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Surface Water Quality Protection Program

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2005 Annual Report
MaineDOT

Program Overview

The Surface Water Quality Protection Program (SWQPP) is a cooperative endeavor that joins local, state and federal organizations in efforts to reduce the effect of polluted stormwater runoff from state highways and other MaineDOT transportation facilities. The program relies on the interest and expertise of local citizens and community groups to locate and nominate these problem areas. The purpose of the program is:

- (1) to identify surface water bodies (lakes, rivers, streams, estuaries, etc.) where water quality is being adversely impacted by runoff from state transportation infrastructure,
- (2) to select and prioritize candidate pollution elimination projects to fund, and
- (3) to manage the design, development and construction of projects selected for funding.

The Maine Department of Transportation (MaineDOT) manages the Surface Water Quality Protection Program through a contractual agreement with Hillier & Associates, Inc. of Augusta, Maine. This program is currently funded under the Transportation Enhancement Program of the Transportation Equity Act for the 21st Century (TEA-21), which is administered by the Federal Highway Administration.

Any person or entity is eligible to submit project nominations. There is no deadline for applications to be considered and they will be reviewed and selected as received. Candidate projects are screened, selected, and prioritized by a MaineDOT/Maine Department of Environmental Protection (MDEP) team according to a 14-point criteria. Sites can be nominated using the nomination form, which can be found through the Environmental Office page within the MaineDOT website. For more information on the program please contact the MaineDOT Environmental Office at 624-3100.



Cove Brook Volunteers Protect Atlantic Salmon Stream

Project Description:

The Hampden project was nominated by Greg Beane of the Maine Division of Environmental Protection in the fall of 2003. The problem area was identified as a part of the Cove Brook Watershed Survey undertaken by the Cove Brook Watershed Council. The site had a slumping road inslope as a result of erosion around a culvert inlet. The erosion contributed sediment loading to a tributary of Cove Brook, one of eight listed Atlantic Salmon rivers.

Best Management Practice Design:

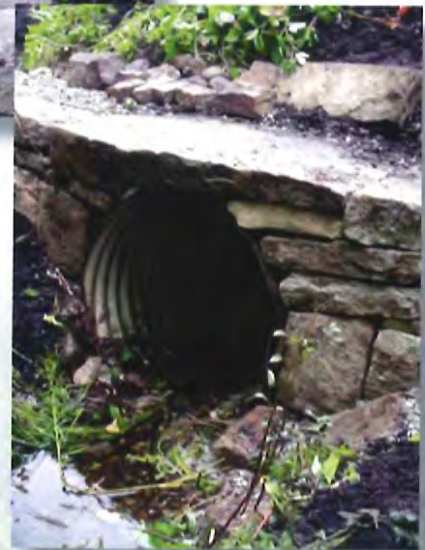
The BMP design for this site was developed as a result of the need to minimize site and stream disturbance. In order to maximize value and minimize disturbance it was decided that the stabilization of the culvert inlet could be accomplished by volunteers. Stonescape, a consulting stonemason company, was hired to direct the installation of a culvert headwall and volunteers planted native vegetation and moved yards of mulch and clean stone. The finished product is both aesthetically pleasing and should be a great improvement to the stability of the Back Winterport Road inslope.

Total Cost: \$3523

PIN NUMBER: 11244.04



BEFORE



AFTER

Shoulder Erosion Minimized on Keoka Lake

Project Description:

The Waterford project was nominated by Colin Holme of the Lakes Environmental Association in the fall of 2003. The problem area was identified as a part of the Keoka Lake Watershed Survey undertaken by the Keoka Lakes Association. The Route 35 site had a severely eroding road shoulder (>450') that entered directly into Kedar Brook just upstream of Keoka Lake. The area had been a consistent maintenance problem for the town and MaineDOT.

Best Management Practice Design:

The BMP design for this project included a paved shoulder and curbing to eliminate the potential for erosion at the site. Unfortunately, paved shoulders do not reduce other pollutants (winter sand, petroleum products, etc.). As a second stage of the project a new cross culvert will be placed along the project segment in order to reduce stormwater quantity directly entering the brook. The culvert will outlet into a landscaped swale and enter into a wetland area before entering Kedar Brook. The plunge pool constructed at the end of the paved shoulder was landscaped with low-maintenance vegetation to improve buffer and aesthetic value.

Total Cost: \$50,967

PIN NUMBER: 11244.05



BEFORE



AFTER

Stabilization Project in Litchfield to Protect Woodbury Pond

Project Description:

The Litchfield project was nominated by “Nelly” Gamage of the Litchfield Conservation Commission in the fall of 2004. The problem area was identified as a result of catastrophic shoulder and ditch erosion related to runoff events in December 2003. Sediment from the washout along Hallowell Road entered into a narrow wetland strip before depositing in Woodbury Pond. Runoff bypass of a ditch turnout along the road segment contributed to the problems in 2003.

Best Management Practice Design:

The BMP design for this site included a paved shoulder and ditch stabilization. The paved shoulder provides a stable surface that will reduce erosion in the case of future turnout bypass. Additionally, road inslopes were reshaped and stabilized with vegetation and erosion control mix. Three segments of the road had ditches “overexcavated” and then backfilled with small, clean gravel in order to provide some additional runoff storage and act as intermediate filters. The plunge pool/sediment trap at the bottom of the road segment included a “mulch core” check dam that provides filtering capability. The MaineDOT regional maintenance program provided additional funding for portions of the project.

Total Cost: \$94,695

PIN NUMBER: 11244.10



BEFORE



AFTER

MaineDOT Region 1 and SWQPP Team Up for Improvements in Oxford



BEFORE

Project Description:

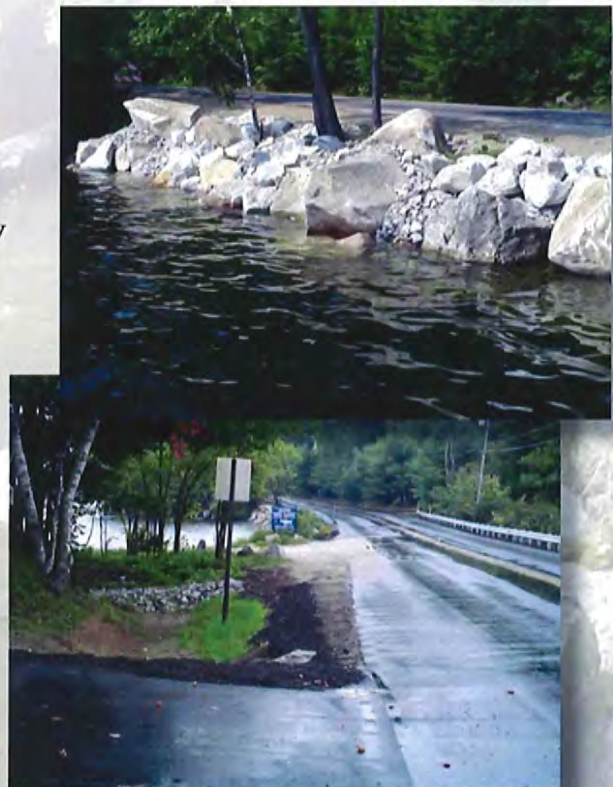
The Oxford project was nominated by Bob Tracy of the Thompson Lake Environmental Association in the fall of 2003. The problem area was identified as one of two areas of concern for the Lake Association. Shoulder erosion along two causeway sections of Route 121 contributed to non-point source pollution of Thompson Lake. Additionally, unstable shoulders and old guardrail did not provide much security for lakeside traffic. MaineDOT Region 1 committed funds to the guardrail placement along both causeway segments and the SWQPP funded the water quality improvements.

Best Management Practice Design:

The BMP design for this site included a paved shoulder, parking area regrading, lakeshore stabilization and a ditch filter berm. The paved shoulder improved stability and reduced the potential for shoulder erosion along the causeway. Lakeshore stabilization was accomplished using local material obtained from a nearby excavation project. Varying sizes of aggregate were used to improve aesthetics and simulate natural lakeshore conditions nearby. Mulching and revegetation will improve the aesthetics of the site over time. Parking area reshaping should reduce concentrated flows at and around the causeway area.

Total Cost: \$37,627

PIN NUMBER: 11244.11



AFTER

Boat Launch Parking Improvements Protect Flying Pond

Project Description:

The Mount Vernon project was nominated by Brian Canwell of the Flying Pond Improvement Association in the summer of 2002. Concentrated runoff across an unpaved boat launch parking area was the primary cause for concern at the site. Other concerns at the site included the poor condition of shoulders along the road segment and old guardrail.

Best Management Practice Design:

The BMP design for this site included the paving of the parking area to reduce erosion and sedimentation at the boat launch, improvement and paving of the shoulders along the problem road segment and ditch stabilization.

In order to reduce the runoff from the paved parking area the site was regraded to promote sheet flow and a perimeter curtain trench was established to provide stormwater storage and treatment. The construction of the paved shoulders took place with perimeter control of erosion control mix which was left in place to provide sheetflow treatment over the next few years. Ditch stabilization consisted of erosion control fabric and riprap.

Total Cost: \$60,142

PIN NUMBER: 11244.11



AFTER

Porous Parking Surface Helps Preserve Biscay Pond

Project Description:

The Bremen project was nominated by Jennifer Brockway of the Pemaquid Watershed Association (PWA) in the fall of 2004. Concentrated road and shoulder runoff along the Biscay Road in Bremen created erosion along an unauthorized “boat launch” and parking area. The project site was identified as a part of a 2003 Watershed Survey conducted by the organization. The landowner and town were in support of closure of the boat launch, while maintaining limited parking and a hand carry access at the site. An official boat launch is available to the public nearby.

Best Management Practice Design:

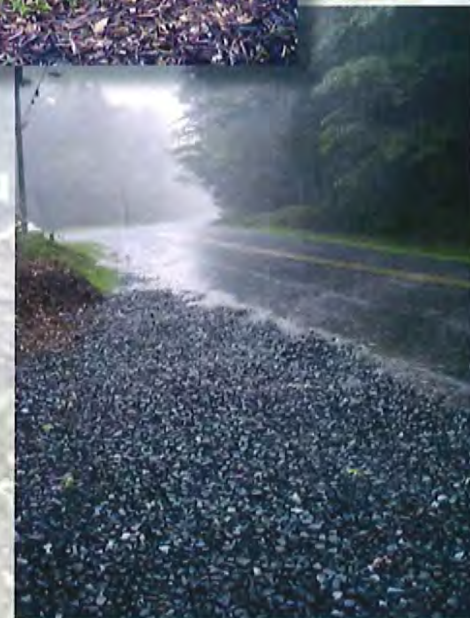
The BMP design for this site included the reshaping of the shoulder to redirect runoff away from the launch area, reconstruction of the parking area to provide “below grade” stormwater storage and to revegetate and stabilize the old boat launch area. The small parking area was “over-excavated” and backfilled with open-graded aggregate to provide a porous surface and below-grade surface stormwater storage. The overflow for this system enters a series of small storage pools that were landscaped by PWA volunteers. The porous parking pad appears to be working extremely well for storage of stormwater and will be monitored over the next few years by the SWQPP program.

Total Cost: \$15,331

PIN NUMBER: 11244.13



BEFORE



AFTER

SWQPP 2004 Follow Up

Testing of a variety of grass and legume mixes has resulted in some “seedy” results...

- Extremely unproductive dry, Recycled Asphalt Pavement (RAP) ditch inslopes on our project in Enfield were sown with three separate mixes over the fall of 2004 and the spring of 2005. Similar site conditions, aspect and moisture contributed to a decent test area. Short segments of the inslope were flagged to document test sections.

Fall (late September) seeding with winter rye was compared to typical “conservation” mix (annual ryegrass, clover, red fescue, others). By October, winter rye seeded inslopes had better germination and cover than the segment with conservation mix. Winter rye stayed green and provided some cover through the winter and spring.

Spring seeding took place on three segments with segments either receiving a spring mix of crimson clover and annual ryegrass, a salt tolerant seed mix or a segment with conservation mix. Each segment was hay mulched. All three segments showed decent results but the crimson clover segment showed significant growth and its ability to fix nitrogen should prove valuable for future vegetation in 2006. Crimson clover is an annual cover crop used throughout the northeast and appears to provide quick “green-up” and cover in early spring and late summer seeding. As a self-seeding annual it will be interesting to see how it does in 2006. We will wait another year to determine consistency of cover on the three segments. One segment was not seeded or mulched and is included in the photos as a control section. These are not scientific results but simply quick tests to help us select seed mixes for other difficult sites.



Crimson clover and annual rye grass mix



No seed or mulch



Salt tolerant mix

2004 Follow Up

Three projects were partially complete in 2004 and follow-up landscaping efforts over the spring and summer of 2005 have resulted in attractive projects. The following photos show the complete, landscaped projects in Jefferson, Freeport and Enfield one year after construction.

- The Enfield project was reseeded in the spring and the reconstructed stream channel revegetated nicely over the summer. One year after reconstruction, the relocated stream channel has improved habitat value with pools, riffles and an improved buffer with native streamside vegetation.



- The Freeport project was completed with a “blown on” mulch/soil/seed product that has grown in with lupine and other native or naturalized wildflowers. The project area backslope was also planted with low-maintenance vegetation. The project required additional granite check dams after some material movement in the base of the channel over the summer.

- The Jefferson project’s rock wall, constructed in 2004, was landscaped by the landowner and has become a nice centerpiece of the village area. All riprap plunge pools on this project were completely vegetated by mid-summer using erosion control mix, soil and seed mixes.



National Recognition for the SWQPP Program

Runoff Control Project

WATERBORO, MAINE



RESIDENTS OF WATERBORO, MAINE, enjoy the benefits of the Transportation Enhancements (TE) program while lounging by the water at Little Ossipee Pond. Beneath the feet of kids at play and sun-soaked adults, a subsurface filtration system keeps the lake water pure and clear.

Before the system was put in place, an unsightly drainage pipe emptied polluted runoff from nearby Route 5 directly into the public swimming area. The Maine Department of Transportation and the town of Waterboro solved the problem with the help of \$65,000 in TE funds. They created a drainage system that pipes the highway runoff into a gravel filtration area covered over with beach sand. Now the town has a brand new beach and clear water to swim in.

The cleaned-up beachfront is attracting a multitude of visitors. Michael DeAngelis, Waterboro's Recreation Director remarked, "On warm weekdays, after school is out for the summer, the beach sees upwards of 100 visitors per day. On weekends that number may triple."

Waterboro's success story is one of many in Maine since the creation of the Surface Water Quality Improvement Program or SWQPP (pronounced "squip"). The Maine Department of Transportation created the program in 1998 in response to concern about the impacts of roads on the state's water resources, especially the 6,000 fresh-water lakes and ponds present throughout the state.

CONTACTS

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14 **Communities Benefit!**

Reprint from Communities Benefit a publication from the National Transportation Enhancements Clearinghouse (NTEC)

- One of Ten National Project Highlights

Rainwater runoff washes over road surfaces and transports pollutants into Maine's lakes, causing degradation in the water quality. The health of the lakes suffers as a consequence, and so does Maine's economy. Maine's lakes earn the state more than \$1.2 billion each year, and support 50,000 jobs. These revenues come primarily from recreation on the lakes, and from property taxes in valuable lakefront areas. Polluted lake water is unattractive to tourists and residents, and can cause revenue from the lakes to decline.

A 1996 study from the Maine Agricultural and Forestry Experiment station

showed that, in some areas, a reduction in the clarity of the water by as little as one meter could result in the loss of 5 percent total property value for the town. In a state where more than 60 percent of municipal revenues come from property taxes, water quality decline in Maine's lakes has serious consequences.

The runoff control project in Waterboro, along with hundreds of other similar projects funded through SWQPP, is an investment in the ecological health of Maine's lakes and in the strength of the state's economy. In Waterboro, the results of this investment are *clearly visible*.

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The Benefits of TE

Special Thanks



Winthrop Crew #71215 of Region 2 after the finishing touches in Mt. Vernon.
(Front left to right) Paul Cyr, Art Laplante, Cathy Kastberg and in back from left to right is Arthur Russell, Bob Beland, Rick Blaisdell, Norman Brown, Ben May.

The SWQPP owes a special thanks to the regional maintenance crews that help to make this program work. Exceptional work has been completed this year by MaineDOT crews and without their effort and expertise the projects would not have been nearly as successful. Thanks again to the crews, regional supervisors and environmental coordinators for their continuing support of the program.

2005 Summary

In 2005, the Surface Water Quality Protection Program (SWQPP) continued to develop high-quality, Best Management Practice (BMP) demonstration projects in erosion/sediment control and stormwater management for transportation infrastructure. This year the SWQPP constructed 6 new projects. The program has two remaining funded projects that will be completed next year and has plans to dedicate new '06-'07 funding for at least 6 projects in 2006.

The regional maintenance programs of the MaineDOT again provided the SWQPP with excellent support in 2005. On many of the projects, the regions provided funding and labor for elements of the project related to safety or general maintenance. In this way, the improvement projects get "much more for the money" in an era of tight state budgets. Approximately \$262,287 was spent on the 6 projects. 2005 projects were constructed primarily by MaineDOT maintenance forces with one project being constructed by volunteers.

The SWQPP continues to make headlines for its innovative projects. The 2004 Waterboro project appeared in the National Transportation Enhancement Clearinghouse's (NTEC) *Communities Benefit* publication (see pages 10-11) and was the only water quality improvement project to be publicized as a part of a spotlight on Transportation Enhancement projects across the country. The Waterboro project was also highlighted in a county-wide tour of innovative conservation efforts hosted by the York County Conservation Districts. The SWQPP also appeared in the Kennebec Journal for its efforts on the Hallowell Road in Litchfield and in the Lincoln County News for its project in Bremen.

The SWQPP continues to develop cooperative projects that attempt to incorporate innovative stormwater treatment systems relevant to transportation infrastructure. This year the program is experimenting with "ditch filter berms" in an attempt to not only safely convey roadside stormwater but to provide an improved level of filtration for suspended solids, metals and other pollutants. In 2006 the program, the Transportation Research Division of the MaineDOT and the University of New Hampshire's Center for Stormwater Technology Evaluation and Verification will team up to study the effectiveness of these types of structures for roadside stormwater improvement. The program also constructed two low-tech, below-grade storage and detainment structures around road shoulder parking areas. These systems should provide sufficient stormwater storage to greatly reduce runoff at these sites. The systems will be monitored for function and effectiveness over the next few years.

The development of effective treatment for impervious surface stormwater runoff will continue to provide challenges in 2006 as a number of stormwater-related projects have been nominated to the program. Overall the program remains dedicated to its core mission of providing the best possible BMP demonstration on stormwater and erosion/sediment control and to improve community relations through cooperative water quality improvement efforts.



MaineDOT

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