one of the busiest lakes of the western Adirondack region. It is the only public access point for motorboats to the lower lakes of the Fulton Chain, including Old Forge Pond, First, Second, Third, Fourth, and Fifth Lakes, which stretch 10 miles between Old Forge and Inlet. Sixth, Seventh, and Eighth Lakes are not connected to the lower lakes through a navigable waterway. The Fulton Chain is a popular location for both recreational boaters and fishermen. The lakes are highly developed, and include lakeside cottages, rental properties, two hotels, and the Alger Island public campground as accommodations.

Fourth Lake is the largest and busiest of the Fulton Chain, roughly five miles in length and 85 feet deep at its deepest point, and includes half the acreage of the 4,310 acre Fulton Chain. Fishermen can enjoy the benefits of both shallow and deep water species, including bass, northern pike, lake trout, rainbow trout, landlocked Atlantic salmon, brown bullhead, tiger muskellunge, and ample sunfish and rock bass for the kids.

According to the Adirondack Park Invasive Plant Program (APIPP), Fourth Lake contains both variable leaf milfoil (VLM) and Eurasian watermilfoil (EWM). It appears that this is a relatively recent invasion, as a survey in 2009 did not detect EWM. It is reported to be small, contained, and actively managed. According to their website, the Fulton Chain of Lakes Association (FCLA) is aware of the presence of EWM on Fifth, Sixth, and Seventh Lakes and is actively managing those invasions through eradication efforts. They are very supportive of the WSP presence on Fourth and Seventh Lakes. The steward attended the annual FCLA meeting. It would be important to inform future stewards of the most current AIS information so they can act as a bridge between cutting-edge information from APIPP, the Adirondack Watershed Institute and the boating community. There are currently no transport laws regarding AIS in the area.

Methods

Fourth Lake received coverage from 7:00AM – 4:00PM Memorial Day Weekend (May 28) through Labor Day Weekend (September 5), with a total of one hour of breaks during the day. The steward on duty approached boaters, identified herself and her program, and discussed the issue of AIS, especially those threats most pertinent to Fourth Lake. Boaters were shown photos of several of the species, including EWM and zebra mussels. The steward then asked if the boat had been in any other body of water during the last two weeks, and what, if any, steps the boater took to prevent the spread of AIS. If the boater was deficient in any steps, the steward discussed

recommended preventative measures with the boater; if the boat had last been in a body of water infested with zebra mussels, the steward discussed specific actions targeted to eliminate their spread and why such drastic actions were necessary. The steward then proceeded to inspect the watercraft and its trailer, checking points such as the motor, wheel wells, bunks, and any sharp edges that would be likely to snag aquatic weeds. During the inspection, the steward noted the type of boat, horsepower and type of outboard engines, number of people in the group, and state of registration. Finally, the steward gave the boater an informational card about AIS. The steward had additional pamphlets about terrestrial invasive species and local fishing if the boater was interested.

Results

Fourth Lake Stewards encountered 1,346 boats and 3,364 people between May 28 and September 4, 2011. The week surrounding July 4th, from Friday July 1st through Thursday July 7th, was the busiest week for both boats and people: 233 boats and 597 people. WSP stewards were stationed at Fourth Lake Boat Launch 12 weekends throughout the summer with Tuesdays being covered least with six work days. Staff numbers sharply decreased in August as the stewards returned to school.

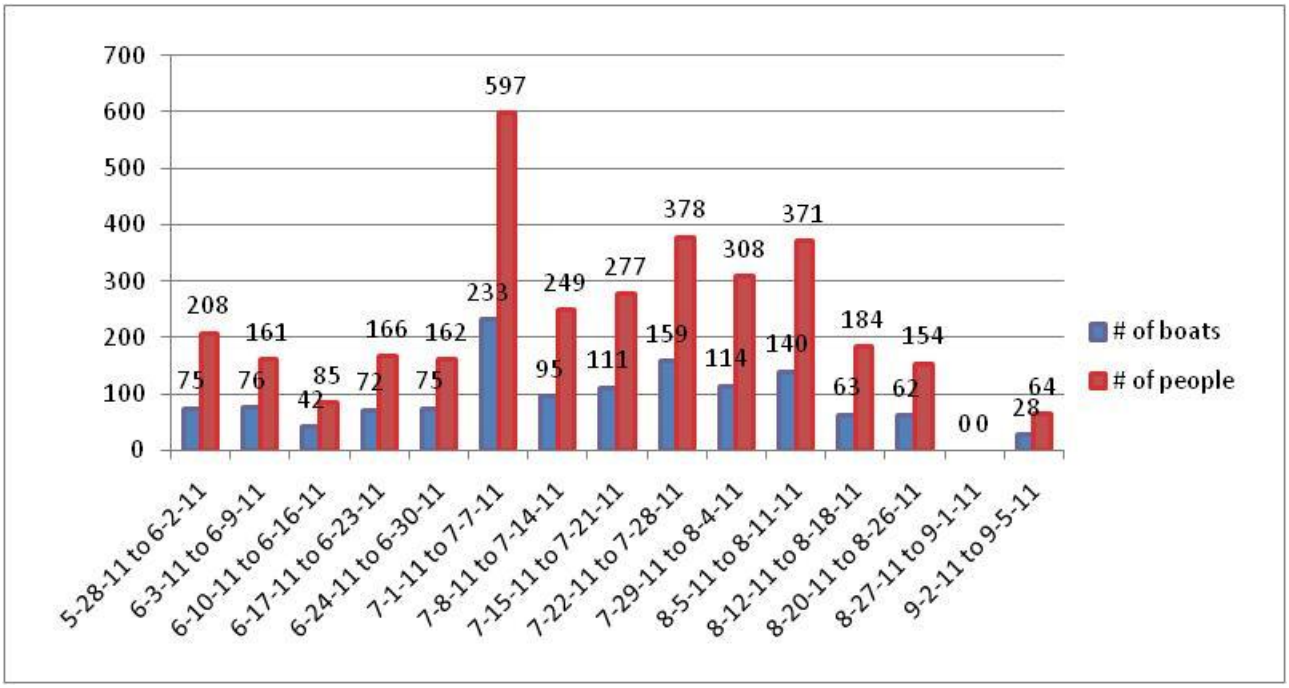


Figure 15- Fourth Lake State Boat Launch use, 2011 (note no steward present 8-27 to 9-1).

	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Total Days Covered per Week
5-28-11 to 6-2-11		X	X					2
6-3-11 to 6-9-11	X	X	X	X	X	X	X	7
6-10-11 to 6-16-11	X	X	X	X	X	X	X	7
6-17-11 to 6-23-11	X	X	X	X	X	X	X	7
6-24-11 to 6-30-11	X	X	X			X	X	5
7-1-11 to 7-7-11	X	X	X	X		X	X	6
7-8-11 to 7-14-11	X	X		X			X	4
7-15-11 to 7-21-11	X		X	X	X	X	X	6
7-22-11 to 7-28-11	X	X	X		X	X	X	6
7-29-11 to 8-4-11		X	X			X	X	4
8-5-11 to 8-11-11	X	X	X	X	X	X		6
8-12-11 to 8-18-11	X		X	X			X	4
8-20-11 to 8-26-11		X				X		2
8-27-11 to 9-1-11								0
9-2-11 to 9-5-11		X	X					2
Total Days Covered by day of the week	10	12	12	8	6	10	10	68

Table 18- Days of steward coverage at Fourth Lake State Boat Launch, 2011.

The day of greatest use was Saturday. Not only does this make sense as far as weekend-trippers, but it is also the customary day that week-long rentals begin. An average of 26 boats was seen on Saturdays, while Tuesdays, the slowest day of the week, an average of six boats was seen. It should be noted that Fourth of July fell on a Monday in 2011. Without the 49 boats encountered on July 4th, Monday's average drops to four boats. Finally, due to staff meetings Thursday mornings, the launch was only covered part of the day on Thursdays. Actual number of boats launched and retrieved between 7:00 AM and 4:00 PM on Thursdays is likely higher than the value represented in the graph.

Out of the 1,346 boats encountered at the Fourth Lake Boat Launch during the summer of 2011, over three-quarters (1,026) were motorboats. Personal watercraft were the next most common at 211 encountered, while sailboats, canoes, and kayaks comprised only 8% of watercraft. Negligible numbers of barges and rowboats were encountered. The small number of canoes and kayaks launched is probably due to the fact that these watercraft can be put in without the use of a boat ramp. In addition, there is a public launch near Alger Island on Fourth Lake that serves canoes and kayaks; paddlers keen on avoiding the weekend mayhem of the Fourth Lake State Boat Launch could likely find other launching places.

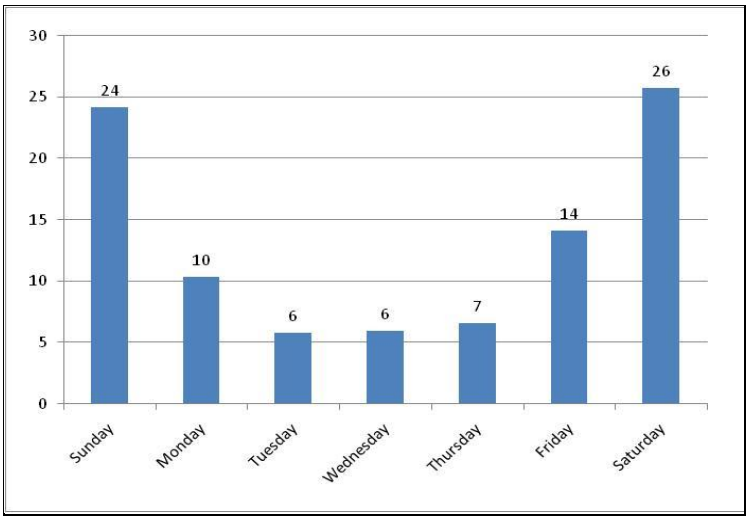


Figure 16- Average Number of Boats Encountered at Fourth Lake State Boat Launch by Day of the Week 2011.

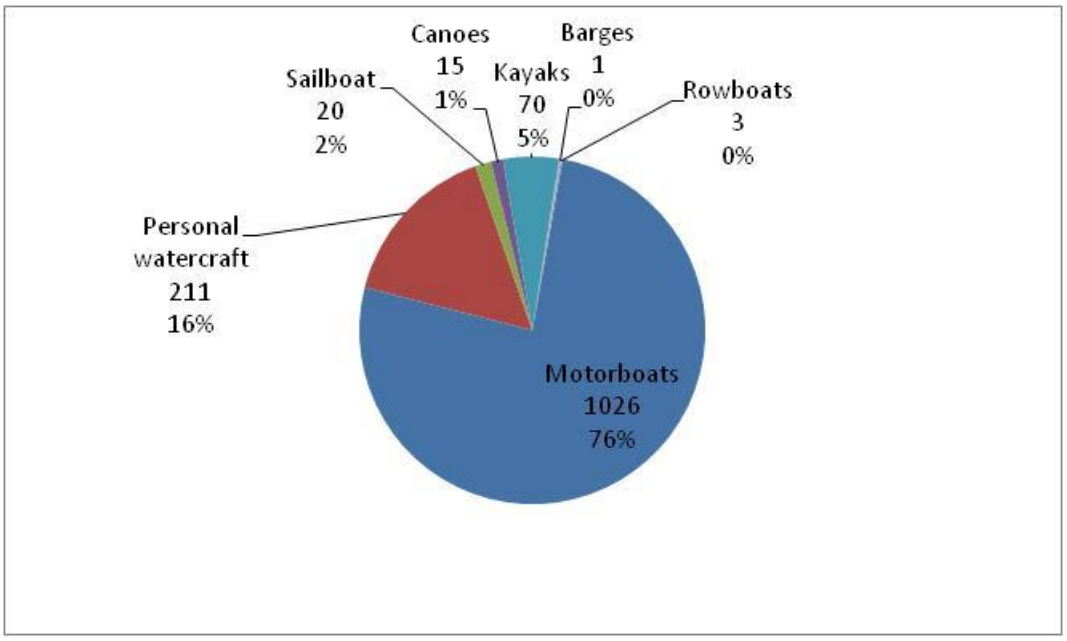


Figure 17- Watercraft launched by type, Fourth Lake State Boat Launch 2011.

Stewards noted the horsepower of outboard motors and if they were two or four stroke motors. Many of the boats stewards encountered were inboard or inboard-outboard. For those that had outboard engines, 146 were four-stroke and at least 10 were Evinrude E-TEC motors (stewards did not consistently record E-TEC motors). The Evinrude E-TEC uses a computer to calculate how much fuel to inject into the motor for maximum efficiency. This creates lower air and water pollution than a standard two-stroke because there is complete combustion of the fuel. Motors varied from 5 to 250 HP.

Boaters were also asked if their boats were in any other body of water in the previous two weeks. Not only is this information valuable from a recreation use perspective, allowing one to see the draw area of visitors to Fourth Lake, but it also allows us to determine possible pathways of AIS spread. Roughly half of boaters reported that they were not in a body of water in the previous two weeks.

Body of Water	# boats	Infection Status	Body of Water	# boats	Infection Status
Atlantic Ocean	3	yes	Lake Bonaparte	1	
Big Moose Lake	8		Lake Erie	2	yes
Tupper Lake	1	yes	Lake Flower	1	yes
Black River	2		Lake George	6	yes
Blue Mountain Lake	1		Lake Moraine	1	
Brantingham Lake	2		Lake Ontario	21	yes
Caburga Lake (Quebec)	1		Lake Placid	1	yes
Canadorago Lake	2		Lake Pleasant	1	
Canandaigua Lake	9		Limekiln Lake	3	
Candlewood Lake (CT)	1		Lime Lake	1	
Caniscius Lake	2		Long Lake	1	yes
Caroga Lake	1		Mahopak Lake	1	
Cayuga Lake	2	yes	Lake Moomaw (VA)	1	
Cazenovia Lake	1		Moose River	3	
Conneaut Lake (PA)	1		Niagara River	8	yes
Cranberry Lake	3		Ohio River, PA	1	
Cross Lake	1		Old Forge Pond	2	
Delta Lake	16		Oneida Lake	26	yes
Delaware River/Lehigh River (PA	1		Otisco Lake	1	
Eighth Lake	7		Otsego Lake	1	
Erie Canal	2		Otter Lake	2	
Fifth Lake	2		Owasco Lake	3	
First Lake	2		Panther Lake	1	
Fourth Lake	172	yes	Quiver Pond	2	
Fulton Chain of Lakes	6	yes	Raquette Lake	22	yes
Guilford Lake	1		Redfield Reservoir	1	
Glimmerglass Lake	1		Sacandaga Lake	1	yes
Goodyear Lake	1		Saranac Lake	3	yes
Great Sacandaga	3	yes	Saratoga Lake	3	yes
Greenwood Lake (NJ)	1		Seneca Lake	1	
Hinkley Lake	8		Seneca River	2	yes
Hudson River	3	yes	Sixth Lake	1	
Indian Lake	1	yes	Seventh Lake	13	yes
Jordan Lake, NC	1		Skaneateles Lake	5	
Kayuta Lake	7		St. Lawrence River	6	yes
Keuka Lake	2		Stillwater Reservoir	3	
			White Lake	5	

Table 19- Lakes visited in previous two weeks prior to use of Fourth Lake State Boat Launch, 2011.

Especially toward the beginning of summer, many boaters told stewards that they had a home or camp on the lake and were launching the boat for the season. However, other boaters were coming from lakes as far away as North Carolina and Quebec. Clearly Fourth Lake and the Fulton Chain cater to many different people, from those here for a day or weekend to those here year-round.

For motorized boats, the state of registration was also recorded. Of 1,237 motorized watercraft launched and retrieved, 879 were registered in NY, although visitors came from as far away as Florida, Texas, and Wyoming.

State	# Boats	State	# Boats
CT	2	NY	879
FL	9	OH	8
MD	2	PA	23
ME	2	TX	1
MA	1	VA	5
NC	3	VT	4
NJ	20	WY	1

Table 20- State of registration, Fourth Lake State Boat Launch visitors, 2011 (USPS abbreviations used).

Each boater was also asked if she took steps to prevent the spread of invasive species. If a boater responded negatively, it was recorded as "no" even if they subsequently acknowledged that they had unknowingly taken steps. This was done to ensure that prevention steps recorded were consciously taken.

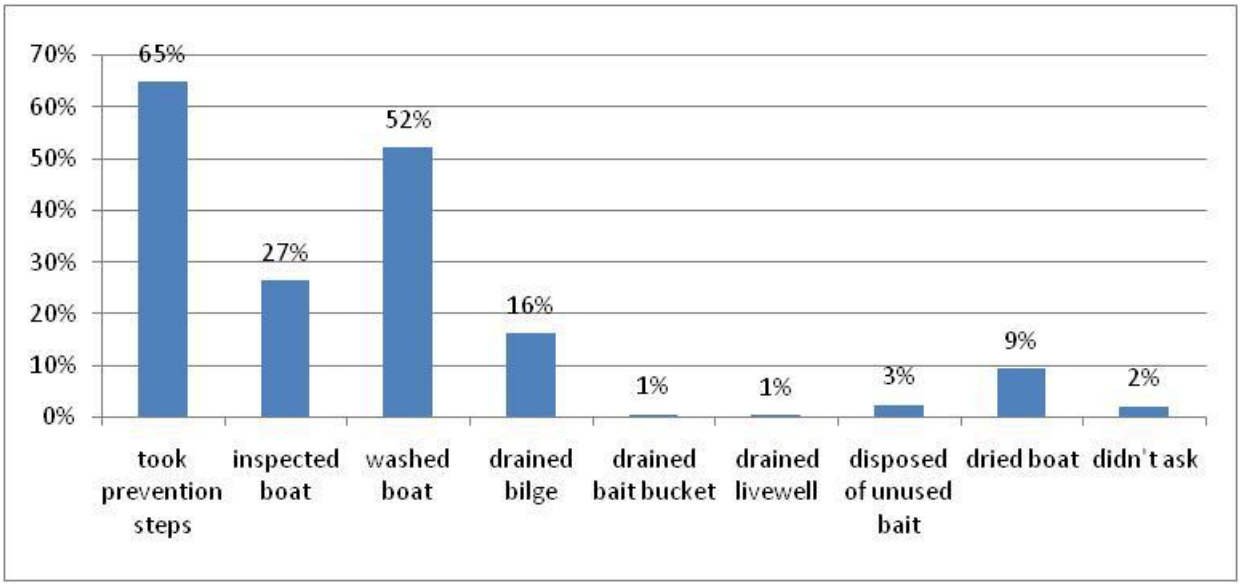


Figure 18- Aquatic Invasive Species prevention steps taken by boaters at Fourth Lake State Boat Launch, 2011.

Out of 1,131 groups, 736 responded that they took AIS prevention steps. The most common prevention step was boat washing (592 boaters), followed by draining the bilge (184), inspecting the boat (301), and drying the boat (107). 29 disposed of bait, eight drained bait buckets, and seven drained livewells.

The steward was interested to see if percent of boaters who reported taking AIS prevention steps increased throughout the summer, which would indicate increased awareness and education. However, as seen In Figure 19, there did not seem to be a significant upward trend in the percent of boaters taking AIS prevention steps. This is probably a result of two things: 1) the continual stream of visitors each week who are encountering our program for the first time, and 2) the people who have become familiar with our program from launching multiple times at Fourth Lake often do not take their boats elsewhere, and hence do not take AIS prevention steps.

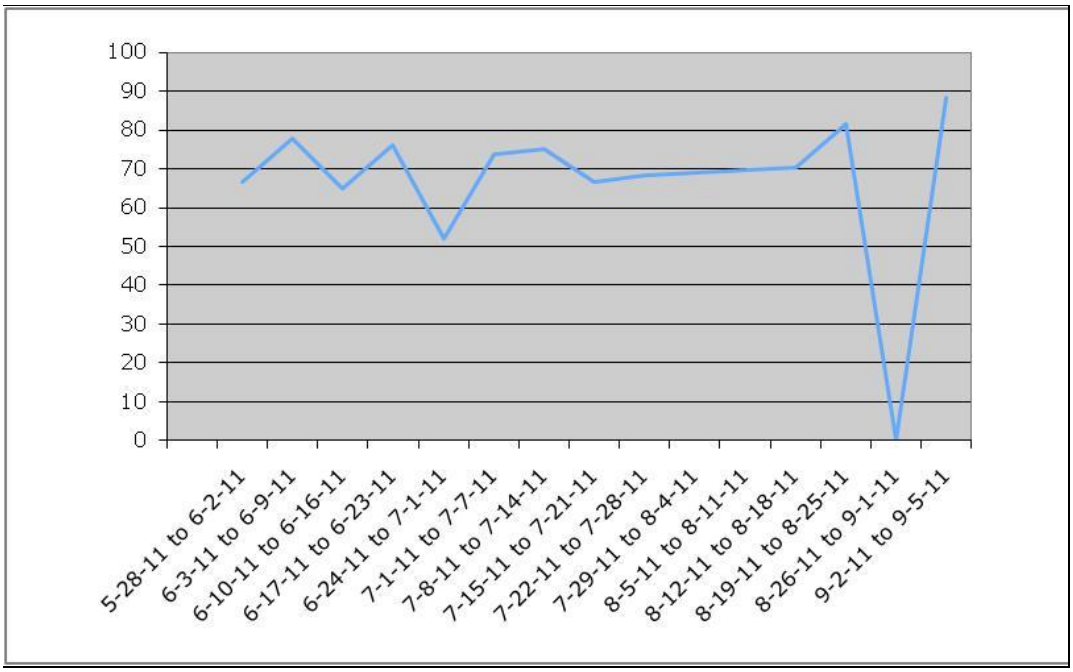


Figure 19- Percent of boaters by week who took AIS prevention steps at Fourth Lake State Boat Launch, 2011. (No steward present during the week of 8-26 to 9-1.).

Stewards reported any organisms found on boats. Grass was the most common organism encountered. 8.7% of organisms encountered were invasive. Zebra mussels, variable-leaf milfoil, and Eurasian watermilfoil were all found on boats launching at Fourth Lake. Water Chestnut was not. The category "other" includes non-invasive debris like sticks or pine needles. Although Fourth Lake is home to variable-leaf milfoil and small populations of Eurasian watermilfoil, none was found coming out of the lake.

Organism	Entering	Leaving	Prior waterway
Bladderwort	7	4	
Eurasian watermilfoil	14	0	Oneida Lake, Lake Ontario, Canandaigua Lake, Lake George, Kayuta Lake
Grass	43	29	
Native milfoil	1	0	
Other (unidentified)	65	48	
Variable-leaf milfoil	2	0	Niagara River, Fulton Chain of Lakes
Zebra mussels	3	0	Oneida Lake

Table 21– Organisms found on boats at the Fourth Lake State Boat Launch, 2011.

Discussion

One of the goals of this program is to promote awareness of AIS. Most boaters were aware of AIS, but their awareness seemed largely restricted to zebra mussels and not milfoil or other aquatic weeds. Almost no boaters were aware of the status of Fourth Lake and the Fulton Chain—the steward talked to many boaters who assumed that zebra mussels were in the lake, and others who weren't aware there was a problem here at all. Those in the first group seemed glad to learn that the Fulton Chain has no zebra mussels, and some expressed a greater willingness to take AIS prevention steps once they learned that Fourth Lake was relatively uninvaded. Those in the latter group seemed concerned that there were invasives in the lakes, and wanted to know what was

being done to eliminate them. There seems to be a disconnect between local AIS knowledge and the public, despite current outreach efforts—this is where our program can play an important role.

As seen earlier, the percent of people taking AIS prevention steps did not seem to increase over the summer. However, this does not necessarily mean that awareness did not increase. Many lake residents who launched multiple times became aware of the problem and why we were there, but did not take prevention steps with their watercraft which are only launched on Fourth Lake. It will be interesting to see if the percent of people taking AIS prevention steps increases in the years to come, assuming the program will have a continued presence in the area.

Public perception of the program was largely positive, given the fact that most boaters in the beginning of the season did not know why we were here. Stewards noticed that some of the most resistant visitors were year-round residents of the lake who launched their boat on or near Memorial Day weekend. At that point, the stewards did not have a sign for the Fourth Lake launch, and many visitors assumed that we were New York State Department of Conservation (DEC) employees. Even after explaining the program, some seemed to view it as an unnecessary extension of bureaucracy and regulation, and did not understand why we were checking their boats when they stayed in Fourth Lake all summer. Other local residents, however, seemed to have a positive view of the program, and were grateful that we were trying to keep the lakes clean.

Conversely, some of the most compliant and interested boaters were those vacationing for the week or weekend who lived near infested lakes. It is unfortunate that public awareness was generally higher with people used to dealing with the effects of AIS near their homes; hopefully our program can spur early awareness leading to prevention here in the west-central Adirondacks. In fact, the program already seems to have made an impact on local awareness and prevention: it inspired many local residents and the FCLA to look into a transport law. In the future, the WSP should encourage the town of Inlet to install a boat wash station—many boaters told the steward that they would be much more likely to clean their boat if a station was available.

Recommendations

Throughout the summer, but particularly during the early part of the season, the stewards encountered many boaters who were year-round or summer residents of the Fulton Chain. It might be interesting next year to include this information on the data sheets, not only because it would help assess recreational use of Fourth Lake, but also because it would help explain why many boaters did not take any steps to prevent the spread of invasive species.

Public awareness will be essential to the long-term success of the program in this part of the Adirondacks. This being the first year, most boaters did not seem familiar with the program until later in the summer. Towards the middle of the summer, one of the local papers printed a small article about the program, which a few boaters who came to the launch seemed familiar with, but more media coverage earlier in the summer would have helped. The program sandwich board was a very successful addition mid-summer, as it helped decrease the anxiety of people who thought that the stewards were DEC officers writing tickets and collecting money; people seemed much more receptive to the steward's message after its appearance.

The stewards also noticed that the samples of VLM, EWM, and zebra mussels at the Raquette Lake Village boat launch were very successful at engaging the interest of the public. Seeing and touching the real thing seemed to make them more interested in the threat and cognizant of its reality. Samples were procured for the Fourth Lake boat launch in late July, and seemed to be very successful, although repositioning the table closer to the dock might allow more people to come in contact with them, and the other material. On a related note, it seemed to engage public interest when the steward could tell people if a previous body of water they had been in contained any AIS. A more extensive list that included lakes outside the Adirondack Park would be helpful.

Additionally, the Fourth Lake Boat launch was extremely busy, particularly on weekends. It was often difficult or impossible for the steward to reach boats exiting the boat launch due to the importance of reaching those entering. The limited space near the launching area did not permit exiting boaters to wait very long to be inspected, either. Having two stewards stationed here on weekends (especially holiday weekends) would be extremely helpful in reaching all boaters and eliminating the stress of boaters (and stewards!) during busy times. One way to accomplish this could be through having a rover on weekends who could help the Fourth Lake steward if busy, or go to another boat launch if not.

Conclusion

The extension of the WSP into the west-central Adirondacks, specifically to the Fourth Lake Public Boat Launch, was extremely successful this year. Local property owners associations as well as weekend visitors became aware of the threat of AIS and the current status of the Fulton Chain of Lakes. Many moved past awareness to concern for the lakes and a willingness to take action to make sure AIS stay out. As the program continues, awareness will only increase, and hopefully boaters will come to expect to see a cheerful face in uniform greet them at the boat launch, ready to keep invasive species out of the Fulton Chain. The Watershed Stewardship Program gratefully acknowledges the funding support of the Great Lakes Restoration Initiative and the United States Fish and Wildlife Service.

Fourth Lake Recreation Study 2011

	Boat Type							total #	Weekly Avg	Four	# of
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	people
5-28-11 to 6-2-11	61	9	1	2	2	0	0	75	71	7	208
6-3-11 to 6-9-11	61	8	0	1	7	0	0	77	94	18	161
6-10-11 to 6-16-11	33	7	0	0	1	0	1	42	71	15	85
6-17-11 to 6-23-11	56	14	1	0	1	0	0	72	48	8	166
6-24-11 to 6-30-11	58	10	2	1	4	0	0	75	77	16	162
7-1-11 to 7-7-11	180	41	9	0	3	0	0	233	76	30	597
7-8-11 to 7-14-11	73	14	2	1	5	0	0	95	79	4	249
7-15-11 to 7-21-11	84	17	1	1	8	0	0	111	62	7	277
7-22-11 to 7-28-11	118	25	2	2	10	0	2	159	83	10	378
7-29-11 to 8-4-11	91	13	0	6	4	0	0	114	85	9	308
8-5-11 to 8-11-11	98	26	1	0	14	1	0	140	79	13	371
8-12-11 to 8-18-11	50	10	1	1	1	0	0	63	80	3	184
8-19-11 to 8-25-11	45	9	0	0	8	0	0	62	77	4	154
8-26-11 to 9-1-11	0	0	0	0	0	0	0	0	0	0	0
9-2-11 to 9-5-11	18	8	0	0	2	0	0	28	85	2	64
totals	1026	211	20	15	70	1	3	1346	Summer Avg = 71	146	3364
									Median = 77		

Table 22-Summary, 2011. M= motorboat; K= kayak; C= canoe; B= construction barge; R= rowboat; S=sailboat; PWC= personal watercraft.

Fourth Lake Recreation Study 2011												
	# groups	# groups	organisms found		organism type							
Week	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other
5-28-11 to 6-2-11	70	11	30	0	0	0	0	13	0	0	0	17
6-3-11 to 6-9-11	61	24	8	0	0	0	0	6	0	0	0	2
6-10-11 to 6-16-11	33	13	2	3	0	0	0	2	0	0	0	3
6-17-11 to 6-23-11	63	15	5	2	0	0	0	1	0	0	0	6
6-24-11 to 6-30-11	54	24	5	1	0	1	0	3	0	0	0	2
7-1-11 to 7-7-11	191	46	10	5	1	2	0	5	0	0	0	7
7-8-11 to 7-14-11	56	37	12	4	1	1	0	8	0	0	0	6
7-15-11 to 7-21-11	72	41	12	10	1	0	0	9	0	0	0	12
7-22-11 to 7-28-11	119	46	13	6	1	2	0	4	0	2	1	9
7-29-11 to 8-4-11	89	25	14	2	4	0	0	4	0	0	0	8
8-5-11 to 8-11-11	92	49	19	9	3	1	0	8	0	1	0	15
8-12-11 to 8-18-11	36	29	14	9	2	2	0	5	0	0	1	13
8-19-11 to 8-25-11	35	24	14	5	0	2	1	4	0	0	0	12
8-26-11 to 9-1-11	0	0	0	0	0	0	0	0	0	0	0	0
9-2-11 to 9-5-11	15	12	1	1	1	0	0	0	0	0	0	1
totals	986	396	159	57	14	11	1	72	0	3	2	113

Table 23- EWM= Eurasian watermilfoil; BW= bladderwort; NM= native milfoil, GRS= grass; WC=water chestnut; ZM= Zebra mussel; VLM= variable leaf milfoil

Fourth Lake Recreation Study 2011

	visitor prevention steps									
Week	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
5-28-11 to 6-2-11	48	0	43	15	2	1	0	3	0	72
6-3-11 to 6-9-11	56	31	47	17	0	3	0	10	0	72
6-10-11 to 6-16-11	26	9	18	9	0	0	0	1	0	40
6-17-11 to 6-23-11	51	13	44	12	0	0	0	1	1	67
6-24-11 to 6-30-11	38	2	36	5	0	0	0	2	8	73
7-1-11 to 7-7-11	166	13	98	27	0	0	0	64	7	225
7-8-11 to 7-14-11	61	12	45	22	0	0	0	3	7	81
7-15-11 to 7-21-11	68	13	48	22	0	0	0	3	1	102
7-22-11 to 7-28-11	101	42	86	45	3	3	2	11	1	148
7-29-11 to 8-4-11	74	51	25	0	2	0	11	0	0	107
8-5-11 to 8-11-11	88	55	32	0	1	0	14	2	0	126
8-12-11 to 8-18-11	43	36	13	0	0	0	2	1	0	61
8-20-11 to 8-26-11	45	19	39	5	0	0	0	6	1	55
8-27-11 to 9-1-11	0	0	0	0	0	0	0	0	0	0
9-2-11 to 9-5-11	23	5	18	5	0	0	0	0	0	26
totals	888	301	592	184	8	7	29	107	26	1255
	78%	27%	52%	16%	1%	1%	3%	9%	2%	

Table 24- I= inspected boat; WB= washed boat; DB= drained bilge, BB= emptied bait bucket; LW= drained livewell; Dis= disposed of unused bait; Dry= dried boat.

Recreation Use Study: Lake Flower State Boat Launch

By William Martin, Watershed Steward

Figure 20- Lake Flower State Boat Launch.

Introduction

In 2011, Lake Flower experienced its first season under the watchful eye of the Paul Smith's College Watershed Stewardship Program (WSP). Lake Flower was created in 1827 after the damming of the Saranac River. Located within the Village of Saranac Lake, Lake Flower's shoreline is primarily privately owned. Previously called Newell's Pond, this approximately 300-acre body of water was later re-named for former New York Governor Roswell P. Flower (three-year term, 1892-1894). Lake Flower is divided by the boundary between the Town of North Elba and the Town of Harrietstown. Lake Flower can also be considered the last water-body of the Saranac Chain Lakes before giving way to the Saranac River, which flows northeasterly to its terminus at Lake Champlain in the City of Plattsburgh.

Due to its high visitation rates and surrounding population, Lake Flower is a "hot spot" for invasive species. Stewards were stationed at the state boat launch site on Lake Flower eight hours per day, seven days per week. The chain of lakes upriver from Lake Flower are known to harbor the invasive aquatic plant Eurasian watermilfoil. Because of the direction of the water flow, high visitation, and multiple potential threats of non-point source pollution, Lake Flower is host to several invasive aquatic plants: Eurasian watermilfoil, variable leaf milfoil, and curly leaf pondweed. These invasive plants pose a threat to native aquatic plants, fish habitats, as well as

swimming and other recreation alike. They have the ability to aggressively reproduce from the smallest fragments, forming dense mats, which crowd out other species and inhibit recreational pursuits.

Stewards inspected and removed any threatening species clinging to boats and trailers entering Lake Flower, and did the same for boats and trailers exiting Lake Flower, with special focus on the invasive species listed above to prevent the spread of invasive species to other uninfected waterways. Due to the boat launch location, weather patterns, and the direction of the current, many invasive plants were visible on and/or around the boat ramp, making it difficult at times to exit the waterway without invasive plants clinging to boats and/or trailers. Stewards involved boat owners in the clean-up and inspection process and made efforts to remove any and all foreign species found on boats and trailers prior to entering and exiting Lake Flower. Stewards increased public awareness about the threat of invasive species in the area and the measures that should be practiced to prevent the transport of invasive species.

Methods

From May 28th to September 5th a steward was on site at the Lake Flower boat launch every day from approximately 7:00AM to 4:00PM. Stewards welcomed all visitors and delivered comprehensive interpretive briefs on the presence and potential threats of invasive species in Lake Flower, as well as other interconnected watersheds. Boaters were asked if their boat had been in any other body of water in the previous two weeks, and if so, the name and location of the last body of water. Data was also collected on the steps visitors took to prevent the transport of invasive species, group size, horsepower of outboard engines, and if the outboard engine was 2-stroke or 4-stroke. The state from which motorboats were registered under was also collected.

A visual inspection was conducted by the steward on duty either prior, during, or after the verbal data collection process. Propellers, outdrives, trailer axles, standing water, and any other notable edges were areas of particular steward focus due to the potential for acquiring invasive hitchhikers. Boaters were offered informational literature on invasive species and how to prevent them from infecting other waterways. Though a boat wash was not available at the Lake Flower boat launch site, boat washes were recommended by stewards when available, regardless of the boat's condition. All viable boater responses were recorded in a Microsoft Excel database for future study and determination of use and risk.

Figure 21- Watershed Steward conducting boat inspection at Lake Flower.

Results

During the 2011 season, the WSP observed and inspected 1,603 vessels entering and/or exiting the State Boat Launch at Lake Flower. 163 boats were registered from out of state. Along with those vessels, stewards came into contact with 3,782 visitors at the Lake Flower site. Of the 1,603 vessels entering and/or exiting Lake Flower, 643 (40%) of the vessel operators listed Lake Flower as being the last body of water visited in the previous two weeks. The highest influx of visitors was observed during the week of June 30th through July 6th, which contains the national 4th of July holiday celebration. 211 (13% of total) vessels were observed and inspected that week, which enabled stewards to come into contact with 485 (13% of total) visitors.

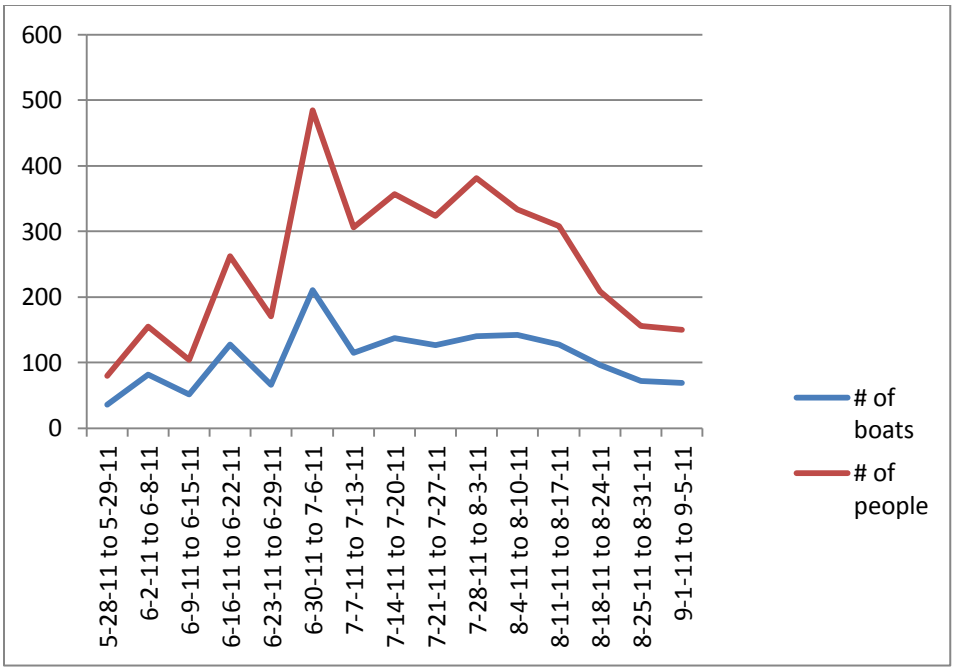


Figure 22- Boat launch usage, Lake Flower, summer 2011.

Motorboats were the most commonly launched vessel type in the 2011 season with 1,228 inspected and observed or 77% of the total. Kayaks came in second with 134 (8%) observed and inspected, while personal watercrafts and canoes came up third and fourth with 118 (7%) and 116 (7%) vessels respectively. Of the motorboats with outboard engines, 341 were found to be 4-stroke (28%).

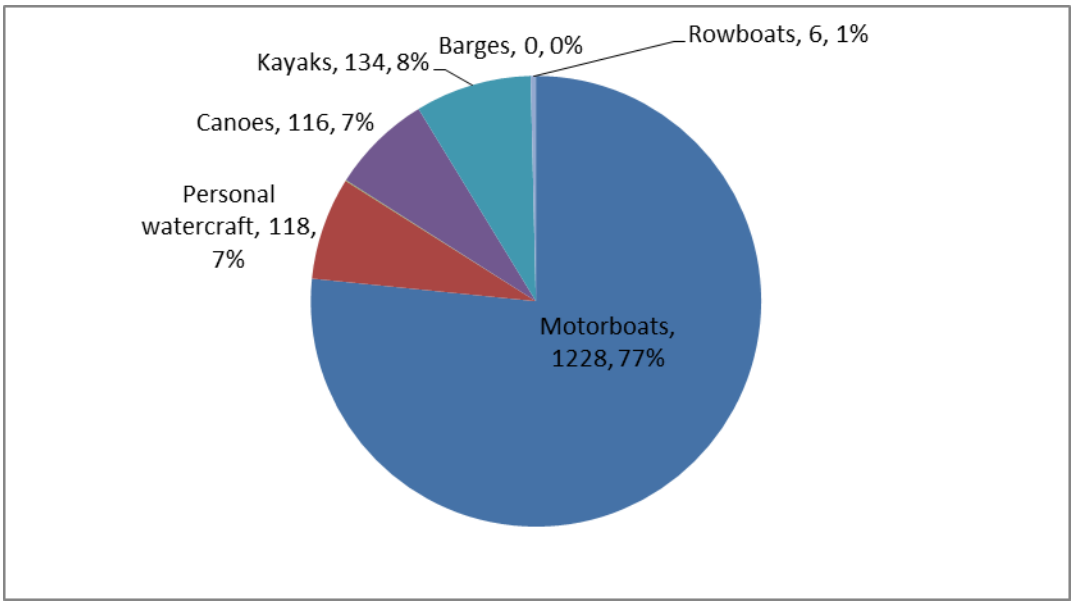


Figure 23- Watercraft types observed at Lake Flower boat launch, 2011.

According to the data collected pertaining to the prevention steps taken by the boat owners when changing bodies of water; 1,213 (79% of 1526 groups encountered) took some steps to prevent the transport of invasive species, 760 (50%) indicated that they washed their vessel before changing waterways, 567 (37%)

indicated that they inspected their vessel for any hitchhikers before changing waterways, 188 (12%) indicated that they dried their vessels sufficiently before changing waterways, 127 (8%) indicated that they drained their bilge before changing waterways, and less than 1% of the visiting groups drained their live wells, drained their bait buckets, disposed of their bait and/or were not specifically asked about their measures of prevention.

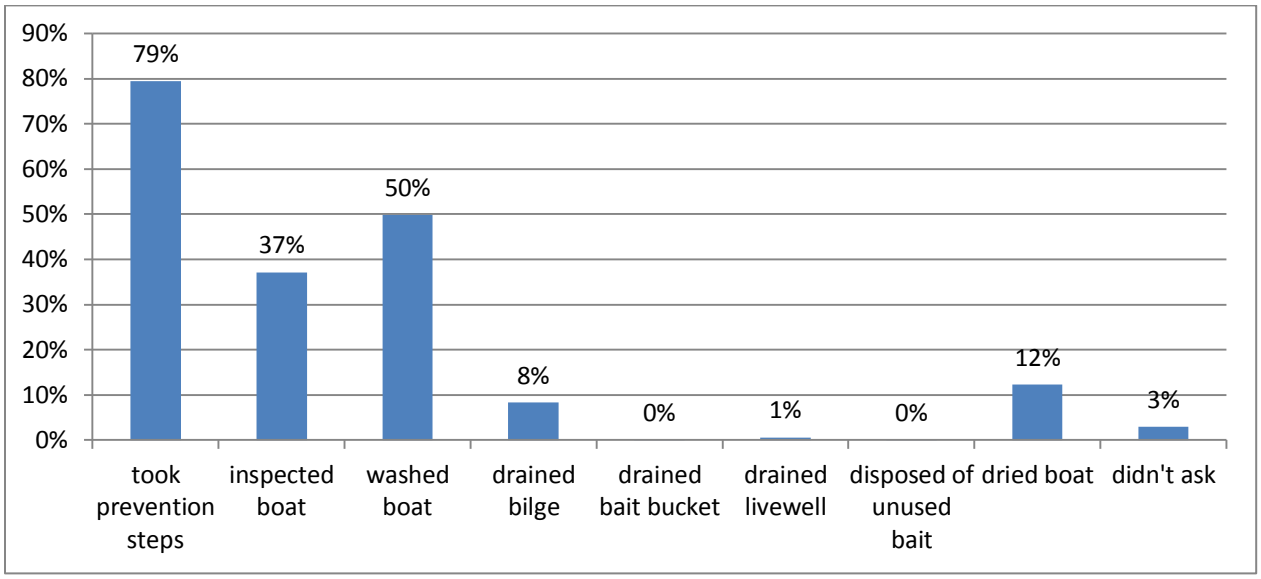


Figure 24- Aquatic invasive species spread prevention measures taken by visitors, Lake Flower boat launch, 2011.

Plant and animal fragments removed from water craft

During the visual inspection process, stewards removed and identified 327 plant or animal fragments on checks of boats entering and/or exiting Lake Flower. 102 organisms were removed from 1,175 groups launching watercraft and 225 organisms were removed from 640 groups retrieving watercraft. This results in a transport rate (any organism) of 8.6% of groups launching watercraft and an transport rate (any organism) of 35% for groups retrieving watercraft, indicating a quadrupled risk of transporting organisms on boats departing Lake Flower compared with boats entering Lake Flower. Of the hitchhikers found, 56 were identified as Eurasian water milfoil, 23 were identified as bladderwort (native species), 17 as native milfoil, 15 instances of lilypads, 12 of various pondweeds, 10 were identified as variable leaf milfoil, 6 were unidentifiable, and one each of algae, tree leaves, pickerelweed and a slug. 13 of the Eurasian watermilfoil samples were removed from boats entering the boat ramp, while 43 were removed from boats departing. Curly leaf pondweed was found on two boats entering and 3 boats departing the boat ramp. The one zebra mussel was found on a boat entering the boat ramp. One of the variable leaf milfoil samples came from a boat entering, while 10 came from boats departing. Overall, 17 boats were found to be bearing confirmed aquatic invasive species when entering the Lake Flower boat ramp, for an invasive species transport rate of 17 of 1175 groups or 1.4%. Overall, 55 boats were found to be bearing confirmed aquatic invasive species when departing the Lake Flower boat ramp, for an invasive species infestation rate of 55 of 640 groups or 8.5%.

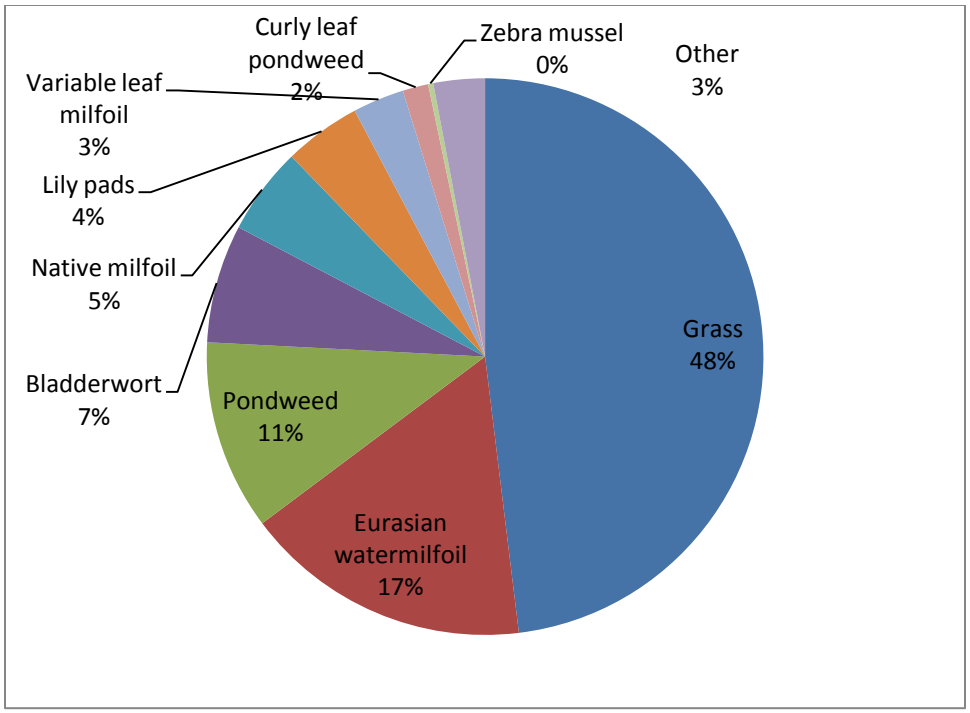


Figure 25- Organisms removed from watercraft, Lake Flower 2011.

Lake Flower emerged as the most frequently cited prior water body visited for boats found to transport the 56 instances of Eurasian watermilfoil (EWM), the 10 instances of variable-leaf milfoil (VLM), the 5 instances of curly leaf pondweed (CLP), and the one instance of zebra mussels (ZM). Other lakes reported as prior visits for boats carrying one of the four detected aquatic invasive species included Barnum Pond, Chazy Lake, the Hudson River, Lake Champlain, Lake Kiwassa, Lake Placid, Lower Saranac Lake, Old Forge, Saratoga Lake, Skaneateles Lake, St. Regis Lake and Tupper Lake. These findings suggest that Lake Flower is a comparatively common source for transported invasive species, and thereby poses a threat to waterways both near and far.

Water body	EWM	VLM	ZM	CLP
Barnum Pond	1			
Chazy Lake	1			
Hudson River	1			
Lake Champlain	2			
Lake Flower	34	4		2
Lake Kiwassa		1		1
Lake Placid	3	1		
Lower Saranac Lake		1		
Old Forge	1			
Saratoga Lake	2	1	1	1
Skaneateles Lake	1			
St. Lawrence River	1			
St. Regis Lake	1			
Tupper Lake	1			
None/ unknown	7	2		1
totals	56	10	1	5

Table 25- Prior waterway visitation history for boats found with organisms attached, Lake Flower 2011. EWM = Eurasian watermilfoil, VLM = variable leaf milfoil, ZM = zebra mussels, CLP = curly leaf pondweed.

Discussion

The Watershed Stewardship Program made its debut at the Lake Flower Boat Launch this season. Stewards successfully prevented the introduction of zebra mussels into Lake Flower, as well as new introductions of the already present Eurasian watermilfoil and variable-leaf milfoil. The removal of such species from boats exiting Lake Flower also prevented invasive species being transferred into other waterways in and around the Adirondack Park. Lake Flower is a crucial recipient of steward coverage due to its high volume of visitation, public visibility, and close proximity to other popular waterways. Both local and regional visitation levels at Lake Flower were comparable to the other highly-used boat ramps at Second Pond, Lake Placid and Tupper Lake, making the boat launch an essential data collection site in the future for the Watershed Stewardship Program.

The data collected on visitor behavior in relation to the steps they'd taken to prevent the transport of invasive species was optimistic, revealing that 1,213 (approx. 79%) out of the 1,526 groups that visited Lake Flower took some steps of invasive species spread prevention. Many visitors noted that if a boat wash station were present near the launch, they would be more diligent about cleaning off their vessel. Stewards interacted with many out of state visitors, as well as many visitors from all over New York State. The majority of boaters recreating on Lake Flower were from New York, but the 163 out-of-state visitors gives the WSP's message more range.

State	# boats	State	# boats
AR	2	NJ	55
CT	24	NY	1243
DL	3	OH	10
FL	9	ON	1
GA	2	PA	9
IN	1	QC	2
KY	3	RI	3
MA	14	VA	1
MI	2	VT	10
MD	9	WV	1
NH	2	**Total**	**1406**

Table 26- Watercraft state of origin, Lake Flower 2011.

Figure 26- Watershed steward work station, Lake Flower 2011.

Body of Water	Infected	#	Body of Water	Infected	#
Atlantic Ocean	Yes	5	Meachum Lake	Yes (EWM)	4
Ausable River	Unknown	2	Merrill Creek	Unknown	1
Bantam Lake (CT)	Unknown	4	Mirror Lake	Not observed	1
Barnum Pond	Unknown	1	Mohawk River	Yes	6
Black Creek	Unknown	1	Monksville Reservoir	Unknown	1
Black Lake	Unknown	1	Moose Pond	Not observed	4
Bristol Pond (VT)	Unknown	1	Mountainview Lake	Yes (EWM)	2
Cayuga Lake	Yes (EWM,	1	Niagara River	Yes	2
Chateaugay Lake	Yes (EWM)	5	Oneida Lake	Yes (ZM)	2
Chazy Lake	Yes (EWM)	3	Oseetah Lake	Yes	2
Chemung River	Unknown	1	Osgood Pond	Not observed	5
Church Pond	Unknown	1	Otsego Lake	Yes (SWF, ZM)	2
Connecticut River (CT)	Yes	3	Owasco Lake	Yes (AC)	1
Cossayuna Lake	Yes	1	Rainbow Lake	Yes (SN)	7
Cranberry Lake	Yes	4	Raquette Lake	Yes (SN)	2
Erie Canal	Yes	2	Raquette River	Yes (VLM)	7
Fern Lake	Yes	1	Rich Lake	Unknown	1
Fish Creek Pond	Yes (EWM)	8	Rochester Canal	Unknown	1
Floodwood Pond	Yes	2	Rollins Pond	Yes	2
Follensby Clear Pond	Yes	1	Rosters Canal	Unknown	1
Fourth Lake	Yes	1	Saranac Chain	Yes (EWM)	113
Franklin Falls Pond	Yes (EWM,	1	Saranac River	Yes	7
Glen Lake	Yes (ZM)	1	Saratoga Lake	Yes (EWM)	3
Great Sacandaga Lake	Yes (EWM,	2	Schroon Lake	Yes (EWM)	1
Greenwood Lake	Yes (EWM)	1	Schroon River	Unknown	1
Hitchens Pond	Unknown	1	Scomotion Creek	Unknown	1
Hoel Pond	Unknown	4	Seneca River	Yes	2
Hudson River	Yes (WC, Z	13	Silver Lake	Unknown	2
Housatonic River (CT)	Unknown	1	Silvia Lake	Unknown	1
Indian Lake (Franklin C	Yes (EWM)	1	Skaneateles Lake	Yes	2
Kiwassa Lake	Yes	8	St. Lawrence River	Yes	8
Lake Abenaki (VT)	Unknown	1	St. Regis River	Unknown	2
Lake Bomoseen (VT)	Yes	1	Smith Mountain Lake	Yes (Hydrilla, CLP, etc.)	1
Lake Champlain	Yes (EWM,	25	Stoney Creek Pond	Unknown	1
Lake Clear	Not Observe	2	Stoney Lake	Unknown	1
Lake Colby	Yes (EWM)	9	Stoney Creek	Unknown	1
Lake Dunmore	Unknown	1	Swinging Bridge (QC)	Unknown	1
Lake Erie	Yes	1	Taylor Pond	Yes (EWM)	2
Lake Flower	Yes (EWM,	643	Tupper Lake	Yes (VLM)	19
Lake Gaston	Unknown	1	Union Falls	Yes (EWM)	2
Lake George	Yes (EWM,	3	Upper Saranac Lake	Yes (EWM)	55
Lake Hopatacong	Yes	1	Upper St. Regis Lake	Not Observed	16
Lake Heritage (PA)	Unknown	1	Warner's Lake	Unknown	1
Lake Ontario	Yes (ZM)	6	White Lake	Unknown	1
Lake Placid	Yes (VLM)	68	Windsor Pond	Unknown	1
Lincoln Pond	Yes (EWM)	1	**Total**		**1159**
Long Lake	Unknown	7	Weren't Asked		23
Long Pond	Unknown	1	Rentals		37
Loon Lake	Yes (EWM)	1	N/A		13
Lower St. Regis Lake	Not Observe	5	**No Lakes Visited**		413

Table 27- Waterways visited in prior two week period, Lake Flower State Boat Launch, 2011. EWM = Eurasian watermilfoil, WC = water chestnut, CLP = curlyleaf pondweed, AC = Asian clam, VLM = variable leaf milfoil, SWF = spiny waterflea, ZM = zebra mussel.

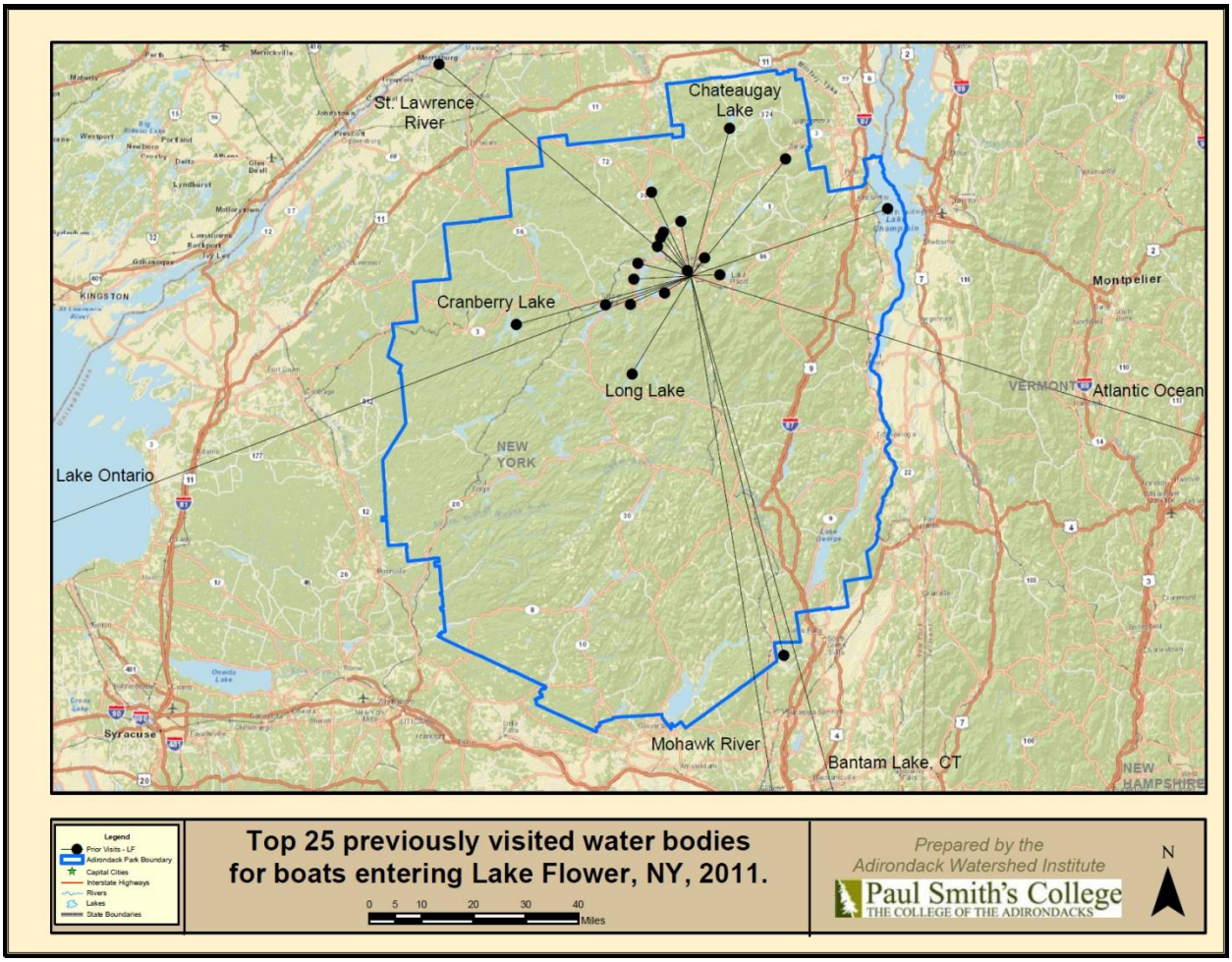


Figure 27- Prior waterway visits, Lake Flower, 2011.

Conclusion

Throughout the Adirondack Park and locally at the Lake Flower Boat Launch, the Watershed Stewardship Program has become a part of the community. Watershed stewards encountered some resistance early on, but as the season progressed, the public acclimated to the program and welcomed stewards to inspect their vessels and engage in conversation. This is where education took place, both formally and informally. Stewards were able to engage in educational conversations with recreational enthusiasts, sharing and building knowledge and awareness of the presence and effects of invasive species. Interacting with out-of-state or out-of-country boaters was particularly successful at bringing to the forefront the interconnectedness of our waterways and watersheds. Invasive species are, after all, a global problem. The Watershed Stewardship Program at Lake Flower helped prevent the transport of invasive species between bodies of water, but perhaps more importantly, it made a positive impact on a community, which will carry the knowledge of the program and its mission further than we can ever know. We acknowledge the generous support of the Adirondack Chapter of the Nature Conservancy and the Wallace Research Foundation for underwriting the Lake Flower Steward Program. Special thanks to the Watershed Stewards of Lake Flower, the Director of the Watershed Stewardship Program, Dr. Eric Holmlund, and the local community of the Village of Saranac Lake for their support.

Lake Flower Recreation Study 2011

	Boat Type							total #	Weekly Avg	Four	# of	# groups	# groups
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	people	launching	retrieving
5-28-11 to 5-29-11	29	5	0	1	1	0	0	36	68	9	80	31	11
6-2-11 to 6-8-11	58	4	1	4	15	0	0	82	79	14	155	62	39
6-9-11 to 6-15-11	46	2	0	4	0	0	0	52	78	15	104	42	19
6-16-11 to 6-22-11	102	9	0	10	6	0	1	128	87	36	262	101	52
6-23-11 to 6-29-11	50	5	0	7	2	0	2	66	67	19	171	53	23
6-30-11 to 7-6-11	165	18	0	16	12	0	0	211	70	56	485	174	75
7-7-11 to 7-13-11	89	8	0	9	9	0	0	115	55	25	306	61	36
7-14-11 to 7-20-11	104	11	0	5	18	0	0	138	71	29	357	117	49
7-21-11 to 7-27-11	91	12	0	12	12	0	0	127	70	21	324	87	58
7-28-11 to 8-3-11	106	6	0	12	16	0	0	140	63	33	381	102	56
8-4-11 to 8-10-11	115	11	0	6	10	0	0	142	69	24	334	103	70
8-11-11 to 8-17-11	101	5	0	11	11	0	0	128	66	21	308	73	57
8-18-11 to 8-24-11	72	13	0	6	5	0	1	97	68	11	209	67	40
8-25-11 to 8-31-11	54	6	0	5	6	0	1	72	76	15	156	52	38
9-1-11 to 9-5-11	46	3	0	8	11	0	1	69	60	13	150	50	17
totals	1228	118	1	116	134	0	6	1603	Summer Avg = 70	341	3782	1175	640
									Median HP = 60				

Table 28- Lake Flower use figures, 2011. Key: M = Motorboat; PWC = personal watercraft; S = sailboat; C = canoe; K = kayak; B = barge (construction); R = rowboat.

Lake Flower Recreation Study 2011

	organisms found		organism type									
Week	entering	leaving	EWM	BW	NM	PN	GRS	WC	ZM	CLP	VLM	other
5-28-11 to 5-29-11	1	9	2	0	4	0	3	0	0	0	1	0
6-2-11 to 6-8-11	1	8	0	0	2	0	5	0	0	0	1	1
6-9-11 to 6-15-11	1	10	0	0	2	3	2	0	0	0	1	3
6-16-11 to 6-22-11	12	10	0	0	0	5	11	0	0	0	0	6
6-23-11 to 6-29-11	7	11	2	1	1	3	8	0	0	2	1	0
6-30-11 to 7-6-11	13	37	14	4	1	2	22	0	0	0	2	5
7-7-11 to 7-13-11	6	10	3	2	0	0	8	0	0	0	1	2
7-14-11 to 7-20-11	10	12	3	2	2	2	9	0	0	1	1	2
7-21-11 to 7-27-11	5	14	3	2	0	2	9	0	0	0	1	2
7-28-11 to 8-3-11	6	14	3	3	0	0	10	0	0	0	0	4
8-4-11 to 8-10-11	6	19	5	4	0	0	13	0	0	0	0	3
8-11-11 to 8-17-11	18	20	6	2	1	0	21	0	1	2	0	5
8-18-11 to 8-24-11	6	17	7	0	0	0	14	0	0	0	1	1
8-25-11 to 8-31-11	4	19	6	2	1	0	12	0	0	0	0	2
9-1-11 to 9-5-11	6	15	2	1	3	0	14	0	0	0	0	1
totals	102	225	56	23	17	17	161	0	1	5	10	37

Table 29- Key: EWM = Eurasian Watermilfoil; BW = native bladderwort; NM = native milfoil; GRS = grass; WC = water chestnut; ZM = zebra mussel; VLM = variable leaf milfoil.

Lake Flower Recreation Study 2011										
	Measures taken to prevent transport of invasive species									
Week	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
5-28-11 to 5-29-11	25	6	16	17	1	0	0	16	1	34
6-2-11 to 6-8-11	53	33	34	6	0	0	0	7	3	74
6-9-11 to 6-15-11	46	16	25	11	1	1	1	15	2	50
6-16-11 to 6-22-11	99	58	69	15	0	0	0	12	9	124
6-23-11 to 6-29-11	57	29	40	5	0	1	0	14	1	94
6-30-11 to 7-6-11	183	85	121	22	0	0	0	32	3	210
7-7-11 to 7-13-11	96	54	55	5	0	0	0	14	7	81
7-14-11 to 7-20-11	107	54	51	4	0	0	0	23	5	136
7-21-11 to 7-27-11	91	34	62	6	0	2	0	7	4	125
7-28-11 to 8-3-11	113	46	83	7	0	1	0	11	3	136
8-4-11 to 8-10-11	103	46	64	6	0	0	0	9	4	141
8-11-11 to 8-17-11	92	40	49	11	0	0	0	15	1	94
8-18-11 to 8-24-11	66	28	38	4	0	2	0	7	1	95
8-25-11 to 8-31-11	51	23	33	7	0	1	0	3	0	72
9-1-11 to 9-5-11	31	15	20	1	0	1	0	3	1	60
totals	1213	567	760	127	2	9	1	188	45	1526

Table 30- : I = Inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = drained live well; Dis = disposed of unused bait away from water; Dry = dried boat.

Recreation Use Study: Lake Placid State Boat Launch

By Kyle Milner, Watershed Steward

Figure 28- Whiteface Mountain as seen from Lake Placid.

Introduction

Almost a decade of hard work and commitment has gone into protecting Lake Placid's aquatic resources through Paul Smith's College Watershed Stewardship Program. The summer of 2011 was no exception. Watershed stewards kept up the pressure to educate and inform the general public while at the same time working towards a positive change in the health of Lake Placid. Stewards inspected boats and trailers while also asking where boats came from in the past two weeks prior to arriving on the shores of Lake Placid. In addition to

all this data, stewards also attempted to gauge any possible prevention steps the aware or unaware general public may be taking to stop the spread of all invasive species.

Methods

Paul Smith's College stewards were at the Lake Placid public boat launch 7 days a week from 7am to 4pm, which was the peak of boat traffic. Stewards began the season on 5/28/11 and worked vigilantly through 9/2/11. Every boater that arrived at the state boat launch had their boat visually inspected by the steward. This was an opportunity for the steward to point out places on the boat and trailer where invasive species can get trapped. After the inspection a picture of the recent past was created when the steward asked the visitor where their boat had been in the last two weeks. Stewards also gathered information about horsepower, and the purpose of the visit: recreation, commercial, or fishing. Lastly, the steward attempted to find out what prevention steps a boater took to stop the spread of invasive species. The questions are carefully worded so as not to make the boater feel negligent if they had not taken any prevention steps. Stewards were only interested if boaters took these steps knowing that they were to stop the spread of invasive species. For example, stewards felt there was a difference between boaters who washed their boat to look nice as opposed to a boater who washed their boat to remove invasive species.

Results

From 5/28/11 to 9/2/11 Lake Placid stewards inspected 1,873 boats and interacted with 3,932 people. Peak use of the boat launch was over the 4th of July holiday, where 209 boats were inspected, and 524 people received outreach education.

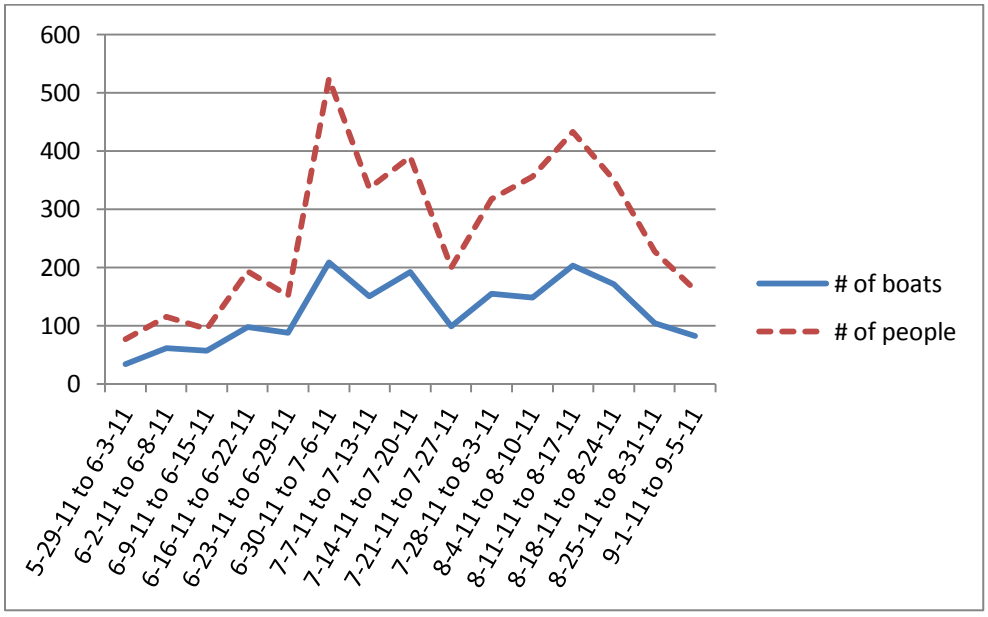


Figure 29- Lake Placid State Boat Launch Use, 2011.

Boat use was broken down into three different catogories: recreation, fishing or commercial (Figure 30). Recreation was by far the largest user group, while fishing and rereation followed each other closely at a significantly lower level.

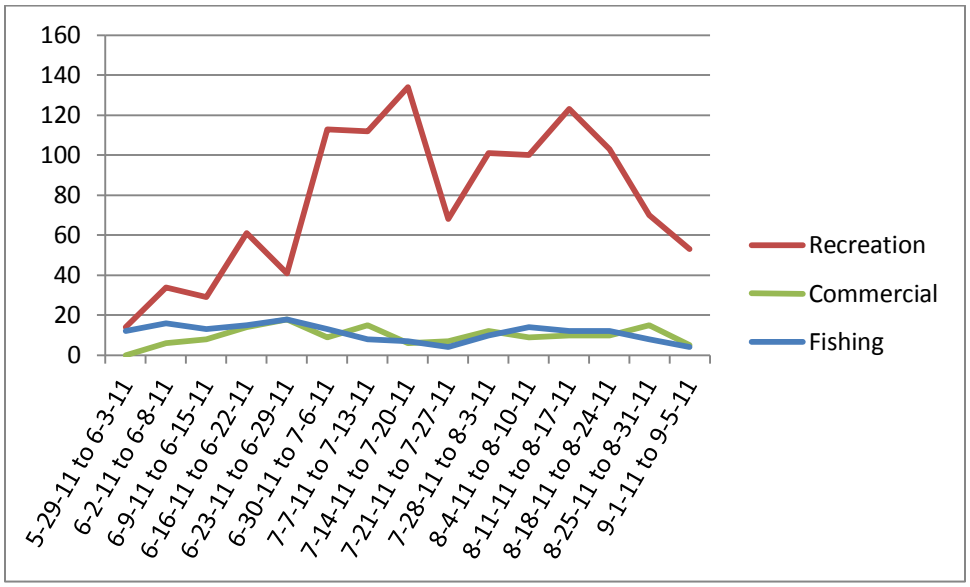


Figure 30- Purpose of visits, Lake Placid, 2011. Recreation = boating or water skiing; Commercial = contractors, deliveries, guides.

The most common watercraft seen launching were motorboats, 1,049, accounting for 56% of the total. Second came kayaks, with 569 representing 31% of the total. Canoes were third most numerous at the launch, with 198 of them consisting of 10% of the total. Barges (14), sailboats (22), rowboats (19) and personal watercraft (2) made up the rest of the total. Stewards also took not of the horsepower of outboard motors, calculating an average of 90 for the summer. Of the motorboats with outboard motors, 520 had four-stroke motors.

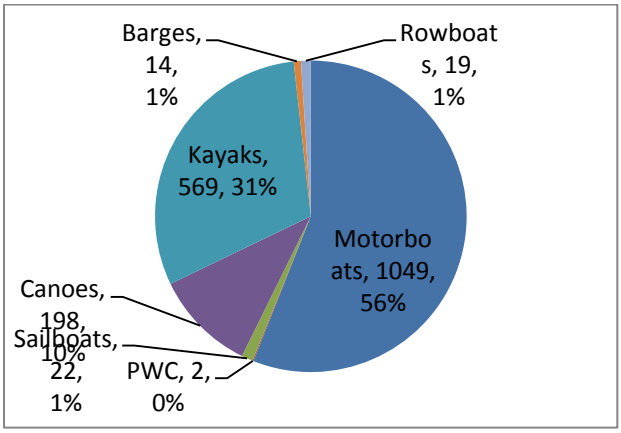


Figure 31- Types of watercraft launched, Lake Placid 2011.

Stewards welcomed visitors from 21 states and 2 Canadian provinces. Stewards noted the state on motorboat registration stickers and on license plates for non-motorized watercraft. 85% of watercraft were from New York, followed by New Jersey (5%) and Connecticut (2.2%).

State/Province	# Boats
CT	28
FL	7
GA	1
IL	1
KY	1
MA	18
MD	9
ME	2
NC	1
NH	8
NJ	62
NY	1046
OH	4
ON	8
PA	16
QC	4
RI	2
SC	1
VA	4
VT	8
WA	2
WI	1

Table 31- State/province of origin, Lake Placid, 2011.

Stewards asked each boater what bodies of water if any they had visited in the last two weeks. This is critical information to try and trace where potential threats from invasive species may be coming from. A total of 112 different lakes were recorded to have been visited prior to arriving in Lake Placid.

The lake that was visited the most frequently in the prior two-week period was Lake Placid with 683 boats (Table 32). 255 boats came from 28 different lakes other than Lake Placid known to be infested with aquatic invasive species. That represents 255 potential chances to infect Lake Placid with a variety of invasive species.

Water Body	Total Visits	Infested?	Water Body	Total Visit	Infested?
LAKE PLACID	683	Y	COSSAYUNA LAKE	1	Y
NONE	66		CRANBERRY	1	Y
SARANAC LAKE CHAIN	63	Y	CROWN POINT	1	Y
MIRROR LAKE	58	N	DELAWARE MARSH	1	Y
LAKE FLOWER	29	Y	DELAWARE RIVER	1	Y
LAKE CHAMPLAIN	20	Y	EAGLE LAKE	1	Y
ATLANTIC OCEAN	12	Y	EIGHTH LAKE	1	N
LAKE GEORGE	10	Y	ERIE CANAL	1	Y
ST. REGIS	10	N	FERN LAKE	1	Y
FISH CREEK PONDS	8	Y	FLORIDA	1	Y
TUPPER LAKE	8	Y	FORKED LAKE	1	Y
TAYLOR POND	7	Y	GARDNER LAKE, CT	1	Y
LAKE ONTARIO	5	Y	GRASSE RIVER	1	Y
SCHROON LAKE	5	Y	GREAT BAY NH	1	Y
SKANEATELES LAKE	5	Y	GREEN RIVER RES.	1	
LAKE EVEREST	4		GREENWOOD LAKE	1	Y
OSGOOD POND	4	N	HEMLOCK LAKE	1	Y
SARANAC RIVER	4	Y	JAMESVILLE RES.	1	Y
AUSABLE RIVER	3		LAC SIMON	1	
BUCK POND	3	N	LAKE ATTITASH	1	Y
CANANDAIGUA LAKE	3	Y	LAKE BOMOSEEN	1	Y
CHUBB RIVER	3		LAKE BRANTINGHAM	1	N
HUDSON RIVER	3	Y	LAKE CLEAR	1	N
KIWASSA	3	Y	LAKE HARRIS	1	N
LAKE CHATEAUGAY	3	Y	LAKE HOPATCONG	1	Y
LAKE COLBY	3	Y	LAKE LILA	1	N
RAQUETTE RIVER	3	Y	LAKE LONELY	1	
BALLSTON LAKE	2	Y	LAKE NOCKAMIXON, PA	1	Y
BARNEGAT BAY ATLANTIC OCEAN	2	Y	LAKE PLEASANT	1	N
BLUE MTN LAKE	2	N	LOWER AUSABLE LAKE	1	N
CASCADE LAKES	2	N	LOWER ST.REGIS\SPITFIRE	1	N
CAYUGA LAKE	2	Y	LOWS LAKE	1	
CONESUS LAKE	2	Y	MAUCH CHUNK LAKE	1	
CROSS LAKE	2		MISSISSIPPI RIVER	1	Y
DERUYTER	2	Y	MOHAWK RIVER	1	Y
DIDN'T ASK	2		MT ARAB LAKE	1	N
FOLLENSBY CLEAR	2	Y	NORWOOD LAKE	1	
FRANKLIN FALLS	2	Y	OCEAN	1	Y
HINCKLEY RES	2		OSEETAH LAKE	1	Y
LAKE ERIE	2	Y	OSSIPEE LAKE, NH	1	Y
LAKE KUSHAQUA	2	N	OSWEGO RIVER	1	Y
LINCOLN POND	2	Y	OTTOWA RIVER	1	
LONG LAKE	2		PANGAEA UPPER AND LOWER	1	
LONG POND/ WILLSBORO NY	2	Y	RAQUETTE LAKE	1	Y
MOOSE POND	2	N	REHOBOTH, DE	1	
ROLLINS POND	2	N	RENTAL	1	
SACANDAGA RES.	2	Y	RESERVOIR NEWARK	1	
ST LAWRENCE	2	Y	ROUND LAKE, NY	1	N
UPPER CHATEAUGAY	2	Y	RYE, NY	1	
1000 ISLANDS	1	Y	SALMON RIVER	1	Y
ALGONQUIN LAKE	1	Y	SARATOGA LAKE	1	Y
BATTENKILL RIVER	1	Y	SPRUCE RUN RES.	1	Y
BRANT LAKE	1	Y	ST. REGIS CANOE AREA	1	N
CAZENOVIA LAKE	1	Y	STEWART'S POND	1	
CEDARVILLE / MICHIGAN	1		SYDNEY COVE, NY	1	
CHAPEL POND	1		THOMPSONS	1	

Table 32- Waterways visited two weeks prior to visiting Lake Placid, 2011.

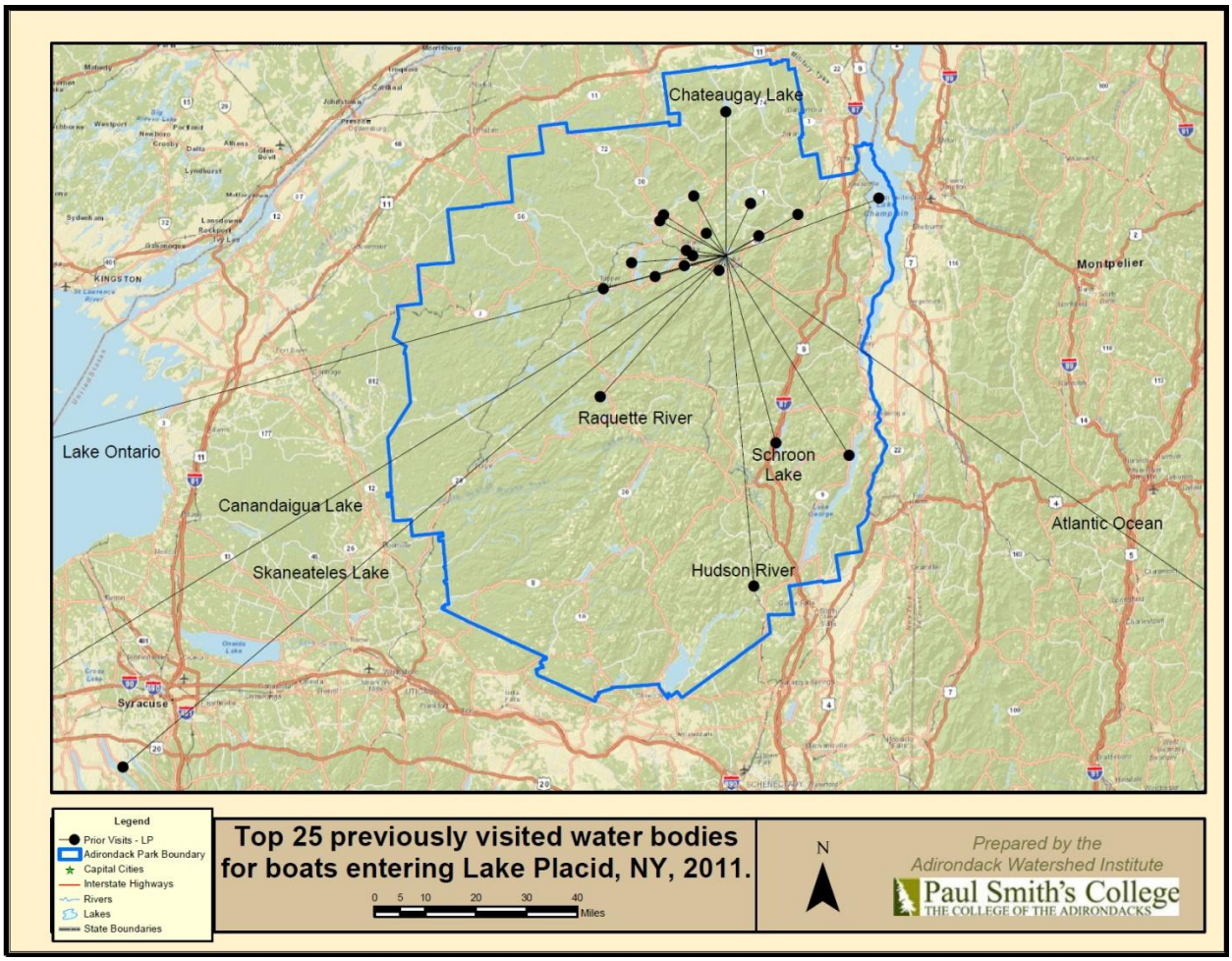


Figure 32- Previous waterway visitation map, Lake Placid 2011.

Stewards attempted to find out what prevention steps a boater took to stop the spread of invasive species. Stewards were only interested if boaters took these steps knowing that they were to stop the spread of invasive species. For example, stewards felt there was a difference between boaters who washed their boat to look nice as opposed to a boater who washed their boat to remove invasive species.

Responses were grouped into the following categories: inspect boat, wash boat, dry boat for at least 2 days, dispose of bait, drain live wells, empty bait buckets, and/or drain bilge. A total of 976 'yes' responses and 1,371 prevention steps were recorded from the 1,426 visitor groups encountered by stewards (Table 36).

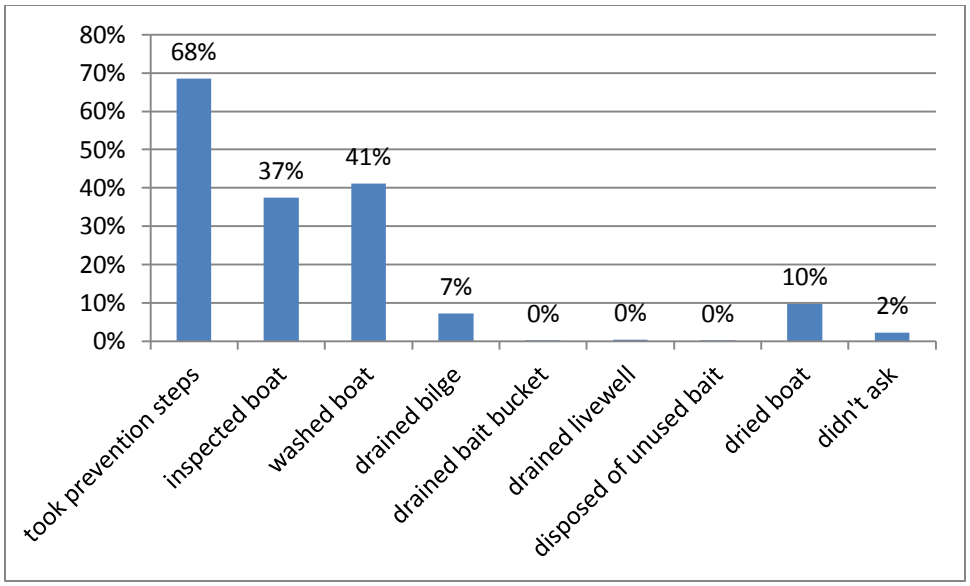


Figure 33- Aquatic Invasive Species spread prevention measures, Lake Placid, 2011.

Stewards' first and foremost duty was to inspect boats and record if an invasive species was found. A total of 79 organisms were found, 3 of them invasive species. 1 zebra mussel (7/31/11), 1 Eurasian watermilfoil fragment (a different boat on 7/31/11), and one fragment of a plant thought to be Hydrilla (8/29/11; no sample retained) were removed from boats entering Lake Placid.

Organism	Entering	Leaving	Prior waterway
Eurasian watermilfoil	1		Lake Champlain
Grass	24	12	
Grass nest	1		
Hydrilla (unconfirmed)	1		Skaneateles Lake
Leaves	13	4	
Native milfoil	2		
Native pondweed	2		
Native snails	1		
Other (unidentified)	2		
Pine needles	11	4	
Zebra mussels	1		St. Lawrence River
totals	59	20	

Table 33- Organisms found on boats entering and leaving Lake Placid, 2011.

Discussion

Overall use in 2011 fell somewhat compared to 2010, with a drop of 12.6% in people and a decline of 8% in the number of boats inspected (Figure 34). Four stroke use increased in 2011 by 55.6%, indicating a welcome continuation of the adoption of this environmentally friendly technology.

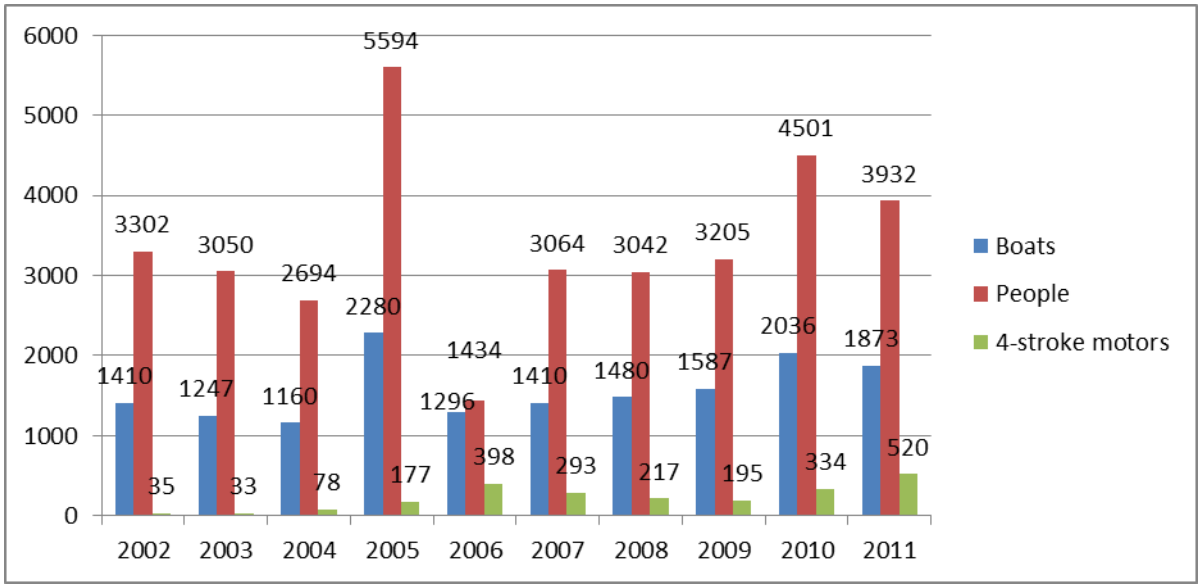


Figure 34- Use characteristics, Lake Placid State Boat Launch, 2002-2011.

Stewards found and removed fewer organisms from watercraft in 2011 (79 organisms) compared with 2010 (115), representing a 31.3% decline. Once again, more organisms were found on entering watercraft (75% of total organisms removed) than on departing watercraft (25%), which is in line with past findings. Pine needles, grass, and deciduous leaves tend to be the most commonly found materials on boats entering and leaving. Overall, the organism transport rate (any organism) of boats using the Lake Placid ramp was 79 of 1,855 watercraft or 4.2%, compared with 5.6% in 2010, a 25% decline. The invasive species transport rate in 2011 was 3 of 1,855 watercraft or 0.16%, compared with 0.24% in 2010, or a 33% decline.

Stewards continue to educate large numbers of visitors and remove a significant number of plant and animal fragments that otherwise would have come into contact with the waters of Lake Placid. The WSP and village and town officials need to develop an approach to implementing the North Elba aquatic species transport ban, which remains an essential statutory tool, but thus far has not been readily enforceable. Stewards had few concerns of note regarding their summer of service at the boat ramp, and generally conducted their duties with efficiency and overall success. The public was receptive and appeared to accept the steward presence with little comment. After ten years of full summer service, the presence of Watershed Stewards appears to be well-established and accepted as part of the boat launching experience from the perspective of users of the boat ramp.

Conclusion

This summer stewards were proud to work 7 days a week to prevent invasives from infecting Lake Placid. The stewards working for the Watershed Stewardship Program received a warm welcome from the general public

and local residents of Lake Placid who appeared grateful for the work they were doing. Stewards were successful in spreading the message and knowledge to help people to actively stop invasives from spreading to new lakes. This knowledge is the most important impact stewards can have. The stewards and the program would like to recognize the support and advice of the Lake Placid Shore Owner's Association. Their strong sense of stewardship and tireless efforts should be commended, and should serve as model for other communities.

Figure 35- Lake Placid boat ramp.

Lake Placid Recreation Study 2011

	Boat Type							total #	Weekly Avg	Four	# of	# groups	# groups
Week	M	PWC	S	C	K	B	R	boats	HP Outboard	stroke	People	launching	retrieving
5-29-11 to 6-3-11	24	0	1	4	5	0	0	34	132	19	77	25	21
6-2-11 to 6-8-11	43	0	1	8	9	1	1	63	116	32	116	49	25
6-9-11 to 6-15-11	39	0	0	5	11	2	0	57	89	25	95	41	25
6-16-11 to 6-22-11	73	2	1	4	18	0	1	99	86	42	194	71	37
6-23-11 to 6-29-11	63	0	4	5	15	1	0	88	101	41	152	68	35
6-30-11 to 7-6-11	118	0	1	24	66	0	2	211	92	57	524	152	87
7-7-11 to 7-13-11	95	0	6	10	38	2	5	156	79	58	336	111	68
7-14-11 to 7-20-11	100	0	2	36	53	1	0	192	76	45	390	133	70
7-21-11 to 7-27-11	50	0	0	26	21	2	0	99	108	28	200	64	43
7-28-11 to 8-3-11	78	0	2	16	58	1	4	159	75	33	318	91	61
8-4-11 to 8-10-11	83	0	1	14	46	4	1	149	77	35	356	94	76
8-11-11 to 8-17-11	91	0	1	21	90	0	2	205	76	40	433	117	68
8-18-11 to 8-24-11	82	0	1	11	77	0	2	173	84	27	351	56	21
8-25-11 to 8-31-11	73	0	0	7	25	0	0	105	81	10	228	48	27
9-1-11 to 9-5-11	37	0	1	7	37	0	1	83	128	28	162	44	35
totals	1049	2	22	198	569	14	19	1873	Summer Avg 90	520	3932	1164	699
									Summer Median 75				

Table 34- Summary, 2011. Key: M = Motorboat; PWC = personal watercraft; S = sailboat; C = canoe; K = kayak; B = barge (construction); R = rowboat.

Lake Placid Recreation Study 2011

	organisms found		organism type								Use		
Week	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other	Fish	Rec	Comm
5-29-11 to 6-3-11	4	2	0	0	0	0	0	0	0	6	12	14	0
6-2-11 to 6-8-11	5	2	0	0	0	2	0	0	0	5	16	34	6
6-9-11 to 6-15-11	6	1	0	0	0	3	0	0	0	4	13	29	8
6-16-11 to 6-22-11	5	1	0	0	0	1	0	0	0	5	15	61	14
6-23-11 to 6-29-11	2	1	0	0	0	2	0	0	0	1	18	41	18
6-30-11 to 7-6-11	2	7	0	0	0	4	0	0	0	5	13	113	9
7-7-11 to 7-13-11	1	1	0	0	0	2	0	0	0	0	8	112	15
7-14-11 to 7-20-11	7	1	0	0	1	7	0	0	0	0	7	134	6
7-21-11 to 7-27-11	3	1	0	0	0	2	0	0	0	2	4	68	7
7-28-11 to 8-3-11	4	0	1	0	0	1	0	1	0	1	10	101	12
8-4-11 to 8-10-11	3	2	0	0	0	4	0	0	0	1	14	100	9
8-11-11 to 8-17-11	1	0	0	0	0	1	0	0	0	0	12	123	10
8-18-11 to 8-24-11	4	0	0	0	1	3	0	0	0	0	12	103	10
8-25-11 to 8-31-11	7	0	0	0	0	2	0	0	0	5	8	70	15
9-1-11 to 9-5-11	5	1	0	0	0	3	0	0	0	3	4	53	5
totals	59	20	1	0	2	37	0	1	0	38	166	1156	144

Table 35- Key: EWM = Eurasian Watermilfoil; BW = native bladderwort; NM = native milfoil; GRS = grass; WC = water chestnut; ZM = zebra mussel; VLM = variable leaf milfoil.

Lake Placid Recreation Study 2011

	visitor prevention steps									
Week	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
5-29-11 to 6-3-11	18	5	4	0	0	0	0	11	0	30
6-2-11 to 6-8-11	45	18	23	7	0	0	1	11	3	29
6-9-11 to 6-15-11	29	14	13	4	0	0	0	1	3	50
6-16-11 to 6-22-11	57	29	37	11	1	0	0	5	3	90
6-23-11 to 6-29-11	44	19	28	1	0	0	0	4	3	77
6-30-11 to 7-6-11	127	91	82	21	0	1	1	30	8	174
7-7-11 to 7-13-11	97	72	52	18	0	2	0	22	0	130
7-14-11 to 7-20-11	100	62	56	7	0	0	0	18	2	149
7-21-11 to 7-27-11	47	25	27	6	0	0	0	5	2	79
7-28-11 to 8-3-11	67	35	40	2	0	1	0	7	1	122
8-4-11 to 8-10-11	80	47	40	5	0	0	0	8	2	134
8-11-11 to 8-17-11	88	42	59	5	0	0	0	1	3	143
8-18-11 to 8-24-11	79	35	52	8	0	1	0	4	0	66
8-25-11 to 8-31-11	58	15	42	5	0	0	0	9	1	92
9-1-11 to 9-5-11	40	25	32	3	0	0	0	3	0	61
totals	976	534	587	103	1	5	2	139	31	1426

Table 36- Key: I = Inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = emptied livewell; Dis = disposed of bait; Dry = dried boat.

Recreation Use Study: Lake Placid Village Launch

By Kyle Milner, Watershed Steward

Figure 36- Lake Placid Village boat launch (Chris Knight, Adirondack Daily Enterprise).

Introduction

This was the first season Paul Smith's College Watershed Stewardship Program has posted a steward at the Village boat launch in Lake Placid. This access point, located on Victor Herbert Road, is also referred to as Paradox Bay. This boat launch was of great concern to the residents of Lake Placid because this location was the site of an infestation of variable leaf milfoil, a non-native invasive species, in 2009. This boat launch tends to be less busy than the larger state boat launch in Lake Placid and tends to service more local residents. The village-owned ramp serves as an unmonitored entry point to Lake Placid. This summer's coverage has been a priority need for both collecting usage data and for removing any organisms that might otherwise add to the invasive species challenges faced by Lake Placid.

Methods

Paul Smith's College Watershed Stewards were stationed at the Lake Placid Village boat launch two days a week, Saturdays and Sundays, from 7am to 4pm, which was the peak of boat traffic. Stewards began the season on 5/28/11 and worked vigilantly to 8/21/11. Coverage decreased at the end of the summer as stewards left the area to return to their home colleges. A steward was at the boat ramp on 8/28/11, but saw no boats due to the oncoming hurricane. The steward inspected every boat that arrived at the Village of Lake Placid- owned boat ramp. This was an opportunity for the steward to point out places on the boat and trailer where invasive species can get trapped. After the inspection stewards asked visitors where their boat had been in the last two weeks. Lastly, the steward attempted to find out what prevention steps a boater took to stop the spread of invasive species. Stewards recorded data on forms on site, and then transferred the data to Excel databases for analysis and archiving.

Results

From 5/28/11 to 8/21/11 Lake Placid stewards inspected 208 boats and interacted with 361 people. Peak use of the boat launch was over the 4th of July holiday, where 33 boats were inspected, and 48 people received outreach education (Figure 37).

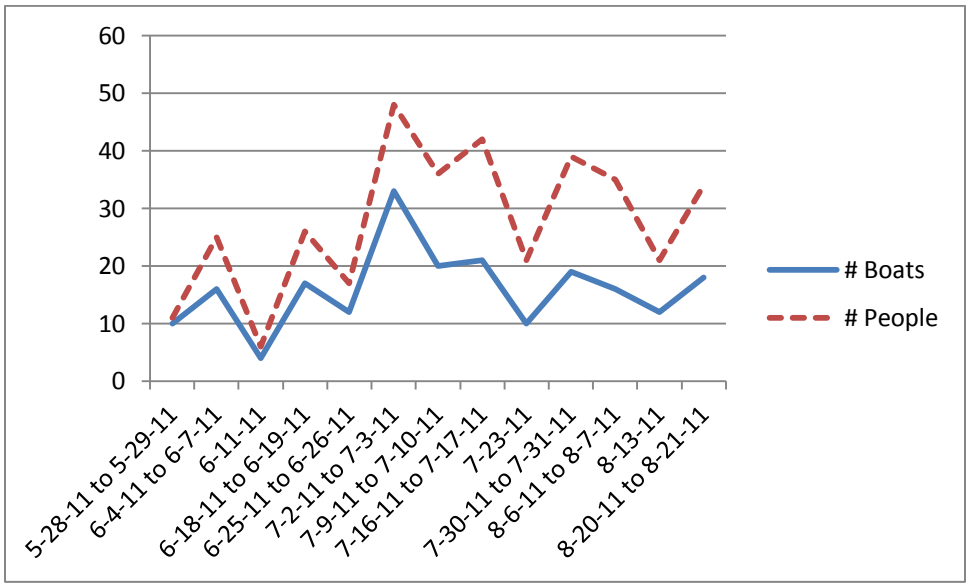


Figure 37- Boat launch use, Lake Placid Village, 2011.

The most common watercraft seen launching were motorboats, 124 (Figure 38) of them accounting for 60% of the total. Second came kayaks, with 56 representing 27% of the total. Canoes were third most numerous at the launch, with 22 of them consisting of 11% of the total. Barges (1), rowboats (3) and personal watercraft (0) made up the rest of the total. Horsepower of outboard motors was also collected, with the average being 79. Of the motorboats with outboard motors, there were 53 with four-stroke motors.

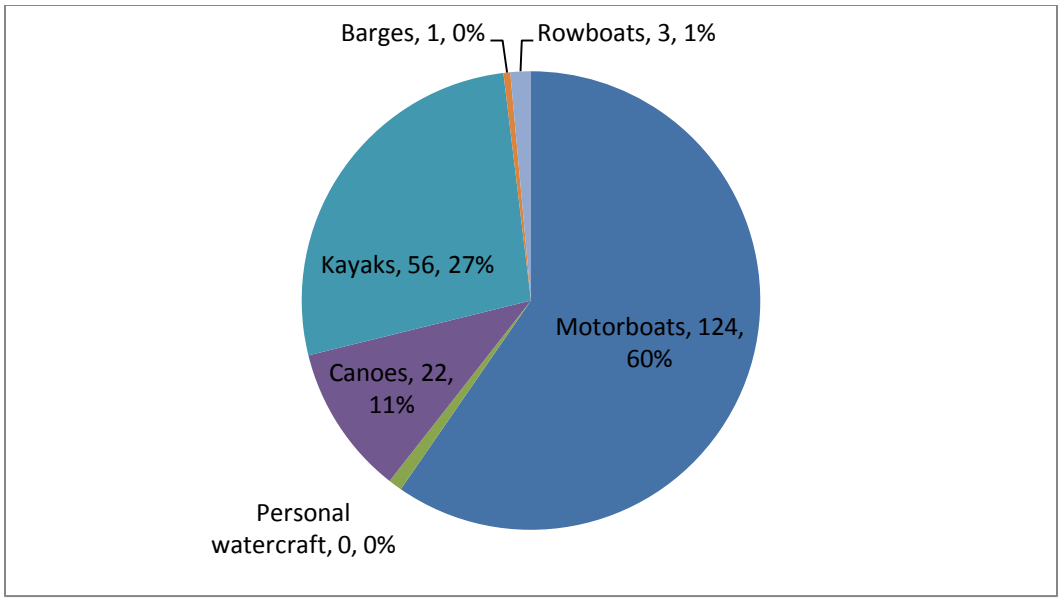


Figure 38- Types of watercraft launched, Lake Placid Village, 2011.

State or province of origin was determined by the registration on motor boats only (Table 37). The Watershed Stewardship Program policy is to minimize the number of questions asked each visitor. Registration stickers on motorboats are visible and require no questioning of visitors. Visitors came from 8 different states, Connecticut, Florida, Maryland, Massachusetts, New Hampshire, New York, Pennsylvania, and Rhode Island, to launch from Lake Placid Village boat launch. The majority of boats were from the state of New York (122).

State	# Visits
CT	1
FL	2
MD	1
MA	3
NH	1
NY	122
PA	1
RI	1

Table 37- State of origin, watercraft using Lake Placid village launch, 2011.

Stewards attempted to create a picture of past boat use and potential sources of transportable invasive species by asking each boater what bodies of water if any they had visited in the last two weeks (Table 38). This is critical information to try and trace where potential threats from invasive species may be coming from. A total of 26 different lakes were recorded to have been visited by 138 boats prior to arriving at Lake Placid Village boat launch. The lake that was visited the most frequently before launching at Lake Placid Village was Lake Placid itself,

with 103 boats (Table 38). 127 boats reported prior visits to known infected lakes, based on existing databases and internet searches of material pertaining to each lake. This represents 127 potential chances to infect Lake Placid with a variety of invasive species. Further, this information indicates that, while local users dominate the traffic, a considerable number of visitors from points across the state and out of state (35 of 208 total boats, or 18.5%) use the facility, presenting a present risk of invasive species introduction.

WATERBODY VISITED	# VISITS	INVASIVES PRESENT
AUSABLE RIVER	2	
CANDLEWOOD LAKE, CT	1	YES
CHATEAUGAY	1	YES
CHUBB RIVER	1	
ELM BROOK PARK, NH	1	YES
FLOODWOOD POND	1	YES
FOURTH LAKE	1	YES
KIWASSA LAKE	2	YES
LAKE COLBY	1	YES
LAKE CONESUS	1	YES
LAKE FLOWER	1	YES
LAKE GEORGE	2	YES
LAKE ONTARIO	1	YES
LAKE PLACID	103	YES
LONG ISLAND SOUND	2	YES
LOWER SARANAC	2	YES
MIRROR LAKE	2	
MISSISQUOI RIVER/QUEBEC	1	
OSGOOD POND	1	
SARANAC RIVER	1	YES
SENECA LAKE	1	YES
SHARBOT LAKE	1	YES
ST. REGIS LAKE	3	
STONY BROOK POND	1	
TAYLOR POND	1	YES
UPPER SARANAC LAKE	3	YES

Table 38- Waterways visited in prior two-week period, Lake Placid Village, 2011.

Stewards attempted to find out what prevention steps a boater took to stop the spread of invasive species prior to visiting the boat launch. Responses were grouped into the following categories: inspect boat, wash boat, dry boat for at least 2 days, dispose of bait, drain live wells, empty bait buckets, and/or drain bilge. A total of 116 'yes' responses and 148 prevention steps were recorded from the 178 groups encountered. 65% of groups reported taking some prevention step, and when asked which steps visitors took, 48% reported washing their boat, 24% inspected their boat, 4% dried it, 4% drained their bilges and 1% drained bait buckets and live wells. By way of comparison, visitors to the Lake Placid state boat launch less than one mile distant reported the following spread prevention numbers: 68% took some prevention step, 41% washed their boat, 37% inspected their boat, 10% dried their boat and 7% drained their bilge.

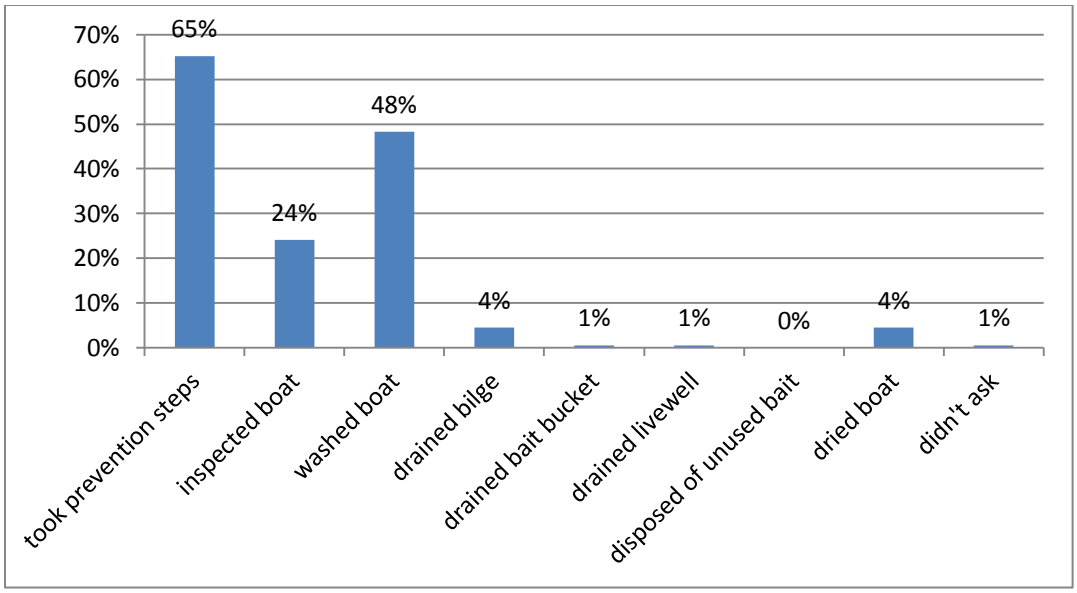


Figure 39- Aquatic invasive species spread prevention measures, Lake Placid Village launch, 2011.

Stewards' first and foremost duty was to inspect boats and record if an organism was found. A total of 14 organisms were found, 2 of them invasive species for organism transport rates of 6.7% (any organism) and 1% (invasive species). 1 Eurasian watermilfoil fragment was removed from a boat reporting a prior visit to Candlewood Lake in Connecticut, which has a significant infestation of the plant. One fragment of variable leaf milfoil was removed from a boat arriving from Seneca Lake in western New York. While they likely pose little risk to a fresh water environment, a boat bearing barnacles and mussels from Long Island Sound also used the ramp, indicating some of the variety of organisms transported on watercraft and introduced into Lake Placid.

Organism	Entering	Leaving	Prior waterway
Eurasian watermilfoil	1		Candlewood Lake, CT
Variable leaf milfoil	1		Seneca Lake
Grass	5	2	
Leaves	3		
Amphibian eggs		1	Lake Placid
Barnacles, mussels	1		Long Island Sound
totals	11	3	

Table 39- Organisms found on boats entering and leaving the Lake Placid Village boat launch, 2011.

Discussion

In 24 days of weekend coverage over the summer, stewards inspected 208 boats and talked with 361 people, averaging almost nine boats per day. If we assume a conservative launch rate average of 6 boats per day over a 14 week season from Memorial Day to Labor Day, we can arrive at an estimate of 588 boats using the Lake

Placid Village boat ramp during the high use months of the summer. This is a considerable number of watercraft, especially considering the 6.7% transport rate (any organism) and 1% invasive species transport rate calculated above, which are both higher than the rates (4.2% and 0.16%, respectively) calculated for 2011 at the Lake Placid State Boat Launch, which features seven day-per-week steward coverage. Applying the Lake Placid Village Launch rates to our estimate of 588 watercraft for the entire summer, 39 total watercraft launched at the village boat launch could be carrying some organism, and 6 boats could be expected to carry an aquatic invasive.

Conclusion

The weekend steward program during the summer of 2011 at the Lake Placid Village Boat Launch was designed as a pilot effort to test the feasibility and impact of boat ramp stewards in light of actual use levels. Little was known about the frequency of use of the launch site, other than the assumption that the current variable leaf milfoil weed bed in Paradox Bay was initiated by a watercraft using the village launch at some point in the past. What we found was moderate yet significant use on weekends. While the average rate of use was nine boats, the high-use days rivaled use rates at other boat ramps included in the Watershed Stewardship Program (for example, 20 boats were inspected at the Lake Placid Village boat launch on 7/2/11, 15 boats on 7/31, and 14 on 7/10). Members of the community who work to maintain the integrity of Lake Placid have reason to be concerned about this heretofore unmonitored access point to the lake. Continued coverage, whether via paid Watershed Stewards or volunteer stewards derived from the Lake Placid community, is strongly suggested by the traffic and transport rate levels of watercraft found at the site.

The Watershed Stewardship Program would like to acknowledge the vision and support of The Adirondack Chapter of the Nature Conservancy and the Wallace Research Foundation in underwriting this important environmental quality and public education initiative.

Lake Placid Village Recreation Study 2011

	Boat Type							total #	Weekly Avg	Four	# of
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	people
5-28-11 to 5-29-11	2	0	0	2	6	0	0	10	50	1	11
6-4-11 to 6-7-11	6	0	1	2	5	1	1	16	127	5	25
6-11-11	2	0	1	0	1	0	0	4	35	1	6
6-18-11 to 6-19-11	9	0	0	1	7	0	0	17	40	2	26
6-25-11 to 6-26-11	11	0	0	0	1	0	0	12	93	5	17
7-2-11 to 7-3-11	18	0	0	3	10	0	2	33	76	8	48
7-9-11 to 7-10-11	16	0	0	2	2	0	0	20	88	7	36
7-16-11 to 7-17-11	11	0	0	3	7	0	0	21	109	5	42
7-23-11	8	0	0	0	2	0	0	10	144	6	21
7-30-11 to 7-31-11	13	0	0	3	3	0	0	19	77	5	39
8-6-11 to 8-7-11	11	0	0	2	3	0	0	16	74	3	35
8-13-11	6	0	0	1	5	0	0	12	71	0	21
8-20-11 to 8-21-11	11	0	0	3	4	0	0	18	45	5	34
totals	124	0	2	22	56	1	3	208	Summer Avg = 85	53	361
									Median HP = 55		

Table 40- Lake Placid Village use figures, 2011. Key: M = Motorboat; PWC = personal watercraft; S = sailboat; C = canoe; K = kayak; B = barge (construction); R = rowboat.

Lake Placid Village Recreation Study 2011												
	# groups	# groups	organisms found		organism type							
Week	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other
5-28-11 to 5-29-11	6	3	0	0	0	0	0	0	0	0	0	0
6-4-11 to 6-7-11	12	7	0	0	0	0	0	0	0	0	0	0
6-11-11	4	2	1	0	0	0	0	0	0	0	0	1
6-18-11 to 6-19-11	9	7	0	1	0	0	0	1	0	0	0	0
6-25-11 to 6-26-11	9	6	1	1	1	0	0	1	0	0	0	0
7-2-11 to 7-3-11	23	7	1	1	0	0	0	1	0	0	0	1
7-9-11 to 7-10-11	2	1	1	0	0	0	0	0	0	0	0	1
7-16-11 to 7-17-11	1	1	2	1	0	0	0	2	0	0	0	1
7-23-11	3	0	0	0	0	0	0	0	0	0	0	0
7-30-11 to 7-31-11	1	4	1	0	0	0	0	1	0	0	0	0
8-6-11 to 8-7-11	2	1	1	0	0	0	0	1	0	0	0	0
8-13-11	2	1	1	0	0	0	0	0	0	0	0	1
8-20-11 to 8-21-11	1	0	1	0	0	0	0	0	0	0	1	0
totals	75	40	10	4	1	0	0	7	0	0	1	5

Table 41- Key: EWM = Eurasian Watermilfoil; BW = native bladderwort; NM = native milfoil; GRS = grass; WC = water chestnut; ZM = zebra mussel; VLM = variable leaf milfoil.

Lake Placid Village Recreation Study 2011										
	Measures taken to prevent transport of invasive species									
Week	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
5-28-11 to 5-29-11	2	0	2	2	0	0	0	0	0	5
6-4-11 to 6-7-11	12	10	3	0	0	0	0	0	0	14
6-11-11	2	0	2	0	0	0	0	0	0	4
6-18-11 to 6-19-11	9	3	5	1	1	0	0	1	0	13
6-25-11 to 6-26-11	5	0	4	1	0	1	0	2	0	9
7-2-11 to 7-3-11	13	3	9	1	0	0	0	3	0	26
7-9-11 to 7-10-11	12	3	10	1	0	0	0	1	0	19
7-16-11 to 7-17-11	14	6	9	0	0	0	0	0	0	18
7-23-11	4	1	4	0	0	0	0	0	0	9
7-30-11 to 7-31-11	9	2	7	1	0	0	0	0	0	19
8-6-11 to 8-7-11	13	2	12	0	0	0	0	0	0	15
8-13-11	7	2	6	1	0	0	0	1	1	10
8-20-11 to 8-21-11	14	11	13	0	0	0	0	0	0	17
totals	116	43	86	8	1	1	0	8	1	178

Table 42- Key: I = Inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = emptied livewell; Dis = disposed of bait; Dry = dried boat.

Recreation Use Study: Long Lake State Boat Launch

By: Brian Hartle, Watershed Steward

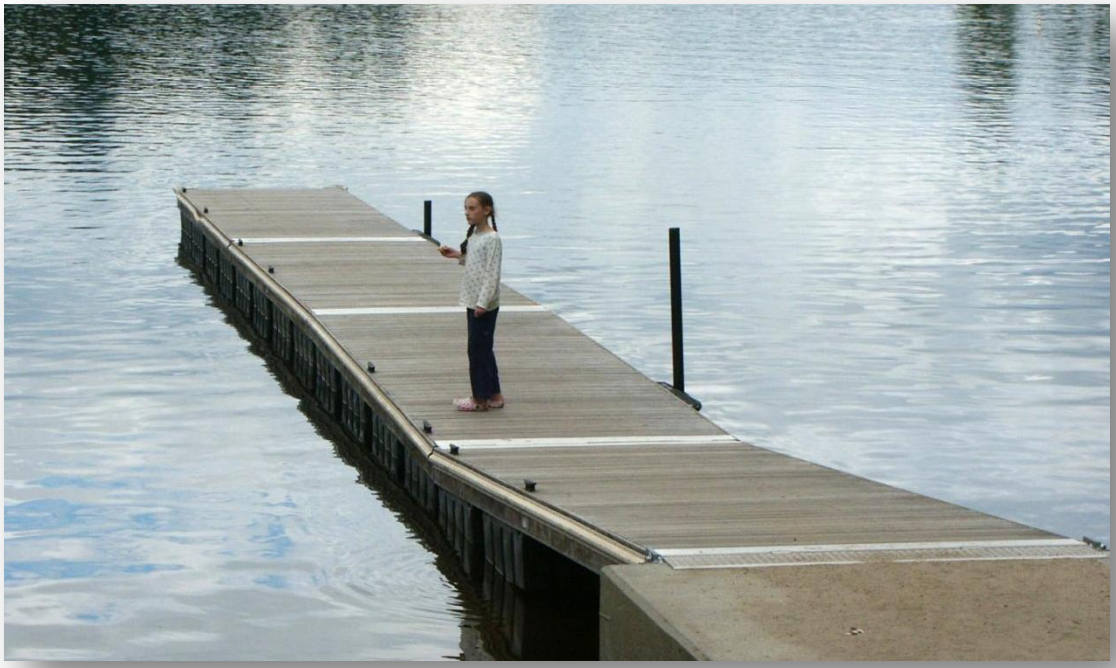


Figure 40- Long Lake boat launch.

Introduction

The Paul Smith's College Watershed Stewardship Program (WSP), a division of the Adirondack Watershed Institute, has been in existence for twelve seasons. Watershed stewards are posted throughout the Adirondack Park and at Saratoga Lake.2011 is the fourth year Long Lake has had a boat ramp steward. Beginning in 2008, a combined effort between the Town of Long Lake, Long Lake Association (LLA), and a grant through State Senator Betty Little facilitated the placement of WSP stewards at the state boat launch. In 2009 and 2010, the Town of Long Lake contributed $4,000and a fundraising campaign conducted by the LLA raised additional funds to cover the cost of watershed stewards. A Great Lakes Restoration Initiative Grant from the U.S. Fish and Wildlife Service, awarded to Paul Smith's College, covered the cost of a WSP steward during the summer of 2011.Because the Town of Long Lake and LLA are aware of the economic impact that would be wrought through the introduction of aquatic invasive species (AIS), they have set aside the $4,000 they anticipated would be necessary this year to have available in the event federal grants are not forthcoming in future years.

Watershed stewards attended a training session at Paul Smith's College prior to Memorial Day where they were briefed on AIS ecology; local and regional bodies of water where AIS are found; a basic history of when AIS were introduced to the U.S. in general and northeast specifically; how to properly and thoroughly inspect watercraft, thereby ensuring AIS are removed prior to launching; and why the work of the Stewardship Program is

important, highlighting previous work and successes. In addition to monitoring launch sites, taking stock of where watercraft are coming from and whether operators are taking any preventative measures to prevent the spread of AIS, stewards are assigned a number of special projects related to preserving the integrity and well being of the Adirondack Park.

Methods

The WSP season went from the Memorial Day holiday weekend through Labor Day. Stewards reported to the launch site each day by 7 A.M. and worked until 4 P.M. with breaks totaling one hour taken during the day. Stewards approached users of all watercraft, introduced themselves, the WSP and their role at the launch, and asked whether they could perform a voluntary search of the vessel. Moreover, all persons launching any type of craft were asked two questions: first, whether they had visited another body of water in the preceding two weeks and, if yes, its name and location and, secondly, whether they had taken any preventative measures to ensure they were not carrying and, consequently, transporting AIS. As stewards conducted their search of the vessel, they interacted with users, demonstrating how to perform a thorough and effective search, highlighting areas that are frequently forgotten (carpeted bunks and wheel wells are two examples). Boaters then were given a summary card to serve as a friendly reminder, to help them recall the best practices they can take to prevent the spread of AIS. For more interested parties (in less of a hurry) stewards shared more detailed information about particular AIS and costs associated with their removal in Lake George, Lake Placid and the Saranac Chain of Lakes. More involved conversations helped underscore the rationale for boat ramp stewards and instilled a sense of ownership among water enthusiasts for preserving the integrity of Long Lake and other water bodies in the Adirondack Park.

Results

Stewards inspected 1,807 watercraft during the 2011 season at the state boat launch in Long Lake. What is more, stewards routinely presented their interpretive message to the entire group, meaning that 3,854 people were informed of the threat posed by AIS, as well as steps they can take to prevent their spread. The LLA stationed volunteers at the boat launch on Thursday mornings during the WSP weekly staff meeting who inspected 12 boats.

Motorboats comprised the majority of watercraft on Long Lake with 57 per cent of the usage. Canoes were a distant second at 25 per cent and kayaks third at 13 percent.

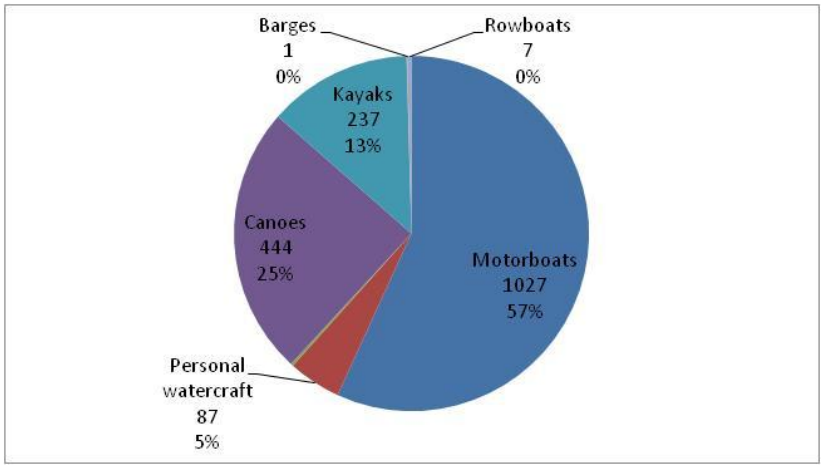


Figure 41- Types of watercraft launched at the state boat launch in Long Lake, NY 2011.

As may be expected, peak use occurred during the week of July 1 to July 7 (207 watercraft), as people flocked to the area to celebrate the Fourth of July. Traffic remained high in the weeks after (187 watercraft during the week of July 8, 144 during the week of July 15 and 138 during the week of July 22).

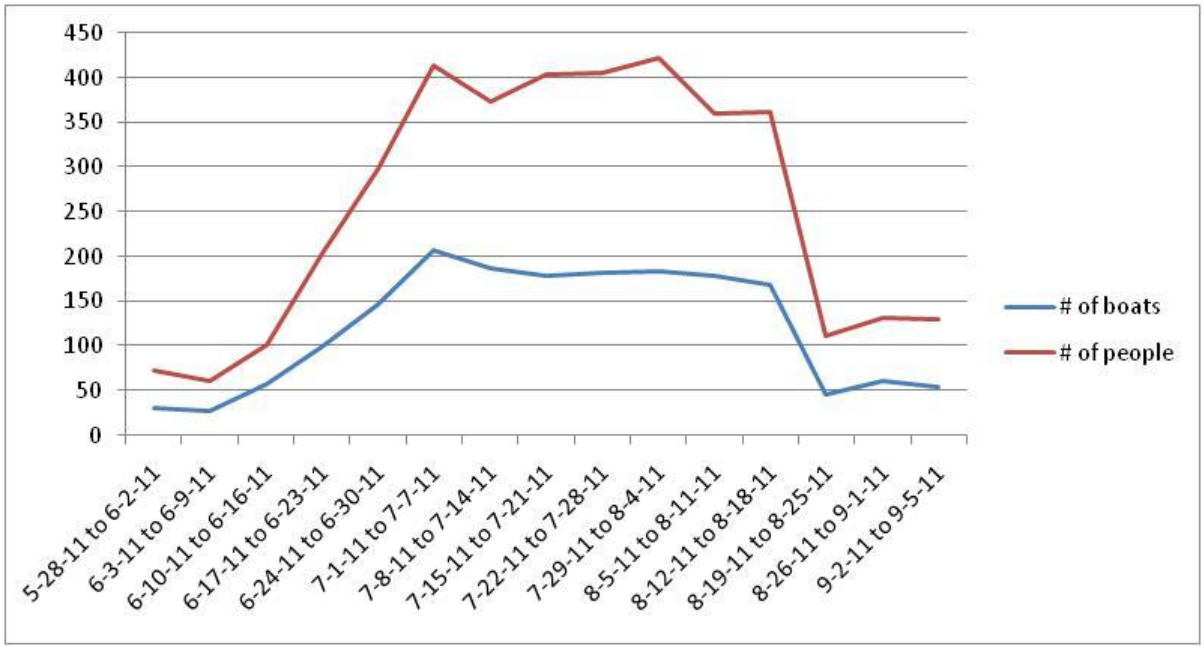


Figure 42- Use of State Boat Launch at Long Lake, NY by week, 2011.

Long Lake is, in fact, not a lake but rather a glacial widening of the Raquette River. The Town of Long Lake is located in the heart of the Adirondack Park and is the most northerly town in Hamilton County. Due to its relatively isolated location, the majority of traffic came from within the state. Given that motorboats are the only type of watercraft registered, in determining the origin of where boaters are coming from, canoes and kayaks are necessarily excluded from the data set.

State	# boats
Connecticut	14
Delaware	2
Florida	5
Georgia	2
Illinois	2
Massachusetts	8
Maryland	2
North Carolina	1
New Hampshire	7
New Jersey	25
New York	796
Ohio	4
Pennsylvania	25
Rhode Island	2
Texas	1
Virginia	3
Vermont	25

Table 43- Point of origin for motorboats using Long Lake, 2011.

Measures Taken to Prevent Spread of Aquatic Invasive Species

Following their interpretive message, highlighting the problem of AIS, stewards asked boaters what, if any, steps they took to inspect their craft and eliminate the possibility they were carrying AIS from one body of water to another. Stewards refrained from asking leading questions (e.g. identifying specific steps) as part of an effort to ward off the skewing halo effect. 50 percent of users took prevention steps. The most widely used prevention step taken by boaters was washing their craft after use, which 36% did. The next most common step taken was a visual inspection of the craft, performed by 19% of visitors. 7% of boaters dried their craft between uses; 5% drained their bilge; 1% drained the livewell, and 1% either drained their bait bucket or disposed of unused bait.

waterbody	total # vis	Infection	waterbody	total # vi	Infection Status
Adirondack Lake	3		Kinderhook Lake	2	
Abanakee Lake			Lake Bonaparte		
Atlantic Ocean	4	yes	Lake Champlain	5	yes
Ballston Lake			Lake Clear		
Berlin Reservoir, OH			Lake Delta		
Big Moose Lake			Lake Dunmore, VT	3	
Black Lake	2		Lake Durant		
Black Pond	2		Lake Eaton	9	
Blue Mountain Lake	7		Lake Erie		
Brant Lake	4	yes	Lake Flower		yes
Buck Pond			Lake George	10	yes
Burden Lake, NY			Lake Harris	2	
Lake Eaton			Lake Marion		
Canadarago Lake	2		Lake Mendota		
Canadice Lake, NY	3		Lake Ontario	7	yes
Canandaigua Lake		yes	Lake Placid	4	yes
Cassayanna - Washington County	2		Lake Pleasant	4	
Cayuga Lake		yes	Lake Sacandaga	2	
Cazenovia Lake	2	yes	Leadmine Pond		
Cedar River	2		Limekiln Lake		
Cedar River Flow			Little Clear Pond		
Cobbetts Pond, NH			Little Tupper Lake		
Cokeburn Reservoir			Long Island Sound	2	
Comerford Dam, NH			Long Lake	334	yes
Conesus Lake			Lower Saranac Lake	2	yes
Connecticut River			Luis Lake		
Copake Lake			McCauley Pond		
Cossayuna Lake	2		Mohawk River	2	yes
Cranberry Lake	2		Newcomb Lake		
Cranberry Lake, NJ			North-South Lake		
Deleware River	2		Old Forge Pond	2	
Delta Lake			Osgood Pond		
DeRuyter Reservoir, NY	4		Oxbow Lake	2	
Eagle Lake			Pawtuckaway Lake		
Eighth Lake			Pine Island Pond, NH		
Erie Canal			Potomac River		
Fish Creek			Rainbow Lake	2	yes
Fish Creek Pond		yes	Raquete Lake	40	yes
Forked Lake			Rich Lake		
Fourth Lake	16		Round Lake		
Glen Lake	5		Round Valley (NJ)		
Grafton Lake			Sacandaga Lake	10	
Great South Bay			Sacandaga Reservoir		
Harris Lake			Salmon River Reservoir		
Hedges Lake			Saranac Lake	10	yes
Hinckley Lake, NY			Saranac River		
Hitchins Pond			Saratoga Lake	8	yes
Horseshoe Lake			Schroon Lake	13	yes
Hudson River	3	yes	Schroon River		
Indian Lake		yes	Seneca Lake	3	
Irondequoit Bay	15	yes	Seventh Lake	5	yes
Keuka Lake	5	yes	South Bay, Whitehall, NY		yes
			Spruce Run Reservoir		
			St. Lawrence River	8	
			St. Regis	2	
			Susquehannah River	3	
			Tupper Lake	15	yes
			Upper Saranac	8	yes
			Wabagoon River, Ontario		
			Waterbury Reservoir	3	
			West Canada Creek		
			West Canon Lake	2	
			Winooski River		

Table 44-Lakes visited in previous two weeks prior to launching at Long Lake State Boat Launch, 2011.

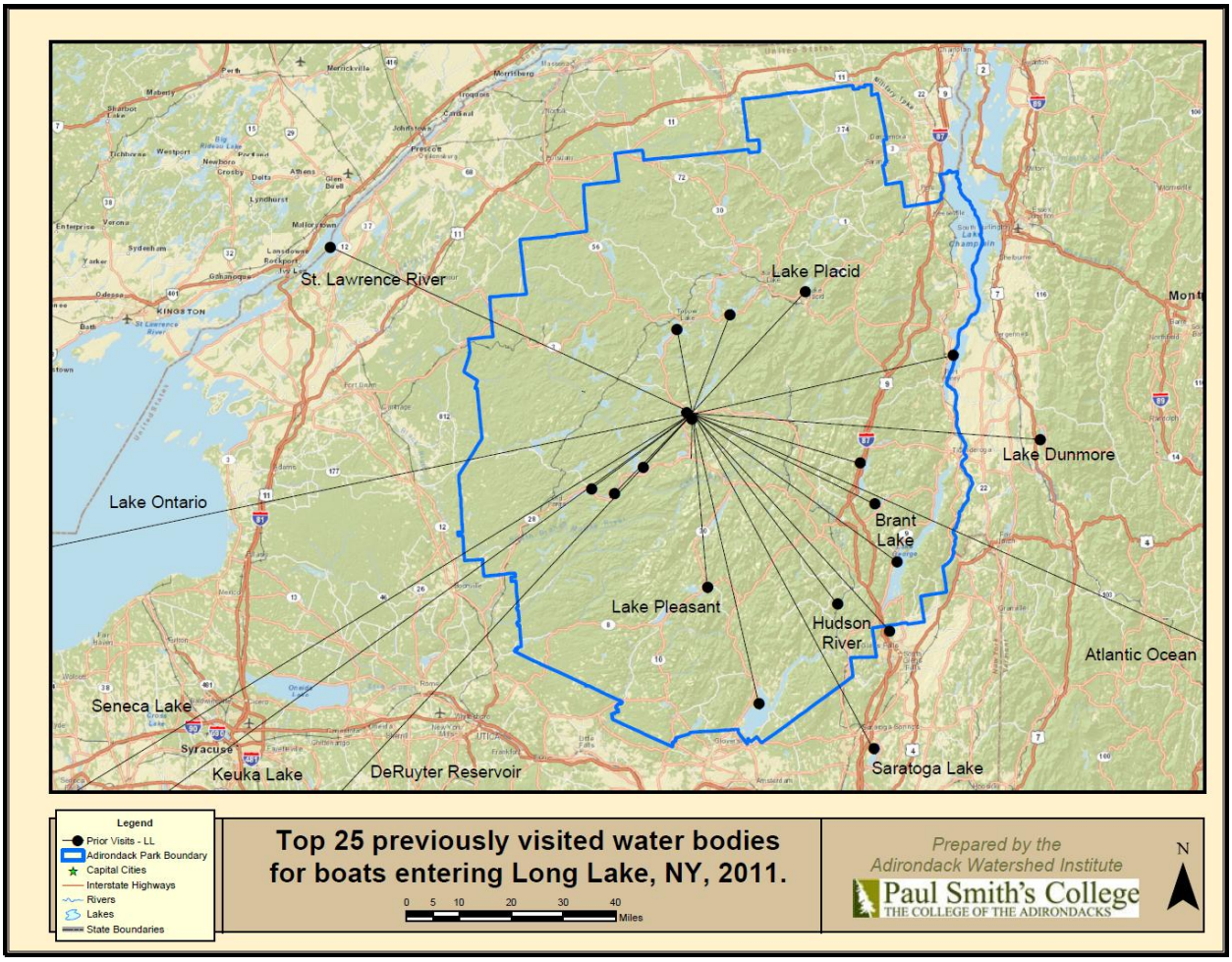


Figure 43- Prior waterway visits for boats launching in Long Lake, 2011.

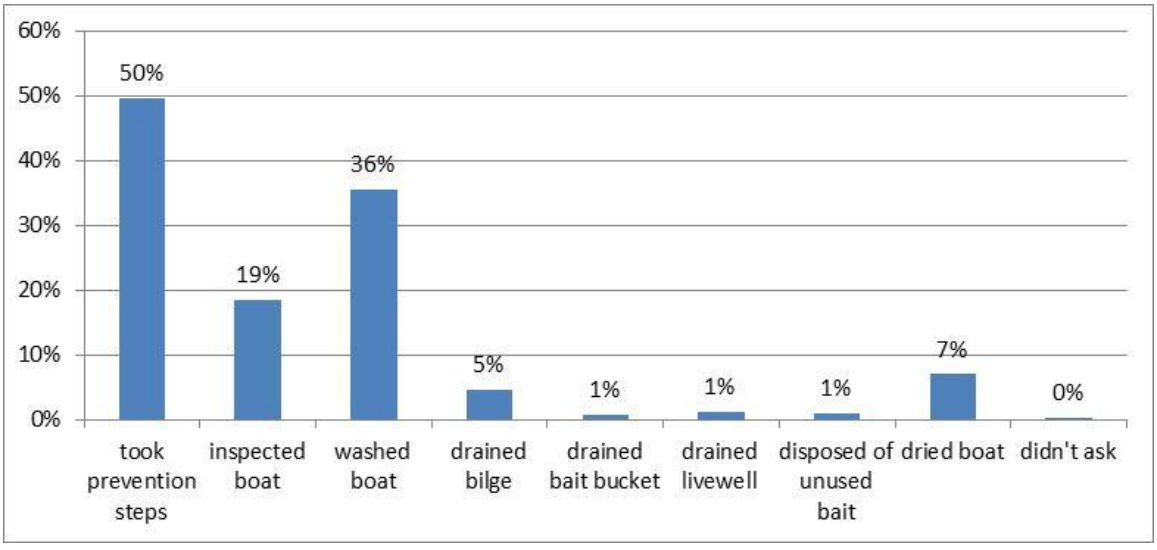


Figure 44- Percent of visitors taking aquatic invasive species spread prevention measures, Long Lake, 2011.

Stewards performed a number of saves – that is, catching AIS on watercraft and/or trailers – including Eurasian water milfoil (11), variable-leaf milfoil (5), zebra mussels (4), and water chestnut (2) thereby preventing their introduction in to the lake. Overall transport rate, any organism was 125 organisms removed from 1,569 groups or 7.9%. The overall invasive species transport rate was 29 invasive species removed from 1,569 groups or 1.4%. This rate is low compared to other lakes serviced by the Watershed Stewardship Program (see executive summary for all lake analysis).

Organism	Entering	Leaving	Prior Waterway
Eurasian watermilfoil	11	0	Fourth Lake, St. Lawrence Seaway, Canadarago Lake, Syracuse-area lake, Chatauqua Lake, Niagara River
Native Milfoil	3	1	
Variable Leaf Milfoil	3	2	Fourth Lake, Long Lake
Bladderwort	2	2	
Grass	34	13	
Zebra Mussels	4		Canadarago Lake, Syracuse-area lake, Chatauqua Lake
Water Chestnut	2		Long Lake
Curly-leaf Pondweed	1		none
Other (unidentified)	35	12	
totals	**95**	**30**	

Table 45- Organisms found on boats entering and leaving the NYS boat Launch at Long Lake, 2011.

In 2008, the WSP inspected 1,258 boats, and interacted with 2,536 people at the Long Lake State Boat Launch. A steward was stationed in Long Lake Friday through Monday for eight hours per day. In 2009, the stewards employed by the Town of Long Lake providing seven day per week coverage inspected 1,348 watercraft. The Town of Long Lake stewards plus 100 volunteer hours inspected 997 boats with 1,947 people in the boating parties during 2010.

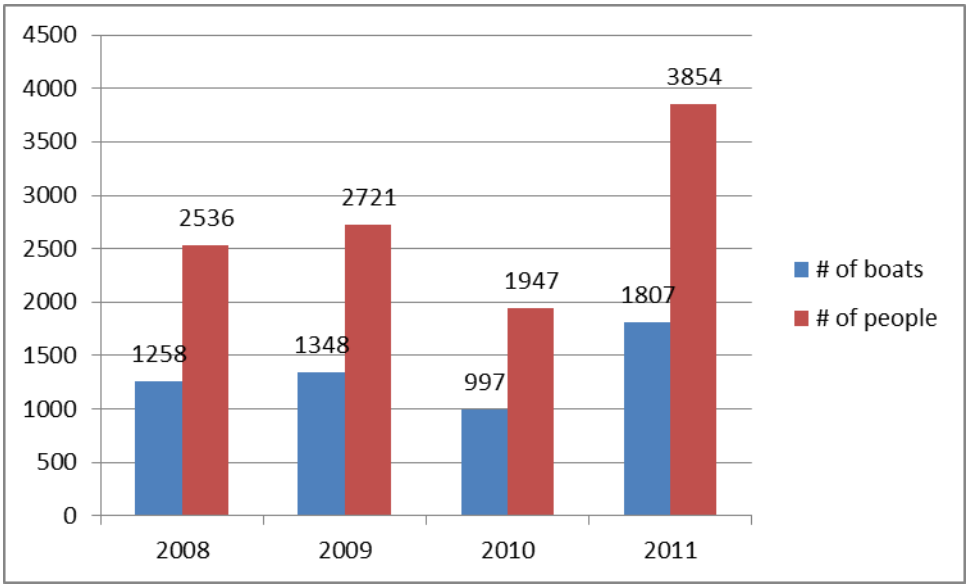


Figure 45- Long Lake use tallies, 2008-2011.

Discussion and Conclusion

The number of boats inspected and visitors encountered at the Long Lake boat ramp both increased markedly in 2011 compared with previous years. This high volume suggests that the steward program has been comparatively effective in 2011 with regard to the number of watercraft inspected and visitors educated about aquatic invasive species. As use trends higher, the risk of exposure to AIS introduction is likely to increase. Stewards are ever more essential in providing ground-level spread prevention services right at the boat ramps of waterways in the Adirondack region.

Despite the level of boat ramp activity, the majority of boaters warmly received stewards and supported the WSP mission. In addition to the continuation of a boat ramp steward program, other measures can be taken to decrease the risk of the spread of aquatic invasive species. Steward Brian Hartle explored the issues around enacting an aquatic species transport law to help stewards motivate the public to take AIS spread prevention measures. Long Lake supervisor, Clark Seaman, seems willing to adopt a local transportation law similar to those already in existence, provided that enforcement can be guaranteed (meaning it has teeth and is not merely a piece of paper). A less significant but equally important measure would be to implement a more robust volunteer steward program where concerned members from the community fill in at the launch when stewards are off duty. This enhanced presence would do much to ensure watercraft entering the lake are not transporting AIS. Volunteers could serve to extend the hours of boat ramp coverage into the evenings after the paid steward shift ends.

The WSP would like to thank Barbara Taylor, Jackie Mallery, Lorraine Pine, and Frank Pine from the LLA and Clark Seaman, Long Lake Town Supervisor, for the wonderful support they have given over the years to the protection of Long Lake. The Watershed Stewardship Program gratefully acknowledges the funding support of the Great Lakes Restoration Initiative and the United States Fish and Wildlife Service.

Long Lake Recreation Study 2011

	Boat Type							total #	Weekly Avg	Four	# of
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	people
5-28-11 to 6-2-11	22	0	0	6	3	0	0	31	96	3	73
6-3-11 to 6-9-11	23	0	0	1	2	1	0	27	61	8	61
6-10-11 to 6-16-11	39	2	0	9	8	0	0	58	57	11	101
6-17-11 to 6-23-11	70	2	1	13	14	0	0	100	72	16	204
6-24-11 to 6-30-11	89	4	0	33	20	0	1	147	75	23	298
7-1-11 to 7-7-11	127	13	1	33	33	0	0	207	80	19	414
7-8-11 to 7-14-11	96	6	0	62	23	0	0	187	64	19	375
7-15-11 to 7-21-11	109	5	0	37	28	0	0	179	58	16	404
7-22-11 to 7-28-11	103	8	0	42	29	0	0	182	65	16	406
7-29-11 to 8-4-11	101	10	1	46	24	0	1	183	74	8	423
8-5-11 to 8-11-11	91	9	0	56	21	0	1	178	75	8	360
8-12-11 to 8-18-11	71	15	0	69	12	0	1	168	56	11	362
8-19-11 to 8-25-11	22	1	1	17	2	0	3	46	42	5	111
8-26-11 to 9-1-11	27	3	0	19	11	0	0	60	73	4	132
9-2-11 to 9-5-11	37	9	0	1	7	0	0	54	53	3	130
totals	1027	87	4	444	237	1	7	1807	Summer Avg = 67	170	3854
									Median HP = 65		

Table 46- Summary of Boat Type, Total Number of Boats and Group Size M = motorboat; PWC = personal watercraft; S = sailboat; C = canoe; K = kayak; B = construction barge; R = rowboat.

Long Lake Recreation Study 2011

	# groups	# groups	organisms found		organism type							
Week	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other
5-28-11 to 6-2-11	26	9	2	1	0	0	0	3	0	0	0	0
6-3-11 to 6-9-11	18	13	2	1	0	0	0	1	0	0	0	2
6-10-11 to 6-16-11	40	21	3	1	0	0	0	1	0	0	0	3
6-17-11 to 6-23-11	64	34	9	1	1	0	0	6	0	0	1	2
6-24-11 to 6-30-11	109	18	5	3	0	1	0	4	0	0	0	3
7-1-11 to 7-7-11	134	46	9	1	2	0	2	2	0	0	0	4
7-8-11 to 7-14-11	96	55	5	3	2	1	0	1	0	1	0	3
7-15-11 to 7-21-11	107	61	0	0	0	0	0	0	0	0	0	0
7-22-11 to 7-28-11	104	54	10	0	2	0	1	3	1	1	1	1
7-29-11 to 8-4-11	99	52	8	7	1	1	0	3	1	1	2	6
8-5-11 to 8-11-11	65	70	2	18	0	0	0	12	0	0	0	8
8-12-11 to 8-18-11	79	49	13	3	1	0	0	7	0	0	0	8
8-19-11 to 8-25-11	18	17	2	0	0	0	0	0	0	0	0	2
8-26-11 to 9-1-11	30	26	4	2	0	1	1	3	0	0	0	1
9-2-11 to 9-5-11	24	31	10	0	2	0	0	1	0	1	1	5
totals	1013	556	84	41	11	4	4	47	2	4	5	48

Table 47- Type of Organisms Found After Inspection; EWM = Eurasian water milfoil; BW = bladderwort (native); NM = native milfoil; GRS = grass; WC = water chestnut; ZM = zebra mussel; VLM = variable-leaf milfoil.

Long Lake Recreation Study 2011										
	visitor prevention steps									
Week	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
5-28-11 to 6-2-11	12	7	8	4	0	0	0	2	0	21
6-3-11 to 6-9-11	18	11	14	2	0	0	0	0	0	27
6-10-11 to 6-16-11	32	3	27	1	0	1	0	5	0	53
6-17-11 to 6-23-11	42	8	32	4	0	3	0	4	0	83
6-24-11 to 6-30-11	46	14	42	0	0	0	0	8	0	93
7-1-11 to 7-7-11	68	20	48	3	1	1	1	9	0	158
7-8-11 to 7-14-11	74	19	56	2	0	0	0	11	0	137
7-15-11 to 7-21-11	75	12	51	4	0	0	0	12	0	404
7-22-11 to 7-28-11	105	40	73	13	10	11	10	22	0	143
7-29-11 to 8-4-11	89	44	51	9	1	1	1	18	2	142
8-5-11 to 8-11-11	78	44	55	16	0	0	0	4	0	91
8-12-11 to 8-18-11	55	23	41	8	0	1	0	2	2	93
8-19-11 to 8-25-11	14	7	10	2	1	1	1	1	0	46
8-26-11 to 9-1-11	37	19	27	4	0	0	1	3	1	46
9-2-11 to 9-5-11	44	23	29	0	0	0	0	10	1	50
totals	789	294	564	72	13	19	14	111	6	1587

Table 48- Steps Taken to Prevent Spread of AIS. I = visual inspection; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = drained live well; Dis = disposed of unused bait; Dry = dried boat.

Recreation Use Study: Meacham Lake State Campground Boat Launch

By Danielle Thompson, Watershed Steward

Figure 46- View from Meacham Lake boat launch.

Introduction

The Watershed Stewardship Program (WSP) of Paul Smith's College's Adirondack Watershed Institute was founded in 2000 to develop awareness and educate the public about aquatic invasive species (AIS). Thanks to the many supporters of the WSP, there were nearly triple the number of stewards on duty in 2011 as compared to 2010. The increased number of stewards made it possible for the WSP to be present at more lakes and ponds than ever before. One of these newly supervised sites was the public boat launch at Meacham Lake Campground, approximately 10 miles north of Paul Smiths College on State Route 30. As 2011 marked its first year monitored by the WSP, stewards at Meacham Lake were only present for watercraft inspections on weekend days. Along with their inspection, all stewards provide boaters with information on AIS and collect recreation data from these encounters. Although only in its first year of WSP involvement, continual recreation data gathered in the coming years can be useful to both current and future managers of AIS. This demographic information can help create a

more complete picture of recreational watershed usage and, therefore, a better understanding of the potential for AIS contamination and spread throughout the region.

Methods

A watershed steward was on duty at the Meacham Lake Campground public launch site from 7:30-3:30 on Saturdays and Sundays from May 28th to August 29th, 2011. Upon arrival, each boater was given a brief overview of the WSP, noting specifically the state of Meacham Lake and its potential for AIS contamination. The boater was then asked what, if any, water body their watercraft had been in during the previous two weeks and whether they had taken any steps to prevent the spread of AIS. The steward would then also record the type and number of boats, including horsepower of motor, motor type (two or four-stroke), group size, and state of license plate registration. Each watercraft was then visually inspected by the steward, who also recorded presence and type of any aquatic species found on the watercraft or trailer before launch and after retrieval. If any aquatic species were found to be present on the watercraft, they were attempted to be identified by the steward. The material was then discarded on dry land far away as to have no threat of entering the water body. In the event that an invasive species previously unknown to the area should be found, the steward would record where the species was found and gather as much information from the boater as possible to find out where it may have originated. This information would then be reported to the Adirondack Park Invasive Plant Program (APIPP) for further investigation.

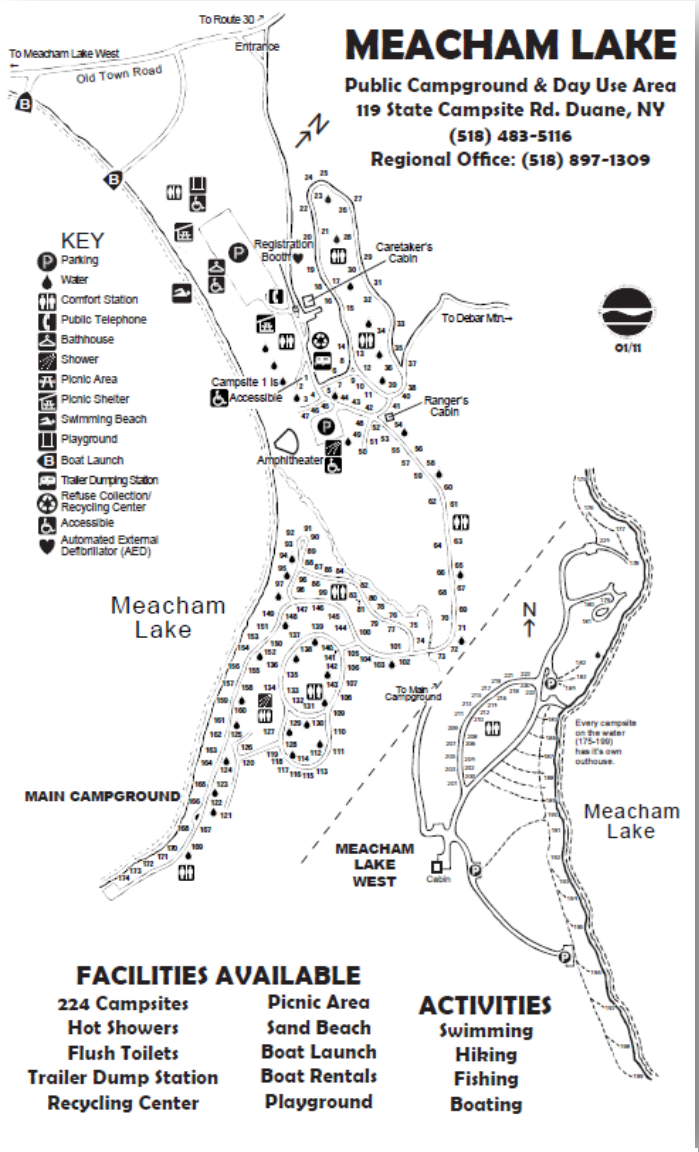


Figure 47- NYSDEC Campground map, Meacham Lake.

To help educate the boater, the steward would explain their method of visual inspection; noting how and where to properly check for aquatic hitchhikers on the watercraft. If the boater had answered "no" to taking any steps to prevent AIS, they would be educated during the inspection on ways to help stop the spread of AIS. Finally, the boater was given an informational card with these instructions along with a list of common invasive species to watch out for. Stewards could also offer the boater a "stop invasive hitchhikers" sticker to place on their trailer as a personal reminder always to inspect their watercraft.

Results

From May 28th to September 4th, Stewards at Meacham Lake inspected 220 watercraft and educated 589 boaters during their weekend, 8 hour shifts at the NYS boat launch. The peak for both number of visitors and watercraft was the weekend of July 2nd and 3rd, with 32 boats and 74 people present at the launch. July was the most-visited month, with 123 boats and 334 visitors seen at the launch. This trend is also due to the fact that overall use of the launch was strongly affected by daily weather.

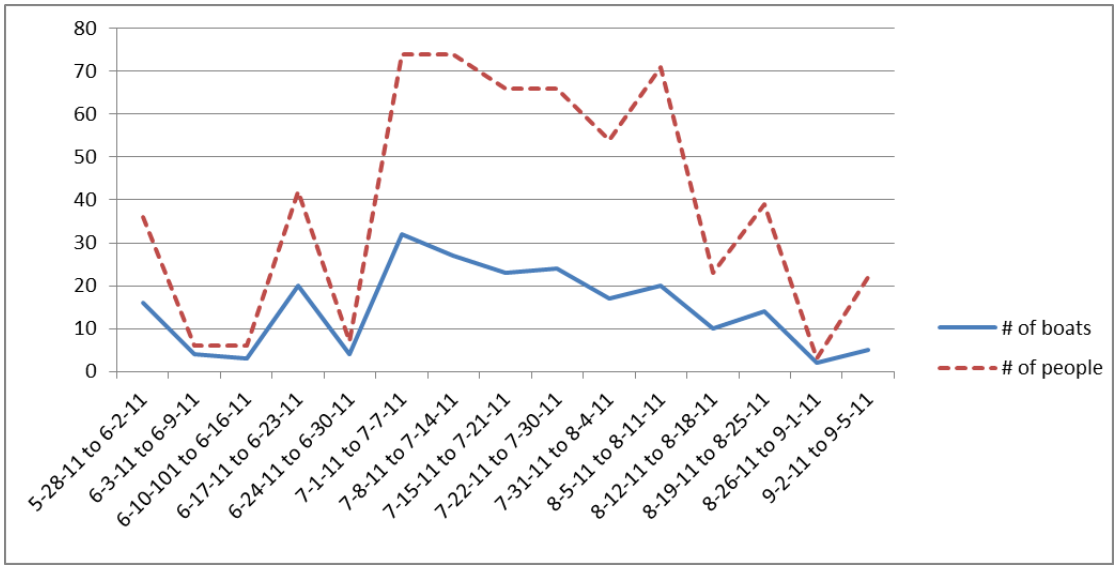


Figure 48- Use at Meacham Lake State Boat Launch, 2011.

The majority of watercraft inspected at Meacham Lake in 2011 were motorized boats. Motorboats, rowboats, and personal watercraft made up over three-quarters of all watercraft at the launch, while canoes and kayaks made up 21%. Since this was the first year of the WSP presence at Meacham Lake, a comparison cannot be made to previous years of recreation use in terms of watercraft type used.

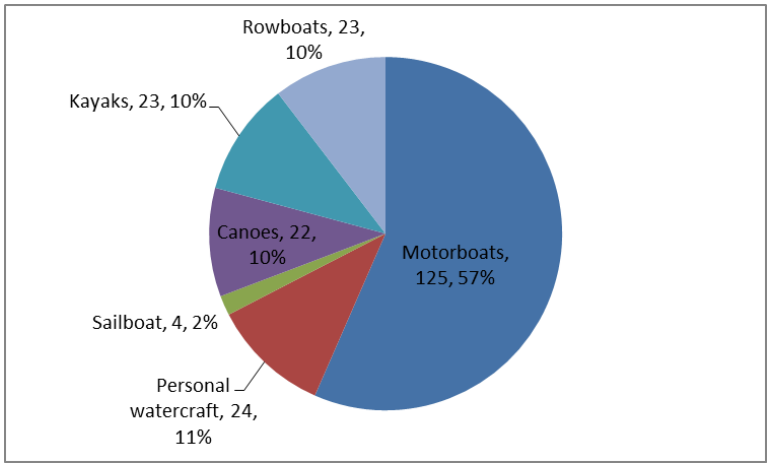


Figure 49- Types of watercraft launched, Meacham Lake, 2011.

The Meacham Lake Campground boat launch is supported by the NYSDEC and permits access to motorized boats, granted they are able to be launched at the non-paved, very shallow launch site. Due to its size and central location in the Adirondacks, it was expected that many of the users would be local with boats registered in New York State.

State	# boats
NY	128
QC	3
ON	1
Total	**132**

Table 49- Points of origin, watercraft launched at Meacham Lake, 2011.

104 out of the 221 watercraft (47%) inspected by stewards at the Meacham Lake boat launch site reported using their watercraft during the last two weeks. 19% of watercraft (41 of 221 boats) were used in a body of water other than Meacham Lake. 25 of these reported visits (11% of all watercraft inspected) were in water bodies known to be infected with aquatic invasive species. Knowing this, we can assert the importance of asking the boater where they have launched in the last two weeks. Boats coming from infected waterways can then be more carefully scrutinized upon inspection by the steward.

Water body	# of Visits	Infected
Chateaugay Lake	5	Yes (EWM)
Church Pond	1	
Cranberry Lake	1	
Deer River	1	Yes (EWM)
Grass River	1	
Higley Flow	1	
Hudson River	2	Yes (WC, ZM)
Indian Lake	1	Yes (EWM)
Irondequoit Bay (Rochester)	1	Yes
Jamesville Reservoir	1	Unknown
Lake Champlain	3	Yes (EWM, VLM, CLP, WC, ZM)
Lake Flower	1	Yes (EWM, VLM, CLP)
Lake St. Louis	1	Unknown
Lincoln Pond	1	Yes (EWM)
Meacham Lake	63	Yes (EWM)
Mohawk River	1	Yes
Mountain View Lake	2	Yes (EWM)
None	18	
Norwood Pond	1	
Osgood Pond	3	
Raquette River	1	
Rideau Canal (Canada)	1	
Sacandaga Lake	1	Yes (EWM, SWF)
St. Francois Lake (Quebec)	1	
St. Lawrence River	6	Yes
St. Regis Falls	1	
St. Regis River	2	
Total	122	

Table 50- Waterways visited in prior two-week period, Meacham Lake, 2011.

Another way for the steward to determine the likelihood of AIS presence on a watercraft is by asking the boater if they regularly take steps to reduce the spread of aquatic hitchhikers. Not only will this question help the steward determine how carefully to inspect the watercraft, it also helps them to educate the boater on the common, simple preventative measures they can take to reduce the spread of AIS in the future. These preventative steps include visual inspection, washing the boat, draining bilge water, emptying bait buckets and live wells, disposing of live bait away from the waterway, and drying the watercraft.

When posed the question, stewards did their best not to lead the interviewee to a response. For example, if a steward asks a boater, "Did you wash your boat before launching?" they might be more likely to respond affirmatively since they know it is what our program is promoting. The steward will instead ask a more open-ended question, such as, "Did you take any steps to prevent the spread of invasive species?" This way the steward will be able to see the level of knowledge the boater has in reference to invasive species, and the mission of our program and education.

Stewards at Meacham Lake found that 58% of the 153 groups interviewed answered yes to taking at least one of the preventative measures against transporting AIS. The most common preventative measure was visual inspection (38%), followed by washing the boat (28%). Upon visual inspection by the steward, plant material was removed from 20 watercraft; eight upon launching, twelve upon retrieval. This material was described to be either grass or "other", meaning that none of the discarded plants was invasive.

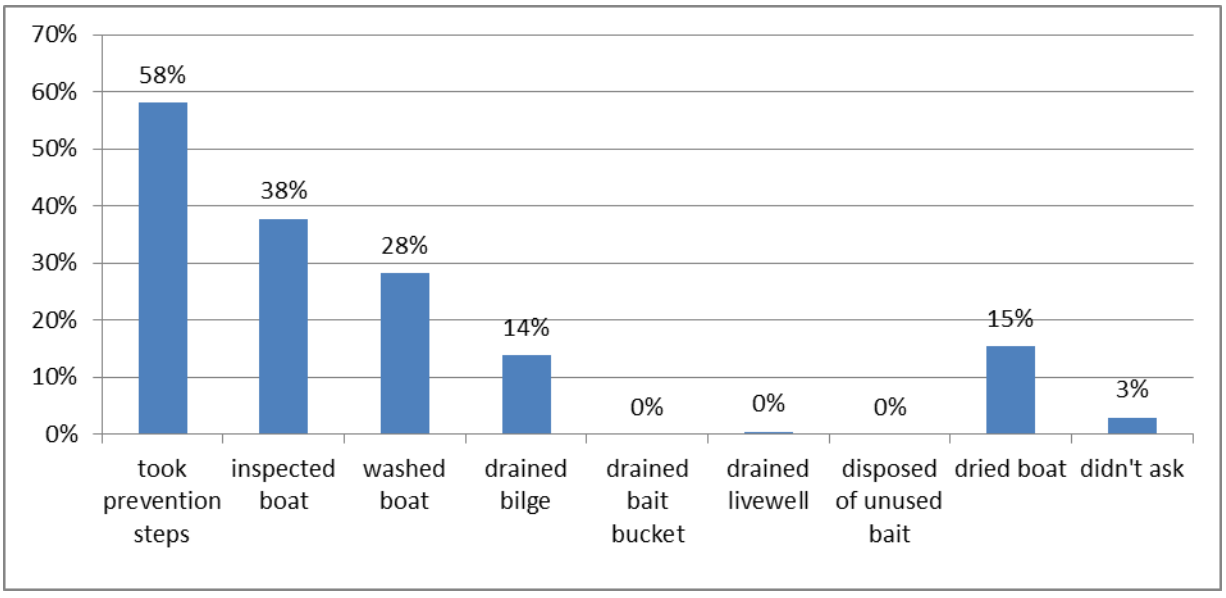


Figure 50- Aquatic invasive species spread prevention measures taken by visitors, Meacham Lake, 2011.

Discussion and Conclusion

The location, number of days of steward on duty, and accessibility of the public boat launch at Meacham Lake are all factors which contribute to the comparatively small number of visitors encountered by stewards of the WSP in 2011. As previously mentioned, this was the first year of steward presence at Meacham Lake, so the number of watercraft inspected and people interviewed cannot be compared with previous years. Although the percentage of users who take steps to prevent aquatic species is similar to other boat launch recreation surveys, the WSP would like to see more growth in this area. The program is optimistic that the figures are will continue to grow and will strive for greater awareness in the coming years of their presence at Meacham Lake. As stated, 104 of 220 watercraft inspected had reported using their watercraft during the last two weeks, 41 of which were used in a body of water other than Meacham Lake. With the ever-increasing threat of aquatic invasive species spread within (and outside of) the Adirondack park, it is important for the WSP to keep up their education boaters about the methods they can adopt to help stop this spread. The visitors of Meacham Lake are no exception. The Watershed Stewardship Program gratefully acknowledges the funding support of the Great Lakes Restoration Initiative and the United States Fish and Wildlife Service.

Meacham Lake Recreation Study 2011

	Boat Type							total #	Weekly Avg	Four	# of
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	people
5-28-11 to 6-2-11	13	1	0	0	2	0	0	16	85	9	36
6-3-11 to 6-9-11	2	0	0	0	2	0	0	4	42	0	6
6-10-101 to 6-16-11	3	0	0	0	0	0	0	3	80	3	6
6-17-11 to 6-23-11	13	1	2	2	0	0	2	20	52	11	42
6-24-11 to 6-30-11	3	0	0	0	0	0	1	4	46	2	7
7-1-11 to 7-7-11	10	7	0	0	9	0	6	32	39	5	74
7-8-11 to 7-14-11	15	3	1	4	3	0	1	27	39	8	74
7-15-11 to 7-21-11	9	4	0	7	1	0	2	23	45	2	66
7-22-11 to 7-30-11	12	3	0	2	2	0	5	24	59	5	66
7-31-11 to 8-4-11	10	0	0	0	1	0	6	17	42	6	54
8-5-11 to 8-11-11	18	0	0	0	2	0	0	20	68	8	71
8-12-11 to 8-18-11	4	0	1	4	1	0	0	10	20	1	23
8-19-11 to 8-25-11	8	4	0	2	0	0	0	14	31	2	39
8-26-11 to 9-1-11	1	1	0	0	0	0	0	2	90	0	3
9-2-11 to 9-5-11	4	0	0	1	0	0	0	5	77	0	22
totals	125	24	4	22	23	0	23	221	Summer Avg = 49	62	589
									Median HP = 35		

Table 51-Meacham Lake use figures, 2011. Key: M = Motorboat; PWC = personal watercraft; S = sailboat; C = canoe; K = kayak; B = barge (construction); R = rowboat.

Meacham Lake Recreation Study 2011												
	# groups	# groups	organisms found		organism type							
Week	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other
5-28-11 to 6-2-11	15	8	3	0	0	0	0	0	0	0	0	3
6-3-11 to 6-9-11	2	3	0	2	0	0	0	1	0	0	0	1
6-10-11 to 6-16-11	1	2	1	0	0	0	0	0	0	0	0	1
6-17-11 to 6-23-11	13	10	0	0	0	0	0	0	0	0	0	0
6-24-11 to 6-30-11	3	3	1	0	0	0	0	0	0	0	0	1
7-1-11 to 7-7-11	21	9	0	0	0	0	0	0	0	0	0	0
7-8-11 to 7-14-11	18	13	0	3	0	0	0	1	0	0	0	2
7-15-11 to 7-21-11	17	9	0	0	0	0	0	0	0	0	0	0
7-22-11 to 7-28-11	20	4	1	1	0	0	0	2	0	0	0	0
7-29-11 to 8-4-11	10	7	1	1	0	0	0	2	0	0	0	0
8-5-11 to 8-11-11	15	5	0	0	0	0	0	0	0	0	0	0
8-12-11 to 8-18-11	3	8	0	2	0	0	0	2	0	0	0	0
8-19-11 to 8-25-11	10	6	0	1	0	0	0	1	0	0	0	0
8-26-11 to 9-1-11	0	2	0	1	0	0	0	1	0	0	0	0
9-2-11 to 9-5-11	5	3	1	1	0	0	0	2	0	0	0	0
totals	153	92	8	12	0	0	0	12	0	0	0	8

Table 52- Key: EWM = Eurasian Watermilfoil; BW = native bladderwort; NM = native milfoil; GRS = grass; WC = water chestnut; ZM = zebra mussel; VLM = variable leaf milfoil.

Meacham Lake Recreation Study 2011										
	Measures Taken to Prevent Transport of Invasive Species									
Week	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
5-28-11 to 6-2-11	7	4	2	4	0	0	0	0	2	16
6-3-11 to 6-9-11	1	0	1	0	0	0	0	0	0	3
6-10-11 to 6-16-11	0	0	0	0	0	0	0	0	0	3
6-17-11 to 6-23-11	10	9	2	3	0	0	0	0	3	19
6-24-11 to 6-30-11	2	2	0	0	0	0	0	0	0	4
7-1-11 to 7-7-11	20	14	11	2	0	0	0	11	0	24
7-8-11 to 7-14-11	16	14	10	6	0	1	0	5	1	25
7-15-11 to 7-21-11	13	9	7	4	0	0	0	5	0	21
7-22-11 to 7-28-11	7	5	5	2	0	0	0	0	0	21
7-29-11 to 8-4-11	9	4	6	3	0	0	0	0	0	16
8-5-11 to 8-11-11	12	5	8	1	0	0	0	2	0	19
8-12-11 to 8-18-11	6	6	0	1	0	0	0	1	0	10
8-19-11 to 8-25-11	7	3	3	0	0	0	0	4	0	13
8-26-11 to 9-1-11	2	0	0	1	0	0	0	1	0	2
9-2-11 to 9-5-11	5	1	2	1	0	0	0	2	0	5
totals	117	76	57	28	0	1	0	31	6	201

Table 53- Key: I = Inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = emptied livewell; Dis = disposed of bait; Dry = dried boat.

Recreation Use Study: Osgood Pond Waterway Access Site

By Danielle Thompson, Watershed Steward

Figure 51- View of Osgood Pond.

Introduction

The Watershed Stewardship Program (WSP) of Paul Smith's College's Adirondack Watershed Institute was founded in 2000 to develop awareness and educate the public about aquatic invasive species (AIS). 2011 marks the fourth consecutive year of steward presence inspecting watercraft at the public boat launch on Osgood Pond. The Osgood Pond Association also aids the WSP by scheduling volunteer stewards at the launch on weekend days. Along with their inspection, all stewards provide boaters with information on AIS and collect recreation data from these encounters. Recreation data gathered over the years can be useful to both current and future managers of AIS. This demographic information can help create a more complete picture of recreational watershed usage and, therefore, a better understanding of the potential for AIS contamination and spread throughout the region.

Methods

A watershed steward was on duty at the Osgood Pond public launch site from 7:30-3:30 on Mondays and Fridays from June 3rd to August 30th, 2011. Upon arrival, each boater was given a brief overview of the WSP, noting specifically the state of Osgood Pond in its potential of AIS contamination. The boater was then asked what, if any, water body their watercraft had been in during the previous two weeks and whether they had taken any steps to prevent the spread of AIS. The steward would then also record the type and number of boats, including horsepower of motor, motor type (two or four-stroke), group size, and state of license plate registration. Each watercraft was then visually inspected by the steward, who also recorded presence and type of any aquatic species found on the watercraft or trailer before launch and after retrieval. If any aquatic species were found to be present on the watercraft, they were attempted to be identified by the steward. The material was then discarded on dry land far away as to have no threat of entering the water body. In the event that an invasive species previously unknown to the area should be found, the steward would record where the species was found and gather as much information from the boater as possible to find out where it may have originated from. This information would then be reported to the Adirondack Park Invasive Plant Program (APIPP) for further investigation.

To help educate the boater, the steward would explain their method of visual inspection; noting how and where to properly check for aquatic hitchhikers on the watercraft. If the boater had answered "no" to taking any steps to prevent AIS, they would be educated during the inspection on ways to help stop the spread of AIS. Finally, the boater was given an informational card with these instructions along with a list of common invasive species to watch out for. Stewards could also offer the boater a "stop invasive hitchhikers" sticker to place on their trailer as a personal reminder to always inspect their watercraft.

Results

From June 3rd to September 5th, Stewards at Osgood Pond inspected 146 watercraft and educated 220 boaters during their bi-weekly, 8 hour shifts at the public launch. Data from weekend volunteer stewards was not available to include in this report. The peak day for both number of visitors and watercraft was July 4th, with 30 boats and 39 people present at the launch. July was the most-visited month, as overall use was strongly affected by daily weather.

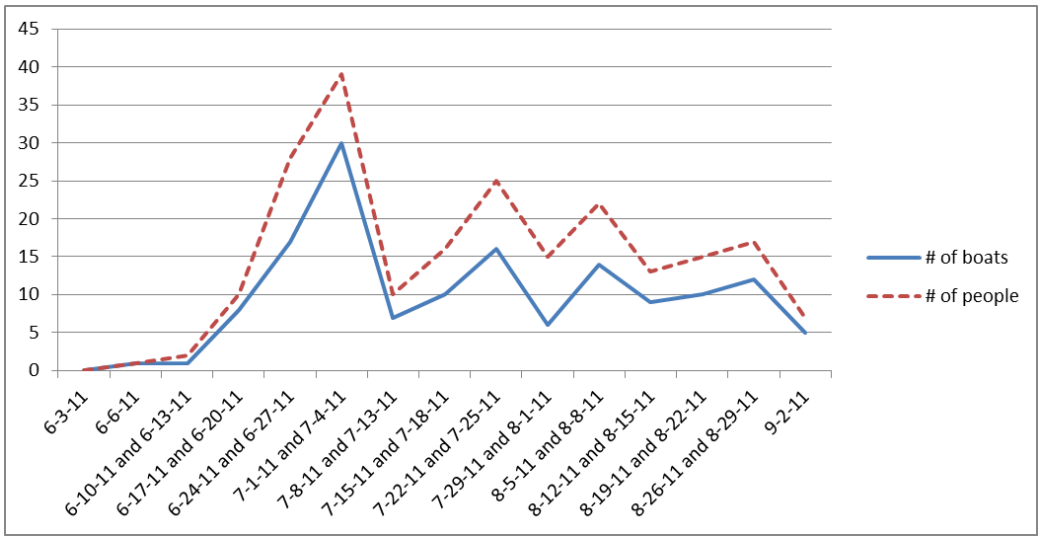


Figure 52- Boat launch use, Osgood Pond, 2011.

The majority of boats inspected at Osgood Pond in 2011 were non-motorized watercraft. Kayaks and canoes made up over three-quarters of all watercraft at the public launch, while motorized boats made up just over 12%. These statistics are consistent with those from previous survey years at Osgood Pond.

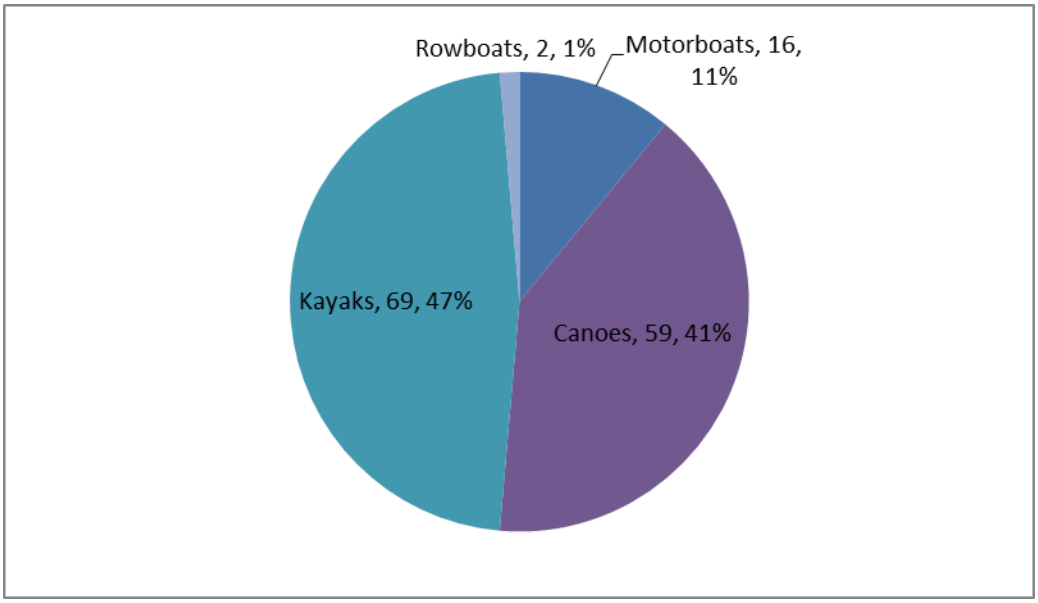


Figure 53- Types of watercraft launched, Osgood Pond 2011.

Osgood Pond features a smaller-sized public launch permitting access to motorized boats, granted they are relatively small and able to be launched, but not to personal watercraft such as jet skis. Due to its small size and central location in the Adirondacks, it was expected that many of the users would be local with boats registered in New York State. Nine boats were from New York and one boat was from Florida.

39 out of the 146 watercraft inspected by stewards at the Osgood Pond waterway access site had reported using their watercraft during the last two weeks. Of these, 71.8% (28 of 39 boats) were used in a body of water other than Osgood Pond. Seven of these reported visits (8% of all watercraft inspected) were in water bodies known to be infected with aquatic invasive species. Knowing this, we can assert the importance of asking the boater where they have launched in the last two weeks. Boats coming from infected waterways can then be more carefully scrutinized upon inspection by the steward.

Body of Water	Infected	Total Visits
Black Pond	Unknown	3
Bog River	Unknown	1
Buck Pond	Not Observed	2
Coles Creek	Unknown	1
Chateaugay Lake	Yes (EWM)	1
Deer River	Unknown	1
East Pine Pond	Unknown	1
Fish Creek Pond	Yes (EWM)	1
Lake Clear	Not Observed	1
Lake Colby	Yes (EWM)	1
Lake Everest	Unknown	1
Lake Placid	Yes (VLM)	2
Little Clear Pond	Unknown	3
Lower St. Regis Lake	Not Observed	2
Meacham Lake	Yes (EWM)	1
Menuski River	Unknown	1
Moose Pond	Not observed	2
Osgood Pond	Not observed	11
St. Lawrence River	Yes	1
Upper St. Regis Lake	Not Observed	2
Total		**39**

Table 54- Waterways visited in prior two-week period, Osgood Pond, 2011.

Another way for the steward to determine the likelihood of AIS presence on a watercraft is by asking the boater if they regularly take steps to reduce the spread of aquatic hitchhikers. Not only will this question help the steward determine how carefully to inspect the watercraft, it also helps them to educate the boater on the common, simple preventative measures they can take to reduce the spread of AIS in the future. These preventative steps include visual inspection, washing the boat, draining bilge water, emptying bait buckets and live wells, disposing of live bait away from the waterway, and drying the watercraft.

When posed the question, stewards did their best not to lead the interviewee to a response. For example, if a steward asks a boater, “Did you wash your boat before launching?” they might be more likely to respond affirmatively since they know it is what out program is promoting. The steward will instead ask a more open-ended question, such as, “Did you take any steps to prevent the spread of invasive species?”. This way the steward will be able to see the level of knowledge the boater has in reference to invasive species, and the mission of our program and education.

Stewards at Osgood Pond found that 56% groups interviewed answered yes to taking at least one of the preventative measures against transporting AIS. The most common preventative measure was visual inspection (47%), followed by washing the boat (28%). Upon visual inspection by the steward, plant material was removed from only one boat. This plant was removed upon retrieval of the watercraft and was (thankfully!) not identified to be an invasive species.

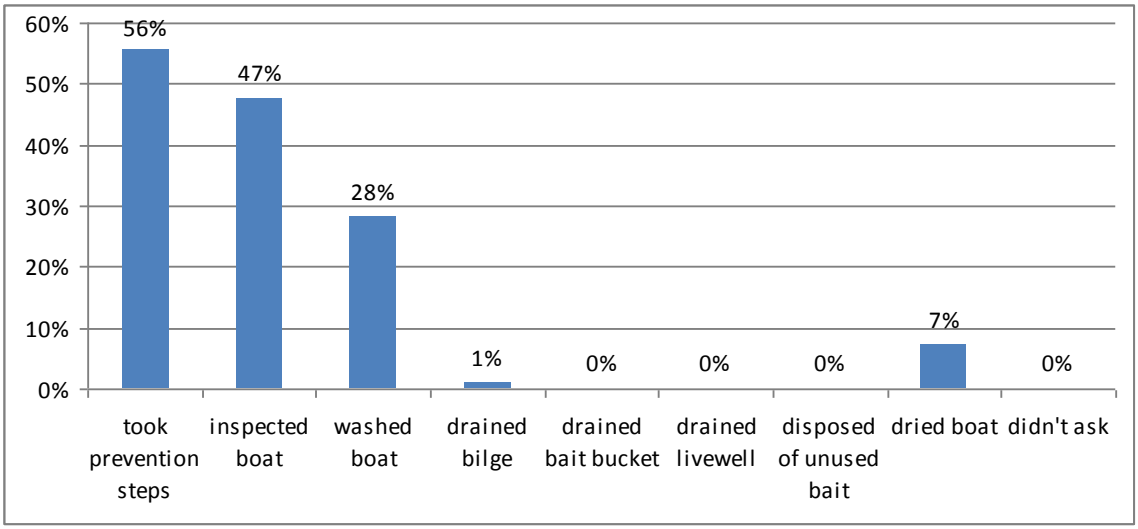


Figure 54- Aquatic invasive species spread prevention measures taken by visitors, Osgood Pond, 2011.

Volunteers from the Osgood Pond Association also helped to monitor the boat launch on various occasions throughout the summer. Volunteer stewards were present at the boat launch on 11 days spaced throughout the summer, inspecting a total of 44 boats and educating 92 people. They found no invasive species and no plant or animal fragments of any kind. Please see the end of this report for a summary of their data.

Discussion and Conclusion

The size, location, and accessibility of the public boat launch at Osgood Pond are all factors which contribute to the relatively small number of visitors encountered by stewards of the WSP in 2011. The number of watercraft inspected and people interviewed in 2011 was greater than previous summers. However, these figures are difficult to compare as stewards in 2011 were on duty one additional day per week in comparison with other years. Despite a difference in number of inspections and users interviewed, the percentage of boaters who took steps to prevent the spread of aquatic species was the same (54%) in 2010 as in 2011. Although the WSP would like to see more growth in this area, the program is optimistic that the figures are consistent and will strive for greater awareness in the coming years of their presence at Osgood Pond. As stated, 39 of 146 watercraft inspected had reported using their watercraft during the last two weeks, 28 of which were used in a body of water other than Osgood Pond. With the ever increasing threat of aquatic invasive species spread within (and outside of) the Adirondack park, it is important for the WSP to keep up their education boaters about the methods they can adopt to help stop this spread. The visitors of Osgood Pond are no exception here. Although the number of visitors is small in comparison to those of other boat launch sites, they are just as important to the WSP recreation studies and equally valuable as supporters of the WSP mission.

Osgood Pond Recreation Study 2011

	Boat Type							total #	Weekly Avg	Four	# of
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	people
6-3-11	0	0	0	0	0	0	0	0	0	0	0
6-6-11	0	0	0	1	0	0	0	1		0	1
6-10-11 and 6-13-11	1	0	0	0	0	0	0	1		0	2
6-17-11 and 6-20-11	1	0	0	3	4	0	0	8	1	0	10
6-24-11 and 6-27-11	2	0	0	11	3	0	1	17	25	2	28
7-1-11 and 7-4-11	3	0	0	10	16	0	1	30	6	1	39
7-8-11 and 7-13-11	2	0	0	2	3	0	0	7	15	1	10
7-15-11 and 7-18-11	0	0	0	3	7	0	0	10		0	16
7-22-11 and 7-25-11	0	0	0	4	12	0	0	16		0	25
7-29-11 and 8-1-11	2	0	0	3	1	0	0	6	49	2	15
8-5-11 and 8-8-11	2	0	0	6	6	0	0	14	15	1	22
8-12-11 and 8-15-11	0	0	0	3	6	0	0	9		0	13
8-19-11 and 8-22-11	0	0	0	5	5	0	0	10		0	15
8-26-11 and 8-29-11	1	0	0	7	4	0	0	12		0	17
9-2-11	2	0	0	1	2	0	0	5	35	0	7
totals	16	0	0	59	69	0	2	146	Summer Avg = 22	7	220
									Median HP = 15		

Table 55- Osgood Pond use figures, 2011. Key: M = Motorboat; PWC = personal watercraft; S = sailboat; C = canoe; K = kayak; B = barge (construction); R = rowboat.

Osgood Pond Recreation Study 2011

	# groups	# groups	organisms found		organism type							
Week	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other
5-28-11 to 6-2-11	0	0	0	0	0	0	0	0	0	0	0	0
6-3-11 to 6-9-11	1	1	0	0	0	0	0	0	0	0	0	0
6-10-11 to 6-16-11	1	0	0	0	0	0	0	0	0	0	0	0
6-17-11 to 6-23-11	4	2	0	0	0	0	0	0	0	0	0	0
6-24-11 to 6-30-11	11	8	0	0	0	0	0	0	0	0	0	0
7-1-11 to 7-7-11	19	8	0	0	0	0	0	0	0	0	0	0
7-8-11 to 7-14-11	5	3	0	0	0	0	0	0	0	0	0	0
7-15-11 to 7-21-11	6	4	0	0	0	0	0	0	0	0	0	0
7-22-11 to 7-28-11	9	7	0	0	0	0	0	0	0	0	0	0
7-29-11 to 8-4-11	4	3	0	1	0	0	0	0	0	0	0	1
8-5-11 to 8-11-11	8	5	1	0	0	0	0	1	0	0	0	0
8-12-11 to 8-18-11	6	2	0	0	0	0	0	0	0	0	0	0
8-19-11 to 8-25-11	8	3	1	1	0	0	0	2	0	0	0	0
8-26-11 to 9-1-11	8	5	0	0	0	0	0	0	0	0	0	0
9-2-11 to 9-5-11	3	3	0	0	0	0	0	0	0	0	0	0
totals	93	54	2	2	0	0	0	3	0	0	0	1

Table 56- Key: EWM = Eurasian Watermilfoil; BW = native bladderwort; NM = native milfoil; GRS = grass; WC = water chestnut; ZM = zebra mussel; VLM = variable leaf milfoil.

Osgood Pond Recreation Study 2011										
	Measures Taken to Prevent Spread of Invasive Species									
Week	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
5-28-11 to 6-2-11	0	0	0	0	0	0	0	0	0	0
6-3-11 to 6-9-11	0	0	0	0	0	0	0	0	0	1
6-10-11 to 6-16-11	0	0	0	0	0	0	0	0	0	1
6-17-11 to 6-23-11	1	1	0	0	0	0	0	0	0	5
6-24-11 to 6-30-11	2	2	4	0	0	0	0	0	0	6
7-1-11 to 7-7-11	11	10	5	0	0	0	0	0	0	20
7-8-11 to 7-14-11	4	3	4	1	0	0	0	1	0	6
7-15-11 to 7-21-11	3	1	2	0	0	0	0	0	0	7
7-22-11 to 7-28-11	6	6	0	0	0	0	0	2	0	12
7-29-11 to 8-4-11	3	3	1	0	0	0	0	0	0	4
8-5-11 to 8-11-11	6	6	1	0	0	0	0	3	0	10
8-12-11 to 8-18-11	3	3	2	0	0	0	0	0	0	6
8-19-11 to 8-25-11	6	3	4	0	0	0	0	1	0	8
8-26-11 to 9-1-11	7	6	4	0	0	0	0	0	0	9
9-2-11 to 9-5-11	3	3	1	0	0	0	0	0	0	4
totals	55	47	28	1	0	0	0	7	0	99

Table 57- Key: I = Inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = emptied livewell; Dis = disposed of bait; Dry = dried boat.

Osgood Pond	Boat Type			total #	# of	# groups	# groups	organisms found	
Volunteer Steward	M	PWC	NM	boats	visitors	launching	retrieving	entering	leaving
Summer Totals	24	0	40	64	133	45	11	0	0

organism type								"Yes," is aware of	visitor prevention steps							
EWM	BW	NM	GRS	WC	ZM	VLM	other	EWM threat	yes	I	WB	DB	BB	LW	Dis	didn't ask
0	0	2	0	0	0	0	0	30	2	23	20	3	0	0	0	0

Table 58- Osgood Volunteer Steward Data, 2011. M = motorized, PWC = personal watercraft, NM = non motorized, EWM = Eurasian watermilfoil, BW = bladderwort, NM = native milfoil; GRS = grass; WC = water chestnut; ZM = zebra mussel; VLM = variable leaf milfoil. I = Inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = emptied livewell; Dis = disposed of bait; Dry = dried boat.

Recreation Use Study: Rainbow Lake/ Buck Pond Campground Boat Launch

By Kimberly M. Forrest and Kyle Milner

Introduction

The Rainbow Lake boat launch is located within the heart of the NYS DEC Buck Pond Campground on the eastern shore of Lake Kushaqua. This launch gives access to the interconnected Rainbow Lake waterway. Starting from Lake Kushaqua one can travel into the Kushaqua Narrows down to the Rainbow Narrows where the north branch of the Saranac River connects. From the Rainbow Narrows, one can journey further into Rainbow Lake and The Flow. The interconnectedness of these water bodies makes their protection from invasive species important, for if one part were to become infected the entire waterway could become seriously degraded.

Lake Kushaqua is home to a nuisance species called southern naiad (*Najas guadalupensis*). This submerged aquatic plant makes it hard for people to fish swim and boat. Watershed Stewards took extra care to remove this plant from boats so that it would not travel anywhere else and become invasive. Otherwise, Lake Kushaqua and the Rainbow Lake Waterway host no aquatic invasive species.

Methods

From May 28th through July 1, 2011 a Watershed Steward was on duty at the Rainbow Lake boat launch from 7am to 4pm Thursday through Monday. From July 1 through September 5, volunteer stewards took over duties on Fridays, reducing Paul Smith's College steward coverage to Thursdays, Saturdays, Sundays, and Mondays. Before a boater would launch or after a boater would retrieve his boat the Watershed Steward would ask the boater a series of questions regarding the boat's previous use and if the boater had taken any steps to prevent the spread of aquatic invasive species. Stewards recorded these steps along with any waterbody used within two weeks prior to the boater's visit to the Rainbow Lake Boat launch. The Watershed Steward would alert the boater of any steps that they could be taking in addition to any they already took, and educate them about the resident nuisance species, southern naiad. The boater would also be encouraged to use the Buck Pond boat wash facility before and after any use.

After conducting the interview, stewards then proceeded to visually inspect each boat for any attached organisms. Stewards inspected the lower unit of engines, the hull, trailer, axles, and any surface that could carry invasives. If any plant or animal matter was found it would be removed from the boat, and then it would be recorded on the Watershed Steward's data sheet. The type of boat, horsepower of outboard motor, the number of strokes of the motor, group size, and boat registration would also be recorded.

Results

During the 2011 season on Rainbow Lake the stewards on duty encountered 474 watercrafts and 866 visitors. Peak use came in the week of 7/28 to 8/3/11, when 61 boats and 126 visitors were encountered. Use was at a minimum during the weeks of 6/9 – 6/15 (rain) and 8/25-8/31 (Tropical Storm Irene) for understandable reasons.

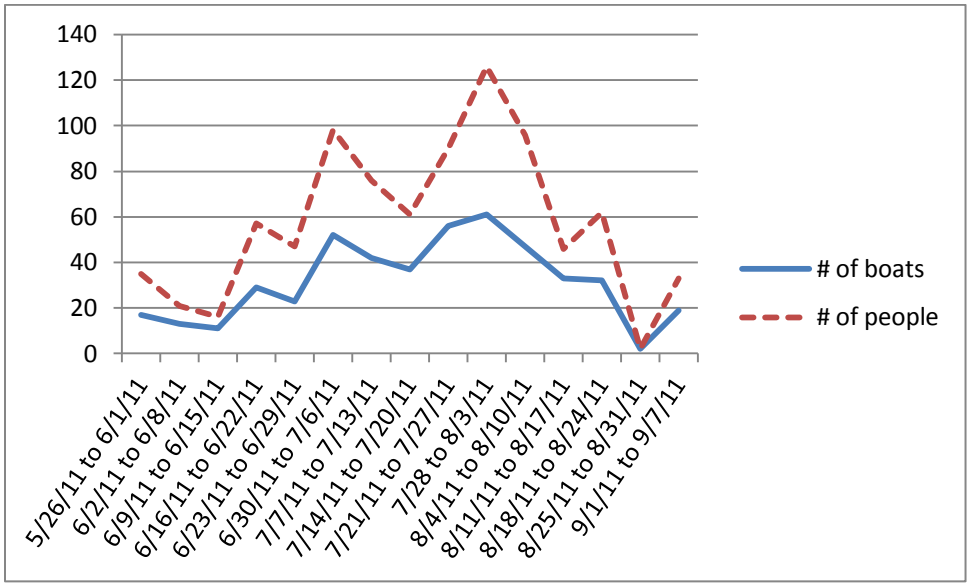


Figure 55- Boat Launch use, Rainbow Lake waterway 2011.

The most common watercrafts observed in 2011 were kayaks, which made up 36% of the vessels. Motorboats made up a very close second with 35% of the visiting watercrafts, which compares very closely to watercraft category distribution in 2010. 88 of 168 motorboats (52%) were propelled by environmentally-friendly four stroke outboard motors, which is double the rate observed in 2010.

Figure 56- Rainbow Lake waterway ramp at Buck Pond Campground.

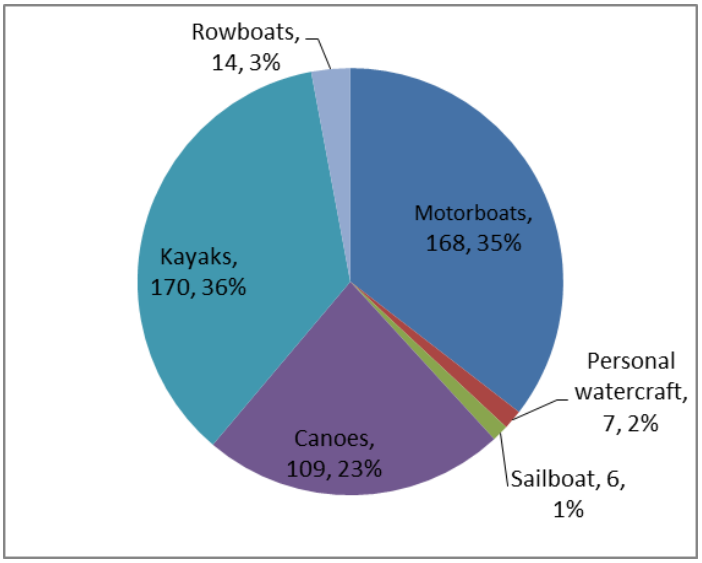


Figure 57- Types of watercraft launched, Rainbow Lake Waterway 2011.

Stewards encountered watercraft from eight states and provinces, with New York as the most frequent state of origin. Stewards asked the boat owners at the Rainbow Lake Boat Launch which aquatic invasive species (AIS) spread prevention measures they had taken since the last use of the boat in question. 118 (33% of 358 total groups) boat owners washed their boats before they launched, and 65 (18%) of boat owners had dried their boats for two days or greater. The number of boat owners that had inspected their boat and boating equipment for any organic matter was 78 (22%). 14 (4%) boaters had drained their bilge after their last use, and 1 (0.3%) of the boaters had drained their live wells. 0 (0%) boaters had drained their bait buckets or disposed of their live bait properly. Of the total 358 groups 199 (56%) of them had taken some preventative measures before launching their boats. 34 boats of the total 494 (7%) had been washed using the boat wash at the boat launch either before or after use in the Rainbow Lake waterway, which is down considerably from 22% in 2010 and 19% in 2009. In fact, each of the spread prevention statistics is lower in 2011 than in 2010, suggesting a disquieting reversal of environmental protection attitude or behavior, or possibly a variation in the way the questions were asked by the watershed stewards compared with other years.

State/Province of Origin	# Visits
CT	1
NC	1
NH	2
NJ	5
NY	179
OH	1
PA	1
QC	1

Table 59- State or province of origin, boats using Rainbow Lake boat launch, 2011.

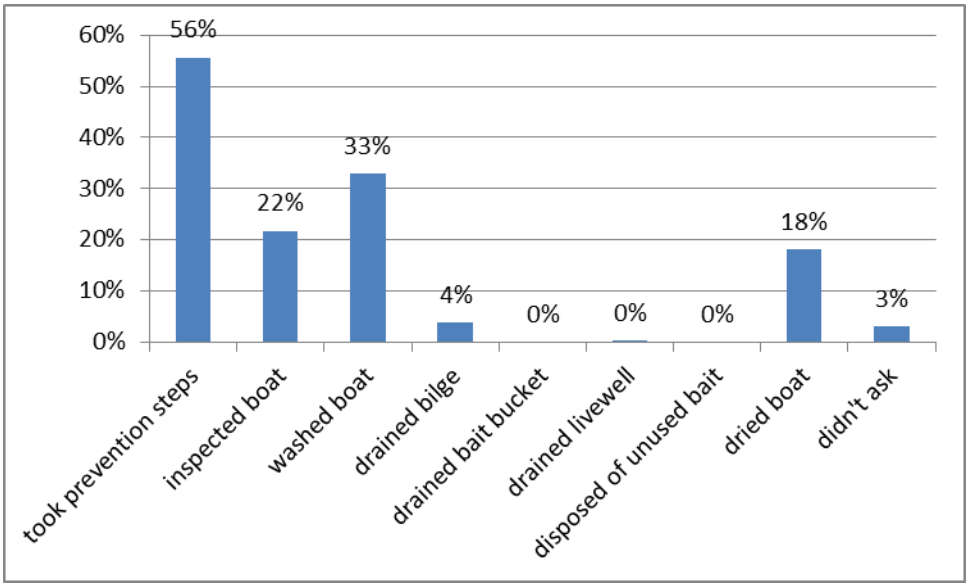


Figure 58- Aquatic invasive species spread prevention measures taken, Rainbow Lake waterway 2011.

Stewards asked visitors where their boat had been in the preceding two-week period. 177 boat operator groups had been in no waterway in the preceding two weeks. Of the 261 owners reporting a prior waterway, the most frequently mentioned waterbodies were Buck Pond (79 visits), Rainbow Lake (45), and Lake Kushaqua (17), none of which have invasive species of concern to Rainbow Lake. 82 of the 261 visits (31.4% of boats reporting a prior waterway visit) were from waterbodies with known infestations of aquatic invasive species. The most frequently listed infested waterways were Lake Flower (9 visits), Lake Champlain (6), Chateaugay Lakes (5), Taylor Pond (5), and Fish Creek Ponds (5). Lake Flower and Fish Creek Ponds are located close to Rainbow Lake, implying short transport distances from infested waterways and an increased chance of transporting invasive organism fragments on boats and trailers.

The overall organism transport rate for boats using the Rainbow Lake waterway access site at Buck Pond was 18 of 554 boats or 3.2%. None of the organisms removed presented a confirmed threat of a new invasive species to the Rainbow Lake waterway. Only the four southern naiad fragments represent a species of regional concern according to the Adirondack Park Invasive Plant Program, even as the species is already established in the Rainbow Lake Waterway. If these four are counted as “invasive” (southern naiad would not be a welcome addition to the flora of other Adirondack lakes), the transport rate-invasive species for boats using the Rainbow Lake waterway boat ramp would be 4 of 554 boats or 0.7%. The overall transport rate is dramatically lower than in 2010, when organisms were found on 60 of 300 boats (20% transport rate). There is no obvious explanation for this decrease in transport rate.

Organism	Entering	Leaving
Grass	2	8
Southern Naiad		4
Bladderwort	1	1
Brown algae	1	
Other (unidentified)		1
totals	4	14

Table 60- Organisms removed from watercraft, Rainbow Lake 2011.

Water body	# visits	Infested?	Water body	# visits	Infested?
Ausable River	1		Lewy Lake, Maine	1	Unknown
Barnum Pond	2		Long Pond	1	
Black Pond/ Long Pond	1		Loon Lake	2	Yes
Buck Pond	79		Lower Saranac Lake	1	Yes
Burden Lake	1	Yes	Lowes Lake	1	
Cascade Lake	2		Madawaska Lake	1	No
Cedar River Flow	1		Mason Lake	1	
Chateaugay Lake	5	Yes	Meacham Lake	3	Yes
Chazy Lake	3	Yes	Middle Saranac Lake	1	Yes
Connecticut River	1	Yes	Moose Pond	2	
Delaware River	1	Yes	Mountain View Lake	1	Yes
Erie Canal	2	Yes	Nassau Lake	1	Yes
First Lake/Otter Lake	1	Yes	Oregon Pond	3	
Fish Creek	5	Yes	Oswagatchie River	1	Yes
Floodwood Pond	1	Yes	Putnam Pond	1	Yes
Follensby Clear Pond	1	Yes	Rainbow Lake	45	
Genesee River	2	Yes	Raquette River	1	Yes
Henderson Lake	1		Rollins Pond	2	
Hudson River	2	Yes	Sacandaga	1	Yes
Jones Pond	3		Saranac River	4	Yes
Katyville Beach (Saranac River)	1	Yes	Second Pond	2	Yes
La Platte River	1		Seneca River	3	Yes
Lake Champlain	6	Yes	Susquehanna River	1	Yes
Lake Colby	2	Yes	Silver Lake	1	
Lake Eden	1		St. Regis	7	
Lake Everest	1		Stinson Lake	3	
Lake Flower	9	Yes	Stoney Creek	1	
Lake George	1	Yes	Taylor Pond	5	Yes
Lake Kushaqua	17		Union Falls Pond	2	Yes
Lake Lillinonah	1	Yes	Upper Saranac	3	Yes
Lake Luzerne	1	Yes	None	177	
Lake Placid	3	Yes	Total	261	

Table 61- Waterways visited in prior two-week period, Rainbow Lake, 2011.

Service projects

Rainbow Lake shore owners are a close-knit community working to protect and manage the lake they live on. This hands-on, community-based approach produces the highest level of management and leads to well-thought-out decisions made by the stakeholders themselves. Paul Smith's College strives to use watershed stewards to more closely link shore owners with the resources of the Adirondack Watershed Institute and the College.

Several small projects were undertaken this summer by watershed stewards to aid the shore owners of Rainbow Lake in gathering field data, creating GIS maps of interest, and attending shore owner meetings to answer questions and receive directives for future projects.

When reports of possible new infestations of invasive species on Rainbow Lake are shared with watershed stewards at the boat launch, joint investigations spring into action. Watershed stewards, with the help of shore owners, snorkeled the locations reported and gathered samples to be brought back to the Adirondack Watershed Institute lab for analysis. Two reports of potential new invasive species were investigated this summer, and in both cases the samples gathered turned out to be native plants that closely resemble non-native variable leaf milfoil.

The shore owners also expressed an interest in obtaining GIS maps of Rainbow Lake to aid in management decisions, and better visualize their resource. Stephen Ellis of Paul Smith's College and watershed steward Kyle Milner produced large GIS topographic maps, incorporating digital elevation modeling. Also a flash drive was loaded with all the digital files used to make the maps which enable the shore owners to print as many maps as needed while also providing a base GIS map to which more data can be added to in the future.

Figure 59- Buck Pond campground beach.

Discussion

2011 was the seventh season that the Paul Smith's College Watershed Stewardship program has been stationed at the Rainbow Lake boat launch, preventing the spread of southern naiad and the introduction of any other aquatic invasive species. With the expansion of the program in 2011 Watershed Stewards were able to be on duty at the Rainbow lake boat launch five days a week compared to the two days a week in the previous seasons.

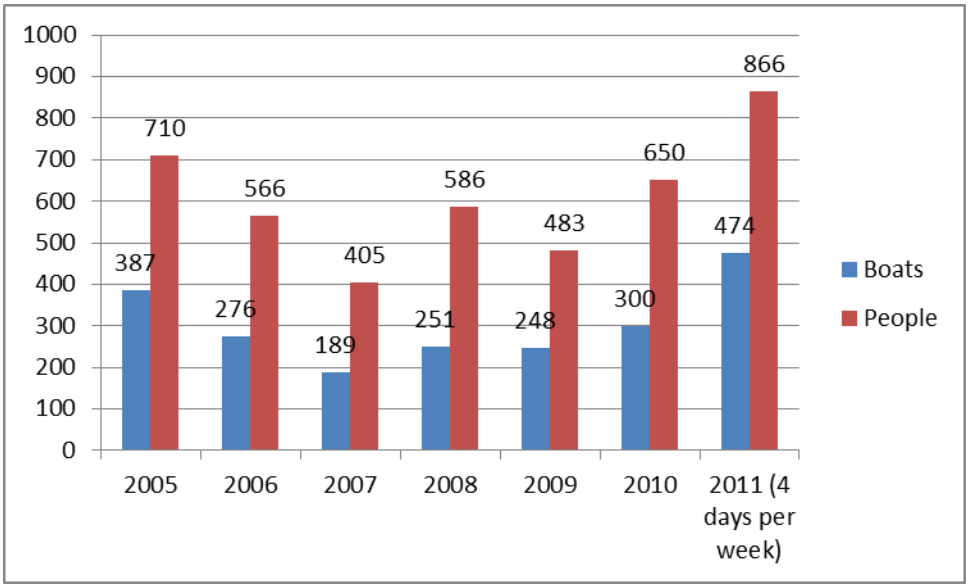


Figure 60- Use figures, Rainbow Lake waterway, 2005-2011.

While stewards saw more boaters and inspected more watercraft than they ever have at the Buck Pond Campground boat ramp, many other indicators were markedly different from previous years. Compliance with the boat wash was down dramatically from a year ago (21% compliance in 2010 versus 7% in 2011). The percentage of people taking AIS spread prevention measures was down to 56% from 79%, the number of people inspecting their watercraft was down to 22% from 42.8% and the number of people washing their boats before arriving fell to 33% from 38%. Despite these troubling indicators of a decline in visitor awareness and compliance with generally accepted AIS spread prevention techniques, the boats themselves appeared much cleaner, in terms of organisms removed. Stewards only removed 18 organisms from 554 boats in 2011 (3.2%) compared with 60 organisms from 300 boats (20%) in 2010. 2011's organism transport rate is closer to that found in 2009, when 19 of 248 boats were found to be carrying organisms (7.6%).

The increase in coverage in 2011 from previous years resulted from grant support to the Rainbow Lake Association from the Lake Champlain Basin Program. This funding allowed the RLA to hire Paul Smith's College stewards and to supplement the paid coverage with volunteers. Rainbow Lake remains a comparatively pristine waterway, with high quality ecosystems and uninfested waters. The stewards enjoyed the support and collaboration of the Rainbow Lake property owners, particularly Jim Hauber, who provided advice and encouragement to all the stewards.

Rainbow Lake Recreation Study 2011											
	Boat Type							total #	Weekly Avg	Four	# of
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	people
5/26/11 to 6/1/11	11	0	0	1	4	0	1	17	54	8	35
6/2/11 to 6/8/11	7	0	0	1	5	0	0	13	44	3	21
6/9/11 to 6/15/11	6	2	0	2	1	0	0	11	33	3	16
6/16/11 to 6/22/11	20	0	0	8	0	0	1	29	42	13	57
6/23/11 to 6/29/11	10	0	0	4	9	0	0	23	23	3	47
6/30/11 to 7/6/11	20	0	0	10	20	0	2	52	57	11	98
7/7/11 to 7/13/11	10	0	0	11	16	0	5	42	39	8	76
7/14/11 to 7/20/11	11	1	0	14	10	0	1	37	39	9	61
7/21/11 to 7/27/11	13	0	0	13	30	0	0	56	63	7	90
7/28 to 8/3/11	16	3	6	12	23	0	1	61	59	7	126
8/4/11 to 8/10/11	12	0	0	16	18	0	1	47	48	3	96
8/11/11 to 8/17/11	12	0	0	1	20	0	0	33	34	5	46
8/18/11 to 8/24/11	10	1	0	12	8	0	1	32	79	7	62
8/25/11 to 8/31/11	0	0	0	2	0	0	0	2	none	0	2
9/1/11 to 9/7/11	10	0	0	2	6	0	1	19	48	1	33
totals	168	7	6	109	170	0	14	474	Summer Avg 47	88	866
Volunteer Steward Data	29	2		21	28				Median 30		

Table 62- Rainbow Lake use figures, 2011. Key: M = Motorboat; PWC = personal watercraft; S = sailboat; C = canoe; K = kayak; B = barge (construction); R = rowboat.

Figure 61- Rainbow Lake narrows.

Rainbow Lake Recreation Study 2011

	# of Groups		organisms found		organism type							
Week	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other
5/26/11 to 6/1/11	15	8	0	0	0	0	0	0	0	0	0	0
6/2/11 to 6/8/11	8	4	1	3	0	0	0	4	0	0	0	0
6/9/11 to 6/15/11	7	5	0	0	0	0	0	0	0	0	0	0
6/16/11 to 6/22/11	19	19	0	2	0	0	0	1	0	0	0	1
6/23/11 to 6/29/11	16	4	0	1	0	0	0	1	0	0	0	0
6/30/11 to 7/6/11	29	18	0	3	0	0	0	0	0	0	0	3
7/7/11 to 7/13/11	25	10	0	2	0	0	0	1	0	0	0	1
7/14/11 to 7/20/11	19	15	0	1	0	1	0	0	0	0	0	0
7/21/11 to 7/27/11	31	10	2	1	0	1	0	1	0	0	0	1
7/28 to 8/3/11	38	16	0	0	0	0	0	0	0	0	0	0
8/4/11 to 8/10/11	26	15	0	0	0	0	0	0	0	0	0	0
8/11/11 to 8/17/11	20	8	1	0	0	0	0	1	0	0	0	0
8/18/11 to 8/24/11	20	11	0	1	0	0	0	1	0	0	0	0
8/25/11 to 8/31/11	1	1	0	0	0	0	0	0	0	0	0	0
9/1/11 to 9/7/11	11	6	0	0	0	0	0	0	0	0	0	0
totals	285	150	4	14	0	2	0	10	0	0	0	6

Table 63-Key: EWM = Eurasian Watermilfoil; BW = native bladderwort; NM = native milfoil; GRS = grass; WC = water chestnut; ZM = zebra mussel; VLM = variable leaf milfoil.

Rainbow Lake Recreation Study 2011

	boat	Measures taken to prevent transport of invasive species									
Week	wash	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
5/26/11 to 6/1/11	2	11	0	10	1	0	0	0	0	1	17
6/2/11 to 6/8/11	0	6	0	4	1	0	0	0	1	2	10
6/9/11 to 6/15/11	1	7	3	6	2	0	0	0	4	0	10
6/16/11 to 6/22/11	5	16	11	9	3	0	1	0	4	3	28
6/23/11 to 6/29/11	3	10	2	5	1	0	0	0	4	2	19
6/30/11 to 7/6/11	4	24	12	13	1	0	0	0	10	0	39
7/7/11 to 7/13/11	5	23	9	14	1	0	0	0	13	0	30
7/14/11 to 7/20/11	7	18	5	12	0	0	0	0	9	0	25
7/21/11 to 7/27/11	3	12	4	7	2	0	0	0	5	0	35
7/28 to 8/3/11	0	23	7	12	2	0	0	0	7	0	43
8/4/11 to 8/10/11	0	20	11	8	0	0	0	0	6	0	36
8/11/11 to 8/17/11	0	9	5	6	0	0	0	0	1	3	23
8/18/11 to 8/24/11	4	14	7	8	0	0	0	0	0	0	28
8/25/11 to 8/31/11	0	0	0	0	0	0	0	0	0	0	1
9/1/11 to 9/7/11	0	6	2	4	0	0	0	0	1	0	14
totals	34	199	78	118	14	0	1	0	65	11	358

Table 64-Key: I = Inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = emptied livewell; Dis = disposed of bait; Dry = dried boat.

Recreation Use Study: Raquette Lake Village Boat Launch

By: Jaden Aronow, Watershed Steward

Figure 62- View from boat launch in Raquette Lake Village.

Introduction

In its twelfth year, the Paul Smith's Watershed Stewardship Program (WSP) employed more stewards across the Adirondack Park than ever before. The main goal of the stewards' work is to stop the spread and educate the public about aquatic invasive species (AIS). Through careful boat inspections, knowledge of problematic species, and an optimistic upbeat attitude stewards hope to prevent any further ecological damage from AIS. A grant from the U. S. Fish & Wildlife Service through the Great Lakes Restoration Initiative made it possible for the WSP to reach out to boat launches in the eastern Lake Ontario Headwaters, includingRaquetteLake.24 stewards were divided into three geographic areas, the western and eastern Adirondacks and Saratoga Lake. The western division covered the Raquette Lake Village boat ramp and cartop launch area. In 2008 a WSP steward, paid for by the Raquette Lake Property Owners Association (RLPOA) and the Town of Long Lake, covered the launch five days per week and members of the RLPOA volunteered two days per week.355 boats were inspected by the WSP in 2008. In 2009 and 2010 the RLPOA and Town of Long Lake provided a paid steward five days per week and members of the RLPOA volunteered on Tuesdays and Wednesdays. 1,533 boats were inspected in 2009 and 1,765 in 2010[1]. It should be noted that in 2010 the inspection program went through September 11with the inspection of boats for the Adirondack Canoe Classic. In 2010 the steward adjusted the eight-hour shift on Friday to end at 7 pm. The 2009 and 2010 data also included boats inspected at Burke's Marina on Raquette Lake. There were 122 boats inspected by the WSP in 2011 at Burke's Marina. The RLPOA inspected 612 boats, mostly Friday nights at Burke's Marina, but also other times and occasionally at Bird's Marina. This data is discussed in more detail in the Roving Site report elsewhere in this publication. For this reason, invasive

species awareness is not a new theme at Raquette Lake. The RLPOA has worked tirelessly to establish a general knowledge of AIS spread and prevention. This summer the WSP had the opportunity to integrate into an area that already hada well established awareness about invasive species. In cooperation with the local community and RLPOA volunteers the WSP was able to gain a crucial understanding of recreation use in an areawhere they did not previously have a strong presence.

Methods

A steward was posted at the village boat launch at Raquette Lake seven days per week, eight hours per day from 7:00 am to 4:00 pm with breaks totaling one hour per day between the Memorial Day weekend and Labor Day. There was a staff meeting Thursday morning during which a RLPOA volunteer would steward the boat launch. Each boat that came through the launch during those hours was inspected for AIS. In the event of finding AIS upon the boat or trailer the steward would proceed to remove it. At the request of RLPOA, in cases where AIS were found, the Clorox Company cleaning agent Formula 409 was applied to kill anything that may have been missed, a procedure sanctioned by the New York State Department of Environmental Conservation. In a minority of extreme cases the boat was denied launch and asked to be power washed before entry was allowed. The boaters were also asked if they had taken any preventative measures regarding AIS and where their boat had been in the previous two weeks. This information was recorded along with the type of boat, the horsepower of the motor, and whether it was a two-stroke or four-stroke engine, what time the boat was launching or retrieving and the results of the boat inspection. All of this information was gathered throughout the summer on datasheets that were transferred to a cumulative electronic spreadsheet in Microsoft Excel. The Raquette Lake Village boat launch is privately owned which gives that steward the authority to deny access. Stewards also distributed literature to those that were willing to accept it and provided more information about the implications of AIS.

Figure 63- Table located next to the Raquette Lake boat launch.

Results

The seven day per week coverage of the Raquette Lake Village boat launch yielded 971 boat inspections. Motorboats comprised 53% of the total inspections. Kayaks and canoes followed with 21% and 20% of the total. Only 49inspections where done for personal watercraft, making up 5% of the total. Total visitors numbered 1,963. RLPOA volunteers inspected 97 boats, mostly on Thursday mornings.

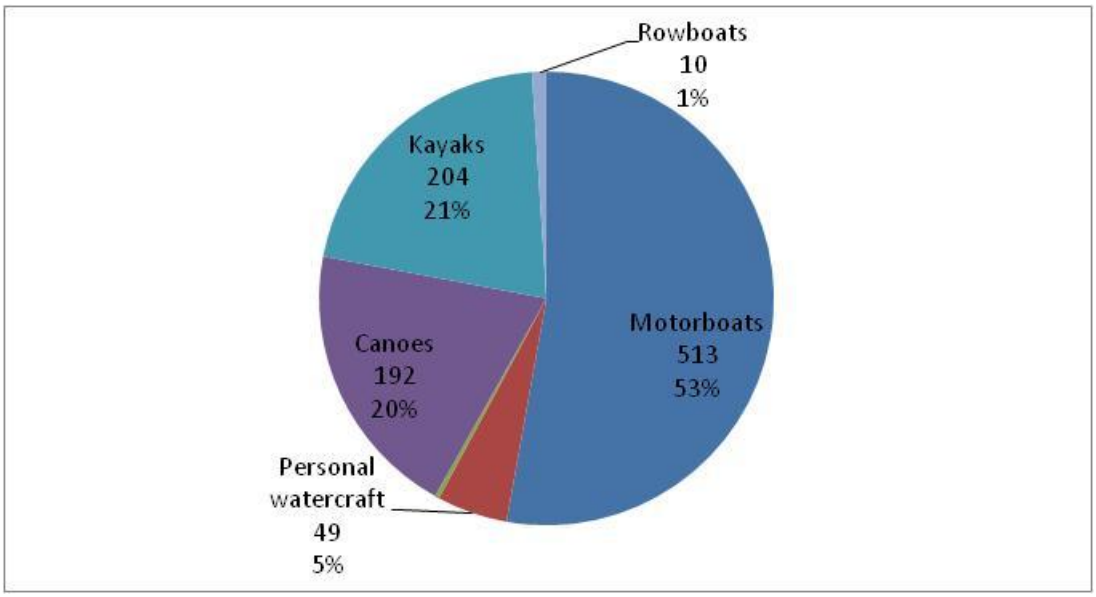


Figure 64- Total boats inspected at Raquette Lake in 2011.

Typically the busiest days of the summer were during weekends. A select number of weeks brought more traffic through the launch relative to other weeks throughout the summer. The weeks of7/1/11 – 7/7/11, 7/8/11 – 7/14/11, and 7/22/11 – 7/28/11 averaged nearly one hundred boats each week. The number of boats and visitors varied throughout the rest of the summer due to weather, community events, and other variables. There was a general increasing trend in the traffic as the summer began to progress.

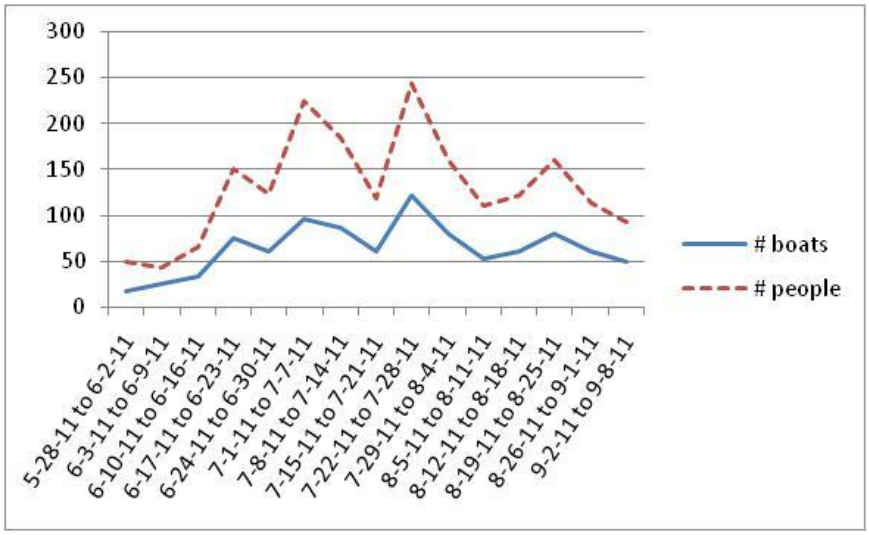


Figure 65- Total number of boats and people observed at Raquette Lake in 2011.

The busiest days of the summer were Saturdays with 214 boats. Sundays and Fridays followed with 188 and 127 boats. The slowest days were Tuesdays which only accounted for 77 boats. The busiest day of the summer was Saturday July 23, the12th Annual Raquette Lake Bass Tournament, with 35 boats. There were multiple days where no boats were inspected.

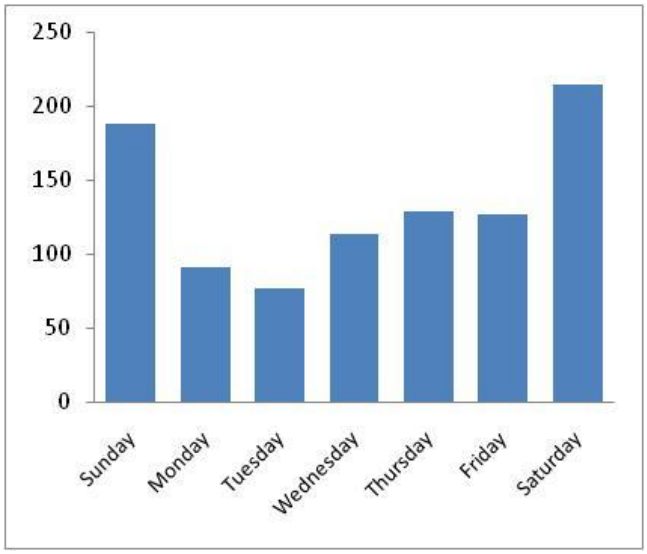


Figure 66- Number of boats inspected by day of the week at Raquette Lake in 2011.

When comparing the data gathered about the motors of the boats, there is great variability in horsepower and outboard/inboard motors. The horsepower of outboard motors ranged from 350 to 9.9, with a mean of 57. The majority of boats inspected this summer were registered in New York State. There were 505 inspections of New York State registered boats and some boats traveled from as far away as Florida.

State	# of boats
Arizona	1
Connecticut	22
Delaware	2
Florida	2
Georgia	1
Indiana	4
Massachusetts	15
Maryland	1
North Carolina	1
New Jersey	47
New York	505
Ohio	1
Pennsylvania	7
Quebec	1
Rhode Island	2
Texas	1
Vermont	8

Table 65- Registration of boats visiting Raquette Lake in 2011.

A total of 62% of boaters that were interviewed did take prevention steps regarding AIS. The most common practice was washing their boat and the least common practice was disposing of unused bait properly. 7% of the boats that were inspected weren't asked if they had taken prevention steps.

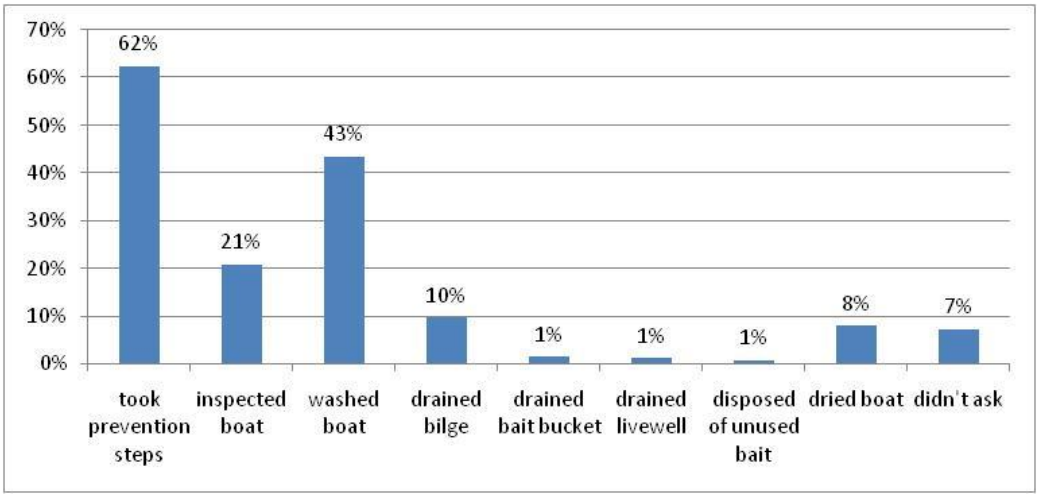


Figure 67- Percentage of boaters that took prevention steps.

Boat ramp stewards inspected every boat entering and leaving the lake. They removed a total of 232 organisms of a variety of types from watercraft entering and exiting the lake. 110 organisms were removed from 507 groups launching (22% overall organism transport rate- boats launching) and 122 organisms were removed from 357 groups retrieving watercraft (34% overall transport rate- boats departing). Overall, 232 of 864 boat groups were found to be transporting organisms (27% overall transport rate).

A subset of the organisms that stewards removed from watercraft were confirmed as invasive species. 9 instances of Eurasian watermilfoil (6 on boats entering and 3 on boats leaving the ramp), 11 instances of variable-leaf milfoil (1 entering and 10 leaving), one zebra mussel instance on a boat entering, and one curly-leaf pondweed, also on a boat entering. Two watercraft bringing invasive species (curly-leaf pondweed and Eurasian watermilfoil) reported coming from the Fulton Chain in the last two weeks, suggesting a risk of connectivity between the waterways. Infestation rates for invasive species are as follows: boats entering, 9 of 507 groups (1.7%); boats leaving, 13 of 357 groups (3.6%); overall infestation rate for invasive species, 22 of 864 groups (2.5%).

Organism	Entering	Leaving	Prior waterway
Bladderwort	4	23	
Curly leaf pondweed	1		Fulton Chain
Eurasian watermilfoil	6	3	None (2), Redfield Res., Fulton Chain, Oneida Lake (2), Lake Champlain, Niagara River
Grass	51	24	
Native milfoil	1	4	
Native pondweed		1	
Other (unidentified)	45	57	
Variable-leaf milfoil	1	10	Raquette Lake (5), None (3), Brown's Tract, Connecticut River
Zebra mussels	1		None
totals	110	122	

Table 66- Organisms found on boats entering and leaving the Raquette Lake Village boat launch, summer 2011. Prior waterway listed for invasive species of interest.

Discussion

The WSP was implemented to educate the public and stop the spread of AIS. The stewards noticed that the Raquette Lake community already had a well established awareness of AIS. The RLPOA was extremely helpful in establishing the presence of the WSP stewards at the launch in Raquette Lake Village. The RLPOA provided all the equipment needed at this site, including a tent, table, samples of invasive species for display, buckets, pamphlets, and scrubbers. The local residents of Raquette Lake were very familiar with a boat launch steward inspecting their boat. They often didn't recognize the difference between the RLPOA steward and a WSPsteward, but it was very beneficial for people to understand why the stewards were there.

Raquette Lake was one of the western division's seven day per week coverage sites. The total number of boats that were inspected was comparable to previous summers, when the boats inspected at Burke's and Bird's Marinas by RLPOA (612) and WSP stewards (122) are added to the Raquette Lake Village launch numbers, as was the practice in 2009 and 2010. Raquette Lake was one of the WSP's busiest sites in the western Adirondacks. The Raquette Lake boat launch was a valuable site due to the amount of non-boating visitors that were interacted with. Although the launch did see a lot of boats, many visitors that weren't launching were talked to. The location of the launch right in the middle of the small town put it in view of many visitors that were not necessarily using the boat launch. Hence the number of visitors contacted is not fully represented by the data. The General Store attracts many visitors to the area, which makes the boat launch a valuable location for educating the public. Another benefit of a small town is that word travels fast. Stewards intercepted a boat with zebra mussels on it and the news of this traveled quickly.

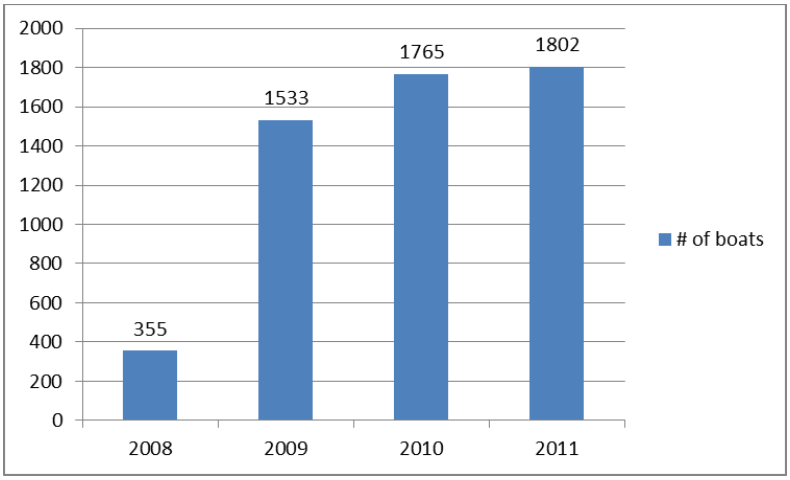


Figure 68- Number of boats inspected, Raquette Lake Village, Bird's and Burke's Marinas, 2008-2011. (Bird's and Burke's were not staffed in 2008.).

There was a great deal of variability in the data that was collected throughout the summer. There were many types of boats and many different things they were being put to use for. Raquette Lake is a well known fishing, camping, and recreational lake. There are many inlets to Raquette Lake, which drew kayakers to the lake. Lean-tos and campgrounds are on Raquette Lake also. Throughout the summer large and small groups of travelers with canoes came through for long weekends and overnight stays. This also explained the smaller boats that the steward observed to take supplies back and forth. The large number of summer camps on Raquette Lake also had an influence on the traffic, as most of them are boat access only. Larger boats were launched for water sports and fishing. Multiple fishing derbies were held at Raquette Lake throughout the summer. A good deal of early morning traffic can be attributed to fishing boats.

Waterbody	#of Visits	Infection Status		Waterbody	#of Visits	Infection Status	
Big Moose Lake				Lake Erie	2		
Black Lake	3			Lake George		yes	
Blue Mountain Lake	7			Lake Ontario	3	yes	
Brantingham Lake	3			Lake Pleasant			
Brant Lake	2	yes		Limekiln Lake	4		
Brown's Tract	6			Long Lake	14		
Candlewood Lake				Loon Lake			
Cayuga Lake		yes		Marion River			
Champlain Canal				Moose River		yes	
Chenango River				Nick's Lake	2		
Conesus Lake		yes		O K Slip Pond	2		
Conneticut River		yes		Old Forge Pond			
Delaware River				Oneida Lake		yes	
Delta Lake	4			Oswego Lake			
Eighth Lake	5			Paradox Lake			
Erie Canal				Quincy Lake	2		
First Lake	2			Raquette Lake	115	yes	
Forked Lake	2			Redfield Reservoir	6		
Fourth Lake	30	yes		Prollins Pond			
Fulton Chain of Lakes	4	yes		Sacandaga Lake		yes	
Galway Lake				Sagamore Lake			
Goodyear Lake				Sandy Hook Bay (NJ)		yes	
Grass River	2			Saratoga Lake	2	yes	
Guilford Lake	3			Schroon Lake		yes	
Hemlock Lake				Salmon River			
Hinckley Reservoir	6			Seventh Lake	14		
Honeoye Lake				Skaneateles Lake		yes	
Hudson River	6	yes		Sodus Bay	3	yes	
Indian Lake	3	yes		St. Lawrence River	4	yes	
Kayuta Lake				St. Regis Lakes			
Lake Abanakee				Third Lake			
Lake Champlain	2	yes		Tupper Lake		yes	
Lake Delta	6			Upper Saranac Lake			
Lake Durant	2						

Table 67- Lakes visited in previous two weeks prior to launching at Seventh Lake State Boat Launch, 2011.

A unique feature of the Raquette Lake boat launch was the surveillance camera, Internet-Landing Installed Device Sensor (I-LIDS), which was installed next to the boat launch. RLPOA installed this device with a $16,000 grant from Covanta Energy through The Nature Conservancy. The device recorded video of entering and exiting boats for AIS. It also played a prerecorded audio message reminder for boaters to conduct inspections and pay the launch fee. RLPOA is hoping that they can use this tool to enforce stopping the spread of AIS. Unfortunately there are very little restrictions and governing laws in New York State to prevent the spread of AIS. I-LIDS served as more of a deterrent for visitors that hadn't inspected their boat.

Figure 69- Photo of steward's table at Raquette Lake boat launch with I-LIDS on left.

Conclusion

This was the first summer that the WSP was located at the Raquette Lake Village boat launch seven days per week. In previous years a steward was located at the launch and an AIS awareness program was already in place. This made it much easier to explain the WSP to visitors. It was a very successful summer at Raquette Lake. The majorities of visitors were receptive to the message and cooperated without any hesitation. Due to a relatively high amount of boat traffic, especially on weekends, Raquette Lake Village would be a very important site to have Stewards at in future summers. The RLPOA along with all the other volunteers helped to make it a very enjoyable and successful summer. A special thank you goes to Pat Deyle and Ken Hawks for their assistance throughout the summer. The Watershed Stewardship Program gratefully acknowledges the funding support of the Great Lakes Restoration Initiative and the United States Fish and Wildlife Service.

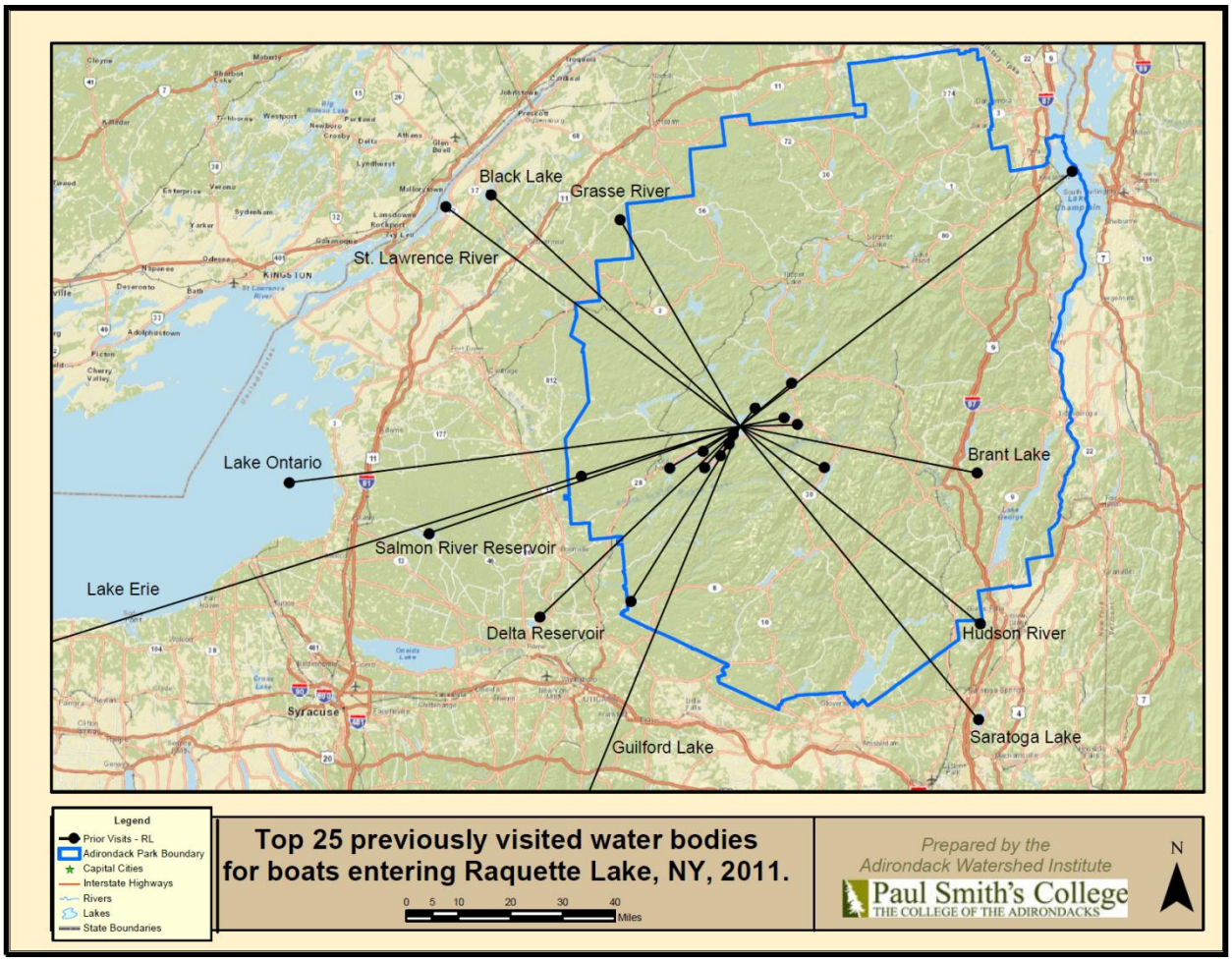


Figure 70- Prior waterway visitation map, Raquette Lake, 2011.

Raquette Lake Village Recreation Study 2011											
	Boat Type							total #	Weekly Avg	Four	# of
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	people
5-28-11 to 6-2-11	9	0	0	2	7	0	0	18	141	4	49
6-3-11 to 6-9-11	21	0	0	0	5	0	0	26	42	11	43
6-10-11 to 6-16-11	23	0	0	7	4	0	0	34	57	11	65
6-17-11 to 6-23-11	41	0	0	15	19	0	0	75	79	20	151
6-24-11 to 6-30-11	39	0	0	9	13	0	0	61	78	11	124
7-1-11 to 7-7-11	63	7	1	8	18	0	0	97	61	20	225
7-8-11 to 7-14-11	52	4	0	17	14	0	0	87	45	16	184
7-15-11 to 7-21-11	34	2	0	20	5	0	0	61	77	10	119
7-22-11 to 7-28-11	51	4	1	39	25	0	2	122	80	5	244
7-29-11 to 8-4-11	33	7	0	27	13	0	1	81	58	8	161
8-5-11 to 8-11-11	31	3	1	7	9	0	3	54	53	3	110
8-12-11 to 8-18-11	25	9	0	9	18	0	0	61	100	3	122
8-19-11 to 8-25-11	37	4	0	15	23	0	2	81	47	4	160
8-26-11 to 9-1-11	32	3	0	13	13	0	0	61	50	5	113
9-2-11 to 9-8-11	22	6	0	4	18	0	2	52	62	1	93
totals	513	49	3	192	204	0	10	971	Summer Avg = 69	132	1963
									Median HP = 61		
RLPOA								97			183
								1068			2146

Table 68- Summary, 2011. M= motorboat; K= kayak; C= canoe; B= construction barge; R= rowboat; S=sailboat; PWC= personal watercraft.

Raquette Lake Village Recreation Study 2011										
	organisms found		organism type							
Week	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other
5-28-11 to 6-2-11	3	4	0	1	0	3	0	0	0	3
6-3-11 to 6-9-11	4	3	0	0	0	3	0	0	0	4
6-10-11 to 6-16-11	7	0	0	0	0	3	0	0	0	4
6-17-11 to 6-23-11	8	9	0	1	0	9	0	0	1	6
6-24-11 to 6-30-11	1	1	0	0	1	0	0	0	0	1
7-1-11 to 7-7-11	13	9	0	2	2	11	0	0	1	6
7-8-11 to 7-14-11	19	13	2	1	0	7	0	0	0	22
7-15-11 to 7-21-11	5	9	1	2	0	5	0	0	0	6
7-22-11 to 7-28-11	16	26	2	9	1	14	0	1	3	12
7-29-11 to 8-4-11	3	8	0	1	1	5	0	0	1	3
8-5-11 to 8-11-11	5	8	1	1	0	3	0	0	1	7
8-12-11 to 8-18-11	7	10	0	3	0	5	0	0	3	6
8-19-11 to 8-25-11	10	11	1	3	0	4	0	0	0	13
8-26-11 to 9-1-11	8	4	2	0	0	3	0	0	0	7
9-2-11 to 9-8-11	1	7	0	3	0	0	0	0	1	4
totals	110	122	9	27	5	75	0	1	11	104
RLPOA	2								2	

Table 69- EWM= Eurasian watermilfoil; BW= bladderwort; NM= native milfoil, GRS= grass; WC=water chestnut; ZM= Zebra mussel; VLM= variable leaf milfoil.

Raquette Lake Village Recreation Study 2011

	visitor prevention steps									
Week	**yes**	**I**	**WB**	**DB**	**BB**	**LW**	**Dis**	**Dry**	**didn't ask**	**# groups**
5-28-10 to 6-2-10	7	2	3	0	1	0	0	1	1	18
6-3-10 to 6-9-10	17	8	10	0	0	0	0	2	2	26
6-10-10 to 6-16-10	20	7	18	2	1	1	1	3	0	26
6-17-10 to 6-23-10	45	8	32	6	1	1	0	5	3	63
6-24-10 to 6-30-10	26	9	16	6	0	0	0	2	17	44
7-1-10 to 7-7-10	53	14	25	5	2	0	0	23	7	83
7-8-10 to 7-14-10	47	13	39	11	0	0	0	1	12	68
7-15-10 to 7-21-10	31	7	28	5	2	2	2	2	0	45
7-22-10 to 7-28-10	58	21	41	12	2	1	1	5	2	81
7-29-10 to 8-4-10	34	13	26	4	0	1	0	1	4	55
8-5-10 to 8-11-10	37	13	22	9	0	0	0	7	1	47
8-12-10 to 8-18-10	29	9	19	3	0	0	0	1	2	44
8-19-10 to 8-25-10	30	12	21	5	1	2	1	6	3	63
8-26-10 to 9-1-10	20	14	12	1	0	0	0	0	0	53
9-2-10 to 9-8-10	18	7	17	3	0	0	0	1	0	41
totals	472	157	329	72	10	8	5	60	54	757
	62%	21%	43%	10%	1%	1%	1%	8%	7%	

Table 70- I= inspected boat; WB= washed boat; DB= drained bilge, BB= emptied bait bucket; LW= drained livewell; Dis= disposed of unused bait; Dry= dried boat.

[1]Raquette Lake Property Owners, Inc. 2010. Raquette Lake Boat Launch Steward 2010 Final Report.1-17.

Recreation Use Study: Saratoga Lake State Boat Launch

By: Corrie Mersereau and Emily Russell, Watershed Stewards

Figure 71- View from Saratoga State Boat Launch.

Introduction

During the summer of 2011, the Saratoga Lake Protection and Improvement District (SLPID) sponsored the Paul Smith's Watershed Stewardship Program (WSP) for the second time to provide visitor education and boat inspection at the State Boat Launch site on Saratoga Lake. This initiative continued to expand the WSP outside the Adirondack Park to the program's busiest boat launch. Aided by a small group of volunteers, the lake stewards inspected boats and educated launch users about the dangers of invasive species. Saratoga Lake is known by anglers as "the fish factory" and hosts many fishing tournaments throughout the summer. Sport fishermen came from as far away as Florida while local fisherman came every day. Saratoga Lake is also highly used by recreational boaters, sail boats, and crew boats as well.

Saratoga Lake is home to many aquatic invasive species including Eurasian watermilfoil, curly-leaf pondweed, zebra mussels, and water chestnuts. The Saratoga Lake community is actively engaged in a multi-element lake management initiative intended to control existing invasive species infestations and to prevent the spread of new invasives. In addition to their support of the Saratoga Lake stewards, SLPID administered chemical treatments (Sonar and Renovate 3) in an attempt to control Eurasian watermilfoil and curly leaf pondweed. SLPID

also operates two harvesters that cut down densely weeded areas of the lake. Along with addressing the invasives in Saratoga Lake, SLPID is also concerned with limiting the possibility that boaters from Saratoga Lake carry invasive species to uninfected lakes near and far. For this reason, the Saratoga Lake stewards were instructed to inspect boats leaving the lake as well.

Methods

The Saratoga lake Stewards were on duty seven days a week, from 7:00 AM -3:00PM. The Cornell Cooperative Extension provided their intern to assist the watershed stewards on Sundays, as public education was a part of the summer internship. Stewards approached boaters with a smile and asked each one if their boat had been in any body of water in the past two weeks, if the boater had washed it, drained the bilge, inspected the boat, drained bait buckets and live wells, disposed of bait properly, and dried the boat. The stewards also noted the time, type of boat, horsepower of the motor (if outboard), if it was a four stroke or not, and the state the boat was registered in. If the stewards found any plant debris on the boat they recorded what type of invasive it was and removed it. On the way out they removed plants that came off the boats and recorded findings.

Figure 72- Steward Emily Russell inspecting a boat (Erica Miller- *Saratogian*).

Results

At the Saratoga Lake State Boat Launch stewards collected data from 4,121 boats and 9,264 people between May 28th and September 5th. The busiest day of the summer was June 19th (Fathers' day), which saw 132 boats. The slowest day of the summer was June 2nd with 3 boats. All summer attendance varied depending on the day of the week and the current weather conditions.

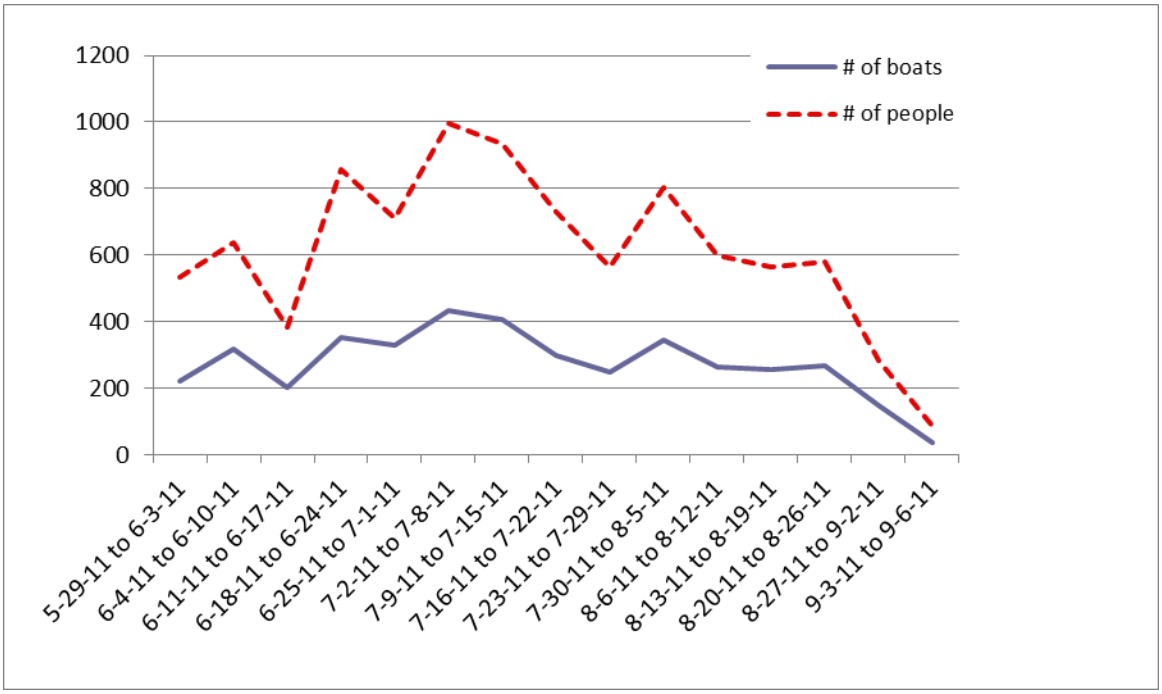


Figure 73- Boat launch usage, Saratoga Lake, 2011.

Saturday was the busiest day of the week with 993 boats, Sunday was second with 952 boats and Friday was third with 529 boats. According to the data Monday was the slowest day of the week with 355 boats, followed closely by Tuesday with 384 boats and Wednesday with 474 boats. Thursday was the busiest weekday with 490 boats.

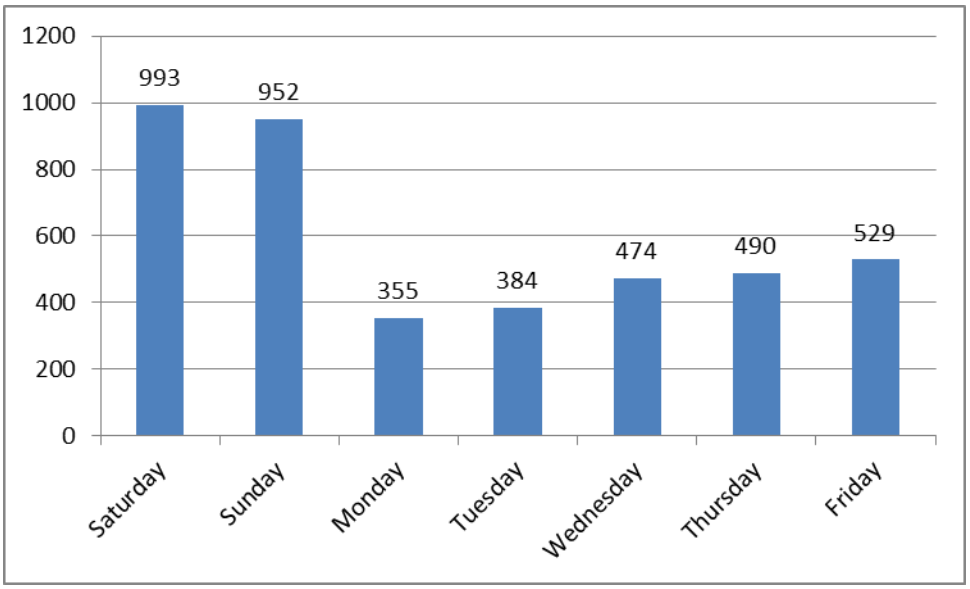


Figure 74- Boat launch usage, number of boats launched, Saratoga Lake, 2011.

Out of the 4,121 boats stewards inspected in 2011, 3,542 were motorboats, 255 were personal watercrafts, 220 were kayaks, 31 were sailboats, 58 canoes, 12 rowboats and 3 barges. Many boaters attached small motors to canoes, kayaks, and rowboats; for data purposes we consider these motorboats. With two stewards on busy days it made it easier to talk to both small boaters at the dirt launch and motor boaters at the main ramp.

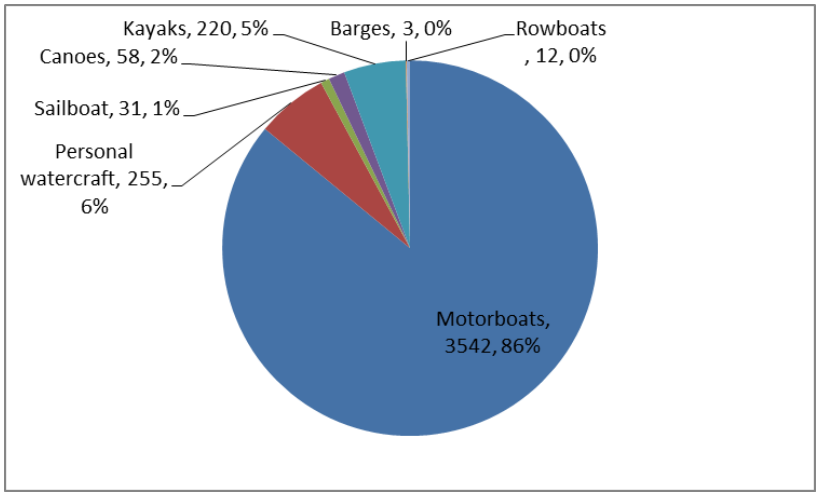


Figure 75- Watercraft types, Saratoga boat launch, 2011.

The most important question the stewards asked boaters this summer was where their boats had been in the last two weeks. 1,511 boats had not been in the water in the past two weeks. Out of the remaining 2,593 boats, 82% or 2,114 were returning to Saratoga Lake. 87 boats had been in Lake George, 66 from the Mohawk River, 65 from Great Sacandaga Reservoir (spiny waterflea source), 46 boats came out of the Hudson River and 27 boats out of Lake Champlain. 4 boats had traveled to Saratoga Lake after being in the Atlantic Ocean in the past two weeks.

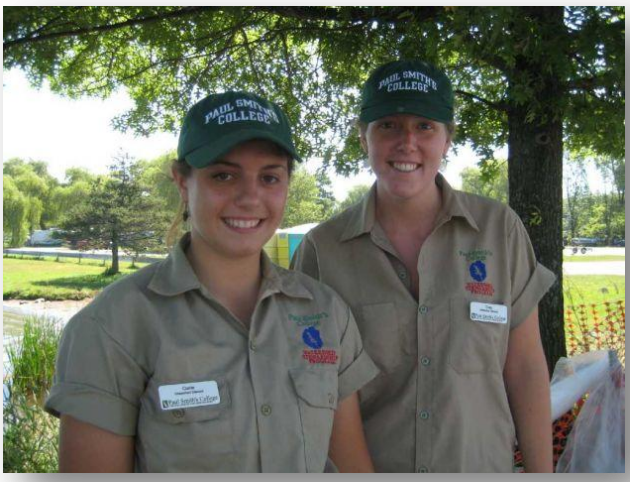


Figure 76- Stewards Corrie Mersereau and Emily Russell (Leigh Hornbeck- *Times Union*).

Water body	# Visits	Water body	# Visits
Adirondack Lake	2	Lake St. Catherine	1
Atlantic Ocean, ME	4	Long Lake	7
Ballston Lake	18	Manasquan Resevoir, NJ	2
Battenkill Creek	2	Merrimack River	1
Black Lake	1	Mohawk River	66
Brant Lake	6	Moreau Lake	3
Burden Lake	1	None	1511
Butterfield Lake	1	Onderdonk Lake	1
Canada Lake	1	Oneida Lake	4
Candaraga	1	Oswego Lake	1
Candlewood	1	Paradox Lake	3
Chatauqua Lake	1	Rainbow Lake	1
Connecticut River	1	Raquette Lake	3
Cossayuna Lake	17	Reynolds Lake	1
Caroga Lake	1	Richmond Pond	1
Dopler River	1	Round Lake	17
Dunham Reservoir	1	Sebago Lake	1
Fish Creek Pond	1	Saranac Lake	1
Glen Lake	3	Saratoga Lake	2114
Granger Lake	1	Schroon Lake	20
Great Sacandaga	65	Second Pond	1
Harriman Resevoir, VT	1	Somerset, PA	1
Hopkinton Resevoir, MA	1	South Bay, NY	2
Hudson River	46	Speculator	1
Indian Lake	2	Spier Falls	1
Indian River	1	St. Catherine Lake	1
Kayaderosseras Creek	3	St. Lawrence River	4
Kinderhook Lake	4	Stewarts Pond	1
Lake Bomoseen	1	Swinging Bridge Resevoir	1
Lake Catherine	1	Terrance Lake	1
Lake Champlain	27	Thompsons Lake	3
Lake George	87	Ticonderoga	1
Lake Hopatcong, NJ	2	Tupper Lake	1
Lake Lonely	9	Virginia Chicahomany River	1
Lake Mahopac	1	Warners Lake	1
Lake Ontario	3	Whitehill Lake, MA	1
Lake Pleasant	1	Williams Lake	1
Lake Simcoe, Canada	1	Wolf Lake, Canada	1
		total	4104

Table 71- Waterways visited in prior two-week period, Saratoga Lake, 2011.

Because of the high number of boats visiting from Saratoga Lake, the Hudson River, The Great Sacandaga, The Mohawk River and Lake George, it became evident that most boaters lived in the area. Out of 4,097 boats providing state of origin information, 4,003 (98%) were registered in the state of New York. Boats did come as far away as Florida, Georgia, Utah, and South Carolina. 16 states were represented. The stewards also noticed that at times boaters had different plates on their car than on their boats.

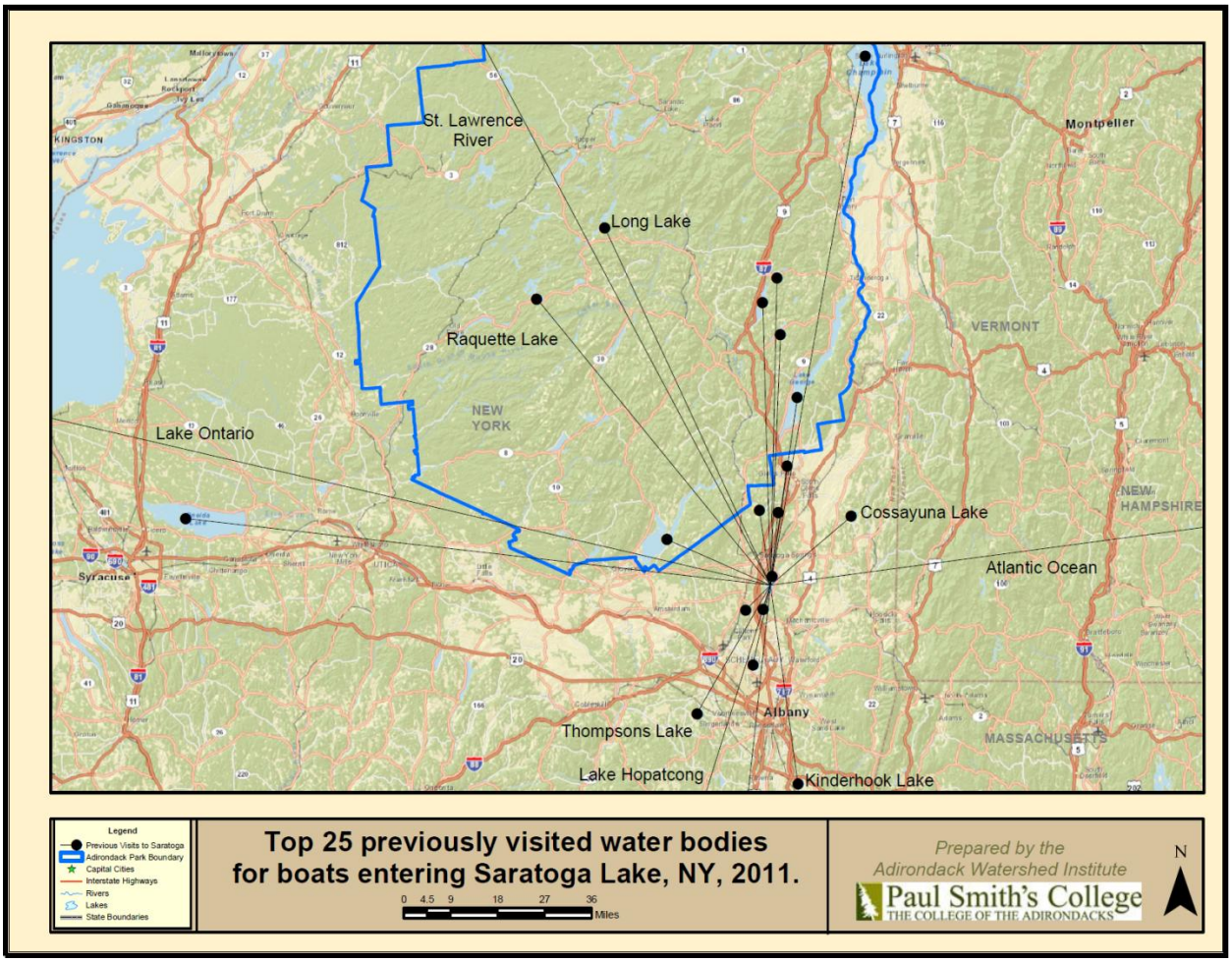


Figure 77- Prior waterway visits, Saratoga Lake, 2011.

State	# Visits
Connecticut	10
Delaware	6
Florida	6
Georgia	1
Maryland	1
Massachusetts	12
New Hampshire	3
New Jersey	30
New York	4003
North Carolina	1
Pennsylvania	2
South Carolina	2
Tennessee	1
Utah	2
Vermont	16
Virginia	1

Table 72- State of origin, boats using Saratoga Lake boat launch, 2011.

73% of boaters claimed to have taken some sort of invasive species prevention measure prior to entering Saratoga Lake. Out of the 4,029 visitor groups, 839 inspected their boats before launching, 1860 boaters washed their boats before entry, and 720 boaters drained bilge water before entry. Eight boaters were not asked if they took preventative steps for various reasons.

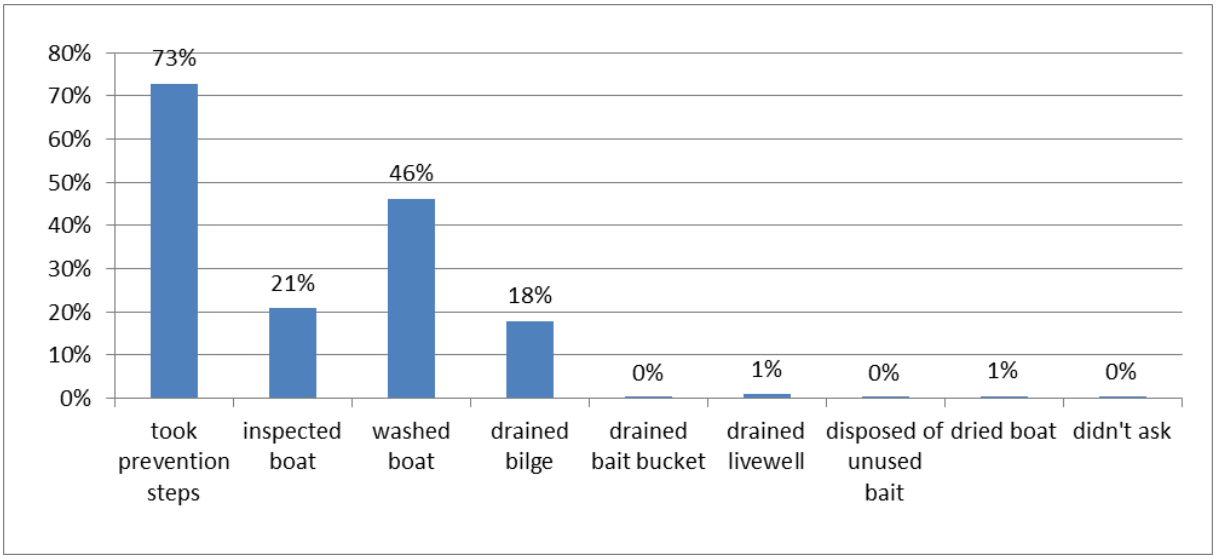


Figure 78- Aquatic invasive species spread prevention measures, Saratoga Lake 2011.

52 organisms or fragments were found on boats entering Saratoga Lake State boat launch while 4 were found leaving. Eurasian water milfoil was found 19 times, Grass was found 24 times, native milfoil was found 3 times, zebra mussels were found twice, and other unidentified organisms were found 8 times.

Figure 79- Boat inspection (Erica Miller- *Saratogian*).

Comparison with 2010 findings

Returning to the Saratoga State Boat Launch for a second summer allowed the stewards to compare data from the 2010 summer to the 2011 summer. The most significant difference between the two summers was the increased numbers of boaters that the stewards conversed with and boats that stewards inspected. This was due in large part to the stewards' increased presence at the launch in 2011 versus 2010. In 2010, there was a steward at the launch five days per week, compared to 2012 where there was at least one steward at the launch every day of the week. This allowed the stewards to talk to more boaters and get a better sense of what the seasonal traffic is at the launch.

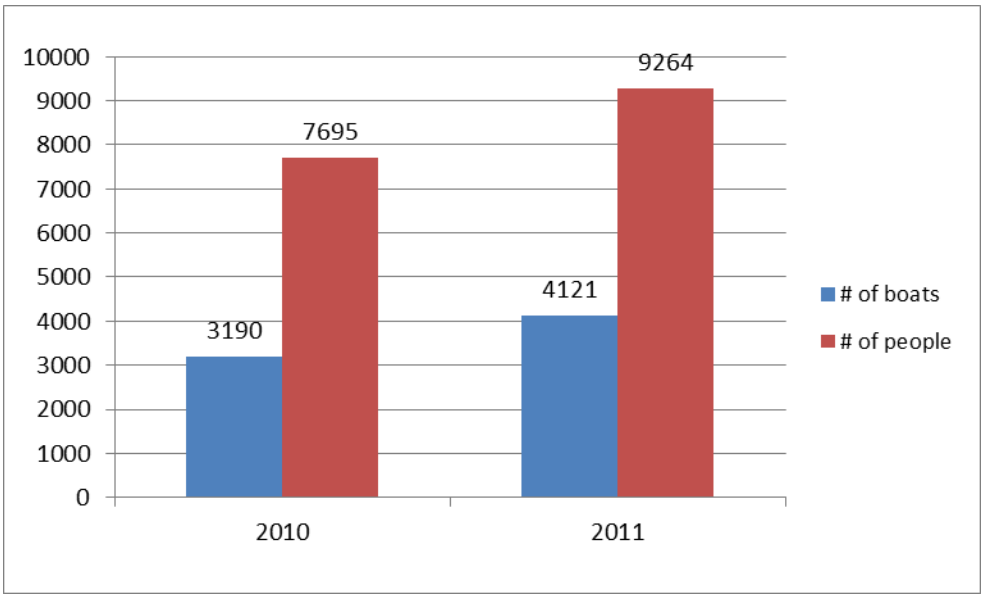


Figure 80- Saratoga Lake boat launch usage comparison.

Another visible difference between the data from the 2010 summer to the 2011 summer was how many boaters had at least inspected their watercrafts for invasive species. This summer boaters were not only more responsive to the stewards, but also more informed about the threat of invasive species and the benefit of taking the necessary precautions with their boat before and after they use Saratoga Lake.

Discussion

Returning to the Saratoga Lake for a second summer allowed a comparison of the two seasons. During the summer of 2010 the steward felt a lot of resistance from boaters, which seemed to dissipate in summer of 2011. Because one of the stewards had the benefit of experience from last summer, she was able to better notice changes between the 2010 and 2011 seasons, and to compile a list of what changes could be made to make the program more effective. Between the two summers, the veteran steward noticed an obvious difference between the boaters' perceptions of the stewards from the first summer to the following summer. During this season, boaters did not have to pay the eight-dollar fee because of construction to the highway 9P bridge. Boaters were happy not to pay the eight-dollar fee and therefore were less likely to complain about the inconveniences made by the ongoing construction. As a result, boaters were more open to talk to the stewards. Another difference between 2010 and 2011 was that many of the boaters were returning to the lake from the previous season, so they anticipated the questions before the stewards asked them. Both stewards agreed that they made better connections with boaters this summer compared to last summer. Questions about the construction were a good transition into talking about the Paul Smith's College Watershed Stewardship Program. Regular boaters began to rely on the stewards for updates.

Another difference between the two seasons was the publicity that the stewards received. In early June there was a short article in the Shore Lines Extra, a local monthly newsletter published and distributed by the Saratoga Lake Association. In early July, *The Saratogian* published an article about the aquatic invasive species problem in the lake as well as what the Stewards were doing to address this problem. *The Saratogian* interviewed one of the stewards and the video of this interview was published on the newspaper's website. Weeks later, the Times Union published an article about the stewards and their return to Saratoga Lake for a second summer. As well as the publicity received this summer, the stewards made a presentation at a monthly Saratoga Lake Association meeting presenting an overview of the Paul Smith's College Watershed Stewardship Program, what work was being done on Saratoga Lake, and what data might be useful for the Saratoga Lake Association.

Recommendations

After the second season at the Saratoga State Boat Launch both stewards gained a better understanding of how the Watershed Stewardship Program worked on Saratoga Lake and how things could run more smoothly for the summers to come. For 2012, SLPID has established a petty cash fund to support incidental purchases to support the steward program. Another issue the stewards encountered was a need for support and additional staffing during weekends. The Cornell Cooperative Extension intern provided extremely helpful support on the days she was available. On the weekends when the Paul Smith's Steward was alone, the traffic at times became overwhelming.

The stewards also considered ways to positively impact the fight against invasive species. After spending a summer watching boaters launch and retrieve their boats from the launch, the stewards noticed how many invasives became attached to trailers and the bottom of boats simply within the launching area. The stewards recommend putting extra effort into keeping the area where boats are launched free of weeds. This effort may decrease how many invasive species are transported from Saratoga Lake to other lakes in the region. The stewards also recommend asking boaters whether they are aware of the invasive species problem to begin with.

These recommendations are not only to help the stewards, but also to help in the fight against the spread of aquatic invasive species from one water body to the next in the Adirondack Lake region.

Conclusion

Paul Smith's College Watershed Stewardship Program expanded outside of Adirondack Park to a very busy lake with great success. Awareness of invasive species has risen in the area. Many boaters were very concerned when they heard about the Asian clam outbreak in Lake George and the spiny water flea in Great Sacandaga Lake. Boaters began to appreciate that SLPID was actively doing something to keep these aquatic invaders out. Along with stewardship, SLPID continued the chemical treatments and both mechanical and hand harvesting Eurasian watermilfoil to create a trifecta of invasive species control.

The new awareness of invasive species on Saratoga Lake will help keep aquatic hitchhikers from making their way into the Adirondack Park watershed and other watersheds. We thank the Saratoga Lake Protection and Improvement District, especially Alan McCauley, for both their support and their vision in creating a stewardship program on Saratoga Lake.

Saratoga Lake Recreation Study 2011											
	Boat Type							total #	Weekly Avg	Four	# of
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	people
5-29-11 to 6-3-11	190	13	5	2	8	0	0	218	100	42	532
6-4-11 to 6-10-11	290	14	4	3	8	0	0	319	83	52	639
6-11-11 to 6-17-11	179	6	2	0	13	0	2	202	84	34	383
6-18-11 to 6-24-11	326	12	2	0	11	0	0	351	107	76	859
6-25-11 to 7-1-11	286	20	3	5	13	3	0	330	51	41	712
7-2-11 to 7-8-11	375	33	3	5	17	0	2	435	102	66	995
7-9-11 to 7-15-11	340	31	1	5	29	0	0	406	97	66	933
7-16-11 to 7-22-11	247	28	1	7	15	0	0	298	86	39	731
7-23-11 to 7-29-11	212	21	1	3	11	0	0	248	104	38	566
7-30-11 to 8-5-11	281	15	6	11	30	0	2	345	87	43	802
8-6-11 to 8-12-11	229	16	1	3	15	0	1	265	100	47	599
8-13-11 to 8-19-11	211	16	2	4	17	0	3	253	92	50	566
8-20-11 to 8-26-11	225	18	0	4	22	0	0	269	51	61	578
8-27-11 to 9-2-11	122	7	0	4	11	0	2	146	119	36	282
9-3-11 to 9-6-11	29	5	0	2	0	0	0	36	102	11	87
totals	3542	255	31	58	220	3	12	4121		702	9264

Table 73- Saratoga Lake use figures, 2011. Key: M = Motorboat; PWC = personal watercraft; S = sailboat; C = canoe; K = kayak; B = barge (construction); R = rowboat.

Saratoga Lake Recreation Study 2011												
	# groups	# groups	organisms found		organism type							
Week	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other
5-29-11 to 6-3-11	218	1	3	0	0	0	0	1	0	1	0	1
6-4-11 to 6-10-11	319	2	1	0	1	0	0	0	0	0	0	0
6-11-11 to 6-17-11	202	6	2	0	1	0	0	0	0	0	0	1
6-18-11 to 6-24-11	351	8	1	0	0	0	0	0	0	0	0	1
6-25-11 to 7-1-11	330	6	7	0	2	0	0	2	0	0	0	3
7-2-11 to 7-8-11	435	0	5	0	3	0	0	1	0	0	0	1
7-9-11 to 7-15-11	407	0	4	0	4	0	0	0	0	0	0	0
7-16-11 to 7-22-11	295	5	4	1	3	0	0	0	0	1	0	1
7-23-11 to 7-29-11	246	5	2	1	0	0	0	3	0	0	0	0
7-30-11 to 8-5-11	343	9	3	0	1	0	1	1	0	0	0	0
8-6-11 to 8-12-11	264	2	1	1	0	0	1	1	0	0	0	0
8-13-11 to 8-19-11	251	4	9	1	4	0	0	6	0	0	0	0
8-20-11 to 8-26-11	269	0	7	0	0	0	0	7	0	0	0	0
8-27-11 to 9-2-11	126	19	3	0	0	0	1	2	0	0	0	0
9-3-11 to 9-6-11	36	0	0	0	0	0	0	0	0	0	0	0
totals	4092	67	52	4	19	0	3	24	0	2	0	8

Table 74- Key: EWM = Eurasian Watermilfoil; BW = native bladderwort; NM = native milfoil; GRS = grass; WC = water chestnut; ZM = zebra mussel; VLM = variable leaf milfoil.

Saratoga Lake Recreation Study 2011										
	visitor prevention steps									
Week	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
5-29-11 to 6-3-11	184	49	144	14	0	1	0	0	3	221
6-4-11 to 6-10-11	259	59	189	51	0	8	0	0	0	325
6-11-11 to 6-17-11	156	29	109	40	0	9	0	0	0	208
6-18-11 to 6-24-11	280	70	204	31	0	3	0	0	1	357
6-25-11 to 7-1-11	257	108	148	51	2	2	0	2	0	244
7-2-11 to 7-8-11	331	130	187	44	0	11	0	1	2	425
7-9-11 to 7-15-11	266	60	164	69	0	0	0	3	0	413
7-16-11 to 7-22-11	204	55	131	51	1	0	0	2	0	304
7-23-11 to 7-29-11	157	49	87	51	0	0	0	3	0	253
7-30-11 to 8-5-11	216	51	142	56	1	1	0	4	1	351
8-6-11 to 8-12-11	173	34	108	72	0	0	0	2	0	253
8-13-11 to 8-19-11	155	46	78	69	0	0	0	2	0	244
8-20-11 to 8-26-11	170	51	95	75	0	0	1	2	0	269
8-27-11 to 9-2-11	102	40	56	42	0	0	0	0	0	135
9-3-11 to 9-6-11	24	8	18	4	0	0	0	0	1	27
totals	2934	839	1860	720	4	35	1	21	8	4029

Table 75-Key: I = Inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = emptied livewell; Dis = disposed of bait; Dry = dried boat.

Recreation Use Study: Second Pond State Boat Launch

By: Sarah Prince, Watershed Steward

Figure 81- Boating on Lower Saranac Lake.

Introduction

The Watershed Stewardship Program is a branch of the Adirondack Watershed Institute (AWI) which strives to educate and increase public awareness of aquatic nuisance species and aquatic invasive species (AIS) as well as multiple other ecological issues which pertain to the Adirondack Park and the watersheds within. This public outreach program was initiated in 2005 at Second Pond boat launch and has returned annually since 2008. The Second Pond entry site is a highly trafficked boat launch providing public access to the Saranac Chain as well as to the Saranac Islands, a popular state campground. Second Pond's ease of accessibility also creates a reason for people to travel from wide-ranging points of origin to take advantage of its recreation opportunities. Eurasian watermilfoil (*Myriophyllum spicatum*) is the primary concern of the AWI because Second Pond is a critical source of this invasive species, which can easily be transported into other waterways.

Attractions

The Saranac Islands Public Campground offers camping on two water bodies, Middle and Lower Saranac Lake. Construction began on the campground in 1934, when the public could lease land from the state and build platform-type camps. By 1974 all of these leases had expired and the Department of Conservation removed all structures on the lakes to open the public campground. Many people come to fish for a variety of different species including largemouth bass, smallmouth bass, northern pike, yellow perch, bullhead, and pickerel. This state campground, comprised of 87 remote campsites, is a vacation destination for many people, offering one of the most attractive areas for boat recreation and camping in the Adirondacks.

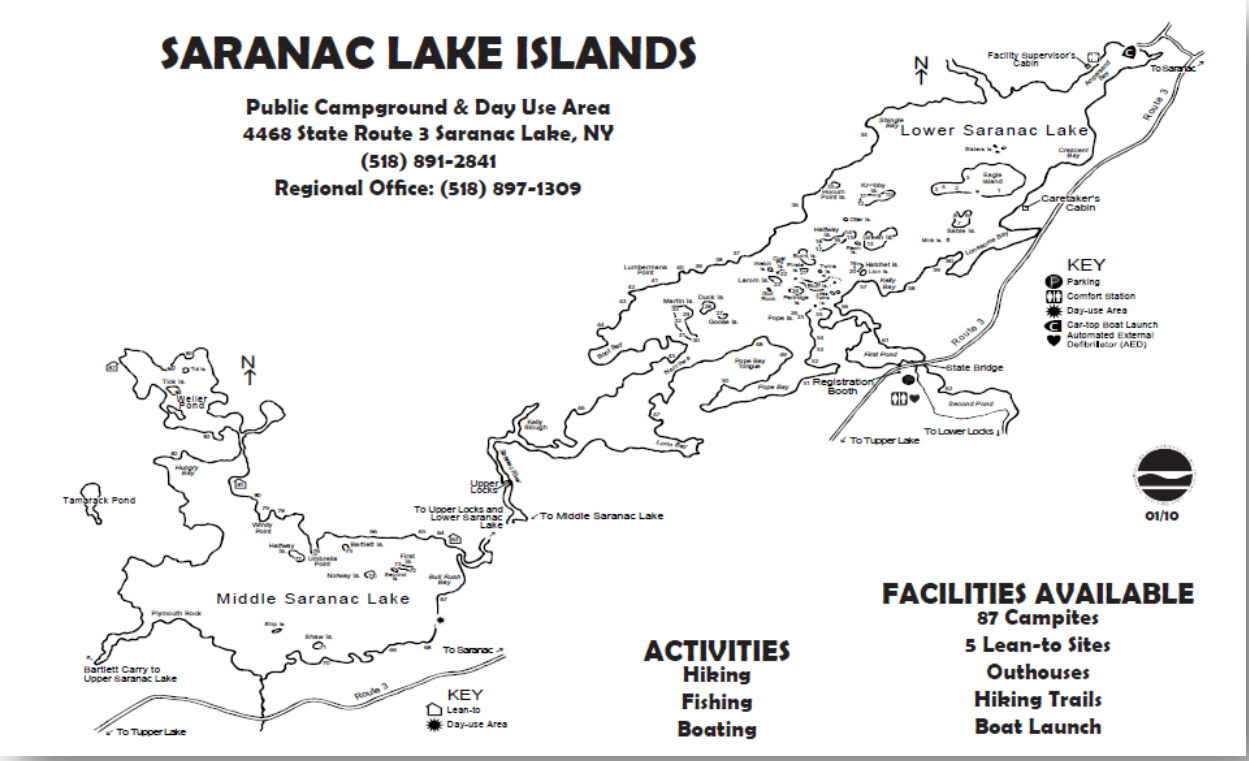


Figure 82- Saranac Lake Islands Campground Map.

Methods

Watershed Stewards were stationed at NYSDEC Second Pond boat launch from May 28th through September 4th, Monday-Sunday from seven am to four pm. Stewards were responsible for collecting data which included boat type, horsepower of outboard engines, group size, state of registration, time of launch and retrieval, and species of any organism found on the trailer. In addition, stewards asked each boater what the previous body of water entered was in the past two weeks and if any prevention steps to stop the transportation of aquatic invasive species (AIS) were taken. After this data was collected, stewards then checked each boat and trailer over with the boater and showed them where the AIS can get entangled and removing any species that were found.

Stewards provided information to the boaters, explaining the harmful effects AIS can have on a watershed. Information cards provided by the Adirondack Watershed Institute were also handed out to the public.

Results

In 2011, watershed stewards encountered 3,414 boats and 6,248 visitors at the NYS Access Site between May 28th and September 4th. There were a total of 1,005 motorboats (29% of all launched), 1,234 Kayaks (36%), 1,189 canoes (33%), 51 Personal watercrafts(2%), and 13 rowboats(1%).

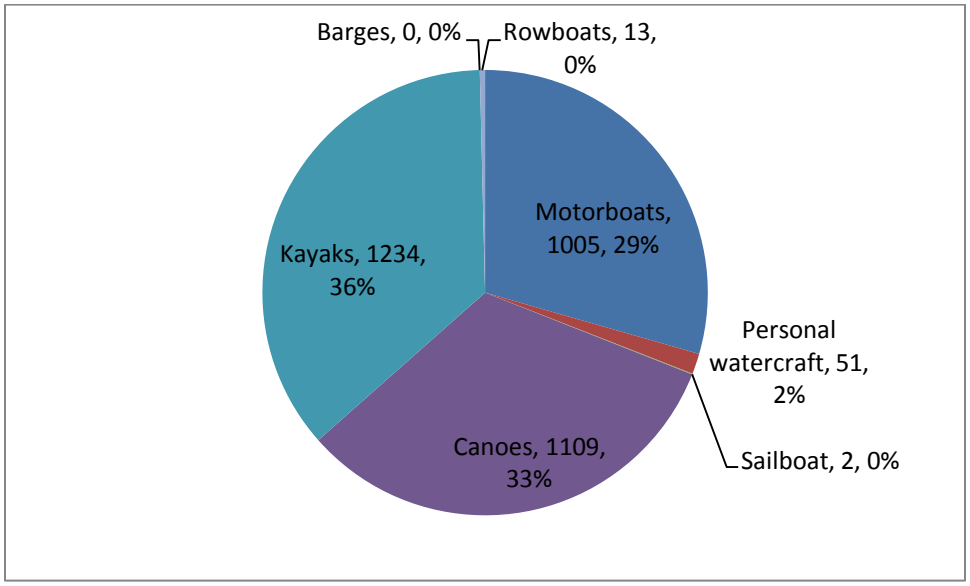


Figure 83- Types of watercraft launched, Second Pond 2011.

Within the dates and time covered by the stewards it is evident that there are two peak weeks of useage at the Second Pond boat launch, occuring the weeks of 7/16/11-7/22/11 with 371 boats and 7/30/11-8/5/11 with 372 boats. Levels of use oscillated throughout the summer, presumably impacted by factors such as weather and special events, with a general increase until August 5th.

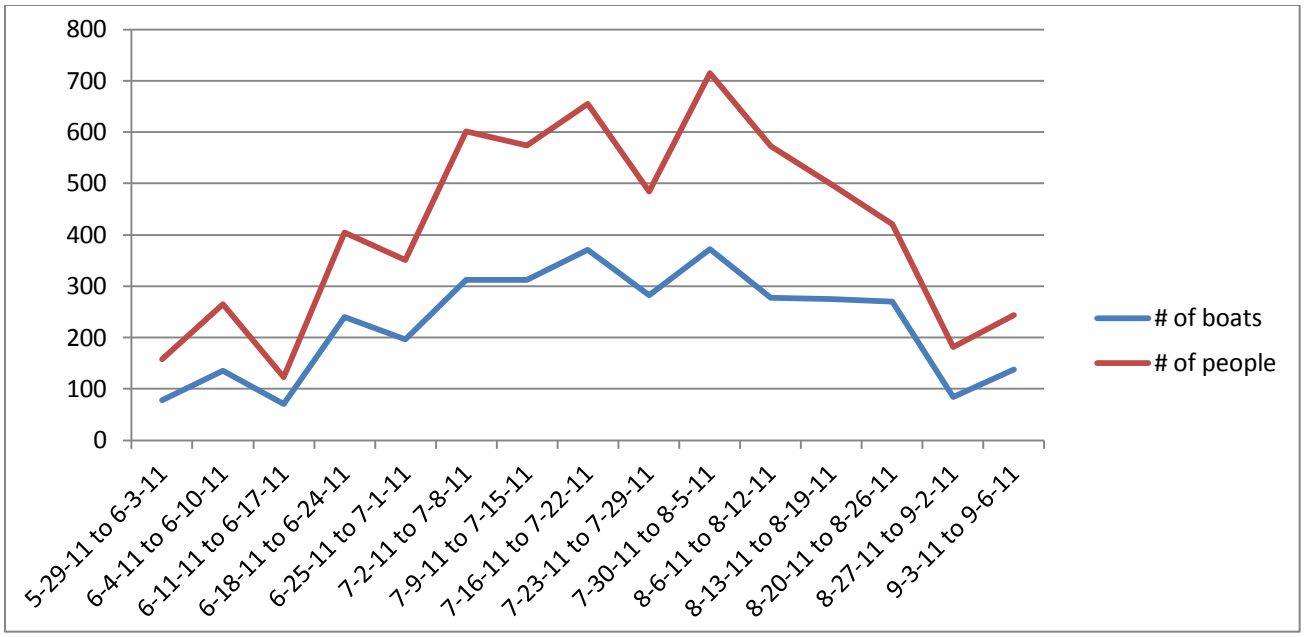


Figure 84- Boat launch use, Second Pond 2011.

The Second Pond boat launch is located in the Adirondack Park of New York State, consequently, it was expected that the majority of the watercrafts entering the water body would be registered in NYS. Of the 1,455 boats from which state of origin data could be gathered, 1,174 (81%) originated in New York State. New Jersey was the next most common state of origin (57 visits, 4%), followed by Connecticut (39, 2.6%), Massachusetts (36, 2.4%), Vermont (32, 2.1%), and Pennsylvania (30, 2%). Boaters reported coming from 26 different states and provinces, attesting to the wide popularity of the Saranac Lake waterway and the Saranac Lake Islands State Campground.

State/Province	# Visits	State/Province	# Visits
Canada	1	NY	1174
CO	1	OH	5
CT	39	OK	1
DE	1	ON	6
FL	15	OR	1
IN	1	PA	30
KY	3	QC	12
MA	36	RI	5
MD	5	SC	4
ME	5	TX	1
MI	2	VA	6
NC	6	VT	32
NH	6	total	1455
NJ	57		

Table 76- Usage by state, Second Pond boat launch 2011.

Previously Visited Bodies of Water

Due to certain characteristics and competitive nature of AIS, many of them can survive for a exceedingly long period of time outside bodies of water. This is what makes them so easily transported through multiple waterways across a far distance. Watershed stewards asked boaters where their boats were last in the preceding two weeks to get an accurate idea of the likelihood that a boat could be transporting viable aquatic species.

In 2011, of the 3,414 boats inspected, 1,670 reported being on another body of water in the past two weeks. The majority of lakes listed are hosts to various aquatic invasive species. The most frequently mentioned lakes visited in the previous two weeks were Rental (276 times mentioned), Second Pond (253), Saranac Lake (161), Lake Flower (87), Lake Placid (54), Lake Champlain (36), Tupper Lake (30), and the Hudson River (19).

Figure 85- A typical day at Second Pond boat ramp.

Previously visited waterway	# Visits	Previously visited waterway	# Visits	Previously visited waterway	# Visits
Ampersand	1	Hudson River	19	Oneida Lake	5
Atlantic Ocean	9	Indian Lake	6	Oseetah Lake	2
Ausable River	1	Indiana	1	Osgood Pond	6
Barnum Pond	1	Irondequoit Bay, Lake Ontario	1	Ottawa River	1
Battenkill River	1	Jones Pond	4	Paradox Lake	1
Bear Hill Pond, MA	1	Kiwassa Lake	5	Piseco Lake	1
Big Bass Lake	1	Kayuta Lake	1	Pontoosuc Lake	1
Black Creek	2	Kushaqua Lake	2	Portage Lake	1
Black Lake	1	Lake Alice	2	Potomac River	1
Blue Mountain Lake	2	Lake Bonaparte	2	Putnam Pond	1
Bog River	4	Lake Champlain	36	Race Town Dam, PA	2
Boquet River	1	Lake Cherry	1	Raquette Flow	1
Brant Lake	2	Lake Clear	4	Rainbow Lake	5
Brianard Lake	2	Lake Colby	11	Raquette River	16
Buck Pond	5	Lake Durant	3	Redfield Reservoir	1
Canandaigua Lake	3	Lake Erie	3	Rental (many prior waterways)	276
Candlewood Lake, CT	1	Lake Everest	4	Rhode Island	1
Cascade Lakes	1	Lake Flower	87	Rice Lake	2
Cayuga Lake	1	Lake George	8	Rideau Canal	1
Cedar River Flow	1	Lake Gordon	1	Rochester Canal	1
Charlston Lake	1	Lake Iroquois	1	Rock Gorge	1
Chateaugay Lake	13	Lake Lila	2	Rollins Pond	11
Chazy Lake	4	Lake Ontario	10	Sacandaga Lake	5
Chubb River	1	Lake Placid	54	Saranac Lake	161
Church Pond	1	Lake Quassapaug	1	Saranac River	4
Clear Pond	1	Lake St. Louis	2	Saratoga Lake	11
Conesus Lake	1	Lake St. Peter	1	Schroon Lake	6
Connecticut River	14	Lake Waramaug	1	Second Pond	253
Cranberry Lake	7	Lemonade Lake	1	Seneca Lake	1
DEC Boat (multiple prior lakes)	2	Lincoln Pond	4	Silver Bay	1
Delaware River	2	Linear Pond	1	South Creek	1
Did not ask	2	Little Clear	1	Spofford Lake	2
Dunham Reservoir	1	Little Tupper Lake	4	Square Pond	1
Eagle Lake	2	Long Island Sound	7	St. Lawrence River	7
Eaton Brook Reservoir	1	Long Lake	4	St. Regis	6
Echo Lake	1	Long Pond	3	Stony Creek	1
Ellicott Creek	1	Lower Saranac Lake	17	Susquehanna River	1
Fern Lake	1	Lower St. Regis	4	Swinging Bridge	1
Fish Creek	15	Mantokoling Bay	1	Taylor Pond	7
Floodwood Pond	5	Marion River	1	Teller Pond	1
Follensby Clear Pond	9	Massachusetts	2	Thames River	1
Fourth Lake	2	Meacham Lake	7	Tonawanda Creek	1
Franklin Falls	1	Meadowy River	1	Tully Lake	2
Garnet Lake, NY	2	Middle Saranac	13	Tupper Lake	30
Glenn Lake	1	Mirror Lake	8	Union Falls	4
Grass River	1	Mohawk River	6	Upper Salmon	1
Great Egg Harbor River	1	Monksville Resevior	1	Upper Saranac Lake	17
Great Sacandaga	2	Montour Preserve, PA	1	Upper St Regis	10
Green Pond	1	Moody Pond	1	Utowana Lake	1
Greenwood Lake	2	Moose Pond	6	Vermont, unspecified lake	1
Heart Lake	1	Moreau Lake	3	Wappinger Creek	1
Henderson Pond	1	Mountain View Lake	1	Weller Pond	2
Henry's Lake, PA	1	Mohawk River	1	White Lake	1
Highland Lake, CT	1	none	262	Winooski River	1
Hoel Pond	5	Norwood Lake	2	Wolf Pond	1
Horseshoe Lake, Canada	1	Ohio	1	Total Visits	1669
		Old Forge (Fulton Chain)	1		

Table 77- Two-week prior waterway history, boats visiting Second Pond 2011.

Measures Taken to Prevent Invasive Species Introduction

Watershed stewards on duty asked visitors if there were any preventative measures taken to stop the transportation of any and all species, native or invasive from one body of water to the next. Stewards then recorded the prevention steps which included visually inspecting the watercraft, washing or drying the water craft, draining the bilge, live well, or bait buckets, and disposing of species in an appropriate receptacle. A total of 1,849 spread prevention measures were taken by the 2,173 groups, with some groups using more than one technique. 64% of groups took some prevention measures. 34% of groups inspected their watercrafts, 39% washed their boat, 7% drained bilge water, 6% dried boats and a negligible number of groups drained live wells, bait buckets, and disposed of bait properly (Figure 86)

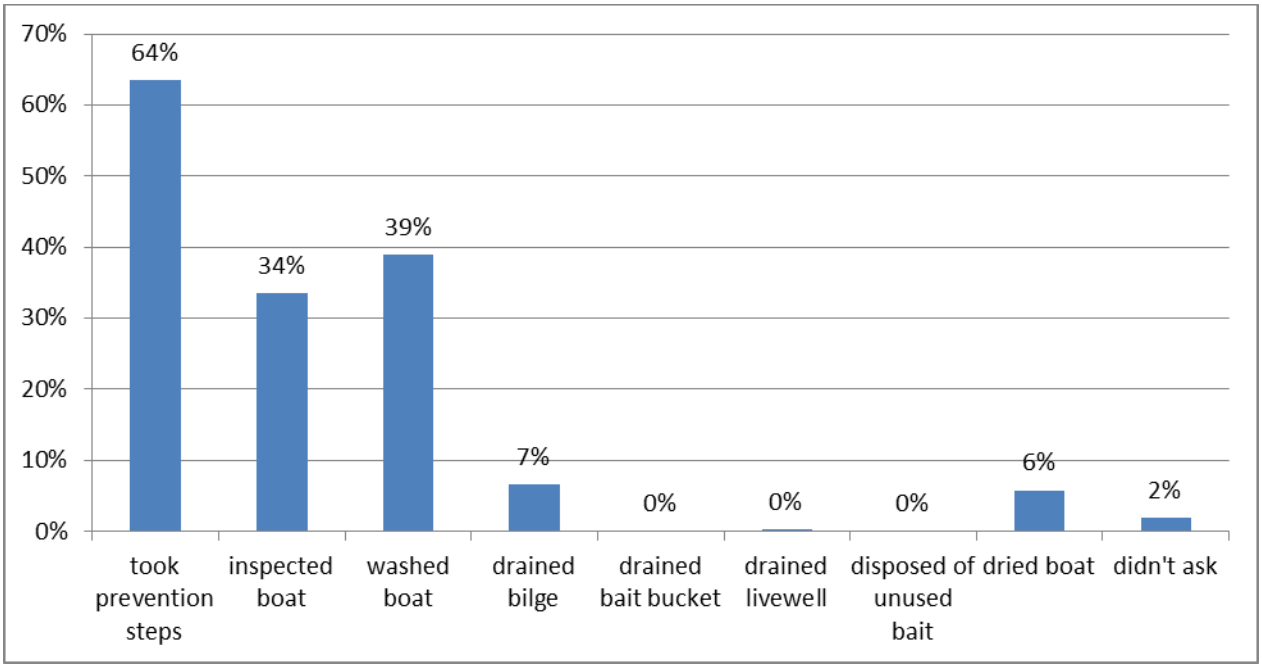


Figure 86- Aquatic Invasive Species spread prevention measures, NYSDEC boat launch at Second Pond, Summer 2011.

Organisms Removed from Watercraft

On a relatively common basis, stewards saw and removed organisms and organic material from boats both entering and leaving the boat ramp at Second Pond. Stewards found these materials on 38 boats launching and 70 boats departing the ramp, representing an overall organism transport rate of 2.3% for boats launching and 7.7% for boats leaving the waterway. Thus, boats were more than three times as likely to be transporting materials of any kind when they were departing the waterway as compared with when they were arriving. This finding underscores the threat for organism transport from Second Pond. In the case of invasive species, stewards removed 49 fragments of Eurasian watermilfoil, 1 water chestnut fragment, and 1 curlyleaf pondweed fragment from watercraft for an overall invasive species transport rate of 2% (51 invasive species found on 2,491 total boat inspections). Eurasian watermilfoil was most often present on boats leaving the Second Pond ramp, where it was likely picked up, but prior waterway history includes many nearby and distant waterbodies that are known host

sites for milfoil infestations. The boat carrying water chestnut had previously been in the Mohawk River, and the boat carrying curlyleaf pondweed had been in Second Pond.

Organism	Entering	Leaving	Prior waterway
Eurasian watermilfoil	5	44	canoes from VT, Lower Saranac Lake (2), Second Pond (11), Middle Saranac Lake, Kiwassa, Lake Champlain, Lake Flower, Saranac Lakes (3), Lake Placid, Highland Lake, Franklin Falls, Canandaigua Lake, Buck Pond (2), Mohawk River, Schroon Lake
Curly leaf pondweed		1	Second Pond
Grass	24	9	
Native milfoil	1	4	
Native pondweed	3	4	
Water Chestnut	1		Mohawk River
Pine needles	1	3	
Mud	1		
Terrestrial root		1	
Fish eggs		1	
Tree limb		1	
Native aquatic grass		1	
Other (unidentified)		1	
totals	36	70	

Table 78- Organisms removed from boats, Second Pond boat launch 2011.

Conclusion

This was the fifth summer watershed stewards have been present at the Second Pond public boat launch. While the summer of 2011 featured approximately twice as many boat inspections and visitors encountered compared with prior years, note that coverage at the launch increased from 3 days per week to 7 days per week, thanks in part to funding from the Lake Champlain Basin Program. For this reason, use levels in 2011 can be considered comparable to what has been encountered in the past.

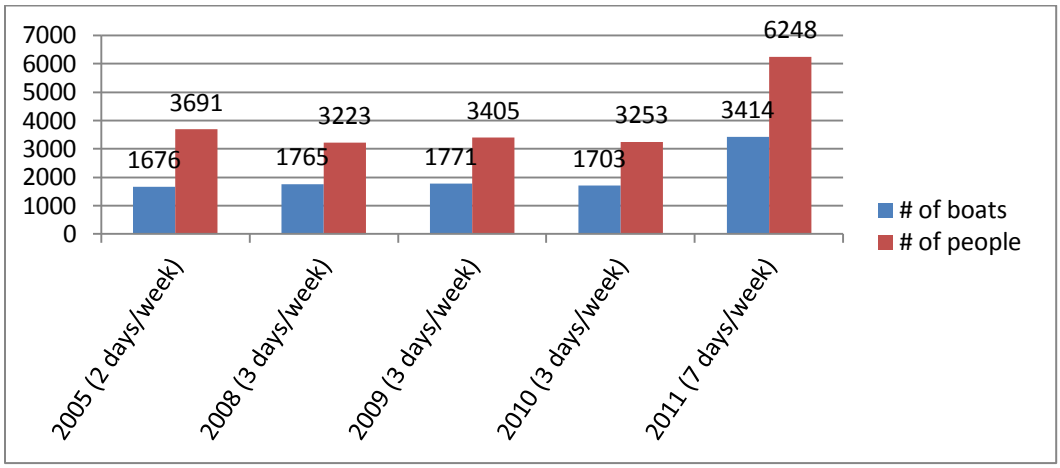


Figure 87- Multi-year use figures, Second Pond 2005-2011.

The percentage of groups taking some AIS spread prevention measure is almost identical to that found in 2010, and only 5% lower than what was found in 2009, when half the number of people were encountered by stewards. This relatively stable rate of self-reported compliance indicates that the public remains aware of the AIS challenge and that most boat

operators are aware that they need to take at least minimal steps to avoid transport of harmful organisms. The WSP would like to give recognition and appreciation to the cooperation of NYSDEC campground operations staff, fish and wildlife staff, and Environmental Conservation Officers, whom offered support and encouragement. Stewards posted to Second Pond were partially funded by a grant from the Lake Champlain Basin Program for which the Watershed Stewardship Program, Paul Smith's College and the communities of the northern Adirondacks are grateful.

Second Pond Recreation Study 2011

	Boat Type							total #	Weekly Avg	Four	# of
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	People
5-29-11 to 6-3-11	27	1	0	25	25	0	0	78	50	17	158
6-4-11 to 6-10-11	35	5	0	52	43	0	0	135	56	19	265
6-11-11 to 6-17-11	26	1	0	24	19	0	1	71	56	16	123
6-18-11 to 6-24-11	97	7	0	51	84	0	1	240	57	37	404
6-25-11 to 7-1-11	66	3	0	61	65	0	1	196	56	26	351
7-2-11 to 7-8-11	107	4	0	81	118	0	2	312	65	43	601
7-9-11 to 7-15-11	92	6	1	106	107	0	0	312	53	31	574
7-16-11 to 7-22-11	93	7	1	140	128	0	2	371	60	33	655
7-23-11 to 7-29-11	89	0	0	92	100	0	1	282	55	20	484
7-30-11 to 8-5-11	75	4	0	137	154	0	2	372	60	28	715
8-6-11 to 8-12-11	94	4	0	84	94	0	2	278	63	25	573
8-13-11 to 8-19-11	74	5	0	100	95	0	1	275	55	22	498
8-20-11 to 8-26-11	73	0	0	81	116	0	0	270	56	19	421
8-27-11 to 9-2-11	35	1	0	17	31	0	0	84	55	35	182
9-3-11 to 9-6-11	22	3	0	58	55	0	0	138	54	5	244
totals	1005	51	2	1109	1234	0	13	3414	Summer Avg = 58	376	6248
									Median HP = 50		

Table 79- Second Pond use summary, 2011. M = motorboat; K = kayak; C = canoe; B = construction barge; R = rowboat; S = sailboat; PWC = personal watercraft.

Second Pond Recreation Study 2011													
	# groups	# groups	organisms found		nism type								
Week	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	CLP	VLM	other
5-29-11 to 6-3-11	59	22	2	0	0	0	0	2	0	0	0	0	0
6-4-11 to 6-10-11	61	52	11	3	1	0	0	11	0	0	0	0	2
6-11-11 to 6-17-11	31	30	5	3	0	0	0	6	0	0	0	0	2
6-18-11 to 6-24-11	130	73	7	4	4	0	2	4	1	0	0	0	0
6-25-11 to 7-1-11	99	43	2	11	7	0	0	1	0	0	0	0	5
7-2-11 to 7-8-11	161	75	5	6	6	0	0	4	0	0	0	0	1
7-9-11 to 7-15-11	146	80	1	6	6	0	0	1	0	0	0	0	0
7-16-11 to 7-22-11	166	88	1	3	1	0	0	1	0	0	0	0	2
7-23-11 to 7-29-11	127	77	0	4	2	0	0	0	0	0	1	0	1
7-30-11 to 8-5-11	148	76	2	1	1	0	0	1	0	0	0	0	1
8-6-11 to 8-12-11	135	75	0	10	9	0	0	0	0	0	0	0	1
8-13-11 to 8-19-11	112	75	0	5	5	0	0	0	0	0	0	0	0
8-20-11 to 8-26-11	136	62	0	2	0	0	0	0	0	0	0	0	2
8-27-11 to 9-2-11	42	24	1	4	4	0	0	1	0	0	0	0	0
9-3-11 to 9-6-11	53	33	1	8	3	0	3	1	0	0	0	0	2
totals	1606	885	38	70	49	0	5	33	1	0	1	0	19

Table 80- EWM = Eurasian watermilfoil; BW = bladderwort; NM = native milfoil; GRS = grass; WC= water chestnut; ZM = Zebra mussel; VLM = variable leaf milfoil.

Second Pond Recreation Study 2011										
	Measures taken to prevent transport of invasive species									
Week	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
5-29-11 to 6-3-11	38	25	19	7	0	0	0	17	0	69
6-4-11 to 6-10-11	59	28	44	27	0	0	0	0	4	87
6-11-11 to 6-17-11	41	27	33	12	1	0	0	0	0	51
6-18-11 to 6-24-11	138	94	67	24	0	0	0	3	3	174
6-25-11 to 7-1-11	115	67	72	7	0	0	0	7	6	176
7-2-11 to 7-8-11	136	89	72	14	0	2	0	26	7	217
7-9-11 to 7-15-11	119	50	83	6	0	0	0	13	4	194
7-16-11 to 7-22-11	142	97	73	8	0	0	1	6	5	224
7-23-11 to 7-29-11	107	50	68	5	0	0	0	10	3	160
7-30-11 to 8-5-11	122	48	80	8	0	3	0	16	1	208
8-6-11 to 8-12-11	105	54	63	9	0	0	0	13	4	135
8-13-11 to 8-19-11	91	31	63	7	0	0	0	5	1	176
8-20-11 to 8-26-11	97	39	62	7	0	0	0	4	1	158
8-27-11 to 9-2-11	29	12	21	1	0	0	0	5	2	62
9-3-11 to 9-6-11	41	17	25	1	0	0	0	1	0	82
totals	1380	728	845	##	1	5	1	126	41	2173

Table 81-I = inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = drained livewell; Dis = disposed of unused bait; Dry = dried boat.

Recreation Use Study: Seventh Lake State Boat Launch

By Seth Crevison, Watershed Steward

Figure 88- Seventh Lake on a Monday morning in July 2011.

Introduction

Paul Smith's Watershed Stewardship Program (WSP) posted stewards at the New York State Department of Environmental Conservation Boat Launch at Seventh Lake (Seventh Lake) this summer for the first time. A grant of Great Lakes Restoration Initiative money through the U.S. Fish and Wildlife Service funded ten stewards in the Great Lakes and St. Lawrence Seaway watershed. It was an important opportunity to inform the public of how water bodies can be affected by aquatic invasive species (AIS). Watershed stewards were trained to inform the public on the threat of AIS and to inform boaters where to look on their boats and what to do to prevent the spread of AIS.

The Seventh Lake site is located on New York State Route 28 in Hamilton County three miles east of the Hamlet of Inlet. There is parking for 20 cars and trailers and the site is wheelchair accessible. The Sixth and Seventh LakeAssociation is composed of residents (both seasonal and permanent), businesses and repeat vacationers on

both lakes. Seventh Lake is infested with Eurasian watermilfoil and efforts to eradicate it have been undertaken by the Adirondack Watershed Institute.

A new initiative in 2011 expanded the WSP into the heart of the Adirondack Park to this boat launch. The steward inspected boats and educated launch users about the threats and dangers AIS pose on these lakes. Seventh Lake is known for having one of the shallowest launches in the area. This comes as no surprise as the winds move the sand across the bottom of the lake right into the boat launch site. Seventh Lake is also home to one of the few sea plane services in the Adirondack Park. Payne's Seaplanes and Air Service is located on the shore of SeventhLake. Visitors and tourists take scenic plane rides daily. Seventh Lake is known to have rainbow trout, lake trout, yellow perch, landlocked salmon, and brook trout. The site is used by locals to launch their boats for the summer and by tourists who enjoy the lake for fishing, water sports, and camping. Seventh Lake has many lean-tos in addition to access to the Seventh Lake Launch at the Eighth Lake Campground. The Sixth and SeventhLake Association is concerned with limiting the possibility of transporting Eurasian water milfoil to uninfected lakes near and far, and so stewards closely inspect boats leaving the lake to make sure no Eurasian watermilfoil is found on any boat. Boats entering the lake are also inspected very closely to make sure no new contaminates or AIS are found coming into Seventh Lake.

Figure 89- One of the islands on Seventh Lake, summer 2011.

Methods

The Seventh Lake steward was on duty from 7:00 AM – 4:00 PM with one hour of breaks seven days a week in June and Tuesday – Sunday in July and August. Stewards greeted boaters and asked them if their boats had been in any water body in the past two weeks, if they had washed it, drained their bilge, inspected it, drained bait buckets and live wells, disposed of bait properly, and if they dried their boat. Stewards noted time, boat type, horsepower, four stroke or not, and state registration. Boats were inspected for invasive species and if found recorded as to what type. Boats were also checked leaving the lake to make sure no aquatic hitchhikers were present. If plants were unidentifiable a sample was taken back to Paul Smith's College for identification. Also plants could be sent to the Adirondack Park Invasive Plant Program in Keene Valley, NY for identification.

	Fri	Sat	Sun	Mon	Tues	Weds	Thurs
5-28-11 to 6-2-11		X	X				
6-3-11 to 6-9-11	X	X	X	X	X	X	X
6-10-11 to 6-16-11			X	X	X	X	X
6-17-11 to 6-23-11	X	X	X			X	
6-24-11 to 7-1-11	X	X	X			X	
7-1-11 to 7-7-11		X				X	X
7-8-11 to 7-14-11			X			X	X
7-15-11 to 7-21-11	X		X			X	X
7-22-11 to 7-28-11			X			X	X
7-29-11 to 8-4-11	X		X		X	X	X
8-5-11 to 8-11-11	X		X		X	X	
8-12-11 to 8-18-11		X	X			X	
8-19-11 to 8-25-11							
8-26-11 to 9-1-11							
9-2-11 to 9-5-11		X	X				

Table 82- Steward Coverage at the NYS DEC Seventh Lake Boat Launch, summer 2011.

Figure 90- View of Seventh Lake.

Results

At the Seventh Lake Boat Launch, the stewards collected data for 364 boats and 734 people between May 28th and September 4th. The peak week for boats launching was July 16th through July 22st with 43 boats and 82 people. For two weeks in the latter part of August, stewards were not available for duty. Service resumed on Labor Day weekend.

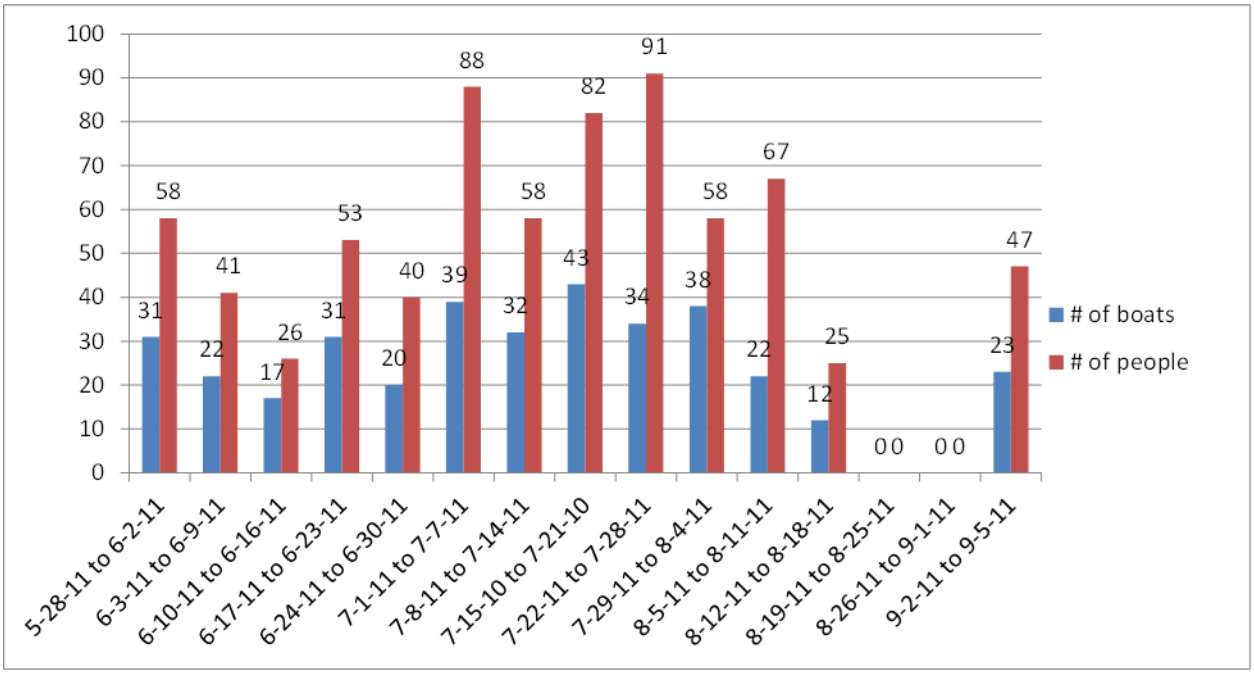


Figure 91- Seventh Lake State Boat Launch Visits, 2011.

Out of the 364 boats that stewards inspected in 2011, 179 were motorboats, 19 were personal watercraft, 102 were kayaks, 2 were sailboats, 56 canoes, 4 rowboats and 2 barges. Barges were on the water, but were taken out on motorboats in pieces and assembled on the water.

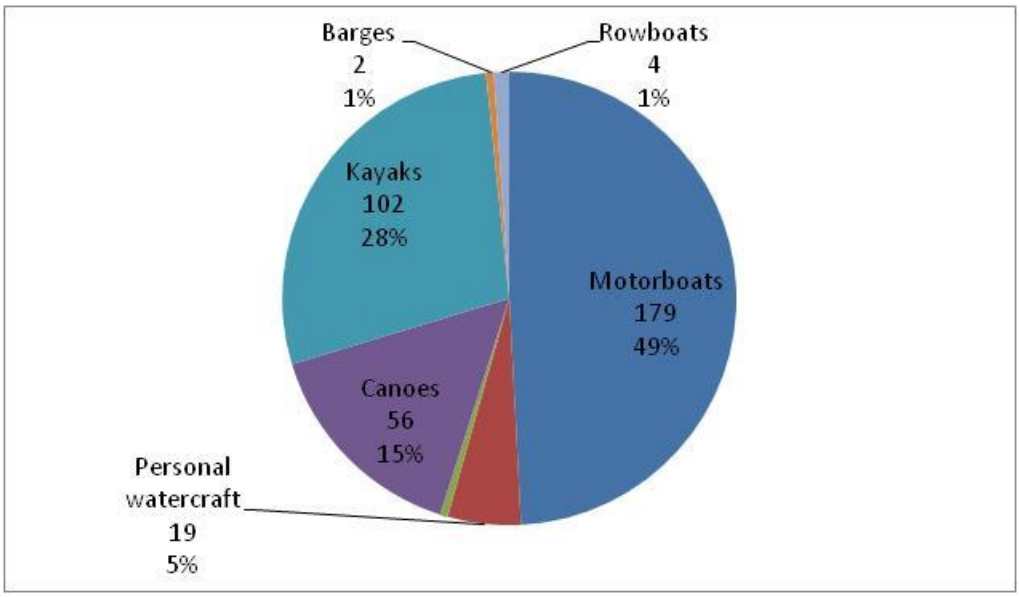


Figure 92- Watercraft launched by type, Seventh Lake State Boat Launch, 2011.

Stewards recorded the horsepower of outboard motors and whether the outboard motor had a four stroke engine. The lake steward asked boaters where their boats had been in the last two weeks. 97 boats had not been in the water in the past two weeks. Out of the remaining boats, five had been through the Fulton Chain of Lakes, 33 had been in Seventh Lake, 28 had been in Fourth Lake, eight had been in Eighth Lake, and 3 had been in Long Lake.

waterbody	total # visits	Infection Status	waterbody	total # visits	Infection Status	
Cayuga Lake	1	yes	Onondaga Lake	1		
6th lake	1		Erie Canal	2		
Great Sacandaga Reserv	1	yes	Moose river	2		
7th lake	33	yes	Forked Lake	1		
4th lake	28	yes	Limekiln Lake	1		
8th lake	8		Sagamore Lake	2		
Blue mt. Lake	2		Moss Pond	1		
Canadaigua Lake	1	yes	Fish Creek	2	yes	
Black River	1		Lake Serene	1		
Kayuta Lake	1		Big Moose Lake	1		
Floodwood Pond	1		Long Lake	3	yes	
Oneida Lake	1	yes	Canisius Lake	1		
St. Lawrance River	1	yes	Fulton Chain of Lakes	5	yes	
Lake Ontario	2	yes	Connecticut River	1	yes	
Raquette Lake	9		Lake Bonaparte	1		
Lake Durant	2		Rondaxe Lake	1		
Nicks Lake	2		Keuka Lake	1	yes	
Delta Lake	1		Otter Lake	1		
Jessup River	1		Stillwater Reservoir	1		

Table 83- Lakes visited in previous two weeks prior to launching at Seventh Lake State Boat Launch, 2011.

The lake steward recorded state registration every time a motorized boat entered or left the launch at Seventh Lake. If the boat had entered that day, the state recorded was not recorded twice. 141 boats came from New York, 8 boats came from Pennsylvania, and 5 boats came from Connecticut in 2011 out of a total of 179 boats.

state	# boats
Connecticut	5
Massachusetts	2
Michigan	1
New Hampshire	1
New Jersey	3
New York	141
Ohio	1
Pennsylvania	8
Vermont	2

Table 84- Number of boats visiting Seventh Lake from each state in 2011 (USPS abbreviations used).

Every boater that was approached by a steward was asked if they took prevention steps to stop the spread of AIS. 222 groups said that they did take prevention steps, 64 said that they inspect their boat after use, 142 said that they washed their boat after use, 14 said that they drained their bilge water, and four people did not respond to the question.

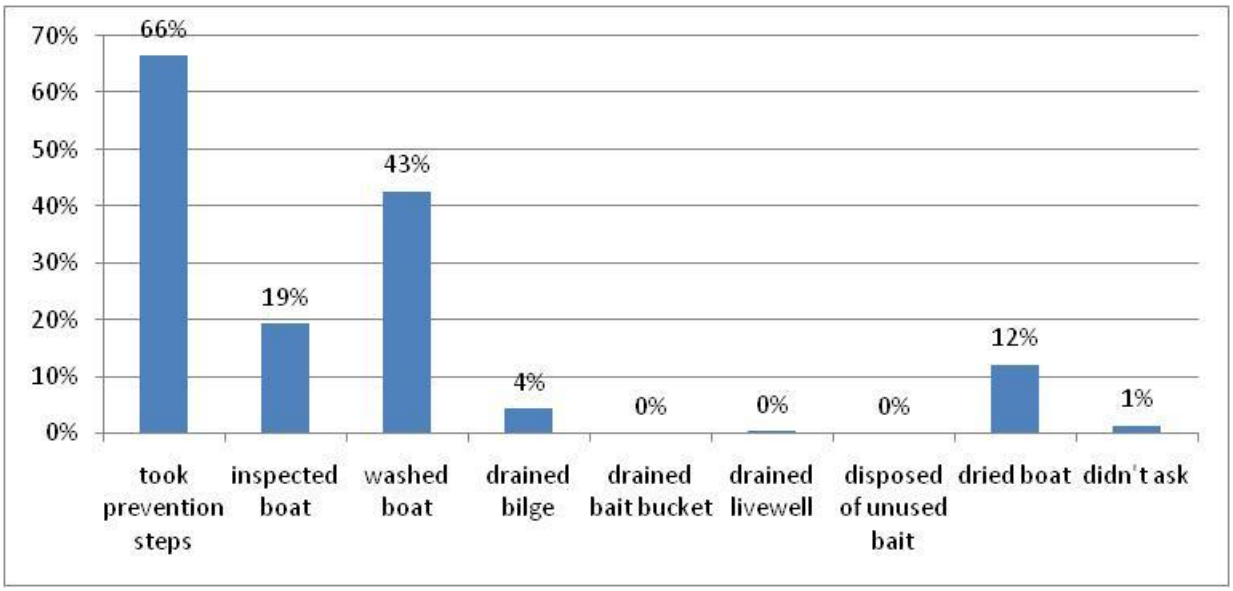


Figure 93- AIS Spread Prevention Steps taken by boaters at Seventh Lake State Boat Launch, 2011.

Seventh Lake is known to have one invasive species, Eurasian water milfoil. 20 organism fragments were found on boats entering. 9 organisms were found on boats leaving the boat launch. The steward successfully stopped 29 organisms from entering or leaving Seventh Lake.

Organism	Entering	Leaving
Eurasian Water milfoil	0	0
Bladderwort	2	1
Native Milfoil	0	0
Grass	10	6
Water Chestnut	0	0
Zebra Mussel	0	0
Variable Leaf Milfoil	0	0
Other	7	3

Table 85- Organisms found from boats using the Seventh Lake State Boat Launch, 2011. No AIS of interest were observed.

When organisms were found on boats they were recorded and picked off and discarded away from Seventh Lake. 2 pieces of bladderwort were found on boats coming and leaving, 14 pieces of grass were found, and 10 other organisms were found on boats. No pieces of Eurasian watermilfoil were found on any boats leaving the launch.

Discussion

This was the first year a watershed steward was placed on Seventh Lake. Boaters were receptive to the AIS message when rack cards were presented at the time the message was given. Seventh Lake had many types of boaters from pleasure boaters to fishermen and families camping at one of the lakes' lean-tos. The steward learned throughout the summer that these groups need to be approached differently.

When pleasure boaters received the message from stewards, stewards responded to visitor interest in particular aquatic invasive species shown on the educational card that stewards distributed. Stewards approached

fishermen with an abbreviated message and quick questions while giving them an inspection of their boat. Boaters who were camping on the lake seemed to enjoy the message of awareness of AIS the most as they asked many questions about plants and methods of aquatic invasive species spread prevention after the main message was given. Campers seemed responsive to also receiving fire wood transportation law information as many were excited to learn what the hanging purple boxes were for. There was a purple emerald ash borer trap hung at the Seventh Lake State Boat Launch which aroused curiosity. Many groups were also using the launch for hiking and camping on shore as there are two lean-tos accessible by foot. Groups such as Boy and Girl Scouts were seen throughout the summer hiking around Seventh Lake. These groups were very responsive and receptive to the message about invasive species on land and in the water. Many of these young people wanted to know what they could do to stop the spread.

Many first time boaters were frustrated with the Seventh Lake Launch as it is shallow and very hard to launch many kinds of boats. Boaters returning to Seventh Lake also expressed their concern at the shallow launch. Once boaters realized the steward had nothing to do with the state and not being able to do anything about the launch or how shallow it was boaters were more responsive, but still showed irritation as they answered survey questions.

As the stewardship program at Seventh Lake continues it will become easier to approach boaters. Around August boaters expected to see the stewards and were ready to answer their questions. Next year the new steward can build upon the data of 2011 along with the reputation the WSP has gained from the first year of working in the area.

Recommendations

This was a demanding job for one steward on holidays. Having two stewards on busy holiday weekends would help in the collection of more accurate data and more stable messages given instead of rushed messages to make sure every boat was recorded. Having the presence of more than one steward would also calm boaters to show they are not the only ones being held up and waiting for the launch. Having a New York State Department of Conservation Ranger at the launch at busy periods would help with concerns and complaints about the launch and the land around it.

The steward at Seventh Lake should also be prepared to present information on camping and the location of lean-tos as many people had questions about length of stay and location on land around the lake. There should also be more notification as to the purpose and approved uses of the parking lot. Many campers use the parking lot to leave their cars, but the parking lot is designated for boaters only. On busy days and weekends boaters become frustrated when they have no place to park. Many visitors bring their dogs to swim at the launch so it would be beneficial to provide bags for visitors to clean up after their pets as an effort to keep the trails and area around the launch clean.

The Sixth and Seventh Lake Association was very responsive and glad to have a steward present. Another prop that is very useful at the launches is having samples of invasive species to show the public. The public loves to be able to touch and to hold the species that are on the rack cards. This helps in identifying and helps the public to feel like they have accomplished something.

Conclusion

The WSP expanded into the heart of the Adirondack Park to a lake with great response and beautiful breathtaking views. Our goal has been achieved by raising the awareness of AIS in the area by not only informing boaters through distributing the AIS education cards but by also showing them examples of Eurasian watermilfoil. Many boaters were very concerned when they heard about the many AIS found on boats coming in from other lakes and water bodies. The public began to appreciate the steward by the end of the summer as many thanks were given for caring about the health of Seventh Lake. The continued awareness of AIS on Seventh Lake will keep aquatic hitchhikers from establishing a presence in the heart of the Adirondack Park. The Watershed Stewardship Program gratefully acknowledges the funding support of the Great Lakes Restoration Initiative and the United States Fish and Wildlife Service.

Seventh Lake Recreation Study 2011												
	Boat Type							total #	Weekly Avg	Four	# of
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	people
5-28-11 to 6-2-11	13	2	0	5	11	0	0	31	42	4	58
6-3-11 to 6-9-11	14	0	0	1	7	0	0	22	26	5	41
6-10-11 to 6-16-11	8	2	0	4	3	0	0	17	93	1	26
6-17-11 to 6-23-11	14	0	0	9	6	2	0	31	40	3	53
6-24-11 to 6-30-11	11	4	0	1	4	0	0	20	78	1	40
7-1-11 to 7-7-11	17	3	1	4	13	0	1	39	43	1	88
7-8-11 to 7-14-11	15	2	0	5	9	0	1	32	32	4	58
7-15-10 to 7-21-10	16	0	1	9	17	0	0	43	44	2	82
7-22-11 to 7-28-11	16	1	0	7	9	0	1	34	50	7	91
7-29-11 to 8-4-11	26	0	0	3	9	0	0	38	78	2	58
8-5-11 to 8-11-11	11	2	0	5	4	0	0	22	72	9	67
8-12-11 to 8-18-11	7	1	0	1	3	0	0	12	23	1	25
8-19-11 to 8-25-11	0	0	0	0	0	0	0	0	0	0	0
8-26-11 to 9-1-11	0	0	0	0	0	0	0	0	0	0	0
9-2-11 to 9-5-11	11	2	0	2	7	0	1	23	49	1	47
totals	179	19	2	56	102	2	4	364	Summer Avg = 44	41	734
									Median HP = 43		

Table 86- Summary, 2011. M= motorboat; K= kayak; C= canoe; B= construction barge; R= rowboat; S=sailboat; PWC= personal watercraft.

Seventh Lake Recreation Study 2011												
	# groups	# groups	organisms found		organism type							
Week	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other
5-28-11 to 6-2-11	23	11	1	0	0	0	0	1	0	0	0	0
6-3-11 to 6-9-11	15	14	1	1	0	0	0	2	0	0	0	0
6-10-11 to 6-16-11	9	7	0	1	0	0	0	0	0	0	0	1
6-17-11 to 6-23-11	27	14	2	1	0	1	0	2	0	0	0	0
6-24-11 to 6-30-11	17	9	1	0	0	0	0	1	0	0	0	0
7-1-11 to 7-7-11	37	7	1	0	0	0	0	0	0	0	0	1
7-8-11 to 7-14-11	26	14	1	1	0	1	0	0	0	0	0	1
7-15-10 to 7-21-10	31	28	0	1	0	0	0	1	0	0	0	0
7-22-11 to 7-28-11	29	14	2	1	0	0	0	1	0	0	0	2
7-29-11 to 8-4-11	26	20	3	1	0	1	0	0	0	0	0	3
8-5-11 to 8-11-11	13	16	3	0	0	0	0	2	0	0	0	1
8-12-11 to 8-18-11	5	9	0	0	0	0	0	0	0	0	0	0
8-19-11 to 8-25-11	0	0	0	0	0	0	0	0	0	0	0	0
8-26-11 to 9-1-11	0	0	0	0	0	0	0	0	0	0	0	0
9-2-11 to 9-5-11	14	S	5	2	0	0	0	6	0	0	0	1
totals	272	163	20	9	0	3	0	16	0	0	0	10

Table 87- EWM= Eurasian watermilfoil; BW= bladderwort; NM= native milfoil, GRS= grass; WC=water chestnut; ZM= Zebra mussel; VLM= variable leaf milfoil.

Seventh Lake Recreation Study 2011										
	visitor prevention steps									
Week	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
5-28-11 to 6-2-11	11	1	9	0	0	0	0	2	0	25
6-3-11 to 6-9-11	11	4	6	0	0	1	0	3	0	19
6-10-11 to 6-16-11	9	1	5	0	0	0	0	6	0	14
6-17-11 to 6-23-11	18	3	4	0	0	0	0	1	1	53
6-24-11 to 6-30-11	16	4	12	3	0	0	0	0	2	12
7-1-11 to 7-7-11	22	9	12	1	0	0	0	5	0	39
7-8-11 to 7-14-11	22	3	13	0	0	0	0	8	0	32
7-15-10 to 7-21-10	28	7	24	0	0	0	0	2	0	43
7-22-11 to 7-28-11	26	6	18	3	0	0	0	10	0	34
7-29-11 to 8-4-11	23	7	17	1	0	0	0	0	1	23
8-5-11 to 8-11-11	16	10	10	3	0	0	0	2	0	22
8-12-11 to 8-18-11	7	3	3	1	0	0	0	0	0	12
8-19-11 to 8-25-11	0	0	0	0	0	0	0	0	0	0
8-26-11 to 9-1-11	0	0	0	0	0	0	0	0	0	0
9-2-11 to 9-5-11	13	6	9	2	0	0	0	1	0	18
totals	222	64	142	14	0	1	0	40	4	346

Table 88- I= inspected boat; WB= washed boat; DB= drained bilge, BB= emptied bait bucket; LW= drained livewell; Dis= disposed of unused bait; Dry= dried boat.

Recreation Use Study: St. Regis Canoe Area

By Tim Willson, Watershed Steward

Figure 94- Little Clear Pond.

Introduction

The Watershed Stewardship Program (WSP) of Paul Smiths College's Adirondack Watershed Institute educates the public about aquatic invasive species (AIS) and other issues of interest in the Adirondack Park. This was the first year for the WSP to station watershed stewards in the St. Regis Canoe Area. Stewards were located at Long Pond, Hoel Pond, and Little Clear Pond. These three access points are well used for recreation and fishing in the Canoe Area. There are a total of 58 ponds in the St. Regis Canoe area; there are many special regulations that apply to this area to give the user a true wilderness experience. One regulation is that motors are not allowed, which makes it a great destination for paddlers of all experience levels. As of 2011 the Canoe Area is free of any AIS, making this a critical point for watercraft inspections.

Methods

Coverage was from Friday to Monday, from 7 am to 4 pm. On Fridays, a steward was stationed at Long Pond boat access, on Saturdays and Sundays, a steward was stationed at Little Clear Pond, and on Mondays, a steward was stationed at Hoel Pond. These locations were determined upon consultation with the New York State Department of Conservation forester responsible for the St. Regis Canoe Area Unit Management Plan. When stewards were on duty they recorded the boat type, group size, and launching or retrieval times. Boaters were also asked if they have taken measures to prevent the spread of AIS, and well as the body of water the watercraft was in last, in the previous 2 weeks. The stewards would field many questions about AIS. The primary AIS of concern is Eurasian Milfoil, which has spread quickly throughout the Adirondack Park. All watercraft were inspected for organisms and would educate the public on taking the most effective preventive steps to prevent the spread of AIS.

Figure 95- Little Clear and St. Regis Ponds from St. Regis Mountain.

Results

Within the hours covered by a steward in the 2011 season, the steward encountered a total of 474 watercrafts, and 791 total people. Canoes made up 74% of the boats encountered by stewards. Kayaks were next after canoes with 25% of the total boats.

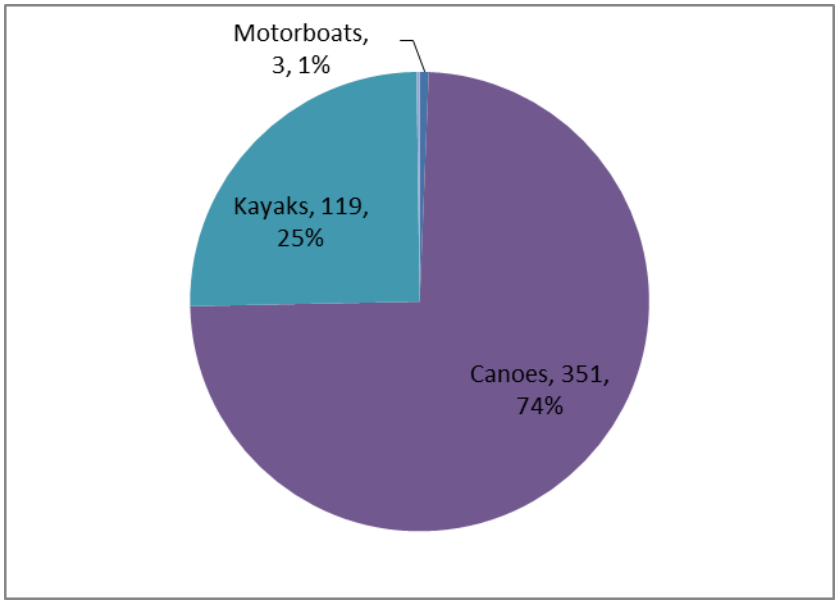


Figure 96- Types of watercraft launched, St. Regis Canoe Area 2011.

The peak week of usage was 7-30-10 to 8-5-10. During this week a total of 138 people were contacted. August 1 was busiest single day, with 25 boats inspected at Hoel Pond.

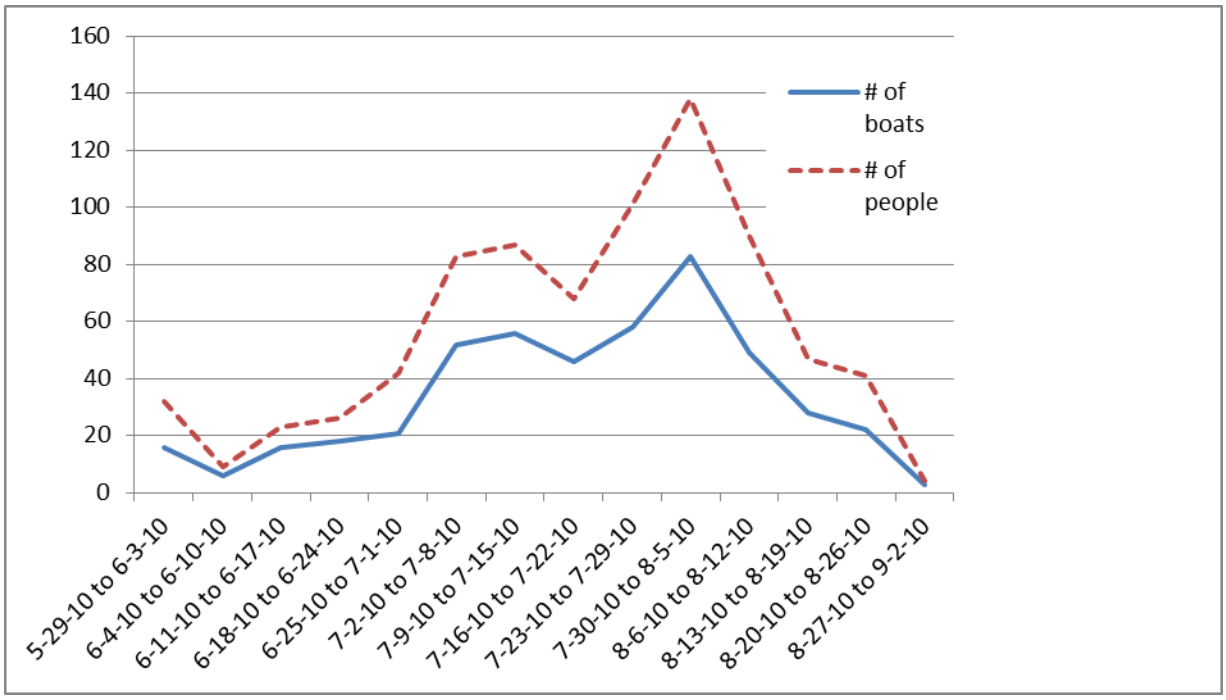


Figure 97- Boat launch use, St. Regis Canoe Area boat launches, 2011.

The four days, Fridays-Mondays, feature comparable use levels at the three sites. The assumption before the summer was that weekends at Little Clear Pond would be comparatively busy owing to that site's location at the beginning of several common canoe routes through the St. Regis Canoe Area. Hoel Pond was known to be busy, and Mondays were thought to be a good time to educate visitors and campers after the weekend. Long Pond was the most remote site, near the end of the Floodwood Road, and use was predicted to be the most light owing to the location's isolation. Compared with other WSP boat ramps, each of the SRCA posts experienced light use.

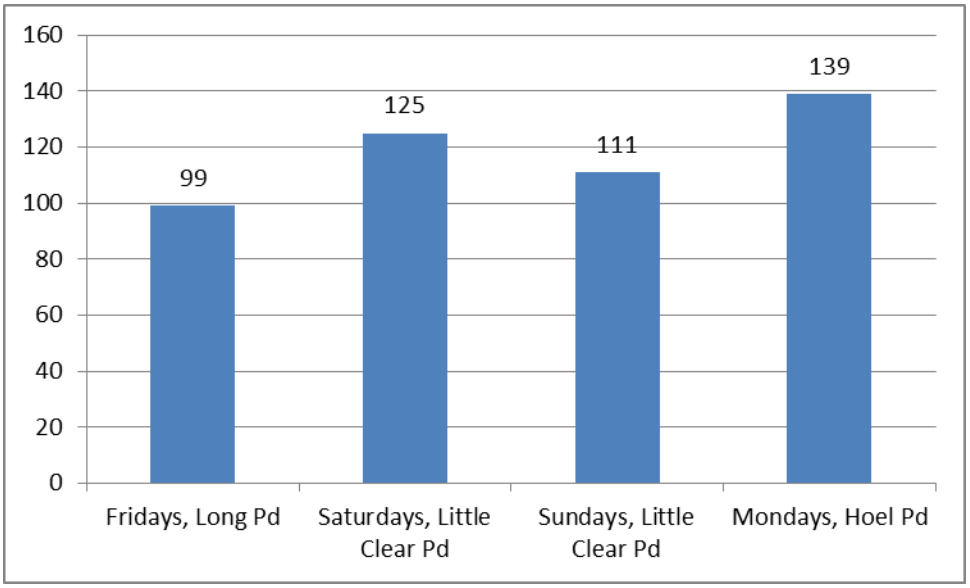


Figure 98- Boats inspected at four access points, St. Regis Canoe Area, 2011.

Service projects

During the 2011 season for 6 weeks one steward was posted in the St. Regis Canoe Area working on conservation projects with an AmeriCorps backcountry steward, under the supervision of the Forest Ranger. In this capacity, the steward reclaimed many fire pits, by resizing them and relaying them with mineral soil to prevent underground root fires. There are many miles of trails in the area that are used to access ponds, there were many trees that have fallen making it harder for users to access these remote ponds. The two stewards would find areas that had trees down and would use axes and handsaws to remove these obstacle logs. The two stewards also cleared downed trees on the St. Regis Mountain trail.

Previously Visited Water bodies

What makes AIS such a nuisance species is that they are able to survive out of the water for an extended period of time. By asking boaters the last body of water their watercraft was in the preceding two weeks, the steward on duty could more accurately assess if the boater had a higher likelihood of transporting AIS. This information was crucial in the watercraft inspection. The most frequently mentioned prior waterway was Little Clear Pond itself (32 responses), followed by “rental” (28), which likely represents any of the local waterways, infected and not infected. A total of 58 different responses were noted, most of which hosted some form of AIS.

Previous Water	# Boats	Infected	Previous Water	# Boats	Infected
9 Mile Creek	1	Unknown	Little Clear Pond	32	Not Observed
Beaver River flow	1	Unknown	Little Green Pond	3	Not Observed
Black Pond	2	Unknown	Littleville Lake, MA	1	Unknown
Buck Pond	1	Not Observed	Long Lake	1	Yes (EWM)
Bushkill PA	1	Unknown	Long Pond	7	Not Observed
Cayuga Lake	1	Yes (EWM, ZM)	Lower St. Regis	1	Not Observed
Clamshell Pond	1	Not Observed	Marsh Creek Lake, PA	1	Not Observed
Connecticut River	1	Yes (EWM,DID)	Mohawk River	1	Yes
Farm Pond	1	Unknown	Moose Pond	1	Not Observed
Farmington River, Ct	1	Yes (DID)	Nicks Lake	1	Unknown
Fish Creek Ponds	3	Yes (EWM)	Osgood Pond	1	Not Observed
Floodwood Pond	6	Yes (EWM)	Pine Barrens, NJ	1	Unknown
Follensby Clear Pond	3	Yes (EWM)	Polliwog Pond	8	Not Observed
Franklin Falls Flow	1	Yes (EWM, CLP)	Rainbow Lake	4	Yes (SN)
Grass Pond	1	Unknown	Raquette River	3	Yes (VLM)
Hoel Pond	6	Not Observed	Rental	28	
Hope Pond	1	Unknown	Rollins Pond	1	Unknown
Hudson River	1	Yes (WC, ZM)	Round Lake	1	Unknown
Indian Pond	1	Unknown	Saranac River	1	Yes
Jones Pond	1	Unknown	Second Pond	1	Yes (EWM)
Kasoag Lake	1	Yes (EWM)	Silver Lake	1	Unknown
Lake Champlain	2	Yes (EWM, VLM, CLP, WC, ZM)	Slang Pond	4	Not Observed
Lake Clear	2	Not Observed	St. Regis Pond	3	Not Observed
Lake Colby	2	Yes (EWM)	Tupper Lake	2	Yes (VLM)
Lake Dunmore	1	Yes (EWM)	Turtle Pond	2	Not Observed
Lake Flower	3	Yes (EWM, VLM, CLP)	Upper Saranac Lake	3	Yes (EWM)
Lake Ninevah, VT	1	Yes (EWM, ZM)	Upper St Regis	6	Not Observed
Lake Ontario	1	Yes (ZM)	White Lake	1	Unknown
Lake Placid	1	Yes (VLM)	Woodhall Pond	1	Unknown

Table 89- Two-week prior waterway history, boats visiting St. Regis Canoe Area, 2011. EWM=Eurasian Watermilfoil; CLP= Curlyleaf Pondweed; VLM=Variable Leaf Milfoil; WC=Water Chestnut; ZM=Zebra Mussels; DID= Didymo .

Measures Taken to Prevent Invasive Species Introduction:

Boaters were questioned if they had taken prevention steps of AIS from one body of water to another. 61% of the groups encountered at St. Regis Canoe Area access sites reported taking AIS prevention steps, such as visual inspection, washing/ drying boat, draining the bilge and live wells, and disposing of their bait buckets. Of the 271 groups encountered 161 did take prevention steps with 87 groups inspecting and 79 groups washing their watercraft.

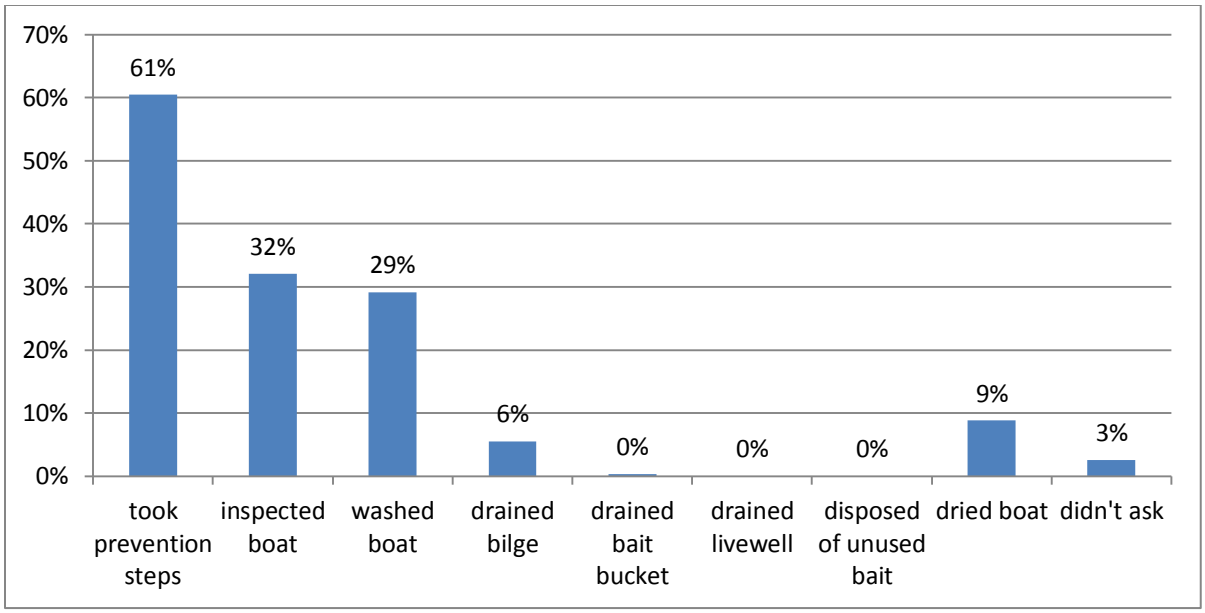


Figure 99- Aquatic Invasive Species spread prevention measures taken by visiting groups, St. Regis Canoe Area, 2011.

Discussion and Conclusion

The summer of 2011 was the first year stewards were stationed as St. Regis Canoe area access points. With reaching 791 people this was a crucial area for education. Canoes were expected to be a majority of the inspected watercraft. This was true, as canoes comprised 74% of the inspected watercraft followed by kayaks at 24%. Many paddlers did not think that they had to worry about introducing AIS. However, this is not true. Stewards found 9 organisms on 4 launching and 2 retrieving watercraft, none of which were confirmed AIS. Only 28% of groups reported washing their boats, and 33% reported visually inspecting their boat. Canoes and kayaks do not have bilges or live-wells so this was also expected not to be a prevention step used by visitors. Visitors reported that in the previous two weeks there was a total of 57 previously visited water bodies, which is a threat to the St. Regis Canoe Area. With continued AIS awareness the WSP hopes that prevention step compliance will increase in the upcoming years. The Watershed Stewardship Program gratefully acknowledges the funding support of the Great Lakes Restoration Initiative and the United States Fish and Wildlife Service.

St. Regis Canoe Area Recreation Study 2011									
	Boat Type							total #	# of
Week	M	PWC	S	C	K	B	R	boats	people
5-29-10 to 6-3-10	0	0	0	12	4	0	0	16	32
6-4-10 to 6-10-10	0	0	0	6	0	0	0	6	9
6-11-10 to 6-17-10	0	0	0	8	8	0	0	16	23
6-18-10 to 6-24-10	0	0	0	11	7	0	0	18	26
6-25-10 to 7-1-10	0	0	0	17	3	0	1	21	42
7-2-10 to 7-8-10	2	0	0	35	15	0	0	52	83
7-9-10 to 7-15-10	0	0	0	41	15	0	0	56	87
7-16-10 to 7-22-10	0	0	0	33	13	0	0	46	68
7-23-10 to 7-29-10	0	0	0	50	8	0	0	58	101
7-30-10 to 8-5-10	1	0	0	56	26	0	0	83	138
8-6-10 to 8-12-10	0	0	0	42	7	0	0	49	90
8-13-10 to 8-19-10	0	0	0	17	11	0	0	28	47
8-20-10 to 8-26-10	0	0	0	22	0	0	0	22	41
8-27-10 to 9-2-10	0	0	0	1	2	0	0	3	4
totals	3	0	0	351	119	0	1	474	791

Table 90- St. Regis Canoe Area use summary, 2011. M = motorboat; K = kayak; C = canoe; B = construction barge; R = rowboat; S = sailboat; PWC = personal watercraft.

St. Regis Canoe Area Recreation Study 2011												
	# groups	# groups	organisms found		organism type							
Week	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other
5-29-10 to 6-3-10	13	5	0	0	0	0	0	0	0	0	0	0
6-4-10 to 6-10-10	2	4	0	0	0	0	0	0	0	0	0	0
6-11-10 to 6-17-10	4	7	1	0	0	0	0	1	0	0	0	0
6-18-10 to 6-24-10	10	5	1	0	0	0	0	1	0	0	0	0
6-25-10 to 7-1-10	8	7	0	1	0	0	0	0	0	0	0	1
7-2-10 to 7-8-10	27	12	0	0	0	0	0	0	0	0	0	0
7-9-10 to 7-15-10	20	8	0	0	0	0	0	0	0	0	0	0
7-16-10 to 7-22-10	21	13	1	0	0	0	0	0	0	0	0	1
7-23-10 to 7-29-10	18	14	0	1	0	0	0	0	0	0	0	1
7-30-10 to 8-5-10	28	17	1	0	0	0	0	0	0	0	0	1
8-6-10 to 8-12-10	12	12	0	0	0	0	0	0	0	0	0	0
8-13-10 to 8-19-10	13	8	0	0	0	0	0	0	0	0	0	0
8-20-10 to 8-26-10	7	3	0	0	0	0	0	0	0	0	0	0
8-27-10 to 9-2-10	0	2	0	0	0	0	0	0	0	0	0	0
totals	183	117	4	2	0	0	0	2	0	0	0	4

Table 91- EWM = Eurasian watermilfoil; BW = bladderwort; NM = native milfoil; GRS = grass; WC= water chestnut; ZM = Zebra mussel; VLM = variable leaf milfoil.

St. Regis Canoe Area Recreeation Study										
	visitor prevention steps									
Week	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
5-29-10 to 6-3-10	11	7	2	3	0	0	0	1	0	15
6-4-10 to 6-10-10	4	1	0	1	0	0	0	2	0	4
6-11-10 to 6-17-10	7	4	5	2	1	0	0	2	0	9
6-18-10 to 6-24-10	10	6	5	1	0	0	0	1	0	12
6-25-10 to 7-1-10	10	8	3	0	0	0	0	1	0	19
7-2-10 to 7-8-10	27	13	12	5	0	0	0	7	0	33
7-9-10 to 7-15-10	16	10	5	1	0	0	0	4	4	27
7-16-10 to 7-22-10	14	10	7	0	0	0	0	3	3	26
7-23-10 to 7-29-10	16	8	9	1	0	0	0	0	0	30
7-30-10 to 8-5-10	19	9	11	1	0	0	0	3	0	38
8-6-10 to 8-12-10	12	3	10	0	0	0	0	0	0	27
8-13-10 to 8-19-10	9	4	5	0	0	0	0	0	0	19
8-20-10 to 8-26-10	8	4	4	0	0	0	0	0	0	10
8-27-10 to 9-2-10	1	0	1	0	0	0	0	0	0	2
totals	164	87	79	15	1	0	0	24	7	271

Table 92- I = inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = drained livewell; Dis = disposed of unused bait; Dry = dried boat.

Recreation Use Study: Upper St. Regis Lake Public Boat Launch

By: Tim Willson, Watershed Steward

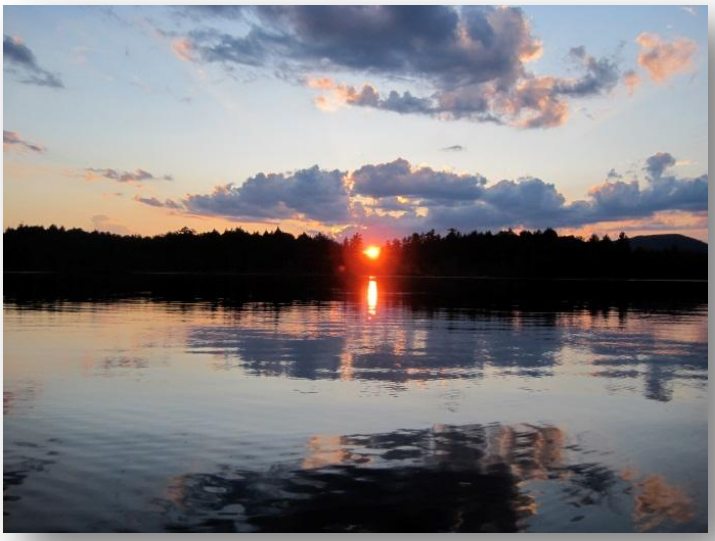


Figure 100- Sunset on Upper St. Regis Lake.

Introduction

Paul Smith's College Watershed Stewardship Program (WSP), seeks to prevent the spread of Aquatic Invasive Species (AIS) in the Adirondack Park by educating the public and conducting courtesy watercraft/trailer inspections. Invasive species are non-indigenous species that negatively affect the ecosystem and outcompete native species are grow at extremely rapid rates. Watershed stewards went through a rigorous training period. Stewards learned identification techniques as well as preventive measure to reduce the spread of AIS. At the Upper St. Regis boat launch stewardship awareness is well known, as watershed stewards have been stationed there for the past 12 years. There are two boat launches located on St. Regis Carry Road, one being private as well as a public boat launch. A boat wash station is located before the entrance to the public and private boat launch. As of 2011 the St. Regis chain of Lakes is free of all AIS. Upper St. Regis is a major access point for Spitfire Lake, Lower St. Regis, and well as the St. Regis Wilderness Canoe Area. The St. Regis Chain of Lakes as well as the St. Regis Canoe area offer great fishing and recreation. As, a result this is a critical area for watercraft/ trailer inspections and public outreach in the Adirondacks.

Methods

May 28th marked the first day of 2011 where a watershed steward was located at the St. Regis boat launch through September 5th. The stewards were on duty from 7am to 4 pm seven days a week. When watercrafts were being launched and retrieved the steward was responsible for collecting data. The data

collected includes watercraft type, horsepower of outboard motor, two of four stroke, group size, state of registration, launch/retrieval time, and the species of any organism found on the watercraft or trailer. In addition to this data the steward would ask if the boater took steps to prevent the spread of AIS, as well as the last water body visited in the previous two weeks if any. As the data was being collected the steward would inspect the watercraft/trailer with the boater and show where AIS are likely to be attached. If organisms were found they were identified and discarded. Boaters were then encouraged to use the boat wash, and were given informational cards providing preventions steps and pictures of invasive species that are threating the lakes.

Results

During the watershed steward for the 2011 season, stewards located at the Upper St. Regis boat lunch encountered 845 boats and 1,400 people. Among the seven types of watercrafts, motor boats were the most abundant (307, 36%), followed by canoes (282, 33%), and then kayaks (242, 20%) respectively.

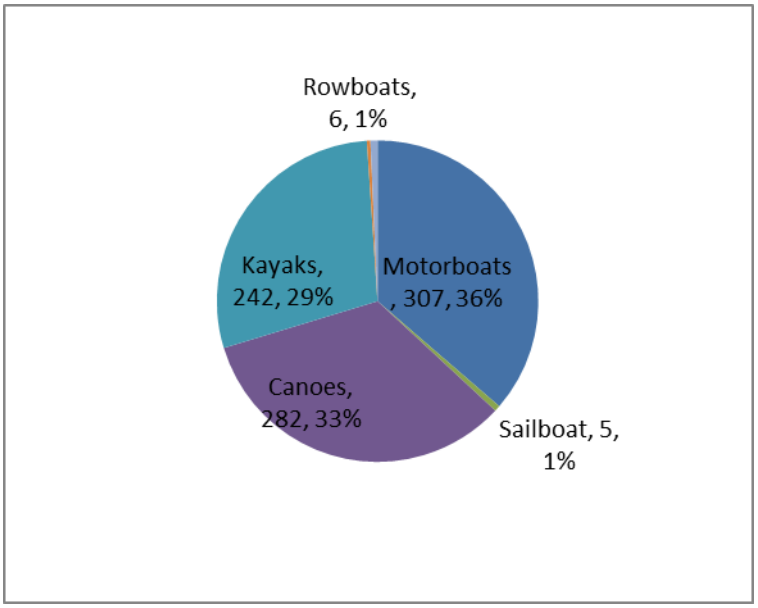


Figure 101- Watercrafts launched at Upper St. Regis boat launch, 2011.

The peak of usage was during 7/30/11 to 8/5/11 (98 boats and 155 people), and the peak day was 7/30/2011 with a total of 25 watercrafts and 42 people**.** Weekends made up a majority of watercraft launching and or retrieving.

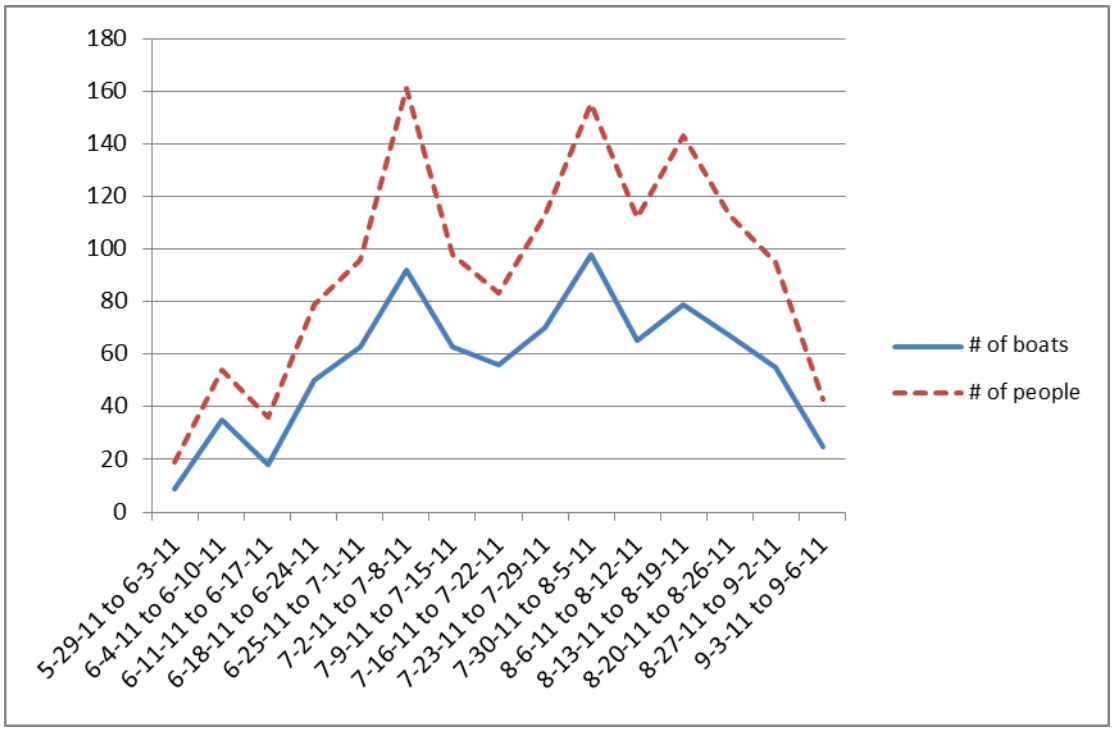


Figure 102- Boat launch use, Upper St. Regis, 2011.

State/ Province of Origin

The St. Regis Chain of Lake is located in Northern Adirondack mountains of New York State, so it was expected a majority of the use would be from watercrafts registered in New York State (291 Boats). Motorized boats with registrations were recorded in this data set. Canoes and kayaks were not a part of this data set.

State	#	State	#
RI	1	NH	1
CT	2	NY	291
DL	2	VT	1
FL	1	PA	2
MA	3	NJ	1
MI	2	total	307

Table 93- State of origin, motorboats, Upper St. Regis, 2011.

Prevention steps of AIS taken by Visitors

Stewards asked visitors if they had taken steps to prevent the transport of aquatic invasive species (AIS) from one body of water to another, prior to arriving at the waterway. 78% of the groups encountered at the Upper St. Regis Boat Launch reported taking AIS prevention steps, such as visual inspection, washing/ drying boat,

draining the bilge and live wells, and disposing of their bait buckets. Of the 610 groups encountered by the steward, 53% washed their boat followed with 36% visually inspecting their boat.

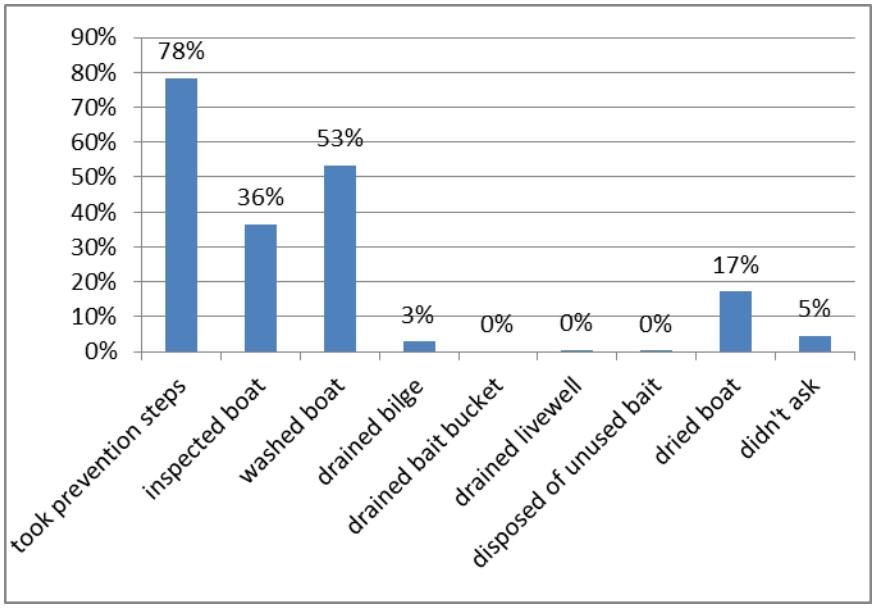


Figure 103- Aquatic invasive species spread prevention measures taken by visitors, Upper St. Regis 2011.

Previously Visited Water Bodies

What makes AIS such a nuisance species is that they are able to survive out of the water for an extended period of time. By asking boaters the last body of water their watercraft was in the preceding two weeks, the steward on duty could more accurately assess if the boater had a higher likelihood of transporting AIS. This information was crucial in the watercraft inspection. Visitors cited 82 different waterbodies as prior use locations, representing possible sources of transported organisms. The most frequently mentioned prior use locations were Upper St. Regis (179 visits), rental (24 boats from outfitters), Upper Saranac Lake (22), Lake Flower (13), Lake Placid (13), and Lake Champlain (11), all of which, excepting Upper St. Regis, present risks of transporting invasive organisms. Overall, 258 of the 610 user groups (42%) encountered reported visiting another waterway with their boat in the prior two-week period.

Water Body	# Visits	Infected	Water Body	# Visits	Infected
Black Lake	1	Yes (EWM)	Long Island Sound	2	Yes
Bog River	2	Unknown	Loon Lake	1	Yes (EWM)
Brandy Brook	1	Unknown	Lower Saranac	7	Yes (EWM)
Buck Pond	2	Not Observed	Lower St. Regis	2	Not Observed
Canandaigua Lake	1	Yes (ZM,QM,EWM,CLP)	Meachum Lake	2	Yes (EWM)
Cossayuna Lake	1	Unknown	Middle Saranac	8	Yes (EWM)
Cascade Lake	1	Unknown	Mill Pond	1	Yes (Fan)
Cayuga Lake	1	Yes(HYD,EWM,SWF)	Mirror Lake	2	Not Observed
Cedar River Flow	1	Unknown	Moose Pond	3	Not Observed
Chateaugay Lake	3	Yes (EWM)	Moss Lake	1	Unknown
Chazy Lake	2	Yes (EWM)	Mountain View Lake	3	Yes (EWM)
Conesus Lake	1	Yes (EWM)	Mystic River	1	Yes (WC)
Deer River Flow	3	Yes (EWM)	Northern Montreal	1	Unknown
Delaware River	2	Yes (ZM)	Osgood Pond	7	Not Observed
Fish Creek	2	Yes (EWM)	Oswegachie River	1	Yes (VLM)
Floodwood Pond	3	Yes (EWM)	Parmeter Pond	1	Unknown
Follensby Clear Por	6	Yes (EWM)	Polliwog Pond	1	Not Observed
Franklin Falls	1	Yes (EWM,CLP)	Rainbow Lake	8	Yes (SN)
Grasse River	2	Yes (FB)	Raquette Lake	1	Yes (VLM)
Green Pond	2	Not Observed	Raquette River	3	Yes (EWM)
Hoel Pond	2	Not Observed	Rental	24	
Horseshoe Pond	1	Not Observed	Rollins Pond	7	Unknown
Indian Lake	1	Yes (EWM)	Round Pond	1	Unknown
Jones Pond	3	Unknown	Great Sacandaga Lake	1	Yes (EWM, SWF)
Kiwassa Lake	2	Yes (EWM)	Saranac River	4	Yes
Lake Champlain	11	Yes (EWM, CLP, VLM, WC)	Seneca Lake	1	Yes (ZM)
Lake Clear	5	Not Observed	Seneca River	1	Yes (ZM)
Lake Flower	13	Yes (EWM, VLM, CLP)	Skaneateles Lake	1	Yes (EWM)
Lake George	1	Yes (EWM, CLP, ZM)	South Lake	1	Unknown
Lake Kushaqua	1	Yes (SN)	Square Pond	1	Yes
Lake Minerva	1	Yes (EWM)	St Regis Pond	2	Not Observed
Lake Ontario	1	Yes (ZM)	St Regis River	3	Not Observed
Lake Ozonia	1	Unknown	St. Lawrence River	4	Yes (ZM,SWF,CLP,EWM)
Lake Placid	13	Yes (VLM)	Tupper Lake	8	Yes (VLM)
Lake Titus	1	Unknown	Upper Saranac Lake	22	Yes (EWM)
Lake Wawayanda	1	Unknown	Upper St Regis	179	Not Observed
Leplatte River, VT	1	Unknown	White Birch Pond	1	Unknown
Little Clear Pond	12	Not Observed	Long Pond	1	Not Observed
Little Green Pond	3	Not Observed	Mountain Pond	1	Not Observed
Little Long Pond	1	Not Observed	Schroon Lake	1	Yes (EWM)
Little River	1	Unknown	Lake Colby	2	Yes (EWM)
			Fourth Lake	1	Yes (EWM)

Table 94- Waterways visited in the prior two weeks, Upper St. Regis Lake, 2011. EWM=Eurasian Watermilfoil; CLP= Curlyleaf Pondweed; VLM=Variable Leaf Milfoil; WC=Water Chestnut; ZM=Zebra Mussels; QM=Quagga Mussels; SWF=Spiny Waterflea; HYD=Hydrilla; FB= Europe.

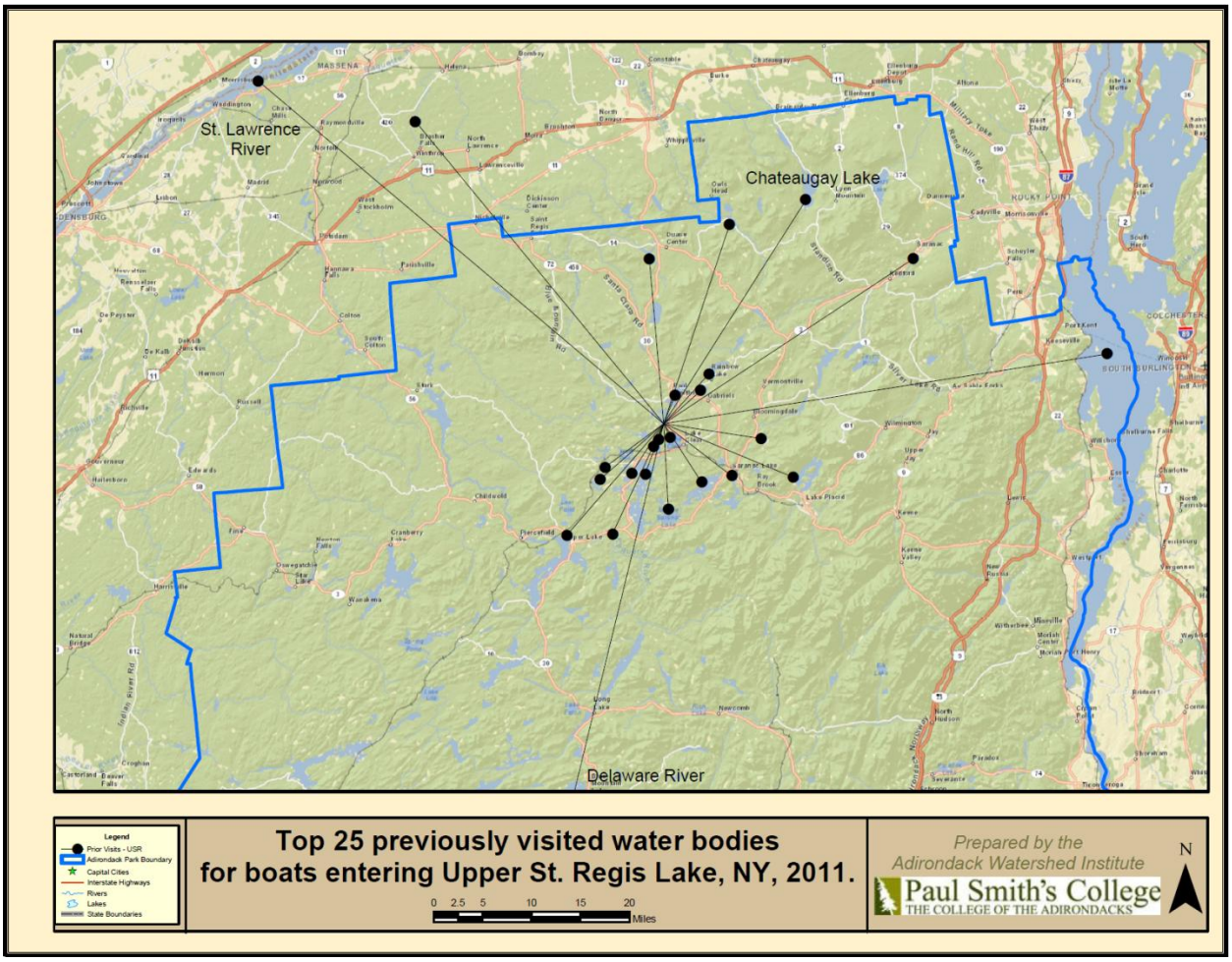


Figure 104- Prior waterway visitations, boats launching in Upper St. Regis Lake, 2011.

Invasive species spread prevention- Organisms removed from watercraft

Stewards removed a total of 32 organisms from watercraft both entering and leaving the Upper St. Regis boat ramp. Stewards removed only two invasive species, both from a 150 horsepower outboard boat on 8/11/11 which reported having previously visited Upper St. Regis Lake in the prior two week period. The boat, registered in New York State, was exiting from Upper St. Regis Lake at the time of the inspection and did not use the boat wash. Boats were more likely to be carrying organisms when entering the boat ramp as compared with leaving the waterway, but this could be a result of fewer boat inspections on watercraft leaving the boat ramp due to the steward's position near the boat wash, down the road from the ramp. It is common for boaters leaving the boat ramp to speed by the steward's station, precluding a thorough inspection. The overall infestation rate for any organism for watercraft using the Upper St. Regis boat ramp is 32 of 610 total groups, or 5.2%. The invasive species infestation rate is 2 of 610 groups, or 0.3%, which is low compared with other waterways in the WSP (see Executive Summary). 181 visitors used the boat ramp, of 610 total groups, or 30% of groups. This is down considerably from 2010, when 53% of groups used the boat wash.

Organism	Entering	Leaving	Prior waterway
Eurasian watermilfoil	1		Upper St. Regis
Curlyleaf pondweed	1		Upper St. Regis
Grass	13	1	
Leaves	1		
Native milfoil	1	2	
Native pondweed	1	1	
Moss	2		
Bladderwort	1		
Pine needles	6	1	
totals	27	5	

Table 95- Organisms removed from watercraft, Upper St. Regis Lake, 2011.

Discussion:

The summer of 2011 at the Upper St. Regis Lake boat launch brought a 12% decrease from 2010 in the number of watercrafts and a 13% decrease in visitors. This is the 12th year that a watershed steward has been present as the boat launch. This season motorboats were the most prevalent form of watercraft using the Upper St. Regis boat launch. Four stroke outboards increased from 22% in 2010 to 36% in the 2011 summer. Motor boats made up 36% of the watercraft this season compared to 32% in 2010. Of the 610 groups encountered, 178 used the on-site boat wash (29%), which is a lower rate than the 37% figure tallied in both 2010 and 2009. This decrease in compliance bears attention in terms of analyzing reasons for non-compliance in the future. 30 organisms were discarded after being removed from watercrafts. The stewards educated 1,400 people this season at the Upper St. Regis boat launch about AIS. Many of the boaters only use their boats on the St. Regis Chain of Lake. 179 groups reported Upper St. Regis as the previously visited water body.

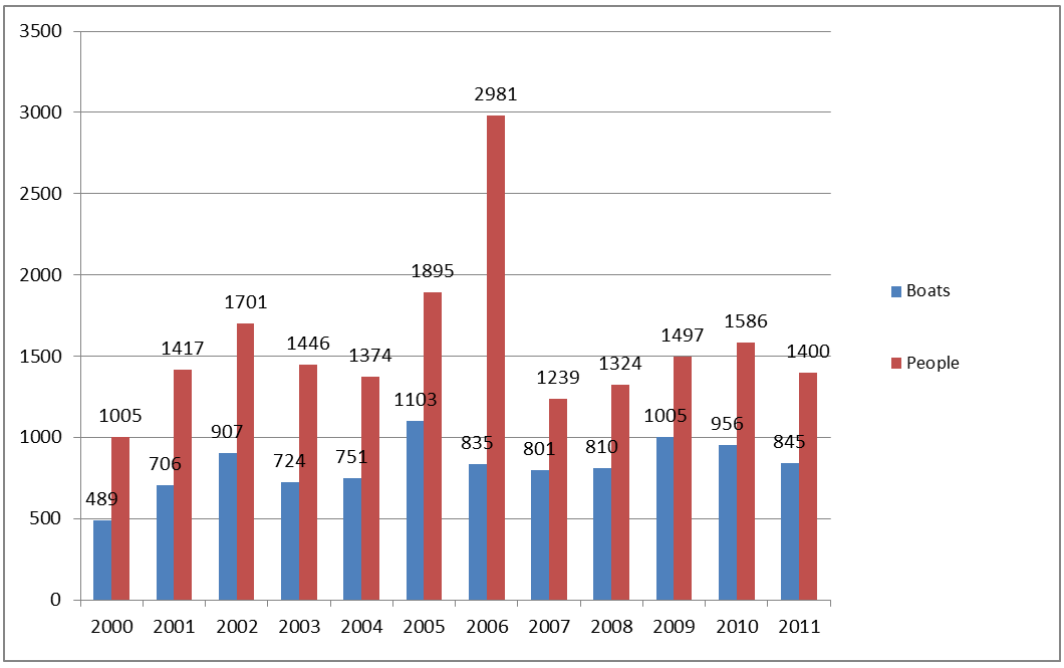


Figure 105- 12-year use figures, Upper St Regis Lake, 2000-2011.

Special Projects on the St. Regis Chain of Lakes

One watershed steward worked for two days on campsites and Lean- tos on the St. Regis chain of Lakes. During these two days the steward worked on a total of 6 sites. The steward would record the condition of the site, fire pit, picnic table, shelter, trails, boat landing, signs, and water access. Stewards also monitored and controlled purple loosestrife (*Lythrum salicaria*) on the St. Regis Lakes, as well as monitoring the banded loons on Spitfire and Upper St. Regis Lake. Finally, a steward was stationed on most weekends at the summit of St. Regis Mountain to encourage Leave-No-Trace ethics.

Conclusion:

During the summer of 2011, when a steward was on duty, a total of 1,400 people and 845 boats used the Upper St. Regis boat launch to launch/retrieve their watercraft. With the increase is awareness of AIS more boaters will engage in using more prevention measure. Stewards removed 32 organisms from watercrafts. Many of the watercrafts were inspected after the boater washed their boat at the wash station located before the launch.

For next year, we hope to achieve a greater boat wash compliance rate from the property owners as well as the visitor boaters. The watercraft owned by property owners and their caretakers present a risk of introducing new invasive species into the St. Regis Chain of Lake. This is why stewards urge boaters to use the boat wash launching and retrieving watercraft.

2011 marked the 12th year of stewardship at Upper St. Regis boat launch, funded each year by the St. Regis Foundation, as well as the St. Regis property Owners' Association. The 2011 watershed stewards would like to thank these groups for their continued support of the program, and by helping us achieve our mission to educate the public about the treat of AIS throughout the Adirondack Park.

Figure 106- Upper St. Regis Lake from summit of St. Regis Mountain.

St Regis Recreation Study 2011											
	Boat Type							total #	Weekly Avg	Four	# of
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	people
5-29-11 to 6-3-11	3	0	0	5	1	0	0	9	92	2	19
6-4-11 to 6-10-11	18	0	0	6	11	0	0	35	83	10	54
6-11-11 to 6-17-11	13	0	0	2	3	0	0	18	41	3	36
6-18-11 to 6-24-11	26	0	0	12	11	1	0	50	61	10	79
6-25-11 to 7-1-11	33	0	0	18	11	0	1	63	47	17	96
7-2-11 to 7-8-11	40	0	0	32	19	1	0	92	58	14	161
7-9-11 to 7-15-11	26	0	1	19	17	0	0	63	52	12	98
7-16-11 to 7-22-11	23	0	1	13	19	0	0	56	60	7	83
7-23-11 to 7-29-11	12	0	0	35	22	0	1	70	40	2	113
7-30-11 to 8-5-11	27	0	0	28	43	0	0	98	53	7	155
8-6-11 to 8-12-11	26	0	0	15	24	0	0	65	79	7	112
8-13-11 to 8-19-11	16	0	0	40	21	0	2	79	53	6	143
8-20-11 to 8-26-11	17	0	0	23	26	0	1	67	63	6	113
8-27-11 to 9-2-11	20	0	2	23	9	0	1	55	65	6	95
9-3-11 to 9-6-11	7	0	1	11	5	1	0	25	39	0	43
totals	307	0	5	282	242	3	6	845	Summer Avg = 59	109	1400
									Median = 50		

Table 96- Upper St. Regis Lake use summary, 2011. M = motorboat; K = kayak; C = canoe; B = construction barge; R = rowboat; S = sailboat; PWC = personal watercraft.

St Regis Recreation Study 2011														
	private	# groups	# groups	organisms found		organism type							
Week	side	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other
5-29-11 to 6-3-11	0	9	1	0	0	0	0	0	0	0	0	0	0
6-4-11 to 6-10-11	4	28	11	2	0	0	0	0	1	0	0	0	1
6-11-11 to 6-17-11	1	16	9	0	0	0	0	0	0	0	0	0	0
6-18-11 to 6-24-11	6	17	9	1	0	0	0	0	0	0	0	0	1
6-25-11 to 7-1-11	12	20	10	1	0	0	0	0	0	0	0	0	1
7-2-11 to 7-8-11	6	57	20	6	0	0	0	0	4	0	0	0	2
7-9-11 to 7-15-11	11	38	19	0	0	0	0	0	0	0	0	0	0
7-16-11 to 7-22-11	7	36	22	0	0	0	0	0	0	0	0	0	0
7-23-11 to 7-29-11	8	38	10	1	1	0	0	1	0	0	0	0	1
7-30-11 to 8-5-11	10	29	15	2	0	0	0	1	1	0	0	0	0
8-6-11 to 8-12-11	7	45	17	2	0	1	0	0	0	0	0	0	1
8-13-11 to 8-19-11	3	40	25	1	0	0	0	0	1	0	0	0	0
8-20-11 to 8-26-11	8	36	20	3	1	0	0	1	2	0	0	0	1
8-27-11 to 9-2-11	6	36	12	6	3	0	1	0	4	0	0	0	4
9-3-11 to 9-6-11	5	14	8	2	0	0	0	0	1	0	0	0	1
totals	94	459	208	27	5	1	1	3	14	0	0	0	13

Table 97- EWM = Eurasian watermilfoil; BW = bladderwort; NM = native milfoil; GRS = grass; WC= water chestnut; ZM = Zebra mussel; VLM = variable leaf milfoil.

St Regis Recreation Study 2011											
	boat	Measures taken to prevent invasive species transport									# groups
Week	wash	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	
5-29-11 to 6-3-11	3	9	2	5	0	0	1	0	2	0	9
6-4-11 to 6-10-11	5	22	15	20	1	0	0	0	3	2	28
6-11-11 to 6-17-11	6	15	8	8	0	0	0	0	3	2	18
6-18-11 to 6-24-11	14	46	17	24	6	0	0	0	13	3	44
6-25-11 to 7-1-11	9	39	22	21	0	0	0	1	9	1	48
7-2-11 to 7-8-11	23	55	32	32	3	0	0	0	23	2	67
7-9-11 to 7-15-11	13	41	27	27	2	0	1	0	15	1	47
7-16-11 to 7-22-11	14	32	19	23	2	0	0	0	8	2	44
7-23-11 to 7-29-11	10	25	5	21	0	0	0	0	4	3	43
7-30-11 to 8-5-11	22	52	25	38	1	0	0	0	4	3	48
8-6-11 to 8-12-11	12	39	15	32	0	0	0	0	3	1	50
8-13-11 to 8-19-11	19	31	14	22	0	0	0	0	5	0	53
8-20-11 to 8-26-11	17	35	12	25	0	0	0	0	7	2	47
8-27-11 to 9-2-11	12	25	7	19	1	0	0	0	2	4	44
9-3-11 to 9-6-11	2	12	2	8	1	0	1	0	4	2	20
totals	181	478	222	325	17	0	3	1	105	28	610

Table 98- I = inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = drained livewell; Dis = disposed of unused bait; Dry = dried boat.

Recreation Use Study: St. Regis Mountain

By Kyle Milner

Figure 107- St. Regis Fire Tower and Observer- 1940 (Agnes Martin).

Introduction

St. Regis Mountain has a special place in the hearts of those who attend Paul Smith's College as well as an historical connection with the local population. Due to the popularity of hiking St. Regis Mountain, soil erosion and summit degradation is a cause for concern. 2011 was been one of the wettest spring seasons on record; as a result the main trail to the summit has been severely impacted.

The Watershed Stewardship Program educated visitors and collected data on visitor recreation for thirteen Sundays from 5/29/2011 – 8/14/2011 on the summit of St. Regis Mountain. The data that was collected attempts to gauge recreational use levels, user groups, and hiker's behavior. In addition several reports and reflective essays as well as natural observations on the evolution of the trail conditions and the user groups throughout the summer were submitted. St. Regis Mountain is located in the St. Regis Canoe Area, therefore the

N.Y.S. D.E.C., “Leave No Trace” policies and philosophies were reinforced and explained to all of the hikers that ascended St. Regis Mountain on the days Paul Smith’s College Watershed Stewards were present.

Figure 108- Ascending St. Regis Mountain.

Methods

Eight-hour work shifts began at 9:00 am. From 9:00 am until 11:00 am, the steward climbed to the summit. While ascending, stewards observed the condition of the trail. The observations ranged from the saturation of the soil and erosion, to obstructions blocking the trail, as well as flora and fauna. From 11:00 am to 3:30 pm, stewards positioned themselves at the summit to educate, record, and observe the various user groups. Data was collected regarding group size, gender, time spent at summit, pets, preparedness, and behavior. Stewards identified distant points of interest to the visitor and answered questions. These interpretive conversations often led to deep and meaningful discussions about the Adirondack Park with regards to its rich and colorful past, present and future.

Results

Stewards encountered 283 people in 101 different groups. The largest volume of people arrived on the Fourth of July weekend. The gender ratio was to 54% male, 46% female. Hiker behavior was overwhelmingly positive. Over 80% of hikers walked and rested on the exposed bedrock and avoided trampling the grass. Most hikers were adequately prepared for ascending St. Regis Mountain. Fewer than 10% of hikers encountered brought their dog. Of that percentage, only one hiker had their dog on a leash. The average group size was 2.8, the mode group size was two, and the average time spent on the summit was 63 minutes.

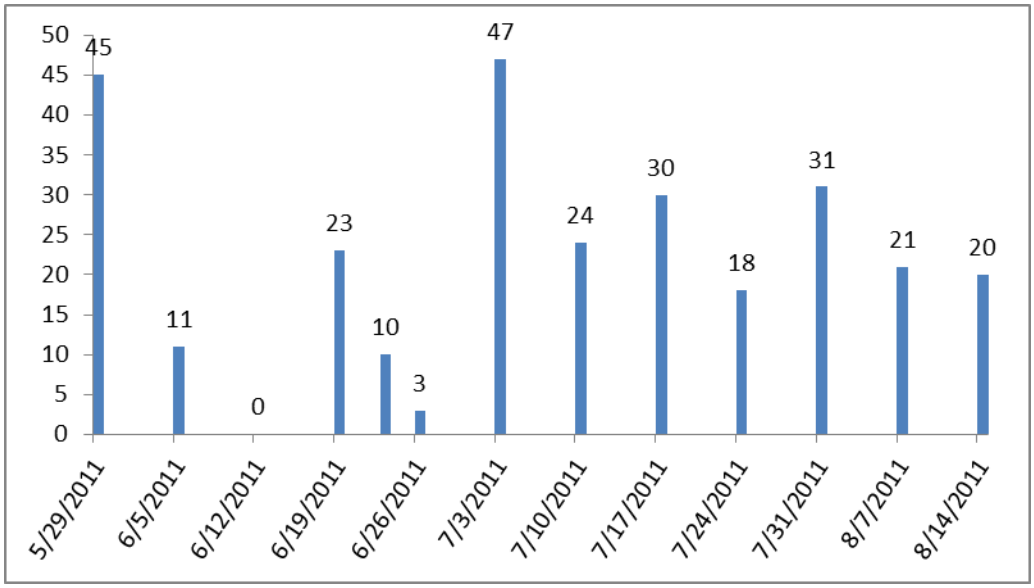


Figure 109- Visitors tallied, St. Regis Mountain summit, 2011.

For the purposes of this study, stewards defined hikers as well prepared if they were wearing boots, non-cotton clothes, and carried a backpack (presumably packed with food, water and first aid supplies). Conversely, hikers with no backpacks, cotton clothes and sneakers/sandals were classified as underprepared. Of the 101 groups observed over the summer of 2011, only 33 groups were observed with either no back pack, sneakers, or cotton clothes (or a combination of these characteristics), for a rate of 33% underprepared user groups. Only a quarter of groups observed brought pets.

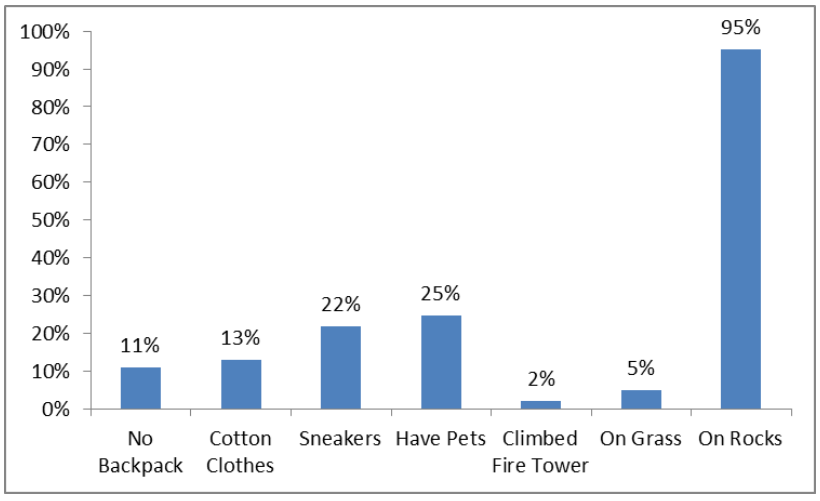


Figure 110- Visitor equipment and behavior, St. Regis Mountain, 2011.

One of the steward's primary educational goals was to inform visitors about Leave No Trace outdoor ethics, specifically with reference to vegetation on the summit. The summit of St. Regis Mountain is almost

completely bare, owing to heavy hiking and resting behavior on part of visitors. While this provides a panoramic view, the remaining soil, grass, and flower communities are threatened by hiker trampling and water erosion due to the increased velocity of surface runoff from the exposed bedrock. The message that the steward imparts is similar to that of the Summit Steward program located in the Adirondack High Peaks: the steward informs the visitor about the status of the remaining soil and vegetation and requests that the visitor avoid stepping or sitting on the remaining soil and vegetation. Of the 101 groups encountered, only five were observed to walk or rest on the grass (5%). These five groups of grass walkers also were likely fall into the category of "underprepared," as four of the five groups (80%) had some combination of cotton clothing, sneakers or lacked a backpack. Only one group that was considered suitably prepared walked on the grass. Only two groups, a single male and two males, climbed the fire tower (2% of total groups).

Discussion and Conclusion

On 6/12/11, no people arrived on the summit; this can most likely be attributed to the rain. On 8/21/11, no ascent was made due to a daylong severe thunder and lightning warning put out by the national weather service. Steward Kyle Milner completed 10 days of coverage, Steward Kim Forrest completed 2 days of coverage, and Tim Willson covered the summit on one day, a Thursday in June.

Over all, the end of May 2011 was extremely wet and was accompanied with major flooding in the region. The water pooled up on the start of the trailhead and beyond. The majority of trail flooding during this wet period occurred from the trailhead to the bridge over the stream crossing. It took many weeks for this massive amount of water to drain away. At the same time trail impact was accelerated with these wet conditions.

Hikers were better prepared overall than they were the last time the study was conducted, in 2007. Slightly fewer lacked a backpack or wore cotton clothes. About the same number wore sneakers and had pets. Far fewer people in 2011 were observed walking on summit grass, and more groups were observed walking and resting on the rocks, which is the desired behavior for soil and vegetation conservation. About the same percentage of visitors climbed the fire tower.

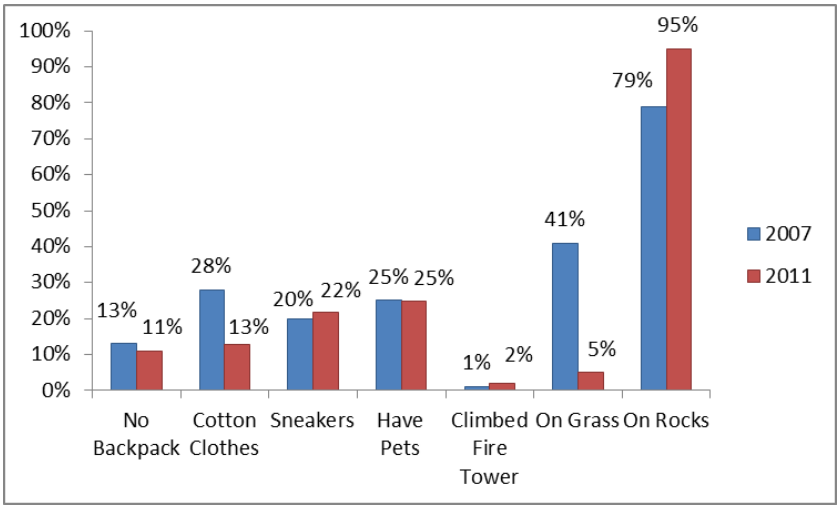


Figure 111- Visitor preparation and behavior, 2007 and 2011.

Weekend Hikers St. Regis Mountain	
Year	# Hikers
2001	632
2002	554
2003	689
2004	859
2007	562
2011	283

Table 99- St. Regis Mountain visitor tally, 2001-2011.

Overall, the number of weekend hikers observed in 2011 appeared fewer than in past years, but stewards only covered Sundays, where in past years, Saturdays were covered in addition to Sundays. Thus, use levels are estimated to be comparable to past summers. Almost every hiker stewards came in contact with was generally receptive to the message and actively attempted to minimize their impact on the trail and summit. Stewards would recommend strategic placement of a sign on the summit informing the public of the sensitive nature of summit soil and vegetation.

St. Regis Mt. Data Summer 2011														
Dates	Average	# of	Total	Avg. Time	Gender		Equipment			Pets		Behavior		
of coverage	group size	groups	visitors	on summit	Male	Female	NBP	CC	S	Y	N	climb twr	on grass	on rocks
5/29/2011	6	7	45	33	25	20	1	0	1	4	3	0	0	7
6/5/2011	3	4	11	33	5	6	0	0	0	0	0	0	0	4
6/12/2011	no visitors													
6/19/2011	2	15	23	33	12	11	2	0	3	3	12	0	0	15
6/23/2011	5	2	10	n/a	4	6	2	2	2	0	0	0	0	0
6/26/2011	3	1	3	2	1	2	0	1	1	0	0	0	0	1
7/3/2011	3	16	47	22	28	19	1	1	3	5	11	0	0	16
7/10/2011	2	13	24	46	11	13	0	0	3	3	10	0	0	13
7/17/2011	4	8	30	43	16	14	0	0	0	3	5	0	0	8
7/24/2011	3	6	18	42	9	9	0	0	0	2	4	0	0	6
7/31/2011	2	14	31	87	19	12	3	7	3	1	13	1	3	12
8/7/2011	3	8	21	65	13	8	2	1	3	3	5	1	2	7
8/14/2011	3	7	20	77	10	10	0	1	3	1	2	0	0	7
Totals	summer avg = 2.8	101	283	63	153	130	11	13	22	25	65	2	5	96

Table 100- St. Regis Mountain data, 2011. NPB = no backpack; CC = cotton clothes; S = wearing sneakers.

Figure 112- Bedrock and vegetation on summit of St. Regis Mountain.

Recreation Use Study: Tupper Lake State Boat Launch

By: Katelin Isaacson, Watershed Steward

Introduction

In 2011, Paul Smith's College Watershed Stewardship Program placed a steward Friday-Monday at the Tupper Lake state boat launch to prevent the spread of variable leaf milfoil (VLM), other aquatic invasive species and native plant life through public education and boat inspections. This four-day span was an increase in coverage compared to the summer of 2010, where a steward on duty only on Saturdays and Sundays. The only known invasive species on Tupper Lake is variable leaf milfoil (*Myriophullum heterophyllum*). VLM is a threat to other bodies of water near Tupper Lake and Simond Pond that currently do not have VLM beds. It has become a nuisance because it creates thick mats which can out-compete native plants for sunlight. This causes a reduction in the quality of recreation because the VLM can become ensnared in boat propellers and it can make it harder for people to swim and fish.

Figure 113- Steward Andrew Bull and friend in Tupper Lake parade.

Methods

From Memorial Day to Labor Day, the Watershed Stewardship Program posted stewards were at the Tupper Lake State boat launch from Friday through Monday each week. Stewards worked from 7:00 am to 4:00 pm welcoming boaters to the launch and giving them a brief interview and courtesy boat inspection. Stewards asked boat operators where they had been in the last two weeks prior to the launching. Secondly, they asked what preventative measures visitors had taken to help stop the spread of invasive species, and if visitors knew about the threats of VLM and other aquatic invasive species (AIS). Stewards collected additional data consisting of the number of people in each group, the type of boat, the horsepower of the engine, and if the outboard motors were four-stroke.

After the interview was conducted, the stewards visually inspected the boat for any aquatic plant and animal life. They paid close attention to hard to reach areas, like the transom and prop on the motor, as well as any protruding edges and the wheel wells of the trailer. After the inspection, boat operators were handed cards and stickers to remind them of the inspection process and some of the aquatic invasive species information. Stewards also reminded boaters to keep the waters clean. Stewards participated in the annual community parade, walking alongside volunteers to promote the message of the Watershed Stewardship Program and to encourage the community to help prevent the spread of aquatic invasive species.

Results

In the summer of 2011, Paul Smith's College Watershed Stewards inspected 1,216 boats at the state boat launch. These boats were launching or retrieving during the 7am-4pm shifts on Friday through Monday. Stewards came in contact with 2,658 people that included boat operators and their guests. The highest number of boats occurred during July 1, 2011 through July 4, 2011 (174 boats). Weeks with high volumes of boats and recreators occurred July 15-18, 2011 and August 5-8, 2011.

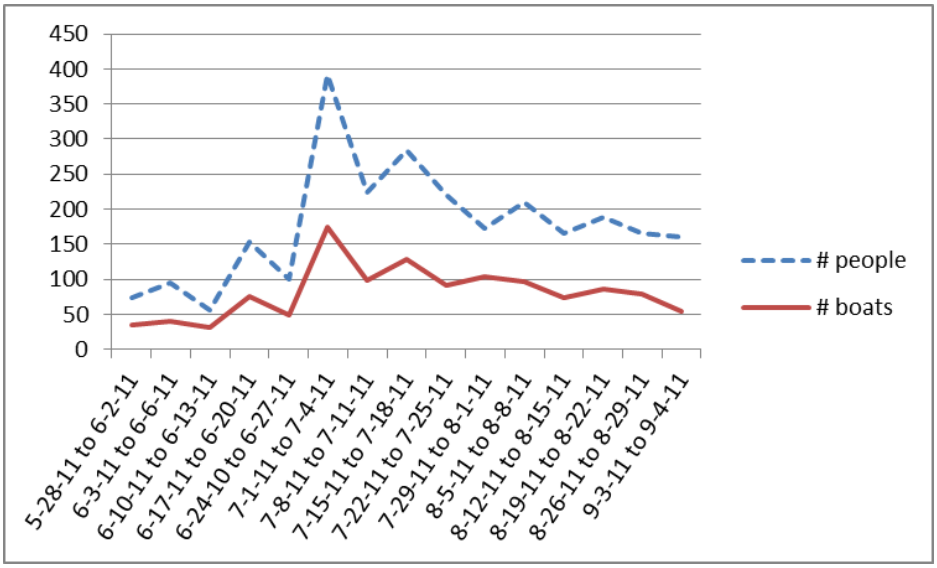


Figure 114- Use at Tupper Lake state boat launch, 2011.

The most frequent category of watercraft that launched at the site was motorboats, with a total of 927. This represented 76 % of the total watercraft observed between Memorial Day and Labor Day. Canoes (140, 12%) and kayaks (80, 7%) were the next most encountered watercraft. While the steward was conducting a courtesy boat inspection on the motorboat, they recorded whether it had a four-stroke or two-stroke outboard. Out of the total 896 motor boats 340 had a four-stroke engine, for a rate of 38%. Over the 55 days of coverage for the summer, the average number of watercraft inspected each day was 22, indicating a steady and significant degree of usage.

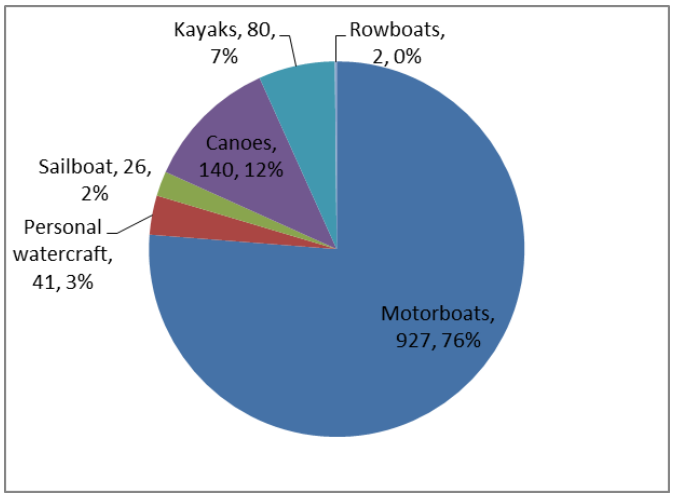


Figure 115- Categories of watercraft, Tupper Lake 2011.

The steward recorded the state of origin of each group to help determine the range of usage within the state boat launch. To determine the state, the steward observed the boat's registration sticker. If this were unavailable, the steward would ask where visitors were from. New York was the most common state with a total of 795 watercrafts. In total there were 15 different states and 1 province observed at the boat ramp.

State/Province	# boats	State/Province	# boats
CT	13	NC	2
FL	2	NH	1
ID	1	NJ	21
IL	2	NY	795
MA	5	OH	1
MD	2	PA	24
ME	1	VA	2
QC	1	VT	5
		Total	878

Table 101- State/province of origin, boats launched at Tupper Lake, 2011.

In addition to the state of origin collected, stewards also asked recreationalists if they took any preventative measures to stop the spread of invasive species and native plant life upon their watercraft. 1,069 user groups were queried. Of these, 726 (68%) took aquatic invasive species (AIS) spread prevention measures when transporting their watercraft from one body of water to another. The most common spread prevention measure taken by visitors was washing their watercraft (51%), followed by boat inspection (39%), drying their boat (7%) and draining their bilges (5%).

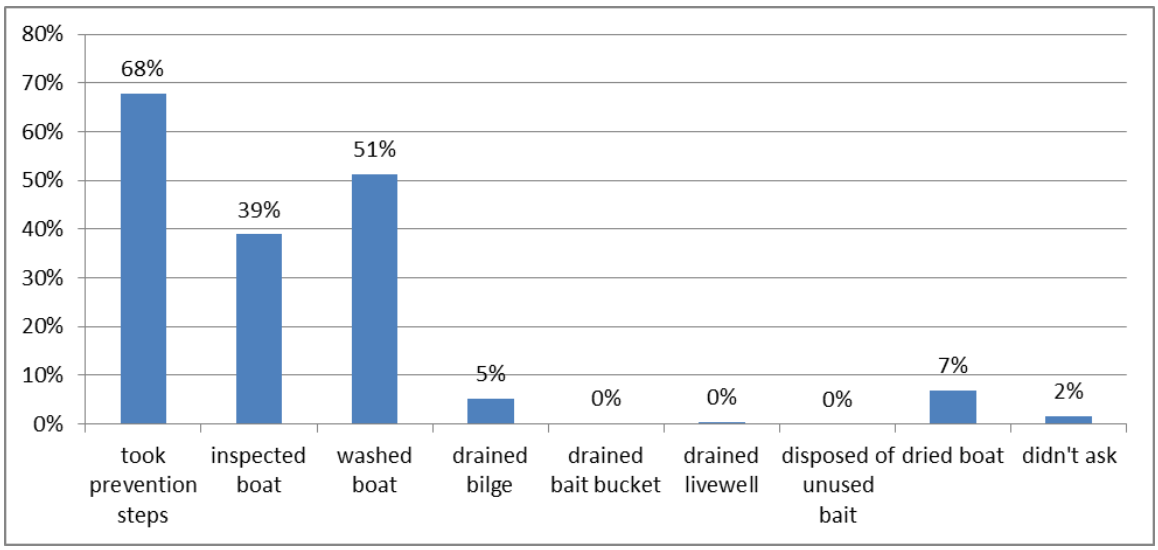


Figure 116- Aquatic invasive species spread prevention measures taken by visitors, Tupper Lake 2011.

The watershed steward also visually inspected each watercraft, with the owner's permission, to look for any invasive species or native plant life. Specifically, they checked the boat, trailer, fishing gear, live wells and anchor lines. If the inspection revealed an organism, this was recorded and removed from the watercraft. Twice, stewards found water chestnut nutlets on watercraft entering the boat ramp. In both cases, the boats had not been in any waterway in the prior two weeks. Also on two occasions, stewards removed Eurasian watermilfoil from watercraft, on one boat entering the boat ramp, which reported having been in Tupper Lake in the prior two weeks, and on a boat leaving the waterway, which cited having been on Middle Saranac Lake. Four boats departing the ramp were infested with variable leaf milfoil. Three of these boats reported visiting Tupper Lake previously, and the fourth reported no prior visits to other waterways. A variety of other organism fragments were removed from watercraft. 73 organisms were removed in total from boats departing the waterway (infestation rate of 17 %) while 50 organisms were removed from boats entering the waterway (infestation rate of 6%). Thus, boats were three times as likely to be infested with some organic material when they were departing Tupper Lake. The overall infestation rate (any organism) for boats using the boat ramp was 127 organisms found on 1,216 boats, or 10%, with an infestation rate (invasive organisms) of 8 of 1,216 for a rate of 0.6%.

Organism	Entering	Leaving	Prior waterway
Eurasian watermilfoil	1	1	Tupper Lake, Middle Saranac Lake
Water Chestnut	2		First time out, trailer from NJ, boat from NY
Variable milfoil		4	First time out, Tupper Lake (3 boats)
Grass	31	61	
Bladderwort	1	3	
Tree leaves	1	1	
Lily pad		1	
Native pondweed	1	1	
Moss	1		
Twig	1		
Pine needles	5		
Other (unidentified)	3	1	
totals	47	73	

Table 102- Organisms removed from watercraft, Tupper Lake 2011.

In addition to the state and type of plant life found while conducting the boat inspection, the steward asked the boater where their boat had been prior to Tupper Lake in the previous two weeks. As previously stated, this would help to determine if there could be new outbreaks of plant life on the lake, or if the boat had picked up the specimen at the previous body of water. Out of the total number of boats launching and retrieving, they reported of using 74 different bodies of water. The majority of the bodies of water visited were within New York and surrounding states. The most frequented body of water was Tupper Lake with a total of 560 boats. Tupper Lake was followed by Long Lake with 19 visits and Upper Saranac Lake with a total of 14 visits.

Body of Water	Infected	Total Visits	Body of Water	Infected	Total Visits
Atlantic Ocean	Yes	1	Long Lake		19
Albany,NY	Unknown	1	Lower Saranac Lake	Yes (EWM, VLM, CLP)	1
Bald Eagle Resevoir		1	Middle Saranac Lake	Yes (EWM, VLM, CLP)	2
Blue Mountain Lake		1	Mirror Lake		1
Boat Repair	Unknown	1	Mohawk River	Yes	2
Boot Tree	Unknown	2	Nabnasset Lake, MA	Yes	1
Canada Lake	Unknown	1	Nicks Lake		2
Canandaigua	Yes	3	None		212
Carry Falls Reservoir	Yes (VLM)	3	Norwood Lake		1
Cayuga Lake	Yes (EWM, ZM)	2	Not Sure		2
Connecticut River	Yes	1	Oneida Lake	Yes (ZM)	2
Copake Lake	Yes	1	Otisco Lake	Yes (EWM)	1
Cranberry Lake	Yes (VLM)	12	Pleasant Lake	Unknown	1
Didn't Ask		7	Rainbow Lake	Yes (SN)	1
Durant Lake	Unknown	1	Raquette Lake	Yes (SN)	8
East Fork Cincinnati		1	Raquette River	Yes (VLM)	7
Finly Lake	Unknown	1	Rental		14
Fish Creek Pond	Yes (EWM)	3	Richelieu River (Canada)	Yes (ZM)	1
Floodwood Pond	Unknown	1	Rockland County		1
Forked Lake		1	Rollins Pond	Unknown	1
Fourth Lake	Yes (EWM, VLM)	1	Saranac Chain	Yes (EWM)	1
Franklin Falls	Yes (EWM, CLP)	1	Saranac Lake	YES	6
Hoel Pond		2	Saratoga Lake	Yes (EWM)	1
Honeyoye Lake	Yes (EWM, CLP)	1	Schenectady Lake		1
Hudson River	Yes (WC, ZM)	5	Seneca Lake	Yes	1
Indian Lake		2	Silver Lake		1
Inlet		1	Sodas Bay	Unknown	1
Kiwassa Lake	Yes (EWM)	1	Speculator		1
Lake Bonaparte	Yes (EWM)	1	St. Lawrence River	Yes	11
Lake Champlain	Yes (EWM, VLM, CLP,	3	St. Lawrence Sound	Yes	2
Lake Delta		1	Stoney Creek	Unknown	1
Lake Erie	Yes	3	Summers Point Bay, NJ	Unknown	1
Lake Flower	Yes (EWM, VLM, CLP)	9	Tompsons Lake		1
Lake George	Yes (EWM, CLP, ZM)	2	Tupper Lake	Yes (VLM)	560
Lake Ontario	Yes (ZM)	6	Twitchell Lake	Unknown	1
Lake Placid	Yes (VLM)	8	Upper Saranac Lake	Yes (EWM)	14
Little Tupper Lake	Not Observed	1	Upper St. Regis Lake	Not Observed	1
Little Wolf		2	Whites Lake		1
Long Island Sound	Yes	5	Wolf Pond		1
			Total		987

Table 103- Two-week prior waterway history, boats visiting Tupper Lake, 2011.

Discussion

Over the course of Labor Day through Memorial Day in the summer of 2011, stewards at Tupper Lake educated a total of 2,658 boaters in 1,069 groups. While discussing aquatic invasive species, they inspected 1,216 boats. In 2010, the number of boaters encountered was 3,253 and the number of boats inspected was 1,703. The coverage of Tupper Lake State Boat Launch increased from 3 days weekly in 2010 to 4 days in 2011. However, despite an increase in coverage, there was a decrease in the number of people contacted at the launch. Perhaps getting volunteers from the Tupper Lake Steward volunteer program to cover extra days would allow for more

outreach to the community. Courteous boat inspections remain important for the protection of Tupper Lake to prevent it becoming infected with other aquatic invasive species besides Eurasian watermilfoil. Our findings indicate that boats using Tupper Lake are more likely to transport organic material elsewhere than are boats entering the lake. Tupper Lake's present infestation of variable leaf milfoil has the potential of being spread to other bodies of water on boats leaving the ramp. Boaters continue to recreate on Tupper Lake and travel from many parts of New York State and surrounding states. This shows the importance of education and the need for education on preventative measures to help slow the process of introducing new AIS into the Tupper Lake and surrounding bodies of water.

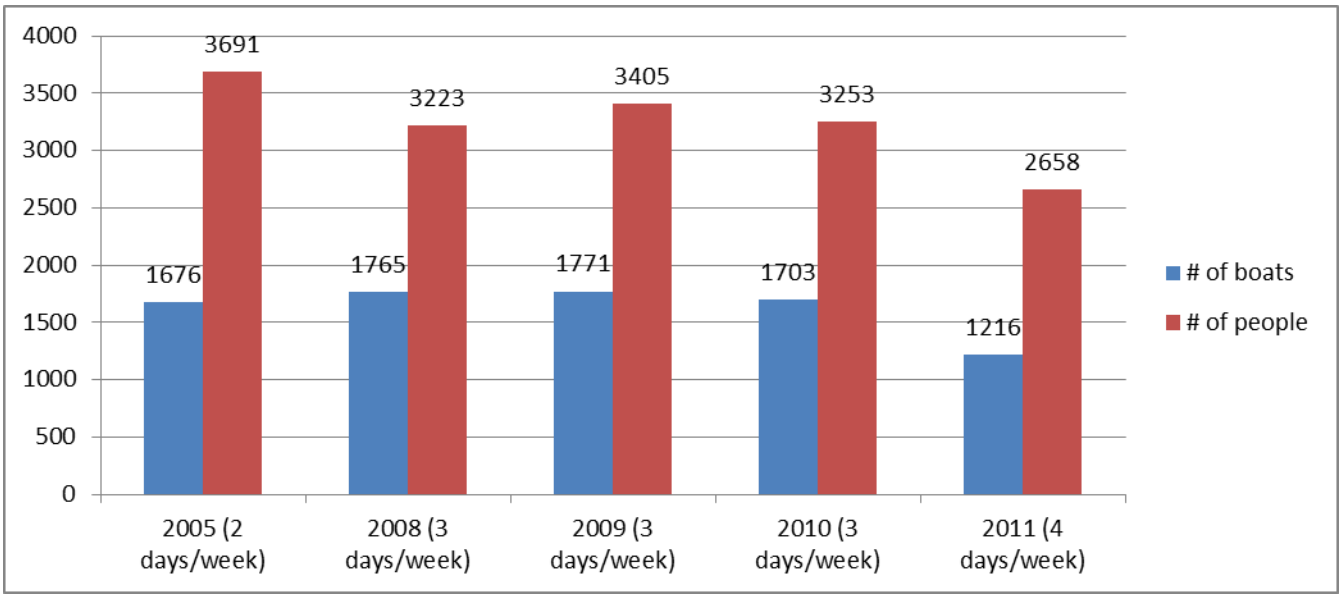


Figure 117- Use tallies, 5-year period, Tupper Lake boat launch.

Conclusion

While use of the Tupper Lake boat ramp appears to be steadily declining over the past five summers, it remains a comparatively well-used access point which merits a spread prevention and education presence to intercept boats both entering and leaving the waterway. Tupper Lake is a high-quality waterway that deserves interpretation and protection as a local and regional recreational and ecological resource. Tupper Lake is infested with at this point only one invasive species, and thus it is important for the watershed stewards to provide crucial preventative measures to boat operators and their guests. All boaters within and outside the community should be aware of how they can take responsibility in order to stop the spread of aquatic invasive species on their boats and equipment. Taking five minutes of their time at a launch to provide simple tips will help visitors and residents to protect the lake they love.

The Watershed Stewardship program helps to connect the environment to people who utilize all Tupper Lake's resources for recreation and commercial purposes. Outreach to not only people within the community but to visitors will allow Tupper Lake to grow as a community within the town and help protect the precious watershed. This summer's Watershed Stewards prevented two aquatic invasive species (water chestnut and Eurasian watermilfoil) from entering the lake. Hopefully these courteous boat inspections and awareness stickers will keep the Tupper Lake watershed for future generations to come recreate and experience the plant and aquatic life thriving within Tupper Lake. The watershed steward program in 2011 was made possible through a generous grant from the federal Great Lakes Restoration Initiative through the United States Fish and Wildlife Service.

Tupper Lake Recreation Study 2011

	Boat Type							total #	Weekly Avg	Four	# of
Week	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	people
5-28-11 to 6-2-11	32	1	0	1	0	0	0	34	87	16	73
6-3-11 to 6-6-11	35	0	0	4	1	0	0	40	65	16	94
6-10-11 to 6-13-11	27	0	0	5	0	0	0	32	63	8	56
6-17-11 to 6-20-11	69	2	0	3	1	0	1	76	59	31	154
6-24-10 to 6-27-11	39	1	0	4	4	0	0	48	54	7	100
7-1-11 to 7-4-11	147	10	1	4	12	0	0	174	72	62	391
7-8-11 to 7-11-11	72	7	0	17	3	0	0	99	64	14	224
7-15-11 to 7-18-11	100	5	1	14	8	0	1	129	71	35	284
7-22-11 to 7-25-11	69	3	0	13	6	0	0	91	75	30	221
7-29-11 to 8-1-11	78	3	0	17	6	0	0	104	65	27	173
8-5-11 to 8-8-11	48	6	0	34	8	0	0	96	76	18	209
8-12-11 to 8-15-11	62	2	2	0	8	0	0	74	74	28	165
8-19-11 to 8-22-11	53	1	0	17	15	0	0	86	72	19	189
8-26-11 to 8-29-11	48	0	22	1	8	0	0	79	60	13	165
9-3-11 to 9-4-11	48	0	0	6	0	0	0	54	77	20	160
totals	927	41	26	140	80	0	2	1216	Summer Avg = 70	344	2658
									Median HP = 60		

Table 104-Upper St. Regis Lake use summary, 2011. M = motorboat; K = kayak; C = canoe; B = construction barge; R = rowboat; S = sailboat; PWC = personal watercraft.

Tupper Lake Recreation Study 2011

	# groups	# groups	organisms found		organism type							
Week	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other
5-28-10 to 6-2-11	24	17	0	2	0	0	0	2	0	0	0	0
6-3-11 to 6-6-11	34	14	4	3	0	0	0	5	0	0	0	2
6-10-11 to 6-13-11	24	8	3	2	0	0	0	2	0	0	1	2
6-17-11 to 6-20-11	66	26	6	5	0	0	0	7	2	0	1	1
6-24-11 to 6-27-11	38	14	5	1	1	0	0	4	0	0	0	1
7-1-11 to 7-4-11	147	49	4	17	0	1	0	12	0	0	2	6
7-8-11 to 7-11-11	59	38	3	5	0	0	0	4	0	0	0	4
7-15-11 to 7-18-11	82	41	8	3	0	0	0	9	0	0	0	2
7-22-10 to 7-25-11	65	40	3	7	0	0	0	8	0	0	0	2
7-29-11 to 8-1-11	65	44	7	8	0	2	0	11	0	0	0	2
8-5-11 to 8-8-11	44	35	1	9	0	0	0	8	0	0	0	2
8-13-10 to 8-19-10	49	32	1	10	1	1	0	9	0	0	0	0
8-20-10 to 8-26-10	41	27	1	1	0	0	0	2	0	0	0	0
8-27-10 to 9-2-10	53	31	1	3	0	0	0	4	0	0	0	0
9-3-10 to 9-6-10	31	28	3	2	0	0	0	5	0	0	0	0
totals	822	444	50	78	2	4	0	92	2	0	4	24

Table 105- EWM = Eurasian watermilfoil; BW = bladderwort; NM = native milfoil; GRS = grass; WC= water chestnut; ZM = Zebra mussel; VLM = variable leaf milfoil.

Tupper Lake Recreation Study 2011										
	Measures taken to prevent transport of invasive species									
Week	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
5-28-11 to 6-2-11	27	18	23	3	0	0	0	2	1	34
6-3-11 to 6-6-11	31	17	25	3	0	1	0	4	4	38
6-10-11 to 6-13-11	23	12	17	4	1	0	0	3	2	28
6-17-11 to 6-20-11	52	34	44	4	0	0	0	2	2	63
6-24-11 to 6-27-11	36	24	24	1	0	0	0	1	1	69
7-1-11 to 7-4-11	138	83	111	6	0	1	0	13	5	167
7-8-11 to 7-11-11	56	41	32	2	0	0	0	1	1	79
7-15-11 to 7-18-11	91	65	63	11	1	1	0	11	1	114
7-22-11 to 7-25-11	45	18	36	5	0	0	0	3	0	82
7-29-11 to 8-1-11	53	34	42	3	0	0	0	1	0	67
8-5-11 to 8-8-11	44	23	31	2	0	0	0	3	0	66
8-12-11 to 8-15-11	28	7	22	2	0	0	0	0	0	69
8-19-11 to 8-22-11	30	17	17	3	0	1	0	5	0	64
8-26-11 to 8-29-11	55	21	48	3	0	0	0	24	1	76
9-2-11 to 9-5-11	17	2	14	3	0	0	0	0	0	53
totals	726	416	549	55	2	4	0	73	18	1069

Table 106- I = inspected boat; WB = washed boat; DB = drained bilge; BB = emptied bait bucket; LW = drained livewell; Dis = disposed of unused bait; Dry = dried boat.

Recreation Use Study: Western Roving Sites

By: Kirsten Goranowski, Stephanie Pena, Kristen Haynes, and Greg Cerne, Watershed Stewards

Figure 118- View of Limekiln Lake Campground Entrance (K. Goranowski).

Introduction

The goal of the Paul Smith's College Watershed Stewardship Program (WSP) is to educate and promote awareness about the negative impacts of aquatic invasive species (AIS) within the Adirondack Park. Waterways with an AIS population have the potential of changing entire ecosystems as well as affecting businesses and tourism in the affected areas. Initiated in 2000, the WSP has expanded from the eastern Adirondacks into the central and western portion of the park in the summer of 2011 thanks to a grant from the U.S. Fish & Wildlife Service with funding from the Great Lakes Restoration Initiative. During a one-week training session, Stewards were taught how to properly engage the public with information about AIS prevention and the importance of keeping all boats and boating equipment clean.

In addition to their regularly scheduled duties at Fourth Lake, Seventh Lake, Raquette Lake and Long Lake boat ramps, stewards intermittently visited six additional sites deemed significant by New York State officials and property owner associations concerned with regional AIS spread prevention. One of the launches covered for the first time in the summer of 2011 by the WSP in the western Adirondacks was Limekiln Lake Public Campground and Day Use Area (Limekiln Lake). Just outside Inlet, NY Limekiln Lake has 271 tent and trailer sites, pavilion rental, a

swimming area, nature trail, and canoe rentals. The land for the campground was purchased from Gould Paper Company and the campground was opened in 1963. Fortunately there are no known AIS within Limekiln Lake, and therefore preventative measures were highly stressed while launching all watercraft. A courtesy boat inspection was given to launching boat users and the Steward recorded lake-user profile data. Recorded data was then input into an electronic database.

Eighth Lake Public Campground (Eighth Lake), located on State Route 28 between the towns of Inlet and Raquette Lake in Hamilton County, NY has 126 tent and trailer sites that can accommodate up to a 40 foot RV. Eighth Lake is located on the southeast shore of 314 acre Eighth Lake and offers great fishing for lake trout. The Civilian Conservation Corps established a work camp on Eighth Lake that built a new campground which opened in 1935.

A steward spent one day at Forked Lake Public Campground (Forked Lake) in the town of Long Lake, NY. There are 77 campsites accessible by boat and/or trail and three sites that can accommodate up to 20 foot RVs.

Figure 119- Car barge at the Stillwater Reservoir NYS DEC Boat Launch, 2011. (G. Cerne).

A Steward was stationed at Stillwater Reservoir four times during the summer, camping out one night both times. Stillwater Reservoir is 6,700 acres and is surrounded by the Five Ponds Wilderness Area and the Independence River Wild Forest. Camping is limited to 46 designated sites around the perimeter of the reservoir or 150 feet above the high-water mark.

Figure 120- View of Burke's Marina on NYS Route 28, 2011. (G. Cerne).

The Hollywood Hills Homeowners Association was contacted and a steward covered their private boat launch on First Lake one Saturday during the summer. The steward was told that the launch is busiest on Sundays, as that is the day rentals turn over in the area. Only property owners in Hollywood Hills and their guests can use the launch; however, the steward was informed that even among property owners, it is common to launch in multiple waterways during the summer, which could pose a threat to the Fulton Chain of Lakes. Many of the residents of Hollywood Hills were very supportive of the program, and interested if the WSP would have a continued presence there. A steward was occasionally stationed at Burke's Marina on Raquette Lake while the Raquette Lake Property Owners' Association (RLPOA) usually covered Friday evenings. Volunteers from the RLPOA stewarded at Burke's Marina on Friday nights. They also used volunteer stewards on some other occasions at both Burke's and Bird's Marina on Raquette Lake for a total of 612 boats inspected with 929 people.

Figure 121- Burke's Marina Boat Launch on Raquette Lake, 2011. (G. Cerne).

Methods

From May 29th until September 4th, Watershed Stewards were stationed at the boat launches from 7am until 4pm, with one hour for breaks (Table 107). Boaters who were preparing to launch were approached by the Watershed Steward on duty, and given a brief introduction of the WSP goals and importance of the Stewards presence at the boat launch. As the boaters were preparing to launch the watercraft, observable data was recorded on a data sheet which included boat type, horsepower of the outboard, if it was a four stroke, state of registration, launching/retrieval time, visitor's AIS prevention steps, and the last body of water visited within the past two weeks. Next a visual inspection of the launching watercraft was given for any possible AIS that might be on the boat. If any organisms were found, they were collected and properly disposed of far away from the shoreline. Stewards left the boaters with the take home message "Clean Boats Clean Waters" as well as a convenient reference card outlining basic AIS information and prevention measures. With the given information and interpretive talk from the steward, it is hopeful that boaters will understand the importance and follow through with AIS prevention measures.

Week	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday
5-28-11 to 6-2-11		B, 8, L	B, 8, L				
6-3-11 to 6-9-11	8, L		B				
6-10-11 to 6-16-11		B					
6-17-11 to 6-23-11		B					
6-24-11 to 6-30-11							
7-1-11 to 7-7-11		B					8, L
7-8-11 to 7-14-11		B	8				
7-15-11 to 7-21-11	B, 8	L					8, L
7-22-11 to 7-28-11		B, 8	L			8, L	8, L
7-29-11 to 8-4-11		B	L			B, 8	F
8-5-11 to 8-11-11	SR	SR					
8-12-11 to 8-18-11	SR	SR, HH					
8-20-11 to 8-26-11							
8-27-11 to 9-1-11							
9-2-11 to 9-5-11							

Table 107 - Steward coverage at six roving sites, B=Burke's Marina (11), 8=Eighth Lake Campground (10), F=Forked Lake Campground (1), L=Limekiln Lake Campground (10), HH=Hollywood Hills private boat launch (1), SR=Stillwater Reservoir NYS Boat Launch (4).

Results

Out of the watercraft that launched at the six roving sites, motorboats were the most observed with 52% of the use followed by kayaks with 29% (Figure 122). There were more cartop boats than motorboats launched at the three campground sites (70%) whereas the opposite is true at the larger boat ramps on bigger lakes such as First Lake (Hollywood Hills), Raquette Lake (Burke's Marina), and Stillwater Reservoir.

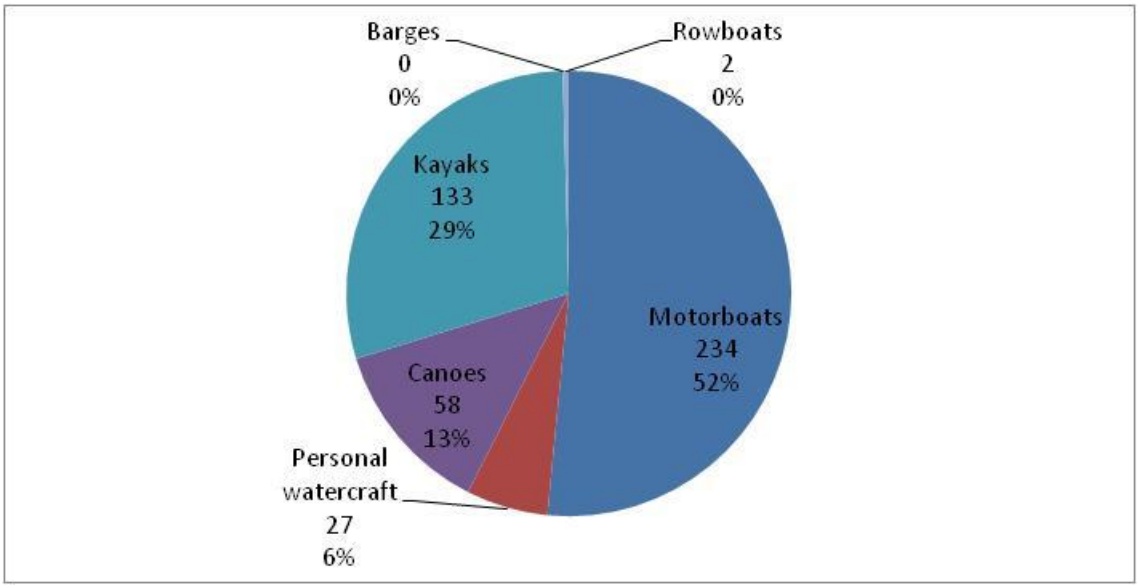


Figure 122- Percentage of watercrafts launched at Roving Sites, 2011.

The recorded boats with registration were limited to motorized watercraft because non-motorized boats do not need to be registered. 160 boats were registered in New York, three from Pennsylvania, four from Vermont, two from Connecticut, one from Massachusetts, and one from Delaware.

Waterbody	Infection Status	# of Visits	Waterbody	Infection Status	# of Visits
13th Lake		2	Hinckley Reservoir		3
Beaver River		2	Hudson River	Yes	2
Black Lake		1	Labrador Pond (Syracuse)		1
Black River		2	Lake Flower	Yes	1
Blue Mountain Lake	Yes	3	Lake Ontario	Yes	6
Canandaigua Lake	Yes	1	Lake Wallenpark, PA		1
Cayuta Lake	Yes	3	Limekiln Lake		15
Conesus Lake		1	Long Lake	Yes	3
Cranberry Lake		2	Morraine Lake, Hamilton		2
Delta Lake		3	Nick's Lake		1
Deruyter Lake		1	North Lake		1
Dunham Reservoir		1	Oneida Lake	Yes	2
Durant Lake		2	Owasco Lake		2
Eagle Bay		1	Raquette Lake	Yes	7
Effley Falls Pond		1	Redfield Reservoir		1
Eighth Lake		8	Salmon River Reservoir		1
Erie Canal		1	Salmon River, Redfield		1
Forked Lake		1	Saratoga Lake	Yes	1
Fourth Lake	Yes	5	Seventh Lake		12
Fulton Chain	Yes	5	Sixth Lake	Yes	2
Genesee River		1	Skaneatales Lake		1
Grafton State Park		1	Sodus Bay	Yes	
Hammond Lake, PA		1	Stillwater Reservoir		15
			Toronto Reservoir		1

Table 108- Waterways visited in two weeks prior to launching at Roving Sites, 2011.

The use of AIS prevention steps was recorded by asking boaters if they take any precautions or carry-out acceptable protocol when launching/retrieving their water craft. With prevention steps including visual inspecting, washing, draining bilge, draining live well, draining bait bucket, and drying. Of the 393 groups contacted, only 182 had taken prevention measures. Eurasian watermilfoil was encountered five times on boats that had been to Effley Falls Pond, Lake Ontario, Oneida Lake, and Sodus Bay in the last two weeks. Zebra mussels were found on boats that came from Lake Ontario and Oneida Lake.

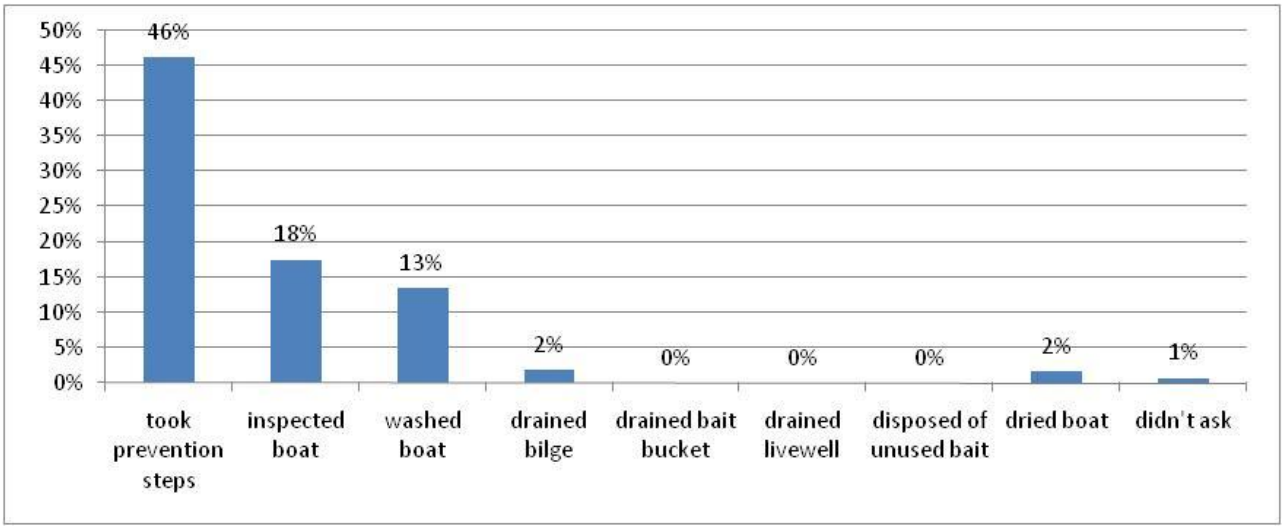


Figure 123- Percent of visitors taking Aquatic Invasive Species Prevention Measure at the Roving Sites, 2011.

Conclusion and Discussion:

Coverage of several sites intermittently worked well during the first year of the WSP in the central and western part of the Adirondack Park. This method allowed for collection of data at a number of different locations to aid in the decision process of where to place stewards for maximum effect in future years. This technique, versus a set schedule, also gave the stewards more exposure to boaters in various areas so local people as well as vacationers could become familiar with the WSP. Consistent coverage on the weekends during July and August at all the roving sites should be considered if staff levels permit. The high number of visitors at Stillwater Reservoir suggests more coverage days there in future summers would be beneficial. The Inlet Town Supervisor, John Frey, also noted that a different set of users may drive to Stillwater Reservoir from the west, than the users of the Fulton Chain of Lakes who come up from the Old Forge direction. Hollywood Hills is a private boat launch that may see the same users, so minimal coverage on Saturdays in July and August may be all that is needed to get the AIS prevention message out. The RLPOA provides volunteer steward coverage at Burke's Marina on Friday nights and it is an asset to have continued WSP coverage on Saturday if not throughout the weekend. The high numbers of boaters that the RLPOA saw on Friday night highlights the fact that day of the week and time of day are extremely important when placing stewards for maximum effectiveness. The three public campgrounds should be stewarded as staff levels allow during future summers. The campground staff could be given training in the future so that they can provide boaters with some AIS prevention education.

Thank you to Burke's Marina for fully supporting AIS prevention measures and allowing a steward at their boat launch. The Hollywood Hills Association is concerned about AIS and welcomed a steward at their private boat launch. The stewards were also graciously allowed at the NYS Stillwater Reservoir Boat Launch as well as in the campgrounds. Special thanks to NYS Forest Ranger Luke Evans for his encouragement and assistance to the stewards camping at Stillwater Reservoir. The Watershed Stewardship Program gratefully acknowledges the funding support of the Great Lakes Restoration Initiative and the United States Fish and Wildlife Service.

Roving Sites Recreation Study 2011

	Boat Type							total #	Average	Four	# of
Site	M	PWC	S	C	K	B	R	boats	HP outboard	stroke	People
Burkes Marina (11)	106	9	0	2	5	0	0	122	75	37	253
Eighth Lake Campround (10)	24	2	0	23	52	0	0	101	55	4	194
Forked Lake Campground (1)	3	0	0	5	0	0	0	8	100	2	23
Hollywood Hills - Private (1)	5	5	0	0	1	0	0	11	97	2	25
Limekiln Lake Campground (10)	26	6	0	11	51	0	2	96	35	3	181
Stillwater Reservoir (4)	70	5	0	17	24	0	0	116	47	8	302
Totals	234	27	0	58	133	0	2	454	68	56	978

Table 109- Summary, 2011. M= motorboat; K= kayak; C= canoe; B= construction barge; R= rowboat; S=sailboat; PWC= personal watercraft.

WSP Western Recreation Study 2011

	# groups	# groups	organisms found		organism type							
Site	launching	retrieving	entering	leaving	EWM	BW	NM	GRS	WC	ZM	VLM	other
Burkes Marina (11)	95	37	4	4	1	1	1	0	0	0	0	5
Eighth Lake Campround (10)	48	28	4	1	0	0	0	4	0	0	0	1
Forked Lake Campground (1)	6	4	1	2	0	0	0	2	0	0	0	1
Hollywood Hills - Private (1)	7	3	4	2	0	0	0	2	0	0	0	4
Limekiln Lake Campground (10)	47	58	10	6	1	0	0	11	0	1	1	2
Stillwater Reservoir (4)	70	36	8	4	3	0	2	4	0	1	0	2
Totals	273	166	31	19	5	1	3	23	0	2	1	15

Table 110- EWM= Eurasian watermilfoil; BW= bladderwort; NM= native milfoil, GRS= grass; WC=water chestnut; ZM= Zebra mussel; VLM= variable leaf milfoil.

Roving Sites Recreation Study 2011

	visitor prevention steps									
Site	yes	I	WB	DB	BB	LW	Dis	Dry	didn't ask	# groups
Burkes Marina (11)	61	14	52	6	0	0	0	2	1	**118**
Eighth Lake Campround (10)	15	15	19	5	1	1	1	17	4	**65**
Forked Lake Campground (1)	6	2	5	0	0	0	0	0	0	**9**
Hollywood Hills - Private (1)	5	0	5	1	0	0	0	0	0	**9**
Limekiln Lake Campground (10)	34	15	27	8	0	0	0	0	4	**88**
Stillwater Reservoir (4)	61	23	45	2	0	0	0	1	0	**104**
Totals	182	69	153	22	1	1	1	20	9	**393**

Table 111- I= inspected boat; WB= washed boat; DB= drained bilge, BB= emptied bait bucket; LW= drained livewell; Dis= disposed of unused bait; Dry= dried boat.

Effects of desiccation on Eurasian watermilfoil and Northern watermilfoil

By Mike Hall and Erin Corrigan, Watershed Stewards

Introduction

Several species of watermilfoil are found in New York State's Adirondack Park. Native milfoils, including northern watermilfoil (NWM) (*Myriophyllum sibiricum* Kom.) are an important part of the littoral plant community in many lakes in Maine and New England and other parts of the country. The highly invasive Eurasian watermilfoil (EWM) (*Myrophyllum spicatum L.*), which is becoming more and more prevalent in Adirondack lakes is a submerged aquatic rooted perennial that invades lakes and ponds in a wide range of areas outside of its native boundaries (Madsen et al. 1991).

The invasion of EWM has negative impacts on biodiversity and water recreation and can alter the structure of the littoral zone. The Adirondack Park Invasive Plant Program (APIPP) reported 52 known water bodies that have been infested with EWM, making it the most common aquatic invasive plant in the park (Watershed Stewardship Program 2010). These invasions are likely due to boat traffic between water bodies both within and outside the park, where Eurasian watermilfoil fragments get attached to boats and trailers and then accompany them into their next destination (Barnes et al. 2009). Once Eurasian water milfoil has been established in a water body it is nearly impossible to eradicate. Effective management methods include benthic matting (Mayer 1978) and hand harvesting (Kelting and Laxson 2010). Hand harvesting has been done extensively in New York's Upper Saranac Lake since 2004 and after two years it was reduced to <5% cover for more than 90% of the area. This method of hand harvesting, though effective, is very costly and therefore not feasible for most lakes and ponds.

A much more cost-effective method of controlling the spread of Eurasian watermilfoil is prevention. While a study in the Great Lakes has shown that high-pressure boat washing and visual inspection reduces the amount of macrophytes introduced into water bodies by 88%, these precautions are only taken by about one third of all registered boaters (Rothlisberger et al. 2010). Paul Smith's College has established the Watershed Stewardship Program to help address this need for increased education in the importance of taking these precautionary measures. Stewards are stationed at boat launches at 19 lakes and ponds in the Adirondacks to inspect boats and educate boaters on the importance of doing so themselves. This program has been effective in increasing the awareness about the problems of invasive species for boaters in the area.

When boat operators inadvertently transport milfoil strands between lakes on boats and boat trailers, the plant fragments experience various degrees of drying or desiccation. This drying likely has a significant impact on whether or not the fragment is still viable and able to experience regrowth once it is rehydrated. However, very few studies have been done to evaluate this relationship. A New Zealand study showed a large decrease in plant survival with increased desiccation (Johnstone et al. 1985). In a study by Barnes et al. (2009) it was reported that desiccation of Eurasian watermilfoil was at 70% after one hour and 90% after three, with coiled fragments drying at a slower rate. In the majority of aquatic plants, sufficient drying results in death, with different species having varying degrees of desiccation tolerance.

Paul Smith's Adirondack Watershed Institute performed a study on Eurasian water milfoil to address this lack of data on the effects of desiccation. Evans et al. (2010) found fragments to be 87% desiccated after 3 hours drying time and 100% desiccation after approximately 13 hours, aligning closely with the findings of Barnes et al. (2009). These drying times would vary in real transport situations where the stands are exposed to a number a variables not present in the laboratory. The higher percentage of desiccation significantly reduced the likelihood of fragment regrowth, with the regrowth dropping off dramatically by the 3 hour drying time. Though not seen in

the majority of fragments some regrowth was actually seen in the fragments that had been 100% desiccated after they had been re-submerged in water for 4 weeks, indicating that though less likely, growth in plants that had been 100% desiccated is still possible (Evans, et al., 2010).

In field observations, EWM often out-competes other native milfoils in lakes that it invades (Valley and Newman, 1998). This is likely due to its ability to grow quickly and form thick mats that collect sunlight and shade other plants. NWM is native to the Adirondack region where this competition often takes place. Both milfoil species rely almost exclusively on auto fragmentation in growing new strands, where new lateral growth is formed off of existing nodes and then breaks off, with roots of these growths submerging itself into the soil (Madsen and Smith, 1997). Fragmentation is increased with the disruption of motors and paddles from boaters. Milfoils grow vertically with much of the growth occurring near the tip of the plant, called the apex.

In a laboratory study (Valley and Newman, 1998) of the competitive interactions between EWM and NWM, NWM was shown to be the superior competitor in terms of overall productivity, with higher accumulated biomass in both combined and separate cultures. Observations in the field have shown EWM outcompeting the native so biomass accumulation may not play a key role in this competition. EWM may gain an advantage because its biomass is distributed in a way that allows it to shade other plant species; particularly apical growth. In the field this would especially be an advantage because sunlight would not always be as plentiful as in the laboratory setting. NWM also seemed to gain a head start on the Eurasian, forming its rootlets and starting its growth much sooner. EWM grew at a much faster rate once it got started, making the NWM head start less of an advantage (Valley et al, 1998).

Building on the results of our 2010 research we studied the rate of desiccation and the viability and vigor of EWM and NWM after different drying times to see if they respond differently after desiccation treatments. We also included an examination of the role of apical dominance both with respect to control over lateral bud growth with and without desiccation, and with respect to how much new biomass in fragments of each species is a function of apical growth *versus* lateral growth.

In order to better understand the physiology and desiccation response of EWM and NWM we conducted a 6 week laboratory study to determine, **1)** the rate at which desiccation occurs in the two milfoil species **2)** the proportion of fragments likely to form lateral growth and rootlets in undesiccated fragments (control) and in fragments that had been desiccated for 1, 2, 3, 6, 12, and 24 hours, **3)** whether the presence of an apex has an effect on lateral growth, **4)** how drying time effects apical growth length, and **5)** how drying time affects the presence and growth of rootlets.

Methods

Laboratory experiment.

Milfoil fragments were collected from infested Adirondack lakes in late June, 2011. The fragments were weighed and separated based on species and presence or absence of apical tips; for fragments without apices we broke off the apical section to have a fragment with 10 easily distinguishable nodes. The fragments were then dried for various times before being rehydrated. EWM fragments with apical tips had drying treatments of 0, 3, 12, and 24 hours. EWM without apical tips had drying treatments of 0, 1, 2, 3, 6, 12, and 24 hours. NWM fragments both with and without apical tips had drying treatments of 0, 3, 12, 24 hours.

After drying fragments were reweighed and rehydrated by being placed into separate 16 oz plastic cups with small holes and nylon screens in each to allow water movement but prevent fragment loss. The cups each had small pieces of clean granite gravel to keep them from floating and were placed in larger plastic tubs filled with lake water from Lower St. Regis Lake. Air stones were placed in each tub to allow the water to circulate and oxygenate. Halogen grow lights , hanging approximately 1.5 meters above the tubs were set to cycle of 16 hours on and 8 hours off. After 4 days lake water was added to each experimental tub to replace the water that had evaporated and the air stones were moved to different locations within each tub. Each week half of the water in each tub was replaced with fresh lake water and the cups and tubs were rotated to reduce and variability in the amount of light each strand received. The tubs were kept at approximately room temperature (21 degrees C). Each week we examined strands and recorded the number of nodes on fragments that had lateral growth or rootlets. We also noted whether the apex (if there was one) was viable and growing. At the end of six weeks,

strands were harvested and all new lateral and apical growth was measured and the total number of nodes with viable rootlets were determined.

Data analysis. In this report data are presented graphically and in tables to show patters that we found in these data. These data are pending a full statistical analysis by the research team that will be used to prepare this work for publication in a peer reviewed journal so the information can be widely disseminated.

Results and Discussion

The effect of drying on viable growth in Eurasian watermilfoil and Northern watermilfoil

Figure 124 shows the relationship between drying time and average total viable growth (combined apical and lateral growth – not including roots). What we observed was that as the drying time increased, there was a dramatic decrease in the average amount of total viable growth. Growth was greatest for strands that had an apex for both species across all treatments. The control treatment, not surprisingly, had the greatest overall growth in both species. The largest amount of viable growth occurred on the EWM. As expected, drying time reduced viable growth in both species. After a 12 hour drying time treatment for both species, regardless of apical presence, average total viable growth was less than 1cm and after the 24 hour treatment there was 0 cm of growth. Note that in the 12 hour drying treatment the only growth that occurred was in the native NWM.

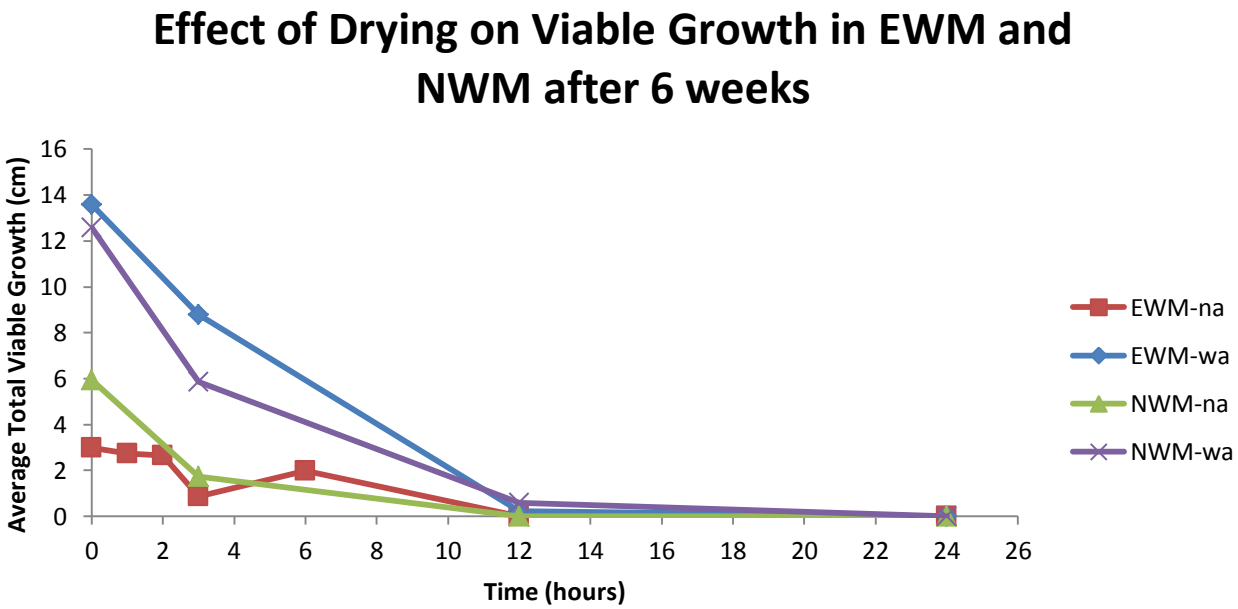


Figure 124- Changes in average total viable growth at different drying times for Eurasian watermilfoi (EWM) and Northern watermilfoil (NWM) after a 6 week regrowth period. "na" = no apex; "wa" = with apex.

Eurasian watermilfoil dried out very quickly in this study, similarly to the study we conducted previously (Evans et al, 2010). It has been shown that those macrophytes that dried more, or faster, had lower regeneration (Silveria et al, 2009). Northern watermilfoil followed a similar negative relationship with drying time to that of the Eurasian watermilfoil. It was also found in a similar study done by Michelan et al in 2010 that the ability of invasive macrophyte fragments to regenerate and colonize decreases with increasing time of exposure to desiccation.

Apical influence on total viable growth of EWM and NWM

Regardless of the presence of an apical meristem, for the bottom 10 nodes (the focal nodes) EWM had a larger amount of average viable lateral growth (Table 112). The proportion of nodes with lateral bud growth was greatest (and similar) in fragments for both species without an apical meristem attached. Looking at EWM and NWM with an apical meristem, EWM had a greater average number of buds. Thus, both the native and invasive species showed apical dominance. An examination of the nodes above the 10 focal nodes (the nodes that make up the apex) suggests that NWM has a greater average number of buds, but less average amount of viable lateral growth.

Nodes	Apical	Species	Average length of Viable Lateral Growth (cm) ± Stdev	Average # buds ± Stdev
Focal 10	With	EWM	1.1 ± 3.16	0.23 ± 0.60
		NWM	0.07 ± 0.22	0.15 ± 0.44
	Without	EWM	1.24 ± 2.03	0.46 ± 0.64
		NWM	0.85 ± 1.41	.0.43 ± 0.70
Apex	With	EWM	0.29 ± 1.83	0.11 ± 0.32
		NWM	0.15 ± 0.60	0.37 ± 0.80

Table 112- Growth of Eurasian watermilfoil and Northern watermilfoil on the bottom 10 focal nodes, and above the 10 focal nodes, with and without apical meristem on 0 hour drying treatments allowed to re-grow for 6 weeks.

After being dried and placed directly back into water between the focal nodes with and without apical meristem and the strands with nodes above the focal nodes, the EWM always had a greater average amount of viable lateral growth than the NWM. But, in the case of the strands with nodes above the 10 focal nodes, NWM had a significantly greater average number of buds. In this case the NWM produced more lateral growth, but EWM produced larger buds. Among all EWM strands, those with the apical present had both a greater average amount of viable lateral growth, and a greater average number of lateral buds. The apical portions regenerate more quickly than other portions of the macrophyte (Michelan et al., 2010). Thus having the apical meristem attached would be advantageous.

Influence of drying on apical growth in EWM and NWM

We found that overall EWM had greater average apical growth than NWM. This corresponds with the idea that although overall biomass growth may be greater in strands of NWM, apical growth may be the critical factor in competition for light in environments where these two species co-occur. For both EWM and NWM, as drying time increased the average apical growth length decreased. In the control, EWM had nearly three times more average apical growth than NWM. For the 3 hour drying treatment EWM showed about two times greater apical growth than NWM, and for the 12 hour drying treatment EWM and NWM had similar average apical growth. After the 24 hour drying treatment there was no viable apical growth for EWM or NWM.

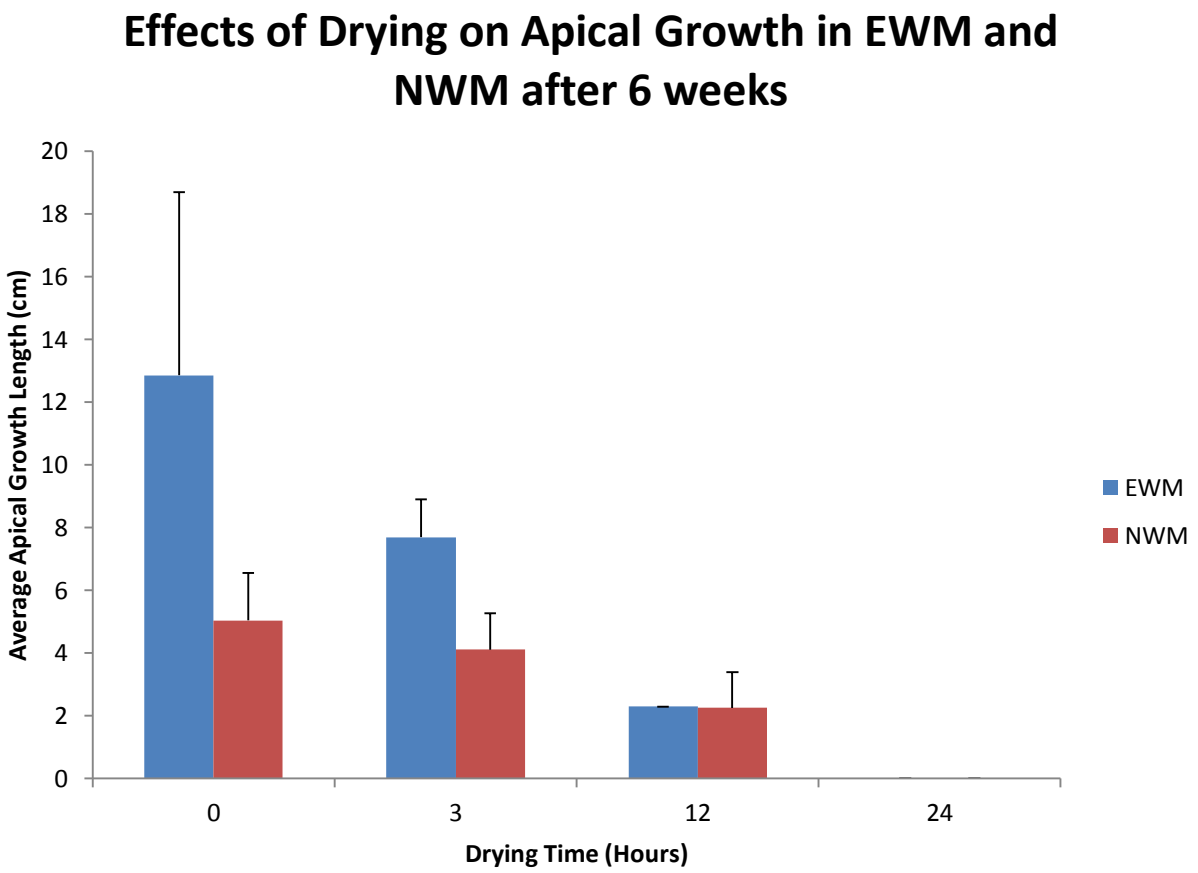


Figure 125. The effects of drying on apical growth in Eurasian Watermilfoil as compared to Northern Watermilfoil after a 6 week regrowth period.

After only 3 hours of drying, the average apical growth dropped from about 12.8cm to about 7.7cm in EWM. In NWM, the 3 hour drying treatment only resulted in a loss in about 1 cm of average apical growth. This would suggest that since EWM has more apical growth after three hours that it would be more likely to compete well in lakes that it colonized through a short distance transport. For both species after a 12 hour drying treatment apical growth was similar, about 2.3cm, and after a 24hour treatment there was no apical growth in any strands of either species. The response of apical growth compared to lateral bud growth (none in EWM after 12 hours drying in this experiment) suggests that strands with apices that are transported may be more likely to survive and continue to grow once they rehydrate in another lake.

Influence of drying on rootlet growth in EWM and NWM

There were no rootlets on any strands of EWM in our initial harvest at the start of the study. For NWM there was an average of 4.45 (± 1.97) nodes with rootlets already growing. At the end of the study, the control treatment had the greatest number of total nodes with rootlets for both species with and without an apex (Table 113). We found an apparent negative relationship between the length of drying time and the number nodes with rootlets in both species (Table 113). As the amount of drying time increased there was almost always a decrease in the number of nodes with rootlets, total and viable. The exception was for NWM with apical tissue, where from the 12 to 24 hour treatment the average number of total nodes remained similar.

Along with counting the total number of nodes with rootlets we also counted those nodes that had clearly viable rootlets, to account for rootlets that had died and were no longer apparently useful to the strand. For most strands there was a noticeable decrease from total nodes with rootlets to nodes with viable rootlets, and occasionally there was no change. As with the total number of nodes with rootlets, the total number of nodes with viable rootlets also displayed a negative relationship with the amount of drying time (Table 113). Between the initial counts of nodes with rootlets to the final count of total nodes with viable rootlets, we found an increase in the number of rootlets in EWM and a general decrease in rootlets for NWM. The exception of this was for NWM, occurring for control treatment with an apex, where there was an increase in the number of rootlets from the initial count to the final count. Also, for both species the total number of nodes with viable rootlets were always greater for strands that had an apex present.

Root Growth on All Nodes

Apical	Species	Dry Time (h)	Avg # Initial Nodes W/ Roots ± Stdev	Avg. # Total Nodes W/ Roots ± Stdev	Avg. # Total Nodes W/ Viable Roots ± Stdev
With	EWM	0	0	4.50 ± 3.98	2.20 ± 1.93
		3	0	3.50 ± 2.76	1.60 ± 1.26
		12	0	0.05 ± 0.22	0
		24	0	0	0
	NWM	0	3.30 ± 2.11	9.40 ± 3.24	6.50 ± 2.68
		3	5.60 ± 1.84	7.70 ± 3.68	4.00 ± 2.70
		12	5.50 ± 1.70	0.55 ± 1.19	0.50 ± 1.15
		24	4.65 ± 1.98	0.55 ± 1.50	0
Without	EWM	0	0	0.70 ± 0.67	0.70 ± 0.67
		3	0	0.40 ± 0.52	0.40 ± 0.52
		12	0	0	0
		24	0	0	0
	NWM	0	4.20 ± 1.69	3.50 ± 2.72	0.70 ± 0.67
		3	4.00 ± 1.63	1.60 ± 2.17	0.60 ± 0.52
		12	3.45 ± 1.96	1.05 ± 1.79	0
		24	4.55 ± 1.85	0.60 ± 1.70	0

Table 113- Presentation of initial, total, and total viable root growth for all nodes on strands of Eurasian Watermilfoil and Northern Watermilfoil after a 6 week regrowth period.

Root biomass has been previously shown to decrease on strands of invasive macrophytes as the amount of drying time or desiccation increases (Michelan et al., 2010) and the results of our study support this. In 2009, Barnes et al. found that EWM actually benefited after one hour of drying or desiccation by establishing roots more readily than the control strands. We examined one set of EWM without apical tips after a one hour drying time and saw a small and steady decrease in total viable growth with increasing drying treatments and no substantial differences in rootlet growth. EWM's ability to allocate its resources towards shoots and roots is primarily controlled by nutrient availability (Stand & Weisner, 2001). We found that EWM fragments started with fewer initial rootlets and at the conclusion of the study had less rootlet growth than NWM. During the study we observed that even though the EWM had fewer initial rootlets, the roots seemed to be either larger or thicker than those rootlets on the NWM.

Conclusions

In this experiment, our preliminary analysis (presented here) suggests that drying strands for 12 hours in the laboratory decreased total viable growth (lateral and apical stem growth) in EWM and NWM to very low levels. We saw no growth in rehydrated fragments that had been dried for 24 hours in either species. Although NWM

tended to initiate a greater number of lateral buds, EWM appeared to have more total viable growth length than NWM. Much of this is due to the growth of the apical meristem in strands that had those. NWM appeared to allocate less carbon to apical growth compared to EWM. This apical growth is likely what helps give EWM an advantage over the native milfoil when it remains viable and either colonizes new areas of an infested lake or ends up in new lakes. Strands of both species that had apical meristems had more total viable growth after 6 weeks than those with meristems removed, when drying times were < 12 hours. Average apical growth in control EWM (13 cm) was double that in NWM (5 cm) and drying reduced apical growth after rehydration such that, after 12 hours, average apical growth was approximately 2 cm and similar for both milfoil species.

NWM tends to produce roots early in the growing season (by mid-June) and EWM produce roots late in July. Some of the early roots (present when we collected them) appeared to loose viability after the 6 week experiment, while some new were produced in both species. We need to examine more closely the allocation to new roots versus the maintenance of older roots in the two species during the experiment.

Results of this study add to the body of knowledge regarding the different physiology of these two species and inform the discussion about competition between a native milfoil and the invasive EWM.

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Loon Monitoring Report: St. Regis Lakes and Big Moose Lake

By: Andrew Bull and Kirsten Goranowski, Watershed Stewards

Figure 126- Adult loon with chick.

Introduction

The Common Loon (*Gavia immer*) is one of five loon species found worldwide; it is a federally protected bird under the Migratory Bird Treaty Act of 1918. The Common Loon is also important since it is a species that can be used as an indicator of overall aquatic health (Evers et al. 2010). The loon is also a widely recognized symbol of the northern wilderness both in image and in that iconic yodel that can be heard on many lakes throughout the Adirondack Park.

Morphologically the Common Loon is a large bodied predominantly aquatic bird, its mass ranges from 1600-8000 g; the length ranges from 70-90 cm and have a wingspan that averages 152 cm (Kirschbaum, Rodriguez 2002). Their bill is very thick black and often called "dagger like", its iris is a blood red color and is believed to aid in the loons' ability for vision clarity underwater. The diet of the Common Loon consists predominantly of fusiform fish; *having soft scales and a laterally compressed body* that range in size from 10-70 g (Forbush 1925). They find

their prey by floating on the surface and peering into the water, upon spotting their prey they perform a dive that starts with the compression of the feathers forcing out all the air. The bird then propels itself underwater with the aid of its legs and wide feet. Each feeding dive lasts an average of 42.6 seconds but can be as long as 90 seconds with food being consumed either underwater or above but all being eaten head first (Mclntyre 1988). The fish are held crosswise in the bill and presented to the young in this manner forcing the chick to then manipulate the fish itself so it may be swallowed head first (Figure 127). Chicks are fed this way for two to three weeks then they begin to do minimal hunting for various aquatic organisms but will still be fed up to the eighth week after fledging (Mclntyre 1988).

Figure 127- Adult loon presenting chick with fish crosswise in bill.

Common loons are thought to be monogamous by remaining with the same partner for life; they breed once per year in the summer. They arrive in the territory of choice in early spring together and usually establish a territory of 60 to 200 acres in size that they patrol with regularity (Kirschbaum, Rodriguez 2002). The courtship begins as soon as the pair is on their territory and may continue up through June pending that the nesting has not begun. The nest of the loon is usually built in a sheltered location and can be located on islands or peninsulas projecting into the water, nests may be artificial or of natural material and reconstructed each year. The same nest site may be used by the same pair year after year. Once the nest is completed the courtship display is what will follow, the display varies in duration from a minute or two up to forty-five minutes, most lasting from three to ten minutes. The copulation that usually follows will begin with the female sitting on the nest, the male will climb onto her back with his feet on her shoulders and this allows for cloacal contact. She will raise her tail and move it to one side and the copulation follows, this will last a few minutes and then the male will walk over her shoulders

and enter the water to preen, the female will sit with her tail up for two to three minutes more before she will enter the water and also preen (Mclntyre 1988). The female will lay 1-3 eggs but the usual number is 2, the eggs are light brown and are laid one to two days apart. The incubation last for 29 days and is done by both the male and female. The chicks will hatch asynchronously usually one to two days apart and will stay in the nest for a day or two following hatching. The fledgling phase of the chick's life will last two to three months, during which the young will be escorted by the parents around the territory either by riding on the parents back or by swimming alongside of the parent. They are able to dive short distances after only 3 days of age and are able to fly after two to three months (Kirschbaum, Rodriguez 2002).

The success of the chicks reaching the fledgling age is dependent upon many contributing factors. Predation of not only the eggs but of the juvenile loons is of great concern; the threat can come from one of many fronts such as avian predation like in the case of eagles and osprey. The risk may also come from mammalian predation like mink, raccoon and skunk or from reptilian and fish predation in the case of snapping turtles and large fish such as muskellunge. But the biggest threat to their well being has to be the ever constant threat from the deposition of particulate matter coming from industrial pollutants in the western states that accumulates in the aquatic systems that the loons annually reside in (Kirschbaum, Rodriguez 2002). The bioaccumulation of mercury (Hg) can affect behavior, physiology, and survivorship in both chicks and adults. The affects can include lethargy in adults, compromised immune systems and changes in blood biochemistry. Studies showed that individuals high in Hg spend less time incubating eggs which may lead to clutch failure. Lead (Pb) found in the aquatic system that comes from the use of lead sinkers from the fishing industry are ingested by the loons mistakenly for pebbles that are used to aid in digestion. Lead poisoning affects the nerve impulse transmission with clinical signs such as head-shaking, wing and eye droop and gaping; long term affects will lead to decreased weight, body fat and muscle mass and can lead to death (Barr et al. 2010). Acid rain is also of concern when talking of loon fledgling success since it affects the overall chemistry of the lake by releasing aluminum ions into the water that are then taken up by the fish through their gills, it increases the release of mercury into the water column and permits faster uptake through the food chain. The plankton and vegetative communities are also affected slowly changing the dynamic of the lake making the productivity degrade and making it a less hospitable place for loons to find food and raise their young (Mclntyre 1988).

The Biodiversity Research Institute's Adirondack Center for Loon Conservation or BRI annually captures common loons in the Adirondack Park, for banding as well collecting blood and feather samples. BRI uses these samples to determine blood mercury levels, identify the bird's gender, if it is unknown, and other aspects such as weight and size of the bird. The principal duty of the BRI's summer field staff is to monitor the progress and reproductive success of the loons both banded and un-banded across the Adirondack Park. Their goal is to supervise the population and verify the effect of the heavy metal populations in aquatic ecosystems and how it is affecting the common loon its behavior and reproductive success in the Adirondack Park.

Methods

BRI has had the help of the Watershed Stewards to perform loon monitoring for some time now. Each year the steward is responsible for monitoring the Common Loon (*Gavia immer*) on the following lakes; Upper St. Regis, Lower St. Regis as well as Spitfire Lake. The monitoring began on June 6th, 2011 and ended on August 26th, 2011. Monitoring was done 1-2 days per week, on the same day each week dependent on weather conditions. A kayak was used to paddle to the seven different territories known to exist throughout the three lakes. Observations began at 6-7am, taking advantage of calmer waters and less boat traffic, and lasted roughly 5 to 6 hours. Common Loon observations and behaviors were obtained at a distance using 10 x 42 binoculars when a close proximity was not an option. Data recorded into a field notebook included time of day, weather, Beaufort

scale, water conditions, number of loons present, is the territorial and or nesting pair present, nest location, nest type, clutch size, and number of chicks to hatch and fledge. The loons were observed for bands on the legs the left leg would have colored bands that are associated to that bird only (Fig 2). The right leg would have bands also that are not colored and have a number that is just for that bird's identification purpose. All data was entered into the BRI's data forms provided to the steward previously to the monitoring season.

Figure 128- The bands on this bird are orange/red as seen on the left leg, this bird was on Lower St. Regis during the 2011 season.

Results

Upper St. Regis Lake:

In the summer of 2011, Upper St. Regis Lake contained six territories, four of which were shared by all the loons present. Two territories were occupied by pairs, only one of which nested successfully. The Birch Island pair was seen together every outing but were not successful in producing a chick. The pair consists of one female loon that was banded with orange/yellow and a band number of #898-091-14, and a male, which was un-banded and cannot be confirmed as the mate from last year who was also un-banded. This is thought to be the same pair that has occupied this territory for many seasons now and this is the second season with a nest failure. This nest failure could be due to the early season having a very high water height and inability to find proper nesting sites or other causes not explored within the parameters of this project.

The Spring Bay pair, both un-banded loons, was first observed on June 13th 2011 and last observed on August 23rd 2011. The nest site was located in the southeastern corner of the bay on a small marsh island. The nesting was believed to have begun on June 6th, clutch size was two eggs. Both eggs were successfully hatched on July 5th with both chicks still surviving as of the last observation on the 28th of August.

Spitfire Lake:

Spitfire Lake contained one territorial pair that has nested on this same lake for many years. They were first observed on June 6th 2011 and last observed on August 23rd 2011. In this year the pair had built a scrape nest on the rocky island that has been used by this pair for the last two years. The pair produced a clutch of two eggs both were successfully hatched on June 18th 2011. The male was an un-banded bird and the female was banded with orange/green on the left leg and a band number of # 649-088-50. This is the same female from this territory last year the male being un-banded is believed to be the same mate but that can not be proved.

Lower St. Regis Lake:

Lower St. Regis Lake contained one nesting pair on the main portion of the lake as well as one nesting pair in the channel of the lake. They were observed from June 6th to August 28th, since this is not a normal zone in which the stewards monitor the trips to these sites were not as numerous as the other lakes. The nesting pair on the main portion of the lake had one nest failure early in the season most likely caused by nest predation. The re-nesting was successful and the pair had one chick that has been raised to fledgling state. One loon was banded with orange/red but since it was not a bird previously seen on this lake its number of identification could not be made. The second loon was un-banded so its identity could also not be made. The loons in the channel were both un-banded and had one chick that was raised to fledgling state as well.

Western Adirondack Loon Monitoring:

Once a week from June 8th through August 18th, 11 observation days in total, the Watershed Steward working for the Biodiversity Research Institute monitored loon populations in the North Bay Inlet, and Main Lake territories of Big Moose Lake throughout the summer of 2011. Depending on weather conditions, the Steward launched her kayak at a private launch with observation duration averaging around 5 hours. Most often the Watershed Steward would head out to the launch between 5 and 7 am, before the wind picked up in the Main Lake territory. To take advantage of the calm waters, the steward would first kayak through the Main Lake territory, into the Inlet territory, and back through the Main Lake toward North Bay before the wind would pick up. If loon signs or activity were observed, stewards were responsible and required to take notes on a provided journal. The data that was recorded included Common Loon behavior, time of observation, weather, nest type, nest location, and number of chicks hatched.

Results

North Bay Territory

Located in a separate finger of Big Moose Lake North Bay a very big territory that would be suitable for nesting loons. However, no nesting pair was observed during the summer of 2011.Weekly observations from 6/8 to 7/6 were the only outings at which a pair of unknown loons was observed in North Bay. Their disappearance is unknown. Possible explanations could include nest failure, or a territory switch.

Main Lake Territory

The main lake territory of Big Moose Lake contained no known territorial or nesting pairs in the summer of 2011. Different unknown loons were observed, but none were visually identified by their bands.

Inlet Territory

The Inlet territory contained one territorial and nesting pair that was monitored from June 15th through August 16th. Loon # 669-205-03 was mated with an unbanded loon in the summer of 2011. The pair built a bowl

shaped nest on the second bog island to the left when first headed into the inlet channel. The nest start date is unknown, but one chick had hatched while the other chick was found dead laying in the half hatched shell by July 9th. Both the chick and eggshell fragments were collected and given to the BRI. The loon pair and their surviving chick were last observed on August 5th swimming and foraging in the Inlet territory.

Figure 129- Common Loon with chick in Inlet Territory. (K. Goranowski)

Throughout the summer of 2011, Big Moose Lake had one territorial and nesting pair between the three territories monitored from June 8th through August 16th. Only one banded bird was observed and confirmed as one of the loons in the inlet territorial/nesting pair as loon # 669-205-03.

Discussion

The BRI and the Adirondack Center for Loon Conservation focus the majority of their research on the effects that environmental pollutants have on aquatic ecosystems and the wildlife that inhabit them. Each season in the month of July the BRI and members of the New York State Department of Environmental Conservation team up for two to three nights to capture loons that are previously banded, un-banded and juvenile loons to band if necessary, collect blood and feather samples and examine overall health. The BRI analyzes the samples for toxins such as lead and mercury in order to gain a tighter grasp on the effects that these pollutants have on loon behavior and reproductive success. Lower levels of blood mercury results in greater reproductive success and therefore loons will have a greater ability to perpetuate the species into lakes that are currently unpopulated by loons. If high mercury levels are allowed to continue it will further disrupt the already delicate nature of Common Loon reproductive levels, which may be evident by the number of nest failures and pairs that continue to have difficulty raising young to fledgling levels constantly year after year. The lower level of nest failures this year is an encouraging indication. In 2010 two separate loon pairs experienced nest failures and the other two nesting pairs had chicks predated upon.

Conclusion

Within the 2011 season there were five territorial pairs as well as two individual or loner birds on the three lakes monitored. Three of the resident birds were banded the rest of the loons remain un-banded. One banded individual was seen only once but was not counted among the banded since it did not reside on the lakes and was just hunting in a cove on one observation day. These loons that are banded one of whom was banded in 1998 are still a vital part of the research that the BRI is conducting on the Common Loon. Four of the five pairs hatched chicks and all were still alive as of August 28th 2011, one egg was predated on in Lower St. Regis but the sibling hatched and was of fledgling age. It is difficult to say why one year would be more productive for the Common Loons, but this year's increase in the amount of chicks hatching and fledging is a very positive sign. It is always essential to stress the importance of the anthropogenic impacts that humans can have on the Common Loon and its habitat. The splendor and beauty of the loons should be observed from an appropriate distance as to not interfere with their behavior.

The mean reproduction rate was up from last year; the Common Loons showed a higher increase in successful hatching and fledging of offspring. The cause for this increase is not known, it can be suggested that the impacts caused by humans and any environmental factors were not responsible for any nest failures or chick mortalities. The levels of harm that the toxicity will play on the loons present and their chicks that will fledge with them this fall is yet to be determined.

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Relative abundance and diversity of Odonata in the northeastern Adirondack Park using adult and larval sampling methods

By: Kimberly Forrest and Mike Hall, Watershed Stewards

Introduction

The order Odonata contains two sub-orders Ansioptera and Zygoptera. The name Ansioptera means unequal wings and contains all dragonflies. Dragonfly wings differ in shape and size with the hind wing broader than the forewing (Lam, 2004). Zygoptera means similar wings and contains all damselflies (Lam, 2004).

Most people recognize dragonflies as they fly over ponds, marshes, and fields. In comparison to these large adult insects, the larvae are less easily distinguished and understood. Typically odonates will spend anywhere from 1 to 4 years in the aquatic larvae stage (Remsburg, 2008). They are known for being abundant in lentic (standing) waters but can be found in lotic waters (flowing) (Bouchard, 2004). Within each habitat odonates occupy a vast array of niches. In the lotic and lentic habitats they can be classified as climbers, sprawlers, or burrowers (McCafferty, 1981; Lambert, 1999). Odonates that are climbers hide in vegetation and debris where they stalk their prey. Sprawlers have long legs to move across substrate, allowing them to be more active hunters are somewhat camouflaged due to many setae, hair like structures, which collect mud and other particles. Also, some larvae have adapted the ability to burrow themselves into the substrate and conceal themselves (McCafferty, 1981; Lambert, 1999).

Similar to the adults, the larvae are also predatory. The most common method of larval odonate predation is the sit-and-wait method, where the larvae will lie motionless until a prey item gets close enough and then they rapidly extend their labium (lower lip) (Bouchard, 2004). The labium is an “extendable mask-like or scoop-like appendage that covers other mouthparts” (Bouchard, 2004).

Mature larvae possess two pairs of wing pads and their legs end in two claws. In the larval stage odonates can be difficult to identify. Structural changes occur at each molt and coloration is commonly related to their environment including the habitat and food they have been eating. More mature larvae are the most reliably identifiable (McCafferty, 1981).

The first objective in this study was to identify the different species of odonates found at all four sites. The second objective was to record the frequency of sightings of each species. Thirdly, we wanted to analyze the differences in species composition and see if any differences in composition were related to habitat. Finally, our fourth objective was to validate and expand the data on species with larval odonate sampling. By finding the larvae along the lake shore with the matching adult odonate data collected in the same time period, early August, we can confirm the presence of those adults, compare larval and adult abundances, and possibly allow for observations of those odonates as larvae that are more difficult to observe as adults.

Methods- Adult

Data Collection

Entomologist Dr. Janet Mihuc of Paul Smiths College trained the Stewards in the capture and identification of odonates. The Stewards were all given a combination net and a picture identification key of Franklin County odonates created by Evan Rea (Watershed Steward, 2009) to aid in their data collection. Captured specimens were either held in one's hand or placed in a plastic envelope to determine the species. Common species with distinct markings were not always captured but identified through observation. Specimens that were not identifiable were photographed for expert examination at a later time. The data collected was recorded on a data sheet adapted from the New York State Dragonfly and Damselfly Survey Protocol (NYSDDS). Due to the possibility that specimen could be captured more than once, a frequency of is presented rather than number of individuals.

Stewards collected data once weekly at each site for a minimum of 40 minutes. Data that were collected was on the species presence, frequency of occurrence of the species, habitat, surrounding landscape, vegetation that the individual was caught on, height of that vegetation, site, weather during sample period, and the method of identification. Sampling began on June 27, 2011 and lasted through August 6, 2011.

Study Sites

We had four sample sites, Osgood Pond, Upper St. Regis Lake, Rainbow Lake, and Meacham Lake. Osgood Pond is a medium sized pond off Route 86 in Paul Smiths, NY. A dirt road passes through an open mixed wood to the boat launch. Tall shrubs line the sandy shore, and *pondweed and yellow water lily* and plants appear in the shallow mucky littoral zone in the mid-summer. To the one side there is a shaded trail adjacent to a stagnant channel to Church Pond. Upper St. Regis Lake is located off State Route 30 in Harrietstown, NY. A dirt road leads into the boat launch through a mixed wood and past a wetland. Tall grasses and broad leaf plants sprout up along the road before the boat launch. Pondweed grows along the lakeshore in the mid-summer. Rainbow Lake is a mixed waterway. The road to the boat launch passes between Buck Pond on the left and Lake Kushaqua on the right. On one side of the road there are tall milkweeds, wild raspberry, and sweet gale plants. On the other side of the road there are sparse grasses, broad leafed sedge plants, and blueberry plants. The boat launch is very sandy and surrounded by a mixed wood with many red pine trees. Yellow and white water lilies grow above the water in the sandy littoral zone. Meacham Lake is located off Route 30 in McColloms, NY. The boat launch is surrounded by mixed woods, and has a grassy and rocky base. Meacham Lake is very shallow and sandy with almost no emergent vegetation in the lake. Adjacent to the boat launch is a grassy path with woods on one side that leads to a groomed field. Along the lake there are tall grasses and shrubs. Proceeding beyond the field there is a heavily used beach and a marsh.

Larvae

Collection of live odonate larvae occurred at the three sites of Osgood Pond, Upper St. Regis Lake, and Rainbow Lake. Sampling occurred at Osgood Pond on July 22nd, at Upper St. Regis Lake on August 4th, and at Rainbow Lake on August 19th 2011.

Sampling was accomplished by use of a D-net in an area 20 meters on either side of the center of the boat launch at that site, and out to depths of about 1.6 meters. Sampling occurred for a minimum of 40 minutes with no maximum time limit.

The D-net was used in a scoop and sweep method, collecting lake-bottom debris. A D-net has a long handle and at the bottom a metal frame in the shape of a D, and on it a cloth bag with the bottom having a fine mesh. The net was allowed to drain and what was left was placed into a large plastic bin to be sorted with forceps, and any large invertebrates that were easily seen and placed into a smaller container. The debris was sorted through with the forceps to look for any odonates that may be small and not easily seen. Any invertebrates that were not in the Odonata order were immediately replaced back into the lake.

For each sampling site the date, start and end times were recorded. Odonates were identified by eye by the collector, whom had been previously trained to identify common aquatic invertebrates to family by eye. Odonates were recorded to sub-order and family. Also for samples the surrounding landscape and microhabitat information was recorded (open sandy area, vegetation, etc.); any vegetation was identified to species (i.e.

pickerel weed) and classified as emergent or submerged. After identification the odonates were set aside until all sampling was complete, and then released back into the lake.

Results and Discussion

Adults

Of the four sample sites Osgood Pond had the most sampling time and the least amount of odonates recorded, where Upper St. Regis Pond had the least amount of sampling and the most odonates recorded. Table 114 shows the total search time for each site and the total odonates recorded for the 2011 season.

Site	Total Search Time (min.)	Number of Odonates Recorded	Average Rate (Odonates/Minute)
Osgood Pond	325	27	0.083077
Meacham Lake	200	32	0.16
Upper St. Regis Lake	120	53	0.441667
Rainbow Lake	140	39	0.278571

Table 114- Search time and Odonata recordings for each site for the 2011 season. Number of individuals recorded includes observed and photographed.

The most abundant genus of Odonata at each site from our records was tallied and compared to the other sites. The genus *Gomphus*, which includes Clubtails, was the highest in abundance at Osgood Pond. At Meacham Lake the genus *Sympetrum*, which includes Meadowhawks, was the highest in abundance. At Upper St. Regis Lake, *Ladona*, the Corporals were the highest in abundance. At Rainbow Lake *Enallagma* was the genus with the highest abundance. Figure 130 is a comparison of the genus of highest abundance at an individual site with the other genera of high abundance at all other sites.

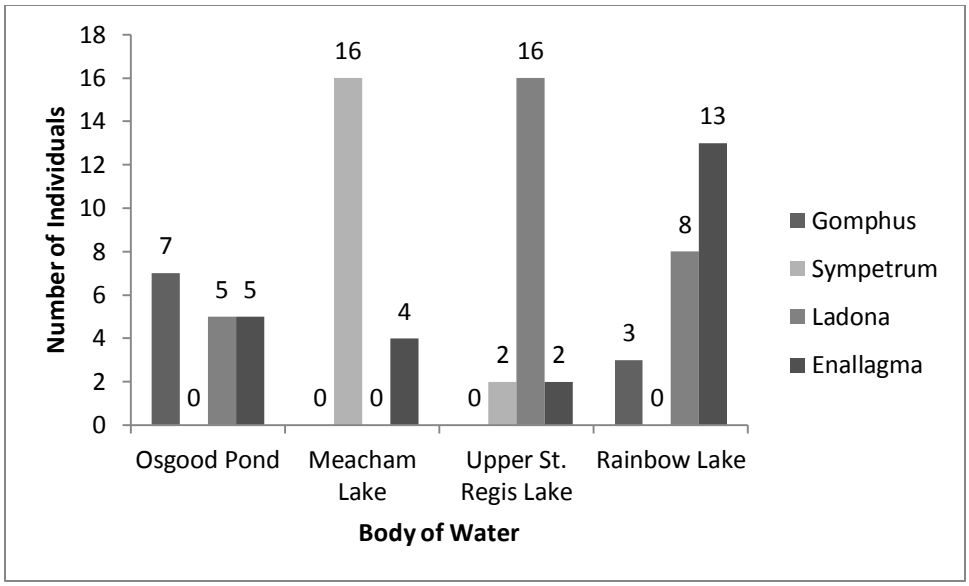

Figure 130- Abundances of the most common genus for the four sites, Osgood Pond, Meacham Lake, Upper St. Regis Lake, and Rainbow Lake.

From all four sites the different species that were recorded were tallied. Table 115 shows the different genera and the number that were identified and recorded throughout the 2011 season.

Dragonfly (Anisoptera) Genera	n	Damselfly (Zygoptera) Genera	n
Aeshnidae	1	*Amphiagron*	5
Anax	1	*Argia*	10
Didymops	1	*Chromagrion*	2
Dromogomphus	5	*Coenagrion*	1
Epitheca	1	*Enallagma*	25
Gomphus	10	*Ischnura*	15
Ladona	29	*Lestes*	2
Leucorrhinia	15	*Nehalennia*	5
Libellula	3		
Plathemis	1		
Styrulus	1		
Sympetrum	19		

Table 115- Frequency of genera of Odonata from all sample sites: Osgood Pond, Meacham Lake, Upper St. Regis Lake, and Rainbow Lake. (n=the number of individuals captured, observed, or photographed).

We wanted to know if the genus *Ladona* and *Enallagma* are more general in their habitat use compared to the other top two genera *Sympetrum* and *Gomphus*. Table 116 compares the number of habitats in which each

genus occurred and the modal height of the vegetation on which the individuals were perched. In our study there were a total of 9 possible habitats (marsh, swamp, bog/fen, pond/lake, running water, field, forest, road, trail/path) and four categories of vegetation height (0 – 10 cm, 10 – 30 cm, 30 – 70 cm, 70 – 100 cm and >100 cm).

Genus	Number of Habitats in which genus was recorded	Modal Vegetation Height category(cm)
Ladona	6	0 - 10
Enallagma	7	10 - 30
Sympetrum	3	10 - 30
Gomphus	2	0 -10

Table 116- Number of habitats used by all recorded Odonata and the modal height of the vegetation in the habitats they used. Data collected in summer 2011 at Osgood Pond, Meacham Lake, Upper St. Regis Lake, and Rainbow Lake.

In the 2011 season Upper St. Regis Lake had the highest abundance of Odonata with a total of 53 individuals and 14 different species. Of those 53 individuals 16 were in the *Ladona* genus and all were the species *L. julia*, the Chalk Fronted Corporal. The second highest genus that was encountered at Upper St. Regis Lake was *Leucorrhinia* with 14 individuals and three different species *L. proxima, L. frigida*, and *L.glacialis*. In the 2010 season at Upper St. Regis Lake there was a total of 811 minutes that were used for searching and only 36 individuals had been recorded, averaging at 0.044 odonates per minute. The 2011 average for Upper St. Regis Lake for identifying odonata is 0.441 odonata per minute.

Rainbow Lake had the second highest abundance of odonata with 39 individuals identified and recorded. Of those 39 individuals 13 were in the genus *Enallagma*, making the bluets the most abundant genus. *Enallagma* species of *E. boreale, E. vesperum, E. ebrium*, and *E. hagini* were identified. The genus with the second most individuals was *Ladona* with 8 individuals, all of which were in the species *L. julia*. Rainbow Lake in the 2011 season had a reduction in search time from the 2010 season and also had a reduction in the amount of Odonata identified. There was a total of 39 individuals identified within the 140 minutes searched, making the Rainbow Lake average for identifying Odonata in the 2011 season 0.278 odonates per minute. This is a slight increase from last year's average at 0.269 odonates per minute.

Of the 27 individuals identified at Osgood Pond the most common genus was *Gomphus* with a total of 7 individuals identified. Species of *Gomphus* identified include *G. borealis* and *G. exilis*. The second highest abundance was tied between the genii *Ladona*, and *Enallagama* with 5 individuals each. All *Ladona* individuals were again in the species *L. julia.* Species of *Enallagma* that were found include *E. exulans* and *E. boreale*. Osgood Pond had a decrease in the total odonates identified from 36 individuals in 2010 to 27 individuals in 2011. Osgood Pond also had an increase in the amount of time that was used to search for odonates which lowers the average identifying rate per minute from 0.137 odonata per minute in 2010 to 0.083 odonata per minute in 2011.

Meacham Lake had a total of 32 individuals identified. Of those 32 individuals 16 were within the genus *Sympetrum* with species of *S. obtrusum* and *S. rubicundulum*. The second most common genera identified were *Dromogomphus* and *Enallagma* with 5 individuals within each genus. All individuals within the genus *Dromogomphus* were of the species *D. spinosus*, the black shouldered spinyleg. Species of *Enallagma* that were identified include *E. carunculatum* and *E. boreale*. There were a total of 200 minutes used to search and identify odonates at Meacham Lake in 2011 making the average identifying rate 0.16 Odonata per minute.

After looking at the most abundant genus at each site and comparing it to the other three sites, the genus *Enallagma* and *Ladona* were the most wide spread with *Enallagma* found at all four of our study sites and *Ladona* at three of our four study sites. These genera also utilize more habitats than the other abundant genera. The other two abundant genera, *Sympetrum* and *Gomphus*, were relatively abundant at their respective lakes with only 1 or 2 individuals found at the other lakes. Although there was a difference in habitat use throughout the four genera, they all utilized vegetation that was between 0 and 30 cm high the most.

Differences from year to year in the average recording rate (odonates/min.) for our four sites could be due to many factors including natural population variability, sampling and identification expertise, and annual climatic differences. Over the long term, our database will be able to determine trends in odonate capture rates which will be useful for understanding effects of natural and anthropogenically caused environmental change.

The site generality and specificity of the four most abundant genera can not only be attributed to the terrestrial habitat but the type of lake that they choose to oviposit their eggs. The species of *Enallagma* that were found prefer both open and vegetated lakes and ponds as well as marshes, bogs, and slow streams (Lam, 2004). Rainbow Lake as a mixed waterway has vegetated and open areas of Lake, and boggy areas between patches of forest. Species of *Ladona* prefer boggy, marshy, or swampy ponds, lakes, and slow streams in forests with acidic water (Dunkle, 2000). The Upper St. Regis boat launch, where *Ladona* are the most abundant, is surrounded is an open lake surrounded by a mixed wood with areas of wetland. According to Driscoll et al. (1991) in Frolich Strong (2004) the Adirondack Mountain region has the 2nd highest proportion of acidic lakes in the United States. The two species of the genus *Sympetrum* prefer temporary or permanent ponds and lakes, swamps and bogs (Dunkle, 2000). They are also found commonly foraging on grassy meadows where adults perch on stems and twigs (Garrison, 2006). Along one shore at Meacham Lake is a marsh and field, and the majority of *Sympetrum* were caught in this area. Lastly, Osgood pond makes a perfect home for (Frolich Strong & Robinson, 2004) as they prefer muck and sand bottomed ponds (Dunkle, 2000; Garrison 2006). Adults are often found along trails or at margins of stagnant water, and larvae seek refuge in the muck and burrow shallowly (Garrison, 2006).

Larvae

A total of 199 minutes was spent sampling between Osgood Pond, Upper St. Regis Lake and Rainbow Lake. The average time spent sampling was 49.5 minutes. The sampling at the three sites yielded four different families of odonates, all within the sub order Anisoptera. The most common odonate family found was Corduliidae, which was found at all three sites and was always found within microhabitats that had either emergent or submergent vegetation.

Family	Ossgood Pond	Upper St. Regis Lake	Rainbow Lake	Total
Aeshnidae	1	0	0	1
Corduliidae	1	2	7	10
Gomphidae	3	1	0	4
Macromiidae	6	0	0	6
Total	11	3	7	21

Table 117- This table displays the number of occurrences of larval Odonates during sampling at Osgood Pond, Upper St. Regis Lake, and Rainbow Lake within the Adirondacks of New York State.

A total of 21 larval odonates were collected during sampling. Of the 21 Odonates 4 different families were represented; Aeshnidae, Corduliidae, Gomphidae, and Macromiidae. Aeshnidae was the least commonly observed, 1 individual total, and was only found at Osgood Pond. Corduliidae was the most abundant, 10 individuals total, and was observed at all three locations. Gomphidae was found in two of the three locations and there were 4 occurrences total. Macromiidae was the second most commonly observed, 6 individuals total, and occurred only at Osgood Pond.

During sampling multiple microhabitats were sampled. Those microhabitats included vegetated areas and non-vegetated areas which tended to be sandy lake-bottom with lake-bottom debris. Odonates were found primarily in the microhabitats that contained vegetation. Of the 9 samples that yielded odonates only one sample that was not vegetated had an occurrence of odonates.

Vegetation Type	Number of Occurences
Emergent	7
Submerged	1
None	1
Total	9

Table 118- This table displays the number of occurrences of larval odonates at different vegetation types in Osgood Pond, Upper St. Regis Lake, and Rainbow Lake within the Adirondacks of New York State.

Vegetation was broken down further into emergent and submerged categories. The greatest number of occurrences of odonates occurred in the emergent vegetation type. Emergent vegetation samples in which there were occurrences of odonates included most commonly pickerelweed, with one sample near white lily pads that yielded odonates.

Sampling of Osgood Pond, Upper St. Regis Lake, and Rainbow Lake showed that larval odonates were present at all three locations and each location had some variability. odonates are predators and are most likely found in areas of high prey densities. In our small preliminary sample we found that odonates were located most numerously in those areas that had emergent vegetation. Emergent vegetation may provide a highly suitable habitat for many prey species of odonates.

Only one of the four larval odonate families, Corduliidae (emeralds), were found at all three locations which would suggest that they are capable of living in variable habitat types. Corduliidae were also the most numerous of the odonate larvae collected.

All odonates that were collected were of the sub-order Anasoptera or dragonflies. The sub-order Zygoptera, damselflies, was absent. A larger sample size would have provided a clearer illustration of odonate populations within the three locations.

Comparison between Adult and Larval Odonates

Adult dragon and damselflies were collected from June until August at four boat launches while larvae were collected only in mid to late August at three boat launches. Due to the differences in timing of sampling and relatively small sample sizes, we use caution in interpreting the comparison of information yielded by each sampling protocol.

The most notable difference is that the family Libellulidae (which includes the genera *Sympetrum* and *Ladona*) that was most commonly represented in the adult form in Upper St. Regis lake (and Meacham lake which was not sampled for larvae) and present in the other sites, was completely absent in the larval sampling. All the other families were represented in both adult and larval data. This may be due to the dip net sampling occurring late in August, since *Sympetrum* and *Ladona* emerge in mid-summer (J. Mihuc pers. comm.). The other main observation is that in the larval sampling, representatives of the family Corduliidae were the most abundant and found in all three sampling locations, whereas only one adult was identified during the season. One possible reason for this is that the medium and larger bodied odonates often have multi-year life cycles. This category also includes the Macromidae (known as cruisers) and the Aeshnids which were also found in larval sampling. Sampling in late summer would likely result in proportionately more multi-year larvae being sampled since the single year life cycle organisms would more likely have emerged already.

Sampling earlier in the summer season and at the same time as adults are sampled could yield higher numbers and diversity of species as different groups have differences in life cycle length and emergence time. Our

ongoing study of larval odonates in concert with continued adult sampling will provide valuable long-term information.

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Amphibian Biodiversity Inventory

By Seth Crevison and Kristen Haynes, Watershed Stewards

Introduction

Did you know that there are 18 species of salamanders and 14 species of frogs and toads in New York (Gibbs et al. 2007)? Most people only encounter the occasional toad or frog, despite the fact that the Red-backed Salamander (*Plethodon cinereus*) alone is thought to be the most abundant vertebrate in forests of the Northeast (Petranka 1998). That's because many of these fascinating creatures are elusive, nocturnal, fossorial, or live in very specific habitats. In our survey of amphibians, we searched both aquatic and terrestrial habitats to attempt to document species abundances in different habitats in the west-central Adirondacks. Our survey was done in accordance with the Adirondack All Taxa Biodiversity Inventory (Milewski and McNulty 2006).

The Adirondack Park is a region of great biodiversity, containing within its boundaries 90% of all the species found in Northeastern United States (Milewski and McNulty 2006). The Adirondack ATBI is an effort to survey and inventory all life in the park through the help of citizens and scientists (Milewski and McNulty 2006). The ATBI attempts to connect people to the land and increase awareness and appreciation of the diversity of life here while gathering scientific knowledge that can be used in management and future studies (Milewski and McNulty 2006). The Great Smoky Mountains National Park of Tennessee was the first site of an ATBI in the world, conducted by Discover Life in America (Discover Life in America (DLIA) 2011). So far, they have cataloged 17,523 species and discovered 910 new species in the national park (DLIA 2011). The Adirondack Park is over ten times the size of the Great Smoky Mountains, so who knows how many species there are, and how many we have yet to discover?

Figure 131- Dragonfly sample, summer 2011. (S. Crevison)

Surveying for the Adirondack ATBI is standardized and straight-forward. In early May, training was provided for identifying amphibians based on sound and sight. Anyone is encouraged to get involved, even those without a scientific background—it's as simple as being provided with a database template and recording simple characteristics of the habitat and specimen, including a photo to ensure quality control of citizen science.

Most of the survey work for the Adirondack ATBI is concentrated near Paul Smith's College, due to the college's involvement. With the expansion of the Watershed Stewardship Program into the west-central Adirondacks this year, it seemed to be a great opportunity to sample in a new region and new habitats. This area

of the Adirondacks contains large tracts of state land including the Moose River Plains Wild Forest, but also contains areas of high human disturbance along roadways and some lake shores.

The purpose of our study was to discover the diversity of amphibian species living in the west-central Adirondacks, and in what habitats. Sampling was done at several locations, in the hope of encompassing a wide range of habitats as well as levels of human disturbance, hypothesizing that as human disturbance increases, species richness of amphibians decreases. This survey also serves as a pilot study for future research on amphibians in the area.

Figure 132- Green frog, summer 2011. (S. Crevison)

Natural History

New York's amphibians include two orders: Caudata (Salamanders) and Anura (Frogs) (Gibbs et al. 2007). Within Caudata, species from five families are present in New York: Cryptobranchidae (Giant Salamanders), Proteidae (Waterdogs), Ambystomidae (Mole Salamanders), Salamandridae (True Salamanders), and Plethodontidae (Lungless Salamanders) (Gibbs et al. 2007). Four of these five families reside in the Adirondack Park—all execpt Cryptobranchidae (Gibbs et al. 2007). As for the Anurans, New York hosts four families: Pelobatidae (Spadefoot Toads), Bufonidae (True Toads), Hylidae (Treefrogs), and Ranidae (True Frogs) (Gibbs et al. 2007).

The name "Amphibian" means "both kinds of life," referring to the fact that amphibians use both aquatic and terrestrial habitats at different life stages (Gibbs et al. 2007). However, even when inhabiting terrestrial environments, most amphibians require moisture, because most gas exchange occurs cutaneously, through the skin (Gibbs et al. 2007). Most amphibians return to water to breed, although some, such as Plethodontid salamanders, are strictly terrestrial (Gibbs et al. 2007). Mole salamanders in particular are known for their mass migrations to vernal pools to spawn—it is the time when they are most likely to be seen (Gibbs et al. 2007).

With a few exceptions, amphibians have a complex life style, from egg, to larva, to adult, with the latter transformation involving metamorphosis (Gibbs et al. 2007). For most species, the egg and larval stages are aquatic while the adult stage is largely terrestrial (Gibbs et al. 2007). There are some interesting exceptions, including the abundant *Plethodon cinereus* and other Plethodontids, which complete their metamorphosis within

the egg and hatch into tiny juveniles (Gibbs et al. 2007). Others, like *Cryptobranchus alleganiensis* and *Necturus maculosus* remain in aquatic habitats as adults, and even retain their gills (Gibbs et al. 2007). Salamanders that inhabit running water as adults are dubbed stream salamanders.

Amphibians are ectotherms, meaning that they must use behavior to obtain heat form their environment, instead of maintaining a constant body temperature like endotherms (Gibbs et al. 2007). If an ectotherm cannot warm itself sufficiently, it is forced to remain inactive—most hibernate during the freezing temperatures of the winter (Gibbs et al. 2007).

Frogs and salamanders are mostly insectivorous, but some also eat worms, crayfish, fish, mollusks, other salamanders, and eggs (Gibbs et al. 2007). They are preyed on by fish, birds, turtles, snakes, large insects, and some mammals (Gibbs et al. 2007).

Methods

Surveys were conducted at 9 study sites in the west-central Adirondacks. Site 1 is a pond and wetland fed by Seventh Lake through culverts. It is located adjacent to Route 28 and is surrounded by mixed woods. Site 2 is a very small pond located near Fourth Lake, surrounded by a few houses, semi-impermeable surfaces, and mixed woods. It has no inlet or outlet, and is shallow and eutrophic. Site 3 was a small moving stream that feeds into Fourth Lake, surrounded by deciduous slopes and bordered on one side by an impermeable surface. Site 4 was Quiver Pond, a large pond bordering South Shore Road in the Town of Webb. It is surrounded by mixed and coniferous woods. Site 5 is a trail leading out to Grassy Pond. It is a wet mixed forest that had recently been flooded. Site 6 is a deciduous slope in the Brown Tract Pond public campground. Sites 7-9 are located in the Moose River Plains Wild Forest. Site 7 was located the Fawn Lake outlet, at the site where a beaver dam separates the lake from a stream, and contained tall marsh grasses, shrubs, and large boulders. Site 8, was an unnamed brook near Twoline Camp in the Moose River Plains which runs near one of the roads. It was spring-fed and contained large and small rocks, small cataracts, still pools, and seeps. Site 9 is a small bog pond near Helldiver Pond. It is surrounded by black spruce and other coniferous trees and shrubs, and is dominated by sphagnum moss and bog plants.

The time spent for collection at each site consisted of approximately 45 minutes. Species were collected by hand and combination net. Terrestrial and aquatic salamanders were surveyed by flipping cover objects (Test and Bingham 1948). Specimens were photographed and identified using a field guide. Gary Lee provided assistance in frog identification while in Moose River Plains. Data were recorded on spreadsheet templates provided by David Patrick.

Figure 133- – Salamander sample, summer 2011. (S. Crevison)

Results

A total of 49 specimens representing eight species were captured and photographed from the nine study sites. Four species of Anurans were detected in our survey. These included American Bullfrog (*Lithobates catesbeianus*), Green Frog (*Lithobates clamitans*), Mink Frog (*Lithobates septentrionalis*), and American Toad (*Anaxyrus americanus*). American Bullfrog and Green Frog were detected with highest frequency, with six specimens captured and photographed, while American Toad was the least detected, with three.

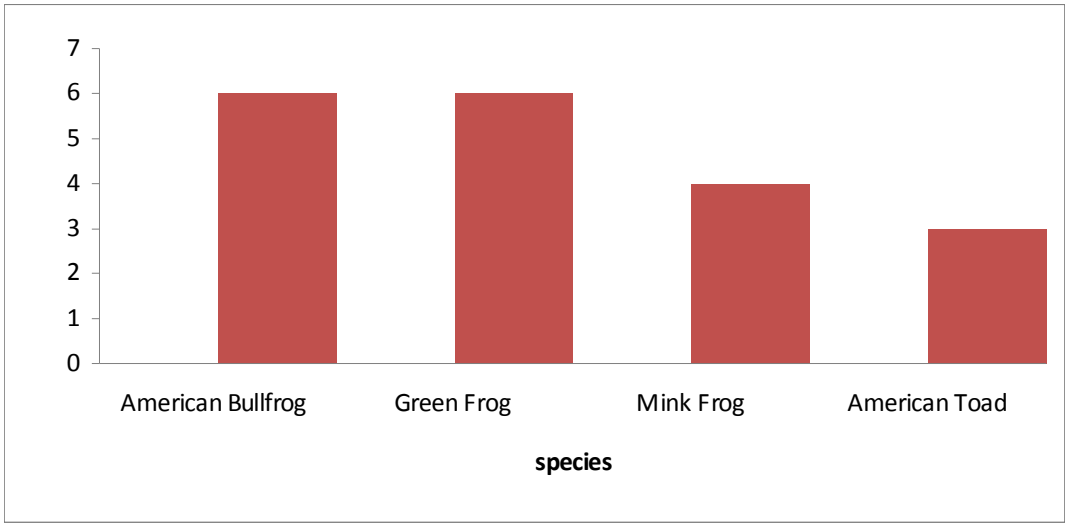

Figure 134- – Number of specimens captured and photographed of the order Anura in the west-central Adirondacks, summer 2011.

Five species of the order Caudata were detected in our survey, including four Plethodontids and one of the family Proteidae. Red-backed Salamanders (*Plethodon cinereus*) were the most abundant species with 18 individuals collected and photographed. The Northern Two-lined Salamander (*Eurycea bislineata*) and Northern Dusky Salamander (*Desmognathus fuscus*) were the least abundant, with only one specimen collected for each.

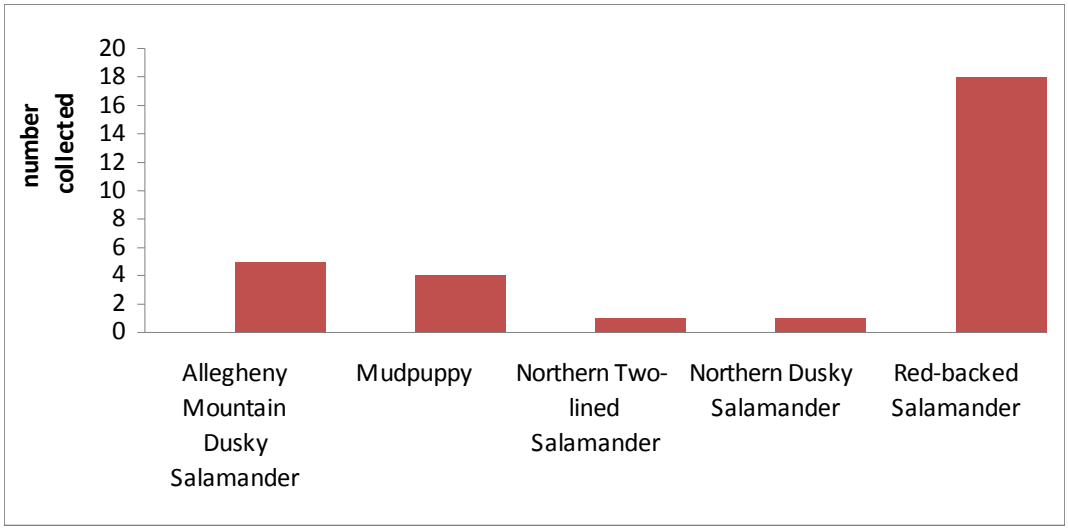

Figure 135- – Number of specimens captured and photographed of the order Anura in the west-central Adirondacks, summer 2011.

We compared the number of specimens collected at each site to the total amount collected. 45% of total specimens collected were from Brown Tract Pond public campground. Counted as a whole, the sites from Moose River Plains (those in lighter colors—Fawn Lake Outlet, Helldiver Pond, and Brook near Twoline Camp) yielded 33% of the specimens. This suggests that there was a higher abundance of amphibians at Brown Tract Pond campground and the Moose River Plains than other sites. Notably, most other sites were closer to roads and more disturbed by humans.

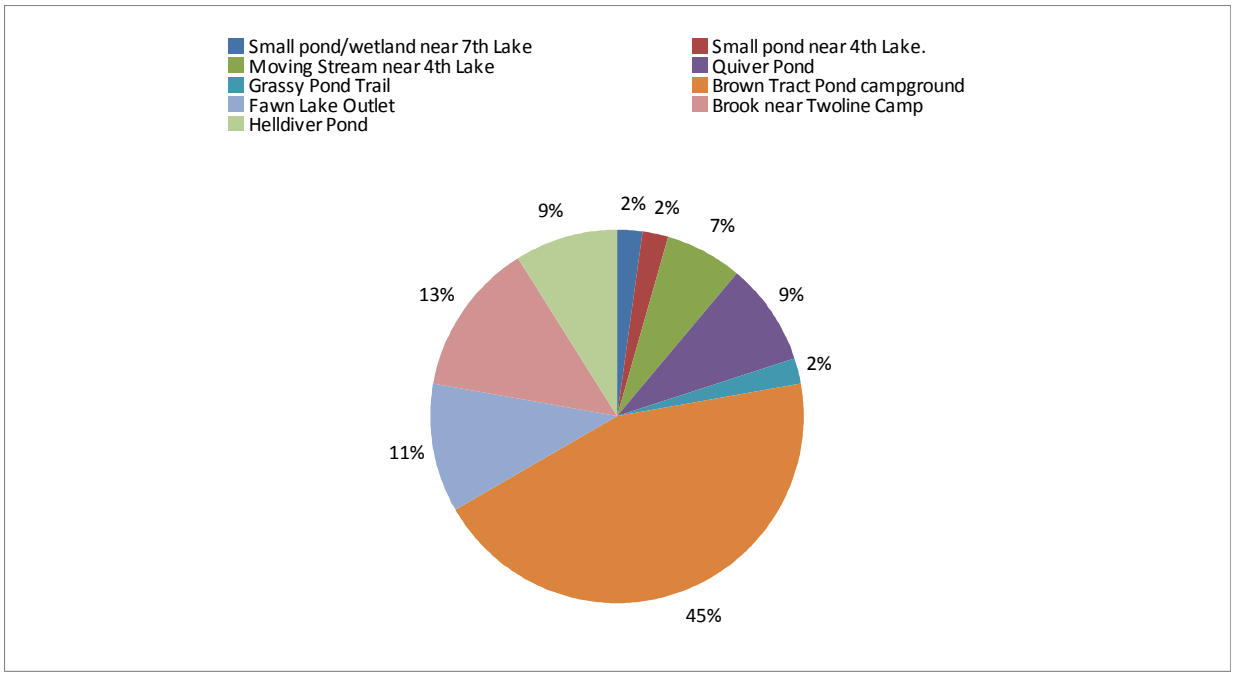

Figure 136- – A comparison of number of specimens collected at each site, summer 2011. Number of species is not reflected.

We also compared number of *species* found at each site. Here we can see that although Brown Tract Pond campground yielded the greatest number of specimens, those found at Moose River Plains represented a much more biodiverse assortment. Eight species were surveyed at Moose River Plains, while only three at Brown Tract Pond campground, the next highest. The other sites fell in with only one or two species. Again, most of these were sites more disturbed than either Moose River Plains or Brown Tract Pond campground.

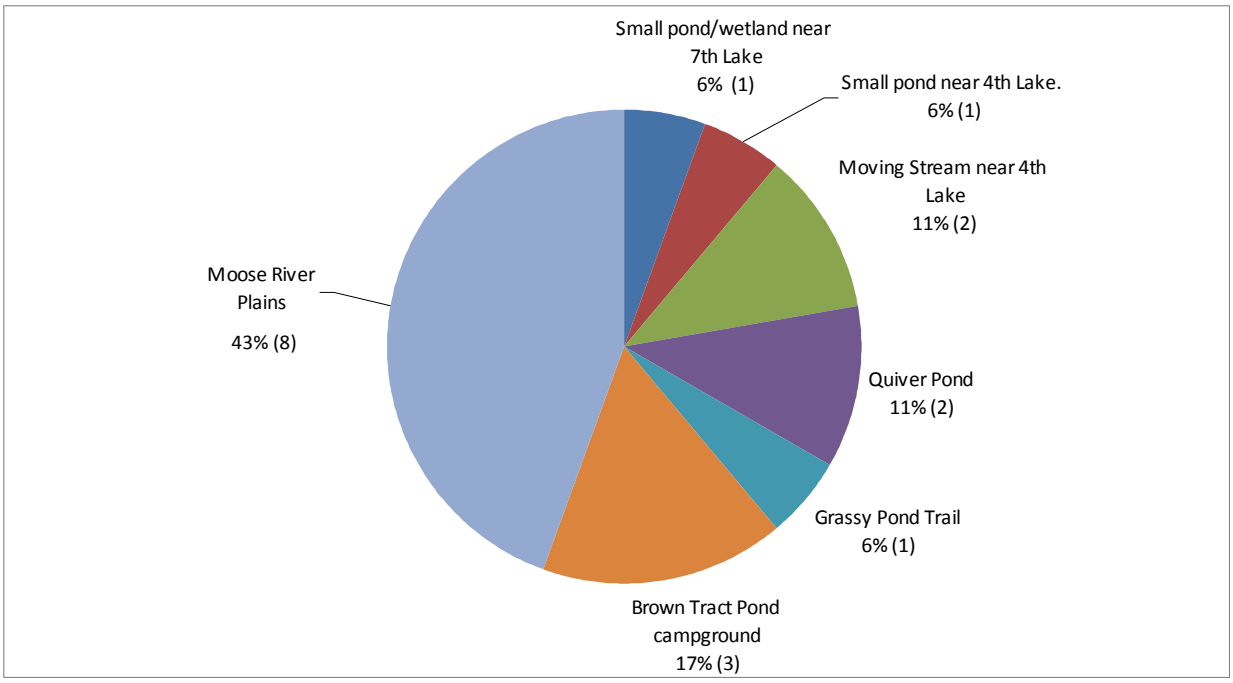

Figure 137- – A comparison of number of species collected at each site, summer 2011. Note that totals from sites in Moose River Plains are combined.

Discussion

As a survey for the Adirondack ATBI and a pilot study for the Watershed Stewardship Program, this study was a success. Our hypothesis that species richness decreases as human disturbance increases was supported. While we did not quantitatively measure the levels of human disturbance, it can be assumed that areas bordering highways would have a higher level of disturbance than sites far from roads. The highest species diversity was discovered in the Moose River Plains Wild Forest, followed by Brown Tract Pond public campground, followed by the other study sites, most of which were located near major roads. Green Frogs, Bullfrogs, and Red-backed Salamanders were abundant species that seemed tolerant of moderate human disturbance, while others like the Northern Dusky Salamander, Mink Frog, and Northern Two-lined Salamander were only found in the mostly undisturbed Moose River Plains.

There were several possible sources of error in this study. One was that we sampled each site once spanning the summer, so species composition may have changed in the locations. Weather is another variable that may have affect species composition on shorter scales—hot, dry weather can force some species to burrow or aestivate (Pauley et al. 2006). Another is human error—we may not have observed every individual present (almost a certainty with the salamanders), and of those we observed, we were not able to capture every individual. Additionally, we sampled during the day, while many amphibians are crepuscular or nocturnal. Finally, we biased our study towards certain substrates, sampling mostly grassy or shrubby areas. This would not account for tree frogs or subterranean amphibians.

Conclusion

This study was successful in concluding that human disturbance does affect the species diversity of amphibians in a habitat. For next year we would recommend concentrating the amphibian study in the Moose River Plains Wild Forest, a large biodiverse wilderness area comprising a variety of habitats. The presence of mudpuppies (*Necturus maculosus*) is extremely significant, as at least one major field guide (Gibbs et al. 2006) does not describe them as inhabiting the Adirondack Park. It does, however, list mudpuppies as inhabiting the Hudson and Mohawk Rivers and connecting waterways (Gibbs et al. 2006). Four major watersheds of New York converge in the Moose River Plains – the Upper Hudson River, Mohawk River, Lake Champlain, and St. Lawrence River watersheds (NYSDEC 2011). Gary Lee, a former forest ranger, has reported adult mudpuppies in Cedar River Flow, part of the Upper Hudson River Watershed, while the juveniles from Site 8 were most likely in the Black River watershed, although we weren't able to obtain a detailed-enough map to be certain (NYSDEC 2011). It is certain, however, that Site 8 and the Cedar River Flow lay in different watersheds (NYSDEC 2011). It would be interesting in the future to do extensive sampling of the streams in this convergence area to see if mudpuppy presence was linked to certain watersheds. It would also be interesting to do a genetic study to see if mudpuppies from different watersheds, but close in proximity, showed great genetic divergence, assuming that little gene flow could occur between populations from different watersheds for a strictly aquatic species.

Finally, relating to all amphibians and ATBI work, future studies may want to include samples taken at night or aural surveys of frogs, which may capture species our study did not.

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Purple Loosestrife Monitoring and Control

By Matthew Potel, Watershed Steward

Introduction

Lythrum salicaria, commonly known as Purple Loosestrife, is an invasive plant species that has spread through the country. Native to Eurasia, this perennial plant is believed to have spread by contaminating the ballast of large ships, as well as being brought in for its ornamental value (USDA Purple Loosestrife National Invasive Species Information Center, 2011). *Lythrum salicaria* generally grows 3-7 feet long, with up to 50 stems densely growing out of a single woody root system. The four sided, sharply ridged stem yields "spearhead" shaped purple leaves. The Rhizome roots form a dense mat allowing the plant to concentrate and multiply (Wisconsin Department of Natural Resources, 2004).

Purple Loosestrife flourishes in wetland areas, penetrating bogs, marshes, and lakeshores. It also commonly flourishes in ditches along roadsides. It blooms from July through September, and creates an enormous seed bank (Ling). One plant can produce up to 300,000 seeds per year, with a 70% survival rate (Wisconsin Department of Natural Resources, 2004). Its dominance as an invasive species comes in its ability to adapt and crowd out native plant species. While it thrives in wetter environments, once established it has been known to tolerate dry soils. Purple Loosestrife seed's remain viable for long periods while dormant, and can germinate in a wide range of PH soil levels. It is fairly shade tolerant, and has shown a unique ability to adjust to a variety of ecological factors (Wisconsin Department of Natural Resources, 2004). This ability, in combination with the plant's fast, concentrated growth and seed dispersal, make it very problematic for fragile native habitats.

Figure 138- *Lythrum salicaria* dominating a wetland in the Adirondacks.

Purple Loosestrife grows densely in wetlands, crowding out native plant species. It is considered a nuisance

species throughout the nation. Its presence on the St. Regis Lake Chain has led to an ongoing monitoring and eradication project over the past 10 years, headed by the Adirondack Watershed Institute's Watershed Stewardship Program.

Management Techniques and Timeline

There are a variety of methods for Purple Loosestrife management and control. The most effective method on the small scale calls for digging and hand-pulling individual plants. Herbicides such as Roundup and Garlon 3A are also effective treatments, and mowing and tilling can be done on larger sites. The Watershed Stewards managing the loosestrife on the St. Regis chain focus exclusively on the hand-pulling and digging method. While a time-consuming activity, this allows for maximum attention to each individual plant. The AWI technique involves hand pulling or digging from as close to the root as possible, ideally seeking to pry the rhizome root structure out of the ground to ensure that the plant cannot re-sprout. Weeded plants are then sealed in a large plastic bag, and placed in the sun for two weeks to decompose.

An initial survey was completed by Steward Matt Potel on July 18th, once the plants had begun to flower. Old sites with active plants were recorded, and one new site was found. The plants were mostly concentrated all across the shoreline of Spitfire Lake, as well as in the slough leading to Lower St. Regis and the channel connecting Spitfire to Upper St. Regis. On August 1st, Watershed Stewardship Program Director Dr. Eric Holmlund accompanied Potel to site 3, a marsh area located at Camp Regis-Applejack in Penfold Bay. One Hundred and ninety-seven plants were removed from this highly infested site. On August 4th, Brandon Quirion from The Adirondack Park Invasive Plant Program's assisted Potel in pulling plants along most of the shore of Spitfire and the slough. Finally, on August 12th Director Holmlund and Steward Potel visited the remaining sites, as well as circumnavigating the lakes in search of any missed sites. All plant materials collected were bagged and allowed to decompose as previously described.

Results and Discussion

The monitoring project in 2011 yielded 431 plants. This number is down drastically from last year's total of 773. While many sites were down substantially, the most glaring reduction occurred at site 22, situated on Spitfire's eastern shore. These figures suggest a great success in the efforts from last year's pulling, and imply a further reduction in numbers after this year's extensive harvesting efforts.

Site/ GPS UTM	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
S1 N4917982, E556881	0	14	0	0	0	0	0	0	1	0	0
S2 N4917503, E557965	0	0	0	0	0	0	1	0	0	0	0
S3 N4918026, E559045	450	1400	330	742	130	14	380	123	196	222	197
S4 N4917748, E558103	5	63	5	26	5	0	7	10	0	0	10
S5 N4917831, E557837	0	74	23	50	15	54	12	3	15	2	4
S6 N4917905, E557790	0	0	0	0	0	0	7	22	3	0	15
S7 N4918087, E557660	250	915	117	146	250	200	89	34	8	39	76
S8 N4918290, E558390	110	49	3	74	150	101	375	132	3	6	4
S9 N4918149, E557190	0	437	143	116	25	117	107	87	0	72	30
S10 N4918636, E557038	0	123	5	34	25	11	7	3	1	4	7
S11 N4918668, E557451	0	0	0	0	10	0	0	3	0	3	8
S12 N4918680, E5579988	18	11	13	3	10	23	1	0	0	1	4
S13 N4918673, E558675	25	260	35	111	100	96	8	11	55	89	17
S14 N4978647, E558887	0	0	0	0	0	15	0	4	0	0	9
S15 N4918731, E559028	30	8	16	42	40	0	4	9	0	25	11
S16 N4918901, E559086	0	0	0	0	0	3	0	0	0	3	0
S17 N4918960, E559279	0	0	0	1	0	0	0	0	0	0	0
S18 N4920309, E559434	0	0	0	0	4	0	0	0	0	0	16
S19	0	0	0	0	0	0	6	0	0	0	1
S20	0	0	0	0	0	0	0	6	0	0	0
S21	0	0	0	0	0	0	0	3	0	0	0
S22	0	0	0	0	0	0	0	0	25	305	20
S23	0	0	0	0	0	0	0	0	0	2	2
Total	**888**	**3354**	**690**	**1345**	**764**	**634**	**1004**	**450**	**307**	**773**	**431**

Table 119- Summary of the number of purple loosestrife plants pulled at each location on the St. Regis lakes at all locations where purple loosestrife was found from 2001 to 2011 , Site numbers correspond to points in map, 2001-2011.

Lower St. Regis

The only infestation found on Lower St. Regis Lake is located on Paul Smith's Campus, in wetlands just east of the Campus Forestry Club Cabin. This infestation, formerly deemed sites 18 and 19, proved to be contained in one large area, and will therefore be condensed into one site in the future, site 18. The yield of 16 plants is an alarming increase, as none were shown to be found in past years. The number of plants at this site may have built up due to past neglect (many mature plants were found), partially based on its isolated location and difficulty of access. To combat this year's increase, this site should be monitored earlier in the summer and checked on more often than in past years.

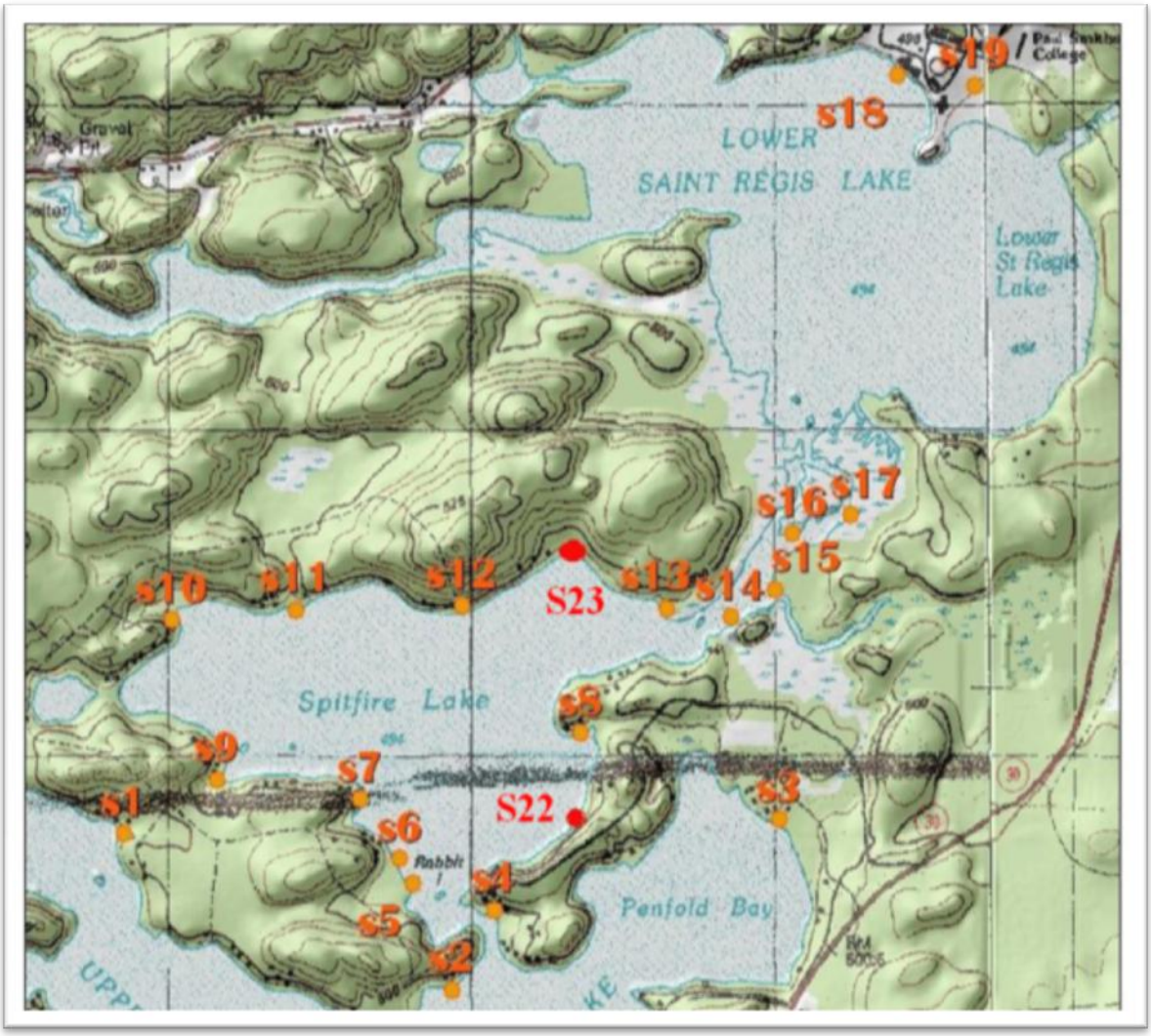

Figure 139- Purple loosestrife sites, St. Regis Lakes. The numbers correspond to numbers in Table 119.

Spitfire and the Slough

These areas represent the majority of the Purple Loosestrife infestation on the St. Regis chain. Site's 13-17 contain the plants in the slough. This swampy channel is an ideal environment for the Loosestrife to thrive. Two sites that have had infestations in the past, 16 and 17, were found to be free of Loosestrife when investigated this year. The other three sites contained many mature plants scattered and hidden in the dense wetland area. The presence of some extremely mature plants at sites 14 and 15 suggest older growth which wasn't previously found due to inaccessible locations. The pulling of these plants should help reduce the large seed banks which build up in the slough area.

Sites 5-12, which are spread evenly all along the shoreline of Spitfire, showed an overall decrease from past years. Not only are numbers down, but most of the sites contain infestations which are concentrated more tightly than in past years. This is evident at site 8, which was previously spread along much of Spitfire's eastern shoreline and was greatly decreased in area this year. However, many of the sites on Spitfire contain juvenile plants which must be monitored closely in the future. Site's 8, 9 and 11 specifically were found to contain young

infestations, with the potential to increase in upcoming years, if not controlled well.

Upper St. Regis and the Channel

This area includes sites 1-4, as well as a newly found site; site 19. A large, single plant was discovered in the channel near Rabbit Island, isolated from the other sites. It was pulled and site 19 was marked by Director Holmlund and Steward Potel. Despite this new site, the other nearby sites in the channel, 1 and 2, were found to be free of Loosestrife. Site 3 is a notorious site on Camp Regis-Applejack property, on the Northwestern shore of Penfold bay. The Loosestrife at this site is spread out in a large bog area behind and around the camp boathouse. While many plants were pulled, numbers for this site are down by 25 plants. Finally, site 1, an isolated area on the western flank of Upper St. Regis, was searched closely and extensively but no plants were found. This is similar to the past 9 years, which has shown almost no Loosestrife activity in that area. This large portion of the lake can now be considered low risk for future infestations.

Summary

Overall, 6 sites had the same number of plants in 2011 as in 2010 (typically locations where there are currently no plants found). There was a decrease in the number of plants at 7 sites, and an increase in the number of plants at 10 of the 23 sites (43%). Still, with these increases in plant numbers, the total number of plants harvested at all sites combined in 2011 was reduced to nearly half of what was harvested in 2011. A qualitative examination of the data suggests that over the past few years of monitoring and removal, there has been a general, and fairly substantial, decrease in the number of stems at locations that in the early years of the project were large infestations. However, as expected small areas of loosestrife continue to be located each year. The monitoring and eradication effort on the St. Regis Lakes chain, is working to reduce infestation size in many locations, but it is critical to maintain or increase the level of vigilance in monitoring and pulling stems, since the threat of colonization or recolonization is constant.

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Education and Outreach Programming, Eastern Stewards

By: Kimberly Forrest, Kate Issacson, and Danielle Thompson

Introduction

The Watershed Stewardship Program (WSP) of Paul Smith's College's Adirondack Watershed Institute was founded in 2000 to develop awareness and educate the public about aquatic invasive species (AIS). 2011 marks the eleventh consecutive year of steward presence inspecting watercraft at the public boat launches in the tri-lakes region. Along with their inspection, all stewards provide boaters with information on AIS and collect recreation data from these encounters. Recreation data gathered over the years can be useful to both current and future managers of AIS. This demographic information can help create a more complete picture of recreational watershed usage and, therefore, a better understanding of the potential for AIS contamination and spread throughout the region.

While the majority of a watershed steward's time is spent at the boat launch, the WSP also enables its employees to dedicate one of their work-week days to special interest projects related to the goals of the program. One of the projects offered for the summer of 2011 was educational outreach. This special offering was made possible thanks to a grant funded by the Lake Champlain Basin Program (LCBP). The grant provided funding for three stewards, one day per week each, to educate the public on topics of importance to both the WSP and the LCBP. These issues included (but were not limited to) habitat and ecosystem function, cultural eutrophication, importance of wetlands and watersheds, and the threat of invasive species. Stewards were referred to as Environmental Issues Educators (EIE).

Two of these educators were stationed at the Paul Smith's College Visitors Interpretive Center (the VIC). This location was an attractive choice, not only for its excellent trail system and frequent visitations (approx. 50,000 visitors annually!), but because it is a recently acquired property for Paul Smith's College. The Paul Smith's VIC was in its first summer of operation after being under New York State ownership for over 20 years, so this was a good opportunity to implement the objectives of the WSP goals at the VIC. The remaining EIE delivered programming to the community, giving presentations and sharing information with the public. This outreach was conducted at some of the following locations: Fish Creek Ponds, Buck Pond and Wilmington campgrounds, Saranac Lake and Lake Placid public libraries, local farmers' markets (Paul Smiths, Saranac Lake, Lake Placid, Keene Valley), and any other highly visited venues and events which presented an opportunity for outreach.

Danielle Thompson's Summary Reflection

Through my involvement with the Watershed Stewardship Program, I was able to spend one day a week working on educational outreach at the Paul Smith's College Visitors Interpretive Center. As a student pursuing a degree in environmental studies, the issues driving the WSP and LCBP are ones which I feel passionate about. Another passion I have is educating children (and really anyone who will listen!) about environmental issues and our role as stewards of the environment.

I spent my weekly visits at the VIC walking the trails as an interpreter, setting up informational displays in the main lobby, and creating daily educational programs for visiting children and their families. Saturday quickly became my favorite day of the week, as I encountered not only first time visitors from across the country, but families and individuals who had been coming to the VIC for years. The diverse groups of people always made for a unique experience, and I was pleased to find that many of these people were interested in the work I was doing for the WSP. Locals were intrigued to find out more about the program they had heard about in passing, and visitors were impressed with the idea of such a program being present to protect and conserve the Adirondack waterways.

Figure 140- Environmental Issues Educator Danielle Thompson and the display she designed in the VIC lobby.

While I did encounter a large amount of people during my weekly shift at the VIC , I wish that there was more I could have done to educate local children about the importance of stewardship. The idea to create a "Junior Steward Program" (see document in appendix) was one which I felt strongly about and was hoping to get started this summer. I thought it would be a perfect way to combine the goals of the WSP with those of the LCBP as stated in the objectives of the grant which we received to do this educational outreach. Working alongside Sarah Keyes, an environmental educator at the VIC, we developed a series of children's programs devoted to educating kids about the many ways they can, and should, be a steward of the environment. Unfortunately, the VIC, under new management by Paul Smith's College, needed to charge money for these programs as it is now a "for-profit" facility. While this is an understandable request, I believe that the cost of the program deterred parents from signing up their children. Although we were able to keep some integrity of the proposed programs by offering no-charge family activities/crafts in line with the weekly theme, I wish that the Junior Steward Program had become what I envisioned in the beginning of the summer.

Aside from these setbacks, I enjoyed my time at the VIC immensely and feel that I was able to get the word out about many of the important issues regarding wetlands, watersheds, invasive species, and stewardship of the environment. I would like to thank the WSP and the LCBP for giving me the opportunity to spend time in such a beautiful facility, educating people about things which I am passionate about.

Figure 141- Portable public education display.

Katelin Isaacson's Summary Reflection

I spent most Sundays at the Paul Smith's College VIC (PSC VIC) with the exception of one Sunday dedicated to education outreach at the Keene Valley Farmer's Market. I had a different experience each day. In the beginning of the summer, most Sunday's were filled with rain and dreary weather. However, I had a formal PowerPoint presentation on Invasive Species Threatened Waterways to give in the theater. I spent an hour out on a trail guiding people on nature and about the Watershed Steward Program. Depending on the visitation rate, I felt that a display in the lobby and my presence in the building allowed me to reach more people than when I was on the trails. When a visitor had a question, I always began with my role as a Watershed Steward and the program and the importance of educational outreach.

Figure 142-One of the EIE stations on the Heron Marsh Trail at the VIC.

I think that overall it was a great experience to reach a wide and diverse audience. It met the goals of the Lake Champlain Basin Program for outreach on invasive species and how they could affect the watershed near and far from the PSC VIC. As a recommendation, I think wearing the volunteer t-shirt rather than the khaki uniform would be less formal and would allow people to approach stewards better on the trails and at the desk. Informal talks and maybe even leading a paddle would be a great way to even expand the program. The trip to Keene Valley Farmer's Market was a wonderful experience for educational outreach. All of the vendors were curious as to what I was representing, and I was able to explain to them my role and how we try to involve people outside of the boat launches in keeping the waters clean. I would sit at the display table and talk with people as they walked by. I had one man from England ask about Japanese Knotweed and if it was a large problem in the Adirondacks. When I explained to him how much of a problem it was here, he was really surprised and glad to learn that there was a "nasty plant" that he could identify.

In my opinion, continuing our presence on Sunday's is an integral part of the Watershed Stewardship Program. If there were one or two stewards dedicated to traveling to different farmer's markets I think it would be worth the experience of meeting some wonderful people and sharing incredible knowledge back and forth.

Figure 143- Closeup image of the LCBP watershed model, used in education and outreach programming by the EIEs.

Education and Outreach Programming, Western Stewards

By Jaden Aronow, Stephanie Pena, and Brian Hartle, Watershed Stewards

Introduction

The western division of the WSP educated the public about aquatic invasive species (AIS) transportation and the ecological consequences of AIS in water bodies within the Great Lakes watershed. Along with stewarding at a boat launch, special projects were assigned to outreach to the boating community at venues other than the boat launches. A steward was directed to educate and spread information about AIS through area newspapers, lake association newsletters, and the WSP newsletter. Events that take place in the area throughout the summer were also opportunities to relay AIS information and interact with people. Boat shows, fishing tournaments, and wilderness expositions are good chances to talk with the people that understand and represent a large portion of the recreationists that use the lakes. The property owners associations in the area are groups that are helpful to contact as well. This project was important, due to the fact that this is the first year that the WSP was located in the Inlet, Raquette Lake, and Long Lake areas.

A steward was assigned the task of researching area AIS transport laws adopted by local governments and assisting both local governments and lake associations in understanding how this legislation might fit in with their strategic planning. As the WSP was new in this area of the Adirondack Park and local governments and lake associations are often understaffed the WSP assisted in all aspects of AIS awareness and education. A study of nearby efforts to eradicate variable leaf milfoil in Lake Placid; control Eurasian water milfoil in Saranac Lake; and eliminate Asian clam from Lake George, illustrated the costs of managing AIS invasions and how adopting transport laws at the local level could benefit the community. The steward attended a meeting with the WSP Assistant Director, Long Lake Town Supervisor, and Long Lake Association on July 18 to discuss the status of Long Lake with regards to AIS prevention measures, the WSP, and future transport laws. The steward also created a power point presentation that could be used by any group interested in an overview of local transport laws.

Methods

Public Outreach was very reliant on dates, times, and locations of possible outreach events. The western steward supervisor worked with the steward in charge of public outreach in order to accommodate those events with the steward's schedule. Saturday was determined to be the steward's special project day due to the large proportion of events that took place on Saturdays. There was also flexibility in the schedule for different opportunities for outreach.

In the beginning of the summer the steward put together a calendar of events to attend. Those events included boat shows, fishing tournaments, town meetings, and property owner association events. Communication through frequent emails and phone calls allowed the steward to remain in contact and informed. It also allowed the steward to receive invitations to other events and consent to be at meetings. Depending upon the event that the steward was attending, the message and the presentation were fitted to the audience.

Different information and media pathways were also considered in public outreach. Word of mouth, formal presentations, regional newspaper, organization newsletters, and a new Facebook group were all utilized

for communicating the AIS prevention message. A newsletter original to the watershed stewardship program was also released and was entitled “The Channel”.

A steward acted as a summit steward on Bald Mt., between Inlet and Old Forge, on two occasions. On June 3 the steward interacted with 34 hikers. The second scheduled summit stewarding day was inclement and the steward was forced to leave the summit. This program was not continued in 2011, but there is great potential for summit stewarding to educate hikers on natural resource protection while hiking. Bald Mt. sees an average of 20,000 hikers per year according to the NYS DEC. Another extremely popular small mountain within the west-central Adirondacks is Blue Mountain. While taking slightly longer to climb, depending on the home location of the steward it may be a shorter roundtrip for them.

Results

The first course of action for the steward this summer was to compile a list of events and possible outreach opportunities throughout the summer. Research online and personal contacts were utilized to create a calendar of events. More information was gathered on specific events and the steward was able to configure a presentation or list of materials to bring that were most suitable for a particular audience. Events such as fishing tournaments and boat shows, often involved friendly conversation about the program rather than a formal presentation.

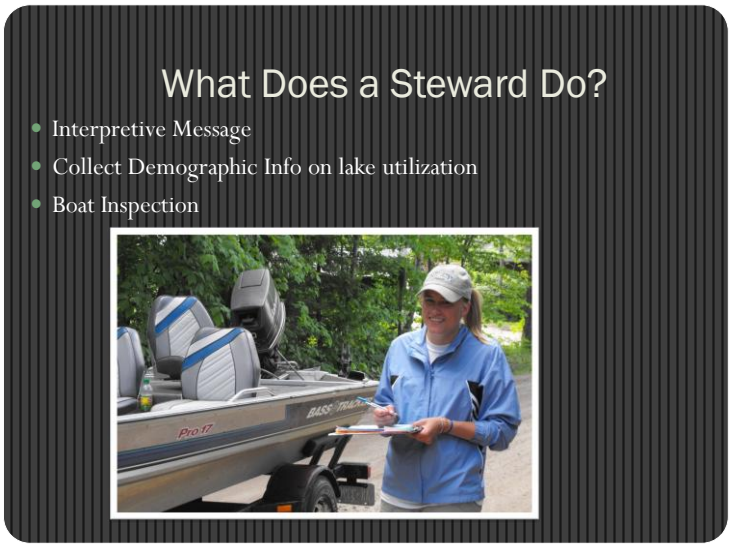

Figure 144 Slide from WSP presentation.

One of the first events attended for public outreach was the Hamilton County Federation of Sportsmen meeting. Two stewards attended with the intention of explaining more about the program. They were given the chance to speak and also receive information about other fishing events. They were able to distribute over 200 rack cards containing information on AIS to be used in different areas. Another formal settings were the annual meetings of the Big Moose Property Owner’s Association and the Raquette Lake Property Owner’s Association. The steward gave a formal power point presentation to all those in attendance at the Big Moose meeting. Rack Cards and other literature were distributed as well. The steward and the program were already well known by the Raquette Lake community, so no presentation was given (http://hawksk.tripod.com/rlpoa.htm). The steward did field questions about the successes of the program and its progression. There were also informal events that the steward was able to attend. The Raquette Lake Bass Fishing Derby, Old Forge Boat Show, Sixth and Seventh Lake

Association Annual Picnic, and Raquette Lake Boat Parade were among those events. The message of stopping AIS spread was delivered in a more casual manner.

Events Attended by WSP	Date
Woods & Water Outdoor Expo (Inlet)	June 11, 12
Old Forge Paddle Classic	June 25
Twentieth Antique Boat Show (Old Forge)	July 8
Fulton Chain of Lakes Association Annual Meeting	August 5
Fulton Chain of Lakes Association July Meeting	July 30
Long Lake Association Annual Meeting	August 6
Raquette Lake Property Owner's Association Annual Meeting	August 5
Big Moose Property Owner's Association Annual Meeting	July 30
Sixth & Seventh Lake Association Annual Meeting	August 6
2011 Long Lake Fish & Game Club Bass & Pike Fishing Derby	June 18
Long Lake Third Annual Bass Fishing Derby	August 4
Raquette Lake Bass Fishing Derby	July 23
Hamilton County Federation of Sportsmen Meeting	June 16
Long Lake Wooden Boat Show	July 9
White Lake Property Owner's Association Meeting Regional Inlet Invasive Plant Program Meeting	September 3 August 5

Table 120 Events with WSP presence.

Print materials were utilized for their value in expressing our viewpoint as well. The steward was able to write a short article about the program which was published in the Raquette Lake Property Owner's Association newsletter. A similar article was also written for the Long Lake Association newsletter and published on the association's website. The western division stewards also produced a newsletter of their own. It contained information about the program, articles on various subjects, and short bios of all the stewards. Pictures were taken for the newsletter and the bios were compiled from each individual. A list of locations to distribute the newsletter was also organized.

Figure 145- Group photo from Regional Inlet Invasive Plant Program Meeting. Jaden Aronow (in WSP uniform) and Greg Cerne (immediately to Jaden's left) representing the WSP.

Discussion

One of the biggest challenges for this special project was figuring out who to contact and what events where taking place. Because this is a new area for the WSP, the stewards were not familiar with the organizations in the area or the communities that they would interact with. Substantial effort was put into research and networking to get in touch with the people that would know where and how we could be most effective (Appendix A).

Figure 146- Article in the Weekly Adirondack, http://www.weeklyadk.com/archives/958.

Once the events and programs that would be attended by the WSP were established, it was easier to determine the method of educating the public about AIS. Formal presentations at community oriented meetings were well received by those in attendance. The atmosphere was often that of gratitude and curiosity. In meetings like the Big Moose Property Owners Association, it was asked that a steward be there to give a presentation. This way it was known that the audience would be curious and open to the program. The Raquette Lake Property Association was already well known and didn't require a presentation from the steward, just an informal reflection on how the summer was going. With events like the Raquette Lake Boat Parade, the Bass Fishing Tournaments, and community gatherings, outreach and education was delivered in a more conversational setting. For the most part people were very receptive. However, outreach outside the boat launches helped the public to see past the uniform and know that we care about the area and the local waterways. At the Hamilton County Federation of Sportsmen meeting the stewards played a smaller role. Everyone already had a firm background in AIS. Instead of the usual message the mechanics of the watershed stewardship program were explained in detail. The board was grateful to have us there, but they had their own practices and methods to educate the public.

Figure 147- July 19th Article from Adirondack Express, http://www.adirondackexpress.com/News/07192011_invasives.

The articles and newsletters that the stewards produced received very good reviews from readers. The Raquette lake Property Owners Association was especially pleased with the short introduction article about the program that was published in their newsletter. Impression like that helped even further to let the communities know why the program was there and that it was meant to help. The newsletter published by the stewards also received good reviews. It was distributed to many different locations and provided good insight and introduced the stewards to the area. However, the best form of outreach was the formal presentations. The steward used substantial information and background knowledge to relate to the various audiences. Through the formal presentations any local resident was able to receive the entire blueprint of the program and understand every aspect of it.

Conclusion

Outreach and education was a very successful special project for the summer of 2011. The key community organizations received the message of the program and its purpose. It was important to interact with the groups

that represented the community as a whole. It was also important to talk to the general public which was accomplished on many occasions. Good feedback was received from the print materials and from outreach in general. The steward could have been more effective had the calendar of events and contact information been made available ahead of time. However, considering that this was an entirely new area for the program, it was a success. The public outreach project adequately transmitted the WSP message of AIS awareness to the communities in the area.

Appendix A

Area Newspapers

Adirondack Express

Hamilton County Express

Utica Observer Dispatch

Weekly Adirondack

Local Lake Associations

Big Moose Lake Association

Fulton Chain of Lakes Association

Hollywood Hills Homeowners Association

Limekiln Lake Association

Long Lake Association

Sixth & Seventh Lakes Improvement Association

Twitchell Lake Fish & Game Club

White Lake Association

Other Contacts

Hamilton County Federation of Sportsmen

Rivett's Marina (Old Forge)

Clark's Marina (Eagle Bay)

New York State Forest Rangers

Appendix: Education and Outreach Programs, Eastern Stewards, 2011

A. Visitor Count- Visitor Interpretive Center, Paul Smiths, New York, 2011

Day of week	Date	Number of Visitors
Saturday	2-Jul	93
Sunday	3-Jul	166
Saturday	9-Jul	185
Sunday	10-Jul	86
Saturday	16-Jul	158
Sunday	17-Jul	195
Saturday	23-Jul	150
Sunday	24-Jul	108
Saturday	30-Jul	327
Sunday	31-Jul	N/A
Saturday	6-Aug	290
Sunday	7-Aug	137
Saturday	13-Aug	
Sunday	14-Aug	
Saturday	20-Aug	
Sunday	21-Aug	

Table 121- number of visitors at the VIC, Summer 2011.

B. Activity summary for Kimberly Forrest, Environmental Issues Educator. Post: Upper Saranac River watershed, NYS DEC campgrounds, Fridays

July 15, 2011- Wilmington Notch Campground

Biodiversity, Invasion, and Pollution- Students will learn a little bit about animal diversity in the Adirondack Park. Live specimens include Wood Frog, American Toad, Green Frog, and Painted Turtle. We will talk about overwintering in the park and a unique trait for each. Animal diversity will include insect diversity with preserved Dragonflies, Damselflies, Moths, Butterflies, and Beetles. The animal diversity will lead into the invasion discussion with live contained Eurasian Watermilfoil (which is sprouting rootlets), Southern Naiad, and Japanese Knotweed. After we will use the watershed model to demonstrate different types of pollution. The program will run from 1-2 pm. A coloring station, a "Who am I" station, and a display with informative material on invasive species and the Adirondack Watershed Institute will be set up from 1-3

Afterword: The Wilmington Notch Campground provided appropriate space for my program. However, the size and general use of the campground did not provide me with a large audience. That day my main audience became the DEC employees who were working that day.

July 22, 2011- Fish Creek Pond Campground

Biodiversity, Invasion, and Pollution-Students will learn about animal biodiversity in the Adirondack Park, pollution in our watershed, and invasive species. Live specimens will include the American toad. It will be touched upon that the introduction of invasive species and pollutants into our ecosystems effects the food web.

The program will last for an hour and run at three times due to the high volume of children.

- 11am for 4-7 years of age
- 12:30 pm for 8-12 years of age
- 14:00pm for 13-15 years of age

A coloring station, a "Who am I" station, and a display with informative material on invasive species and the Adirondack Watershed Institute will be set up from 11:00-15:30.

Afterword: Fish Creek Campground was a success. I had children and adults attend the presentation for the first two sessions. Fish Creek Campground does have a recreation program with a weekly bulletin of activities. For further improvement contact the recreation director and leave a detailed description of future programs to attract more people.

July 29, 2011- Adirondack Waterfest in Lake Placid, NY

An informational tent representing the Adirondack Watershed Institute will be set up at 8:30am and will run from 10am to 4pm. Displays will include contained invasive species, information on the Adirondack Watershed Institute and the Watershed Model. A second steward will assist in running the tent and educating festival goers.

Afterword: The waterfest display was a success as it attracted several festival goers. I felt that the festival was not well advertised for the visitor flow was slow.

August 5, 2011- Buck Pond Campground

The program at the Buck Pond Campground will run from 10-11 am down by the beach with the use of the watershed model at 10am. From 11am-12pm I will remain at the campground to educate the general public with contained invasive species, information on prevention, and the "Who am I" activity set up.

Afterword: The campground did not do a very good job at advertising my program. I had a few people who were headed to the beach come to see what I was doing but no one knew prior to seeing me that there was anything going on.

August 9, 2011- Saranac Lake Farmers' Market

I will have a table set up with the Watershed model from 9:30 to 2pm in Saranac Lake. Also I will have recreation cards, z-cards, and coloring books for my audience. Generally I will talk about pollution within a watershed, point source and non point source, and aquatic and terrestrial invasive species.

Afterword: The audience that I taught at the Farmers' market was quite receptive and positive. There was a mixed audience of all ages and lots of children with their parents. The flow of people was steady and I would consider it a success.

August 19, 2011- Fish Creek Pond Campground

Biodiversity, Invasion, and Pollution-Students will learn about animal biodiversity in the Adirondack Park, pollution in our watershed, and invasive species. Live specimens will include the American toad. It will be touched upon that the introduction of invasive species and pollutants into our ecosystems effects the food web.

The program will last for an hour and run at three times due to the high volume of children.

- 11am for 4-7 years of age
- 12:30 pm for 8-12 years of age
- 14:00pm for 13-15 years of age

A coloring station, a "Who am I" station, and a display with informative material on invasive species and the Adirondack Watershed Institute will be set up from 11:00-15:30.

August 26, 2011

The morning was used to work on special projects. In the afternoon the Watershed Model was returned to the Lake Champlain Basin Program.

C. Activity summary for Danielle Thompson, Environmental Issues Educator. Post: Visitor Interpretive Center, Saturdays

Saturday, May 28th

Help out with "Adirondack Scramble" trail run from 8-4 PM

-On this day I was able to meet many of the staff of the VIC as well as explore the trails on the property. I also spoke with a lot of people at the run about my position as a steward and the program in general.

Saturday, June 4th

Attend birding festival with Brian McAllister from 6:45-12:00

-Again, this day presented a good opportunity for me to learn more about the wildlife and trail system of the VIC. Many people come to the VIC to go birding and it will be important for me as an interpreter to know which species are out there!

Set up WSP information table in the VIC lobby 12:30-3:30

-I spoke with attendees of the festival about being a steward. The birding festival was full of people who truly cared to make sure that the Adirondacks are kept as pristine as they are today. For this reason, it was easy to talk with them about invasive species, as they understand what a threat it could pose to the environment. Many locals were already aware of the program, but there were lots of people coming from out of town, so this was a good way to get the WSP name/mission out there!

Saturday, June 11th

Research and Sit at VIC info desk 7-10:00 (on campus for research) 10-3:30 @ VIC

-There were no special events at the VIC on this day, so I spent my time doing research on the plant and animal species on the property. I was also given a more complete tour of the facilities in the building and took advantage of the upstairs library while doing my research. Sarah Keyes told me that any of the stewards are welcome to come to the library to do their own research on data entry days. There is a large a desk with a light in the corner which she said is not being used and could become a steward study area if we want! I also spoke a lot with Sarah and Matt about what to expect for the summer and shared a few of my ideas with them regarding children's programming.

Monday, June 13th

Attend volunteer training day at VIC 9-12:30

-Kate and I both attended the volunteer training and which featured speakers including Paul Smith's College administrators and faculty members, Richard Nelson, Curt Stager, and Neil Suprenant. The talks were mostly about the history of Paul Smiths and the new relationship between the college and the VIC. Although very informative, it was not the most helpful in terms of out position there. However, Brian McDonnell had us introduce ourselves to the group of volunteers so that they would understand what we were doing there. It was nice to be able to educate the volunteers about our program so that they will be able to share our information with the visitors of the VIC. There was also a journalist from the Adirondack Daily Enterprise there to report on the volunteers and he made sure to ask Kate and me a few follow up questions after the training.

Thursday, June 16th

Help Matt and Sarah with visiting school group 9-12:30

- A group of approx. 40 kindergarteners from Lake Placid Elementary came to the VIC to learn about habitats and why it is important to protect them. I did not get to talk about invasive species with the kids but this was a good opportunity to see how Matt and Sarah run the kids programs.

Saturday, June 18th

Research and draft summer schedule for VIC 7-10:00 (on campus) 10-3:30 @ VIC

- I will create a tentative schedule (this document!) of ideas for programming at the VIC. This will be done using the events already planned at the VIC as well as searching for other opportunities to present information and educate people at other local venues and events.

Saturday, June 25th

Grand Re-Opening of the VIC

-I will set up a table with invasive species information at the event and talk with people about the WSP.

Saturday, July 2nd

Draft themes and activity ideas with Sarah Keyes at the VIC.

-We have decided to do a 5/6 week series of "junior ranger" type classes. Each week will have a different theme. I will incorporate the junior watershed steward idea with a few of these weeks and will try to focus on themes which are important to the Lake Champlain Basin for other weeks. The programs will be directed at ages 8-12 and will likely run from 1-3:00 on Saturdays (dates below).

Saturday, July 9th

Planning Day

-Sarah is going to be out of town this day, so I will focus on preparing for the next few weeks of programming. Also, I will make sure that the programs are advertised in the local paper/campsites.

Saturday, July 16th, 23rd, 30th, and August 13th, and 20th

Proposed program dates (see attached sheet of program details)

-Note: Although these programs were prepared for each week and advertised throughout the community, I believe the expense of the program deterred visitors from participating. In place of the full program, each week we set up the planned craft activity and education information in the classroom or outside in the pavilion at the VIC. This way we could still spread the message of the program theme to children and their families who might want to participate in a short activity during their visit to the VIC. Hopefully our program planning can be used in the future (maybe even next summer), because I believe that the Junior Stewardship Program could be a really great learning experience!

Saturday, August 6th

Wildlife Festival at the VIC.

-I will set up a table with information about the WSP on this day in order to educate the many visitors of the festival.

-I will also use the LCBP's watershed model to do demonstrations for children and their families throughout the day. Again, the large number of visitors will provide a good opportunity to educate people about protecting our watershed!

Paul Smith's College VIC

Junior ADK Steward Program

Purpose: The Junior Steward program at the Paul Smith's College VIC is meant to connect children and nature. Environmental Stewardship is described as the responsibility for environmental quality shared by all those whose actions affect the environment. By living or visiting the Adirondacks we all have an affect on the environment here. Children will explore different parts of the environment and how to care for them.

Goal: Answer the questions, "Why is our environment important?"

Program: The Junior Steward program will occur on Saturdays from July 16th until August 20th. The targeted age group for the program is 8 to 12. Each session will run from 12 – 3pm. Each day we will discuss a different environmental topic including watersheds, Adirondack ecosystems, clean air, wildlife, and recreation. Children should bring a snack and appropriate clothing. Other items that might be useful include a backpack, binoculars, field notebook, and pencil. Each week we will take a pledge to protect the specific part of our environment we are discussing.

Week 1: Introduction/Adirondack Ecosystems

We will introduce the VIC, the Lake Champlain Watershed program, and each other. We will cover expectations for the 5-week program, what we will discuss, and what the kids hope to learn.

The Adirondacks is a very unique ecosystem covering 6 million acres of New York State. We will briefly go over the park, and show "Unlocking the Wilderness". We will brain storm what makes an ecosystem, who lives here, and how they survive, including us! We will explore the VIC trails and look at species first hand that depend on this ecosystem for survival. We will then create our own ecosystems that kids can take home and monitor. See attached "Mini-Ecosystem Activity".

- Questions we will try to answer:

- What is stewardship?
- How do we interact with the environment?
- What is an ecosystem?

Week 2: Watersheds

We will discuss the water cycle, and how we use water. Dani, our Watershed Steward will talk about Lake Champlain and it's importance. We will explore a few activities on watersheds, including looking at invasives, and specifically looking at wetlands.

We will take a walk along the Heron Marsh and discuss species there. We will sample the marsh and take data on the flora and fauna found. We will then take about a half hour to create a piece of artwork related to the wetland. Children can use whatever resources we have available to them, or write a poem. We can work on these pieces for the next few weeks, and then submit them to the River of Words Ecoliteracy Contest, see attached info.

Questions we will try to answer:

- What is a watershed?
- Why is water so important?

Week 3: Clean Air

We will take a look at what air is, and the fact that it is one of the components that all life requires. We will discuss climate change and how clean air is a factor. Topics covered will be emissions, acid rain, the greenhouse effect, and greenhouse gases. We will take a look at our emissions as a group with an emissions calculator and discuss how we can cut down on emissions. Possibly create a greenhouse with the terrarium I create in Week 1. Possible take homes: bubble art, carbon sink, paper making, weather monitoring

- Questions we will try to answer:
  - How does air become polluted?
  - What is climate change?
  - How does climate change affect us?

Week 4: Wildlife

We share the Adirondacks with an array of wildlife. We will discuss how to respect and treat wildlife. We will discuss a wide array of animals that may call the VIC home, and take a closer look at how we can protect them. We will focus on the beaver, a keystone species. We will watch the "Beaver" movie and take a walk to look at the beaver habitat. We will see how the beaver affects other wildlife, and fit into the food chain. Possible take homes:

- Questions we will try to answer:
  - Why are wildlife important and how can we protect them?
  - What types of wildlife call the VIC home?

Week 5: Recreation

We will hike Jenkins Mtn. and explore Leave No Trace principles. We will meet earlier today so that we have plenty of time to go over LNT before we depart the VIC. Once we are on top of the summit we will briefly talk about summit stewards and the importance of alpine environments. Once we complete the hike the kids will have completed the 5-week program in all aspects of Junior Adirondack Stewardship. Each participant will receive a diploma and patch?

- Questions we will try to answer:
  - How should we act when we are out in the woods?
  - What is special about alpine environments?

Cost: $20 a session or $75 for all five, scholarships available

D. **Activity summary for Katelin Isaacson, Environmental Issues Educator. Post: Visitor Interpretive Center, Sundays**

Sunday June 5th

I was at the Paul Smith's VIC all day. I began to look at community events happening in the Lake Champlain Basin on Sunday's. I began to focus my program on educational outreach by creating a formal PowerPoint presentation. Also I began a list of flora and fauna on the Boreal life to be a naturalist on station. While at the desk, I talked with visitors about being a watershed steward and how the Lake Champlain Basin Program has educational outreach opportunities for Aquatic Invasive Species.

Sunday June 12th

I was at the Paul Smith's VIC all day. I walked the trails to keep adding to the list of flora and fauna. While out on the trails I talked with people about the wetland bog and how it could be potentially affected by the Aquatic Invasive Species. Also they asked what a Watershed Steward was, and I described LCBP, APIPP and the PSC AWI program. I continued working on my formal presentation with note cards and PowerPoint while helping visitors and talking with them about being a Watershed Steward.

Sunday June 19th

I was at the Paul Smith's VIC again. I walked the trails in the early morning to talk with visitors about Aquatic Invasive Species and the Watershed program. When the weather became windy and rainy, I went inside to the front desk. I greeted visitors and gave informal talks about my job and how the wetland could be potentially affected by these nuisances. Most people were exteremely intrigued to learn about the effects of invasive species on wetlands. They would ask about different bodies of water and if they were infected. It was great to help them ID some of the potential plants in their water bodies. I polished up my PowerPoint presentation as well as my knowledge on certain naturalist techniques for identifying birds, and wildflowers.

Saturday June 25th & Sunday June 26th

On Saturday, the Paul Smith's VIC had their grand re-opening. I went over in the afternoon and sat at an informational table with Dani. We talked with visitors about the Watershed Steward Program and the importance of prevention against Aquatic Invasive Species. Then on Sunday, I had materials at the front desk and was able to

talk with visitors some more. I walked the trails to catch people near the watershed as an introduction to what a watershed was, and what being a Watershed Steward was about. I had a lot of positive feedback and responses from the people I met who enjoyed learning not only about their current surroundings, but realizing that their own watersheds at home could be jeopardized by Aquatic Invasive Species.

Sunday July 3rd

I was at the Paul Smith's VIC on a gorgeous day. In the morning I helped with a 5K race, taking numbers and talking with the runners. They were interested in what I did and how well the inspections of boats were going. I told them about the water chestnut and the save from entering Tupper Lake. I set up times to give a formal presentation on Invasive Species Threaten Waterways (APIPP,LCPB, PSC, Aquatic Invasive Species). However, there were no large groups at the times provided, so I gave an informal talk to a gentleman. He first asked me why I looked so official and what my job was. I began talking with him about different boat launches and why we were there. I showed him my slideshow on my laptop and gave him a chance to ask questions. He was extremely interested in the topic and was glad he had learned something while waiting for his family to return from their walk. I then sat at the front desk for the rest of the afternoon talking with visitors about not only their questions about the area, but about stewards at different boat launches and St. Regis Mountain that they may encounter.

Sunday July 10th

I went to the Keene Farmer's Market on a warm and sunny day. There were a lot of vendors and visitors to make the event incredible. I had an informational table set up under one of the big tents. I talked with people as they walked by or stopped at the table. I took a break and walked around to the other vendors to introduce myself and the program. They were really thrilled that I was there and could learn about the educational outreach for the Watershed Steward Program. As I was walking up and down the aisle, I would have people see my nametag and Paul Smith's College and ask me what I was doing there. This became a great opportunity to have a conversation about Aquatic Invasive Species, and the general program as a whole. A memorable moment was when an older gentleman stopped by my table. He was from Norwich, UK, and was curious about what types of land and aquatic invasive species were in the Adirondacks. He mentioned Japanese Knotweed, and we talked on the subject for a few minutes. He was so thrilled that he could learn how the Adirondacks had similar plant or possibly aquatic species as the United Kingdom.

Sunday July 17th

I began the early morning with a bird walk at the Paul Smith's VIC. I was able to understand and learn more about the different types of birds by sight and by their songs. This was a great tool for being a naturalist interpreter on site in the afternoon. After the bird walk, I went into the lobby and set up an informational table and display on a Paul Smith's Banner lined table. This helped to spark curiosity within visitors as to who I was. I then would lead into conversations ranging from just about the Watershed program to preventative steps to stop spread of invasives. A lot of the visitors would take the information for themselves, but would also want to share it with fellow neighbors.

Sunday July 24th

I went to the Paul Smith's VIC because there had been an increase of visitors on the weekends. I was at the desk for most of the day, and had materials lined up on the side for people to take. I greeted visitors, told them I was a watershed steward, and talked about the program. They were interested in the types of aquatic invasive species and the LCBP program. Many of the visitors were very grateful and supported the effort to keep the lakes clean. I

spoke with one man for about twenty minutes on Invasive Species. I showed him the informal Power Point about the programs and different species. He was extremely interested and asked many good questions which I managed to answer. He then began to ask about the Purple boxes and we talked about the Emerald Ash Borer as well as the Asian Long Horn Beetle because he was planning to start a tree farm in Dickinson, NY. It was a successful day for educational outreach with about 90 visitors stopping in during the duration of my workday.

Sunday July 31st

I returned to the Paul Smith's VIC for the day. I spoke with many different visitors as they came in asking general questions. I would always try to explain the role as a watershed steward and the different types of pesky invasive species that can be found. I talked with one man for at least ten minutes on the program. He was interested because he was going to SUNY Oneonta and had done some biology and watershed sampling for classes. He even asked about the harmful effects of each of the invasive species and how to address each one. I gave him a research booklet to take and read over. Then I talked with an older man who was so grateful to have the VIC reopened by the college. He asked about the Beach Bark disease around Tupper Lake, New York. He wondered how affected the trees were and how the canopy was re-developing. I was able to describe the forest around the trail and up the mountain from my previous experience working as a Summit Guide for Friends of Mount Arab.

Sunday August 7th

I began my day helping Sarah and Brian with the 10K race on the trails. I registered each racer and showed them the map of the race. I was at the front desk talking with visitors who were not participating in the race. They were curious about my job and the wetland watershed outside. I had some very impressive questions about the program and the surrounding area. One gentleman was curious about all different types of invasives, ranging from aquatic to plant species. There was an informational table set up with a display poster created by Danielle. Many people observed and read the articles as they walked through the side door. If they looked potentially interested I would ask them if they had any questions about the program specifically. I met a wide range of visitors from all over and was able to get them extremely interested in the LCBP and the Watershed Steward Program for potential incoming Paul Smith's students.

Sunday August 14th

I spent most of the day inside at the desk and by the display table. I met many visitors throughout the day. A few people would ask about paddling and I would show them some good routes on the map. This was a great opportunity to explain to them why I was there and how they could keep the lakes clean. Most were interested in the different types of plants and how they affected the lakes. I could show them pictures and statistics on the nice display table. I also began my education summary for my final report. I definitely contacted many people through being in the lobby and explaining the program and how we are slowly expanding our program in collaboration with LCBP, DEC, APIPP and volunteer groups to keep the lakes as clean as possible for all types of recreationalists. I had great responses from visitors, and most people thanked me for all our hard work, especially when they learned how Lake Placid is not affected by invasive species.

Wednesday August 24th

Talked with a gentleman about upper Saranac lake and that his grandparents were from old forge then moved up to Tupper in the early 1900's I believe. We talked about Azure Mountain and I described the history of fire towers and tourism led to the close of most in the 1970's. Then described how I was a watershed steward and worked at

the different boat launches. He was from the Finger Lakes area or had at least visited there and knew about zebra mussels and Eurasian water milfoil. I gave him some literature and a sticker to show his support of washing his boat and the program in case he did encounter a steward up here.

Figure 148- 2011 Paul Smith's College Watershed Stewards.