

Nonpoint Source Management Annual Report 2008



April 2009



Nonpoint Source Management Annual Report 2008

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

April 2009



Table of Contents

Introduction	1
Investigations.....	1
Education and Outreach	2
Agricultural Nutrient Management Grant Program.....	4
Highlights and Overview of Completed Projects.....	4
Coastal Watershed	4
Connecticut River Watershed	6
Merrimack River Watershed	10
Saco River Watershed.....	14
Looking Ahead.....	15
Appendices	16
A. Section 319 NPS Local Initiative Grants Awarded in FFY 2008.....	16
B. Section 319 Watershed Restoration Grants Awarded in FFY 2008.....	16
C. Distribution of Section 319 Grant Dollars Awarded in 2008 by Watershed.....	17
D. Distribution of Section 319 Grant Dollars Awarded in 2008 by NPS Category.....	17
E. Estimated Pollutant Load Reductions Achieved.....	18

Introduction

This annual report describes the results of many projects initiated by DES and our local partners and funded with Section 319 Nonpoint Source Program funding from the U.S. Environmental Protection Agency.

It remains a long-term goal to restore impaired water bodies and several projects described in this report aim to address water quality problems by tackling the land-based problems associated with them. It is a rigorous approach that uses quantitative methods to tie actions directly to water quality improvements, which is not an easy task. A great deal of analysis is needed to develop a watershed-based plan, several of which were completed during 2008. For links to completed watershed-based plans, please see our web site at http://des.nh.gov/organization/divisions/water/wmb/was/watershed_based_plans.htm.

The watershed-based plan approach is not only a sound one for addressing impaired waters; it can work in high quality waters as well. In 2007, we began working with the Newfound Lake Region Association to develop a watershed-based plan to help protect and maintain the quality of the third largest lake in New Hampshire. This year we began three new watershed-based planning processes for high quality waters: Lake Winnepesaukee, Granite Lake and the headwaters of the Salmon Falls River (Acton Wakefield Watershed Alliance).

In addition to project activities, 2008 brought great advancement in dealing with stormwater in New Hampshire. A new law passed the state legislature granting municipalities the authority to form stormwater utilities. The law was a result of the efforts of the bill's sponsor, Rep. Tom Fargo, Dover, and of the growing recognition that stormwater is an often neglected component of essential infrastructure. The legislature also created a stormwater commission to study stormwater issues and make recommendations for legislative changes. To assist developers and local governments, DES is drafting an updated state stormwater manual, which will be available in hard copy and on our web-site in the beginning of fiscal year 2009.

Investigations

DES began implementing pollution source investigations in the coastal watershed in 1996. At that time, the top priority water quality issue in the watershed was related to bacterial sources, which were frequently causing the closure of shellfish beds. Years later DES continues to find and investigate not only the old and forgotten illicit discharges but new sources which are discovered either by incorrect plumbing, infrastructure failure or intentional discharging. Focus has also shifted from initial investigations to technical and informational support for local groups and municipalities. This assistance helps local entities implement and sustain their own watershed pollution source investigations by supplying them with training and in field experience. In 2008 investigations helped locate 20 sources linked to sewer discharge and/or infrastructure failure in seven different towns and cities. Nine of these sources were

disconnected along with four sources identified and scheduled for disconnect in 2009. A summary of the 2008 field investigations is provided below.

Summary of Illicit Discharge Investigations and Detection 2008

Town/City	Samples Collected	Samples E.coli >406cts/100ml	Sources Identified	Sources under Investigation or Scheduled for Disconnect	Sources Eliminated
Dover	62	37	5	3	3
Epping	7	4	3	2	1
Exeter	5	1	0	0	0
Greenland	7	4	1	1	0
Hampton	6	1	0	0	0
Keene	6	5	2	2	0
Newcastle	2	1	0	1	0
Newmarket	2	0	0	0	0
Portsmouth	17	5	6	2	4
Rochester	4	4	1	1	0
Rye	3	2	0	0	0
Somersworth	31	13	2	2	1
Total	152	77	20	14	9

Education and Outreach

Ongoing Projects

GreenWorks

Ongoing projects included the distribution of *GreenWorks* – DES’s ideas for a cleaner environment news column. The column has become one of the most requested and read publications on DES’s e-mail distribution list. Sought after topics in 2008 included: “We’re in Hot Water,” “Have a Very Green Holiday,” “Composting Fall Leaves for a Healthier Lawn and Garden,” and “A Healthy Lawn and Garden Makes for a Healthy Watershed.” These articles and others can be found at: <http://des.nh.gov/organization/commissioner/pip/newsletters/greenworks/index.htm>.

I-93 Road Salt

DES and the “Salt Reduction Workgroup” continued to move forward implementing a plan on how to provide support for the five municipalities in the chloride impaired watersheds within the I-93 corridor. Following presentations at select-board meetings, decision makers were given resolutions to sign formalizing their commitment to try to reduce salt loading in the impaired watersheds and to put together a plan of how that commitment will be met.

Stormwater

Outreach work with the New Hampshire regional stormwater coalitions continued to pay dividends in FY 2008 as municipal DPW staff have increased their capacity to work on stormwater planning and related issues. DES staff continued to coordinate New Hampshire Estuaries Project grant funds for illicit discharge detection and elimination and good housekeeping training for municipal DPW staff and

supervisors. Working with the coalitions has provided many opportunities to network with grant funding, watershed planning, innovative land use planning and implementation, data collection, and technology transfer related to stormwater.

A Few New Efforts

Road Salt Demonstration Project

Work with the Salt Reduction Workgroup identified that parking lots were a major contributor to chloride in the watersheds (in some cases over 50 percent) and that the barriers to reducing salt use in parking lots include liability concerns, lack of training and proper equipment, staff turnover, and user expectations, to name just a few. To identify ways to get past some of these barriers, DES is working with the departments of Transportation and Administrative Services on a “Green Parking Lot” pilot project at DES, 29 Hazen Drive, Concord. The goal of the project is to reduce impacts to a nearby waterbody about to be listed as impaired for chloride without compromising safety and to apply the lessons learned to other parking lots.



Salt residual near storm drain, DES Parking Lot.

Community-based Social Marketing

In order to explore how DES can use community-based social marketing (CBSM) as an outreach tool, a presentation was held for in-house staff. Following this, a special DES committee of interested staff was formed. The committee is working on incorporating CBSM research and planning techniques into DES outreach efforts as well as grant funded projects. Section 319 grantees and their consultants are encouraged to incorporate CBSM techniques into the outreach component of their projects.

Innovative Land Use

The Watershed Assistance Section took the lead in working with the Regional Planning Commissions to create and promote the “Innovative Land Use Planning Techniques: A Handbook for Sustainable Development.” The handbook provides comprehensive sound technical advice about innovative land use techniques, including model ordinances and regulations to “preserve rural character, thriving downtowns, and a sustainable working landscape.” One of the three sections is devoted to “Environmental Characteristics Zoning” and includes eight ordinances related to protecting water quality.



One 319 Project Expands Outreach Across the Coastal Watershed

As a result of a Section FFY 2004 319 Watershed Assistance Project “Protecting Water Resources in New Hampshire’s Coastal Communities.” (see 2007 Nonpoint Source Management Annual Report) The NH Natural Resource Outreach Coalition (NROC) was able to present their curriculum and outreach ap-

proach to other communities, which in turn took their new knowledge and skills back to the local level. Three of the NROC participating municipalities created water quality related groups to follow-up on water quality and growth related issues identified through the training. Milton formed a *Water Resources Group* that coordinated a town-wide presentation to inform over 70 residents about local water quality and quantity issues and to solicit public involvement in implementing a water resources chapter in the town's master plan; Hampton formed an *Innovative Land Use Group* to incorporate low impact development (LID) into their town regulations and to educate town decision makers and developers on LID practices; and, Dover created a *Stormwater Outreach Group* to incorporate LID into local regulations and explore creating a stormwater utility.



Dover NROC Stormwater Outreach Group planning presentation. (Julia Peterson, NH Sea Grant)

Agricultural Nutrient Grant Management Program

Although Section 319 monies were not used to fund projects in 2008, the New Hampshire Department of Agriculture, Markets & Foods (NHDAMF) Agricultural Nutrient Management (ANM) grant program did provide close to \$35,000 to local farmers for BMP projects to help control NPS pollution at 13 sites.

The seven-year ANM program has been well received by the state's agricultural community. The grants and the results have been publicized by a variety of outreach tools including workshops, newsletters and web pages of NHDAMF, DES, the New Hampshire Farm Bureau, USDA NRCS, UNH Cooperative Extension and other organizations. In addition, NHDAMF staff have participated in workshops and training sessions with farm groups to advertise the program.

The ANM program has been an effective and efficient vehicle for assisting farm owners with environmentally sound nutrient management practices that help protect New Hampshire's water resources. The future of this program is unknown due to state budget constraints. However, should it be continued, it is hoped that Section 319 monies will be available to support it.

Highlights and Overview of Completed Projects

Coastal Watershed

Bartlett Street Stormwater Treatment, City of Portsmouth (2004 Base)

Grant Amount: \$25,000 Local Match: \$86,178

As part of a larger sewer and stormwater separation program, this 319 project was awarded to install a stormwater treatment device to treat stormwater discharging to North Mill Pond in the city of Portsmouth. Unfortunately, despite a one year extension, the City was unable to complete the installation of this system. The grant ended up paying for the design and review of treatment options for systems which the city plans on constructing at a later date.

Acton Wakefield Watershed Alliance (AWWA) Youth Conservation Corps, AWWA (2006 Base)

Grant Amount: \$66,041 Local Match: \$113,820

Sediment Load Reduction: 18.4 tons/year

Phosphorus Reduction: 21.8 lbs/year

This project established the AWWA Youth Conservation Corps to remediate shoreline erosion problems on private and publicly owned properties on eight lakes in the towns of Wakefield, N.H. and Acton, Maine. At the completion of the project in December of 2007 the AWWA YCC had installed BMPs at 30 sites and provided technical assistance to an additional 60 landowners. The BMPs included rain gardens, relocating lake access paths, water bars, infiltration trenches and vegetated buffers. In addition, presentations were made to community members to increase their knowledge of water resources and to encourage better stewardship within the watershed.



Before and after infiltration trench installed along driveway, Balch Pond, East Wakefield. (Photo courtesy of AWWA)

Hodgson Brook Watershed Restoration Plan Implementation, Blue Ocean Society (2003 Restoration)

Grant Amount: \$72,546 Local Match: \$67,677

Hodgson Brook is a small freshwater stream that flows through Portsmouth into North Mill Pond, which empties into the Piscataqua River. Development and increased urbanization have caused significant physical, chemical and biological degradation to the brook, ultimately resulting in it being the primary source of pollutants, including fecal coliform and nutrients to North Mill Pond. The purpose of this project was to create the organizational structure to manage the restoration plan for the brook. With a newly hired watershed coordinator and support of the DES Volunteer River Assessment Program, a water quality monitoring plan was developed. Thanks to these efforts, regular monitoring of the watershed is occurring, which includes measurements for E.Coli, chlorides and flow. Results will assist stakeholders in locating and remediating pollution sources. During the project period, one sewer leak was detected and remediated. Other accomplishments included education of conservation commission and planning board members on low impact development techniques, stenciling of 195 storm drains and organized river clean-up events.



Restoration sign for Hodgson Brook.

Stuart Farm BMP Installation, Stuart Farm LLC (2003 Restoration)

Grant Amount: \$6,112

Local Match: \$4,439

Stuart Farm in Stratham is a 270 acre dairy farm. In the late 1980s, an earthen manure storage facility with a wooden picket dam was constructed to provide temporary storage of the manure and bedding generated. The pit leachate and wash water from the milking parlor were directed into a concrete settling basin and constructed wetland cell to provide containment of the solids and organic treatment



Stuart Farm Wetland Treatment Cell.

of the nutrients and pathogens. When the system was initially constructed in the early 1990s, it was proposed that a series of wetland cells be created to provide optimum treatment of the waste water before it enters the adjacent Squamscott River (a main tributary of the Great Bay Estuary). This project was designed to dredge the existing wetland cell of accumulated solids and to construct a second wetland cell to increase the detention storage time of the leachate and increase the efficiency of the biological treatment system. In addition, to eliminate erosion at the manure storage facility, concrete was to be installed and stormwater redirected to the wetland treatment area.

The project was modified due to changes in farm management and use. The wetland cells were dredged and constructed. However, instead of the manure storage area improvements, the farm worked with DES and the Natural Resources Conservation Service to reduce runoff from a silage storage area. Previously, silage was allowed to run off the site into a nearby waterbody. Through this grant, the farm constructed a berm around the silage area, which directed runoff into a drainage system leading to an existing bioretention area.

Connecticut River Watershed

Silver Lake Stormwater Management, Silver Lake Land Trust (2005 Base)

Grant Amount: \$70,000 Local Match: \$55,018
Sediment Load Reduction: 13.3 tons/year
Phosphorus Reduction: 7.6 lbs/year

Silver Lake is a 330-acre lake in southwestern New Hampshire located in the Towns of Harrisville and Nelson. There are approximately 135 cottages, camps and full-time residences located on its shores. Although Silver Lake is still rated as oligotrophic, its water quality has deteriorated over the years, with water clarity diminishing and phosphorous content increasing.

Upon request of the Silver Lake Association and the Silver Lake Land Trust, DES completed a lake diagnostic study in 2001. The study concluded that uncontrolled stormwater runoff – particularly from the dirt roads on the eastern side of the lake – was a contributor of pollution and septic systems located near the shore of the lake presented a threat to water quality.

The purpose of this project was to help control erosion and NPS pollution entering the lake through improved stormwater controls and to address the septic system management practices near the lake. The project team initiated its efforts on stormwater runoff by defining the problem more specifically than had been done previously. By means of direct observation and analysis of stormwater runoff, it identified 13 major sources of pollution along the east side of the lake. Using an engineering contractor, BMPs



Silver Lake Culvert Outlet.

were designed and stormwater controls installed at various problem sites. These included channel stabilization measures, stormwater trenches, culvert inlet/outlet protection, and culvert headwalls.

A survey was conducted of septic systems that might be contributing to pollution of the lake. Although there was no evidence that septic systems were currently having a harmful effect on water quality, a septic system management plan was developed to ensure that septic systems will not pose problems for the lake in the future.

During the course of the project the land trust, along with the lake association held more than a dozen meetings to inform property owners and town officials of project issues, design decisions to be made, and to report progress on the project. Several publications and other communications covering various aspects of the project were disseminated.

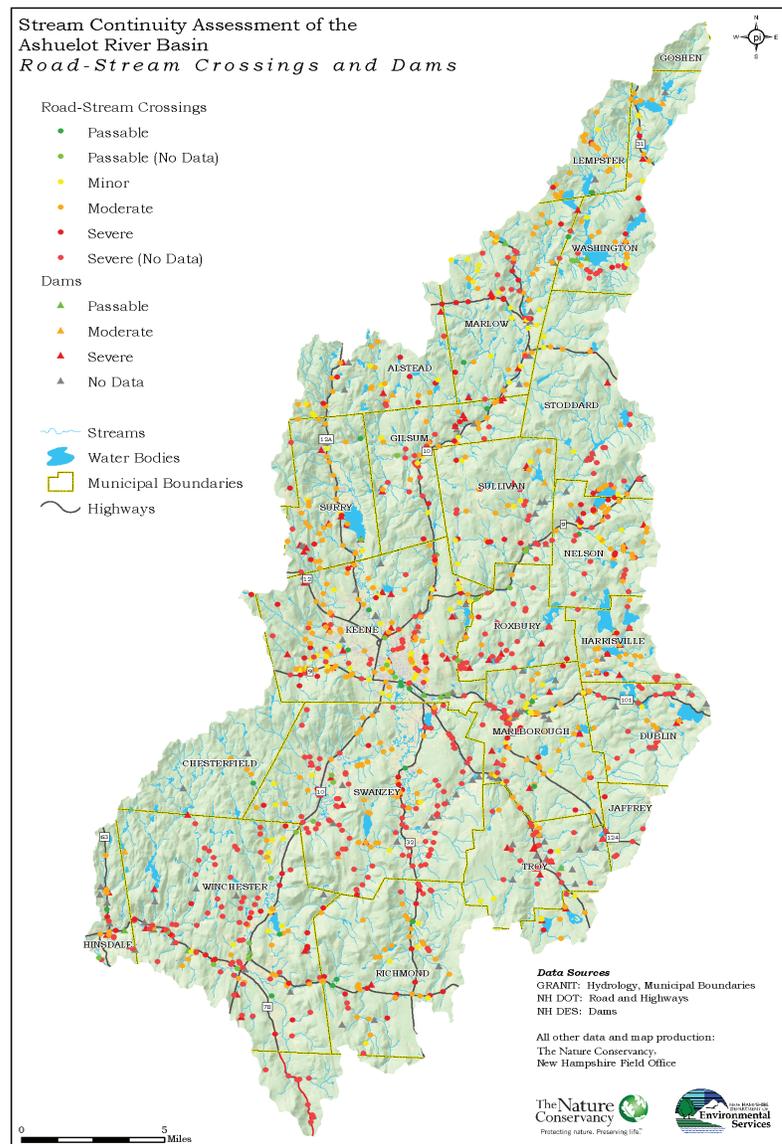
Ashuelot River Continuity Assessment, The Nature Conservancy (2005 Base)

Grant Amount: \$19,600 Local Match: \$13,079

A designated river under the New Hampshire Rivers Management and Protection Program, this study assessed dams and road-stream crossings of the 420 square mile Ashuelot River Watershed. The goal was to identify and map those areas presenting a barrier to aquatic life and to prioritize locations for restoration efforts.

Using a team of volunteers, 663 crossings and 128 dams were assessed for fragmentation effects on aquatic life. Of these, 247 were identified as severe barriers, 374 as moderate and 132 as minor barriers. In addition, GIS analysis evaluated landcover quality and crossing density in addition to other parameters within 12 sub-basins to further help inform the identification of restoration priorities.

The results of this study will be shared with local stakeholders. The next step will be to develop restoration plans what will provide steps to improve or replace severe road-crossing barriers.



Connecticut River Bank Stabilization and Assessment, CRJC (2004 Restoration)

Grant Amount: \$41,631 Local Match: \$46,649

The Connecticut River Joint Commission (CRJC) has been working since 1989 to control riverbank erosion on the Connecticut River. This project focused on two locations – the Colebrook Business Park at the confluence with the Mohawk River and the Northumberland Cemetery between the Upper Ammonoosuc River Confluence and the Old Wyoming Dam.

Using the results of a 2004 fluvial geomorphology assessment the CRJC created erosion hazard maps for 16 towns along the northern Connecticut River. The maps show the location of eroding banks and also note the causes, if known, of the erosion. In addition, an erosion control brochure was created which addresses the three primary erosion causes; channel straightening, sediment input from tributaries and sediment input from high eroding banks. For each cause, management strategies are provided that address each underlying cause as well as presenting immediate short term solutions such as bank armoring.



Bank Erosion at the Colebrook Business Park.

At the Colebrook Business Park, bioengineering plans were developed, a conservation easement obtained and the appropriate permits granted. Bioengineering construction was completed in June 2006 and riparian buffer plantings were installed in the fall. Post monitoring surveys were conducted by the CRJC and Field Geological Services for two years. Terrain mapping surveys have revealed that lateral erosion has been substantially diminished at this location as a result of the log jam installation. The small amount of erosion that continues to occur can be attributed to the adjacent, untreated reach of river bank. As that length of river bank continues

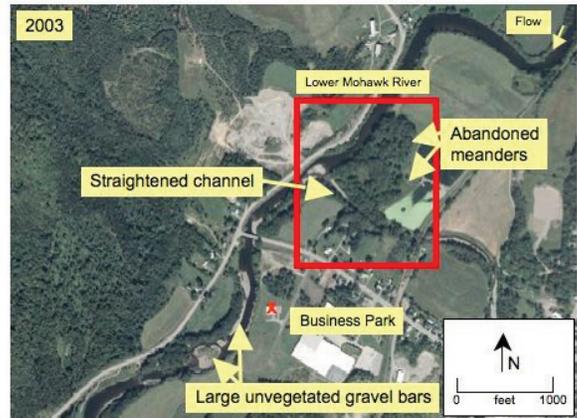
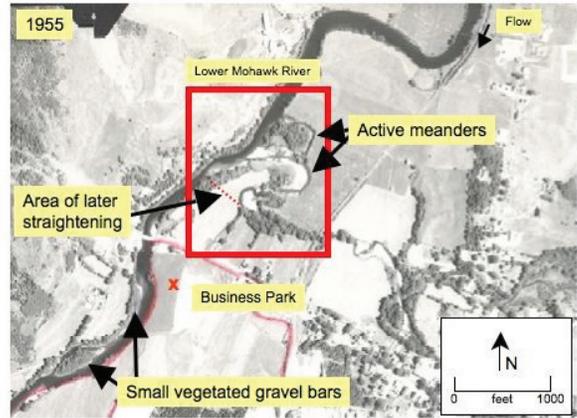
to erode laterally, high flows are penetrating behind the engineered log jam causing erosion. The CRJC is actively seeking additional funding to stabilize the untreated reach of river bank at this site.

At the Northumberland Cemetery, an assessment was conducted in a 3.4 mile reach downstream of the Upper Ammonoosuc River confluence. Potential management solutions were developed and presented at a public meeting. The preferred option was the construction of an engineered log jam in conjunction with revegetation of the upper slopes of the river bank. Additional funding will be needed to detail the engineering design of this restoration effort and to generate construction-ready plans. The CRJC continues to work with Field Geology Services, representatives from the town of Northumberland, and DES personnel on funding strategies that will result in a construction-ready restoration project. Most recently, the CRJC initiated the process for applying to FEMA for hazard mitigation funding. The Northumberland Cemetery will continue to be at risk of losing burial plots if this site is not stabilized in a manner that will provide long term stability without causing instabilities to adjacent reaches of the Connecticut River. It has been estimated that a total project cost to design, permit, and construct a bioengineered solution at this site will approach \$1 million. A variety of funding sources will need to be secured if this next phase of restoration is to be successful.

Lower Mohawk River Restoration Plan, Connecticut River Joint Commission (2003/2005 Restoration)

Grant Amount: \$30,780 Local Match: \$21,172

In order to control the source of the erosion at the Colebrook Business Park (see above) the excess sediment delivery from the Mohawk River needs to be addressed. The purpose of this project was to determine the feasibility of reopening the side channels, which had been abandoned in the 1960s, near the mouth of the Mohawk River. It had previously been determined that the earlier channel straightening of the Mohawk River had resulted in increased transport of sediment to the Connecticut River main-stem. Using hydraulic modeling this project determined that lowering the bank between the currently active channel and the channels abandoned in the 1960s would successfully spread flow over a wider area, decreasing flow velocities and the amount of sediment transported. In addition to reducing sediment delivery to the Connecticut River this restoration proposal will also increase habitat complexity across the alluvial fan. With this feasibility study completed, the CRJC can now proceed with the development of the detailed engineering plans needed prior to implementation.



Close up of meanders to be restored on lower Mohawk River: a) 1955 – meanders are active with small gravel bars downstream and b) 2003 – straightening of channel in 1960's caused abandonment of meanders and growth of gravel bars downstream

Restoration Plan for Mill Brook Confluence with the Upper Ammonoosuc River, Connecticut River Joint Commission (2005 Restoration)

Grant Amount: \$20,000 Local Match: \$13,585

A previous geomorphic assessment of the Upper Ammonoosuc River identified the alluvial fan on Mill Brook as a priority restoration site. Sediment inputs from Mill Brook in Stark have resulted in flooding and significant erosion on the opposite bank requiring repeated repairs to North Side Road. Five management options were considered for reducing sediment inputs from Mill Brook, limiting erosion of the opposite bank, and reducing flooding upstream on the Upper Ammonoosuc River: do nothing; relocate the road away from the bank; protect the eroding bank using bioengineering techniques; engineer meanders on the straightened segment of lower Mill Brook; and divert flow to side channels on the Mill Brook alluvial fan. It was determined that the last option would provide the most desirable and sustainable solution for reducing erosion and creating habitat for fish and waterfowl. Prior to moving forward with this restoration option, the two landowners who own land on either side of lower Mill Brook want further assurances that the project will succeed without significant increases in flooding and erosion on their properties. It is recommended that hydraulic modeling be



Mill Brook, Stark.

either side of lower Mill Brook want further assurances that the project will succeed without significant increases in flooding and erosion on their properties. It is recommended that hydraulic modeling be

completed for Mill Brook, and that the restoration on the lower Mohawk River (see above) be completed and evaluated prior to moving forward with the next phase of this project.

Merrimack River Watershed

Suncook River Geomorphic Based Restoration Plan, Town of Epsom (2006) Restoration

Grant Amount: \$24,000 Local Match: \$18,933

An extreme rain event occurred on May 15 and 16, 2006 in New Hampshire that resulted in flooding events across the state. One extreme event occurred on the Suncook River, which flows southwest to-



Property Damage as a result of the Suncook River 2007 flood event.

ward the Merrimack River from its headwaters at Crystal Lake in Gilmanton. The high flood waters caused the Suncook River to change course (an event know as an “avulsion”) in the town of Epsom, and abandon nearly two miles of channel. This created approximately one mile of new channel through a gravel pit and adjacent land outside of the documented 100 and 500-year floodplains. Approximately 150,000 cubic yards of sediment were introduced into the Suncook River as a result of the new channel flowing through the gravel pit and adjacent wetlands. Up to five feet of silt and sand were deposited downstream of the avulsion causing sever impacts to municipal, private, and publicly owned properties. The impacts upon biological communities residing within the abandoned river corridor were catastrophic, especially upon one of the largest populations of the state-endangered brook floaters mussels (*Alasmidonta Varicose*) ever recorded in New Hampshire.

As a result of the 2006 avulsion, the Federal Emergency Management Agency made a disaster declaration for the Suncook River corridor within the towns of Epsom, Pembroke and Allenstown. The Suncook River was also added to the list of impaired waters for New Hampshire

based upon hydromodification and severe geomorphic instabilities that threaten aquatic life use support. The town of Epsom reacted to the disaster declaration and impairment listing by entering into this 319 grant agreement in order to complete a geomorphology-based restoration alternatives analysis for the Suncook River. The ultimate goal of the project was to provide sufficient information to all stakeholders to allow for an informed decision as to what course of action should be implemented to restore the Suncook River and to prevent further impacts to private property, ecological resources, and water quality. The town of Epsom entered into a contract for services with Vanasse Hangen Brustlin Inc. (VHB). Prior to field work commencing, the Suncook River experienced another 100-year flood event in April of 2007. A second FEMA disaster declaration was made based upon the severity of flood damages caused by *this* event, which in many cases exceeded those experienced during the 2006 disaster.

A field survey of the river was completed during July and August of 2007. This work included over 30 detailed survey cross-sections in the former and new river channels with additional cross-sections being performed in an undisturbed (reference reach) section of the river further upstream of the avulsion site to provide comparative information. At the same time, additional assessment and analysis were conducted by USGS, FEMA, and the DES Dam Bureau. Information and data from those studies supplemented the work carried out by VHB, lead to the development of a detailed *Geomorphology-based Restoration Alternatives* study for project stakeholders to consider.

On May 28, 2008, a public meeting was convened to present the findings of the *Geomorphology-based Restoration Alternatives*. Key findings presented at the meeting included:

- The Suncook River has been quite stable over the last 50 years.
- An active headcut was initiated by the avulsion and is migrating upstream, threatening infrastructure such as US Route 4.
- Severe degradation has occurred at the avulsion site and the new stream channel is up to 15 feet lower than the old channel bed.
- The new channel is rapidly adjusting laterally and impacting private and public lands.
- The new channel is relatively stable at low flows, but prone to excessive erosion and sedimentation for flows exceeding bankfull.
- Instability will remain in the new channel until the river carves an adequate floodplain through the valley and attains a new equilibrium.
- Downstream of the avulsion, deposition of fine material has raised the river bed such that it is at the same elevation as the surrounding floodplain, creating the risk of a second avulsion and increasing the flood hazard to public safety.

Five restoration alternatives with associated preliminary cost estimates were presented. These alternatives ranged from taking no action to returning the river into the pre-avulsion channel configuration. The VHB project team recommended Restoration “Alternative 3” based upon the long term, maintenance free environment created and the cost-benefit ratio. Restoration “Alternative 3” involves leaving the river channel in its current position but addressing erosion and sedimentation at



Suncook River in Epsom taken April 2008.

strategic locations along the river, as well as shaping the new channel into a stable configuration. The intent of this alternative is to provide self-maintaining channel stability and minimize the production of excess sediment through the new channel.

In July 2008, the Suncook River Restoration Task Force was assembled to consider the restoration alternatives presented in May and to come to a consensus on a preferred restoration option. With representatives from the boards of eelectmen from the towns of Epsom, Allenstown and Pembroke, state senators and representatives, the Governors Office, FEMA, USGS, Congress, Homeland Security, and DES, the task force selected "Alternative 3" as detailed in the *Geomorphology-based Restoration Alternatives* study. A decision was also made to pursue federal and non-federal funding sources in the amount of \$3.8 million for design, engineering and implementation. Personnel from the DES Rivers Management and Protection Program and the Watershed Assistance Section are leading the effort to secure the required funding. To date, a New Hampshire State Conservation Committee grant award has been secured as well as in-kind match commitments from NHDOT. It is anticipated that the bulk of the \$3.8 million will be secured through a FEMA Pre-Disaster Mitigation Grant, a Community Block Development Grant, and an Aquatic Resources Mitigation Fund grant.

The 2006 Suncook River Geomorphic Based Restoration Plan project generated the much needed *Geomorphology-based Restoration Alternatives* study for the Suncook River, and pulled the affected communities of Epsom, Allenstown, and Pembroke together to achieve consensus on a restoration strategy. This modest funding award will lead to the development and future implementation of one of the largest geomorphology-based river restoration projects in New Hampshire history. The successes of this initial restoration grant award will continue to be realized into the foreseeable future as the plan is developed and implemented.

Beaver Lake Watershed Management Plan, Beaver Lake Improvement Association, (2004 Base)
Grant Amount: \$52,500 Local Match: \$35,524

The Beaver Lake watershed, located in southern New Hampshire within the towns of Auburn, Chester and Derry, is approximately 10.5 square miles. With over a three and a half fold increase in population between 1960 and 2000 the changes to the landscape have been considerable in both residential and



Beach erosion at Beaver Lake.

commercial areas. In 1992 a DES diagnostic and feasibility study showed increased nutrient loading to the lake caused by runoff from roads, lawns and general non-point sources. This 319 grant project resulted in the development of a comprehensive watershed management plan for the entire watershed with objectives and action steps to improve water quality and to protect the natural, scenic, recreational and cultural values of the watershed. The plan is focused on five main topic areas: open space, land use and growth; water quantity; water quality; biological and habitat; and recreation. The implementation of the plan will be accomplished through the many active participants of the Beaver Lake Water-

shed Partnership. This includes representatives from the towns of Auburn, Chester and Derry; Beaver Lake Improvement Association; Harantis Lake Homeowners Association; Southern NH Planning Commission; Pinkerton Academy; and DES.

Gillingham Drive Stormwater Management, Town of Newbury (2005 Base)

Grant Amount: \$33,100 Local Match: \$23,178

Sediment Reduction: 0.5 tons/year

Phosphorus Reduction: 0.3 lbs/year

Gillingham Drive runs along the eastern shore of Lake Todd and contributes non-point source pollution to the lake in the form of sediment and phosphorus. In order to address this runoff to the lake, the town of Newbury received 319 funding (2001 and 2003) to design and construct stormwater control measures for approximately 2,600 feet of Gillingham Drive. Previous projects resulted in the completion of Phase I and Phase II, which included the development of a preliminary design and construction of stormwater controls to approximately 50 percent of Gillingham Drive. This project was to develop a design and to complete the construction of stormwater controls for the remainder of the Gillingham Drive uncontrolled drainage area to Lake Todd. Unfortunately, the project was unable to be completed beyond the design phase as the lake could not be lowered sufficiently to allow for the installation of the stormwater controls. The town did initiate better housekeeping measures, including street sweeping to reduce sediment loading to the lake.



Erosion along Gilligahm Drive, Newbury.

Baboosic Lake Community Wastewater System-Phase II, Town of Amherst (2002/2003 Restoration)

Grant Amount: \$180,000 Local Match: \$142,697

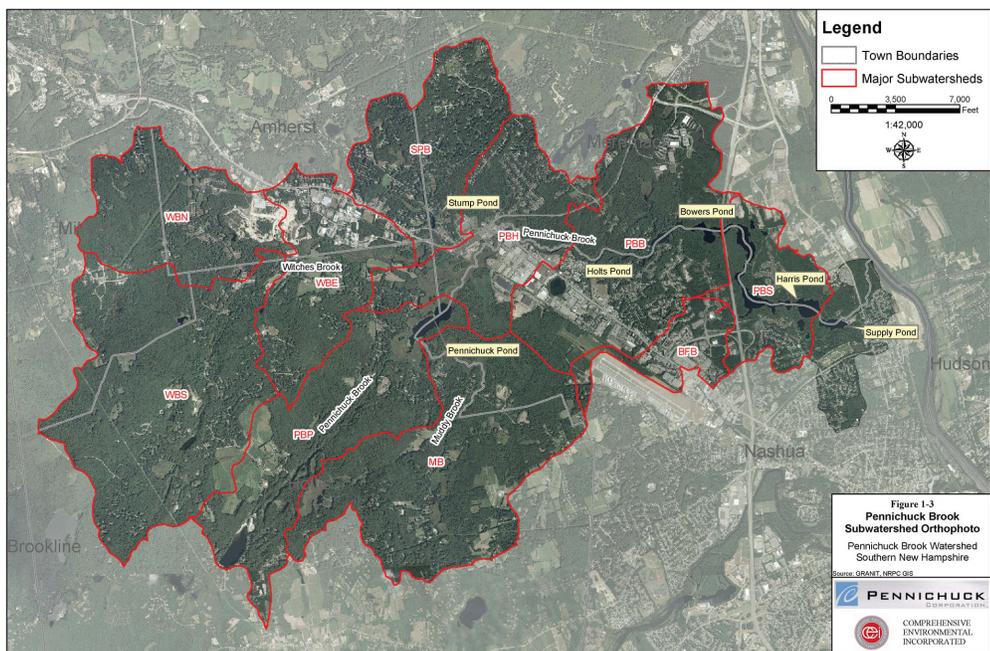
Phosphorus Reduction: 126 lbs/year

This project is the continuation of the design and construction of a community-based septic system for homes in the Baboosic Lake Community, whose current substandard systems are contributing to or pose a significant threat of excess nutrient contamination to the lake. Due to the size of many of the lots, installation of new individual systems is not an option. This project, removed the old systems and tied the homes into a new community disposal system located in an upland area, further removed from the lake. Phase I provided a community equalization tank and two community leach fields serving 12 homes. This project added a pretreatment and denitrification system and tied in an additional 10 dwellings. A third phase of the project is being funded with 2007 restoration funds and will tie in an additional thirteen homes that are at close proximity to the lake. On-going water quality monitoring will measure the project results and the need for continued water quality improvements.

Pennichuck Water Works Watershed Restoration Plan, Pennichuck Water Works (2004 Restoration)

Grant Amount: \$72,840 Local Match: \$76,815

The Pennichuck Brook watershed is comprised of more than 17,000 acres in southern New Hampshire. It is a major drinking water supply source for Nashua and surrounding communities supplied by Pennichuck Water Works, a private water supply company. Extensive development has resulted in



declining yields and water quality, including increased algal blooms in Harris Pond, due to excessive phosphorus loadings. Contributing non-point source factors include major highways, urban traffic and dense commercial/industrial land uses that have developed throughout a large segment of the watershed.

The purpose of this project was to create an updated watershed restoration plan for the Pennichuck Brook watershed, which would meet current state and EPA guidelines, including the *a-i* elements as set forth by EPA. Building on a previously developed 1998 plan and evaluation of restoration efforts, the new restoration plan includes 11 goals with specific action items, objectives and milestones, anticipated costs and potential partners, and funding sources.

restoration plan for the Pennichuck Brook watershed, which would meet current state and EPA guidelines, including the *a-i* elements as set forth by EPA. Building on a previously developed 1998 plan and evaluation of restoration efforts, the new restoration plan includes 11 goals with specific action items, objectives and milestones, anticipated costs and potential partners, and funding sources.

Saco River Watershed

Ossipee Watershed Natural Resource Planning Guide, Green Mountain Conservation Group (2006 Base)

Grant Amount: \$35,000 Local Match: \$76,212

The Green Mountain Conservation Group (GMCG) worked with representatives from the towns of Effingham, Freedom, Madison, Ossipee, Sandwich and Tamworth to establish the Ossipee Watershed Coalition (OWC). The GMCG and the OWC worked together to create the *Natural Resource Planning Guide for the Ossipee Watershed*. This guide was presented and distributed to residents and municipal offices in the six watershed towns. The Ossipee aquifer is New Hampshire's largest stratified drift aquifer, yet few towns have adequate protections in place to deal with threats to groundwater resulting from increased population growth and changes in the landscape. It is hoped that this guide, which provides information about shared resources, GIS regional maps and enacting local ordinances, will assist the OWC communities in developing a common vision for sustainable development to guide growth and preserve this valuable water resource.



Ossipee Watershed Coalition planning meeting.

Looking Ahead

President Obama has clearly stated the need to act quickly and meaningfully to address infrastructure needs that put people to work. By the time you read this, it is likely that Congress will have passed an economic stimulus package including environmental infrastructure funding. We are poised to get as much stormwater infrastructure improvements built in “shovel ready” projects as funding and local effort allow. We hope to tie stimulus package work as closely as possible with completed watershed restoration plans.

Also in 2009, we expect to make progress toward developing strategies to reduce salt use in the impaired I-93 watersheds. Work will focus on developing a salt accounting program so that road and parking lot maintainers can keep track of their salt use over time. We plan to work with the University of New Hampshire Technology Transfer Center to develop training programs that help maintainers focus on efficient use of salt. These programs will help set the stage for broader use of salt management BMPs as we find more and more chloride-impaired waters.

Tying things together is our continuing work on antidegradation with respect to stormwater. In 2008, new Alteration of Terrain Rules were adopted that for the first time require infiltration of stormwater. During 2009, a work group will address proposed antidegradation rules that require pollutant loading analysis for impaired streams and impervious surface limits as well as improved infiltration requirements for development and redevelopment projects.



Photo by Jen Drociak, DES staff.

Appendices

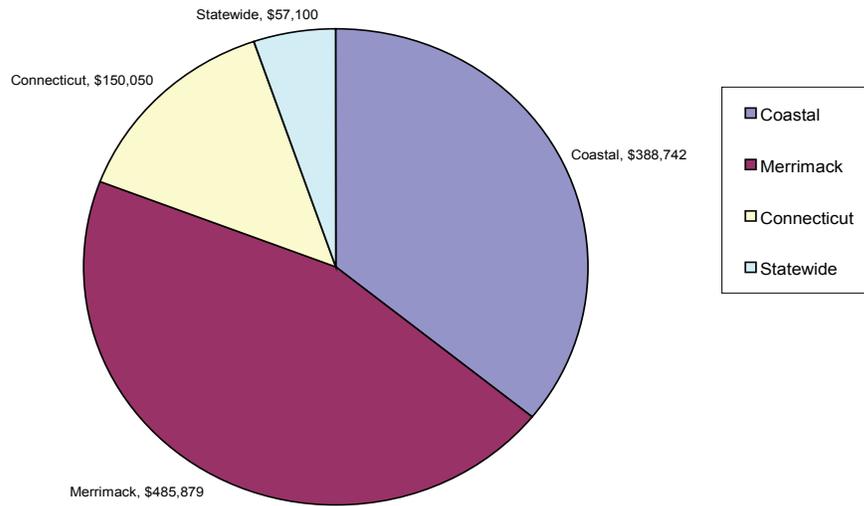
A. Section 319 NPS Local Initiative Grants Awarded in FFY 2008

Grantee	Project Name	Project Number	NPS Category	Watershed	Source of Funds (FFY)	Grant Award
small outreach	Various	Various	General NPS	Statewide	2004/2006	\$5,950
NH Dept. of Environmental Services	Development of Stormwater BMP Manual	B-008-SW-01	Urban Runoff/ Stormwater	Statewide	2003/2005	\$57,100
Acton Wakefield Watersheds Alliance	Watershed Based Plan for High Quality Waters	B-008-C-02	Stormwater Urban/Resident.	Coastal	2005/2007/ 2008	\$103,166
Granite Lake Assoc.	Granite Lake Watershed Mgt. Plan	B-08-M-05	All Sources	Merrimack	2008	\$50,000
The Nature Conservancy – NH Chapter	Restoration Planning for Aquatic Connectivity in HQ Waters of Ashuelot River	B-08-CT-03	Urban Runoff/ Stormwater/ Road Construct.	Connecticut	2008	\$27,136
Lakes Region Planning Commission	A Lake Winnepesaukee Watershed Mgt. Plan: Meredith, Paugus & Sanders Bays	B-08-M-04	All Sources	Merrimack	2008	\$76,640
			Total Awarded			\$319,992

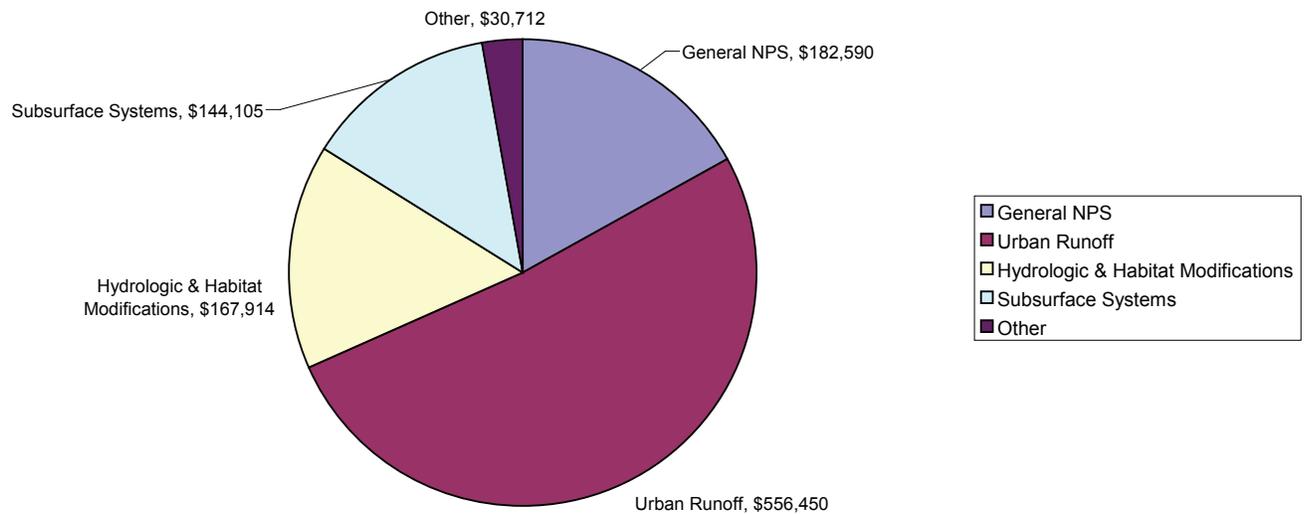
B. Section 319 Watershed Restoration Grants Awarded in FFY 2008

Grantee	Project Name	Project Number	NPS Category	Watershed	Source of Funds (FFY)	Grant Award
Cocheco River Watershed Coalition	Restoration in Cocheco R. Watershed	R-06-C-07	All sources	Coastal	2006	\$50,000
Town of Exeter	Exeter Pet Waste Outreach & Educ.	R-05-C-10	Other	Coastal	2005	\$12,500
City of Somersworth	Somersworth Pet Waste Outreach & Educ.	R-05-C-11	Other	Coastal	2005	\$12,332
Town of Seabrook	Seabrook Pet Waste Outreach & Educ.	R-05-C-12	Other	Coastal	2005	\$5,880
City of Dover	Willand Pond Drainage	R-07-C-02	Urban Runoff/ Stormwater	Coastal	2007	\$68,064
Town of Amherst	Baboosic Lake Community Septic Phase III	R-07-M-03	Urban Runoff/ Stormwater/ Septage Disposal	Merrimack	2007	\$144,105
Town of Washington	East Washington Mill Pond	R-07-M-04	Urban Runoff/ Stormwater/ Pasture Grazing	Merrimack	2007	\$48,456
Cobbetts Pond Improvement Assoc.	Cobbetts Pond Watershed Restoration Phase I	R-08-M-01	Urban Runoff/ Stormwater	Merrimack	2008	\$83,591
City of Franklin	Webster Lake Griffin Beach Sedimentation Restoration	R-08-M-02	Urban Runoff/ Stormwater	Merrimack	2008	\$77,137
Town of Seabrook	Cains Pond Restoration Dredging	R-08-C-03	Urban Runoff/ Stormwater	Coastal	2008	\$91,800
Connecticut River Joint Commission	Lower Mohawk River Stream Restor.	R-07-CT-01	Hydromodification	Connecticut	2007	\$122,914
DES Watershed Mgt. Bureau	Exeter River Watershed Geomorphic Assessment & Restoration Plan	R-03-C-12	Hydromodification	Coastal	2003	\$45,000
Total Awarded						\$761,779

C. Distribution of Section 319 Grant Dollars Awarded in 2008 by Watershed



D . Distribution of Section 319 Grant Dollars Awarded in 2008 by NPS Category



E . 2008 Estimated Pollutant Load Reductions Achieved

Grantee	Project Name	FFY Source of Funds	319 Funds	Total Cost	P(#/yr)	N(X/yr)	Sediment (tons/yr)	Model/Method	Notes
Town of Amherst	Baboosic Lake Phase 3 Community Wastewater System	2007 Incremental	\$144,105	\$431,000	66			Engineering Calculation	BMP implemented but project not complete
Town of Amherst	Baboosic Lake Phase 2 Community Wastewater System	2003 Incremental	\$180,000	\$322,697	126			Engineering Calculation	
City of Manchester	Nutts Pond Watershed Improvement Project	2005 Incremental	\$60,000	\$291,410			63	Measure of sediment removed from BMP	BMP implemented but project not complete
Silver Lake Land Trust	Silver Lake Stormwater Management	2005 Incremental	\$70,000	\$125,018	7.6		13.3	Region 5 Model	
Town of Newbury	Gillingham Drive Stormwater Management	2005 Base	\$33,100	\$56,278	0.3		0.5	Region 5 Model	
Baboosic Lake Assoc.	Baboosic Lake Stormwater Management	2005 Incremental	\$30,000	\$20,000	0.7			Region 5 Model	BMP implemented but project not complete
Town of Boscawen Conservation Comm.	Jamie Welch Park Car-top Access Erosion Control & Demo Project	2006 Base	\$24,500	\$40,420	28.7	57.4	28.7	Region 5 Model	BMP implemented but project not complete
Town of Nottingham	Pawtuckaway Lake Watershed Improvement Project	2005 Base	\$30,000	\$30,000	1.5			Region 5 Model	BMP implemented but project not complete
Acton-Wakefield Watersheds Alliance	AWWA Youth Conservation Corps	2006 Base	\$66,041	\$179,860	21.8		18.4	Region 5 Model	
Town of Hancock	Hancock Village Stormwater Mgt. & Water Quality Improvement Project	2007 Base	\$94,800	\$162,250	25.9	265.3	8.8	Simple Model	BMP implemented but project not complete
Town of Peterborough	Contoocook River Urban Stormwater Improvements & BMP Demo Project	2006 Base	\$104,990	\$202,028	0.7	4.8	0.5	Region 5 Model	BMP implemented but project not complete
					279.2	327.5	133.2		

