The Acton Wakefield Watersheds Alliance Youth Conservation Corps

2018 Season Report





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Crew Leader Zack Stadtfeld

2018 Crew Cody Granger Christian Kenney James Shimansky Bryce Stetson







Executive Director Linda Schier

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About AWWA

Mission

The mission of the Acton Wakefield Watersheds Alliance is to protect and restore water quality to maintain the social, economic, and environmental stability in our towns and in the region.

The members of AWWA include representatives of local lake associations, members of town committees including planning boards, and local residents. Our partners include UNH and UME Cooperative Extensions, Maine DEP, New Hampshire DES, York County Soil & Water Conservation District, and the local lake associations.

Watersheds

The AWWA Youth Conservation Corps (YCC) focuses its efforts on the Salmon Falls-Piscataqua and Saco River watersheds within the towns of Acton, Maine and Wakefield, New Hampshire. Within these watersheds AWWA currently services 10 water bodies – Balch Lake, Belleau Lake, Branch River, Horn Pond, Great East Lake, Lake Ivanhoe, Lovell Lake, Pine River Pond, Province Lake, and Wilson Lake.



Executive Summary

The Acton Wakefield Watersheds Alliance, a non-profit organization established in 2005, is dedicated to protecting and restoring the water quality of the lakes, ponds, rivers and streams of Wakefield, New Hampshire and the border region of Acton, Maine. AWWA staff members and volunteers work within the communities to strengthen the understanding that what happens on land determines the health of the local waters. Healthy waterbodies provide essential benefits to our communities as a natural resource, wildlife habitat, recreational opportunity and economic engine.

AWWA's Youth Conservation Corps (YCC) program was developed in 2006 to implement erosion control projects in our target region. The program is designed to reduce pollution caused by runoff from rain

events and seasonal melt water that flows into our local lakes, rivers, and streams. The YCC tackles this through the installation of "Best Management Practices" (BMPs) or landscaped features that promote the infiltration of runoff or divert the runoff away from the lake toward vegetation where it can soak into the ground. Each project showcases solutions to environmental problems faced by waterfront properties that landowners can do themselves.



The process starts with a technical assistance visit between the homeowner and the AWWA program manager. During this initial meeting, the discussion centers on how the homeowners use their property, identifying areas with erosion, and going over potential fixes. The homeowners have the option to sign a pledge indicating they will install at least one of the recommendations within the next 12 months. If they sign the pledge they receive a free technical assistance packet that includes a site design, recommendations, local suppliers, and BMP fact sheets. At this point, homeowners have the option to apply to become a project host for our YCC program. The homeowner can also implement the recommendations themselves or hire a contractor. In addition to the landscape design provided to the homeowner, the program manager focuses on educating homeowners on why the design features were chosen, what they will accomplish, and how to maintain them. This process is important in raising stakeholder awareness of the relationship between land use and water quality. The AWWA board and staff also focus efforts on local outreach to highlight the conservation practices that can reduce non-point source pollution.

If the site is conducive to a YCC project, the homeowner will receive a second packet that outlines specifically what AWWA will do and what is expected of the homeowner. The YCC will then provide free labor to install the BMPs and the homeowner is responsible for buying the materials. Homeowners are also asked to make an optional donation of 20% of the cost of AWWA's labor.

The labor of crew is funded by donations and grants, and the landowner provides all the necessary materials. Behind these projects is a crew of eager high school students supervised by a crew leader and the program manager. The YCC program gives its youth corps the opportunity to effect environmental solutions and empowers them to become the future stewards of our water resources.

Since 2006, the AWWA YCC has completed over 240 projects across 10 water bodies in the Wakefield, NH and Acton, ME region. The past successes set the bar high, but every year the YCC exceeds expectations and does fantastic work.

Amy Arsenault AWWA Program Manager

Ing Joserault



Salmon Falls – Piscataqua River and Saco River Watersheds Map

2018 Technical Assistance (TA) Visits

Requests for technical assistance were received from residents on 8 lakes in the AWWA region. These requests were the result of recruitment efforts by AWWA at community events, press articles, presentations at lake association meetings, the display of AWWA signs at past project host sites, and word of mouth from neighbors. All of these efforts come together to further AWWA's message and grow AWWA's project host program.

In 2018, AWWA received 24 TA requests from property owners who had erosion issues or wished to have their property assessed for issues that could be harming the lake. Not every technical assistance visit results in a design delivered to property owners for use correcting erosion issues on their property. In some cases, TA visits result in a project being completed in the same year. In other cases, homeowners did not receive designs, as their properties were erosion free and in good shape. In additional cases, some problems require serious engineering beyond the scale of a technical assistance visit.

The property owners that do receive design packets sign a pledge stating that they will perform at least one of the recommended designs in the packet within 12 months. Property owners can go about this in several ways. They can do the work themselves using the BMP fact sheets provided to them, they can hire a contractor to perform the work, or they can apply to be part of the AWWA project host program and have the YCC perform the work.

Every year AWWA contacts the previous year's TA clients and performs checks on their sites. This is in compliance with the pledge signed by the property owners and allows AWWA to pursue the property owner as a project host or to see if the owner needs a new design to fit their budget or landscaping. The technical assistance design packets include an introductory letter, an outline of the recommendations and an explanation of why those specific BMPs were chosen, a landscape design plan, a pledge sheet, a local suppliers list, and fact sheets for the recommend BMPs. The fact sheets outline the purpose, design, and instructions for constructing the BMP.

| 2018 Technical Assistance Visits by Lake *Indicates that the homeowner(s) became a project host in 2018 | | | |
|--|--|---------------------------------------|--------------------|
| Balch Lake | | | |
| 1. | Quincy Whitney | 4 Hemlock Drive | East Wakefield, NH |
| Bellea | u Lake | | |
| 2. | Pam Gelardi | 11 Lexington Drive | East Wakefield, NH |
| 3. | Gene Parker (BLPOA) | Fire Plug Beach – Beverly Hills Drive | East Wakefield, NH |
| Great | East Lake | | |
| 4. | Jack Crowley | 531 Abbott Road | Acton, ME |
| 5. | Leonard Lagasse* | 253 Parsons Point Road | Acton, ME |
| 6. | Bob Peachey | 708 Lakeside Drive | Acton, ME |
| 7. | Cory Sells | 1 Mallard Lane | East Wakefield, NH |
| Horn F | Pond | | |
| 8. | Nancy Labbe | 143 Martha Horn Road | Acton, ME |
| 9. | Jeff Russell | 73 Mountain View Drive | Acton, ME |
| Lake Iv | vanhoe/Round Pond | | |
| 10. | Joyce Mikesh | 21 Shore Road | East Wakefield, NH |
| 11. | Tony & Stephanie Retrosi* | 45 Shore Road | East Wakefield, NH |
| Lovell | Lake | | |
| 12. | Elaine Blaylock | 416 Pond Road | Sanbornville, NH |
| 13. | Anusia Hirsch* | 698 Brackett Road | Sanbornville, NH |
| 14. | Anusia Hirsch / Anusia Gillespie* | 680 Brackett Road | Sanbornville, NH |
| 15. | Peter Lewis* | 141 Red Gate Road | Sanbornville, NH |
| 16. | David & Jeri Pawlowski Susan & Richard Cadogan* | 536 Brackett Road | Sanbornville, NH |
| 17. | Area Princi | 42 No. Roberts Cove Road | Sanbornville, NH |
| 18. | Harold & Beth Seldin | 381 Lovell Lake Road | Sanbornville, NH |
| 19. | Denise Stewart | 131 Lovell Lake Road | Sanbornville, NH |
| 20. | Mark Tagen | 110 Pond Road | Sanbornville, NH |
| 21. | Amanda & Jeff Thacher | 772 Brackett Road | Sanbornville, NH |
| Provin | ce Lake | | |
| 22. | Dennis Badman* | 236 Point Road | East Wakefield, NH |
| 23. | Pat Benzing | 4982 Province Lake Road | East Wakefield, NH |
| Wilson | n Lake | | |
| 24. | Pam Grignaffini | 73 Hummingbird Road | Acton, ME |

2018 Technical Assistance Map



2018 Youth Conservation Corps (YCC) Overview

The 2018 AWWA YCC consisted of the Program Manager Amy Arsenault, Crew Leader Zack Stadtfeld, and crew members, Christian Kenney, James Shimansky, Cody Granger and Bryce Stetson.

After spending several years as a crew member, Zack moved into the Crew Leader position. We welcomed back Christian and James, and welcomed Cody and Bryce to the team. Throughout the year, Amy met with interested landowners to discuss their erosion concerns and then created site-specific design solutions for each property. Youth Conservation Corps projects are selected from technical assistance designs based on criteria set by the AWWA YCC Committee.

The YCC was able to complete 17 projects across 5 different waterbodies in the Wakefield and Acton region. The crew worked diligently for eight weeks starting at the end of June and working into the middle of August. The crew and experienced crew leaders were able to install 125 Best Management Practices (BMPs) which are the landscaped features designed to slow down runoff, divert it away from the lakes, and infiltrate the runoff into the ground before it reaches the lake. These 102 BMPs are estimated to stop 51.9 tons of sediment and 43.8 pounds of phosphorus from entering the lakes.

The projects that were completed consisted of erosion control Best Management Practices (BMPs) ranging from a few plantings, to sites with more than 10 BMPs installed. The crew readily attacked these problems and worked their hardest to ensure that when it rains, pollution does not happen on these properties.

Thank you to all AWWA staff, crew, crew leaders, and everyone who helped make this season a wonderful success!



How to Count Best Management Practices for YCC programs

This list standardizes BMP types, which encourage continuity across YCC programs in Maine. AWWA has adopted this method so that we are consistent with our fellow YCC programs. BMPs are grouped by type, and some types are split into size categories. Larger size categories will count as more than one BMP in the "Type of BMP Installed" table. Categories are based on size or how much material is used for each project.

Three types of BMPs:

Infiltration includes trenches, drip edge drains, dry wells, erosion control berms, rain gardens, detention basins and infiltration steps.

Diversion includes rubber razors, water bars, culverts and turnouts.

Stabilization includes rip-rap, vegetative buffers, ECM, driveway stabilization, path stabilization.

Infiltration Standards

| | Small | Medium | Large |
|---------------------|-------------------|--------------------|--------------------|
| Type of bivit | (Counts as 1 BMP) | (Counts as 2 BMPs) | (counts as 3 BMPs) |
| Infiltration trench | <10' | 10-20' | 20'+ |
| Dripline Trench | <10' | 10-20' | 20'+ |
| Dry well* | <5 cubic feet | 5-10 cubic feet | 10+ cubic feet |
| ECM berm | <10' | 10-20' | 20'+ |
| Rain gardens | At least 9 sq. ft | 9-25 square ft | > 25 square ft |
| Detention basins | <6' diameter | 6-10' diameter | 10' diameter |
| Infiltration steps | <5 | 5-10 | 10+ |

*dry well size refers to capacity to store water (if the structure is filled with crushed stone, divide your capacity by 2)

Diversion Standards

| Type of BMP | Small (Counts as 1 BMP) | Medium (Counts as 2 BMPs) | Large (counts as 3 BMPs) |
|--------------------------------|----------------------------|------------------------------|-----------------------------|
| Rubber razors | <14' | 14-28' | 28'+ |
| Water Bars | <10' | 10-20' | 20' |
| Culverts (metal or plastic) | <15" diameter pipe | 15-24" diameter pipe | > 24" diameter |
| Turnouts | 1 road/driveway turnout | 2 road/driveway turnouts | 3 road/driveway turnouts |
| Open Top Culverts | <14' | 14-28′ | 28'+ |
| Seed Bumps/ Drainage Swale | <14' | 14-28' | 28'+ |
| Ditches | <100' | 100-200' | 200'+ |

Stabilization Standards

| Type of BMP | Small (Counts as 1 BMP) | Medium (Counts as 2 BMPs) | Large (counts as 3 BMPs) |
|--|----------------------------|------------------------------|-----------------------------|
| Rip-Rap | <25sq ft | 25-50 sq ft | 50+ sq ft |
| Vegetative Buffers | <12 plants | 12-24 plants | 25+ plants |
| ECM | <100 sq ft | 100-400 sq ft | 400+ sq ft |
| Driveway stabilization | <30 linear ft of driveway | 30-60' linear ft | 60+ linear ft |
| Path Stabilization | <50 linear ft | 50-100 linear ft | 100+ linear ft |
| Crown/Ramp Driveway | <30 linear ft of driveway | 30-60' linear ft | 60+ linear ft |
| Crown/Ramp Path | <50 linear ft | 50-100 linear ft | 100+ linear ft |
| Cover Path with Erosion Control Mulch | <50 linear ft | 50-100 linear ft | 100+ linear ft |



| 2018 Summary of Installed BMPs | | |
|--------------------------------|------------------|--|
| Best Management Practice (BMP) | Number Completed | |
| Erosion Control Mix | 37 | |
| Vegetated Buffer | 22 | |
| Dripline Trench | 16 | |
| Waterbar | 15 | |
| Infiltration Trench | 8 | |
| Native Vegetation | 7 | |
| Rubber Razor | 6 | |
| Infiltration Pathway | 5 | |
| Firehose Diverter | 5 | |
| Rain Garden | 3 | |
| Infiltration Steps | 2 | |
| Detention Basin | 2 | |
| Retrofit Infiltration Steps | 1 | |
| Crushed Stone | 1 | |
| Dry Well | 1 | |



| 2018 YCC Project Sites by Lake | | | |
|--------------------------------|---|--------------------------|--------------------|
| Love | Lovell Lake | | |
| 1. | David & Jeri Pawlowski Susan & Richard Cadogan | 536 Brackett Road | Sanbornville, NH |
| 2. | Anusia Hirsch | 698 Brackett Road | Sanbornville, NH |
| 3. | Anusia Hirsch | 680 Brackett Road | Sanbornville, NH |
| 4. | Beverly Lawrie | 46 N. Roberts Cove Road | Sanbornville, NH |
| 5. | Peter Lewis | 141 Red Gate Road | Sanbornville, NH |
| 6. | Nick Mourginis | 356 Lovell Lake Road | Sanbornville, NH |
| 7. | Cindy Scally | 40 N. Roberts Cove Road | Sanbornville, NH |
| Great East Lake | | | |
| 8. | Deb Henault | 54 Mariah's Lane | Acton, ME |
| 9. | Leonard Lagasse | 253 Parsons Point Road | Acton, ME |
| Horn Pond | | | |
| 10. | Jon & Kelley Sewell | 57 Mountain View Drive | Acton, ME |
| Lake Ivanhoe | | | |
| 11. | Sharon Coyne | 34 Middle Road | East Wakefield, NH |
| 12. | Tony & Stephanie Retrosi | 45 Shore Road | East Wakefield, NH |
| Province Lake | | | |
| 13. | Dennis Badman | 236 Point Road | East Wakefield, NH |
| 14. | Province Line Associates | Route 153/Province Beach | East Wakefield, NH |
| 15. | Province Line Associates | Route 153/Province Beach | East Wakefield, NH |
| 16. | Province Line Associates | Route 153/Province Beach | East Wakefield, NH |
| 17. | Province Line Associates | Route 153/Province Beach | East Wakefield, NH |

2018 YCC Project Host Site Map



David & Jeri Pawlowski / Susan & Richard Cadogan Lovell Lake – Sanbornville, NH

David and Jeri contacted us in because they wanted to know if there were any improvements that could be done on their property which they co-own with family. When they first called, their initial concern was with runoff from the road flowing down their long driveway and into their yard. In addition to issues in the driveway, we found some other areas around the property that could be improved to allow for better stormwater infiltration. Most of the yard was bare soil with several erosion gullies. This erosion was the result of very little groundcover, which normally helps keep soil in place. Roof runoff was also a large contributing factor causing erosion all around the house.

To address the erosion issues on this property, the YCC installed a few BMPs around the property to help better manage stormwater runoff. The YCC added a rubber razor in the driveway to divert runoff coming from Brackett Road and from their long driveway into a vegetated area. Three dripline trenches were installed under the roof eaves to catch roof runoff before it can flow across the yard. These dripline trenches were boxed in with pressure treated lumber to contain the crushed stone and to allow for more holding capacity. In addition, the YCC crew spread erosion control mulch around the entire yard to prevent the bare soils from washing into Lovell Lake. Since the project was completed, there have been several heavy rainstorms and the project has been working effectively. This project was highlighted on our end of the season project tour.













| Total Number of BMPs | Approximate Cost to Landowner | |
|--------------------------------|-----------------------------------|--|
| 11 | \$1,500 | |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced | |
| 7.0 | 5.9 | |
| Crew Hours | Crew Value | |
| 177.5 | \$2,280 | |
| BMPs Installed | Materials Used | |
| Erosion Control Mulch | Erosion Control Mulch – 38 yards | |
| 3 Dripline Trenches | Crushed Stone – 5 yards | |
| Rubber Razor Driveway Diverter | Pressure Treated Lumber - 96 feet | |
| | Rubber Conveyor Belt – 14 feet | |

Anusia Hirsch – Property #1 Lovell Lake – Sanbornville, NH

Back in 2010, the YCC installed waterbars, erosion control mulch, an infiltration trench, and a rain garden on Anusia's property. The original project needed to be spruced up, and some additional BMPs were added to better manage stormwater on this property. The pathway that was installed back in 2010 was washing out in one of the corners, and had become clogged with sand over time. In addition, the original erosion control mulch had degraded and needed to be replenished.

This summer, Anusia had some other problem areas she wanted to address. Along the driveway and next to the garage, there were some bare areas that needed to be stabilized. The YCC added erosion control mulch to prevent sediment from washing away. On the other side of the garage there is a steep hill that had some scarce grass on it. The hill leads to the grassy lawn allowing stormwater to flow easily across the yard towards the lake. In addition, a gutter is directed to the area alongside the hill. To catch stormwater coming from the hill and from the gutter, the YCC added some native vegetation, erosion control mulch, and installed a rain garden.





| Total Number of BMPs | Approximate Cost to Landowner | |
|--------------------------|---------------------------------------|--|
| 7 | \$465 | |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced | |
| 0.5 | 0.4 | |
| Crew Hours | Crew Value | |
| 84.5* | \$1,100* | |
| BMPs Installed | Materials Used | |
| Erosion Control Mulch | Erosion Control Mulch – 8.5 yards | |
| Infiltration Pathway | Native Vegetation – Approx. 15 plants | |
| Native Vegetation | Loam – 2 yards | |
| Rain Garden | Crushed Stone – 1 yard | |

*Crew hours and crew value are totals for both of Anusia's properties. Please see the next page for the second project.

Anusia Hirsch – Property #2 Lovell Lake – Sanbornville, NH

In 2016, the YCC completed a project on Anusia's other property next door to her house. Originally, the YCC installed several BMPs around the property including two rain gardens, an infiltration trench, waterbars and erosion control mulch. This summer, Anusia called AWWA concerned about the water's edge. Along the water there was an existing buffer made of natural plants and plants Anusia has added.

The YCC enhanced the buffer by adding more native plants and erosion control mulch. Plants help filter pollutants out of stormwater before they enter the lake, and they also provide root structure keeping soil in place. Erosion control mulch not only protects underlying soil, but it also improves the soil as it decomposes. In addition to the buffer, the crew spread mulch on an area of bare soil uphill of the lake. Without adding groundcover, the sandy soil would easily wash away. The YCC also replenished the mulch in between the waterbars from the project in 2016.







| Total Number of BMPs | Approximate Cost to Landowner | |
|--------------------------|---------------------------------------|--|
| 5 | \$745 | |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced | |
| 1.3 | 1.1 | |
| Crew Hours | Crew Value | |
| 84.5* | \$1,100* | |
| BMPs Installed | Materials Used | |
| Vegetated Buffer | Erosion Control Mulch – 18 yards | |
| Erosion Control Mulch | Native Vegetation – Approx. 15 plants | |
| | Loam – 2.5 yards | |

*Crew hours and crew value are totals for both of Anusia's properties.

Beverly Lawrie Lovell Lake – Sanbornville, NH

In 2006, Beverly's sister was a project host at their property on Lovell Lake. Despite being a project host in the past, the property still had some problem areas that needed to be addressed. In addition to adding more BMPs, the original projects needed some maintenance to help them work more effectively.

The YCC installed a rubber razor leading into a detention basin in an area of the yard that was not previously addressed. Runoff was coming from the road, passing across the neighbor's property, and into Beverly's yard down a slope leading to the lake. Adding a rubber razor across the yard diverts water into the drywell before it can flow towards the lake. Erosion control mulch was added on the slope below the rubber razor which had sparse grass and bare soils. This slope acted as a sluiceway towards the lake with nothing to slow or intercept stormwater. A vegetated buffer was also added at the water's edge to act as a final barrier trapping pollution before it can enter Lovell Lake.

The crew also cleaned out the infiltration trench installed in 2006, and replenished erosion control mulch in the existing rain garden. The infiltration pathway from the original project was filled with larger stone making it difficult to walk on. It was also slightly clogged and not quite deep enough to properly trap and infiltrate runoff. The YCC dug the walkway deeper, and replaced the larger stone with smaller $\frac{3}{4}$ " crushed stone.

















| Total Number of BMPs | MPs Approximate Cost to Landowner | |
|-------------------------------|-------------------------------------|--|
| 10 | \$860 | |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced | |
| 1.3 | 1.1 | |
| Crew Hours | Crew Value | |
| 99.5 | \$1,275 | |
| BMPs Installed and Maintained | Materials Used | |
| Vegetated Buffer | Erosion Control Mix – 8.5 yard | |
| Infiltration Pathway | Rip Rap & Crushed Stone – 2.5 yards | |
| Erosion Control Mulch | Pressure Treated Lumber – 48 feet | |
| Rubber Razor | Rubber Conveyor Belt – 24 feet | |
| Detention Basin | Native Vegetation – 6 plants | |
| Infiltration Trench | Loam – 1 yard | |

Peter Lewis Lovell Lake – Sanbornville, NH

Peter's property has been under construction and as a result there was a lot of bare soil and potential areas for erosion around the property. One of the main sources of runoff was the large downward sloping driveway. Driveways are always tricky, especially when they are plowed in the winter. Normally in gravel driveways, we recommend installing rubber razor diverters. However, this can pose a problem because plows will often destroy the rubber razors.

As an alternative, the YCC added two firehose diverters to help prevent runoff from easily flowing down the driveway picking up erosive power. The driveway still needs some work on the sides due to some channelized runoff blowing it out in sections before the firehoses will be effective. At the end of the firehose near the road, the YCC added a small detention basin with stones found around the property. This helps catch any sand coming from Red Gate Road. At the end of the second firehose, the YCC installed a rain garden to help collect driveway runoff. The YCC also added a vegetated buffer along a stream running beside the house. Finally, the YCC added erosion control mulch in several areas around the property to protect the bare soils from washing away into Lovell Lake.









| Total Number of BMPs | Approximate Cost to Landowner |
|---|--------------------------------|
| 13 | \$400 |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced |
| 21 | 17.8 |
| Crew Hours | Crew Value |
| 89.75 | \$1,150 |
| BMPs Installed and Maintained | Materials Used |
| 2 Firehose Diverters | Erosion Control Mix – 13 yards |
| Erosion Control Mulch | Crushed Stone – 0.5 yards |
| Vegetated Buffer | Loam – 3 yards |
| Rain Garden | Native Vegetation – 22 plants |
| Detention Basin Firehose Diverters – 52 fee | |

Nick Mourginis Lovell Lake – Sanbornville, NH

Back in 2009, the YCC added erosion control mulch, waterbars, and a dripline trench to this property. This summer, Nick contacted us to see what else could be done. Unfortunately, the mulch from the original project degraded long ago, and we needed to add some more BMPs to help manage the runoff. Although we would have like to have done more at this property, the schedule this summer only allowed us to install a few smaller BMPs.

The waterbars that were installed in 2009 act as steps leading towards the water. This summer, the YCC dug out behind those steps and added crushed stone to make them retrofit infiltration steps. Crushed stone is great for infiltrating runoff into the ground before it can cause erosion. The YCC also installed another dripline trench along the boathouse to catch roof runoff. Along the porch an infiltration trench made of crushed stone was added to catch anything right before it hits the lake. This project took about half a day to complete.





| Total Number of BMPs | Approximate Cost to Landowner | |
|-------------------------------|-------------------------------|--|
| 6 | \$140 | |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced | |
| 0.2 | 0.1 | |
| Crew Hours | Crew Value | |
| 27.5 | \$355 | |
| BMPs Installed and Maintained | Materials Used | |
| Retrofit Infiltration Steps | Crushed Stone – 3 yards | |
| Dripline Trench | | |
| Infiltration Trench | | |

Cindy Scally Lovell Lake – Sanbornville, NH

Cindy contacted us in 2017 about her concerns about erosion on her property. We identified problem areas and decided on the areas where BMPs would be helpful in managing stormwater and pollution. Areas of concern were in the driveway, places with heavy foot traffic, and along the water's edge.

In the driveway the YCC installed two rubber razors that divert runoff into the woods. In a pathway leading towards the lake, the YCC added a set of infiltration steps. These steps help slow and infiltrate runoff, and create a stable place to walk. The crew also added native plants along the porch, and put pea stone down in a well-travelled area where water pools during rain events. Along the shoreline a vegetated buffer was added to act as a last defense to stop sediment, and filter out pollutants before they can reach the lake.







| Total Number of BMPs | Approximate Cost to Landowner | |
|--------------------------------------|------------------------------------|--|
| 11 | \$800 | |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced | |
| 3.3 | 2.7 | |
| Crew Hours | Crew Value | |
| 140.75 | \$1,825 | |
| BMPs Installed and Maintained | Materials Used | |
| Vegetated Buffer | Pea/Crushed Stone – 2 yards | |
| Infiltration Steps | Native Vegetation – 30 plants | |
| Pea Stone | Erosion Control Mulch – 1 yard | |
| Erosion Control Mulch | Pressure Treated Lumber – 120 feet | |
| 2 Rubber Razor Driveway Diverters | Rubber Conveyor Belt – 28 feet | |

Deb Henault Great East Lake – Acton, ME

Deb asked AWWA to look at her property when she saw us over at her neighbor's house conducting a site visit. After discussing how she uses the property, we planned to enhance the overall look while helping manage stormwater. The YCC converted an existing pathway into an infiltration pathway by adding crushed stone. Native plants and erosion control mulch were added on the slope around and below the pathway to help stabilize bare soils. Mulch was also spread on two sides of the camp to protect exposed tree roots. In addition, a dripline trench was added to help prevent any more tree roots from being exposed.









| Total Number of BMPs | Approximate Cost to Landowner | |
|-------------------------------|-----------------------------------|--|
| 6 | \$560 | |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced | |
| 2.7 | 2.3 | |
| Crew Hours | Crew Value | |
| 55.5 | \$725 | |
| BMPs Installed and Maintained | Materials Used | |
| Vegetated Buffer | Crushed Stone – 1 yard | |
| Infiltration Pathway | Native Vegetation – 6 plants | |
| Dripline Trench | Erosion Control Mulch – 3 yards | |
| Erosion Control Mulch | Pressure Treated Lumber – 20 feet | |

Leonard Lagasse Great East Lake – Acton, ME

Lenny was familiar with AWWA because he had a technical assistance visit in 2016. After some guidance, he was able to construct his own lengthy set of infiltration steps leading from the house all the way down the hill. This summer, he contacted AWWA again because of issues he was having with his large hill. Lenny's property was tricky because not only did he have mostly bare soil around the entire house, but it's steep. He did not know how to address his issues in a way that would not only be effective but would also help the lake.

We decided that erosion control mulch would be the best and quickest way to get ground cover over the bare soil. Despite being very thick and stable, erosion control mulch can be tricky on very steep slopes. We decided to add waterbars down the entire slope to help keep the mulch in place. In addition to the mulch, by re-vegetating the slope we were able to help further stabilize the soil. Plants are also great at filtering out pollutants and they also intercept raindrops reducing their impact on the soil. This project took just over a day to complete.











| Total Number of BMPs | Approximate Cost to Landowner | |
|-------------------------------|-----------------------------------|--|
| 15 | \$810 | |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced | |
| 7.3 | 6.2 | |
| Crew Hours | Crew Value | |
| 56.5 | \$730 | |
| BMPs Installed and Maintained | Materials Used | |
| 7 Waterbars | Native Vegetation – 30 plants | |
| Erosion Control Mulch | Erosion Control Mulch – 15 yards | |
| Native Vegetation | Crushed Stone – 2 yards | |
| | Pressure Treated Lumber – 62 feet | |

Jon & Kelley Sewell Horn Pond – Acton, ME

Jon and Kelley originally contacted AWWA because they were concerned with exposed tree roots in the path leading to their dock. Unfortunately, installing infiltration steps in this spot would be too difficult and time consuming for our novice YCC crew. However, that did not stop the Sewell's from taking it upon themselves to install infiltration steps.

The YCC crew supplemented the work the Sewell's did by adding BMPs around the rest of the property. A dripline trench was installed along one side of the house to help mange roof runoff. Along the deck the YCC added an infiltration trench to catch stormwater coming from this impermeable surface. Next to the deck the Sewells added rocks below a gutter to help slow rainwater below it flows into the yard. Despite those efforts, erosion was still occurring in this area because there was nowhere for the water to go. Instead of leaving stones on the surface, the YCC dug a drywell which has some holding capacity. In addition, erosion control mulch was spread around the entire property to protect areas that were eroding, and native vegetation was added at the water's edge to create a buffer.













| Total Number of BMPs | Approximate Cost to Landowner | |
|--------------------------------------|----------------------------------|--|
| 10 | \$700 | |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced | |
| 1.5 | 1.2 | |
| Crew Hours | Crew Value | |
| 35.5 | \$475 | |
| BMPs Installed and Maintained | Materials Used | |
| Vegetated Buffer | Native Vegetation – 15 plants | |
| Erosion Control Mulch | Erosion Control Mulch – 11 yards | |
| Infiltration Trench | Crushed Stone – 2.5 yards | |
| Dripline Trench | | |
| Drawell | | |

Sharon Coyne Lake Ivanhoe – East Wakefield, NH

The was our first project of the season, and it was a great introduction for our new crew members. The homeowner contacted us because she wanted to make her property more lake friendly. Luckily, there were some simple BMPs that could be added to achieve this goal.

Along the front of the camp, the YCC added a dripline trench to catch roof runoff before it can erode the surrounding soils. At the water's edge, the YCC dug out several inches of soil and replaced it with crushed stone to create an infiltration pathway. A waterbar was added at the end to keep the stone from falling into the lake. Crushed stone was also spread behind and underneath the deck to cover bare soils that were eroding into the lake.



















| Total Number of BMPs | Approximate Cost to Landowner | |
|--------------------------------------|----------------------------------|--|
| 5 | \$150 | |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced | |
| 0.4 | 0.3 | |
| Crew Hours | Crew Value | |
| 33.5 | \$430 | |
| BMPs Installed and Maintained | Materials Used | |
| Dripline Trench | Crushed Stone – 3 yards | |
| Infiltration Pathway | Pressure Treated Lumber – 3 feet | |
| Waterbar | | |

Tony & Stephanie Retrosi Lake Ivanhoe – East Wakefield, NH

This project came together very quickly towards the end of the season. The Retrosis were looking for some suggestions on how to reduce the amount of runoff reaching their beach. Due to the way they use the property, we were somewhat limited on what we could add. Due to time constraints, the YCC were able to install one waterbar on the side of the house. The Retrosis have future plans to add more plants along the sandy beach, and possibly some erosion control mulch.



| Total Number of BMPs | Approximate Cost to Landowner | |
|-------------------------------|--------------------------------|--|
| 1 | \$315 | |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced | |
| 1.4 | 1.1 | |
| Crew Hours | Crew Value | |
| 7.5 | \$100 | |
| BMPs Installed and Maintained | Materials Used | |
| Waterbar | Crushed Stone – 10 bags | |
| | Pressure Treated Lumber – 8 ft | |

Dennis Badman Province Lake – East Wakefield, NH

Doctor Badman was a project host back in 2012 so he was familiar with BMPs and the importance of stormwater management. In 2012, the YCC installed an infiltration pathway, erosion control mulch, plants, and crushed stone. Over time, erosion began occurring in areas where the mulch had degraded.

This summer, the YCC added more mulch and plantings to an eroding bank. Unfortunately, after a very heavy rainstorm, some of the project washed out. The YCC returned to the site, added two waterbars and fixed the areas where the mulch was not thick enough. The waterbars help keep the mulch in place, and they also help break the velocity of runoff flowing towards the lake.





| Total Number of BMPs | Approximate Cost to Landowner | |
|-------------------------------|-----------------------------------|--|
| 7 | \$350 | |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced | |
| 0.4 | 0.3 | |
| Crew Hours | Crew Value | |
| 25 | \$325 | |
| BMPs Installed and Maintained | Materials Used | |
| 2 Waterbars | Native Vegetation – 12 plants | |
| Erosion Control Mulch | Erosion Control Mulch – 1.5 yards | |
| Vegetated Buffer | Pressure Treated Lumber – 13 ft | |

Province Line Associates Province Lake – East Wakefield, NH

Since 2014, the YCC has been adding sections of vegetated buffer along RT-153 on privately owned property at Province Lake. This road causes major issues for the shoreline, and much of the road is unarmored. Large washouts and gullies in the sand occur up and down the beach. In the Province Lake Watershed Management Plan this road was identified as a major pollutant contributor.

This year, there were funds available through the NHDES Watersheds Assistance grant for the Province Lake Watershed Plan implementation to fund more sections of vegetated buffer. Vegetated buffers include erosion control mulch and native plants. The mulch and plants help slow runoff and filter out sediment and pollutants before they can reach the lake. At the time of this project, New Hampshire Department of Environmental Services had Province Lake under a cyanobacteria advisory because it was experiencing a potentially toxic algae bloom. Situations like these display the need for more action to prevent sediment and phosphorus from reaching our lakes. As the crew was working, we received many compliments from people passing by thanking us for our water quality protection efforts.

This summer the YCC added four sections, counting as four projects, of buffer that were 25 ft, 60 ft, 85 ft, and 30 ft long. These buffers used a total of 16 yards of mulch and 89 plants. The species of plants that were added included beach rose, blueberry, sweet fern, bayberry, and chokeberry.

















| Total Number of BMPs | Materials paid for by NHDES 319 Grant | |
|--------------------------------------|---------------------------------------|--|
| 24 | \$2,700 | |
| Tons of Sediment Reduced | Pounds of Phosphorus Reduced | |
| 3.6 | 3.3 | |
| Crew Hours | Crew Value | |
| 161 | \$2,135 | |
| BMPs Installed and Maintained | Materials Used | |
| Vegetated Buffer | Native Vegetation – 89 plants | |
| Erosion Control Mulch | Erosion Control Mulch – 16 yards | |
| | Loam – 7 yards | |

Previous YCC Project Site Maintenance

Brackett Road Trenches

In 2014 the YCC installed infiltration trenches on Brackett Road. These projects were done in conjunction with the UNH Stormwater Center and Wakefield DPW as part of the Brackett Road projects. This year, the YCC had some availability and notcied that the trenches could use a cleaning. The crew spent a day cleaning out the trenches and making them more functional.







AWWA Office Gardens

In 2015, the YCC installed two rain garens at the AWWA office. Every year the gardens become full of weeds and need to have new ECM added.



Canal Road

Many of the municipal sites we have worked on need continued maintenance in order for them to work properly and effectively. This summer, an infiltration trench along Robinson Road on the Great East Lake Canal was cleaned of sediment and debris. Before being installed in 2008, water would flow across a flat, gravel open area, picking up sediment, crossing paved Canal Road, and would subsequently flow into the Great East Lake/Horn Pond canal. Continued maintenance is essential to keeping this a highly effective BMP.



Gottlieb Detention Basin & Firehose Diverters

In 2007, a detention basin was installed where Veazey Point Road meets Charlene's driveway. Firehose diverters were also added to the very steep driveway to direct water into a wooded area.

Almost every year the YCC removes sediment from the detention basin because it clogs with road material. This year the crew also replaced 2 firehoses that were over 10 years old and falling apart. The old hoses had large rips and tears and therefore were not catching sand like they should.



McKinley Infiltration Trench

In 2007, an infiltration trench was installed on the McKinley's property. Again, sediment from Veazey Point Road and from their driveway had clogged the trench over time. The YCC removed the rocks and cleaned out the sediment.



St. Anthony's Church

AWWA installed a project at St. Anthony's Church in 2007. The church sits directly in front of the Branch River and since then the project has been maintained annually. This year, accumulated sediment was removed from the infiltration trench located along the parking lot.



Boat Launch Cleanups

The YCC also cleaned up trash at the Great East Lake and Horn Pond Boat Launches.







Appendix B – NH DES Pollutant Control Report

NPS Projects - Pollutants Controlled Report

New Hampshire Department of Environmental Services, Watershed Assistance Section



DES Project Number: RI-16-S-01 Date of Report: 10/11/2018

Project Title: <u>Province Lake Watershed Management Plan Implementation Phase 2: Septic System</u> <u>Improvements, Golf Course, Campground, Shoreline and Road Enhancement</u>

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

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

| Waterbody Name | Nitrogen | Phosphorus | Sediment |
|-------------------------|-----------------|-----------------|---------------|
| | pounds per year | pounds per year | tons per year |
| Great East Lake (Maine) | N/A | 8.5 | 10.0 |
| Horn Pond (Maine) | N/A | 1.2 | 1.5 |
| Lake Ivanhoe | N/A | 1.4 | 1.8 |
| Lovell Lake | N/A | 29.1 | 34.6 |
| Province Lake | N/A | 3.6 | 4.0 |
| Totals | N/A | 43.8 | 51.9 |

| Table 2. | Wetlands, Streambanks, Shoreline Protecte | d / 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 | not applicable | not applicable | | |
| /shoreline protected | | | | |
| Stream channel | not applicable | not applicable | | |
| stabilized | | | | |

| 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 NHDES and USEPA. | | | | | | | |
|---|---------------------------|-------------------------------|------------------|--|--|--|--|
| Submitted by (for Grantee): | Smy Gronault Signature | Amy Arsenault Printed Name | date: 10/11/2018 | | | | |
| Reviewed by (for DES): | Signature | Printed Name | date: | | | | |
| | | | | | | | |

NPS Projects - Pollutants Controlled Report

New Hampshire Department of Environmental Services, Watershed Assistance Section

DES Project Number: RI-16-S-01 Date of Report: 10/11/2018

Table 3. List of BMP Sites and Methods Used

Lake: Great East Lake

| Site ID (Name or # from site list) | Site Location Description | Latitude and Longitude (decimal degrees) | Brief BMP Description | Estimation Method / Sub-Method Used | Implementation Date | Pounds of Nitrogen Per Year | Pounds of Phosphorus Per Year | Tons of Sediment Per Year |
|--|-------------------------------------|---|--|--|------------------------|-----------------------------------|-------------------------------------|---------------------------------|
| Henault | 54 Mariah's Lane Acton, ME | 43.5877 -70.9501 | Infiltration pathway, dripline trench, erosion control mulch & vegetated buffer | Region 5 | 7/25/2018 | N/A | 2.3 | 2.7 |
| Lagasse | 253 Parsons Point Road Acton, ME | 43.5765 -70.9296 | 7 Waterbars, erosion control mulch & native vegetation | Region 5 | 7/10/2018 | N/A | 6.2 | 7.3 |
| | | | | | Totals: | N/A | 8.5 | 10.0 |

Table 4. List of BMP Sites and Methods Used

Lake: Horn Pond

| Site ID (Name or # from site list) | Site Location Description | Latitude and Longitude (decimal degrees) | Brief BMP Description | Estimation Method / Sub-Method Used | Implementation Date | Pounds of Nitrogen Per Year | Pounds of Phosphorus Per Year | Tons of Sediment Per Year |
|--|-------------------------------------|---|--|--|------------------------|-----------------------------------|-------------------------------------|---------------------------------|
| Sewell | 57 Mountain View Drive Acton, ME | 43.5650 -70.95979 | Erosion control mulch, vegetated buffer, drywell, dripline trench & infiltration trench | Region 5 | 7/24/2018 | N/A | 1.2 | 1.5 |
| | Totals: | | | | | | | 1.5 |

Table 5. List of BMP Sites and Methods Used

Lake: Lake Ivanhoe

| Site ID (Name or # from site list) | Site Location Description | Latitude and Longitude (decimal degrees) | Brief BMP Description | Estimation Method / Sub-Method Used | Implementation Date | Pounds of Nitrogen Per Year | Pounds of Phosphorus Per Year | Tons of Sediment Per Year |
|--|--------------------------------------|---|--|--|------------------------|-----------------------------------|-------------------------------------|---------------------------------|
| Coyne | 34 Middle Road East Wakefield, NH | 43.6029 -70.9885 | Dripline trench, infiltration pathway & waterbar | Region 5 | 6/26/2018 | N/A | 0.3 | 0.4 |
| Retrosi | 45 Shore Road East Wakefield, NH | 43.6022 -70.9936 | Waterbar | Region 5 | 8/1/2018 | N/A | 1.1 | 1.4 |
| | | | | | Totals: | N/A | 1.4 | 1.8 |

Table 6. List of BMP Sites and Methods Used

Lake: Lovell Lake

| Site ID (Name or # from site list) | Site Location Description | Latitude & Longitude (decimal degrees) | Brief BMP Description | Estimation Method / Sub Method Used | Implementation Date | Pounds of Nitrogen Per Year | Pounds of Phosphorus Per Year | Tons of Sediment Per Year |
|--|---|---|--|---|------------------------|-----------------------------------|-------------------------------------|---------------------------------|
| Pawlowski | 536 Brackett Rd. Sanbornville, NH 03872 | 43.5447 -71.0092 | 3 Dripline trenches, erosion control mulch & rubber razor | Region 5 | 7/5/2018 | N/A | 5.9 | 7.0 |
| Scally | 40 N. Roberts Cove Rd. Sanbornville, NH 03872 | 43.5432 -71.0005 | Vegetated buffer, infiltration steps, crushed stone, erosion control mulch, 2 rubber razors & native vegetation | Region 5 | 7/24/2018 | N/A | 2.7 | 3.3 |
| Lawrie | 46 N. Roberts Cover Rd. Sanbornville, NH 03872 | 43.5432 -70.9995 | Vegetated buffer, infiltration pathway, erosion control mulch, rubber razor, detention basin & infiltration trench | Region 5 | 7/12/2018 | N/A | 1.1 | 1.3 |

| Mourginis | 356 Lovell Lake Rd. Sanbornville, NH 03872 | 43.5429 -71.0206 | Retrofit infiltration steps, dripline trench & infiltration trench | Region 5 | 7/25/2018 | N/A | 0.1 | 0.2 |
|-----------|---|---------------------|---|----------|-----------|-----|------|------|
| Lewis | 141 Red Gate Rd. Sanbornville, NH 03872 | 43.5349 -70.9883 | 2 Firehose diverters, erosion control mulch, rain garden, vegetated buffer & detention basin | Region 5 | 7/31/2018 | N/A | 17.8 | 21 |
| Hirsch | 680 Brackett Rd. Sanbornville, NH 03872 | 43.5426 -71.0051 | Erosion control mulch & vegetated buffer | Region 5 | 8/7/2018 | N/A | 1.1 | 1.3 |
| Hirsch | 698 Brackett Rd. Sanbornville, NH 03872 | 43.5428 -71.0047 | Erosion control mulch, vegetative buffer & | Region 5 | 8/7/2018 | N/A | 0.4 | 0.5 |
| | Totals: | | | | | | 29.1 | 34.6 |

Table 7. List of BMP Sites and Methods Used

Lake: Province Lake

| Site ID (Name or # from site list) | Site Location Description | Latitude & Longitude (decimal degrees) | Brief BMP Description | Estimation Method / Sub Method Used | Implementatio n Date | Pounds of Nitrogen Per Year | Pounds of Phosphorus Per Year | Tons of Sediment Per Year |
|--|--|---|--|--|-------------------------|-----------------------------------|-------------------------------------|---------------------------------|
| Badman | 236 Point Road East Wakefield, NH | 43.6870 -70.9991 | Vegetated buffer, erosion control mulch & 2 waterbars | Region 5 | 6/27/2018 | N/A | 0.3 | 0.4 |
| Province Line Associates | Route 153/Province Beach East Wakefield, NH | 43.6797 -70.9863 | Vegetated buffer & erosion control mulch | Region 5 | 8/13/2018 | N/A | 0.7 | 0.8 |
| Province Line Associates | Route 153/Province Beach East Wakefield, NH | 43.6799 -70.9863 | Vegetated buffer & erosion control mulch | Region 5 | 8/14/2018 | N/A | 1.0 | 1.0 |

| Province Line Associates | Route 153/Province Beach East Wakefield, NH | 43.6811 -70.9840 | Vegetated buffer & erosion control mulch | Region 5 | 8/16/2018 | N/A | 1.0 | 1.1 |
|--------------------------------|--|---------------------|--|----------|-----------|-----|-----|-----|
| Province Line Associates | Route 153/Province Beach East Wakefield, NH | 43.6813 -70.9835 | Vegetated buffer & erosion control mulch | Region 5 | 8/16/2018 | N/A | 0.6 | 0.7 |
| | Totals: | | | | | | 3.6 | 4.0 |

Appendix C – ME DEP Pollutant Control Report

Pollutants Controlled Report Maine Department of Environmental Protection NPS Grants Program – Bureau of Land and Water Quality



YEAR: 2018

NPS Project ID#: 2017RR07

Project Title: Great East Lake Watershed Protection Project (Phase 3 Maine)

Grantee: Acton Wakefield Watersheds Alliance DEP Agreement Admin: Wendy Garland

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

| Water Body Name | Sediment | Phosphorus | Nitrogen | |
|-----------------|---------------|-----------------|-----------------|--|
| | tons per year | pounds per year | pounds per year | |
| Great East Lake | 10.3 | 8.8 | N/A | |
| Horn Pond | 1.5 | 1.2 | N/A | |
| | | | | |
| Totals | 11.8 | 10.0 | N/A | |

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

| Resource | Planned | Actual | Planned | Actual |
|---------------------|----------------|----------------|----------------|----------------|
| | acres | acres | lineal feet | lineal feet |
| Wetlands restored | | | Not applicable | Not applicable |
| Wetlands created | | | Not applicable | Not applicable |
| Streambank / | Not applicable | Not applicable | | |
| shoreline protected | | | | |
| Stream channel | Not applicable | Not applicable | | |
| stabilized | | | | |

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 of the estimates is attached to this PCR for review by DEP / EPA.

Submitted by (for Grantee) Signature:

Printed Name: Amy Arsenault

Reviewed by DEP AA: _____

Printed Name: _____

Pollutants Controlled Report

Maine Department of Environmental Protection NPS Grants Program – Bureau of Land and Water Quality

NPS Project ID#: 2017RR07 for the year 2018

TABLES 3 & 4. List NPS Sites, Methods Used, & Pollutants Controlled

Great East

| Table ID (name or # from site list) | Brief Description NPS Site | Estimation Method/ Sub-Method Used | Sediment Tons / Yr | Phosphorus Pounds / Yr | Nitrogen Pounds / Yr |
|--|---|---|-----------------------|---------------------------|-------------------------|
| Henault | Infiltration pathway, dripline trench, erosion control mulch & vegetated buffer | Region 5/GEE | 2.7 | 2.3 | N/A |
| Lagasse | 7 Waterbars, erosion control mulch & native vegetation | Region 5/GEE | 7.3 | 6.2 | N/A |
| Anderson Cove Road | Replaced culvert, stabilized inlet and outlet, and re-graded road | Region 5/GEE | 0.3 | 0.3 | N/A |
| Totals for the Year: | | | | 8.8 | N/A |

Horn Pond

| Table ID (name or # from site list) | Brief Description NPS Site | Estimation Method/ Sub-Method Used | Sediment Tons / Yr | Phosphorus Pounds / Yr | Nitrogen Pounds / Yr |
|--|---|---|-----------------------|---------------------------|-------------------------|
| Sewell | Erosion control mulch, vegetated buffer, drywell, dripline trench, infiltration trench | Region 5/GEE | 1.5 | 1.2 | N/A |
| Totals for th | | | 1.5 | 1.2 | N/A |

Pollutant Load Reduction Estimation Methods

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

| Descriptors to use for Region 5 Model sub-methods: | |
|--|---|
| R5 / GEE | Gulley Stabilization – uses Gulley Erosion Equation |
| R5 / CEE | Streambank / Ditchbank and Roadbank stabilization - uses Channel Erosion Equation |
| R5 / Fields | Agricultural Fields – uses Revised Universal Soil Loss Equation (RUSLE), sediment |
| | delivery ration and contributing drainage area. |
| R5 / Filter | Filter Strips – uses relative gross filter strip effectiveness |
| R5 / Feedlot | Feedlot Pollution Reduction – uses a 12 step method |

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