

Nonpoint Source Management 2012 Annual Report



New Hampshire
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Nonpoint Source Management 2012 Annual Report

Prepared by
Watershed Management Bureau
New Hampshire Department of Environmental Services
29 Hazen Drive
Concord, NH 03302-0095

www.des.nh.gov

Thomas S. Burack
Commissioner

Harry T. Stewart, P.E.
Director, Water Division

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Front Cover: *Installation of a bar apex log jam to divert high flows on the lower Mohawk River, Colebrook into a previously inaccessible overflow channel. Photo by John Field, Field Geology Services*

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Introduction

This report describes the activities and accomplishments completed and achieved in New Hampshire during the year ending September 30, 2012 with funding from Section 319 of the Clean Water Act, including \$1,187,087 in 2012. Typical projects span multiple years and this report also describes 319 projects completed during the year that were funded in prior years. The New Hampshire Department of Environmental Services (DES) is pleased to report that in 2012 the Pemigewasset River was added to the official Environmental Protection Agency (EPA) list of 319 Success Stories in New Hampshire because an impairment was fully addressed by a 319 project, resulting in the river once again meeting water quality standards (see http://water.epa.gov/polwaste/nps/success319/nh_pem.cfm).

With the 18% budget cuts of 2011 and 2012 behind us, one of the prominent national activities of the 319 program was a joint state/federal effort to update and revise the national 319 program guidelines which govern how states use 319 funding. The draft guidelines address the recommendations of separate program assessments completed by the federal Office of Management and Budget (OMB) and the General Accounting Office (GAO) in 2011 and 2012. Among the recommendations of the OMB report are updating state nonpoint source management program plans; increase leveraging of Clean Water State Revolving Funds; and, improving measures of success by, among other things, tracking progress made toward implementing watershed-based plans.

The revised national 319 guidelines, developed in response to the OMB and GAO reports, will include a requirement for states to update their NPS management programs beginning in 2013. In 2012, DES started the process by compiling New Hampshire specific data to feed into EPA's Recovery Potential Screening Tool. This tool will help prioritize watersheds for both restoration and protection. Such a prioritization system is a requirement for updated state program management plans and will be relied upon to focus our annual grants solicitation and project selection. Watershed prioritization will also benefit other watershed management programs, including monitoring, New Hampshire Clean Lakes and TMDL programs.

DES has continued its work to track progress on the implementation of completed watershed management plans. Through follow-up reporting by past grantees, we compiled an "at-a-glance" status report of progress. Over the long-term we hope to analyze the success, and sometimes failure, of plan implementation, which will allow us to develop realistic expectations about the time and effort involved in implementing completed plans. While this has always been an important consideration when developing plans, it is even more critical now that the 2013 national program guidelines prohibit the use of 319 project funds for plan development.

To help address the shortfall in funding available for development of watershed-based plans, DES revamped its solicitation process in 2012 for Clean Water Act Section 604(b) funds, which are allocated to regional entities for water quality planning. While 604(b) provides modest funding, about \$58,000 annually, one organization, the Southwest Regional Planning Commission, has already taken advantage of the opportunity by securing a grant to develop a watershed-based plan for Lake Warren. In addition, in 2012, for the first time, DES set aside \$2 million of SRF funds for stormwater and NPS related projects.

Finally, this report provides the details behind the pollutant load reductions achieved through the implementation of 319 funded projects this year – 328 pounds of nitrogen, 128 pounds of phosphorus, and almost 59 tons of sediment. This is equivalent to 5 dump truck loads being kept out of New Hampshire waters.

604(b) Water Quality Planning

Since the early 1990s, DES allocated limited 604(b) funds to the nine regional planning commissions to support the work of fledgling Local Advisory Committees (LACs), established under the state's Rivers Management and Protection Program, established in 1988 under RSA 483. The LACs, comprised of municipal appointees, are charged under the law with the development of river corridor management plans. The Act reads "The state shall encourage and assist in the development of river corridor management plans and regulate the quantity and quality of instream flow along certain protected rivers or segments of rivers to conserve and protect outstanding characteristics including recreational, fisheries, wildlife, environmental, hydropower, cultural, historical, archaeological, scientific, ecological, aesthetic, community significance, agricultural, and public water supply so that these valued characteristics shall endure as part of the river uses to be enjoyed by New Hampshire people." While the need for development and revision of corridor management plans remains, DES recognizes that the 604(b) water quality planning funds could be better aligned with the specific purposes described in the Clean Water Act, including, but not limited to:

- Determining the nature, extent, and causes of water quality problems in the state.
- Identifying the most cost effective and locally acceptable facility and nonpoint source measures to meet and maintain water quality standards.
- Developing an implementation plan to obtain state and local financial and regulatory commitments to implement water quality plans.

DES revamped the 604(b) grant solicitation process in 2012 to better align with Clean Water Act criteria. A revised 604(b) Request for Proposals was issued to the Regional Planning Commissions and the Connecticut River Joint Commissions. Twelve proposals were received and DES selected three to receive funding.

The Southwest Regional Planning Commission will receive \$40,800 for a project titled "Nutrient Loading Study of Lake Warren, Alstead, NH" that will result in an EPA guidelines-compliant watershed-based plan for an impaired waterbody. Given the declining funds available through Section 319 for preparation of watershed-based plans, this 604(b) grant is addressing a critical funding need.

The Lakes Region Planning Commission was awarded \$37,602 for a "Site-level Stormwater Planning and Education Program," which takes advantage of heightened interest in water quality planning in the impaired Lake Waukewan watershed in Meredith by implementing DES's new Soak up the Rain NH program.

With new requirements looming, the Nashua Regional Planning Commission's "Stormwater Assistance Program" project will provide critical assistance to MS4 communities addressing stormwater-impaired water bodies. This project also fills a critical nonpoint source funding gap since 319 funds cannot be used to implement MS4 permits.

DES will evaluate the success of these projects and incorporate lessons learned in future biennial 604(b) Requests for Proposals.

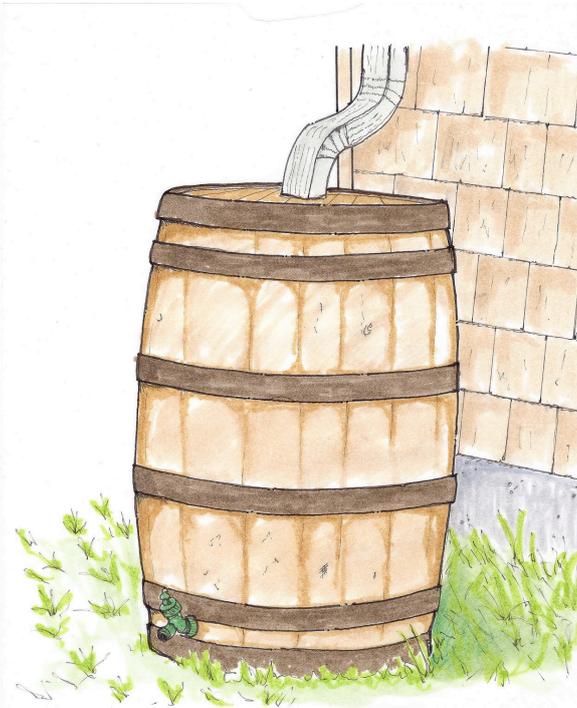
Stormwater Initiatives

The following are some of the major stormwater initiatives accomplished in 2012.

NH Reserves SRF Funds for Stormwater Projects

In a collaborative effort between DES Watershed Assistance and Wastewater Engineering staff, 2012 marked the first year that a portion of SRF funds, \$2 million, was set-aside for stormwater and nonpoint source municipal projects under the Clean Water State Revolving Loan Fund. While this program had traditionally provided funds for wastewater treatment and unlined landfill closures, since 2010 it also has been available for stormwater and nonpoint source projects. The 2012 set-aside enabled DES Watershed Assistance staff to actively solicit pre-applications for these types of projects. As a result, nine pre-applications were submitted for a total request of \$3,860,446. Projects included: stormwater system improvements, roadside drainage reconstruction, bioretention area and gravel wetland installations, culvert replacements, and sand and salt storage shed construction. The amount to actually be loaned is to be determined pending municipal authority to borrow and the submittal of full applications.

Soak up the Rain NH



In 2011, DES published the *New Hampshire Homeowner's Guide to Stormwater Management*. The purpose of this guide is to provide a resource for New Hampshire homeowners wanting to better manage stormwater on their properties. Since then, many local organizations have expressed interest in promoting and coordinating these residential stormwater management efforts in their communities, and have requested assistance from DES to do so. A coordinated approach to many, small residential stormwater improvements can decrease the burden on municipal stormwater infrastructure and help achieve water quality goals of downstream receiving waters.

In response to these requests, DES began Soak up the Rain NH, based on EPA New England's Soak up the Rain program, to encourage widespread adoption of stormwater best management practices (BMPs) in watersheds with high priority water quality problems.

To help develop the program, DES coordinated a work group with participants from 20 organizations around the state including watershed organizations, planners, universities, stormwater and landscape professionals, municipalities, EPA, and others. This work group will play an advisory role to the program, offering expertise, assistance, and feedback. Program development will continue in 2013 with the following:

Messaging and Outreach Materials

Provide unified, targeted messaging with consistent language and easily recognizable logos to raise awareness of stormwater pollution, how individual properties contribute to the problem, and opportunities to be part of the solution. This includes Do-It-Yourself (DIY) stormwater treatment practices, such as installing rain barrels and constructing rain gardens, and general good

housekeeping practices like reducing and monitoring fertilizer applications.

Website

Provide a central web location for audiences to access Soak up the Rain NH materials including links to the EPA New England's Soak up the Rain site, a calendar of events, instructional videos, and photograph examples. Depending on programming resources, the site will also have the ability to track pollutant load reductions achieved over time as a result of the program.

Hands-on Training

Provide hands-on training with on the ground BMP installations to teach local organizations how to conduct site evaluations, develop stormwater plans, and install DIY practices from the DES Homeowner's Guide. This will allow local project leaders to go into their communities and teach others to do the same. Each installation will provide an opportunity to demonstrate BMPs and educate community members about stormwater pollution and treatment.

For more information on Soak up the Rain NH, please contact Jillian McCarthy at 603-271-8475/ jillian.mccarthy@des.nh.gov.



Infiltration steps being installed on Lovell Lake in Wakefield by the Acton Wakefield Watersheds Alliance Youth Conservation Corp.

NH Stormwater Utility Feasibility Studies Grant Lessons Learned - *Don't Assume Anything*

As the challenges and costs of managing stormwater continue to grow, many New Hampshire communities are exploring stormwater utilities as a sustainable option for funding their stormwater management programs. In 2009 DES funded stormwater utility feasibility studies in the cities of Dover, Portsmouth, Manchester, and Nashua. All projects were completed by the end of calendar year 2011.

Each of the four cities completed a comprehensive process to analyze their stormwater programs and identify compelling cases, outreach and education strategies, and rate and billing methodology. Although no municipality in New Hampshire has adopted a stormwater utility to date, the final results of these feasibility studies and the experiences of the participants were documented throughout the process and tabulated for other New Hampshire municipalities interested in identifying a funding mechanism for their stormwater programs. From these studies come the

following suggestions:

- **Involve the Public:** The public must be involved from the beginning. They should have the opportunity to learn about how a stormwater utility works, to ask questions and voice concerns in order to make an educated decision on whether or not they think a stormwater utility is a good option for their municipality.
- **Ensure Political Understanding and Support:** It is essential that municipal decision makers fully understand the purpose and function of a stormwater utility in order to speak accurately about it to their constituents and answer any questions that arise. Ensure all supporters communicate why they support the stormwater utility and invite them to speak at public forums.
- **Provide Real Numbers and Full Disclosure:** In order for the public to better understand how they would be personally impacted by a stormwater utility fee, actual examples of rates based on various rate structures should be developed and available for public review.
- **Identify and Communicate the Need:** It is important to identify and communicate local stormwater needs that could be funded with revenue from a stormwater fee. Highlighting examples of potential fixes to ongoing local stormwater concerns makes the message about solving problems, rather than a message about stormwater.
- **Don't Assume Anything:** No matter how aware your community is about stormwater and how much support appears to exist, do more communication and outreach than you think is needed.

The final reports for Dover, Portsmouth and Nashua are available at <http://des.nh.gov/organization/divisions/water/stormwater/utilities.htm>. To provide further information on the stormwater utility option, EPA sponsored a workshop in Greenland in the fall of 2012, Paying for Municipal Stormwater Programs: Confronting Challenges, Recognizing Opportunities, and Building Community Consensus. This was a great opportunity for DES and municipalities to brainstorm and dialog on the stormwater utility option.

Education and Outreach

The following are some of the major education and outreach activities accomplished in 2012.

Michigan Dogs Sniff out Illicit Discharges in New Hampshire and Maine

In August, DES partnered with consultant FB Environmental in hosting a bacteria source tracking demonstration workshop at the DES Coastal office in Portsmouth. Approximately 70 individuals attended including town officials, engineers, public works directors, and staff from DES, EPA and Maine DEP.

The workshop covered a variety of bacteria source tracking methods, ranging from conventional bacteria tests, video inspection of pipes, to canine detection. Dr. Steve Jones, UNH Jackson Laboratory, discussed genetic fingerprinting methods of source tracking, and Bill Boulanger, Dover DPW, described Dover's successful illicit discharge detection and elimination program using smoke and dye tests. Newton Tedder, EPA, gave an overview of what to expect in the draft MS4 regarding Illicit Discharge Detection and Elimination requirements.



Led by Scott Reynolds of Environmental Canine Services LLC, Sable, a seven year old German shepherd, sniffs a water sample to detect the presence of human bacteria at a workshop held at DES's Seacoast office.

After presentations and a panel discussion, outdoor demonstrations were held by Ted Berry Company on closed circuit television pipeline and catch basin inspections and by Environmental Canine Services (ECS), Vermontville, Michigan on using dogs to detect and track human sewage in stormwater. The highlights of the training involved the dogs. ECS brought two dogs, Sable and Logan, to demonstrate how they are able to detect human bacteria. ECS uses the scent-trained dogs to help clients determine where human bacteria sources are present in waterbodies. The dogs alert to sites and water samples with human-source contamination by performing their trained signal; Sable barks and Logan sits.

Following the workshop, ECS and FB Environmental spent a week in the area testing for contaminated wastewater in Exeter and southern Maine municipalities. In each community visited, potential sources of contamination were discovered through a combination of canine detection and conventional bacteria tests. The towns can now use that information to more efficiently and cost effectively find specific sources and correct problems.

2012 High School Envirothon Theme NPS and LID

The Canon Envirothon is a national high school environmental science competition that encourages an understanding of the principles and practices of natural resource management and ecology. Each year, students from high schools across New Hampshire participate in the competition. In 2012 the theme was "Nonpoint Source Pollution/Low Impact Development".

The New Hampshire specific lesson was developed by staff from the Watershed Assistance Section and Plymouth State University. For their assignment, student teams were asked to research and propose a combination of site planning and structural design strategies to control runoff rates, volumes, and pollutants on a proposed new or redevelopment site within their community. Students then worked with local officials to identify and propose solutions to barriers on implementing these strategies. The Envirothon competition was held at New England College, Henniker. The participating teams completed several scientific exercises and then made an oral presentation on their site plan and design proposal. Judges were comprised of natural resource professionals including several Watershed Assistance staff. This year's winning team was from Keene High School, who then went on to present at the national competition held over the summer at Susquehanna University, Pennsylvania.



2012 Envirothon winners: Keene High School students Chris Penny, Cameron Goller, Peter Murphy, Ashley Yarus and Shelby Redfield with Jim Spielman, NRCS Assistance State Conservationist. Photo: Cliff Learner, Keene High School

Water Words that Work

DES funded a two-part environmental communication workshop, Water Words that Work and Combat Communications, for over 50 DES staff, including the DES commissioner and senior leadership staff, and partner stakeholders. This workshop is highly recommended for anyone doing environmental outreach. Through detailed examples and hands-on activities, communication expert Eric Eckl demonstrated how to be more successful in connecting with your audience. The Water Words That Work environmental message method is a four-step process for changing technical language into words that encourage environmental awareness and behavior change. The Combat Communications training helps perfect skills needed to present the facts clearly and deal with potential controversial issues.

New Hampshire Hosts New England Interstate Water Pollution Control Commission (NEIWPCC) Nonpoint Source Conference

In May, New Hampshire hosted the 23rd NEIWPCC Nonpoint Source Conference in Portsmouth, with a record breaking 200 people in attendance. The conference featured case studies and presentations on stormwater management and watershed restoration, as well as field trips to local sites. The

keynote speaker, Eric Eckl from Water Words that Work provided both the plenary session and a day long hands-on communication workshop. Site tours included: demonstrations at the UNH Stormwater Center; 319 grant projects in Hodgson Brook, Portsmouth and Berry Brook and Willow Brook, Dover; and, a boat tour to UNH Jackson Lab and BMP locations in Great Bay.

Watershed Practitioners Meet the Models

To respond to requests from watershed managers for more training on modeling methods, DES partnered with Maine DEP and 319 Grantees to host Modeling BMP Pollutant Load Reductions: A Workshop for 319 Grantees. The workshop provided modeling basics with hands on assistance as attendees worked through different modeling exercises. Workshop participants downloaded the models to their laptops in advance of the event and followed along during the case studies while using the models. Experts from DES and Maine DEP presented four different models: the Simple Method, Residential Loading Model, Water Erosion Prediction Project (WEPP) Road Model, and the "Region 5" model. Over 30 staff and volunteers from local watershed organizations learned how to model pollutant loads from nonpoint sources at the site scale.



Fred Short, UNH research professor, presenting on eelgrass in the Great Bay Estuary during the Great Bay boat tour.



Attendees follow hands-on at the Modeling Pollutant Load Reduction workshop for watershed managers at DES's Pease Office.

Third Annual 319 Grantees Roundtable and Project Site Tours

In October, 2011 the Watershed Assistance Section hosted the Watershed Managers Roundtable and Project Site Tours in Gilford.

This was the second year that DES combined the traditional EPA Site Tours with the 319 Project Managers Roundtable. In addition to the state and EPA attendees, over fifty past, present, and future Watershed Assistance Grantees participated.

The agenda included an overview of the 319 program and expectations

for the future; the new Residential Loading Model and the Homeowner's Guide to Stormwater Management; and, an update on BMP tracking results from previous grants. Attendees then discussed solutions to different project struggles they encounter including:

- Local and state regulatory barriers.
- Measuring economic benefits of projects to communities.
- Funding sources, gaps and issues.
- Selecting and assessing BMP function.
- Attaining community support.
- Outreach tools and techniques.

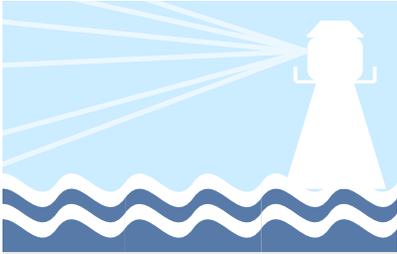
Attendees then took a tour of projects funded by 319 and American Recovery and Reinvestment Act funds including a restored and daylighted stream in Laconia and an assortment of innovative beachside best management practices to help keep Center Harbor waters clean. DES project partners and hosts included the City of Laconia, Center Harbor DPW, Lake Winnepesaukee Watershed Association, and Belknap County Conservation District.

Future outreach efforts will be designed in response to participant feedback.

A common theme that emerged was the need for tools to improve communication skills and messaging to obtain local support for plans and projects.



During the Watershed Roundtable site tour, Matt Murawski, of DuBois & King, Inc. explains the fluvial geomorphology concepts incorporated into the Anthony Drive Stream Restoration project in Laconia.



Highlights and Overview of Completed Projects

Berry Brook Phase I Implementation

Coastal Watershed

Berry Brook
Phase I
Implementation

City of Dover

2006 Restoration

Grant Amount:
\$55,000

Local Match:
\$41,791

TSS Reduction:
327 lbs/yr

Phosphorus
Reduction:
1.11 lbs/yr

Nitrogen Reduction:
9.75 lbs/yr

Berry Brook, a tributary to the Cocheco River, is a 0.9 mile long stream in a 185 acre watershed in downtown Dover. The watershed is nearly built-out with 30% impervious cover (IC) consisting mostly of residential development. The brook is listed on the state's 303 (d) list as impaired for Aquatic Life Use (macroinvertebrates) and Primary Contact Recreation (bacteria).

This project implemented several recommendations identified in the Berry Brook Watershed Management Plan to reduce bacteria and nutrients, improve natural resources within the watershed, and educate property owners about low impact development (LID) methods for treatment of stormwater runoff. It is the first phase in a series of projects that will implement recommendations from the Plan. As part of this phase the following stormwater BMP installations were constructed: two bioretention systems/rain gardens and a tree filter at the Horne Street School; one bioretention unit at the corner of Snow Avenue and Horne Street; and, a bioretention system at a residence on Hillcrest Avenue.

Combined, these installations provide treatment for approximately 1.17 acres of impervious area, effectively decreasing the overall watershed impervious cover (IC) to approximately 29% and reducing pollutant loading of suspended sediment, phosphorus, and total nitrogen by 327, 1.11 and 9.75 pounds per year, respectively.

In addition to BMP construction, community outreach was initiated through a series of watershed and stormwater education activities

at the Horne Street School; a community meeting to discuss stormwater management projects; homeowner workshops and stormwater audits; and a watershed clean-up event.

The City of Dover Department of Public Works contributed labor, equipment time, and materials for construction and installation of the BMPs. The Cocheco River Watershed Coalition coordinated outreach activities and the UNH Stormwater Center conducted survey work, and provided LID recommendations and engineering oversight of the stormwater treatment systems.



Rain garden installed to treat roof runoff from the Horne Street School Photo: Jamie Houle, UNH Stormwater Center

LID in the Willow Brook Watershed

Willow Brook, a tributary to the Cocheco River, is located in the urban center of Rochester. Willow Brook is impaired for primary contact recreation due to bacteria. Recent sampling has also shown an impairment for aquatic life due to low dissolved oxygen. Restoration of the Brook to meet water quality standards is the long term goal for the Willow Brook initiative; however, it will take several phases over time to achieve this goal. An impervious cover (IC) reduction approach is being used to help select and prioritize management activities to address the water quality impairments. The IC method uses IC reduction as a surrogate for pollutant load reduction and is helpful in addressing stormwater impacts in impaired streams where no specific pollutant can be identified as the cause of the impairment.

For this project, several low impact development (LID) BMPs were installed to reduce runoff from impervious cover at two sites. At the School Street School site, LID installations included three rain gardens, a rain barrel, an infiltration dry well, a pervious asphalt basketball court, an infiltration drain, and a pervious concrete sidewalk. These installations treat over 85% of the IC at the project site. The second site was a new development of fifteen homes built on a cul-de-sac. Two tree box filters and a bioretention system were installed to treat stormwater runoff from the neighborhood. In addition, rain barrels were installed at nine residences to demonstrate another method for decreasing residential runoff while conserving and reusing rainwater.

Several community workshops helped promote the project and provided opportunities for residents to learn LID approaches to stormwater management. Students at the School Street School also participated in project activities including site tours, water quality monitoring, and planting days. Finally, the UNH Stormwater Center developed a comprehensive report which identified additional opportunities for the City of Rochester to promote innovative, cost-effective stormwater management to reduce the effects of impervious cover.



UNH Stormwater Center engineers and Rochester DPW staff explain rain garden design and installation to School Street School students. Photo: Lori Chase, Cocheco River Watershed Coalition



Coastal Watershed

LID in the Willow Brook Watershed

Cocheco River Watershed Coalition

2005/2009 Restoration

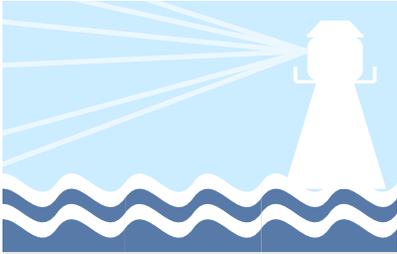
Grant Amount:

\$84,912

Local Match:

\$56,636

TSS Reduction:
34 lbs/yr



Tracking and Reducing Pet Waste in Seacoast Towns

Coastal Watershed

Tracking and Reducing Pet Waste in Seacoast Towns

Blue Ocean Society

2005/2008

Restoration

Grant Amount:

\$48,595

Local Match:

\$34,089

Pet waste in waterways and public areas is of concern both because of its unsightliness and its potential effects on human health. Bacterial source tracking studies conducted in the Coastal watershed have shown that a significant percentage of the bacteria in the water that could be identified from host animals is from dogs. This project focused on reducing bacterial contamination from dog waste in previously identified hot-spot communities. The activities resulted in increased awareness of the effects of dog waste and encouraged pet owners to pick up after their dogs and dispose of waste in a safe and environmentally sound manner.

To achieve this goal, the Blue Ocean Society (BOS) worked with the towns of Rye and Hampton, the City of Portsmouth, the NH Division of Parks and Recreation, veterinarians, pet-related businesses and local residents to discuss and assess the dog waste issue. BOS developed a comprehensive campaign called SCOOP (Seacoast Canine Owners Outreach Program) to address the issue through education, printed materials, the media (television, radio and print), and installation of pet waste bag dispensers and signage at local beaches.

Several thousand people received project information through the distribution of project information at many fairs, festivals and educational programs (including education of over 2,000 students aboard the M/V Thomas Loughton) throughout the 23 months of the project. BOS also documented the reduction of nearly a thousand piles of pet waste on the beach through beach cleanups, ensuring that this bacteria source would not contaminate local waterways.



Students learn about nonpoint source pollution and pet waste onboard the M/V Thomas Loughton. Photo: Blue Ocean Society

Match came from a variety of sources, including state agencies, municipalities, local businesses and numerous volunteers. Major support and in-kind donations and services were provided by Barkin' Biscuit, Darci Creative, Small Town Pictures, Chucky's Fight and Lifeshare Management Group, Inc., NH Division of Parks and Recreation, the Town of Rye, the Town of Hampton, the City of Portsmouth, and the Hampton Beach Village Precinct.

Granite Lake Watershed Management Plan

Granite Lake is a 228 acre lake with a watershed of about 2,432 acres located within the towns of Nelson and Stoddard in Cheshire County. Granite Lake is a high quality lake, but recent results from over eighteen years of New Hampshire Volunteer Lake Assessment Program sampling show increased levels of phosphorus, turbidity, conductivity and chloride. Threats from construction, roads, logging operations and septic systems led the Granite Lake Association to apply for this grant to develop a watershed management plan. Further, a cyanobacteria bloom in Granite Lake occurred in 2007. The watershed management plan provides a current load allocation for the Granite Lake watershed, establishes an in-lake water quality goal for phosphorus; and, as a result, a phosphorus load reduction goal for the watershed.

The analysis suggests that the current loads of phosphorus to Granite Lake should be reduced by 6.5% overall in order to maintain the target summer epilimnetic mean in-lake phosphorus value of 5 ug/L and also achieve the short-term goal of 4.75 ug/L to balance potential phosphorus loads from future watershed development. The plan includes specific targeted measures to control phosphorus inputs to the lake, along with suggestions for improving monitoring and education and outreach efforts.



Merrimack River
Watershed

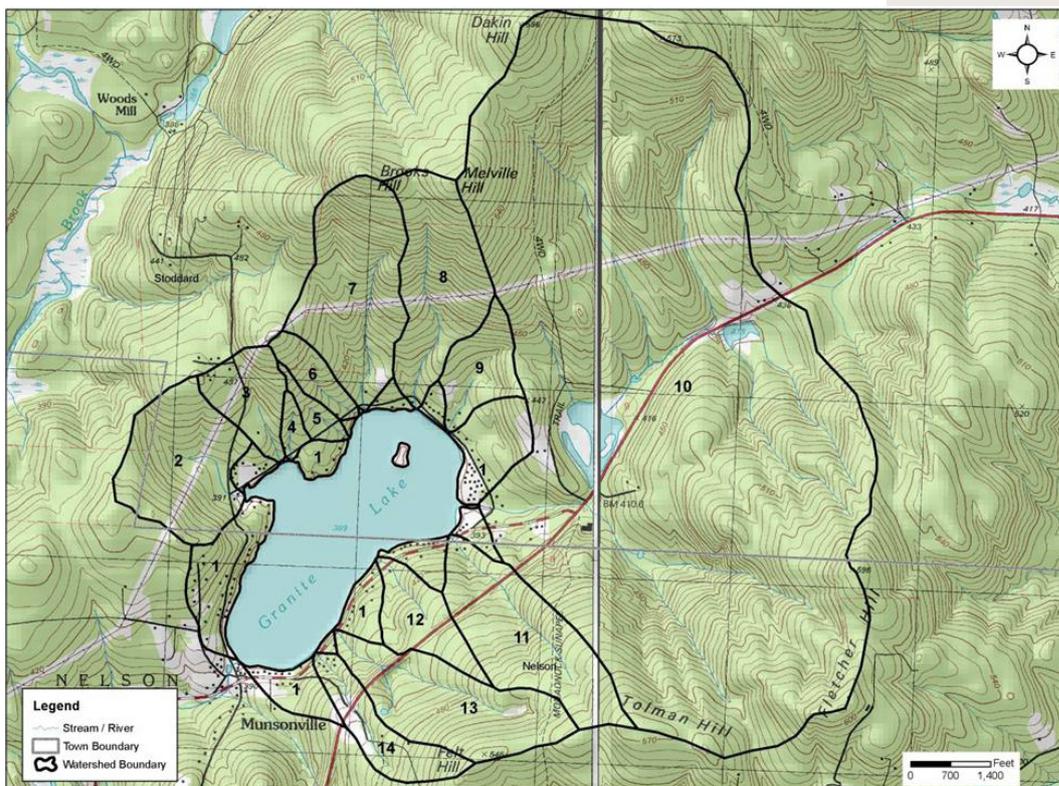
Granite Lake
Watershed
Management Plan

Granite Lake
Association, Inc.

2008 Base

Grant Amount:
\$ 50,000

Local Match:
\$33,355



Granite Lake Watershed



Merrimack River
Watershed

Tinker Road and Everett Turnpike BMPs

Pennichuck
Water Works

2004/2007/2008
Restoration

Grant Amount:
\$210,780

Local Match:
\$280,159

TSS Reduction:
70.3 tons/yr

Phosphorus
Reduction:
67.1 lbs/yr

Nitrogen Reduction:
443.6 lbs/yr

Tinker Road and Everett Turnpike BMPs

Pennichuck Brook has long been the primary source of water supply for a significant portion of southern New Hampshire. The water supply is operated by Pennichuck Water Works Inc. located in Merrimack. Over the last 100 years, extensive development throughout the 17,000+ acre watershed has resulted in declining water quality. Several pond, impoundment, and river assessment units within the Pennichuck watershed are on the New Hampshire 303(d) list of impaired waters.

In recognition that watershed protection requires a multi-faceted approach, Pennichuck Water Works developed a watershed management plan in 1998. The plan identified ten of the most significant problems in the watershed and proposed recommendations for improvement with a focus on urban stormwater management and treatment. In 2007 the plan was updated and reprioritized restoration efforts by incorporating the nine key elements of a watershed based plan. One of the priority restoration sites identified through this process was the Tinker Pond and Harris Pond project area adjacent to the Everett Turnpike.

Harris Pond is the last in a series of ponds along Pennichuck Brook that provides the drinking water supply for the City of Nashua and portions of other towns. The intakes for the Pennichuck Water Works treatment facility are located in Harris Pond, making it a critical location for restoration. The three major threats to the supply reservoir are:

1. Spills from either local roads or from the Everett Turnpike that could cause catastrophic pollution events;
2. Sediments from road sanding and erosion that can fill in water bodies and carry pollutants into the reservoir; and
3. Phosphorus inflows from stormwater, which can encourage algal blooms

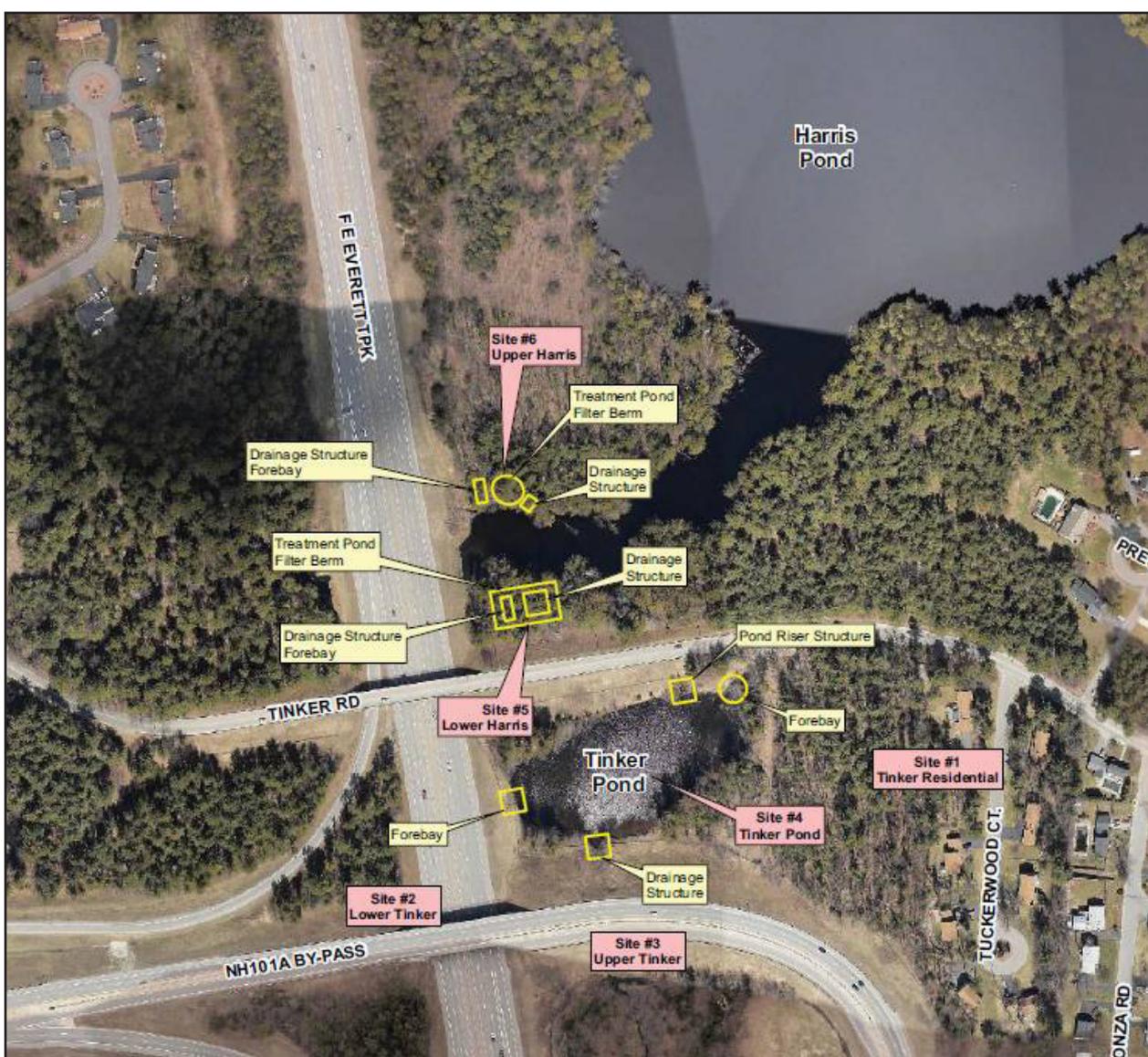
This project focused on addressing the above threats through the following BMPs which now provide spill control and improved treatment of stormwater from the Everett Turnpike:

1. Conversion of Tinker Pond from a non-maintainable detention structure to a state-of-the-art extended detention basin that increased the storage volume by more than 150,000 cubic feet, increased pond circulation to prevent stagnation, and added pretreatment of stormwater inflows.
2. Construction of more than 100 feet of bioretention treatment/filter berms.
3. Construction of a maintenance road and emergency access way to the Tinker Pond detention area as well as the water treatment berms built on Harris Pond to allow for regular maintenance and to provide access to emergency spill control equipment.
4. Construction of forebays sized to handle a tanker truck size spill

with hooded outlets and containment booms to protect Harris Pond from potential spills on the Everett Turnpike.

Installation of these BMPs was completed in June of 2011. The pollutant loading and removal modeling was completed in December 2011. It was determined that roughly 110 pounds of phosphorus enters Tinker Pond and Harris Pond on an annual basis and that these quantities must be reduced to meet the required watershed goals. Currently, with the structural BMPs installed and with continual maintenance, the anticipated annual phosphorus reduction is approximately 67 pounds, or approximately 61% of the current pollutant loading for this subwatershed.

With on-going public educational programs in place, further pollutant reductions are anticipated through public awareness. Additionally, Pennichuck Water Works is evaluating retrofitting additional existing detention areas throughout the entire Pennichuck Brook watershed to meet future goals of the watershed management plan.



Tinker Pond, Merrimack, NH.



Webster Lake Community Septic System Design

The goals of this project were to reduce stormwater volume and velocities to Webster Lake by installing BMPs to promote infiltration along Lake Shore Drive, and to conduct a septic system survey, prepare a plan and secure permits for the construction of a community septic system.

Unfortunately, the City of Franklin was unable to secure the necessary easements and agreements from property owners to proceed with the community septic system portion of the project. Only \$15,261 of the original \$70,000 award was spent, a portion of which went to a drainage analysis and conceptual stormwater treatment design. However, more than half of the stormwater treatments BMPs were able to be constructed utilizing DES Aquatic Resource Mitigation grant funds. Remaining construction is scheduled for 2013, pending additional funds being secured. In addition, \$40,000 in match was generated through the purchase of land within the watershed for conservation.

Merrimack River
Watershed

Webster Lake
Community Septic
System Design

City of Franklin

2009 Restoration

Grant Amount:
\$15,261

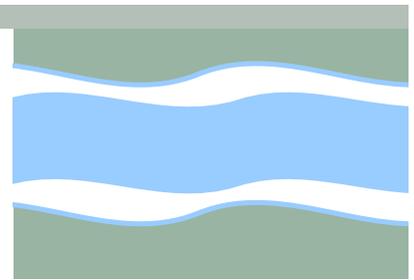
Local Match:
\$44,464

Assessment of the Ammonoosuc River and Floodplain Conservation

The Ammonoosuc River flows for nearly 60 miles from the western slope of Mount Washington through the towns of Carroll, Bethlehem, Littleton, Lisbon, Landaff, Bath, and Haverhill before reaching the Connecticut River. It has a watershed area of 395 square miles. It is a designated river under the New Hampshire Rivers Management and Protection Program in recognition of its outstanding natural and cultural resources. Below the White Mountain National Forest, the Ammonoosuc watershed is currently experiencing increases in commercial and residential growth and a subsequent population rise that exceeds prior expectations. The presence of Interstate-93 and Route 302, which follows the river for most of its length, makes the area a desirable location for commercial development. There is growing concern about the impact of development on the river corridor, including increased road runoff and loss of flood storage. A geomorphic assessment was considered critical for providing a watershed-scale context for river management planning efforts that will be initiated by individual towns and the Ammonoosuc River Local Advisory Committee (LAC).

This Section 319 funded project concluded on December 31, 2011 and produced a Phase 2 geomorphic assessment. The Phase 2 assessment was used to create fluvial erosion hazard maps for the seven towns along the river and a corridor planning guide was generated to identify and select restoration projects along unstable portions of the river. Presentations were made in all seven towns to various board members, local river advisory committees and the public. The products produced for this project provide the scientific data that local and regional organizations can utilize to identify, prioritize, design, and implement restoration and conservation projects that move the river towards an equilibrium condition. This will in turn reduce flooding and erosion hazards, and improve aquatic habitat.

The Ammonoosuc River Geomorphology-Based River Corridor Planning Guide prepared for this project prioritizes 23 potential projects along the river's length that address the most severe hazards and, if implemented, should provide improvements to aquatic habitat while reducing downstream sediment transport. The CRJC technical advisory group in consultation with the LAC selected the Salmon Hole area in Lisbon as the highest priority site for restoration. Detailed topographic surveys were conducted of the area and plans developed for instream and riparian restoration. Using a combination of log jams, boulder structures, and riparian plantings, the proposed project is designed to create flow complexity along an artificially straightened channel, increase sediment storage and reduce instability and bank erosion downstream. Detailed descriptions of the goals and plans for this restoration phase of the river are compiled in Ammonoosuc River Phase 3 Assessment: Salmon Hole Stream Restoration Designs produced with



Connecticut River
Watershed

Assessment of the
Ammonoosuc River
and Floodplain
Conservation

Connecticut River
Joint Commission

2009 Base

Grant Amount:
\$123,890

Local Match:
\$84,995

funding from this project. The CRJC, LAC and other stakeholders hope to collaborate in the future to realize the restoration of the Salmon Hole area by implementing the restoration designs and conservation measures outlined in the Phase 3 assessment and design report.

Channel straightening of the Ammonoosuc River causes mass failure (a) that leads to bar formation in foreground and downstream erosion (b)

a.



b.



Nash Stream Restoration

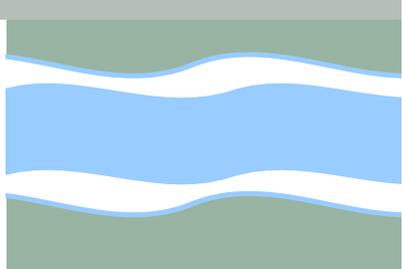
Nash Stream is located within the Connecticut River Watershed in northern New Hampshire with about 90 percent of the watershed lying within the Nash Stream State Forest. Nash Stream once provided excellent angling opportunities as a high quality brook trout fishery as it provided historic habitat for Atlantic salmon.

Unfortunately, aquatic life support and fishing in Nash Stream have become impaired as a result of habitat and hydrologic modification, timber harvest, resource extraction, and road maintenance activities. When an old logging dam broke at Nash Pond Bog in 1969, the resulting flood scoured the streambed and adjacent riparian forest along a nine mile reach. Post-flood activities included extensive channel dredging/berming, and culvert repair. The undersized culverts altered hydrology and morphology by impeding the natural transport of water, sediment, ice, and woody material. Several have failed catastrophically on tributaries to Nash Stream. Although many of these tributaries were relatively healthy, the inability of the fish to access them exacerbated the decline of the fishery. As a result, Nash Stream no longer supports a self-sustaining wild brook trout fishery.

This project started in June of 2007 and supported the initial planning and assessment work, including the completion of a "Phase II" geomorphic assessment and the development of a watershed-based plan and a Site Specific Project Plan. This project also supported the replacement of two impassable culverts on Slide Brook and upper Farrer Brook. In addition to Section 319 funds, the Upper Connecticut River Mitigation and Enhancement Fund, and the New Hampshire Fish and Game Department provided financial support for this project.

Post-construction assessments were performed on both Slide Brook and upper Farrer Brook. The post-construction results generated from this analysis demonstrated that the replacement structures at Slide and upper Farrer Brooks mimic natural stream conditions by matching the width, depth, slope, and substrate of undisturbed upstream and downstream reaches. As a result, both crossings are now passable to all native fish species and life stages. In addition, they are at grade, aligned with the natural channel morphology and at least 1.5 times bankfull width (greater than 2.5 times bankfull for Slide Brook).

In addition to the restored stream crossings, the Phase II geomorphic assessment and the watershed-based plan are now guiding continued restoration work on Nash Stream and its tributaries. Several additional stream crossings are scheduled for replacement, and approximately 7.5 miles of mainstem channel and instream habitat are slated for restoration. Another Section 319 grant awarded in 2010 will continue with measures to restore fish habitat by replacing additional non-functioning stream crossings.



Connecticut River
Watershed

Nash Stream
Restoration

Trout Unlimited

2004/2007
Restoration

Grant Amount:
\$119,000

Local Match:
\$78,400



Slide Brook pre-restoration culvert.



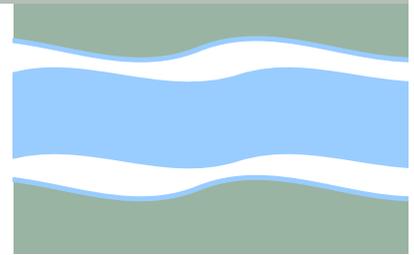
Slide Brook post-restoration.

Stream Restoration at Lower Mohawk River and Colebrook Industrial Park

The lower Mohawk River has a watershed area of 56 square miles and flows through the town of Colebrook before reaching the Connecticut River. The lower Mohawk River was straightened in the 1960s in the hope of reducing ice jams that periodically flooded downtown Colebrook. The straightening resulted in the abandonment of meanders on the Mohawk River, impairing aquatic habitat and increased sediment delivery to the Connecticut River, resulting in the creation of gravel bars downstream. Flow diversion around the gravel bars has led to severe bank erosion at the Colebrook Business Park where two buildings are close to the river's edge.

The Section 319 project objectives were to improve aquatic habitat in the Lower Mohawk River and to stabilize the severely eroding riverbank at the Colebrook Business Park by eliminating the source of the erosive pressure and by installing a protective barrier of engineered log jams along the Business Park riverbank. Given funding limitations, only a portion of the project objective was met. The project was able to help eliminate the source of erosive pressure at the Colebrook Business Park by constructing log jams on the lower Mohawk River and diverting flow into previously abandoned side channels. The stabilization of the eroding bank at the Colebrook Business Park proved too expensive and was not completed as part of this project.

Restoration activities on the lower Mohawk River included three distinct phases: 1) excavation of a cutoff channel between the active channel and abandoned meanders; 2) construction of two log jams near the cutoff channel; and 3) addition of individual logs downstream



Connecticut River Watershed

Stream Restoration at Lower Mohawk River and Colebrook Industrial Park

Connecticut River Joint Commission

2003/2007/2009 Restoration

Grant Amount: \$111,069

Local Match: \$74,111

TSS Reduction: 453 tons/yr



Lower Mohawk River after restoration with log jams in place.

of log jams. With implementation complete, floodwaters are slightly elevated upstream of the log jams, diverting a portion of the flows into the cutoff channel. By spreading the flows out into at least two flow paths, the sediment carrying capacity has been reduced with gravel deposition occurring in both the reactivated meanders and the still active straightened channel. This has resulted in a reduction of sediment delivery to the Connecticut River and alleviated some of the erosion at the Colebrook Business Park downstream of the Mohawk River confluence where large gravel bars were diverting flow into the river bank.

The restoration work has restored flow to former meanders on the Lower Mohawk that were abandoned during channel straightening in the 1960s. Prior to restoration, the artificially straightened channel was unsuitable for aquatic habitat. The channel was wide and shallow with shallow pool depths, little substrate particle size segregation, and no lateral velocity variability. Restoration has improved aquatic habitat by introducing structure in the form of wood. Flow separation around the exposed root wads of the individually installed logs is generating lateral velocity variability important for physical habitat development. Pools have been scoured around the root wads and some gravel and sand segregation and deposition is occurring in the velocity shadows directly downstream of the root wads. Flow constriction between the two log jams has scoured and sustained a deep pool where little pool depth was present prior to restoration. In addition to the primary goal of reducing sediment supplies to the Connecticut River from the Lower Mohawk River, the introduction of large wood installations has improved fish habitat and created spawning areas for cold water species of fish.

In summary, the lower Mohawk River restoration project improved aquatic habitat by increasing stream flow complexity, pool depths, and particle size segregation and helped to alleviate erosion problems along the Connecticut River by capturing sediment in reactivated meanders. It is an excellent demonstration project to show how multiple environmental goals can be achieved over an extended area with just a single project.

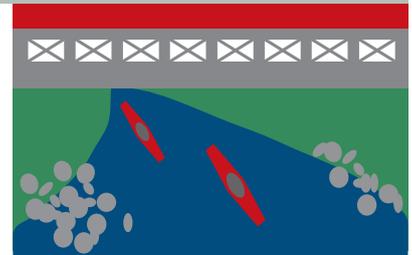
Ossipee Watershed Water Quality Initiative and Ossipee Watershed Plan-Alternative Analysis

The Ossipee Lake watershed encompasses more than 242,000 acres, and is the home of the largest stratified drift aquifer in New Hampshire. The watershed has significant natural and recreational resources which drive the local tourism-based economy. Although the Ossipee watershed includes some of New Hampshire's most rural areas, recent years have seen an increasing population growth along with increased pressure on natural resources. In order to preserve the precious water resources of this area, the Green Mountain Conservation Group (GMCG), has been diligently working on water resource protection in the watershed for approximately ten-years.

Although trend analyses indicate that while water quality is currently good for most of the watershed's surface waters, there are indications of elevated phosphorus concentrations in some locations, and decreasing lake clarity. Increased nutrient and road salt loading associated with shoreline development and roadway maintenance are thought to be among the greatest threats to water quality in the region. Currently, most municipalities in the watershed have minimal regulations or planning in place to guide resource protection and responsible development.

In 2009 a Section 319 project introduced the need for, and concept of, watershed based planning to stakeholders, setting the stage for future plan development. The 2009 project built upon GMCG's on-going activities, and took necessary steps toward developing a watershed based management plan and protecting water resources in the Ossipee Lake watershed in several important ways:

- The project introduced the topic of watershed based planning to the stakeholders by developing and implementing outreach activities in the watershed through presentation of outreach materials in various different media and forums including printed materials, community workgroups, and presentations to municipal officials.
- The GMCG completed the development and delivery of "report cards" to provide guidance to municipalities regarding their zoning regulations. The report cards clearly and quickly show the watershed municipalities what land protections currently exist, and outline vulnerabilities from unplanned and unregulated development in their town. The report cards include information to show municipal officials how their town's regulatory situation compares to other towns in the watershed.
- A Best Management Practice Master Plan was developed to begin assessing potential BMP sites. The BMP Master Plan provides local stakeholders with an introduction to a variety of BMPs that are likely to be implemented in the watershed in the future. It also forms the



Saco River
Watershed

Ossipee Watershed
Water Quality
Initiative and
Ossipee Watershed
Plan-Alternative
Analysis

Green Mountain
Conservation Group
2009 Base

Grant Amount:
\$35,000

Local Match:
\$131,290

TSS Reduction:
27.1 tons/yr

Phosphorus
Reduction: 23 lbs/yr

Nitrogen Reduction:
46 lbs/yr

2011 Base

Grant Amount:
\$15,000

Local Match:
\$14,999

basis for further work to use the identified general problem areas to create a prioritized list of specific structural and non-structural BMPs which could be implemented in the future.

- GMCG also implemented demonstration BMPs at three sites to serve as examples of the methodology which may be used for final selection and implementation of BMPs in the watershed. The selected projects were implemented primarily through volunteer efforts, and donated professional services and supplies. The BMPs included: a rain garden and grading improvements at a children's summer camp; a shoreline stabilization project at a lakefront residence; and, installation of water bars, rain gardens, and infiltration steps at Ossipee's Town beach on Duncan Lake.



Ossipee Lake photo: Green Mountain Conservation Group.

Due to the watershed's large size and hydrologic complexity, a phased approach to developing a Watershed-based Management Plan is being pursued. To determine how best to approach such a plan and achieve success, the 2011 project entailed GMCG contracting with an experienced professional environmental consultant to develop a phasing and alternatives analysis to provide GMCG with a plan of action. The project outcomes included completing base level data gathering and processing that can be

used in future phases of the project. The results identified missing water quality information that will be necessary for designing and costing mitigation measures to reduce loading. Additionally, spatial analysis identified the more problematic sub-watersheds and determined that more detailed land use data will be important to improve understanding of each subwatershed's potential impact on total phosphorus loading. Ultimately, review and consideration of the project's work products led to the conclusion that the best approach is to complete an a – i watershed based plan for each subwatershed, and to subsequently complete baseline watershed loading and internal response models for the entire watershed to the extent practicable. The loading and response models may need to be refined as subwatershed planning progresses, but this should give stakeholders an initial idea of how each subwatershed contributes to overall in-lake water quality.

GMCG has been selected to receive another EPA Section 319 grant in 2013 to continue the watershed management plan development for the Ossipee Lake Watershed. The 2013 project will begin gathering data on sediments and tributaries that were identified as lacking complete loading and response modeling for the watershed, and will complete all nine elements of a watershed based plan for the high-priority subwatersheds of Danforth Pond and Ossipee Lake lower basins.

Looking Ahead

In 2013, we expect to complete a draft of the first revision of the state's Nonpoint Source Management Plan in almost 15 years. A lot has changed since the creation of the 1999 plan – the first stormwater permits were issued to municipalities, the term “green infrastructure” became commonplace, and nonpoint source-impaired water bodies were restored. Yet, many of the same issues remain.

The updated plan needs to address nutrients released by septic systems, lot-scale stormwater BMPs, and a systematic approach to developing and implementing watershed-based plans. The plan will have to make choices about what is most important in New Hampshire so that the greatest environmental benefit can accrue from limited available funding. The planning horizon is only five years, so it will take an incremental approach to water quality problems, breaking off smaller pieces that will make significant progress toward longer-term goals. Under EPA's draft 319 guidelines, annual 319 funding to states will be tied to specific milestones in the state Nonpoint Source Management plan with progress being reported annually.

Two significant bills have been proposed to the 2013 New Hampshire Legislature to address nonpoint source impairments – chloride impairments in the I-93 watersheds and the nitrogen impairment in the Great Bay estuary. A salt applicator certification bill is on the docket, which would provide limited liability for certified applicators who follow best management practices and a bill sponsored by a seacoast representative would require limits on the amount of nitrogen and phosphorus sold in retail lawn fertilizer.

Also in 2013, we expect to break ground on the first homeowner-scale BMPs to be implemented under the Soak up the Rain New Hampshire program. We hope to learn from these installations to build toward a statewide program that eventually helps to make lot-scale BMPs a standard practice rather than a curiosity for the homeowner.

Appendix A

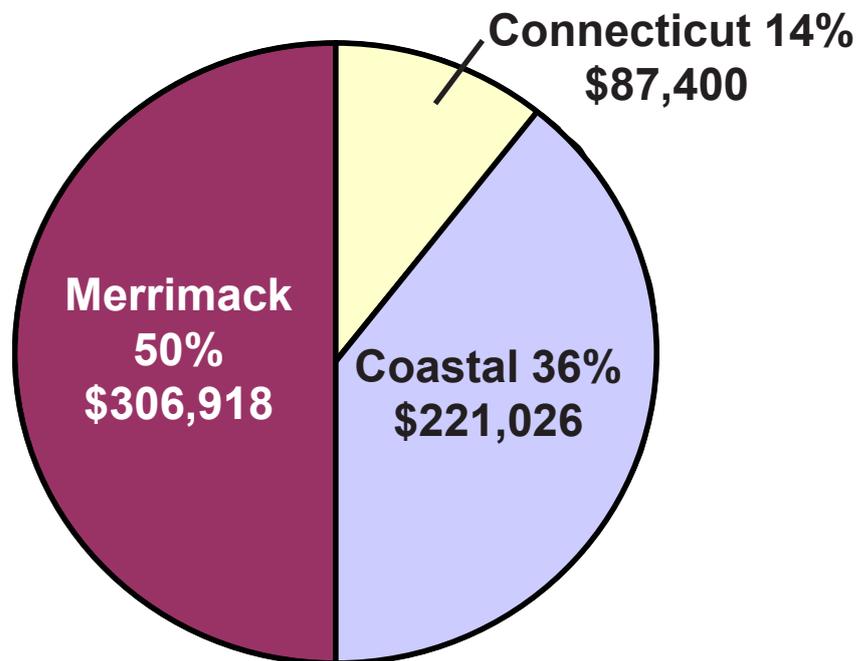
DES Section 319 Watershed Assistance Grants for High Quality Waters Awarded in FFY 2012						
Grantee	Project Name	Project No.	NPS Pollutant Category	Watershed	Source of Funds (FFY)	Grant Award
Acton Wakefield Watershed Alliance	Salmon Falls Headwaters Watershed Based Plan Implementation - Phase 2	B-12-C-01	Urban Run-off/Stormwater	Coastal	2012 Base	\$87,026
Newfound Lake Region Association	Newfound Watershed Management Plan Implementation - Phase 2	B-12-M-02	All Sources	Merrimack	2009/2010/2012 Base	\$64,698
			Total Award:			\$151,724

Appendix B

DES Section 319 Watershed Restoration Grants for Impaired Waters Awarded in FFY 2012						
Grantee	Project Name	Project No.	NPS Pollutant Category	Watershed	Source of Funds (FFY)	Grant Award
UNH Stormwater Center	Great Bay Municipal Bioretention Program	R-12-C-05	Urban Runoff/Stormwater	Coastal	2012 Base	\$134,000
Town of Alstead	Lower Warren Brook Restoration	R-08-CT-05	Hydromodification	Connecticut	2008 Incremental	\$87,400
Mirror Lake Protective Association	Mirror Lake Watershed Stormwater Improvement Project Implementation	R-12-M-04	Urban Runoff/Stormwater	Merrimack	2009/2010/2011 Incremental	\$68,220
City of Manchester	Nutt Pond Watershed Restoration Plan Implementation - Phase 2	R-11-M-03	Urban Runoff/Stormwater	Merrimack	2011 Incremental	\$174,000
			Total Awarded:			\$463,620

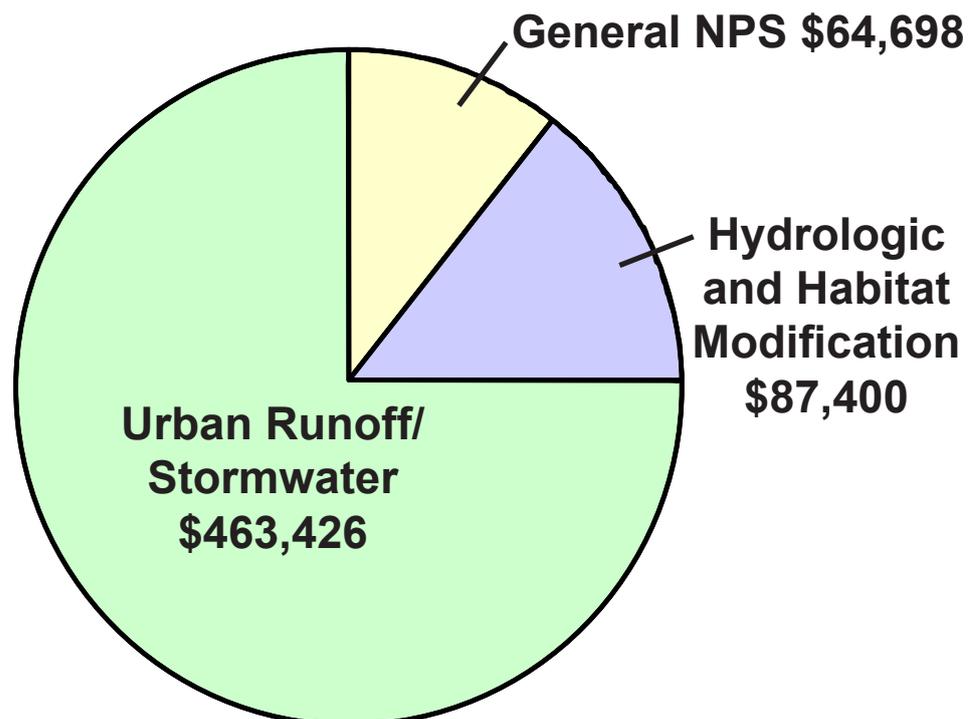
Appendix C

**Distribution of Section 319 Grant Dollars
Awarded in FFY 2012 by Watershed**



Appendix D

**Distribution of Section 319 Grant Dollars
Awarded in FFY 2012 by NPS Category**



Appendix E and F

DES Section 319 Base Projects Completed in FFY 2012							
Grantee	Project Name	FFY Source of Funds	Grant #	Date Completed	Watershed	319 Funds	Total Cost
City of Dover	Dover Stormwater Utility Feasibility Study	2009	B-09-C-04	11/30/2011	Coastal	\$27,500	\$84,150
Granite Lake Association, Inc	Granite Lake Watershed Management Plan	2008	B-08-M-05	12/5/11	Merrimack	\$50,000	\$83,355
City of Manchester	Manchester Stormwater Utility Feasibility Study	2009	B-09-M-05	11/28/2011	Merrimack	\$27,500	\$30,770
City of Nashua	Nashua Stormwater Utility Feasibility Study	2009	B-09-M-06	2/21/2012	Merrimack	\$26,500	\$54,337
Green Mountain Conservation Group	Ossipee Watershed Plan-Alternatives Analysis	2011	B-11-S-01	1/9/2012	Saco	\$15,000	\$29,999
Connecticut River Joint Commission	Assessment of Ammonoosuc River and Floodplain Conservation	2009	B-09-CT-03	1/20/2012	Conn.	\$123,890	\$208,885
City of Portsmouth	Portsmouth Stormwater Feasibility Study	2009	B-09-C-03	5/14/2012	Coastal	\$27,500	\$62,531
Green Mountain Conservation Group	Ossipee Watershed Water Quality Initiative	2009	B-09-S-01	12/9/2011	Saco	\$35,000	\$166,290
					Total	\$332,890	\$720,317

DES Section 319 Restoration Projects Completed in FFY 2012							
Grantee	Project Name	FFY Source of Funds	Grant #	Date Completed	Watershed	319 Funds	Total Cost
City of Dover	Berry Brook Watershed Phase I Implementation	2006	R-06-C-10	11/1/2011	Coastal	\$55,000	\$96,791
Cocheco River Watershed Coalition	LID in the Willow Brook Watershed	2005/2009	R-09-C-05	3/15/2012	Coastal	\$84,912	\$141,548
Trout Unlimited	Nash Stream Restoration	2004/2007	R-06-CT-05	1/15/2012	Conn.	\$119,500	\$197,400
Pennichuck Water Works	Tinker Road BMP	2004/2007/2008	R-08-M-04	12/31/2011	Merrimack	\$210,780	\$490,939
Blue Ocean Society for Marine Conservation	Tracking and Reducing Pet Waste in Seacoast Towns	2005/2008	R-05-C-14	2/9/2012	Coastal	\$48,595	\$82,684
Connecticut River Joint Commission	Stream Restoration at Lower Mohawk River and Colebrook Industrial Park	2003/2007/2009	R-07-CT-01	1/20/2012	Conn.	\$111,069	\$185,180
City of Franklin	Webster Lake Community Septic System Design	2009	R-09-M-03	6/8/2012 (Incomplete)	Merrimack	\$15,261	\$59,725
					Total	\$645,117	\$1,254,267

Appendix G

2012 Estimated Pollutant Load Reductions Achieved										
Grantee	Project Name	FFY Source of Funds	319 Funds	Total Cost	P (lbs/yr)	N (lbs/yr)	Sediment (tons/yr)	Other	Model/Method	Notes
Cobbetts Pond Improvement Association	Cobbetts Pond - Watershed Restoration Plan Implementation Phase 2: Fossa Road BMPs	2006,2007 and 2010 Restoration	\$100,000	\$173,000	n/a	1.2	0.24	Simple Method		project still in progress
Acton Wakefield Watersheds Alliance	Salmon Falls Headwaters Watershed - Watershed Based Plan Implementation Project - Phase 2	2012 Base	\$87,026	\$58,600	n/a	75.3	44.54	Region 5 and Simple	Project still in progress	project still in progress
Newfound Lake Region Association	Newfound Lake Watershed Master Plan Implementation Phase 1	2008 and 2010 Base	\$127,960	\$154,700	9.91	2.73	0.46	Region 5 Model		
Blue Ocean Society for Marine Conservation	Watershed Restoration Plan for Hodgson Brook Phase 2 - Pease Tradeport Retrofit Survey and Panaway Manor and Great Bay Community College Best Management Practices	2009 and 2010 Restoration	\$104,574	\$69,751	5.9	0.4	0.049	Simple Method	Project still in progress	Also 43.9 lbs/yr BOD, 0.26 lbs/yr lead, and 0.54 lbs/yr zinc
Cocheco River Watershed Coalition	Cocheco River Watershed Restoration Plan Implementation Phase 2: Rochester LID	2011 Restoration	\$52,500	\$35,017	0.4	0	0.002	Simple Method	Project still in progress	
Town of Brentwood	Middle Exeter River Watershed Management Plan Implementation Phase 1: Rowell Road West	2010 Restoration	\$49,152	\$35,542	45.62	11.2	8.67	Region 5 Model	Project still in progress	
City of Dover	Berry Brook Watershed Restoration Plan Implementation Phase 2: LID Retrofits in an Urban Environment	2007, 2008, 2009, & 2011 Restoration	\$172,315	\$114,935	266.2	35.9	4.7	Simple Method	Project still in progress	project still in progress
Town of Sanbornton	Lake Winnisquam Watershed Management Plan Development: Phase 1, Black Brook	2010 Base	\$25,000	\$17,365	n/a	1.2	n/a	Simple Method		
				Totals:	328.03	127.93	58.661			