



SQUAM LAKES
ASSOCIATION



2018 Squam Watershed Report

the SLA's annual report of conservation work in the Squam Watershed

2017 marked yet another successful year of conservation work on the Squam Lakes and in the surrounding watershed for the SLA and our many partners. Increasing conservation effort has been the consistent message in six years' worth of Watershed Reports. The efforts undertaken are enormous, and built on the efforts of many volunteers. Our milfoil management team continues to push large infestations of variable milfoil toward the dam while keeping a careful eye on regrowth throughout the Lakes. We have expanding focus on terrestrial invasive species. We have steadily increased our water quality monitoring parameters and the number of sites we monitor. The Squam trail network is growing. Our partners report success as well. Conservation land in and adjacent to the Watershed is expanding and, while the loon population still struggles, the effort to understand and protect this iconic species continues diligently.

All this work occurred in 2017 and is represented in the pages of this Squam Watershed Report. However, many of the achievements from 2017 are not represented in this year's report. Our successful AmeriCorps grant application and the beginning of the inaugural group of Lakes Region Conservation Corps AmeriCorps members in November 2017, is an expansion of capacity and an influx of new minds and passions to the SLA. This group of volunteers, with the addition of more members and host sites at the Squam Lakes Conservation Society and the Lakes Region Conservation Trust, represents a massive increase in conservation capability and capacity across the Lakes Region. In 2019, this will expand to other conservation organizations. The Lakes Region Conservation Corps is modeled on the Squam Conservation Internship, and will soon affect change across the state.

In the short time we have worked with AmeriCorps, members have served in a number of ways with the SLA. They have expanded our water quality program to include a plan for monitoring for harmful algae blooms. They have instituted a trails management plan and headed out onto our trails with volunteer crews. They have analyzed decades of data offering new perspective on our historic work. They've expanded our education programs, now offered weekly throughout the winter and have worked with school groups and afterschool programs. The impact is already apparent and growing.

In 2017 we also received funding from NH Department of Environmental Services to complete a watershed-based management plan. The completed plan makes the important connection between activities in the watershed and the resulting water quality in the Lakes. The Squam Watershed Plan will provide detailed recommendations, including actions for the SLA, homeowners, and watershed towns, to improve the health of the Squam Lakes. The plan will be finished in 2019.

We also received funding in 2017 from NH Charitable Foundation and the Davis Conservation Foundation to explore contaminants in the Squam Watershed. We are working with experts and into the scientific literature to create a monitoring plan that will help us understand the scope and scale of contaminants in Squam.

Finally, the addition of a full-time director of education ensures that we are driving home our conservation message to Squam enthusiasts of all ages, through our summer youth programs, programs for families, and school groups.

The efforts and partnerships outlined in this year's Squam Watershed Report represent the backbone of conservation throughout the watershed. It is with this foundation that we forge into the future with new opportunities and staff that will protect this treasured resource for generations to come.

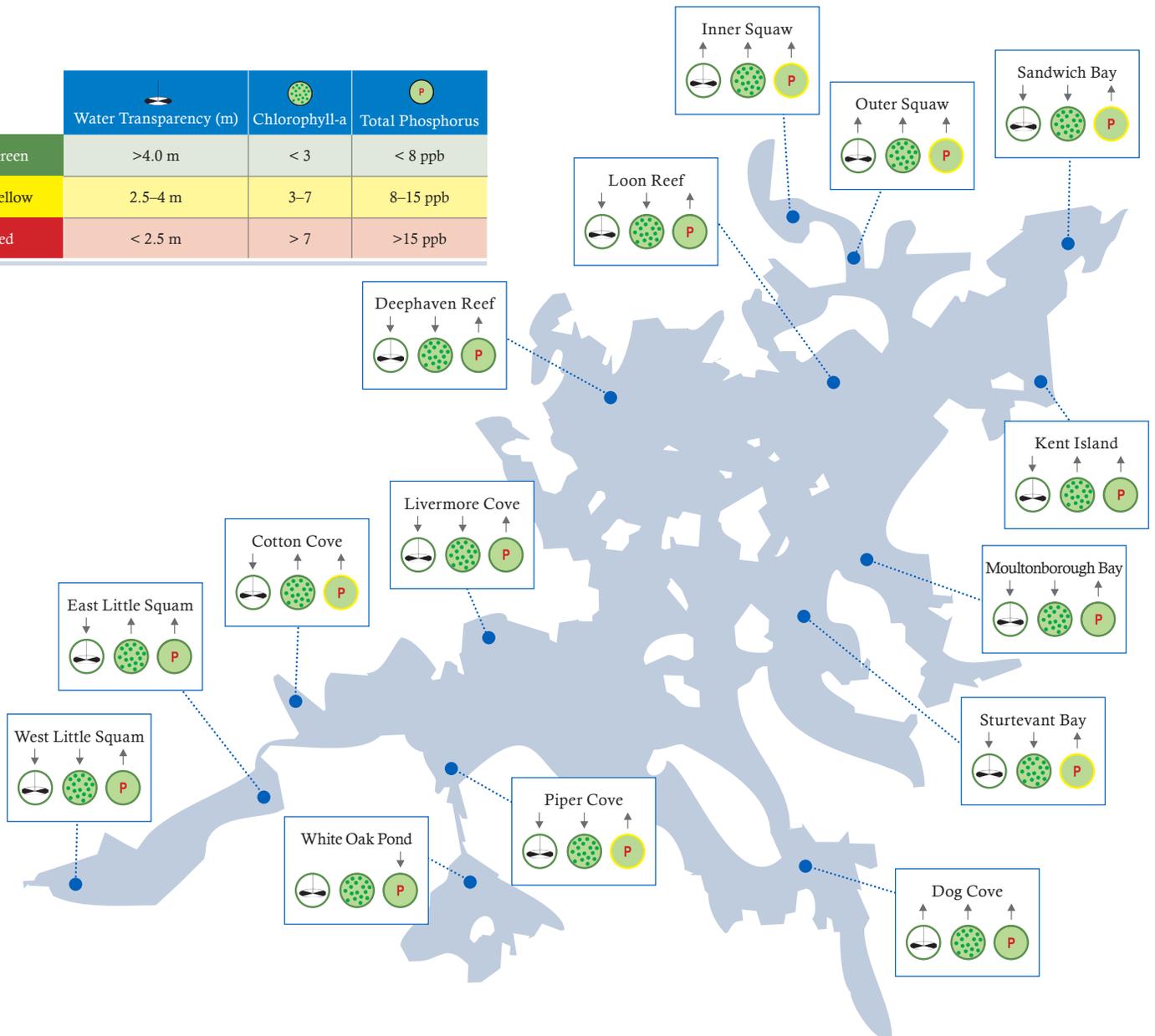
Overall, the Squam Lakes continued to exhibit high water quality in 2017. Our main indicators still include water transparency, measured with Secchi disks, as well as chlorophyll, total phosphorous, and dissolved oxygen levels. For the first time in several years, we saw several water quality sites in the lake with median total phosphorous levels above healthy water limits set by the Department of Environmental Safety (DES), however all of the sites do still fall within healthy water limits set by the DES for chlorophyll, dissolved oxygen, and transparency.

While this is not desirable, it is not necessarily an indication that overall water quality is declining in our lake, as this is only one year's worth of data and does not yet indicate a trend. The fact that our levels have consistently been within DES limits historically is more significant at this time, as well as the fact that in 2017 our other parameters were considered within healthy limits.

Another reason these higher phosphorous levels are not cause for immediate concern is because of the limits of the sampling the SLA is able to do. We will work in the future to be more strategic in our sampling efforts, such as sampling right after rainstorms and flooding events, and sampling at near-shore sites, which could give us more insight into the factors affecting phosphorous levels in the Squam Lakes. We are also digging into our historic data and data from Plymouth State University to hopefully help us understand the reason for these higher values.

The SLA's watershed plan currently in development will be crucial to facing these issues head on. It will identify sources of nutrient loading as well as how to reduce them. Individuals can prevent rising phosphorous levels becoming a concern for our lake in the future by always being mindful of our potential impacts on the lakes. Visit our website to read "50 Ways to Care for the Squam Lakes," which includes tips on making sure you are not contributing phosphorous pollution to Squam Lake.

	 Water Transparency (m)	 Chlorophyll-a	 Total Phosphorus
Green	>4.0 m	< 3	< 8 ppb
Yellow	2.5-4 m	3-7	8-15 ppb
Red	< 2.5 m	> 7	>15 ppb

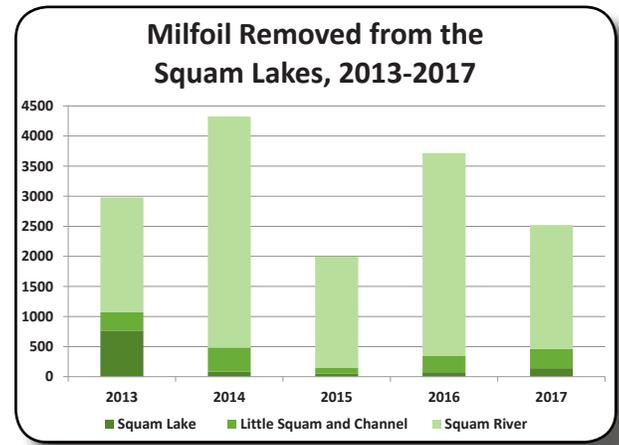


Variable Milfoil Management

data collected by the SLA

Milfoil continues to be a challenge in the Squam Lakes. The SLA has successfully reduced infestations in Big Squam to single plants in three areas, and growth in Little Squam has been slowed. The reduction in upstream areas allows us to focus more efforts in the Squam River, and each year we spend more time closer to the dam in Ashland. This success is great news, but our work is far from over. Constant vigilance is required in the future to ensure milfoil remains controlled.

In 2017 the increased size of our Squam Conservation Internship program allowed us to devote over 1,400 hours to milfoil removal efforts. The SCI removed 2,520 gallons of milfoil from the Squam Lakes with the majority coming from the Squam River. The SLA was able to extend the dive season into mid-October to tackle regrowth site to further reduce grow back in these areas for the 2018 season.



Common Loons



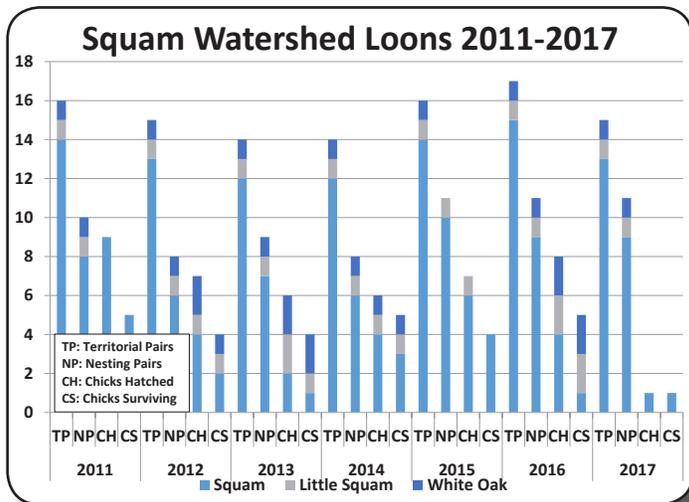
data collected by the Loon Preservation Committee

In 2017 there were eleven nesting pairs of common loons throughout the Squam Watershed. However for the first time in the 43 years the Loon Preservation Committee (LPC) has been monitoring Squam, only one loon chick hatched throughout the Watershed. That sole Squam chick survived to fledge in the fall. There

were two fishing-related loon deaths on Squam this past year, one was due to lead poisoning from fishing tackle ingestion, another was an immature loon that died of fishing line entanglement.



Photo: Brian Reilly



Support Squam Loons! Use only non-lead fishing tackle, reel in fishing line when loons are near, stay at least 150 feet away from loons, respect signed and roped nesting areas, and boat slowly through areas that have loon chicks. Please report any sick, injured, or dead loons to the Loon Preservation Committee at (603) 476-5666 and visit www.loon.org for more information.

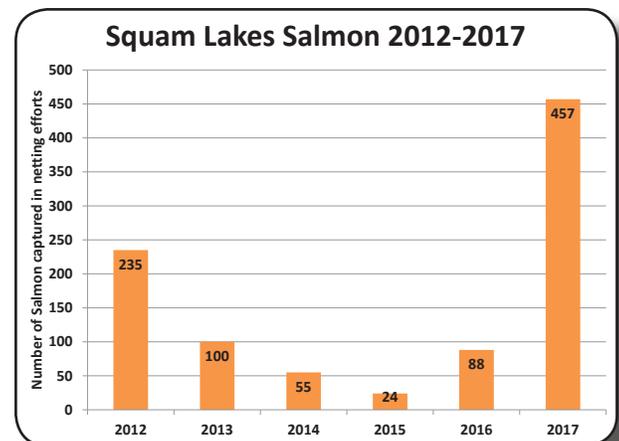
Squam Fisheries



data collected by NH Fish and Game Department

Coldwater fishery (smelt, salmon, trout)
New Hampshire Fish & Game (NH F&G) have been investigating whether the addition of larger class salmon could rejuvenate Squam Lake's populations. In 2017 the salmon restocking efforts have been successful, showing more than a five-fold increase in salmon processed during fall netting operations. This is a strong indication that restocking efforts are a viable remedy for salmon population decline.

Warmwater fishery (large- and smallmouth bass)
The small- and largemouth bass in Squam continue to be a healthy, robust population. In 2017 NH F&G completed a study, in partnership with NH Bass Nation and in cooperation with the SLA, to see if bass that were released in Little Squam Lake would return to Big Squam. The study is now complete, and as of December 2017, 70% of the bass that were caught in Big Squam Lake, then tagged and released into Little Squam, were later detected in the channel.



Land Conservation and Trails

data collected by SLA and the Squam Lakes Conservation Society

The Squam Lakes Conservation Society, the Lakes Region Conservation Trust, the Society for the Protection of New Hampshire Forests, and other organizations work hard to protect the Squam Watershed through conservation easements and land ownership. These organizations protect more than a quarter of the land in the Squam Watershed. The Squam Lakes Conservation Society (SLCS) protected 164 acres in 2017 across four different properties.

The SLA added a new trail to the Squam Range network. The Brooks Fisher Trail starts on Perch Pond Road in Holderness and gradually leads hikers up the flanks of the Squam Range connecting to the Crawford Ridgepole Trail near Mount Webster to a scenic overlook near the summit. This 1.4 mile trail switches back across the slope using a trail building technique called benching and has an average grade of about 6%, which will make it a much easier trail to hike than many around the area. Additionally, SLA staff, interns, and volunteers hiked and maintained SLA's trail network.

Terrestrial Invasive Species



Targeted invasive species removal has yielded incredible results, with some areas being completely transformed with the absence of terrestrial invasives. With the help of Holderness School students and other volunteers, we were able to make a huge difference in the wooded areas around the SLA campus as well as many other areas. The SLA is looking forward to bolstering terrestrial invasive removal programs in the coming season with the help of volunteers.

Boating



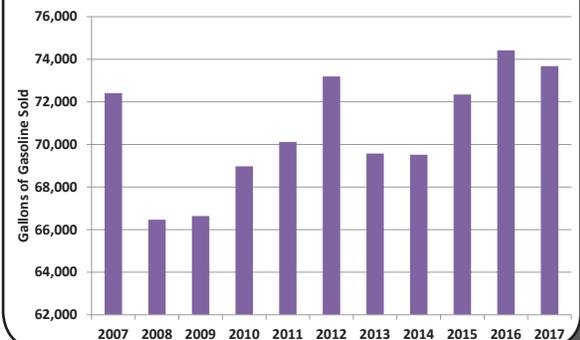
data collected by the SLA, Riveredge Marina, and Squam Boat Livery

Using data collected from an aerial boat survey we can identify key areas around the lake where boats are most concentrated. In total, 172 motorized boats were counted on Squam during this year's aerial survey. Both Rattlesnake Cove and the Center of Squam, near Bowman and Moon Islands, were the most heavily trafficked areas with nearly 40% of the counted boats residing in these areas. Complete data for the areas survey can be found on the SLA website. In addition, gasoline sales provided by the Riveredge Marina and Squam Boat Livery

nearly matched last year.

In subsequent years we will focus on boat ramp data, static boat count, and gasoline consumption to estimate recreational use on the lakes.

Gasoline Purchased at Two Squam Marinas, 2007-2017



Acknowledgements

Thank you to the following for contributing data, analysis, and expertise to this report:

IAN Image Library
Lakes Region Conservation Corps-
AmeriCorps
LightHawk
Loon Preservation Committee
NH Department of Environmental
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NH Fish and Game
NH Lakes
Riveredge Marina
Squam Boat Livery
Squam Lakes Conservation Society
SLA Staff, Volunteers, and Membership
University of New Hampshire Lakes Lay
Monitoring Program
White Oak Pond Watershed Association

Conservation through Education

The SLA's education programs provide another avenue for the successful implementation of our conservation mission. Through youth programs, and the many education opportunities for youth and adults focused on conservation and Squam, we are actively developing our community of Squam conservationists. For more information about our education programs, including JSLA, CYSP, Adventure Ecology, and Speaker Series, visit our website.



SQUAM LAKES
ASSOCIATION

The Squam Watershed Report is compiled, designed, and edited by SLA Director of Conservation Rebecca Hanson

The Squam Lakes Association is dedicated to conserving for the public benefit the natural beauty, peaceful character and unique resource values of the lakes and surrounding watershed. In cooperation with local and state authorities and other conservation organizations, the Association promotes the protection, careful use and shared enjoyment of the lakes, mountains, open spaces and wildlife of the Squam Lakes region.

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