Pleasant Lake/Parker Pond

Watershed Conservation Project

Cumberland County Soil & Water Conservation District

Prepared by Heather True

November 2011

Acknowledgments

Sponsors

Cumberland County Soil and Water Conservation District (CCSWCD)

Pleasant Lake and Parker Pond Association (PLPPA)

Maine Department of Environmental Protection (MDEP)

US Environmental Protection Agency

Towns of Casco and Otisfield

Portland Water District (PWD)

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This report is dedicated to Joel Bloom (1916-2009) who was a lifelong resident and water quality steward of Pleasant Lake and Parker Pond .

Painting by Alex Cohen (www.themagpie.org)

The Pleasant Lake / Parker Pond Watershed Conservation Project was funded in part by the US Environmental Protection Agency (EPA) under Section 319 of the Clean Water Act. Section 319 grants are administered by the Maine Department of Environmental Protection in partnership with EPA in order to prevent or reduce water pollution in Maine.

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Pleasant Lake / Parker Pond Conservation Project Summary

Pleasant Lake, Casco.

In 2006, volunteers surveyed the entire Pleasant Lake and Parker Pond Watershed for pollutant sites (primarily sediment from erosion) that was washing into the lakes threatening water quality. Sixty-four sites were identified with the majority of sites identified on residential and private roads.

Based on these findings, Cumberland County Soil and Water Conservation District (CCSWCD) in partnership with the Pleasant Lake / Parker Pond Association (PLPPA), were awarded a grant to address the highest impact sites identified through the survey. This grant project was titled the *Pleasant Lake / Parker Pond Conservation Project.*

Site identified in the 2006 survey in which sediment is washing down a driveway and into Pleasant Lake.

The *Pleasant Lake / Parker Pond Conservation Project* started in April 2009 and completed in November 2011. During its timeframe, it offered free technical assistance, addressed twelve high priority abatement sites, and provided recommendations and cost-sharing for twenty-five residential and commercial sites. It is estimated that over 83 tons of sediment per year have now been prevented from washing into the two lakes.

Next Steps

The future of water quality protection for Pleasant Lake and Parker Pond will depend on its local community and residents. Water quality impact considerations should be made prior, during and after alterations to the landscape. A variety of conservation practices can be used to help stabilize erosion sites and prevent erosion from occurring. For more information on conservation practices, soil erosion control, and water quality protection, please visit the CCSWCD website at: www.cumberlandswcd.org

WATERSHED

All the area of land in which water drains into the same waterbody

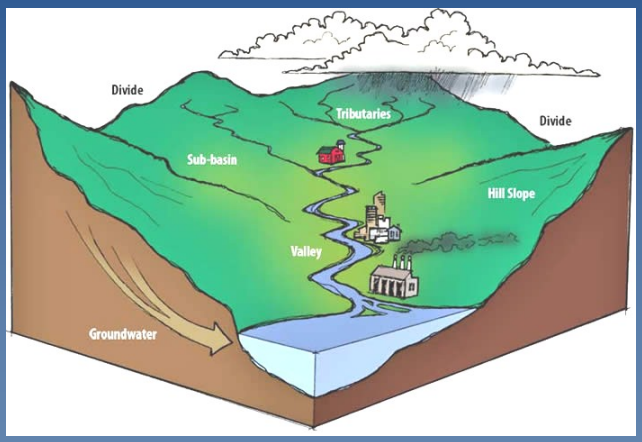


Photo credit: www.twp.west-bloomfield.mi.us/departments/Watersheds.cfm

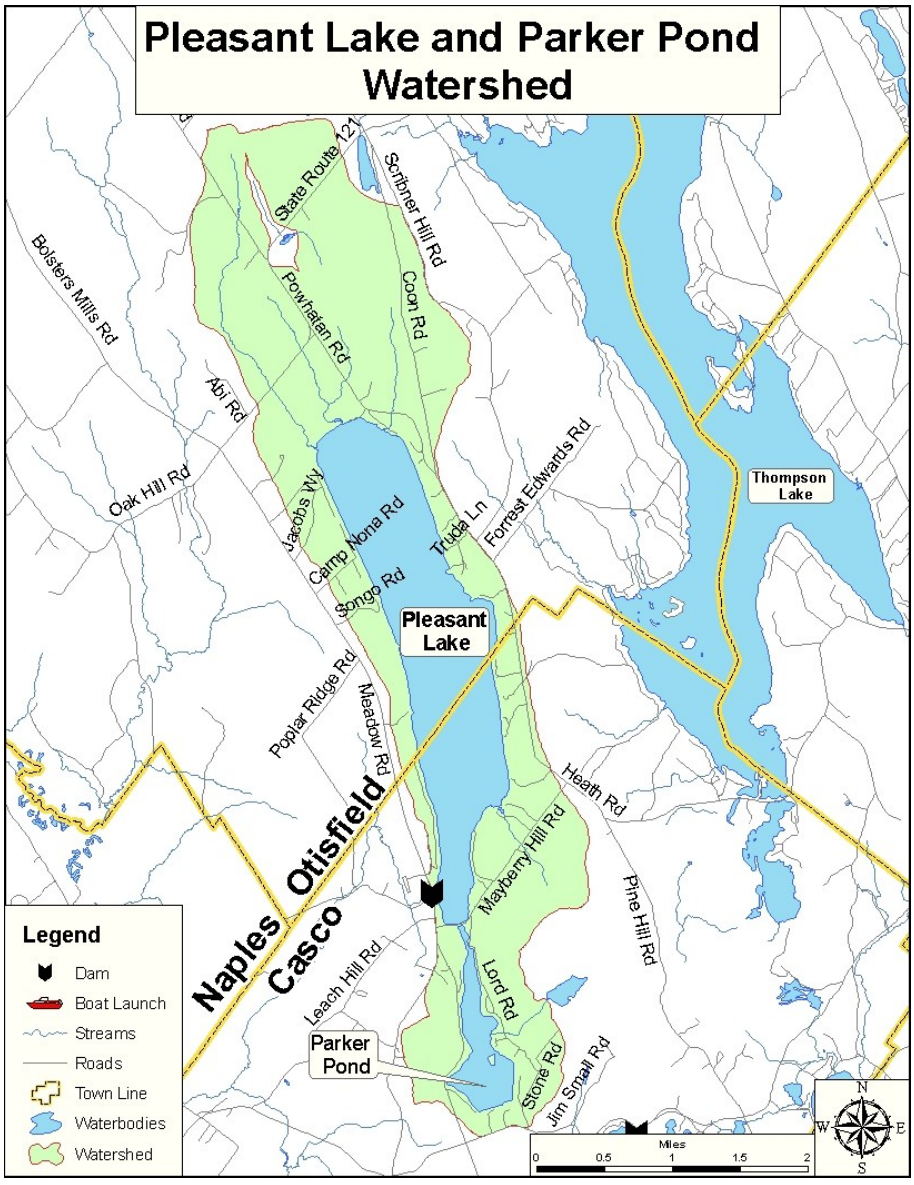
Project Purpose

The primary purpose of the Pleasant Lake / Parker Pond Conservation Project was to significantly reduce erosion and the export of sediment and phosphorus into Pleasant Lake and Parker Pond. The goal was to install conservation practices that reduce erosion and polluted runoff at priority sites throughout the watershed. This project also aimed to raise awareness of watershed issues and worked to promote long-term watershed stewardship.

Watershed Description

Pleasant Lake and Parker Pond are located in the Towns of Casco and Otisfield. Pleasant Lake has a surface area of 1,077 acres and an immediate watershed of 5.64 square miles. Parker Pond covers 166 acres and has a watershed area of 1.06 square miles. Both lakes have been placed on the Maine Department of Environmental Protection's (MDEP) *Nonpoint Source Priority Watersheds* list and lie within the Sebago Lake and greater Casco Bay watersheds.

There are currently about 150 shoreline homes on Pleasant Lake and Parker Pond. A boat launch on each lake offers public access. Route 121 runs along the entire eastern side of the lakes with numerous town and private roads surrounding it on the western shores. Three youth summer camps are located on the shoreline of Pleasant Lake. They are Hoop Camp, Camp Arcadia, and Seeds of Peace.



Background

The Maine Department of Environmental Protection (MDEP) and volunteer monitors have been monitoring the water quality in Pleasant Lake and Parker Pond since 1977 and 1978, respectively. The water quality in both lakes is currently considered to be above average. However, Pleasant Lake only flushes (replaces entire water within the lake) 0.2 times per year. This is well below the 1-1.5 flushes per year average for Maine lakes. As a result, any pollutants entering the lake likely remain there for 5 years.

Algal blooms like the one pictured above decrease the amount of dissolved oxygen available in the water needed for aquatic organisms such as fish.

Soil Erosion Runoff

↓

Excess Phosphorus

↓

Excess Algal Growth

↓

Decreased Dissolved Oxygen

The most significant water quality threat to Pleasant Lake and Parker Pond is polluted runoff that washes into the lakes from the surrounding watershed. As with many Maine lakes, uncontrolled soil erosion is the biggest source of pollution. Sediment easily binds to the nutrient phosphorus. Soil erosion can wash excess sediment and phosphorous into the lakes. Excess phosphorus can increase algal growth. The decay of excess algal growth depletes the amount of dissolved oxygen available in the water for advanced life forms such as fish.

In 2006, Pleasant Lake Parker Pond Association (PLPPA) and the Cumberland County Soil and Water Conservation District (CCSWCD) conducted a survey to identify specific polluted runoff problems in the watershed. PLPPA volunteers and CCSWCD identified 64 areas with soil erosion and uncontrolled runoff to the lake. Parker Pond had a total of seventeen sites identified and Pleasant Lake with a total of forty seven sites identified. The majority of sites were associated with residential areas (25%), driveways (17%), private roads (15%), commercial sites (13%), state road sites (12%), and town road sites (8%). The remaining sites were associated with new construction, right-of-ways and boat access sites.

Watershed survey volunteer documenting an erosion site within the Pleasant Lake / Parker Pond Watershed in 2006.

Pleasant Lake / Parker Pond Watershed Conservation Project

Based on the results of the watershed survey, CCSWCD applied for and were awarded grant funds through MDEP from the U.S. Environmental Protection Agency's Section 319 of the Clean Water Act to address the highest impact sites. The ***Pleasant Lake/Parker Pond Watershed Conservation Project*** started in April 2009 and ended in November 2011. This project was overseen by a steering committee and aimed to complete the following goals:

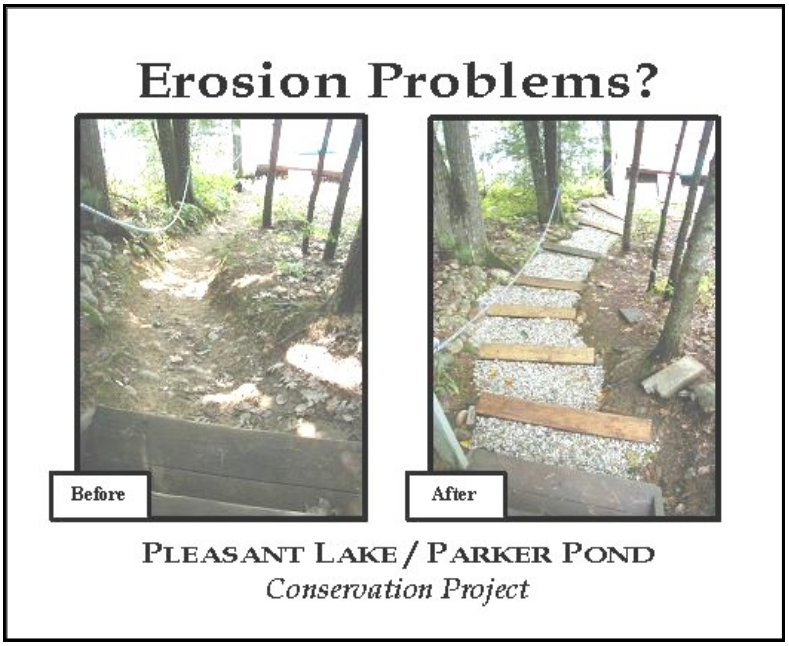
- Provide free technical assistance and engineer oversight where needed
- Address at least 11 priority sites identified in the watershed survey offering up to 60% cost sharing
- Provide 25 residential matching grants up to $500

The following pages highlight the accomplishments of this project.

Chris Baldwin, CCSWCD Engineer, oversees work being done at a construction site.

Technical Assistance

Free technical assistance was offered to all watershed residents. This service consisted of on-site visits from CCSWCD technical staff, verbal and written recommendations, and engineering designs and construction oversight where needed.



CCSWCD is a non-regulatory organization. All recommendations and participation in this project were strictly voluntary. Advertising about this project and its opportunities were provided through the Pleasant Lake and Parker Pond Association, in local newspapers, through the towns of Otisfield and Casco and through two separate postcard mailings to shoreline residents.

Postcard sent to residents advertising free technical assistance and residential matching grants.

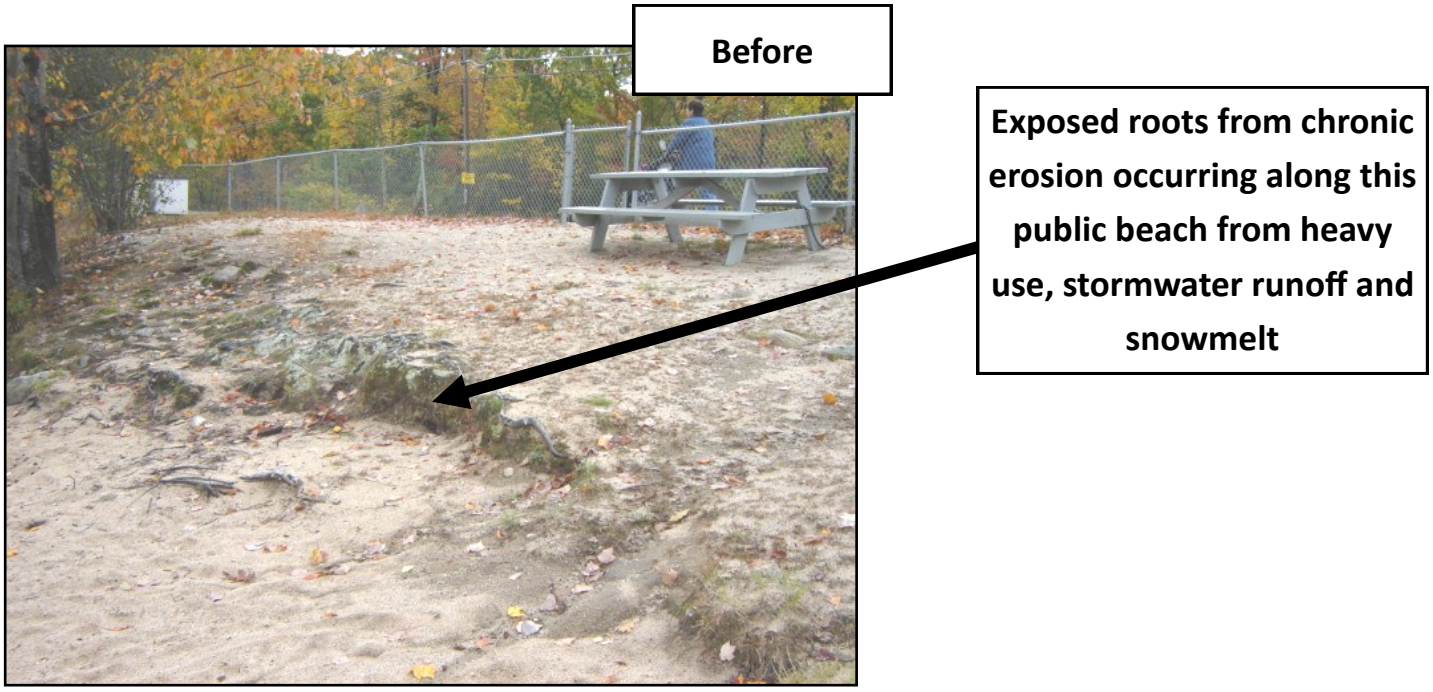
Priority Sites Addressed

A total of twelve priority sites were addressed through this grant to prevent sediment and phosphorus from washing into Pleasant Lake and Parker Pond:

- Casco Town Beach
- Country Lane
- Heniger Park Road
- Hoop Camp
- Lilley Brook Culvert
- Lord Road (3 sites)
- Mayberry Hill Road Dry Hydrant
- Miller Road
- Otisfield Boat Launch
- Route 121 / Pleasant Lake House

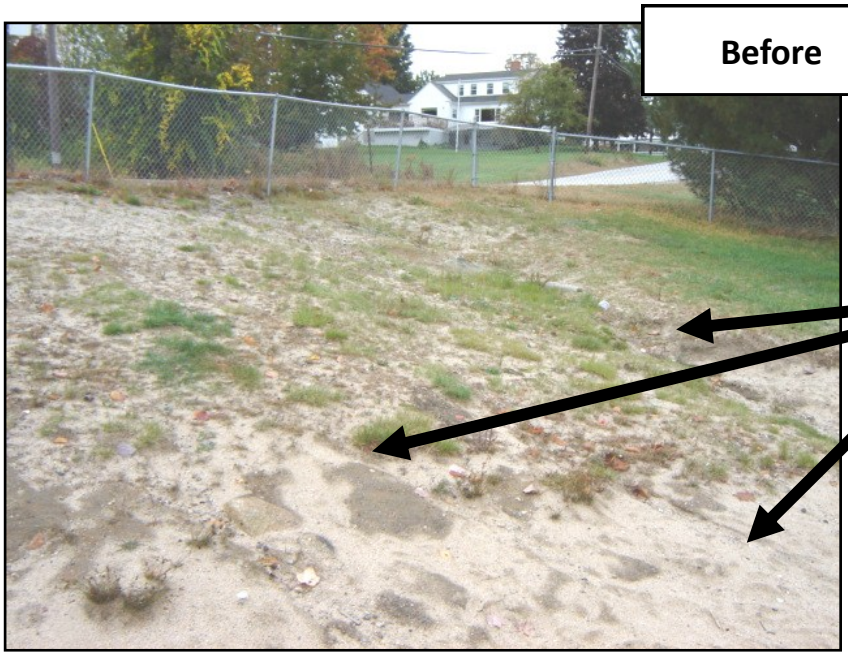
Most of the sites addressed received water quality improvement recommendations, technical assistance and follow-up and engineering designs and oversight if needed. About half of the sites also received cost-share assistance of up to 60% of the project's cost to implement water quality protection recommendations. The following pages are some highlights of the work accomplished.

Casco Town Beach - Mayberry Hill Road, Casco



Casco Town Beach

Before



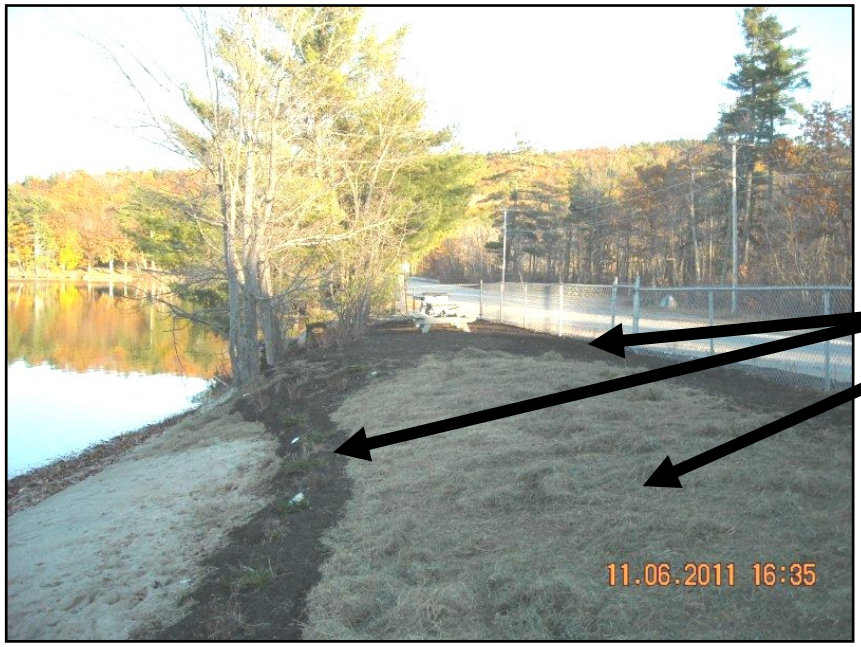
Erosion gullies and steep bare slope eroding into Pleasant Lake

During Construction

Crushed stone infiltration trench wrapped in geotextile installed at top of beach area to absorb and infiltrate stormwater

Straw wattles used to stabilize shoreline bank

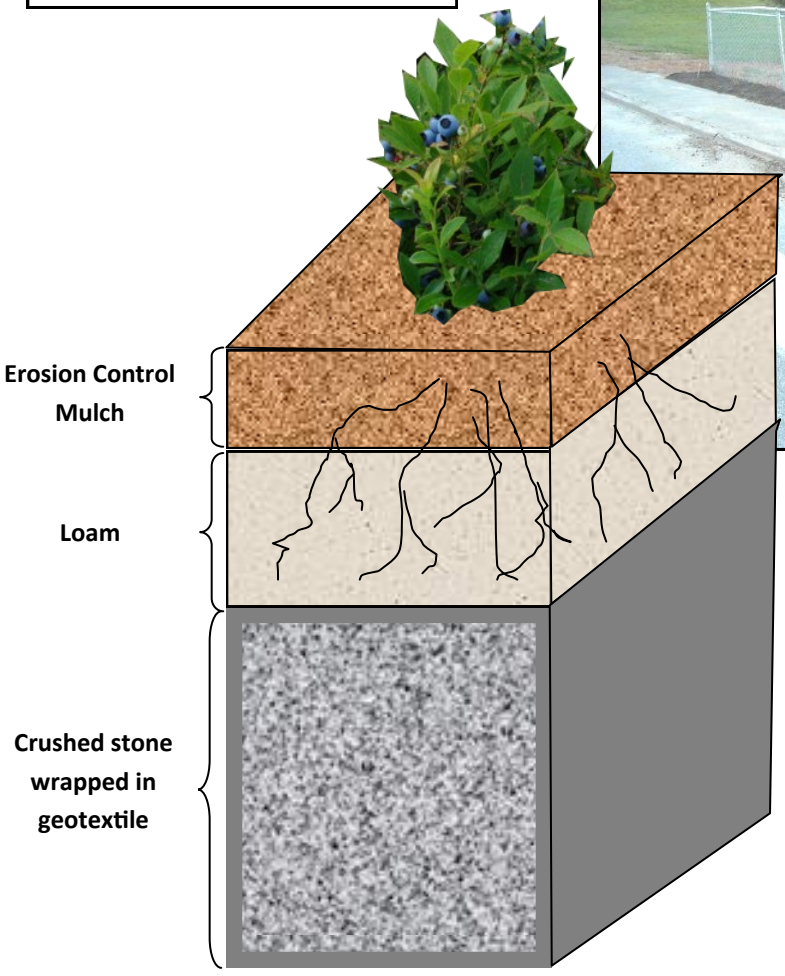
After Photos



Fine erosion control mulch and native plants used to define walking path to beach

Recreation area stabilized with seed and hay

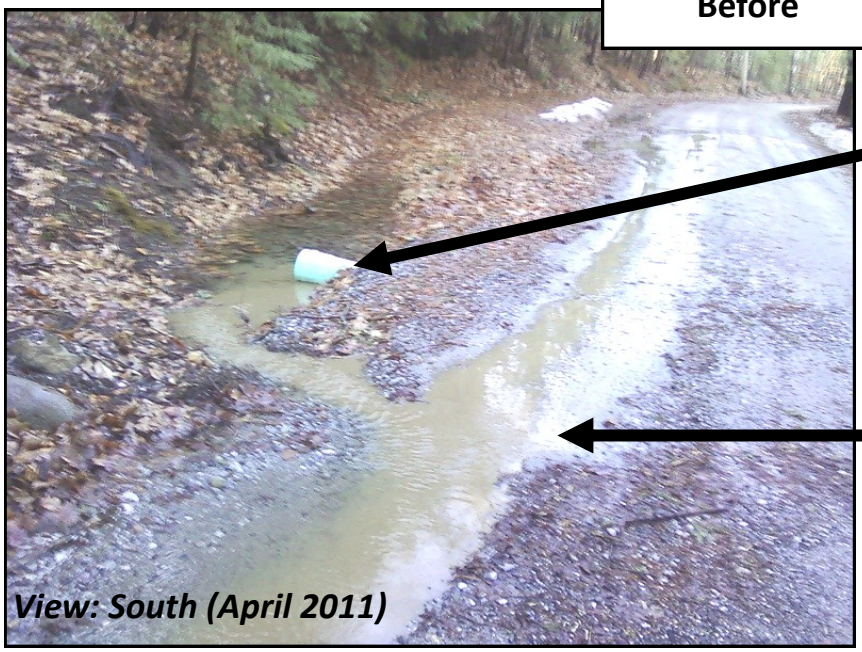
Underground filtration system diagram



Underground crushed stone infiltration trench with blueberry bushes planted along gate

Miller Road, Casco

Before

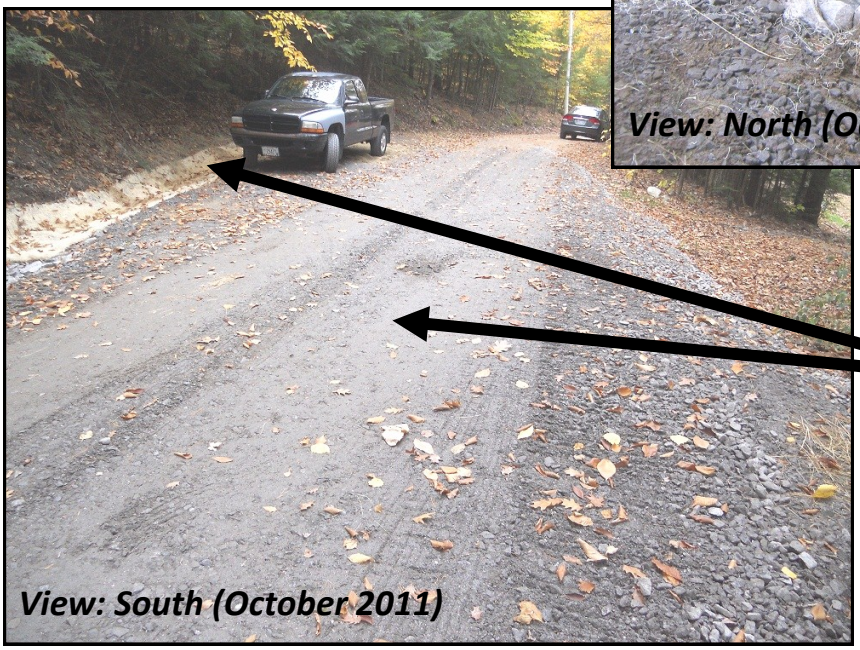


Small, 8 inch culvert

Lack of ditch and adequate sized culvert causing water to pool in road and wash sediment downhill into Pleasant Lake

After Photos

New 15 inch culvert and riprapped culvert inlet



Gravel road material added to build up road and allow water to flow into new stabilized ditch

Otisfield Town Boat Launch

Before

View: South (April 2006)

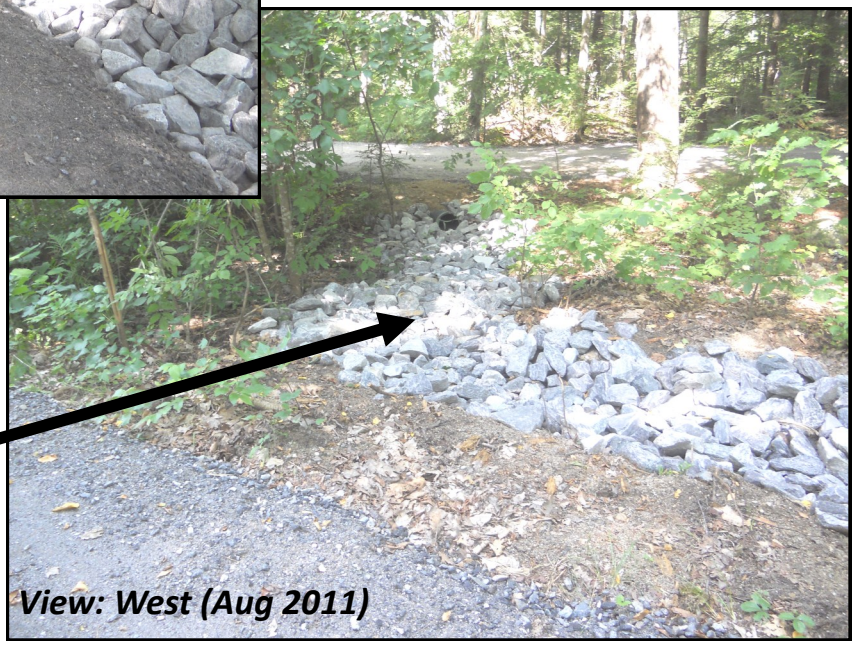
Erosion gully washing sediment down gravel road into Pleasant Lake

Crushed stone gravel road material added to road and road pitched to direct water into adjacent ditch

After Photos

View: South (Aug 2011)

Riprap ditch leading to newly installed culvert at the top of the hill

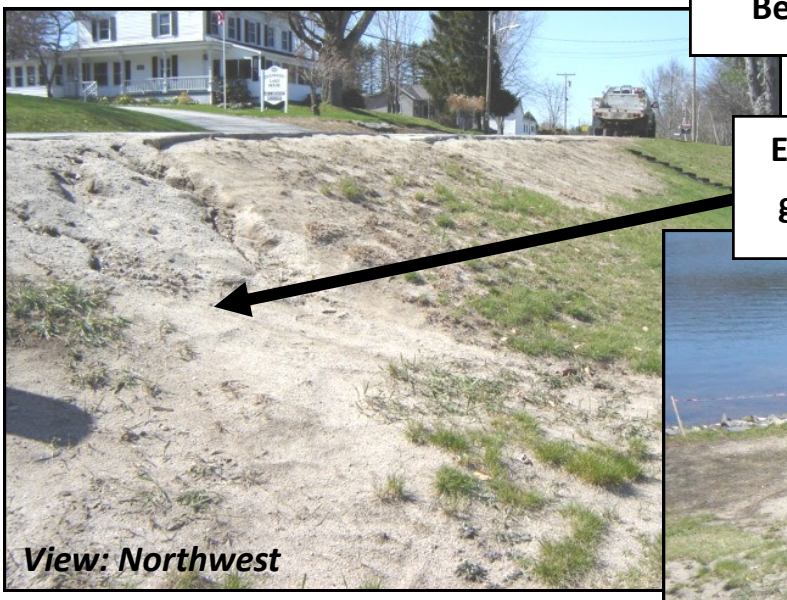


View: West (Aug 2011)

Riprap turnout installed at base of hill leading to newly installed 12 inch culvert

Route 121 / Pleasant Lake House, Casco

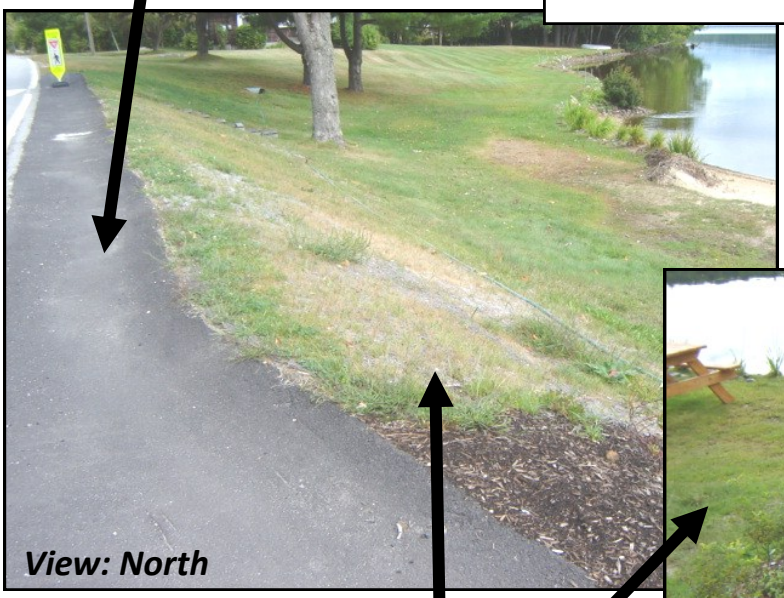
Before Photos



Erosion gullies

Paved road shoulder swale

After Photos



Turnout created and stabilized with riprap, border planted with native shrubs

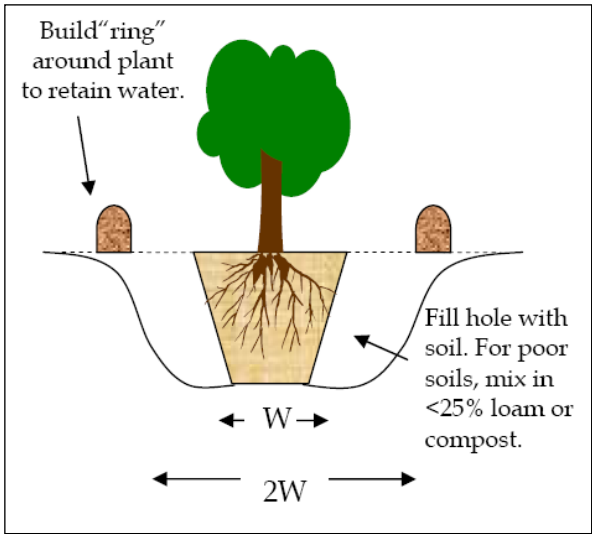
Areas of bare soil stabilized with grass

Residential Matching Grants

Twenty-five $500 cost-share matching grants were awarded throughout the duration of this project to prevent erosion from washing sediment and phosphorus into Pleasant Lake and Parker Pond. Below are some common conservation practices that were installed.

Vegetative Buffer Planting

Vegetative buffers include trees, shrubs, and groundcover plants that catch and absorb water, sediment, and pollutants before they reach lakes or streams.



After

Planting native plants along shorelines, such as was done at this property on Lord Road in Casco, helps stabilize shoreline banks and prevent erosion.

Erosion Control Mulch

Erosion Control Mulch (ECM) is a specific kind of mulch that protects bare soil from erosion and retains moisture. ECM is made of composted bark, sand, gravel, stone, and wood fragments. It is heavier than other types of mulch and is good for walkways, recreational areas, and between plantings.

Erosion control mulch.

Meandering Pathways

Meandering pathways prevent stormwater from flowing directly into downhill waterbodies. They help prevent concentrated water flows and thus the likelihood of scouring and erosion. Directing foot traffic also helps to protect vegetated areas used for erosion control and shoreline stabilization.

Above is a meandering pathway at Camp Arcadia in Otisfield leading to the shoreline of Pleasant Lake . Erosion control mulch, stones, and native plants were used to direct foot traffic.

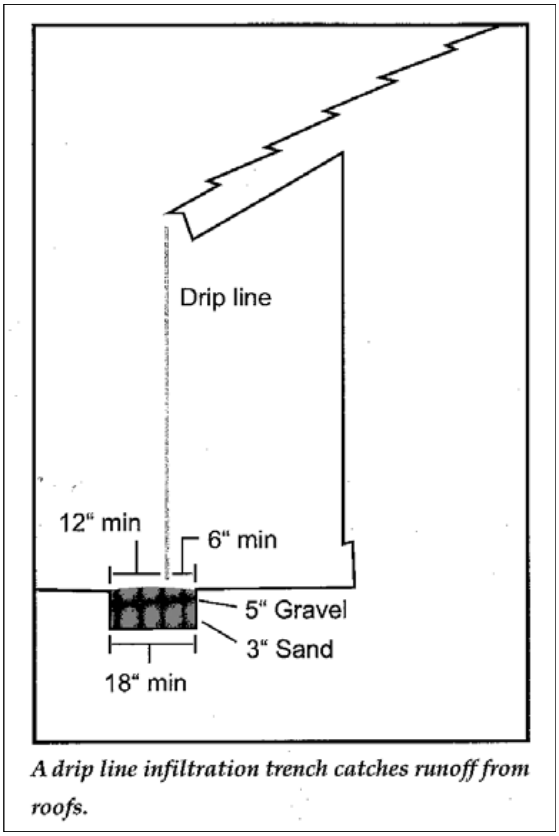
Conservation Practices

For fact sheets on a variety of conservation practices you can easily implement on your own property, please visit the publications section of CCSWCD's website: www.cumberlandswcd.org

Drip line trenches being constructed along Camp Arcadia's cabins.

Roof Drip Line Trenches

Drip line trenches collect and infiltrate rooftop runoff. Drip line trenches are typically at least 18 inches wide by 8 inches deep and are filled with 3/4 to 1.5 inch washed crushed stone.



A drip line infiltration trench catches runoff from roofs.

Drywells, Rain Barrels, and Rain Gardens

In addition to drip line trenches, roof runoff can also be controlled using drywells, rain barrels, and rain gardens. Please see the publication section of CCSWCD's website for additional information on these practices. (*Photos from Maine DEP / Portland Water District Conservation Practices for Homeowners Factsheet Series.)*

Drywells are deep reservoirs of stone used to infiltrate stormwater from roof gutter downspouts.

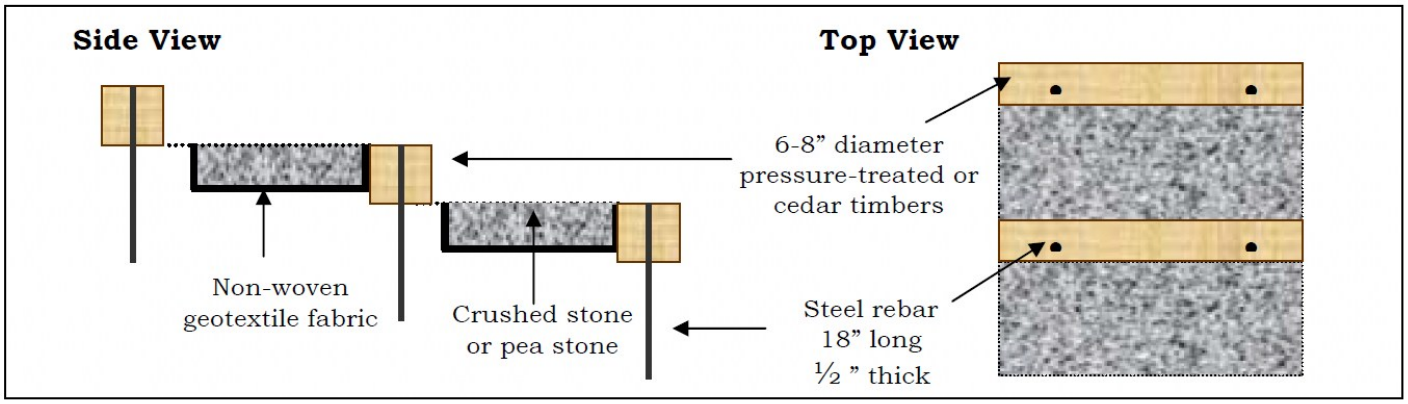
Rain barrels capture roof runoff from gutter downspouts to be used at a later time for activities such as watering gardens and flowerbeds.

Rain gardens are bowl-shaped planted gardens that are aesthetically pleasing and allow rainwater to slowly infiltrate into the ground.

Infiltration Steps

Like drip line trenches, infiltration steps use crushed stone to slow down and infiltrate runoff. Infiltration steps are typically used in walkways with moderate slopes.

Infiltration steps leading to Pleasant Lake's shoreline were created at this residential site off of Scribner Lane in Casco..



Road and Driveway Drainage

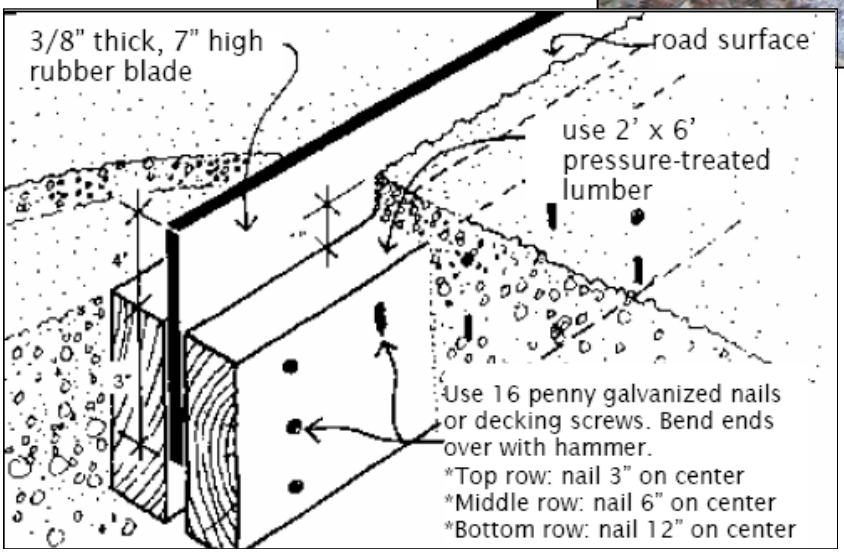
Gravel roads and driveways must drain properly to prevent water from channeling causing erosion and sediment to wash into Pleasant Lake and Parker Pond. Surface material needs to pack well, be durable, and shed water. Crowning the driveway will allow water to shed off the driveway quickly.

This driveway off of Heniger Park Road in Otisfield was recently built up, crowned and compacted to divert water into adjacent vegetation.

Water Diverters

A variety of water diverters can be used on gravel roads, driveways, and walking paths to reduce channelized water flow. Below are some examples of common water diverters used.

Pictured above is a series of rubber razor water diverters placed on a driveway in Denmark, Maine.



Rubber razor water blade / diverter diverts water yet allows vehicles to drive over them.

Conservation Practice Goals

To divert and infiltrate stormwater runoff to prevent erosion and to filter pollutants.

This "speed bump" water diverter was created at the top of a gravel road at Camp Arcadia to direct stormwater off the road into stable vegetation.

Cumberland County Soil & Water Conservation District

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