Youth Conservation Corps Project

A Final Report to

The New Hampshire State Conservation Committee

Submitted by

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Sally Soule	New Hampshire Department of Environmental Services
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Julia Peterson	UNH Cooperative Extension/Sea Grant
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Executive Summary

2008 marked the third complete season of the Acton Wakefield Watersheds Alliance (AWWA) Youth Conservation Corps (YCC) program. The intended outcome of the AWWA YCC program is the reduction of pollution caused by stormwater runoff and other non-point sources to the lakes, ponds, rivers and streams of the Wakefield, New Hampshire/Acton, Maine region. One facet of this work is the implementation of best management practices (BMPs) through YCC projects and technical assistance designs. An addition, the AWWA Board and staff conduct education and outreach activities to raise stakeholder awareness of the relationship between land use and water quality in order to highlight conservation practices that can reduce non-point source pollution.

One goal of the 2008 season was to continue the success of the previous two seasons by applying our acquired knowledge and experience to implement more sophisticated and technically advanced best management practices (BMPs) in order to increase the pollution reduction efficiency. A portion of this season involved returning to previous project host sites to repair previously installed BMPs that had either failed, needed improvements, or required maintenance. New BMPs were installed where additional erosion control measures were needed. The remaining projects utilized a wide variety BMPs to solve isolated erosion issues as well as amend entire landscapes.

Raising public awareness was a critical objective of the project. The success of AWWA is directly dependent on the public holding a stake in the health of the lakes and utilizing us as a resource in that interest. Since our inception, AWWA has been a reputed name in the community and synonymous with water quality conservation. Outreach has increased on a yearly basis and the 2008 season was filled with numerous outreach endeavors including press releases; presentations at local events, town meetings, and lake associations; volunteer education sessions; seminars with state agencies; and signage and uniforms with AWWA and partners' logos.

Partner support was maintained, enhanced, and increased in 2008. AWWA maintains strong communication and interaction with our partners and continually seeks to foster an ever-improving depth of support in the community and region. It has been a policy of AWWA to integrate our knowledge of the power of strong cooperation in our actions and affiliations.

Staffing is a perennial issue for AWWA, chiefly due to our remote location. However, the YCC once again hired a highly motivated and talented crew leader and four competent and skilled crew members from the surrounding community. The staff was aptly trained and prepared for the season. During the work season, the crew performed proficiently and competently, completing all projects to the standard of the technical director and the approval of the AWWA YCC committee and landowner.

The crew was well supplied with tools, equipment, materials, and supplies for the entire season. Few new tools were required for the season thanks to the care and quality of the tools purchased in previous seasons. Tools that were procured were supplemental to the existing supply and helpful to the increased efficiency of the crew in implementing the BMPs. Transportation of the crew and tools was also provided during the length of the season thanks to the donation of the use of a work truck by a local auto dealership.

Sixteen total projects were completed on eight waterbodies [Appendix 1] during the YCC's seven week-long season. During this period, 39 BMPs were installed. Pollutant Load reduction estimates were performed using the Region 5 Model, and these estimates indicated a sediment load reduction of 13.4 tons per year and a phosphorus load reduction of 11.9 pounds per year as a result of the BMPs installed on the 2008 YCC project sites [Appendix 2].

Technical assistance designs were also created during the YCC season. 39 landowners received some sort of technical assistance, and every lake in the region was represented [Appendix 1]. Valuable information was made available to interested parties who wished to address the erosion issues without the aid of the YCC. Recipients of technical assistance designs pledge to implement at least one BMP within one year of the landowner's receipt of the information.

Administrative responsibilities are attended to promptly and on a timely basis. Funding, reporting, budgeting, meetings, communication, etc. are all integral duties that allow AWWA to function smoothly. The properly functioning administrative aspect of AWWA is the key to allowing us to effectively carry out our operations.

The 2008 season marked a notable growth and maturity for AWWA and the YCC. Our mission has been clearly drawn and our efforts focused. We look forward to continuing the success built over the past three years and to improving the quality of the water in our lakes and streams.

The Board of Directors and staff of the Acton Wakefield Watersheds Alliance express their gratitude to the NH State Conservation Committee for its generous support.

TASK 1Raise Public Awareness

Articles highlighting the AWWA YCC projects appeared in the Granite State News, Carroll County Independent, Sanford News [Appendix 4]. Articles were also printed in the lake association sponsored *Newichawannock News* for Great East Lake Improvement Association, the Lovell Lake Association Newsletter, Pine River Pond Association newsletter, and Wilson Lake newsletter. Included in these newsletters was a one-page insert Request for Assistance form [Appendix 5]. The final season update was sent to each association with a website and highlighted on www.AWwatersheds.org.

AWWA volunteers and staff manned a booth at Wakefield Pride Day on May 17, 2008 with a display board highlighting YCC projects and direct contact with interested visitors. They also engaged the local youth with the Enviroscape to demonstrate NPS pollution and its prevention. The AWWA Annual meeting on May 29, 2008 highlighted a presentation by LaMarr Clannon of Maine NEMO - "Weathering the Storm to Protect our Children's Water." The AWWA Technical Director shared the progress and services of the YCC with community members and town officials at the AWWA Kickoff Meeting for the Watershed-based Management Plan.

AWWA staff and volunteers gave presentations promoting our services and explaining the benefits of using conservation practices to the Great East Lake Improvement Association, the Lovell Lake Association, the Pine River Pond Association, the Belleau Lake Property Owners Association, the Balch Lake Improvement Association and the Province Lake Association. The listeners were engaged and a number of requests for assistance were generated at those venues.

Linda Schier and board member Chuck Hodsdon conducted a series of three interactive lessons for Peter Boucher's three seventh grade classes at the Paul School in Wakefield. The lessons included watershed protection and non-point source pollution, water quality monitoring and lake ecology, and aquatic invasive species.

AWWA partnered with the NH DES Shoreland Protection Division to showcase permitted shorefront landscaping techniques for 56 attendees at the CSPA workshop in Wakefield. AWWA was pleased to be credited with many of the slides used by NH DES in their explanation of lake friendly landscaping techniques and the acknowledgment that AWWA initiated the BMP installation program in NH educating shorefront landowners to the benefits of preventing pollution caused by stormwater runoff.

AWWA's YCC crew always wore AWWA logo t-shirts when on the job. A 2'x 3' AWWA sign, with the Moose Plate sign attached, were installed at work sites while the crew was on site. The four large signs were placed on the most visible sites for the remainder of the summer season. This year AWWA created 15"x15" lawn signs to be installed at every previous project site. These signs will be distributed to all project hosts in the Spring 2009 with the recommendation that they be stored for the winter and reinstalled each Spring. The AWWA Technical Director will remind project hosts to display the signs as necessary.

TASK 2Solicit and Maintain Partner Support

Executive Director Linda Schier met with the Acton Warrant and Finance Committee who recommended a \$5,000 appropriation for AWWA for FY 2008-09 which was approved at the Acton Town Meeting. Linda Schier and Technical Director Adam Shoukimas shared a slide presentation with the Wakefield Selectmen and then met with the Budget Committee. The Budget Committee has recommended that the Town approve \$12,000 for AWWA for FY 2009-10.

As mentioned earlier, presentations were delivered to each local lake association and donations were requested by mail. The Great East Lake Improvement Association, Lovell Lake Association, Pine River Pond Association and Wilson Lake Association sent contributions. The Belleau Lake Property Owners Association pledged to recommend AWWA's efforts but was unable to make a financial contribution as a result of astronomical expenses repairing roads due to spring flooding.

AWWA continues to enhance its partnerships with NH DES, ME DEP, UNH Cooperative Extension, York County Soil and Water Conservation District, Moose Mountains Regional Greenways, Three Rivers Land Trust, local and regional watershed agencies and non-profits, local businesses and individuals. Relevant letters of support have been sent to potential funding agencies as needed.

TASK 3 Staffing

Recruitment of a qualified crew leader began with advertisements for the position at local colleges including the University of New Hampshire and Plymouth State University. Additionally, we advertised for the position on websites such as nh.craigslist.org. Postings were also placed on the websites of many of our partners, including NH Lakes, NH DES, and ME DEP. We received some response and scheduled interviews for mid-spring. After some deliberation, we hired Patrick Jackson, whose experience, attitude, aptitude, and enthusiasm for the position were most fitting for our organization.

Once the crew leader was hired, the crew positions were next to be filled. We advertised for the position through the local high schools and local papers, as well as through our partners' websites as we had with the crew leader position. Also, we contacted previous employees for recommendations of new hires. We received many interested students and interviewed at the beginning of the summer. We rehired two previous employees, knowing that their experience would help propel the crew through the introductory phase of the season with ease, and to help the new crew leader get his bearings on the first few projects. Two new crew members were also hired, for a final crew size of four members.

The crew was trained during a two-day event. The first day consisted of educating the crew about the water cycle, water chemistry, erosion, best management practices, lake stewardship, and lake health. This academic approach prepared the crew to fully understand the purpose of the work to be performed over the summer season. We tried to instill a deep understanding of the underlying reasons for our work and foster a sense of purpose and genuine regard for the health of the lakes and surrounding ecosystems. PowerPoint presentations and internet resources were utilized during this in-office portion of the training. The second day of training involved getting out into the field and touring previous YCC project sites. The tour demonstrated examples of all of the BMPs that we could employ during the season. It also showed how the BMPs work with each other and fit into the landscape to become a functioning system that controls erosion. Additionally, we used this time to cover the installation process, including how to manage the crew, which BMPs to install in what order and with what materials, specifications for BMP installation, and how to amend BMPs that were not functioning properly. The proper use of tools was demonstrated, including safety precautions. Also, work site safety instructions were taught addressing such situations as safety zones, lifting, heat and dehydration precautions, and bites and stings. Following the two day-training sessions including the academic and field days, the crew was well prepared to begin the season. The crew leader entered the position previously certified in first-aid and CPR.

TASK 4 Tools & Equipment

The YCC received and purchased many quality hand tools over the previous two seasons, making this year's crew well stocked with most of the necessary tools to perform the installation of BMPs. However, over the course of the season, some tools were broken and needed replacement, and some installations required additional tools in order for the project to be completed successfully. New tools that were purchased include the following:

- □ Wheelbarrow
- □ Hand saw
- Circular saw blade
- Marking paint
- Lines and stakes for laying out BMPs
- □ Hardware for signage
- □ Hoe
- Brooms
- □ Auger drill bits
- Hacksaw blades
- □ Wood for signage

All tools received necessary maintenance to ensure prolonged use, including tightening hardware, sharpening, handle replacement, etc. We have made an effort to purchase quality tools at a higher price because of the amount of abuse the tools take. It is important to have tools that can withstand excessive use without breaking. The replacement of tools is very costly to the crew in terms of both money and time, so it is a policy of our organization to treat our tools with great respect and care.

The crew also received the seasonal use of a truck from a local automobile dealership, Miller Ford of Sanford. The truck is large enough to transport the crew and tools, as well as any necessary materials that we would need to supply or deliver. Eagle Storage of Wakefield donated the use of a large storage space for garaging the truck and storing materials. This allowed for speedy access to our equipment as the tools could be kept in the truck in the security of the storage shed, without having to load and unload the tools everyday, or decide which tools to bring and which to leave behind since all the tools fit into the bed of the truck.

TASK 5BMP Projects

The crew completed 16 projects over the course of the seven week season. There was a wide diversity to the scope, size, and design of the projects that reflected the sophistication, maturity, and abilities that the YCC has developed over the three years that we have operated. Each project host received a packet prior to the YCC's arrival outlining the nature of their project, their responsibilities, what the YCC would provide, a letter of agreement signed by both the land owner and the technical director, and fact sheets defining maintenance procedures for each BMP to keep their project functioning properly. [Appendix 6]

A follow-up procedure was adopted this year to formally inspect and subsequently ensure the viability of the BMP project sites. The policy exists as follows:

- Follow-up visit and photo documentation by Technical Director (TD) will occur at least once within 12 months of project completion.
- TD will inspect site and BMPs for functionality, looking for reemergence of gullies or other indicators of erosion.
- If BMPs are functioning properly, TD will review maintenance procedures with Project Host (PH) and TD will not return unless contacted by PH for further evaluation, as described below.
- If erosion continues to occur, TD will evaluate whether it is the result of improper design, BMP failure, lack of maintenance, or caused by a larger issue.
 - If cause of erosion is result of lack of maintenance, TD will review maintenance procedures with PH and revisit within 12 months to reevaluate. Referrals for maintenance companies will be made available upon request of the landowner.
 - If cause of erosion is improper design or BMP failure, TD will redesign project for PH and discuss implementation options, either YCC or self-install.
 - If cause of erosion is due to a larger issue outside of the scope of our capabilities, TD will formally address the issue with the responsible party.
- TD will visit redesigned site within 12 months of new implementation and reevaluate BMP performance.
- PH is encouraged to contact TD to request assistance with any erosion problems.

YCC Project Hosts by Waterbody

Great East Lake

- 1. Public Launch
- 2. Community Property (upper)
- 3. Community Property (lower)
- 4. Dee Kasprzak
- 5. Sue Cain

Lovell Lake

Leisure Lane
Leisure Lane
74 Chipmunk Run
370 Mann Road

North Shore Drive

Eloven Lake6. Alan Heacock298 Brackett Road7. Public LaunchWitchtrot Road

East Wakefield, NH Sanbornville, NH Sanbornville, NH Acton, ME Acton, ME

Sanbornville, NH Sanbornville, NH

<u>Belleau Lake</u>		
8. Will Collier	214 Fisher Road	East Wakefield, NH
9. Bob Grant (upper)	182 Fisher Road	East Wakefield, NH
10. Bob Grant (lower)	182 Fisher Road	East Wakefield, NH
Province Lake		
11. Municipal Property	Bonnyman Road	East Wakefield, NH
<u>Great East Lake Canal</u>		
12. Municipal Property	Robinson Road	Acton, ME
Branch River		
13. St. Anthony's Church	251 Meadow Street	Sanbornville, NH
Horn Pond		
14. Barbara Wing (driveway)	11 Mountain View Drive	Acton, ME
15. Barbara Wing (lower)	11 Mountain View Drive	Acton, ME
Wilson Lake		
16. Celia Thibodeau	Peacock Road	Acton, ME

Descriptions of YCC Projects

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1. <u>Alan Heacock</u>	Lovell Lake	<u>Sanbornville, NH</u>
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Alan served as a project host at the end of the 2007 season. Large ruts were cut into the driveway due to the high velocity of the runoff. Four rubber razors had been installed to divert the runoff coming from the paved road above the driveway. The rubber razors slowed and diverted the runoff into nearby vegetation. However, over the course of the fall, winter, and spring, ruts had reappeared and it became obvious that the rubber razors we had installed were not operating correctly due to some improper installations. It was the responsibility of the YCC to return to the site, amend the previously installed BMPs, and install an additional rubber razor to fully remediate the site. The crew re-sank the two rubber razors at the top of the driveway to place them flush with the driveway surface so that runoff would be diverted by the rubber and not the lumber anchor. The two rubber razors at the bottom of the driveway had their angles reversed so that they diverted water to the opposite side of the driveway where the runoff could be more effectively controlled by the receiving vegetation. A fifth rubber razor was installed in the middle of the driveway above the parking area to divert any remaining runoff into nearby vegetation. This project was important in demonstrating the YCC's commitment to the quality of our work and the desire to provide a quality service focused on sustainability and effectiveness.



Alan Heacock Before



Alan Heacock After



Alan Heacock New Rubber Razor

BMPs installed:	Rubber Razors
Total Number of BMPs:	1
Ton of Sediment Prevented:	1.3
Pounds of Phosphorus Prevented:	1.1
Cost to Landowner: Crew Man Hours:	\$0.00 (landowner already owned materials) 28.5 hours 1 day (3 crew + crew leader)

2. <u>Will Collier</u> <u>Belleau Lake</u> <u>East Wakefield, NH</u>

This property was relatively flat, but received a large amount of runoff from the roof, which was concentrated by gutters and downspouts. The downspouts led to bare soil at the front of the house that was easily eroded to the back of the house and down a final steep slope to the lake. The runoff from the gutters at the back of the house concentrated flow onto a beach leaving large

gullies where the sand had been eroded into the lake. Rain barrels were originally recommended to be placed at the downspouts to collect the runoff, but they were difficult to find and expensive to purchase. Additionally, the rain barrels would not be able to contain the entire amount of runoff from the roof during even minor precipitation events. It was then recommended that a rain garden be installed on one side of the house to collect the roof runoff from the downspouts on that side. Also, the rain garden would help to stabilize the ground surface, protecting it from any other surface runoff. Both downspouts led to the large rain garden, sized to contain large quantities of water and infiltrate it into the ground and feed the native vegetation planted inside. A buffer strip was added as a last line of defense between the property and the final steep slope leading to the lake. This buffer would capture any runoff that was not contained by the rain garden and infiltrate it into the ground as well. The downspouts on the other side of the house were redirected to vegetated areas with high absorption capacities where the soil had not been compacted by vehicle or foot traffic.



Will Collier Before



Will Collier After

3. Public Launch	Great East La	ake	East Wakefield, NH
Cost to Landowner: Crew Man Hours:	\$550.00 25 hours	1 day	(2 crew + crew leader)
Pounds of Phosphorus Prevented:	0.1		
Ton of Sediment Prevented:	0.1		
Total Number of BMPs:	2		
BMPs installed:	Rain Garden Buffer Strip		

This property is used as a boat launch for the local residents. There is a relatively long and flat right-of-way dirt access to the lake leading to a steep drop down to the water. The adjacent properties are elevated above the right-of-way, causing water flowing down the road to enter the boat launch, erode the ramp surface, and carry sediment into the lake. The steep portion of the

ramp is paved with asphalt before turning back to dirt at the waterline. The eroded access surface is punctuated with tree roots and large rocks, making the installation of diverters nearly impossible. Additionally, there is no place to divert the runoff to as the access is the lowest property in the area. It was decided that the most severely eroded part of the property, the slope adjacent to the paved section, should be stabilized in order to curb any further erosion, and absorb and infiltrate any runoff entering it. The severity of the slope demanded a solution that would hold on to the surface and not easily erode away, even with frequent inundations. Erosion control mix was utilized for these exact reasons. It will adhere to very steep slopes, it will not float or wash away easily, and it will absorb runoff and control it while it infiltrates into the ground. The erosion control mix also improved the overall aesthetics of the property by filling and stabilizing the bare landscape with a uniform covering.



Public Launch Before



Public Launch After



Public Launch Before



Public Launch After

BMPs installed:	Erosion Control Mix
Total Number of BMPs:	1
Ton of Sediment Prevented:	3.2

Pounds of Phosphorus Prevented: 3.2

Cost to Landowner:	\$539.09 (with	projects #4 and	l #5 below)
Crew Man Hours:	22 hours	1 day	(2 crew + crew leader)

4. Public Launch

Lovell Lake

Sanbornville, NH

This property was a YCC project site from the 2007 YCC season that runs along the lower portion of a heavily used road by the center of town. It required some maintenance to keep it working effectively and looking manicured and professional. This site receives a lot of use by the public and also is our most visible project site. It has been the policy of the YCC to maintain these municipal project sites by providing the necessary labor combined with the financial support of the towns for required materials. Stormwater runs down the paved road and initially enters the project site where it is diverted by a waterbar into a rain garden. The rain garden infiltrates the water into the ground at the lake's edge, rather than allowing the runoff to enter the lake directly. Further down the site, runoff entering the property is controlled by a strip of erosion control mix. This erosion control mix not only absorbs and controls the road runoff, but also provides a stable temporary parking area for vehicles utilizing the boat launch. The erosion control mix is bordered by a line of timber waterbars, preventing the migration of sediment and runoff into the grassy portion of the property adjacent to the lake. However, over the past year, the vehicular traffic and large amount of precipitation have taken a high toll on the efficiency of the BMPs. The maintenance of the site involved spreading another layer of erosion control mix to the strip adjacent to the road, installing and fastening another row of timber waterbars, and removing the accumulated sediment from the rain garden. The erosion control mix and rain garden can again adequately absorb the road runoff, and the new waterbars can better contain the erosion control mix, divert runoff into the rain garden, and reestablish the visually attractive sharp contrast between the erosion control mix and grass areas.



Public Launch Before



Public Launch After

BMPs installed:

Erosion Control Mix Waterbar **Total Number of BMPs:** 2 **Ton of Sediment Prevented:** 04 **Pounds of Phosphorus Prevented: 0.4 Cost to Landowner:** \$539.09 (with projects #3 and #5) **Crew Man Hours:** 28 hours 1 day (2 crew + crew leader)18.5 hours $\frac{1}{2}$ day (3 crew + crew leader)**Total:** 46.5 hours $1 \frac{1}{2}$ days

5. <u>Municipal Property</u> <u>Province Lake</u>

This is a community lot providing lake access for many of the backlot residents in the area. A considerable amount of runoff comes from the surrounding landscape and adjacent paved road washing into the top portion of the property. This inflow eventually weaves its way over the

East Wakefield, NH

washing into the top portion of the property. This inflow eventually weaves its way over the property and finally down a slope into the lake. During the 2007 YCC season, the crew installed many BMPs to successfully control the runoff at the top part of the property where the runoff first enters the site. The BMPs include waterbars and drywells that we cleaned out and revitalized this season to ensure proper working order. On the lower portion of the site, adjacent to the lake, the crew had previously installed simple timber steps to provide access to the lake. However, we learned over the past year, that local residents wanted more sure-footed access. We also knew that we were capable of constructing a better solution to the erosion problems occurring on the slope. This was the first test of the crew's abilities to install a more technically advanced BMP. We removed the old steps and constructed a large staircase of infiltration steps that were capable of collecting as much runoff as the site could provide. These steps also created a wide, deep, stable platform for easy access to the lakefront. The staircase tied in with stabilizing riprap the crew previously installed to make a complete barrier for runoff interception. Above the stairs, the crew better defined the walkway leading through the property to dissuade residents from trespassing onto adjacent properties. Along this path, timber waterbar steps were installed to divert water off the trail into vegetation and provide better traction along the steeper portions. The new BMPs proved to be a dramatic improvement over the previous design, and boosted the crew's confidence in their construction abilities.



Municipal Property Before



Municipal Property After

BMPs installed:	Infiltration St Paths & Walk Waterbars Riprap	eps tways	
Total Number of BMPs:	4		
Ton of Sediment Prevented:	3.4		
Pounds of Phosphorus Prevented:	2.9		
Cost to Landowner: Crew Man Hours: Total:	\$539.09 (with 142.5 hours 15 hours 157.5 hours	a projects #3 ar 4 ¼ days 1 day 5 ¼ days	nd #4 above) (3 crew + crew leader) (2 crew)

6. St. Anthony's Church Bra

Branch River

Sanbornville, NH

The YCC installed two rain gardens and an infiltration trench to this site in 2007 in order to collect and control the massive amounts of runoff created by the large paved driveway surrounding the church. Further compounding the challenge was the asphalt berm bordering the driveway, concentrating the runoff to inconvenient areas, and the small portion of workable land between the berm breaks and the Branch River. Also, winter sand was used liberally on the site and never cleaned up. The two rain gardens and infiltration trench that were installed worked very efficiently. However, a year's worth of sediment had accumulated in them and the site needed maintenance that the priest was not able to perform. The YCC returned this season to clean the sediment out of the infiltration trench and the rain gardens, returning them to their original functioning condition. Next year, a volunteer crew from the congregation will be trained and utilized to perform these maintenance procedures. Additionally, it has been recommended that the winter sand be removed from the site in the spring to minimize the impact on the BMPs.



St. Anthony's After

St. Anthony's After

BMPs installed:	Infiltration Trench (maintenance) Rain Garden (maintenance)
Total Number of BMPs:	2
Ton of Sediment Prevented:	sheet erosion, could not measure
Pounds of Phosphorus Prevented:	could not calculate
Cost to Landowner: Crew Man Hours:	\$0.00 (no materials involved) 24 hours $\frac{3}{4}$ days (3 crew + crew leader)

7. <u>Municipal Property</u> <u>Great East Lake Canal</u> <u>Acton, ME</u>

Water coming down Robinson Road is shed off the road surface and runs along the side of the road as it opens to a turnaround area. Ordinarily, water would flow across this flat, gravel open area, pick up sediment, cross paved Canal Road and subsequently flow into the Great East Lake/Horn Pond canal. An infiltration trench already existed on this site to intercept the runoff as it initially flowed off of Robinson Road, but it was not functioning property. It had filled with sediment and could no longer collect road runoff and transport it. A new infiltration trench was installed by the YCC. The trench was deeper and wider and led to a new part of the property that could adequately control the runoff. At the terminus of the trench, we installed a drywell to collect and infiltrate the water before it could enter the canal. The trench provides a complete barrier to the flat area at the corner of Robinson and Canal Road where stormwater would ordinarily collect sediment and gain velocity before crossing Canal Road and flowing into the canal. The drywell now properly allows for complete infiltration of the runoff into the ground. The system has proven to be a very effective stormwater control measure. This project was an example of the true benefit of the YCC to the community. With no out-of-pocket expenses and the use of only on-site materials, a dramatic alteration of the site was accomplished and a highly effective system of BMPs was installed to properly control stormwater.



Municipal Property Before

Municipal Property After

BMPs installed:	Infiltration T Drywell	rench	
Total Number of BMPs:	2		
Ton of Sediment Prevented:	0.6		
Pounds of Phosphorus Prevented:	0.5		
Cost to Landowner:	\$0.00 (no ma	terials involved)
Crew Man Hours:	25 hours	1 day	(2 crew + crew leader)
	18.5 hours	½ day	(3 crew + crew leader)
Total:	43.5 hours	$1 \frac{1}{2} \text{ days}$	

8. Community Property (upper) Great East Lake Sanbornville, NH

The size and scope of this property and the time invested by the crew dictated that this site be split into two separate projects, each with its own set of issues and solutions. This season we tried to tackle large projects that amended entire landscapes for a complete solution to a property's erosion problem. Because of the variety of BMPs employed, these large projects were treated as two distinct projects with obvious isolated approaches to each section's solution.

This property is utilized by nine backlot properties that do not have waterfront. It is used for water access by these landowners and thus sees a lot of foot traffic. There is a parking area above a long slope leading down to a relatively flat sitting area before the property dips down sharply to the lake. Runoff from the parking area concentrates on the trail leading to the water and gains velocity as it travels. As the trail is the only non-vegetated area on the slope below the parking lot and is also the lowest point on the lakeside of the parking lot, runoff naturally flows down this narrow path. A steep slope, lack of vegetation, no duff layer, and compacted and

rocky soil combine to create a serious erosion problem as well as difficulties accessing the lake. The solution for the upper part of this property was to install timber waterbars periodically along the sloped trail to regularly break up water flow to reduce velocity and divert the water off of the path into adjacent vegetation. The waterbars also serve as steps for added traction while walking on the trail. The trail surface was then covered with a layer of erosion control mix to absorb and further slow runoff from the parking lot. The erosion control mix, combined with the waterbars, has helped to stabilize this pathway and improve lake access.



Community Property Before



Community Property After

Erosion Cont Paths & Wall	rol Mix kways	
3		
sheet erosion	, could not me	easure
could not cal	culate	
\$1,038.33 (w 148.5 hours 40 hours 188.5 hours	ith project #9 4 ½ days 1 day 5 ½ days	below) (3 crew + crew leader) (4 crew + crew leader)
	waterbars Erosion Cont Paths & Wall 3 sheet erosion could not cale \$1,038.33 (w 148.5 hours 40 hours : 188.5 hours	 waterbars Erosion Control Mix Paths & Walkways 3 sheet erosion, could not me could not calculate \$1,038.33 (with project #9 148.5 hours 4 ½ days 40 hours 1 day 188.5 hours 5 ½ days

9. <u>Community Property (lower)</u> <u>Great East Lake</u> <u>Sanbornville, NH</u>

The bottom area of the community property opens to a flat area perched above the lake to the left of the bottom of the trail. This flat area leads to a dock. To the right of the bottom of the trail, the property dips down to a small flat area just above the level of the lake. The small slope is used to access the lake for swimming, while the perched flat area is used for sitting and dock access. To provide better access to the lower area with direct access to the lake, a series of infiltration steps were installed for better traction on the slope. The infiltration steps also collect any residual runoff from the upper property. Erosion control mix was continued from the upper portion of the site and spread over the perched flat area, on the slope around the infiltration steps, and on the lower flat area close to the lake. The erosion control mix has stabilized the entire area and the infiltration steps now provide sure access to the lake.



Community Property Before

Community Property After

BMPs installed:	Erosion Control Mix Infiltration Steps
Total Number of BMPs:	2
Ton of Sediment Prevented:	sheet erosion, could not measure
Pounds of Phosphorus Prevented:	could not calculate
Cost to Landowner: Crew Man Hours:	\$1,038.33 (with project #8 above) see Project #8

10. Barbara Wing (driveway)Horn PondActon, ME

This site was another large project that required a lot of the crew's time and expertise. The property is situated at the beginning of a gravel camp road just off of a paved road and adjacent landscape sloping towards it. Runoff comes down the paved road, turns into the camp road, and escapes down the driveway of the Wings' property. Addressing this driveway portion of the property was the first project on the site. The runoff needed to be diverted off of the driveway and into the abundant vegetation. This would prevent it from forming gullies in the driveway, gaining velocity, and transporting sediment downhill into the lake. Two rubber razors were installed across the driveway, one close to the top and another above the parking area. These razors effectively divert water off of the driveway surface and the adjacent vegetation adequately infiltrates the runoff.



Barbara Wing Before

Barbara Wing After

BMPs installed:	Rubber Razor	S	
Total Number of BMPs:	1		
Ton of Sediment Prevented:	sheet erosion,	could not meas	ure
Pounds of Phosphorus Prevented:	could not calc	ulate	
Cost to Landowner:	\$1,134.00 (wi	th project #11 b	pelow)
Crew Man Hours:	80 hours	2 days	(4 crew + crew leader)
	22.5 hours	1 day	(3 crew)
	32.5 hours	1 day	(3 crew + crew leader)
Total:	135 hours	4 days	

11. Barbara Wing (lower)Horn PondActon, ME

This portion of the property was much more involved than the driveway aspect and utilized many more BMPs. The property beside the house slopes dramatically and was torn up during a diseased tree removal operation. The exposed sediment on the slope has been eroded by driveway runoff. Furthermore, roof runoff falls onto a portion of the slope and exacerbates the erosion problem. Walking access over the slope was required, and part of the slope needed to be open to vehicular travel at the request of the landowner. In addition to that, the entire slope needed to be stabilized and the project had to effectively address the roof runoff and slope erosion together. A large oak tree growing on the property served as a nice break between the foot traffic and vehicular access areas. On the house side of the tree, a set of infiltration steps was constructed adjacent to a dripline trench. The steps allow for much easier access to the lake from the front of the house as well as slowing down and allowing for the absorption of moving water. On the other side of the tree, a rubber razor was installed above the slope to divert driveway runoff into vegetation. Below the razor, erosion control mix was utilized to stabilize

the slope surface. The rubber razor and erosion control mix allow for a vehicle to access the back yard but still divert and control runoff.





Barbara Wing Before

Barbara Wing After

BMPs installed:	Rubber Razor Erosion Control Mix Infiltration Steps Dripline Trench
Total Number of BMPs:	4
Ton of Sediment Prevented:	2.7
Pounds of Phosphorus Prevented:	2.3
Cost to Landowner: Crew Man Hours:	\$1,134.00 (with project #10 above) see project #10

12. <u>Bob Grant (upper)</u>

<u>Belleau Lake</u>

East Wakefield, NH

Recent renovations left this property as a blank slate for our operations. This part of the town is very sandy and erosion has had a very serious impact on the water quality of the lake. Due to the pitch of the roof, there were two distinct problems occurring at this site. Roof runoff from the front of the house was combining with road and driveway runoff to erode sediment along the side of the house as it flowed toward the lake. Better access to the back of the house was required, and there was a door on the side of the house that was used as the primary entrance. Therefore, whatever BMP we utilized would need to work in conjunction with this doorway. The YCC installed a dripline trench at the front of the house. This dripline trench led to a staircase of wide infiltration steps. The steps were aligned with the doorway so that the middle step was centered at the entrance to provide a firm platform at this area. The rest of the slope was left as it was for the landowner to install further BMPs as a means to engage the landowner as an active stakeholder in the projects. The dripline trench and infiltration steps control the

majority of the erosion, and the landowner is responsible for adding native vegetation and erosion control mix to complete the project.



Bob Grant Before

Bob Grant After

BMPs installed:	Infiltration Ste Dripline Trene	eps ch	
Total Number of BMPs:	2		
Ton of Sediment Prevented:	0.6		
Pounds of Phosphorus Prevented:	0.5		
Cost to Landowner: Crew Man Hours: Total:	NA 32.5 hours 25 hours 40 hours 97 5 hours	1 day 1 day 1 day 3 days	(3 crew + crew leader) (2 crew + crew leader) (4 crew + crew leader)

13. Bob Grant (lower)

Belleau Lake

East Wakefield, NH

The second of the Grant projects involved the confluence of two roofs at an ell, concentrating the runoff into a torrent at the back of the house. This roof runoff had washed a significant amount of sediment from the back of the house into the lake. Water from the roof had to be collected and controlled before it could flow down the back slope into the lake. A large drywell was installed at the corner of the building where the heaviest precipitation occurred. This drywell connected to a dripline trench to collect the remainder of the runoff. A special situation existed at the back of the house because of the location of the back door. This door provided access to the lake from the house but was located over two feet off of grade. Therefore, in order to allow use of the door without compromising the infiltrating capabilities of the project, we built up a set of infiltration steps to the height of the doorway. This was a technique we had never used before

but proved to be quite successful. The underlying dripline trench still functioned effectively and did not compromise the stability of the stairs. Finally, on the path leading to the dock, there was a series of three steps that were retrofitted into infiltration steps. The backfilled soil of the steps had become so compacted that it had become an impervious surface. The soil was removed and replaced with crushed stone to create a porous walking surface where runoff could still be collected. This project concluded with the landowner again pledging to plant native vegetation and spread erosion control mix on the bare soil. Follow up of the landowner's installation will be conducted as outlined under task 6 below.



Bob Grant Before



Bob Grant After

BMPs installed:	Dripline Trench Drywell Infiltration Steps Retrofit Infiltration Steps
Total Number of BMPs:	4
Ton of Sediment Prevented:	0.4
Pounds of Phosphorus Prevented:	0.3
Cost to Landowner: Crew Man Hours:	NA see project #12

14. Dee Kasprzak Great East Lake Acton, ME

Dee's house is set up atop a steep slope that leads directly down to the lake. Some retaining walls, terracing, and native vegetation had already been established on the slope, but it was inadequate given the amount of erosion the property experiences. At the bottom of the slope, the property flattens slightly for a stretch before eventually reaching the water. Basic cinder block stairs descend the hill to provide access to the lake. At the bottom of the steps, a path has been used to walk along the bottom of the hill to reach the dock. This pathway slopes toward the lake,

consists of bare soil, and does not provide adequate traction for foot travel. This project required the implementation of numerous BMPs in order to properly alleviate the erosion problems. The stairs' back-filling had become compacted and was replaced with crushed stone to retrofit them into infiltration steps. Much of the runoff ran down these stairs and gained enough velocity to erode a considerable portion of the beach. The infiltration steps will collect this runoff and provide better access to the lake. The pathway between the bottom of the stairs and the dock was stabilized with a long infiltration step, leading to two smaller infiltration steps to reach the level of the dock. The long step runs along the bottom of the steep hill and collects any runoff before it can enter the lake. It also provides a flat, level, sturdy walking platform. Buffer vegetation was planted between the infiltration step and the lake to further stabilize the soil and absorb water and nutrients, as well as enhance the waterfront aesthetics of the site. Native vegetation was planted and erosion control mix was spread all over the slope above the infiltration step. This will absorb a lot of the runoff coming from the lot above and significantly reduce the amount of runoff reaching the BMPs at the bottom of the slope. Finally, timber waterbars were installed on the slope adjacent to the retrofit infiltration steps. The waterbars will divert the runoff flowing beside the steps into the local native vegetation and keep the water away from the beach area. This project stabilized a very precarious slope.



Dee Kasprzak Before



Dee Kasprzak After



Dee Kasprzak Before



Dee Kasprzak After

BMPs installed:	Waterbars Retrofit Infiltration Steps Erosion Control Mix Infiltration Steps Buffer Strip Native Vegetation		
Total Number of BMPs:	6		
Ton of Sediment Prevented:	0.2		
Pounds of Phosphorus Prevented:	0.2		
Cost to Landowner: Crew Man Hours: Total:	\$840.00 57 hours 11 hours 32.5 hours 100.5 hours	1 ½ day ½ day 1 day 3 days	(4 crew + crew leader) (2 crew + crew leader) (3 crew + crew leader)

15. <u>Sue Cain</u>

<u>Great East Lake</u>

Acton, ME

This property has a long, narrow access road through a heavily wooded area to reach the house directly on the lake. Thanks to the heavy wooded vegetation, the only real source of erosion is runoff from the gravel road and driveway. Runoff was carrying sediment from the road surface and depositing it into the lake. The solution to this erosion problem was rather simple: utilize rubber razors to divert runoff away from the road surface and into the abundant native vegetation where it can be controlled and absorbed. The installation was quick, straight-forward, and highly effective.



Sue Cain Before

Sue Cain After

BMPs installed:

Rubber Razors

Total Number of BMPs:

Ton of Sediment Prevented: sheet erosion, could not measure

3

Pounds of Phosphorus Prevented: could not calculate

Cost to Landowner:	\$560.29		
Crew Man Hours:	38.5 hours	1 ½ day	(2 crew + crew leader)
	6 hours	¹∕₂ day	(2 crew)
	Total: 44.5 hours	2 days	
		-	

16. <u>Celia Thibodeau</u>

Wilson Lake

<u>Acton, ME</u>

This property serves as a right-of-way for several other backlot residents on the road. Water would travel down the paved road and either run off the shoulder and enter the site from the roadside culvert or flow directly from the road down the driveway access. The driveway is long and sloping towards the lake. Complicating the project are the berms on either side of the driveway, severely limiting the ability to shed water away from the driveway surface. It was determined that the runoff needed to be diverted from the right-of-way as early as possible to prevent the runoff from gaining velocity and further eroding the surface material. Two open-top culverts were constructed and installed in areas where water immediately entered the site so that the water would be instantly captured and diverted. At the terminus of each open-top culvert, a turnout was dug through the berm in order to facilitate the movement of water from the site and into the adjacent vegetation. Diverting the runoff so high on the site eliminated the need for further BMP installations closer to the lake, preserving the aesthetics of the property.



Celia Thibodeau Before



Celia Thibodeau After

BMPs installed:

Open-Top Culverts Turnouts

2

Total Number of BMPs:

Ton of Sediment Prevented: 0.5

Pounds of Phosphorus Prevented: 0.4

Cost to Landowner:\$80.00Crew Man Hours:10 hours

1 day

(Technical Director)

TASK 6Technical Assistance Designs

Requests for technical assistance were received from residents on all of the lakes in the region. These requests were the result of recruitment efforts by AWWA at community events, press articles, and presentations at lake association meetings. Also, requests were received thanks to the recommendations of previous YCC hosts and Technical Assistance clients.

A total of 39 technical Assistance Design packets were developed and delivered to landowners for them to implement their own erosion prevention measures. Some of these clients expressed interest in being considered as project hosts for the 2009 YCC season. Others preferred to do the work themselves. Technical Assistance Design clients were asked to sign a pledge sheet indicating that they would implement at least one of the BMPs outlined in the design within 12 months. This will be verified with site visits in 2009. The design packets included an introductory letter, an outline of the recommended BMPs with clear descriptions and instructions, the pledge sheet, and fact sheets for each BMP outlining specifically how to install and maintain each BMP. Additionally, a diagram of the site or altered photos of the property displayed exactly where each BMP should be installed [Appendix 7].

The following is a list of Technical Assistance clients by lake:

Great East Lake

- 1. Bob Berlan
- 2. Lisa & Rich Brown
- 3. Sheila Ross
- 4. Ailene Reyenger
- 5. Ron & Kathy McKay
- 6. Dave Barr

Lovell Lake

- 7. Ernie Dery
 8. Glenn Rowley
 9. Anusia Hirsch
 10. David Tinkham
 11. Bob Eldredge
 12. Debra Fortier
 13. Charles McDonald
 14. John Hooper
- 15. Jack Reynolds

Belleau Lake

16. Janet Consolmagno
17. Rosline Landers

18. Bob Grant

Balch Pond

Elaine Hall
 Bill Sheehan
 Bill Goodwin

365 Langley Shores Drive 791 Canal Road 222 Kiltie Drive 148 Grand View Road 535 Wansor Road 107 Leisure Lane

754 Brackett Road
758 Brackett Road
698 Brackett Road
740 Brackett Road
1041 Lovell Lake Road
441 Lovell Lake Road
125 Witchtrot Road
654 Brackett Road
131 Lovell Lake Road

91 Vange Way 15 Desmond Drive 182 Fisher Road

15 Green Bay Road 98 Kennetts Point Road 478 Raccoon Road

- Acton, ME Sanbornville, NH Acton, ME Acton, ME East Wakefield, NH Sanbornville, NH
- Sanbornville, NH Sanbornville, NH
- East Wakefield, NH East Wakefield, NH East Wakefield, NH

West Newfield, ME West Newfield, ME Acton, ME

Pine River Pond

22. Howie & Pam Knight	139 Chandler Lane	East Wakefield, NH
23. Mary Richards	87 Olde Pine Road	East Wakefield, NH
24. Jack Lemery	26 Crew Road North	East Wakefield, NH
25. Bobbi Darnell	278 Camp Road	Sanbornville, NH
26. Donna Dodge	806 Lord Road	Sanbornville, NH
27. Adin Wolfgram	418 Sparhawk Terrace	East Wakefield, NH
28. Mark McRobbie	488 Pinewood Shores Road	East Wakefield, NH
29. Mike Addesa	962 Lord Road	Sanbornville, NH
30. Norman Clapp	22 Blue Wave Lane	Sanbornville, NH
Wilson Lake		
31. Jeff Brown	346 Peacock Road	Acton, ME
32. John Nadeau	252 Hawk Road	Acton, ME
Horn Pond		
33. Barbara Wing	11 Mountain View Drive	Acton, ME
34. Elaine & David Shippee	220 Donahue Road	Sanbornville, NH
35. Mary James	143 Martha Horn Road	Acton, ME
Province Lake		
36. Grace Barter	219 Bailey Road	Effingham, NH
Lake Ivanhoe		
37. Nancy Takis-Conway	766 Acton Ridge Road	East Wakefield, NH
38. Richard Hoage	32 Dearborn Road	East Wakefield, NH
39. Larry & Norma Gray	40 Dearborn Road	East Wakefield, NH

The following follow-up procedure was developed and adopted this season for the inspection of TA client BMP installations:

- Follow-up visit and photo documentation by Technical Director (TD) will occur within 12 months of Technical Assistance (TA) design mailing, but not before adequate time for implementation.
- If no BMPs from the design have been implemented, TD will discuss the design with TA client to encourage implementation and redesign TA if necessary.
- If at least one BMP has been implemented, TD will evaluate functionality of the BMPs and encourage implementation of additional BMPs.
- If implemented BMP is functioning properly, TD will review maintenance procedures with TA client and not revisit site unless contacted by TA client.
- If BMP has failed, TD will determine reason for failure:
 - If failure is due to design flaw, TD will redesign TA for TA client to implement.
 - If failure is due to improper installation, TD will demonstrate and/or explain proper installation to TA client, and TD will reevaluate site within 12 months.
 - If failure is due to lack of maintenance, maintenance procedures will be discussed with TA client and site reevaluated within 12 months. A list of local maintenance companies will be made available upon request of the landowner.

- Upon successful implementation of TA design and subsequent positive inspection by TD, TA client will be awarded AWWA yard sign indicating active involvement in erosion control and water protection efforts.
- TA client is encouraged to contact TD for assistance with any erosion problem.

TASK 7Administrative Duties

All required administrative duties were accomplished in a timely manner including researching and soliciting future support and reporting on previous grants. All financial records are up-to-date and have been approved through an independent financial review. All necessary insurances are in force and tax filings submitted as required. The AWWA Board meets monthly with additional committee meetings as needed. The AWWA Board continues to be actively engaged with projects and interest in joining the AWWA board continues to increase. All business has been attended to as needed.

Conclusions and Recommendations

The 2008 season demonstrated an increased public awareness and support of the YCC's endeavors. Local response to the YCC's work on both municipal and private properties has been highly positive and vocal. The YCC has become a source of pride in Wakefield and Acton, as selectmen, town officials, residents, and visitors repeatedly cite the success of the YCC at town meetings and public functions. A recent budget committee meeting exemplified this case, as a selectman adamantly advocated for the continued funding of the YCC referring to the success of our grass-roots efforts as the kind of movement the town needs and desires.

On an individual level, the YCC continues to inspire landowner awareness of erosion problems, lake health, and watershed stewardship. Anecdotal evidence abounds of landowner concern for property preservation and lake ecosystem sustainability. Thanks to the ambassadorial role of the YCC crew members, many community members have expressed a greater appreciation of the importance of lake vitality. The YCC's inexpensive, low-tech solutions to persistent problems have inspired a community to spread AWWA's outreach efforts. Neighbors of previous project hosts have requested technical assistance based on the results of the YCC.

The YCC has been successful in spreading the message about the positive correlation between water quality and property values. This has proven to be a valuable tool for inspiring landowner action against erosion. Above the intrinsic and environmental values of the waterbodies in the region, economic value provides the strongest motivation for preservation. It has been reported that even a perceived decline in water quality can negatively affect property values. The YCC has helped to curb this perception by being the physical representation of AWWA in the community, demonstrating the concern for water quality and conservation of lake health.

On project sites, the YCC was welcomed warmly and with great enthusiasm. The services that the YCC provides are unique and fill a long-vacant niche in the community. We provide a forum for discussing pressing issues that were previously left unaired. Prior to the genesis of the YCC, there had been few resources where landowners could receive information about erosion and its remediation, and few open ears for people to express their grievances. All involved landowners expressed gratitude for our assistance and many divulged that they felt that they had no options for fixing the erosion problems they felt plagued by. The YCC continues to perpetuate the conversation within the region regarding economical, effective, simple, do-it-yourself solutions to aggravating erosion problems.

AWWA would like to improve the recruitment plan for the crew leader and crew members. Given the rural nature of the communities and their lack of proximity to the more largely populated areas, it is difficult to attract a wide array of crew leader applicants. While we have been fortunate that the few applicants we have drawn have been highly qualified and capable we are eager to strengthen our recruiting techniques. Greater effort will be put forth to advertise the position at local colleges and universities as well as applicable industry, municipal, and state agency websites.

Additionally, improved recruitment of crew members will be a focus for the future. Neither Acton nor Wakefield has a local high school and the students attend regional schools in Sanford

and Rochester, respectively, making targeted recruitment difficult. Communication with teachers and guidance counselors at area high schools will be increased, with the goal of in-school presentations and lessons to pique interest in our work and attract interested applicants.

The YCC completed a number of sizable projects in 2008, some of which involved multiple BMPs on several areas within the one project site. While the end results effectively corrected pollution problems, there may be a larger impact by visiting more sites and installing some of the recommended BMPs while teaching the landowner to self-install further practices. In the future, the YCC will work more closely with the project host to teach and empower them to take ownership of the project and complete the installation of BMPs once the YCC has installed the most important and technically demanding practices.

The 2008 summer season witnessed unprecedented wet weather creating planning challenges for outdoor work with a youth crew. There were many opportunities to witness the effects of stormwater runoff and the effectiveness of the YCC projects. While the rain offered many teaching opportunities it did impact the amount of time spent on project sites. The Technical Director will attempt to plan activities that can be accomplished during rain events to keep the crew working at peak performance.

YCC projects are chosen from the list of qualified technical assistance requests. Requests for assistance are initially sent to AWWA for review by concerned landowners who have learned about AWWA's services through outreach and education efforts. Property owners self-identified their erosion problems and then initiated the request. In order to more effectively target where the YCC projects will be most effective, AWWA began conducting watershed surveys this season. These watershed surveys identify all instances where sediment is being eroded into the waterbody. Every lot in the watershed is visited and is formally documented when erosion is observed. The information from these surveys will be compiled and used to identify the areas in the watershed where the most serious erosion is occurring and where additional YCC efforts should be focused. This will transition the YCC from a primarily reactionary group to a more proactive one. Landowners will not be forced or pressured into involvement with the program, but they will be strongly encouraged given the weight of the watershed survey data.

In all, the successes and lessons learned during the 2008 season will serve to improve the quality of the YCC's work and improve our effectiveness and efficiency. The YCC strives to refine and optimize its approach to erosion control, and each year is a new exercise in this endeavor. We look forward to the 2009 season to put this knowledge into practice.

Appendix 1

Acton Wakefield Watersheds Alliance Youth Conservation Corps Projects 2008



Technical Assistance Clients 2008


Appendix 2

NPS Projects - Pollutants Controlled Report

New Hampshire Department of Environmental Services, Watershed Assistance Section

DES Project Number: <u>B-08-C-02</u> Annual Report for the year: <u>2008</u>

Project Title: <u>Youth Conservation Corps</u>

Grantee: <u>Acton Wakefield Watersheds Alliance</u>

Table 1. Pollutant Load Reduction Estimates for NPS Sites Treated with BMPs

Waterbody Name	Sediment	Phosphorus	Nitrogen	
	tons per year	pounds per year	pounds per year	
Lovell Lake	1.7	1.5	N/A	
Great East Lake	4.0	3.9	N/A	
Belleau Lake	1.1	0.9	N/A	
Horn Pond	2.7	2.3	N/A	
Province Lake	3.4	2.9	N/A	
Wilson Lake	0.5	0.4	N/A	
Totals	13.4	11.9	N/A	

Table 2. Wetlands, Streambanks, Shoreline Protected / Restored During This Project

Resource	Planned	Actual	Planned	Actual
	acres	acres	linear feet	linear feet
Wetlands restored			not applicable	not applicable
Wetlands created			not applicable	not applicable
Streambank /shoreline protected	not applicable	not applicable		
Stream channel stabilized	not applicable	not applicable		

The estimations in this report were determined using the appropriate estimation model(s) and applied according to the procedures prescribed for the model. To the best of my knowledge these are reasonable estimates using appropriate methods. Documentation is kept on file by the grantee and is available for review by DES / EPA.

Submitted by (for Grantee):			_ on/_/
· · · · · <u> </u>	Signature	Printed Name	
Reviewed by (for DES):	Signature	Printed Name	on/_/

NPS Projects - Pollutants Controlled Report

New Hampshire Department of Environmental Services, Watershed Assistance Section

DES Project Number: <u>B-08-C-02</u>

Annual Report for the year: <u>2008</u>

Table 3. List of NPS Sites and Methods Used

Site ID (name or # from site list)	Brief Description NPS Site	Estimation Method / Sub- Method Used	Tons of Sediment This Year	Pounds of Phosphorus This Year	Pounds of Nitrogen This Year
Alan Heacock Property (Lovell Lake)	Rubber Razors	Region 5/GEE	1.3	1.1	N/A
Will Collier Property (Belleau Lake)	Rain Garden, Buffer Strip	Region 5/GEE	0.1	0.1	N/A
Public Launch Property (Great East Lake)	Erosion Control Mix	Region 5/GEE	3.2	3.2	N/A
Public Launch Property (Lovell Lake)	Erosion Control Mix, Waterbar	Region 5/GEE	0.4	0.4	N/A
Municipal Property (Province Lake)	Infiltration Steps, Waterbars, Riprap	Region 5/GEE	3.4	2.9	N/A
Municipal Property (Great East Lake canal)	Infiltration Trench, Drywell	Region 5/GEE	0.6	0.5	N/A
Barbara Wing Property (lower) (Horn Pond)	Rubber Razor, Erosion Control Mix, Infiltration Steps, Dripline Trench	Region 5/GEE	2.7	2.3	N/A
Bob Grant Property (upper) (Belleau Lake)	Infiltration Steps, Dripline Trench	Region 5/GEE	0.6	0.5	N/A
Bob Grant Property (lower) (Belleau Lake)	Dripline Trench, Infiltration Steps, Drywell, Retrofit Infiltration Steps	Region 5/GEE	0.4	0.3	N/A
Dee Kasprzak Property (Great East Lake)	Waterbars, Retrofit Infiltration Steps, Erosion Control Mix, Buffer Strip, Infiltration Steps, Native Vegetation	Region 5/GEE	0.2	0.2	N/A
Celia Thibodeau Property (Wilson Lake)	Open-Top Culverts, Turnouts	Region 5/GEE	0.5	0.4	N/A
		Totals for the Year:	13.4	11.9	N/A

Pollutant Load Reduction Estimation Methods

1. Region 5 Model Refer to EPA website http://it.tetratech-ffx.com/stepl/default.htm Go to the Region 5 Load Estimation Users Manual, "Michigan Method".

Descriptors to use for Region 5 Model sub-methods:

F F F F F F F F F F F F F F F F F F F	$-\partial$
Region 5 / GEE	Gulley Stabilization - uses Gulley Erosion Equation
Region 5 / CEE	Streambank / Ditchbank and Roadbank Stabilization - uses Channel Erosion Equation
Region 5 / Fields	Agricultural Fields - uses Revised Universal Soil Loss Equation (RUSLE), sediment
	delivery ratio and contributing drainage area.
Region 5 / Filter	Filter Strips - uses relative gross filter strip effectiveness
Region 5 / Feedlot	Feedlot Pollution Reduction - uses a 12 step method

2. WEPP Model. Refer to USFS website http://forest.moscowfsl.wsu.edu/fswepp/ Water Erosion Prediction Project (WEPP) computer model

Appendix 3



Acton Wakefield Watersheds Alliance Region

Appendix 4

Sanford News October 16, 2008 Granite State News October 16, 2008 This is a printer friendly version of an article from **www.fosters.com** To print this article open the file menu and choose Print.

Back

Article published Oct 16, 2008 Acton-Wakefield I Youth Conservation Corps completes third year of lake work

ACTON — This summer marked the third year for the Acton-Wakefield Watersheds Alliance's Youth Conservation Corps (YCC).

The YCC employs high school students during the summer months to participate in conservation efforts to protect the water quality of the ten lakes in and around the Town of Acton.

The YCC provides free labor for landowners to install "best management" practices that are aimed at reducing sediment erosion. Such "best management" practices include planting rain gardens and buffer strips with native vegetation, installing waterbars to divert water off paths and slopes, and constructing infiltration steps to capture water.

During the past three years, the YCC has installed a total of 129 "best management" practices, preventing more than 45 tons of sediment from entering the lakes every year. Additionally, more than 90 additional landowners have received personalized management plans to help control the erosion on their own properties. All participants learn about the low-cost and effective measures they can take to prevent pollution and protect the lakes.

In August, the ten YCCs operating throughout the state of Maine were honored in Yarmouth by the Cumberland County Soil and Water Conservation District. More than 80 students were involved in YCC work this summer, stabilizing miles of shoreline, planting thousands of plants, and installing hundreds of "best management" practices. The group was praised by Maine Department of Environmental Protection Commissioner David Littell and presented with certificates of appreciation.

There was also a friendly competition between the ten YCCs involving a sculpture contest and a relay race with the Acton-Wakefield Watersheds Alliance's YCC winning first place. The Acton-Wakefield Watersheds Alliance's YCC was supported by funds from the sale of the Conservation License Plate (Moose Plate) under the New Hampshire State Conservation Committee grant program; the Towns of Acton and Wakefield, New Hampshire; local lake associations and businesses; the Lake Region chapter of the New Hampshire Charitable Fund; and other private foundations and individual donors.

In addition to the YCC erosion control projects, the Acton-Wakefield Watersheds Alliance and 50 volunteers conducted watershed surveys on Horn Pond in Acton and Lovell Lake to identify sources of pollution that are affecting water quality and reducing property values. The Alliance encouraged Acton's Wilson Lake Association to update its 1994 watershed survey and will coordinate watershed surveys on Great East Lake and Lake Ivanhoe in the spring of 2009. These surveys compile data to help create a watershed management plan for the headwaters of the Salmon Falls River to help guide towns, lake associations, individual property owners, and the Acton-Wakefield Watersheds Alliance to better address improving erosion control at

endangered sites.

The watershed management plan project is funded in part by a grant from the New Hampshire Department of Environmental Services with funding from the U.S. Environmental Protection Agency under Section 319 of the Clean Water Act.

While public and private grants have helped jump-start the Alliance's program, community support is just as important. Looking ahead to 2009, the Alliance is undertaking a membership drive to encourage residents of the Acton and other communities to join in the effort to protect waters throughout the region.

For more information and membership forms, visit online at www.AWwatersheds.org.

N.H. Veterans Home Will Hold Candidates' Forum on Oct. 29

Hampshire Veterans Home (NHVH) will hold a Candidates' Forum on Wednesday, Oct. 29, from 1-4 p.m. in the Home's Great Room. The program is open to the pub-

TILTON — The New lic and there is no admission fee.

> The program will feature candidates for congressional (U.S. Senate; U.S. House of Representatives) seats, state offices (Governor, Executive

Milton/Wakefield Child Check Clinic Nov. 7

WAKEFIELD — SAU #64 will sponsor a free Child Check Clinic for the residents of Milton and Wakefield on Friday, Nov. 7, from 9 a.m. to noon at the Milton Elementary School in the Bright Beginnings classroom. Children between the ages of birth to five years will be screened for possible educational disabilities. If you

suspect your child may have difficulty with speech and language skills, motor skills, or difficulty learning new activities, this Clinic will help answer your questions. Appointments are required. For further information and to schedule an appointment, please call Carol Pike, Secretary, Special Education Services, at 473-2326.

NH State Senate, the House of Representatives, as well as candidates for County Attorney and Sheriff in districts serving Belknap and Merrimack counties). NHVH residents, staff, family, friends, and community members are invited to participate.

Barry E. Conway, NHVH Commandant, said "The Veterans Home is a community

Council, and candidates for resource; by hosting this event, we hope to give the candidates an opportunity to outline their positions on pertinent issues facing New Hampshire."

Each candidate will have a chance to speak for two minutes, a question and answer period will follow, and then audience members and candidates will be able to talk informally and enjoy refreshments. For more information on the Candidates' Human Services, the mod-Forum, please contact Barry Conway at the New Hampshire Veterans Home at 527-4400.

The New Hampshire Veterans Home was established in Tilton in 1890 as the Soldier's Home for Civil War Veterans. One of just four New Hampshire nursing homes to win the 2007 Quality of Life Award from the NH Department of Health &

ern facility is home to men and women who have served their country and fellow New Hampshire citizens. The mission of NHVH is to provide high quality, professional long-term care services to the Granite State's elderly and disabled veterans. NHVH is the only long-term care facility in the Granite State that is dedicated exclusively to veterans.

Gafney Library art exhibit for October

WAKEFIELD — Woodblock and pencil prints, watercolor and puzzles are the featured pieces in the October art exhibit at The Gafney Library in Sanbornville.

AWWA programs build water stewardship

WAKEFIELD — This summer marks the third successful year for the Acton Wakefield Watersheds Alliance (AWWA) Youth Conservation Corps (YCC). The YCC employs high school students over the summer months to participate in conservation efforts to protect the water quality of the area's 10 lakes.

The YCC provides free labor for landowners to install best management practices that are aimed at reducing sediment erosion. Such best management practices include planting rain gardens and buffer strips with native vegetation, installing waterbars to divert water off of paths and slopes, and constructing infiltration steps to capture water. Over the past three years, the YCC has installed a total of 129 best management practices, preventing over 45 tons of sediment from entering the lakes every year. Additionally, over 90 additional landowners have received personalized management plans to help control the erosion on their own properties. All participants learn about the low-cost and effective measures they can take to prevent pollution and protect the lakes. In August, the 10 YCCs operating throughout the State of Maine were honored in Yarmouth, Maine, by the Cumberland County Soil and Water Conservation District. Over 80 students were involved in YCC work this summer, stabilizing miles of shoreline, planting thou-



sands of plants, and installing hundreds of best management practices. The group was praised by Maine Department of Environmental Protection Commissioner David Littell and presented with certificates of appreciation. There was also a friendly competition between the 10 YCCs involving a sculpture contest and a relay race with the AWWA YCC, which is the only YCC also operating in New Hampshire, winning first place. The AWWA YCC was supported by funds from the sale of the Conservation License Plate (Moose Plate) under the N.H. State Conservation Committee grant program, the Towns of Wakefield, N.H. and Acton, Maine, local lake associa- tion 319 of the Clean Water tions, local businesses, the Act. N.H. Charitable Fund— Lakes Region, other private foundations and individual donors. In addition to the YCC erosion control projects, AWWA and 50 enthusiastic volunteers conducted watershed surveys on Horn Pond and Lovell Lake to identify sources of pollution that are affecting water quality and reducing property values. AWWA encouraged the Wil-

son Lake Association to update its 1994 watershed survey and will coordinate watershed surveys on Great East Lake and Lake Ivanhoe in the spring of 2009. These surveys compile data to aid in the creation of a watershed management plan for the headwaters of the Salmon Falls River to help guide towns, lake associations, individual property owners, and AWWA to better address improving erosion control at endangered sites. The watershed management plan project is funded in part by a grant from the N.H. Department of Environmental Services with funding from the U.S. Environmental Protection Agency under Sec-

Local artist Colina Cummings, Jaffrey resident Deb DeCicco and Wakefield "puzzlist" Al Hines have brought forth interesting pieces of work to form an eclectic exhibit challenging exhibit coordinator Peter Abate to arrange various mediums. Abate has risen to the occasion to produce an arrangement of botanicals, places and puzzles.

Cummings began painting when she retired in 2000 to Sarasota, Fla., where she took lessons in watercolor painting for two seasons at the Ringling School of Art. Cummings then joined Venice Art Center in Venice, Fla. and participated in various watercolor lessons and workshops. In August 2008 she was enrolled in a fourday "Painting on Location" workshop with the artist Michael Vermette at Schoodic Point, Maine. She and her husband divide their time between Sarasota and Wakefield.

al artist for over 35 years. Largely self-taught, she has worked in a variety of media including watercolor, fiber arts, bookmaking, collage, graphite, colored pencil and printmaking. This exhibit at the library explores botanical subjects in woodblock prints and pencil. She strives to capture the gesture of the flower and often evokes a mood or attitude through the posture of the flowers and leaves. Beginning with flowers or a cluster of leaves, she creates her composition by what she chooses to draw and what she chooses to leave out. Often, it's after the composition is complete that the mood or message becomes apparent. The woodblock prints are done in the traditional method of moku hanga developed in Japan during the 18th century. Each individual print is made entirely by hand without the use of a press and each color is printed from a

DeCicco has been a visuseparate, hand carved block

using acid free paper, paint, brushes and a hand-held baren. Each print is part of a numbered, signed edition. DeCicco says, "It is my hope, that these prints and drawings will be a reminder to all of the infinite beauty that we see every day, all around us."

Hines has spent years putting together puzzles and then framing the ones he deems worthy. Beautiful scenery and architecture seem to have captured his eye for this exhibit. He has donated his framed puzzles to the library as a fundraiser. He and his wife Joann live in Wakefield and are involved in several community activities.

The art exhibit may be viewed at the library during the open hours of Tuesday and Thursday 1-7:30 p.m.; Wednesday and Friday 10 a.m.-noon and Saturday 9 a.m.-2 p.m. Library Director Beryl Donovan may be reached at the library at 522-3401.



While public and private grants have helped jumpstart the AWWA programs, it is essential that the local communities support its future efforts. Looking ahead to 2009, AWWA is undertaking a membership drive to encourage residents of the Acton and Wakefield to join in the effort to protect our waters. Visit www.AWwatersheds.org for more information and membership forms.

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I'm fluent in mortgages.

When it comes to home financing, you want someone who speaks the language. Mortgages, home equity, refinancing, construction... call me today and I can help identify the right home financing option for you.



Contact Karol Smith

15 Varney Road, Wolfeboro, NH Office: 603-569-0812 ksmith@eOcean.com

www.eOcean.com

Appendix 5 Acton Wakefield Watersheds Alliance

TECHNICAL ASSISTANCE REQUEST FORM

Contact Information		
Name:	Date Requested:	
Home Phone Number:	Lake Phone Number:	
Cell Phone Number:	Other Number:	
Email Address:	Preferred Method of Contact:	
Mailing Address		
Street Address:		
Town, State, Zip Code:		
Physical Lake Addres	ss (If Different From Above)	
Street Address:	Dates at Lake:	
Town, State, Zip Code:	Lake:	

Problem Description

Please describe your stormwater runoff problems as best you can. Include a description of the problem location and how you intend to use the area (footpath, seating area, plantings, etc.) Feel free to attach a photograph of the area.



July 8, 2008

Dee Kasprzak 74 Chipmunk Run Acton, ME 04001

Dear Dee,

Thank you for allowing the Acton Wakefield Watersheds Alliance (AWWA) Youth Conservation Corps (YYC) to assist you on your property. We greatly appreciate your concern for the water quality of Great East Lake and your support of our protection efforts.

The following evaluation and recommendations for your property on Chipmunk Run are based on commonly accepted erosion and phosphorus control measures. They are aimed at improving the quality of water in the Acton and Wakefield watersheds. We encourage the implement of these recommendations but please remember that your participation in the program is purely voluntary.

I have included a copy of the site design, a narrative explaining the design, a list of materials we will need to implement the plans, a list of local suppliers, our project host guidelines, and two copies of our letter of agreement. We ask that you sign one copy and return it in the envelope provided. I have also enclosed copies of fact sheets for each of the best management practices (BMPs) we will implement on your property. These sheets can be referred to for proper maintenance of each BMP. Additionally, I have enclosed a sheet for tracking your time and cost involved with the project. We ask for this information as part of our grant match program. Please fill it out during the course of the project and return it upon the project's completion.

We look forward to working with you to improve your property.

Sincerely,

Adam Shoukimas Technical Director



ACTON WAKEFIELD WATERSHEDS ALLIANCE PO Box 235, 254 Main Street, Union, NH 03887 Tel. (603) 473-2500 info@AWwatersheds.org

YCC Project Host Guidelines

Thank you for your interest in having the Acton Wakefield Watersheds Alliance (AWWA) Youth Conservation Corps (YCC) assist you on your property. Through this project, you will help to protect the lakes of the Ossipee River and Salmon Falls River watersheds from the effects of erosion and polluted stormwater runoff – and you will save some money while doing it! We put the following list of guidelines together for you to prepare and know what to expect as we plan and work with you on your property.

- Letter of Agreement We will send you a letter of agreement to sign before the crew begins work on your property. It is a simple agreement that will outline our responsibilities to each other. Please review it, sign it, and return one copy of the agreement to us. Keep the other copy for your records.
- Know Your Property Lines We want to make sure that the YCC crew has permission from every landowner whose property will be impacted by the proposed work. Please make us aware if any other landowners own portions of the property or road where the work will take place.
- **Permits** Permits relating to the Shoreland Protection Act (through the town code enforcement officer) and the Natural Resources Protection Act (through the Maine Department of Environmental Protection) or the Wetlands Rules and Shoreland Protection Act (through the New Hampshire Department of Environmental Services) may be necessary to complete the agreed upon work. The YCC Director will assist you in obtaining these permits and provide you with copies of the permits for your records.
- Scheduling The crew works Monday through Friday from 8am to 4:00pm. We will schedule the day and time to begin work on your property in advance so you can prepare to have the necessary materials on site before the crew begins. Please be aware that weather, difficulties at other sites, and other factors might force us to rearrange the schedule. We will communicate any schedule changes to you with as much advance notice as possible. Please let the director know if there are any days when work cannot occur at the site.
- What will the crew work on? The Technical Director, Adam Shoukimas, and the Crew Leader, Patrick Jackson, will work with you to determine exactly what work will be completed on your property. The plans will be agreed upon before the crew begins work. Although slight adjustments might be necessary during construction, the crew will not be able to make major design changes or do work not agreed upon by you and the technical director ahead of time.

- **Procurement of Materials** The YCC will bring the necessary equipment and tools to complete the project. You should purchase the project materials and have them on site in advance of the crew beginning their work. The materials you are responsible for can include plants, timbers, gravel, crushed stone, nails, or other hardware. We will work with you to compile a materials list and help identify sources for those materials in advance of the workday.
- **Donations** AWWA is operated as a 501c3 non-profit organization. In addition to grant funds received from the New Hampshire Department of Environmental Services, we rely on contributions from lakes associations, towns, and individual donations to keep this program running. These contributions pay for the crew members, crew leader, and technical director's time spent on your project, as well as insurance and other equipment costs. Any donations to AWWA will be greatly appreciated.
- Safety The crew is made up of local youth between 15 and 18 years old. Safety rules prohibit the crew form doing any work with power tools, chainsaws, tractors, and similar equipment. Please respect these safety considerations when the crew is on your property. Also, please notify the crew leader of any underground or overhead wires, pipes, septic systems, or other safety hazards before the crew begins work.
- **Clean-up** The crew will clean up the site to the best of their ability; however, there is often scrap rock and rock dust left over. The crews would appreciate knowing the best place to dispose of this. In addition, there also may be a small amount of materials remaining, which will be piled neatly on your property. If you would like them moved, we can arrange for them to be transported, either by trailer or with the help of a contractor. However, enlisting the help of a contractor may be more expensive.
- **Maintenance** The Best Management Practices (BMPs) installed on your land will need additional maintenance in order for them to work properly. BMP fact sheets will be provided outlining the BMPs installed on your land and the ways in which to best maintain them. It is up to you to provide maintenance.
- The AWWA YCC is a conservation organization composed of students who care about the water quality of the lakes in Ossipee River and Salmon Falls River watersheds. We are not professional landscapers. If you need the services of a contractor, we can work with you to find a local business.

Thanks again for participating in this project and for being a good lake steward!



ACTON WAKEFIELD WATERSHEDS ALLIANCE PO Box 235, 254 Main Street, Union, NH 03887 Tel. (603) 473-2500 info@AWwatersheds.org

Letter of Agreement Between:

Acton Wakefield Watersheds Alliance Youth Conservation Corps (AWWA YCC) and Dee Kasprzak, 74 Chipmunk Run, Acton, ME

In consideration of implementing planned work to improve water quality, wildlife habitat, accessibility, and overall aesthetics of 74 Chipmunk Run, the parties agree as follows:

Responsibilities of the landowner (Dee Kasprzak):

- 1. Agrees to purchase necessary materials, (i.e. soil, rock, mulch, and plants).
- 2. Agrees to display AWWA YCC sign and permit AWWA YCC representatives access to the site area for BMP monitoring, tours and/or site visits at a mutually convenient time for a period of five years.
- 3. Agrees to routinely water plants until they are sufficiently established.
- 4. Agrees to provide proper maintenance of BMPs for a minimum of five years as outlined in BMP fact sheets and the provided maintenance guide.
- 5. Agrees to pay the permit fees at the time of permit submittal.
- 6. Agrees to track the total amount of money spent, the total number of yards of soil, rock, mulch, etc. purchased, and the total number of plants planted; and supply AWWA with these numbers at the completion of the project.

Responsibilities of the AWWA YCC:

- 1. Agrees to document site conditions through notes and photos and provide a site design plan.
- 2. Agrees to assist landowner in obtaining the proper permits.
- 3. Agrees to provide construction oversight and labor free of charge.
- 4. Agrees to bring equipment necessary to implement plan.
- 5. Agrees to implement BMPs provided in the site design plan exclusively through the use of hand tools.
- 6. Agrees to provide training and education to landowner required for proper maintenance of installed BMPs.
- 7. Agrees to take photos of the completed site.

Signature of Landowner

Name

Date

Signature of AWWA YCC Representative

Adam Shoukimas, Technical Director

Below are the recommendations I suggest based on my visit to your property (74 Chipmunk Run, Acton, ME) on Great East Lake.

1. Infiltration Steps

I recommend installing a very large infiltration step at the base of the stairs that lead from the house down to the lake. There is a large area of bare, sloping sand that runoff is currently allowed to run over and carry into the lake. The infiltration step will terrace the area and level it off. Also, it will provide an opportunity for water running down the hill to slow and be absorbed into the ground rather than flowing directly into the lake with its sediment load. The step will create a level path leading to the dock where another infiltration step should be installed as the terrain drops before reaching the dock. See *Infiltration Steps (New)* fact sheet for construction and installation information.

2. Erosion Control Mix

I recommend spreading a layer of erosion control mix over the slope that leads down to the beach area. There is some ground cover in this area but not enough to significantly reduce any runoff. The erosion control mix will stabilize any loose sediment in this sloped area as well as act as a sponge to soak up water, preventing it from becoming runoff. See *Erosion Control Mix* fact sheet for additional information.

3. Native Vegetation

In the same sloped area as the erosion control mix, additional native plants should be planted. Because this area has a moderately steep slope, vegetation should be implemented so that roots can be established to further stabilize soil and take up water and nutrients. You should plant native plants properly suited to the dry, partial shade conditions of your site. Enough plants should be planted to adequately cover a majority of the area, as much as your budget will allow. They will also add to the aesthetics of the site. Please refer to *Native Plants* fact sheet for a list of appropriate plants.

4. Retrofit Infiltration

I also recommend retrofitting the steps that lead from the house to the lake into infiltration steps. Ordinary, water flows directly over these stairs and down into the lake. By removing the compressed fill behind each step that is currently acting as an impervious surface and replacing it with crushed stone, water will now be able to infiltrate into the earth below the steps rather than remaining as surface water. See *Infiltration Steps (Retrofit)* fact sheet for more information.

5. Timber Waterbar

I also recommend installing timber waterbars in the vegetated area to the left of the stairs leading to the lake from the house (when looking at the house from the lake). These waterbars will help to direct water coming down this slope into an already vegetated basin where it can be collected and absorbed into the ground. Otherwise, water flowing down this slope will run over the beach area and carry sand into the lake. See *Waterbars* fact sheet for installation and maintenance information.

Randall's and Springvale Nurseries is offering a 10% discount to AWWA Technical Assistance Participants with a signed pledge card. They will be very helpful with plant selection, determining material quantities, or advising on material specifics. Please contact me if you have any further questions.

Materials List:

Infiltration Steps:

40 feet – 6x6" pressure-treated timbers 20 feet – $\frac{1}{2}$ " rebar, cut into 10 two-foot sections 2 yards – crushed stone

Waterbars:

40 feet – 6x6" pressure-treated timbers 16 feet – $\frac{1}{2}$ " rebar, cut into 8 two-foot sections

Vegetation:

16 – 24 plants suited for partial shade, dry soil conditions (six for the beach area in front of the infiltration steps)
4 yards – erosion control mix

<u>Total</u>:

- 80 feet -6x6" pressure-treated timbers
- 36 feet $-\frac{1}{2}$ " rebar, cut into 18 two-foot sections
- 2 yards crushed stone
- 16 24 plants suited for partial shade, dry soil conditions
- 4 yards erosion control mix

Local Suppliers

Plants and Soil

Springvale Nurseries Sanford, ME (207) 490-5543 *offering 10% off supplies with a signed letter of agreement or pledge sheet

Spider Web Gardens Tuftonboro, NH (603) 569-5056

Roadside Farmer Wakefield, NH (603) 522-9212

Barron Brothers (soil) Farmington, NH (603) 755-9071

Stone

Randall's Wakefield, NH (603) 522-3643 *offering 10% off supplies with a signed letter of agreement or pledge sheet

Roadside Farmer Wakefield, NH (603) 522-9212

Springvale Nurseries Sanford, ME (207) 490-5543

Mountain Greenery Ossippee, NH (603) 539-4943

Barron Brothers Farmington, NH (603) 755-9071

Ossipee Aggregates Ossipee, NH (603) 539-6820

Rubber (for rubber razors)

Portland Rubber (PRC Industrial Supply) Portland, ME (207) 774-3993

Also try getting used conveyor belts from UPS, gravel pits, mills, grocery stores, etc.

Lumber, Rebar, Nails

Middleton Building Supply Middleton, NH (603) 473-2314

Home Depot Rochester, NH (603) 335-1300

Moulton Lumber Newfield, ME (207) 793-2541

Mulch Suppliers

Simpson's Sanford, ME (207) 324-5412

New England Organics Falmouth, ME (800) 933-6474

Springvale Nurseries Sanford, ME (207) 490-5543

Barron Brothers Farmington, NH (603) 755-9071

















DEPARTMENT OF ENVIRONMENTAL PROTECTION

PERMIT BY RULE NOTIFICATION FORM

(For use with DEP Regulation, Chapter 305)

PLEASE TYP	E OR PRIN	T IN <i>BL</i>	ACK INK ONLY											
Name of App (owner)	olicant:	Michael & Edith Kasprzak					Applicant Mailing74 Chipmunk RunAddress:			ık Run				
Town/City:	Town/City:					State: ME								
Zip Code:	0400	Day (i	vtime Telephone No nclude area code)):	(207)	636-29	13	Proje (to	ect Locat own)	tion: Acton, ME				
County:	York		Maj	p #:	112	Lot #:	016 Name of Wetlan Waterbody:			and or	d or Great East Lake			
Name of Age	ent: A	dam Sho Acton Wa	oukimas, Technical I kefield Watersheds	Direct Alliar	ctor Agent's Telepho ance (include area co			Felephor area cod	one No: (603) 473-25 de)		3-250	0		
Detailed Dire	ections to S	Site:	I-95 South to	exit	19, Ro	ute 109	West	to Act	ton, M	E. Tu	ırn righ	t on H Ro	ad.	
Turn left o	onto Anc	lerson	Cove Road, fol	low	road as	s it bears	s right	at Kn	happ La	ane. 7	Furn le	ft onto		
Chipmunk	x Run. #	74 is o	n the right.				UTM (if kno	Northin wn)	ng:		UT (if l	M Easting: known)		
Description of	of Project:	Th sm	ere is a steep slope lead all beach, and enters th	ling fr e lake	om the ho . The proj	use to the la ect will inv	ake with s olve add	sparse pla ing veget	ants and g tation and	ground co erosion	over. Rund control mi	off comes down x to	hill, cro	osses a
slope in order t allow it to infil	o stabilize se trate into the	diment. A ground.	Also, an infiltration step Two timber waterbars y	o will l vill be	be installed installed a	d at the base along a wel	e of the sl l vegetate	lope alon ed slope t	ig the top to the left	of the be of the be	each to cap	ture any residu	al runofi	f and
divert runoff in leading from th	to low-lying te house to th	vegetation le lake wil	n and away from the be l backfilled with crush	ed stor	ake. Finall ne.	y, steps	Part o	f a larg	er proje	ct?		Yes	Χ	No
(CHECK ON	NE) This	project:	does does	s not	in in	volve wo	rk belo	w meai	n low w	ater.				
I am filing n Rules, Chap checked belo	I am filing notice of my intent to carry out work which meets the requirements for Permit By Rule (PBR) under DEP Rules, Chapter 305. I and my agents, if any, <u>have read</u> and will comply with all of the standards in the Sections checked below.													
Sec. (2) Act. Adj. to Protected Natural Res.			Sec.(10) S	Stream Cro	ossing			Sec Sec	. (17)					
Sec. (3) In	itake Pipes				Sec. (11) State Transportation Facil.				Sec. (18) Maintenance					
Sec. (4) R	eplacement	of Struct	ures		Sec. (12) Restoration of Natural Areas			as	Sec. (19) Activities					
Sec. (5) REPEALED Sec. (13) F&W (F&W Crea	tion/Enl	nance/W	ater		significan	t vernal			
Qual			Quality Improvement				Sec	. (20) Acti	vities in					
Sec. (7) O	Sec. (7) Outfall Pipes Sec. (14) REPEAL			REPEALE	D			:	areas loca	ted				
Sec. (8) Sl	In/on/over nign or Sec. (8) Shoreline stabilization Sec. (15) Public Boa			Public Boa	t Ramps				moderate	value				
🔲 Sec. (9) U	tility Crossi	ng	Sec. (16) Coastal Sar	nd Du	ne Project	ts					wading bi	rd habitat		
		or s	noredira								nesting, fe	eding &		

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staging areas

I authorize staff of the Departments of Environmental Protection, Inland Fisheries & Wildlife, and Marine Resources to access the project site for the purpose of determining compliance with the rules. I also understand that this permit is not valid until approved by the Department or 14 days after receipt by the Department, whichever is less.

I have attached the following required submittals. NOTIFICATION FORMS CANNOT BE ACCEPTED WITHOUT THE NECESSARY ATTACHMENTS:

- □ <u>Attach</u> a check for \$55 made payable to: "Treasurer, State of Maine".
- □ <u>Attach</u> a U.S.G.S. topo map or Maine Atlas & Gazetteer map with the project site clearly marked.
- **Attach** all other required submissions as outlined in the PBR Sections checked above.

By signing this Notification Form, I represent that the project meets all applicability requirements and standards in the rule and that the applicant has sufficient title, right, or interest in the property where the activity takes place.

Signature of Agent or Applicant:			Da	te:		
<u>Keep a copy as a record of permit</u> . Send the form with attachments via certified mail or hand deliver to the Maine Dept. of Environmental Protection at the appropriate regional office listed below . The DEP will send a copy to the Town Office as						
valid for two years. Work carried out in violation of any standard is subject to enforcement action.						
17 STATE HOUSE STATION 312 CAN AUGUSTA. ME 04333-0017 PORTLA		312 CANCO ROAD 106 HOGAN ROA PORTLAND, ME 04103 BANGOR, ME 04		1235 CENTRAL DRIVE PRESQUE ISLE, ME 04769		
(207)287-3901	(207)287-3901 (207)82		(207)941-4570	(207)764-0477		
OFFICE USE ONLY	Ck.#		Staff	Staff		
PBR #	FP	Date	Acc. Date	Def. Date	After Photos	

DEPLW0309-K2006

Project Outline for Edith Kasprzak, 74 Chipmunk Run, Acton, ME 04001:

The house sits approximately 80' back from Great East Lake and about 25' above the water line. There is a significant slope that leads from the house to the lake. About half-way down the slope between the house and the lake is an existing retaining wall that essentially levels off the top portion of the hill, reducing the velocity of most of the surface runoff. Below this retaining wall is a sloped planting area roughly 400 ft² in area. This area has approximately a 30° slope leading up to the bottom of the retaining wall. The slope is sparsely vegetated with hostas and other shade-tolerant plants with a thin layer of bark mulch as a ground cover. We plan to plant additional native shade-tolerant plants in this area to stabilize the slope and then cover the area with erosion control mix to further stabilize any exposed soil. To the left of the slope is a set of cinderblock stairs that lead from the house to the beach area. These stairs are back-filled with gravel road pack and act as impervious surface. We plan to remove the imperious material and back-fill the stairs with crushed stone, thus retrofitting the stairs into infiltration steps. To the left of stairs is another steep slope that is moderately forested. However, surface runoff still flows over this area and into the lake. We plan to install two timber waterbars to divert this runoff down into a very well vegetated lowland area where water can settle and infiltrate into the soil rather then run into the lake. At the bottom of the stairs and the mulched area is a line of rocks. Below the rocks is a beach area with a gentle slope leading to the lake. Water running down the sparsely vegetated slope under the retaining wall runs across the beach and erodes sand into the lake. The top of the beach area is also used as a pathway from the stairs to the dock on the right side of the shore, so that residents walk along the bottom of the steep slope. We plan to construct a long infiltration step at the bottom of the stairs and slope in order to capture and control the runoff from these areas before they can erode the beach and carry additional sediment into the lake. Another step will be constructed at the end of the long step to follow the terrain change leading to the dock. The infiltration steps will serve as a walkway connecting the stairs to the dock, preventing foot traffic from eroding the beach as well. The infiltration steps will be no closer than 7' from the mean high water mark of the lake and will not disturb any of the existing vegetation on the beach. All of the best management practices will be installed according to the procedures outlined in the conservation fact sheets made available from the Portland Water District

(http://www.pwd.org/news/publications.php#Brochures). A silt fence will be installed prior to any activity on the site and it will be removed once the construction is finished. Impact to the site will be minimized and all BMPs installed are designed to minimize erosion and sediment transport into the lake. All other construction BMPs will be observed.



ACTON WAKEFIELD WATERSHEDS ALLIANCE PO Box 235, 254 Main Street, Union, NH 03887 Tel. (603) 473-2500 info@AWwatersheds.org

Youth Conservation Corps Project Host Match Grant Tracking Information

Approximate Time Spent (in hours):Preparing for project:Ordering Materials:Phone Calls:Assisting/monitoringProject construction:Maintaining site:Other	
Total Time: Itemized cost of Project Materials: <u>Material</u>	
	Total Cost:



INFILTRATION STEPS

controlling erosion on steep paths

<u>Purpose:</u> Infiltration steps use crushed stone to slow down and infiltrate runoff. They are effective on moderate slopes, but consider building wooden stairways on 1:1 slopes (45°) or areas where rocks or surface roots make it difficult to set infiltration steps in the ground.

Note: Prior to installation, contact the Maine DEP and town Code Enforcement Officer to find out if permits are required.

Installation: Infiltration steps are steps built with timbers and filled with crushed stone or pea stone. See separate sheet for retrofitting existing timber steps. Build

new infiltration steps as follows (adapted from www.homestore.com):

1. Calculate the Rise and Run of Each Step

First, measure the overall rise and run of your steps in inches. The step height is determined by the 6" thickness of the timber. Divide the rise by 6 and round off to the nearest whole number to determine the number of steps. Divide the run by the number of steps to determine step width. A comfortable width will be at least 15".

2. Stake Out the Steps

Figure out the step width. A 4' width is comfortable for one person. Paths must be less than 6' wide in the shoreland zone. Drive stakes at each corner of the stairway and stretch string between them to outline the steps. Spray paint or sprinkle sand or flour on the ground to mark the outline.

3. Excavate the First Step

Starting at the bottom, dig a trench for the first timber (this will be little more than a shallow groove in the ground). Next, dig trenches for the side timbers, which need to be long enough to extend 6" past the next step's riser. Check to make sure the trenches are level.

Note: Infiltration steps may not require side timbers, especially if the steps are in an eroded pathway where the surrounding land is higher. In this case, extend the timbers into the adjacent banks so water will not go around the steps.

4. Cut the Timbers

Cut the riser timber to length, then measure and cut the side timbers. Drill '4" diameter holes 6" from the ends of each timber. Position the step, then remove or add soil as needed to level it. Anchor the step by driving 18" long pieces of '4" diameter steel rebar through the holes and into the ground. Make sure the rebar is flush or slightly recessed since the edges may be sharp. Set the side timbers in place, and level and anchor them.

Shovel out the soil inside the step to create a surface roughly level with the bottom of the timbers. Additional soil can be removed to provide more area for infiltration. Make sure to dispose of excavated soil in a place where it will not wash into the lake or other resource.













Also Called: ECM, Slope Stabilizer, Erosion Control Mulch, Superhumus™, Wood Waste, Stump Grindings

Purpose: Erosion Control Mix is a kind of mulch made of partially composted bark, sand, gravel, stone and wood fragments. It is much heavier than other types of mulch and its mixture of elongated fibers, gravel and soil lock together to protect the underlying soil from erosion. Like other mulches, it also retains moisture, controls weeds and improves the soil as it decomposes. It can be used on paths, slopes and between plantings.



<u>Installation</u>: ECM should completely cover areas of bare soil to a thickness of 3 to 4 inches. Keep an inch or two of space between the mulch and base of plants. Erosion Control Mix should not be used in areas with concentrated water flows or on slopes greater than 2:1 (27°).

ECM often comes in a fine grade (such as Superhumus^{IM}) that works well in a more landscaped setting and a standard, more "chunky" grade that is less composted and holds up better on steeper slopes and paths. Some people choose to top-dress the chunky ECM with a few inches of Superhumus^{IM} or regular bark mulch for a more finished appearance. If the ECM is going to be used to naturalize an existing lawn or grassy area, a weed barrier such as several layers of newspaper should be placed down before the mulch is added.



Materials: Locating this relatively new product can be difficult. However, many contractors are starting to use it on construction sites in place of silt fence. Contact your local contractor or gravel pit and ask for Erosion Control Mix or the other names mentioned above. Make it clear that you are not looking for landscaping bark mulch because it is not the same product and will not be as effective. Some transfer stations also make ECM available to residents.



<u>Maintenance</u>: Mulched areas should be inspected regularly and after each large rainfall. Mulch should be immediately added to washed out areas to maintain the desired thickness. ECM should be left in place, and new plant growth should be promoted. Mulched areas should not be raked.

Drawbacks of Other Mulches: ECM is the most effective mulch for erosion control purposes. If ECM is not available, however, the following other mulches may be suitable. Any mulch is better than bare soil.

- Pine Needles Washes away easily on slopes. Provides a natural look and is often plentiful and free. Especially good around acid-loving plants like blueberries, azaleas and rhododendrons.
- Bark Mulch Better than bare soil, but easily eroded. Most popular mulch and readily available.
- Wood Chips Will float away in rains and does not enrich the soil like ECM.
- Crushed Stone or Pea Stone Does not allow vegetation to grow, creates an unnatural
 appearance and may not be allowed by DEP or Town depending on distance to water.

Part of the Conservation Practices for Homeowners Factsheet Series, available at. Maine DEP (800.452.1942), http://www.maine.gov/dep/blwq/docwatershed/materials.htm Portland Water District (207.774.5961); http://www.pwd.org/news/publications.php

May 2006 DEPLW0772

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NATIVE PLANT LIST -Part Sun, Dry Soils~

Although this is not an exhaustive list, the following native plants are carried at local nurseries. If a particular plant is not available at your nursery, ASK for it by name. The more demand there is for native plants, the more likely a nursery is to carry it. Additionally, nursery staff may be able to recommend a suitable, NON-INVASIVE substitute.

SMALL SHRUBS (<6')

Bush Honeysuckle (Diervilla lonicera) Also called American Fly Honeysuckle. (Do not confuse with European Fly Honeysuckle which is invasive.) Grows 2 to 5 feet high. A straggling shrub with handsome red berries. Sun to shade. Sandy, dry soil. Drought tolerant. Found in cool, rocky woods. Zones 3-7.

Sheep Laurel/Lambkill (Kalmia angustifolia) Grows from 1 to 3 feet high with a greater spread. Grows best in moist, organic, cool, acidic soils but can tolerate a variety of soil types. Prefers full sun to partial shade. Bright pink flowers bloom in early summer. As the name suggests it is poisonous to livestock. Zones 1-6.

> Fragrant Sumac (Rhus aromatica) Available in standard and 'Gro-Low' varieties. Dwarf grows 2 to 3 feet with a 6 to 8 foot spread. A low shrub with compound leaves and small, fragrant, yellow flowers in spring, followed by red fruit. Excellent orange to red fall color. Leaves are aromatic when crushed. Sun to part shade. Dry, sandy to rocky soil. Good as bank covers and in mass plantings. Dwarf variety used as a ground cover. Found in dry, rocky, open woods. Zones 3-9.

Snowberry (Symphonicarpos alba) Grows 3 to 6 feet high with similar spread. Spreads by suckering so will form thickets, if allowed. Good for erosion control. Blue-green foliage, pink spring flowers and ornamental, white berries in fall. Rapid growth. Sun to part-sun. Moist to dry soil. Adaptable to a variety of soil conditions. Good for kirds. Zones 3-7.

White bell-shaped flowers bloom in the spring and are followed by edible dark blue berries. Leaves turn red in the fall. Berries are attractive to birds and other wildlife. Zones 5-7. Mapleleaf Viburnum (Viburnum acerifolium) Grows from 4 to 6 feet high with

Highbush Blueberry (Vaccinium corymbosum) Grows from 6 to 8 feet in height with a spread of 8 to 12 feet. Typically found near bogs and marshes. Prefers moist, well-drained, acidic soil. Sun to partial shade.

an equal spread. Grows best in well-drained, mildly acidic soil with average moisture but can tolerate drier soils. Prefers shade to partial shade. Similar to other viburnums, a cluster of small white flowers gives way to dark blue/black fruits that are enjoyed by birds and other wildlife. Mapleleaf Viburnum is susceptible to attack from the Viburnum Leaf Beetle. Check with your local nursery to see if the Beetle is a problem in your area. Zones 4-8.

Native Plant List - Part-Sun, Dry Soil, page 1 of 4

February 2007 DEPLW-0824













Full Sun - more than 5 hours of direct

Part-Sun - 2 to 5 hours of direct sun or

Full Shade - less than 2 hours of direct

full day of dappled sun a day

sun a dav

sun a dav



INFILTRATION STEPS

<u>Purpose:</u> Infiltration steps use crushed stone to slow down and infiltrate runoff. They are effective on moderate slopes, but consider building wooden stairways on 1:1 slopes (45°) or areas where rocks or surface roots make it difficult to set infiltration steps into the ground.

Note: Prior to installation, contact the Maine DEP and town Code Enforcement Officer to find out if permits are required.

Installation: Infiltration steps are steps built with timbers and backfilled with crushed stone or pea stone to help water soak



into the ground. See separate factsheet for new infiltration step construction. Many existing timber steps can be retrofitted to create infiltration steps by making the following changes:

- Remove several inches of soil from behind each step. Dispose of excavated soil in a place where it will not wash into the lake or other resource.
- Line the bottom and sides of the excavated area with non-woven geotextile fabric. This feltlike fabric allows water to infiltrate but will separate the stone from the underlying soil.
- 3. Backfill the hole with washed ¾" crushed stone or pea stone so that the tread is level or it just slightly slopes up to meet the above step. Pea stone is comfortable on bare feet but also usually more expensive. Paving stones can also be set into crushed stone to provide a smooth surface for bare feet as long as ample crushed stone is exposed to allow infiltration.
- 4. If the timbers are not firmly secured, drill ½" diameter holes, 6" from the ends of each timber. Drive ½" diameter, 18" long steel rebar through the holes with a sledge hammer. For gentle slopes, wooden stakes or large rocks can also secure the timbers.



<u>Materials</u>: Crushed stone and pea stone can be purchased from gravel pits. Contact your local Soil and Water Conservation District for suppliers of non-woven geotextile fabric. Other geotextiles, including landscaping weed barrier, can be substituted for smaller projects. Pressure treated timbers, cedar landscape timbers and steel rebar can be purchased from lumber and hardware stores. Some stores will cut rebar to the specified length for a small fee. Otherwise, rebar can be cut with a hack saw.

<u>Maintenance</u>: Replace rotten timbers. If the crushed stone or pea stone becomes filled up with sediment over time, remove, clean out sediment and replace.

Part of the Conservation Practices for Homeowners Factsheet Series, available at: Maine DEP (800.452-1942); http://www.maine.gov/dep/blwq/docwatershed/materials.htm Portland Water District (207.774.5961); http://www.pwd.org/news/publications.php

May 2006 DEPLW 0774



WATERBARS diverting water off paths and trail

Purpose: A waterbar intercepts water traveling down footpaths, trails and other areas and diverts it into stable vegetated areas.

Installation: Install waterbars on moderately steep paths with concentrated flows. Select a location where the waterbar outlet can drain to a stable, vegetated area. Install multiple waterbars as needed and space closer together on steeper slopes as directed in Table 1.

Any rot-resistant type of wood, such as cedar, spruce, fir or hemlock logs can be used. For logs, the diameter should be at least 8" at the small end. 6" to 8" diameter, pressure treated or cedar timbers can also be used. The length should extend past the edge of the path on both sides. Install waterbars as follows:



- Dig the trench First, dig a trench for the wood that is a 30° angle across the path. Be sure the trench and the waterkar extends off both sides of the path. The trench should be deep enough so the top of the log will be almost flush with the trail on its downhill side once in place. Soil and rock excavated from the trench should be heaped on the trail below the water bar to be used later as backfill.
- 2. Install the log or timber Place the log or timber in the trench. The log should fit snugly in the trench with no high point or voids under the log. Secure the waterbar with large stones, rebar pins or wooden stakes. If using stones, partially bury on downhill side. If using rebar, drill ½" holes 6" in from each edge and pound in 18" pieces of rebar so that the rebar is flush or slightly recessed with the top.
- 3. Backfill around the waterbar Dig a 12" wide and 6" deep trench along the uphill side of the bar. Fill the trench with crushed stone, leaving a few inches of the timber exposed. Place a flared apron of stones to armor the waterbar outlet. Pack soil and gravel up against the downhill side of the waterbar so that the top of it is flush with the trail. Cover all disturbed soil with seed and mulch or leaf litter.





ACTON WAKEFIELD WATERSHEDS ALLIANCE PO Box 235, 254 Main Street, Union, NH 03887 Tel. (603) 473-2500 info@AWwatersheds.org www.AWwatersheds.org

November 11, 2008

Dee Kasprzak 20 Nottingham Court Kennebunk, ME 04043

Dear Dee,

Thank you for your participation in the Acton Wakefield Watersheds Alliance Youth Conservation Corps 2008 season as a project host. We would like to get your feedback on the free landscape design and subsequent project installation and assistance that you received from the project staff.

We would appreciate if you would take a few minutes to fill out our follow up survey. Your answers will help us to assess the success of this project and guide future lake protection efforts. Please return the form in the enclosed self-addressed stamped envelope within 10 days.

It was a pleasure to work with you on your property to help improve the quality of your lake water. Your project is helping to keep approximately 400 pounds of sediment from entering Great East Lake in the coming year. Thank you so much for you involvement with our organization and your gracious hospitality.

Sincerely,

Adam Shoukimas Technical Director



Sample Technical Assistance Packet

ACTON WAKEFIELD WATERSHEDS ALLIANCE PO Box 235, 254 Main Street, Union, NH 03887 Tel. (603) 473-2500 info@AWwatersheds.org

September 5, 2008

Donna Dodge 32 Baldpate Road Georgetown, MA 01833

Dear Donna,

Thank you for participating in Acton Wakefield Watersheds Alliance (AWWA) Technical Assistance program. We greatly appreciate your concern for the water quality of Pine River Pond and your support of our protection efforts.

The following evaluation and recommendations for your property on Lord Road are based on commonly accepted erosion and phosphorus control measures or best management practices (BMPs). They are aimed at improving the quality of water in the Acton and Wakefield watersheds. You are encouraged to implement these recommendations but please remember that your participation in the program is purely voluntary.

It is important to note that AWWA is not a regulatory agency and that the implementation of the suggested projects is not enforced by our organization and thus must be performed according to your own discretion. As discussed, mitigation activities within the shoreland zone are subject to state and local regulation. Permits should be obtained from the proper authorities before beginning any work. Please be advised that improvements should not start until these permits have been finalized.

I have included a site drawing and a narrative of the recommended BMPs, as well as a fact sheet for each BMP outlining installation and maintenance. Finally, I have enclosed a pledge sheet. We ask that you sign and return one copy to us in exchange for this design.

Please do not hesitate to contact our office if you need any clarification of this report.

Sincerely,

Adam Shoukimas Technical Director



Youth Conservation Corps

The mission of the Acton Wakefield Watersheds Alliance (AWWA) is to preserve or improve the water

quality of lakes and streams in the watersheds in Wakefield, NH and Acton, ME.

AWWA Technical Assistance Pledge

I pledge to implement at least one of the recommendations presented in the AWWA technical 2008. assistance plan within 12 months from the date the plan was received. I received an AWWA Technical Assistance visit on (date)

For additional information or questions please contact Adam Shoukimas at (603) 473-2500 or email at techdirector@awwatersheds.org.

Property Owner signature:

AWWA Technical Director signature:

Date signed_



Funding for this project was provided in part by a grant from the NH Department of Environmental Services with

Agency under Section 319 of the Clean Water Act.

funding from the US Environmental Protection



This project is supported by funds from the sale of the Conservation License Plate (Moose Plate) under the NH State Conservation Committee grant program. Below are the recommendations I suggest based on my visit to your property (806 Lord Road, Sanbornville, NH) on Pine River Pond.

1. Rubber Razor or Open-Top Culvert

I recommend installing a rubber razor or open-top culvert across the top of your driveway in order to divert water off of the surface of the driveway and into nearby vegetation. The vegetation will be able to properly control and absorb the water entering keep the water from directly flowing into the lake. Diverting the water immediately as it enters your property will significantly reduce the amount of erosion you experience. Water is diverted of the face of the rubber razor sticking out of the driveway whereas water falls into and flows down the open-top culvert. See *Rubber Razors* and *Open-top Culvert* fact sheets for more information on choosing the best management practice that works with the aesthetics of your property.

2. Timber Waterbars

I recommend installing timber waterbars along the side of the house that leads down to the patio and eventually the lake. Water flows down the driveway then down this slope before reaching an area where a small stack of retaining wall bricks has been erected. The waterbars will slow the flow of water and thus reduce its ability to erode sediment. These waterbars will also serve as steps making this area more stable for foot traffic. See *Waterbars* fact sheet for more information.

3. Rain Garden

In the area below the waterbars, by the front corner of the patio where the retaining wall bricks have been stacked, I recommend installing a rain garden. Water collecting on the patio and coming from the back of the house tends to flow in this direction. A rain garden will work to capture this runoff before it enters the lake and filter it through the earth. The rain garden will also stabilize the area and prevent water from running down the footpath leading to the lake. See *Rain Garden* and *Shady Rain Garden Plant List* fact sheets for additional information.

4. Erosion Control Mix

On the sloped footpath adjacent to the rain garden and the unvegetated bank leading to the lake, I recommend spreading a layer of erosion control mix. Erosion control mix is a coarser mulch that is very good at stabilizing slopes that ordinary mulch would ordinarily wash off of. It also holds up well to foot traffic and makes a good walking base. See *Erosion Control Mix* fact sheet for more information on this product.

5. Native Vegetation

In addition to the erosion control mix, I recommend planting some native plants on the unvegetated slopes to aid in stabilization and water absorption as well as improve the aesthetics of the area. Choose plants are suited to partial sun and relatively dry conditions on your site and they will need little maintenance. See *Native Plant List* for a list of plants to choose from.

6. Rain Barrel

To prevent a lot of the surface water on the patio, I recommend installing a rain barrel under the downspout of the gutter on the front of the house. Ordinarily, water from the roof collects in the gutter and travels down the downspout where it splatters and pools on the patio, gains velocity before driving down the slope into the lake. The rain barrel will collect the roof runoff and prevent damage to the patio and sediment erosion into the lake. Additionally, the water collected in the rain barrel can be used to water the rain garden and native plants. See *Rain Barrel* fact sheet for additional information.

7. Dripline Trench

I also recommend installing a dripline trench beneath the roof overhang along the back of the house. Currently, water falls off the roof at the back of the house and remains as surface water once it hits the ground. The dripline trench would capture the roof water and hold it to allow it to percolate into the ground. This will reduce the amount of runoff flowing around the side of the house and eventually entering the lake. See *Dripline Trench* fact sheet for installation information.

Springvale Nurseries is offering a 10% discount to AWWA Technical Assistance Participants with a signed pledge card. They will be very helpful with plant selection, determining material quantities, or advising on material specifics. Please contact me at (603) 473-2500 if you have any further questions.

Donna Dodge Before:



Donna Dodge Projected:



Donna Dodge Before:



Donna Dodge Projected:



Donna Dodge Before:



Donna Dodge Projected:


Donna Dodge Before:



Donna Dodge Projected:



Local Suppliers

Plants and Soil

Springvale Nurseries Sanford, ME (207) 490-5543 *offering 10% off supplies with a signed letter of agreement or pledge sheet

Spider Web Gardens Tuftonboro, NH (603) 569-5056

Roadside Farmer Wakefield, NH (603) 522-9212

Barron Brothers (soil) Farmington, NH (603) 755-9071

Stone

Randall's Wakefield, NH (603) 522-3643 *offering 10% off supplies with a signed letter of agreement or pledge sheet

Roadside Farmer Wakefield, NH (603) 522-9212

Springvale Nurseries Sanford, ME (207) 490-5543

Mountain Greenery Ossippee, NH (603) 539-4943

Barron Brothers Farmington, NH (603) 755-9071

Ossipee Aggregates Ossipee, NH (603) 539-6820

Rubber (for rubber razors)

Portland Rubber (PRC Industrial Supply) Portland, ME (207) 774-3993

Also try getting used conveyor belts from UPS, gravel pits, mills, grocery stores, etc.

Lumber, Rebar, Nails

Middleton Building Supply Middleton, NH (603) 473-2314

Home Depot Rochester, NH (603) 335-1300

Moulton Lumber Newfield, ME (207) 793-2541

Mulch Suppliers

Simpson's Sanford, ME (207) 324-5412

New England Organics Falmouth, ME (800) 933-6474

Springvale Nurseries Sanford, ME (207) 490-5543

Barron Brothers Farmington, NH (603) 755-9071

RUBBER RAZORS

managing runoff on gravel roads and driveways~







Also Called: Rubber Razor Blades, Rubber Blades, Rubber Waterbars

<u>Purpose</u>: Rubber Razors divert water off gravel driveways and camp roads into stable vegetated areas.

These structures are well suited for seasonal roads that are not plowed. They can be plowed over if the location is clearly marked and the plow operator lifts the plow blade slightly.

Installation: Install the rubber razor at a 30 degree angle to the road edge and point the outlet toward a stable vegetated area.

Pack gravel around the rubber razor to make sure it is securely installed.

Armor the outlet with a flared grouping of stones to slow down the water before it enters the buffer.

<u>Materials</u>: Rubber razors are constructed using new or used conveyor belts. These may be obtained at no or low cost from industrial sources. Contact your Soil and Water Conservation District for additional sources. Lumber can be purchased at any local hardware store.



Maintenance: To maintain these structures, periodically remove accumulated debris from behind the razor.

Part of the Conservation Practices for Homeowners Factsheet Senes, available at: Maine DEP (800.452.1942); http://www.maine.gov/dep/blwq/docwatershed/materials.htm Portland Water District (207.774.5961); http://www.pwd.org/news/publications.php





Also Called: Box culverts

Purpose: Open-top culverts collect and divert water off a camp road or driveway and discharge it to a vegetated or other stable area. By getting stormwater off the road, open-top culverts reduce erosion of the road surface, while allowing easy movement of vehicles across the structure. Open-top culverts are inexpensive to build and relatively easy to install. They can be built from lumber with common hand tools.

Open-top culverts can be used on seasonal camp roads and driveways that receive little or no winter plowing.

Installation: Open-top culverts can be constructed of pressure treated lumber or cedar timbers. Using pressure treated lumber will considerably extend the life of the structure. Spacers placed in the open-top culverts will hold the shape of the culvert and strengthen the structure.

Open-top culverts will vary in length, depending on the width of your road. When sizing an open-top culvert, remember that it should be installed at an approximately 30' angle down slope. Take this added length into consideration when purchasing materials.

The following is a guideline for materials you will need:

- 2" x 6" pressure treated lumber for the sides (twice the total length as that for the bottom)
- 2" x 8" pressure treated lumber for the bottom
- · Galvanized nails (approximately 3") to secure the base to the sides of the structure
- Spacers to maintain the structure of the culvert (spikes, washers/kolts/nuts, pipe, or 1^{*} pieces of wood and galvanized nails)





WATERBARS diverting water off paths and trail

Purpose: A waterbar intercepts water traveling down footpaths, trails and other areas and diverts it into stable vegetated areas.

Installation: Install waterbars on moderately steep paths with concentrated flows. Select a location where the waterbar outlet can drain to a stable, vegetated area. Install multiple waterbars as needed and space closer together on steeper slopes as directed in Table 1.

Any rot-resistant type of wood, such as cedar, spruce, fir or hemlock logs can be used. For logs, the diameter should be at least 8" at the small end. 6" to 8" diameter, pressure treated or cedar timbers can also be used. The length should extend past the edge of the path on both sides. Install waterbars as follows:



- Dig the trench First, dig a trench for the wood that is a 30° angle across the path. Be sure the trench and the waterkar extends off both sides of the path. The trench should be deep enough so the top of the log will be almost flush with the trail on its downhill side once in place. Soil and rock excavated from the trench should be heaped on the trail below the water bar to be used later as backfill.
- 2. Install the log or timber Place the log or timber in the trench. The log should fit snugly in the trench with no high point or voids under the log. Secure the waterbar with large stones, rebar pins or wooden stakes. If using stones, partially bury on downhill side. If using rebar, drill ½" holes 6" in from each edge and pound in 18" pieces of rebar so that the rebar is flush or slightly recessed with the top.
- 3. Backfill around the waterbar Dig a 12" wide and 6" deep trench along the uphill side of the bar. Fill the trench with crushed stone, leaving a few inches of the timber exposed. Place a flared apron of stones to armor the waterbar outlet. Pack soil and gravel up against the downhill side of the waterbar so that the top of it is flush with the trail. Cover all disturbed soil with seed and mulch or leaf litter.





<u>Purpose</u>: Rain gardens are attractive and functional landscaped areas that are designed to capture and filter stormwater from roofs, driveways, and other hard surfaces. They collect water in bowlshaped, vegetated areas, and allow it to slowly soak into the ground. This reduces the potential for erosion and minimizes the amount of pollutants flowing from your lawn into a storm drain, and eventually into our streams and lakes.



<u>Installation:</u> Rain gardens can vary in size, kut are most effective when built to 20-30% of the drainage area. Rain gardens for single-family homes will typically range from 150 to 300 square feet, but even a smaller one will help reduce water pollution problems.

- The garden should be bowl-shaped, with the lowest point of the garden no more than 6" below the surrounding land.
- The sides should be gently sloping towards the center to prevent sudden drop-offs that could lead to erosion problems or walking hazards.
- Rain gardens are often placed in a preexisting or created depression within a lawn, or in a location that receives roof runoff from a downspout.
- To avoid flooding improperly sealed foundations, build your rain garden 10' away from existing structures, and direct water into the garden with a grassy swale, French drain, gutter extension or other device.

Rain gardens can be placed in sunny or shady regions of your lawn, but plants should be chosen accordingly, with the lowest point planted with wet tolerant species, the sides closest to the center planted with moist tolerant species, and the edges of the rain garden should be planted with subxeric (moist to dry) or xeric (dry) tolerant plants. It is also important to check the permeability of your soil. Sandy soils only need compost added, but clay soils should be replaced with a mix (50-60% sand, 20-30% topsoil, 20-30% compost). After construction of the garden is complete, the entire area should be covered with a thick layer of mulch, preferably Erosion Control Mix.

<u>Materials</u>: Replacement Soil mixes and Erosion Control Mix are available from local garden centers. Native plants can be purchased from your local nursery. Please see *Native Plant Lists* from this series for plant descriptions based on specific sun and soil conditions.

<u>Maintenance</u>: Overall, once plants mature, the maintenance of a rain garden is very low. Watering is important during the first growing season, and some weeding is necessary after planting. As the garden matures, some of the perennials may need to be divided if plantings become too crowded.

Part of the Conservation Practices for Homeowners Factsheet Series, available at: Maine DEP (800.452.1942), http://www.maine.gov/dep/blwq/docwatershed/materials.htm Portland Water District (207.774.5961), http://www.pwd.org/news/publications.php

Shady Rain Garden Plant List



Turtlehead (Chelone glabra) Grows to a height of 2 to 3 feet with a spread of 1.5 to 2.5 feet. Flowers are white with a pinkish tinge and are similar to snapdragons. Prefers a rich, moist to wet, humusy soil with partial shade.



Obedient Plant (Physostegia virginiana) Grows to a height of 3 to 4 feet with a spread of 2 to 3 feet. Pink or white flowers bloom late in the season. Should be divided every 2-3 years to prevent aggressive spreading. Prefers average to wet, well-drained soil in sun to shade. Attracts hummingbirds and butterflies.



Blue Cohosh (Caulophyllum thalictroides) Grows I to 2 feet high with a spread of 1/2 to 1 foot. Foliage is blue-green. Flowers are small and brownish-green to yellowish-green. Clusters of attractive (but poisonous) blue berry-like seeds appear in the summer. Partial to full shade. Needs moist, neutral to slightly acidic soils and is best grown in shady woodland areas.

Columbine (Aquilegia canadensis) Grows from 2 to 3 feet high with a spread of 1 to 1.5 feet. Flowers are light pink with yellow to blood red with yellow and bell shaped. Full sun to part shade. Prefers medium wet, well-drained soil but will tolerate a while range as long as drainage is adequate. Flowers are attractive to hummingbirds.

Downy Yellow Violet (Viola pubescens) Grows from 0.5 to 1 foot high with a spread of 0.5 to 1 foot. Leaves are heart-shaped and pubescent. Yellow flowers have purple veins on the lower petals and flower in early spring. Part shade. Prefers medium to wet, well-drained soil. Low maintenance.

Bloodroot (Sauguinaria canadensis) Grows from 6 to 12 inches high with a spread of 6 inches and is usually found in colonies. Leaves and root contain an orange/ red juice that is poisonous. Flowers in early spring. Grows best in full sun and leaf litter.



Interrupted Fern (Osmanda claytoniana) Gets its name from the brown fertile leaflets, which 'interrupt' the green sterile leaflets on the larger fronds. Common in open woodlands, damp fields, and shaded roadsides. Grows 2 to 3 feet tall with a similar spread. Grows best in part shade in moist soil.



Cinnamon Fern (Osmanda chmamonea) A tall, deciduous, perennial fern of moist woods, grows 2 to 5 feet tall with a spread of 2 to 3 feet. Distinctive, cinnamoncolored fronds. Fiddleheads are sometimes collected in the spring, steamed or boiled, and eaten. Grows best in part shade in moist soil.















Also Called: ECM, Slope Stabilizer, Erosion Control Mulch, Superhumus™, Wood Waste, Stump Grindings

Purpose: Erosion Control Mix is a kind of mulch made of partially composted bark, sand, gravel, stone and wood fragments. It is much heavier than other types of mulch and its mixture of elongated fibers, gravel and soil lock together to protect the underlying soil from erosion. Like other mulches, it also retains moisture, controls weeds and improves the soil as it decomposes. It can be used on paths, slopes and between plantings.



<u>Installation</u>: ECM should completely cover areas of bare soil to a thickness of 3 to 4 inches. Keep an inch or two of space between the mulch and base of plants. Erosion Control Mix should not be used in areas with concentrated water flows or on slopes greater than 2:1 (27°).

ECM often comes in a fine grade (such as Superhumus^{IM}) that works well in a more landscaped setting and a standard, more "chunky" grade that is less composted and holds up better on steeper slopes and paths. Some people choose to top-dress the chunky ECM with a few inches of Superhumus^{IM} or regular bark mulch for a more finished appearance. If the ECM is going to be used to naturalize an existing lawn or grassy area, a weed barrier such as several layers of newspaper should be placed down before the mulch is added.



Materials: Locating this relatively new product can be difficult. However, many contractors are starting to use it on construction sites in place of silt fence. Contact your local contractor or gravel pit and ask for Erosion Control Mix or the other names mentioned above. Make it clear that you are not looking for landscaping bark mulch because it is not the same product and will not be as effective. Some transfer stations also make ECM available to residents.



<u>Maintenance</u>: Mulched areas should be inspected regularly and after each large rainfall. Mulch should be immediately added to washed out areas to maintain the desired thickness. ECM should be left in place, and new plant growth should be promoted. Mulched areas should not be raked.

Drawbacks of Other Mulches: ECM is the most effective mulch for erosion control purposes. If ECM is not available, however, the following other mulches may be suitable. Any mulch is better than bare soil.

- Pine Needles Washes away easily on slopes. Provides a natural look and is often plentiful and free. Especially good around acid-loving plants like blueberries, azaleas and rhododendrons.
- Bark Mulch Better than bare soil, but easily eroded. Most popular mulch and readily available.
- Wood Chips Will float away in rains and does not enrich the soil like ECM.
- Crushed Stone or Pea Stone Does not allow vegetation to grow, creates an unnatural
 appearance and may not be allowed by DEP or Town depending on distance to water.

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NATIVE PLANT LIST -Part Sun, Dry Soils~

Although this is not an exhaustive list, the following native plants are carried at local nurseries. If a particular plant is not available at your nursery, ASK for it by name. The more demand there is for native plants, the more likely a nursery is to carry it. Additionally, nursery staff may be able to recommend a suitable, NON-INVASIVE substitute.

SMALL SHRUBS (<6')

Bush Honeysuckle (Diervilla lonicera) Also called American Fly Honeysuckle. (Do not confuse with European Fly Honeysuckle which is invasive.) Grows 2 to 5 feet high. A straggling shrub with handsome red berries. Sun to shade. Sandy, dry soil. Drought tolerant. Found in cool, rocky woods. Zones 3-7.

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Sheep Laurel/Lambkill (Kalmia angustifolia) Grows from 1 to 3 feet high with a greater spread. Grows best in moist, organic, cool, acidic soils but can tolerate a variety of soil types. Prefers full sun to partial shade. Bright pink flowers bloom in early summer. As the name suggests it is poisonous to livestock. Zones 1-6.

> Fragrant Sumac (Rhus aromatica) Available in standard and 'Gro-Low' varieties. Dwarf grows 2 to 3 feet with a 6 to 8 foot spread. A low shrub with compound leaves and small, fragrant, yellow flowers in spring, followed by red fruit. Excellent orange to red fall color. Leaves are aromatic when crushed. Sun to part shade. Dry, sandy to rocky soil. Good as bank covers and in mass plantings. Dwarf variety used as a ground cover. Found in dry, rocky, open woods. Zones 3-9.

Snowberry (Symphonicarpos alba) Grows 3 to 6 feet high with similar spread. Spreads by suckering so will form thickets, if allowed. Good for erosion control. Blue-green foliage, pink spring flowers and ornamental, white berries in fall. Rapid growth. Sun to part-sun. Moist to dry soil. Adaptable to a variety of soil conditions. Good for kirds. Zones 3-7.

> height with a spread of 8 to 12 feet. Typically found near bogs and marshes. Prefers moist, well-drained, acidic soil. Sun to partial shade. White bell-shaped flowers bloom in the spring and are followed by edible dark blue berries. Leaves turn red in the fall. Berries are attractive to birds and other wildlife. Zones 5-7.

> Highbush Blueberry (Vaccinium corymbosum) Grows from 6 to 8 feet in

Mapleleaf Viburnum (Viburnum acerifolium) Grows from 4 to 6 feet high with an equal spread. Grows best in well-drained, mildly acidic soil with average moisture but can tolerate drier soils. Prefers shade to partial shade. Similar to other viburnums, a cluster of small white flowers gives way to dark blue/black fruits that are enjoyed by birds and other wildlife. Mapleleaf Viburnum is susceptible to attack from the Viburnum Leaf Beetle. Check with your local nursery to see if the Beetle is a problem in your area. Zones 4-8.

Native Plant List - Part-Sun, Dry Soil, page 1 of 4

February 2007 DEPLW-0824













Full Shade - less than 2 hours of direct



RAIN BARRELS



~managing roof runoff in your backyard~



Purpose: Rain barrels provide an innovative way to capture rainwater from your roof, and store it for later use. Water collected from rain barrels can be used to water lawns, gardens, and indoor plants. This water would otherwise run off your roof or through downspouts and become stormwater, picking up pollutants on its way to a storm drain, stream, or lake. You can lower your water bill, conserve well water in the dry season, and reduce polluted stormwater runoff.

<u>Installation:</u> A rain barrel must be placed on a level surface. If you have gutters, place the rain barrel keneath the downspout so the water flows onto the screen on top of the barrel. You may need to have your downspout cut to an appropriate height above your rain barrel.

If you do not have gutters, find a location where water concentrates from your roof and place the rain barrel where it will capture this steady stream of water during rain storms.

Elevate your rain barrel by placing it on cinder blocks or a sturdy wooden frame. Raising the barrel allows the barrel to drain properly, and you to easily fit a watering can underneath the spout, or attach a hose so you can recover the rainwater you have collected. Soaker hoses can also be attached to the rain barrel to slowly release water into gardens and recharge groundwater.



<u>Materials</u>: Rain barrels are available in many sizes and styles, and range in price from \$80 to over \$200. Contact your local hardware store, garden center, or nursery. You can also order rain barrels on-line from SkyJuice New England http://www.skyjuice.us.

Building your own rain barrel is usually the least expensive option. Several web sites exist with material lists and clear directions. Sites are as follows:

- http://www.ci.superior.wi.us/publicwks/wastewater/RainBarrelInstructions.htm
- http://www.cwp.org/Community_Watersheds/brochure.pdf
- http://www.dnr.state.md.us/ed/rainbarrel.html

Finally, you can simply use an open barrel to collect rainwater. Keep in mind that you should use the water within two weeks because the development of a mosquito from egg to adult takes 10 to 14 days.

<u>Maintenance</u>: Gutters and downspouts should be clean of debris. Leaves and pine needles can clog gutters and prevent water from reaching the rain barrel. Furthermore, check the screen on the rain barrel after each storm event and remove leaves or pollen that has plugged the screen.

Freezing water can damage your barrel. Rain barrels should be drained and stored before freezing weather sets in to prevent ice damage. They can be stored outside if they are turned upside down and the faucet is covered. Be sure to put something heavy on your rain barrel so it doesn't roll away. Rain barrels can also be stored inside a garage or other protected area.

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runpose: Dripine trenches collect and infiltrate stormwater, and control erosive runoff from the rooftop. The trenches collect roof runoff and store it until it soaks into the soil. These systems also minimize wear on your house by reducing back splash.



<u>Installation</u>: Dig a trench that is 18" wide and at least 8" deep along the drip line. Slope the bottom away from the house so that water will drain away from the foundation. Make sure to dispose of the soil in a flat area where it cannot be washed into the lake. Fill the trench with $\frac{1}{2}$ " -1¹/₂" crushed stone. The front and sides of the trench may be edged with stone or with pressure-treated lumber to hold the stones in place.

Extend the life of the dripline trench by lining the sides with non-woven geotextile fabric and filling to within 3" of the ground level with stone. Fold a flap of non-woven geotextile fabric over the top of the trench and top off with additional stone.

Note: Dripline trenches work best in sand and gravel soils that can quickly disperse a large volume of water. They should not be used on structures with improperly sealed foundations, as flooding may result.

<u>Materials</u>: Crushed stone can be purchased at your local gravel pit. Contact your local Soil and Water Conservation District for suppliers of non-woven geotextile fabric. Other geotextiles, including landscaping weed barrier, can be substituted for smaller projects.

<u>Maintenance</u>: To maintain these structures, periodically remove accumulated debris and weeds from the surface. Trenches lined with non-woven geotextile fabric will require less frequent maintenance, however, they will still clog over time and the stone will need to be removed and washed to clean out the accumulated sediment and debris.



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