SFHLWP Implementation Project – Phase 2: Brackett Road Load Reductions, Youth Conservation Corps and Outreach

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A Final Report to
The New Hampshire Department of Environmental Services

Submitted by
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Alden N Young Trust
Town of Wakefield, New Hampshire
Great East Lake Improvement Association
Horn Pond Association
Lovell Lake Association
Wilson Lake Association
Local businesses
Generous individual donors

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Executive Summary

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The desired outcome for this watershed-based plan implementation project phase is to preserve the High Quality Water status of the Salmon Falls headwaters including Great East Lake, Horn Pond, Lake Ivanhoe, Lovell Lake and Wilson Lake and achieve phosphorus load reductions for Lovell Lake. It was estimated that residential and roadway BMPs would reduce pollutant loading by at least 21 lbs of phosphorus per year. The estimated phosphorus load reduction on Lovell Lake of 96.88 lbs/yr from the Brackett Road implementation projects and 38.10 lbs/yr from YCC projects on Lovell Lake far exceeded the 15lbs/yr recommended in the Salmon Falls Headwater Lakes Watershed Management Plan.

The project began on May 9, 2012 and was completed on December 31, 2014. The total project cost was $212,819.63 which included the $87,026 grant award and $125,793.63 non-federal match. Match was provided by AWWA, the Town of Wakefield, volunteers, and a private foundation. Highlights are as follows:

Town of Wakefield	$47,245 labor & equipment
Jane B Cook 1983 Charitable Trust	$16,000 cash

In addition to the excellent support from the NH Department of Environmental Services Watershed Assistance Section and particularly Project Manager Sally Soule, AWWA's project partners included:

Great East Lake Improvement Association	GELIA
Horn Pond Association	HPA
Lovell Lake Association	LLA
Maine Department of Environmental Protection	MDEP
UNH Lakes Lay Monitoring Program	UNH LLMP
UNH Stormwater Center	UNH SC
Wilson Lake Association	WLA

All of the Project Objectives were met over the course of the project period:

- AWWA's organizational capacity was more than sufficient to complete the timely reporting requirements of the grant, establish and carry out clear work plans and goals for the project, organize and conduct informative steering committee meetings, hire and manage appropriate staff and coordinate all the project partners.
- The AWWA Youth Conservation Corps installed 165 BMPs on 30 residential sites on Great East, Horn, Ivanhoe, and Lovell lakes reducing the sediment loading by an estimated combined 81.8 tons/yr. and the phosphorus loading by 69.1 lbs/yr. AWWA's Program Managers delivered site specific designs to 51 residential property owners including the Project Hosts of the YCC projects.
- The Town of Wakefield partnered with the UNH Stormwater Center for design and

oversight on the installation of road BMPs at 9 sites along Brackett Road on the northern shore of Lovell Lake reducing the pollutant loading to Lovell Lake by an estimated 8.17 tons of sediment and 96.88 pounds of phosphorus per year.

- Pollutant Controlled Reports were submitted to NHDES for all NPS reduction projects.
- The activities of AWWA's Clean Lakes Campaign included a well-attended NH Shoreland Workshop; the Acton Wakefield Lake Users Survey; publication and distribution of *Clean Water & You* guides to healthy lake living; presentations at the Great East Lake Improvement Association, Horn Pond Association, and Lovell Lake Association meetings; Wonders of Water school programming for the Paul School and Acton Elementary School middle school students; regular informative and dynamic social media presence on www.AWwatersheds .org and Facebook, and frequent attendance at town board meetings to ensure that water quality remains a key focus of town government. Both the Wakefield Planning Board and the Acton Planning Board took significant steps to strengthen regulations for Stormwater Management.
- The lake association volunteers collected water quality data in 2012 and 2013 for Great East Lake, Horn Pond, Lake Ivanhoe and Lovell Lake with varying degrees of consistency. Monitors on Great East and Lovell were committed and collected a robust set of data. Volunteers on Horn and Ivanhoe were less reliable and the Great East monitor filled in for them on occasion. In 2014, AWWA coordinated the partnership between the lake associations and the UNH LLMP who provided interns, Casey Chalmers and Erich Bergerhan, to sample with volunteers ensuring a regular and consistent data set for 2014. The lake associations have agreed to continue that relationship even if it is no longer free of charge.

Introduction

The Acton Wakefield Watersheds Alliance (AWWA) is a non-profit volunteer organization formed in 2004 to protect and improve water quality in the lakes and streams in the Acton, ME, Wakefield, NH border region and ultimately in the rivers, estuaries and bays into which they flow. The Alliance is registered with the State of New Hampshire and holds 501(c)3 status. AWWA has seven active directors and officers who bring a range of expertise and affiliations to the group. As a collaborative, non-regulatory organization, the mission of the Acton Wakefield Watersheds Alliance is to protect and restore water quality in the border region of Acton, Maine and Wakefield, New Hampshire. AWWA focuses its efforts on prevention of non-point source pollution, primarily as it is delivered through stormwater.

The project area encompasses the headwaters of the Salmon Falls River which includes the watersheds of Lake Ivanhoe, Great East Lake, Wilson Lake, Horn Pond, and Lovell Lake. These watersheds cover approximately 26 mi^2 along the border of New Hampshire and Maine. The Salmon Falls River forms the state border to its confluence with the Cocheco River in Dover, NH where it becomes the Piscataqua River and flows into the Gulf of Maine. Lake Ivanhoe and Lovell Lake are entirely in NH, Wilson Lake is in ME and Great East Lake and Horn Pond are bisected by the border.

Both communities are primarily rural and forested with very little industrial or commercial development. While much of the land is undeveloped very little is permanently protected through conservation easements. The Hydrologic Unit Codes are 010600030403 and 010600030401.

The lakes are a valuable resource in these communities providing recreation, relaxation, drinking water and a large percentage of the town revenues in the form of property taxes. Lakes and their surrounding lands also provide habitat for plants, wildlife and aquatic life. While clean water is essential for all life, pollution and irresponsible water use plague the waterbodies, making proactive protection of water resources essential. The Acton-Wakefield region in Western Maine and Eastern New Hampshire has an economy that depends greatly on the local waterbodies, including those that form the Salmon Falls Headwaters.

In 2006, AWWA received its first 319 grant from the NH DES to initiate a Youth Conservation Corps program. After two years of focusing on the YCC program AWWA directors recognized the need for a more comprehensive understanding of the watershed characteristics, potential problems and threats and current water quality of the lakes and applied for additional funding through the 319 program. AWWA chose to focus on the Salmon Falls headwater lakes based on available data for analysis and the stakeholder support from the communities and lake associations.

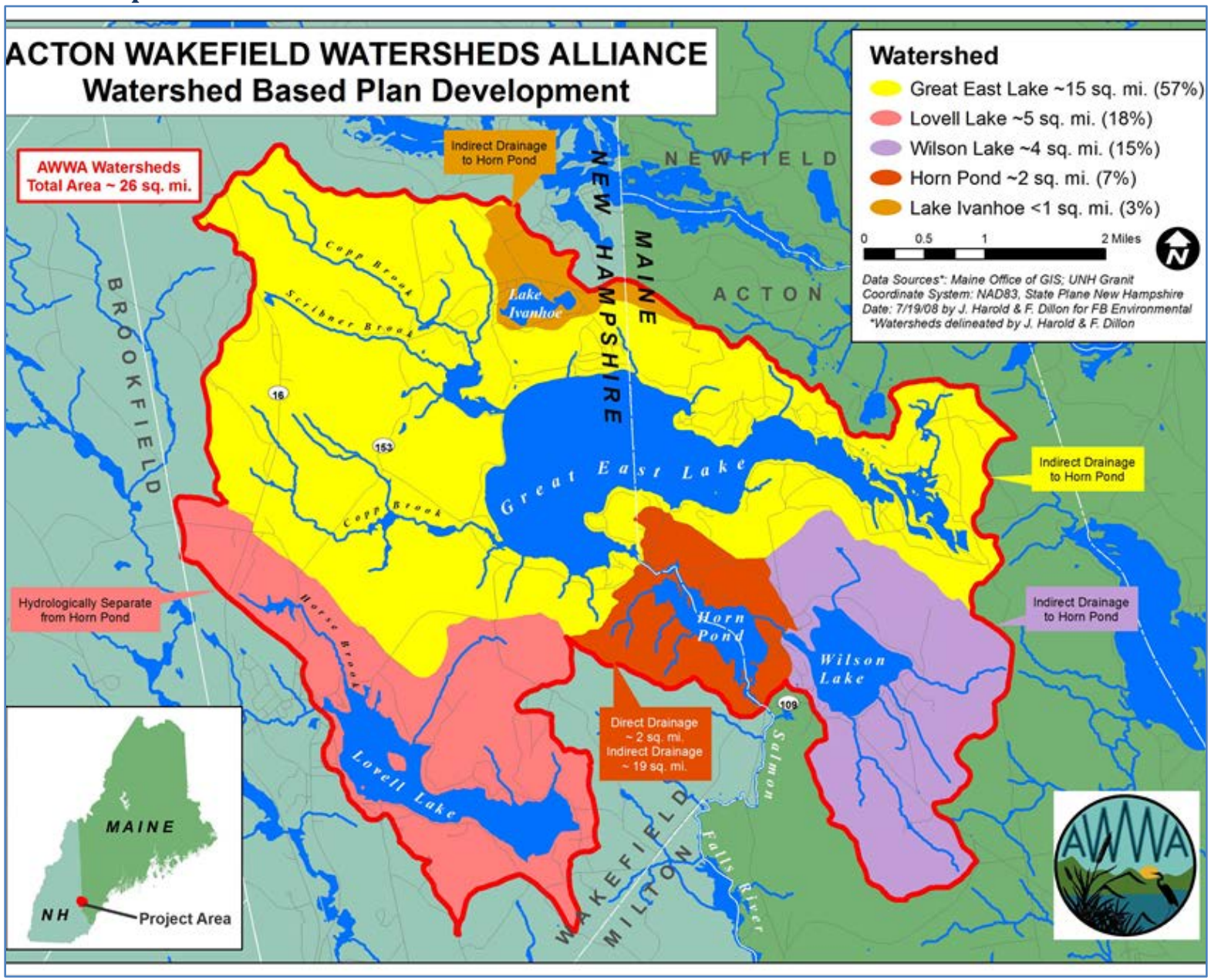
In early 2010, AWWA presented the “Salmon Falls Headwater Lakes Watershed Management Plan” which established measurable water quality goals and provided a detailed action plan for implementation. Later in 2010 AWWA applied once more for funding through the NH Watershed Assistance Section for 319 funding to implement recommendations from the Plan.

Phase 1 of implementation focused on the development of a road management plan for problematic gravel roads around Lovell Lake, continued focus on residential erosion control through the YCC and Technical Assistance programs, lake association outreach with the Clean Lakes Campaign and capacity building projects.

Phase 2 of the Salmon Falls Headwater Lakes Watershed Management Plan Implementation Project focused on installing the recommended road BMPs along Brackett Road on Lovell Lake and additional residential stormwater controls with AWWA's YCC, a suite of outreach activities and strengthened water quality monitoring on the target waterbodies.

The desired outcome of this project was, again, to maintain and protect the water quality of the high quality waters of the AWWA region including Great East Lake, Horn Pond, Lake Ivanhoe, Lovell Lake and Wilson Lake, through implementation of recommendations in the "Salmon Falls Headwater Lakes Watershed Management Plan." In addition, the goal was to reduce the total phosphorus loading to Lovell Lake by at least 15 lbs/yr as recommended in the Plan.

Watershed Map



Project Objectives & Verification

This project was broken down into five objectives including organizational capacity, BMP installations to solve NPS problems on residential and road sites, calculations of pollutant load reductions, outreach and education and water quality monitoring. All the associated tasks were successfully accomplished.

Organizational Capacity:

The AWWA Board completed its visioning process to identify staffing, volunteer and partner needs for the project. The YCC staff was hired each season and the steering committee, representing AWWA, NHDES, the UNH Stormwater Center, the Town of Wakefield administration and highway department, and key property owners, convened as needed. All reports were submitted on a timely basis.

Deliverables:

- Spreadsheet of Tasks, Roles & Responsibilities - available upon request
- Employee contracts - available upon request
- UNHSC/AWWA/Town of Wakefield Memorandum of Agreement (Appendix A)
- Semi-annual reports on file at NHDES
- Steering Committee minutes - available upon request
- Spreadsheet of professional development opportunities - available upon request
- AWWA's membership database - available upon request

NPS Pollutant Load Reductions & Calculations:

AWWA's program managers delivered technical assistance to 51 property owners on Lovell Lake, Horn Pond, Lake Ivanhoe and the NH portion of Great East Lake. 30 of those became YCC project hosts with the installation of 165 BMPs. Those YCC projects reduced the pollutant load by 81.8 tons of sediment per year and 69.1 pounds of phosphorus using the Region 5 Pollutant Load Estimating tool. The reductions, to Lovell Lake alone, from the YCC projects is estimated at 52.7 tons of sediment and 44.7 pounds of phosphorus.

Nine sites (BR002, BR004, BR006, BR007, BR008, BR009, BR010, BR011/012 and BR013) identified in the Management Plan for Brackett and Pond Roads, Wakefield, NH were remedied with the installation of the recommended BMPs. These projects are estimated, using the SIMPLE Method, to reduce pollutant loading to Lovell Lake by 8.17 tons of sediment per year and 96.98 pounds of phosphorus per year.

The total estimated load reduction to Lovell Lake of 141.68 pounds of phosphorus per year far exceeds the recommendation in the SFHLWMP of 15 pounds of phosphorus per year.

Deliverables:

- 51 Technical Assistance packets - available upon request
- 39 Signed Pledge cards - available upon request
- 2012, 2013, and 2014 YCC Season reports (Appendix B)
- Brackett Road Erosion Control Implementation Report (Appendix C)
- 2012, 2013 and 2014 Pollutant Controlled Reports on file at NHDES

Outreach

The Clean Lakes Campaign outreach associated with this project took many forms. The Acton Wakefield Lake Users' Survey, completed by 90 people delivered interesting information about perceptions of water quality and AWWA. 45 people attended the June 23, 2012 NH Shoreland Workshop to learn about how land use affects water quality, shoreland regulations, lake living best practices, native plantings, legislative issues facing lakes, and construction BMPs. *Clean Water and You* booklets were distributed to lake associations and realtors to present lake-friendly living tips to shorefront property owners. Work with the Wakefield Planning Board resulted in the 2014 adoption of strengthened stormwater management zoning regulations and ongoing work with the Acton Planning Board continues with their efforts to do the same. The AWWA website, regular email updates and Facebook page continue to offer interesting, informative and relevant information about water quality protection.

Deliverables:

- Acton Wakefield Lake Users Survey report (Appendix D)
- NH Shoreland Workshop Evaluation report (Appendix E)
- *Clean Water & You* – on file at NHDES
- School program reports - available upon request
- www.AWwatersheds.org
- Minutes of Wakefield and Acton Planning Board meetings - available upon request

Water Quality Monitoring

By 2014, consistent reliable data was gathered on all the target lakes, Great East Lake, Horn Pond, Lake Ivanhoe, Lovell Lake and Wilson Lake by volunteers and interns from the UNH LLMP. The sampling followed the protocols of the UNH LLMP approved QAPP. Sampling was conducted primarily by volunteers in 2012 and 2013 with yearly sampling visits by UNH LLMP. Monitors on Great East and Lovell were consistent in their sampling while those on Horn and Ivanhoe were not. The Great East monitor sampled Horn and Ivanhoe when he could. In 2014, UNH LLMP was able to offer an intern, free of charge, to conduct bi-weekly sampling. The Great East Lake volunteer, Chuck Hodsdon, continued to sample Great East on his own but the interns Casey Chalmers and Erich Bergerhan partnered with volunteers on Horn Pond, Lake Ivanhoe and Lovell Lake.

Deliverables:

- 2012, 2013 UNH LLMP water quality reports for Great East Lake, and Lovell Lake on file at NHDES.
- 2014 UNH LLMP water quality reports for Great East Lake, Horn Pond, Lake Ivanhoe, and Lovell Lake to be filed with NHDES when complete in March 2015.

Project Outcomes & Measurable Results

- BMPs installed at sites BR002, BR004, BR006/007, BR008, BR009, BR010, BR011/012, BR013 on Brackett Road resulting in an estimated pollutant load reduction of 8.17 tons of sediment and 96.98 pounds of phosphorus per year.
- 51 technical assistance visits resulted in 39 signed pledge cards
- 165 BMPs were installed on 30 project sites resulting in an estimated pollutant load reduction of 81.8 tons of sediment and 69.1 pounds of phosphorus per year.
- 90 people completed the Acton Wakefield Lake Users' Survey with 92% ranking AWWA as effective in water quality protection. The respondents identified invasive aquatic plants as the most concerning issue facing the lakes with septic systems, water quality monitoring and stormwater runoff following.
- 27 participants completed the evaluation of the NH Shoreland Workshop with the majority indicating an increase in knowledge about all the covered topics.
- Students participating in the AWWA in the Schools program improved their knowledge of the topic by an average of 30.5%.

Conclusions and Recommendations

The stated desired outcome for the watershed-based plan implementation project was to preserve the High Quality Water status of the Salmon Falls headwaters including Great East Lake, Horn Pond, Lake Ivanhoe, Lovell Lake and Wilson Lake and achieve phosphorus load reductions for Lovell Lake. It was estimated that residential and roadway BMPs would reduce pollutant loading by at least 21 lbs of phosphorus per year. In fact, the estimated phosphorus load reduction of 141.68 lbs/yr to Lovell Lake far exceeded the recommended reduction of 15 lbs/yr as stated in the Salmon Falls Headwater Lakes Watershed Management Plan.

Phases 1 and 2 of this project have successfully addressed action items in all key categories:

- High impact road and residential erosion sites have been remediated and have maintenance agreements in place.
- Wakefield has adopted strengthened stormwater management regulations
- AWWA's outreach and education plan has reached the local schools, lake associations, municipal officials and other concerned citizens with a variety of media including hands-on activities, workshops, presentations as lake association meetings, print materials, website updates, email blasts, social media, and surveys.
- The local land trust organizations continue to pursue and conservation activities within the watersheds.
- Water quality monitoring results indicate that the status of the lakes is stable or improving.

Recommendations for future actions include surveys to identify potential problem septic systems, further work with the towns to strengthen commitment to stormwater management and enforcement, and further BMP installations at complex road sites and additional residential sites.

It will require the continued commitment of all the project partners to see that the Salmon Falls Headwaters Lakes maintain their High Quality Waters status to maintain the ecological, recreational and economic value of the waterbodies within Acton and Wakefield.

Photographic Documentation

See the Brackett Road Erosion Control Implementation Report in Appendix XX

Appendices

A. UNHSC/AWWA/Town of Wakefield Memorandum of Agreement
B. Acton Wakefield Lake Users Survey report
C. Brackett Road Erosion Control Implementation Report
D. NH Shoreland Workshop Evaluation report