

Volunteer Lake Watershed Survey Guide

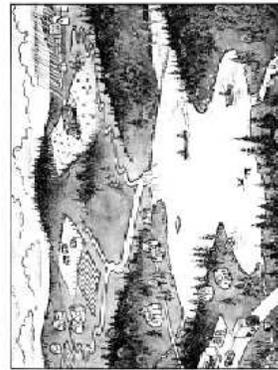
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Appendix A: Outreach Brochure Sample

What is a watershed?

A watershed is the total area of land that drains into a particular lake, river, stream, or bay. Watersheds drain (or “shed”) water into lakes through streams and ditches, directly over the ground surface, or through groundwater. Everything that happens in a lake’s watershed eventually impacts the lake, for better or for worse. No matter where you go— you are always in a watershed!



For more information about this project, contact:

30 Mile River Watershed Association

Lidie Robbins,
Executive Director

Insert Contact Address
Insert Contact Phone Number
Insert Contact Email Address

www.30mileriver.org



Survey Partners:

Parker Pond Association

Basin-David-Tilton Ponds Association

Kennebec County Soil and Water Conservation District

Towns of Chesterville, Fayette, Mt. Vernon, & Vienna

Maine Department of Environmental Protection

Funding for this project, in part, was provided by the U.S. Environmental Protection Agency under Section 319 of the Clean Water Act. The funding is administered by the Maine Department of Environmental Protection in partnership with EPA.

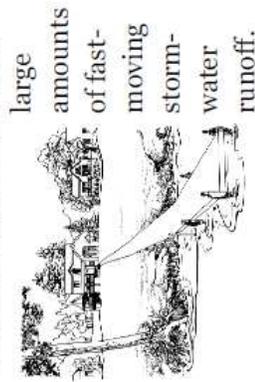
Why are we surveying the watershed?

PARKER, DAVID, & TILTON PONDS WATERSHEDS



What's the problem?

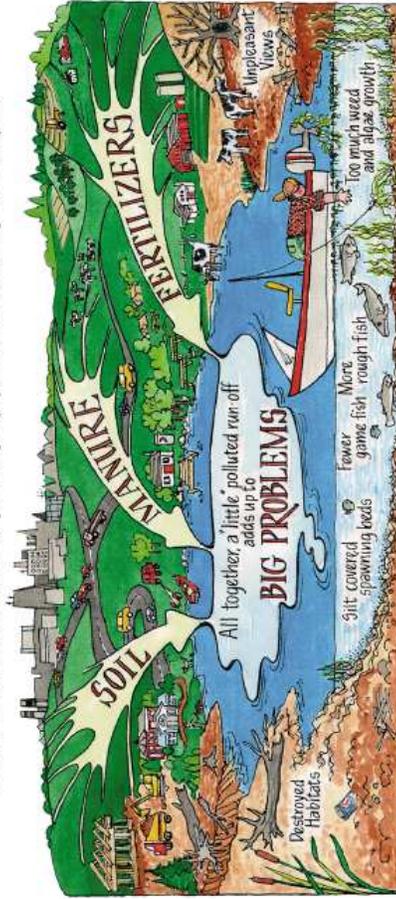
We are very fortunate to have many beautiful lakes here in Maine. But, as humans develop areas around lakes, lake water quality usually declines. The decrease in forest cover and an increase in hard surfaces (roofs, roads, parking lots, driveways, etc.) leads to



As this runoff travels down through the watershed, it causes soil erosion and picks up various pollutants, like phosphorus, and carries them to the lake through ditches and streams. This pollution can cause excessive plant growth, algal blooms, and murky water.

TAKING CARE OF OUR LAKE

A lake is a magnificent water resource. The quality of its water is a reflection of what happens on the land that surrounds it. Rain and melting snow flow across fields, towns and roads, picking up pollutants along the way...



What are we looking for during the survey?

A watershed survey is designed to locate sources of soil erosion and runoff that are damaging or could be damaging to water quality. Our goal is to document trouble spots and then work to find reasonable solu-

tions to reduce the amount of soil erosion and phosphorus draining into the lake. Any information that we collect is strictly used to analyze the pollution sources to the lake and none of the information gathered will be used for enforcement purposes.

Appendix B: Pre-Survey Landowner Letter Sample

Aug. 28, 2000

Dear Bear Pond Watershed Landowner:

The Bear Pond Improvement Association and the Oxford County Soil & Water Conservation District are coordinating a survey in the Bear Pond watershed. The purpose is to locate erosion sites and sources of sediment to the lake. Sedimentation may have a negative effect on water quality by carrying phosphorus into the lake. Too much phosphorus can cause algal blooms that ruin recreation and choke out fish.

A watershed is all of the land that drains to a lake, either by surface flows or through subsurface water movement. Activities in the watershed that take place a long distance from Bear Pond can contribute sediment to the lake. Bear Pond's watershed is more than eight square miles; it includes Little Bear Pond.

The goals of this survey are to make technical recommendations, work with landowners to find solutions, and ultimately protect the land and water for future generations. This survey is voluntary. Neither the Bear Pond Improvement Association nor the Oxford County SWCD are regulatory agencies. Information that is gathered will not be used for enforcement, nor will the landowner be required to fix problems.

Locally-led watershed surveys have been used successfully throughout Maine to document sources of pollution to lakes. They are important for tapping into funds that could help the landowner should he or she choose to restore problem areas identified in the survey.

We will conduct field work for the Bear Pond survey in October and November, 2000, and from early April through May, 2001. We will work with the community to evaluate the information that is gathered and to prioritize sites for restoration. The final report should be completed by next summer.

We would like to include your land in this survey, but we will respect your property lines if you do not wish to participate. If you no longer own this property, please notify us of the name and address of the new owner. Contact either Dick Bray, Bear Pond Watershed Improvement Association, at *insert phone number*, or Jeff Stern at the above address and phone if you do not want us to cross your land or if you have any other questions, ideas or comments.

Sincerely,

Jeff Stern, District Manager
Oxford County SWCD

Mary Wallace, President
Bear Pond Improvement Association

Appendix C: Pre-survey Press Release Sample



PO Box 552
15 Courtyard St.
Damariscotta, ME 04543
Fax: 563-2192
info@pemaquidwatershed.org
www.pemaquidwatershed.org



FOR IMMEDIATE RELEASE

Contact: Donna Minnis, Executive Director
Work: Insert phone #
Cell: Insert phone #

PHOTO CUTLINE: PWA volunteers will survey the Paradise Pond watershed on May 9.

Paradise Pond Watershed Survey

Damariscotta, ME – April 25, 2009 – One way to keep a pond healthy is to proactively prevent contamination from reaching it. On Saturday, May 9, the Pemaquid Watershed Association (PWA) will lead a field survey to look for possible sources of soil erosion runoff that could threaten the quality of Paradise (aka Muddy) Pond in Damariscotta. This is one of many routine surveys that PWA does of the ponds in the Pemaquid River watershed as part of preventative best management practices. The survey will be conducted by PWA volunteers assisted by technical experts from the Maine Department of Environmental Protection. Although most of the survey fieldwork will be conducted on May 9, some follow-up fieldwork also may occur later in May and in June.

A watershed survey entails teams of volunteers walking and driving throughout the specified watershed area looking for possible sources of pollution to the pond. Stormwater runoff carries nutrients (such as phosphorus) and pollutants (such as sediment) to the pond and can result in decreased water quality. Soil erosion is the single largest pollutant (by volume) to Maine's surface waters.

The purpose of the survey is to locate erosion sites and possible sources of sediment contamination that may affect Paradise Pond's water quality. Because activities in the watershed that take place a long distance from the pond can have as much impact on water quality as those that occur in the shoreline area, the survey will include not only the shores but also the developed areas within the pond's watershed. A pond's watershed is the area where all rain and snowmelt running off the land drains to the pond. Paradise Pond's watershed covers about 1.1 square miles. In mid-April PWA sent a letter to every landowner within this 1.1-sq-mile region letting them know of the planned survey and giving them an opportunity to exclude their property from the survey.

Through the survey, volunteers from around the pond will be looking for erosion and polluted runoff. Eroding sediment carries phosphorus, a plant nutrient, as a hitchhiker. Activities like construction, road building, land clearing and even small residential areas with bare soil or sparse vegetation can release sediment into the watershed. If too much phosphorus runs off from the land and enters a lake, nuisance algae growth can occur. In severe cases, mats of algae choke out fish, and ruin water quality and recreation. Once these problems occur, they recur and are very expensive to fix.

Locally-led watershed surveys such as this one have been used successfully throughout Maine to document threats to water quality. The information gathered will be used to give the PWA a better handle on possible sources of pollution to Paradise Pond, to provide opportunities for addressing problem sites, and to provide the information needed for PWA to apply for grant funds that can be used to fix priority problems. In no way will the information gathered be used for any enforcement purposes.

The mission of the PWA is to conserve the natural resources of the Pemaquid Peninsula through land and water stewardship and education. Please contact the PWA if you would like to learn more about the survey or other PWA activities, 207-563-2196 or www.pemaquidwatershed.org.

###

Appendix D: Pre-Survey Handout for Volunteers

Thank you for considering volunteering for the _____ Lake Watershed Survey!

What is a watershed survey again?

Watershed surveys are field surveys conducted by trained volunteers in the community to determine the extent of pollution in a particular lake watershed. Volunteers are trained to identify erosion problems because soil erosion is the largest source of phosphorus and sediment -- the major pollutants -- to lakes. Soil erosion is also easy to identify and solutions are generally simple and inexpensive.

What would be the objective of my work?

Your primary objective would be to locate as many erosion problems in the watershed as possible. Eroding soil is caused by stormwater runoff and enables pollutants, in the form of phosphorus and sediment, to reach the lake. A second, but equally important objective, is to help the watershed community understand how land use in the watershed influences lake water quality. Once their awareness is raised, people are more likely to change habits that are harmful to the lake.

How much time would be required of me?

You'll need to commit the majority of the day, and possibly a few hours more another day or two. The total time commitment is usually 8-25 hours.

When and where does the survey take place?

Insert Survey Date, Time, and Meeting Location. There is a 2 hour indoor training to start the day, then more training in the field while conducting the survey. Groups finish their part of the survey that day or pick a time to finish their sector within a month.

How will I know what to do?

During the first part of the day you will be trained to recognize common types of erosion problems, the related recommended fixes, and how to document the erosion sites using prepared forms. Also, each group should have a technical leader to help train in the field and answer questions.

What information is covered in the training?

Training topics include:

- polluted runoff -- with a focus on soil erosion -- and its effects on lake water quality
- typical erosion problems
- recommended fixes for common erosion problems
- site documentation
- communicating with landowners

What will I be looking for?

You'll look for evidence of erosion problems, small and large. You'll look closely at roads, driveways, shoreline properties, and other developed areas for signs of erosion, such as gullies, rills, and sheet erosion.

What's it like in the field? Would we be going on private property?

The best way to investigate your section of the watershed is to walk it, but you may use your car to get around the watershed or to drive long sections of roads or driveways. You will likely also be accessing private property. The survey will have been well

publicized before the actual day of the survey, so the watershed residents should be aware of what you're doing and leaders will be aware of properties which do not want to be surveyed. At each residence where your group would like to access the property, your group will knock on the door to ask permission prior to accessing their land.

Who will be out there with me?

Usually each group consists of 2-3 volunteers and one technical leader.

What do I need to bring?

- Clothing appropriate for light hiking outside and for the weather
- Digital camera if you have one
- GPS unit if you have one
- Water, lunch, snacks
- Bug spray, sunglasses

Who do I go to with questions?

Insert local contact name, number, and email if available.

Appendix E: Volunteer Roles and Responsibilities

Volunteer Roles and Responsibilities for a watershed survey

- Who:** Anyone who lives in the pond watershed, or anyone else who is interested – no experience necessary!
- When:** Approximate total time commitment: 10-20 hours
- A Saturday (date TBD) in the spring for training and fieldwork
 - And possibly another day or half day to finish
- What:** Assist with conducting a survey of erosion sites in the pond watersheds:
- On the Saturday (date TBD), participate in daylong training/survey:
 - Morning indoor classroom training
 - Outdoor training and survey in the field for the rest of the day with your sector group
 - Finish surveying any remaining parts of your sector within three weeks of the training/survey day
 - Submit completed survey forms and photos to volunteer coordinator
- What to Bring:**
- Bring bag lunch, water, bug spray, and sunscreen
 - Appropriate footwear and clothing for walking around the watershed – the survey occurs rain or shine!
 - Clipboard, digital camera, and GPS, if you have them

Appendix F: Volunteer Waiver Sample



James River Association Extreme Stream Makeover Sign-In Sheet & Health Form (Please Print)

Name (First & Last): _____ Age: _____ Sex: M F
Participating family members (and ages): _____

Phone: () _____ Address: _____
City: _____ State: _____ Zip: _____ E-mail: _____
Project Site(s): _____

In Case of Emergency:

Contact: _____
Relationship: _____ Phone: () _____
Address: () Check if same as above: _____
City: _____ State: _____ Zip: _____

Health Concerns:

Please list any allergies, health problems, or special needs pertaining to the participant, such as asthma, diabetes, allergic to bee stings, etc.: _____

ALL JRA EVENT PARTICIPANTS (AND/OR THEIR GUARDIANS) PLEASE READ AND SIGN THE FOLLOWING:

All of the above information is to the best of my knowledge, correct. I understand that participation in James River Association (JRA) activities is entirely voluntary. I understand that the JRA event may involve "hands on" activities such as planting trees, plants and shrubs, picking up trash, using equipment, or wading in shallow water; and I understand the risks and dangers involved in the above-named activities. I know and understand that unanticipated dangers might arise. I hereby release the James River Association from any responsibility for injury which might occur as a result of participation in JRA activities. I give permission to authorize personnel to carry out such emergency diagnostic and therapeutic procedures as may be necessary for me / my child, and also permit such treatment procedures to be carried out at and by local hospital(s) for me / my child in the event of an emergency. I understand that any medical expenses will be billed directly to me or my insurance company. I hereby grant the James River Association the unconditional right to use my / my child's name, voice, and photographic likeness in connection with any audio video production, articles, website materials or press releases, but not as an endorsement.

For children under 18:

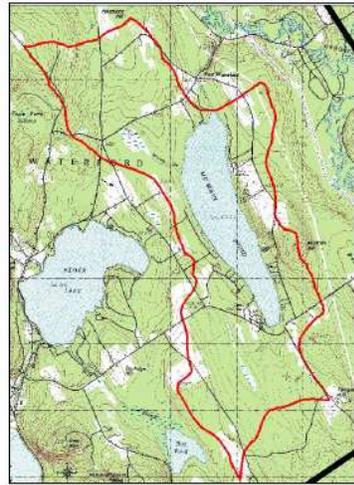
I give permission for _____ to participate in all field activities, except as otherwise noted.

Signature of participant or parent / guardian

Date

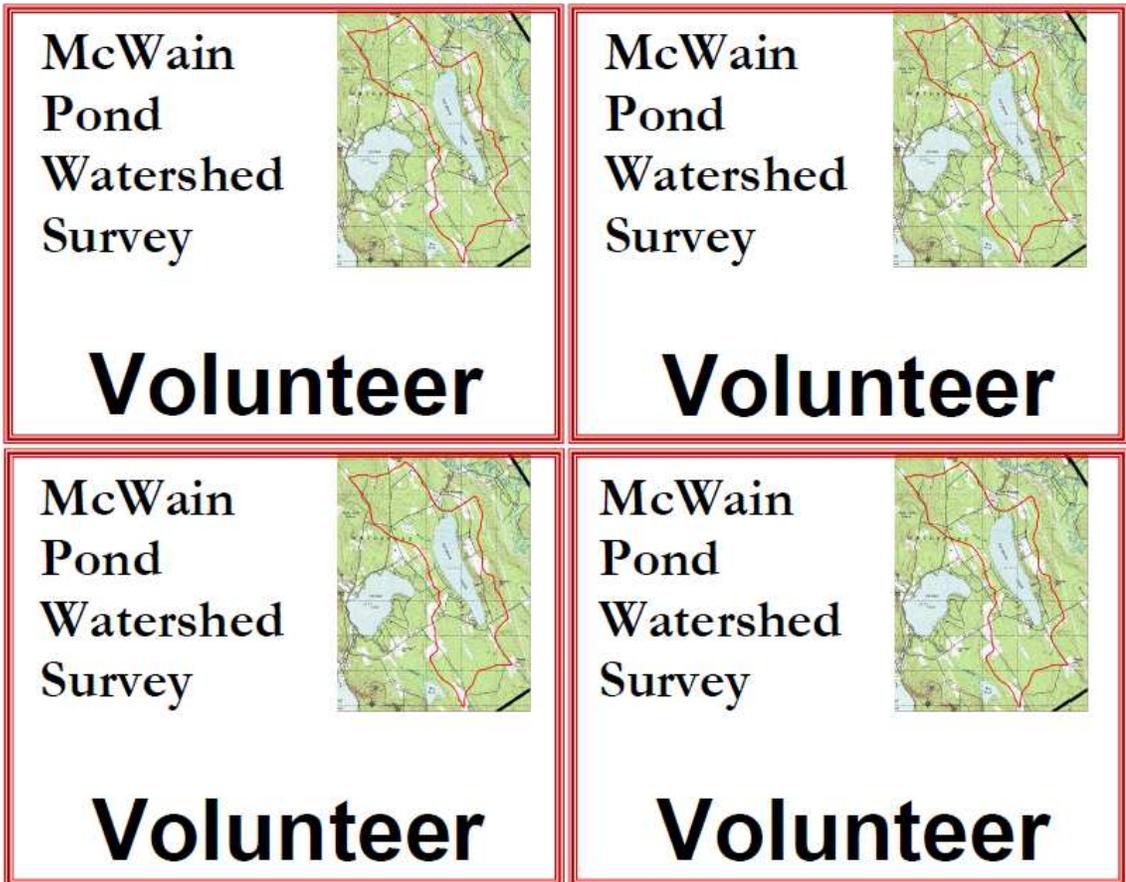
Appendix G: Vehicle ID Card Sample

**McWain
Pond
Watershed
Survey**



Volunteer

Appendix H: Volunteer Badge Sample



Appendix I: Photo Number Template

(only first page is shown below as an example – see individual online appendices for full template)



Appendix J: Survey Field Forms and Form Guidance

Lake Watershed Survey Site Guidelines

Do you Document the Erosion Site as a Problem Site?

Only erosion sites which are likely delivering phosphorus to the lake should be written up as problem sites. Keep in mind that phosphorus is the pollutant of concern, and eroded sediment is the primary way that phosphorus is transported to lakes. If the eroded sediment clearly settles out into a vegetated buffer and phosphorus is not likely entering the lake, stream or ditch, it should not be written up as a problem site. Sites with bare soil, even in close proximity to the lake or a tributary, should not be documented as problem sites if there is no sign of soil transport, the exposed area is relatively small, or there is low potential for soil movement due to flat slope.

Following are some field observations to make to help you decide if sediment and phosphorus is likely to erode and make its way into the lake.

1) Is there Soil Erosion?

First, evaluate the degree of current or likelihood of future soil erosion at the site. Is there evidence of considerable recent/active erosion and potential for continued (or likely future) soil erosion at the site?

Considerations:

- Bare exposed soil & soil texture (clay, silt, sand, gravel);
- Slopes or topography of the site;
- Visible signs of erosion: rills, gullies, bank slumping, exposed roots, deposited sediment;
- Active erosion or is it just a 'scar' of past activity; and
- Look uphill, consider water runoff entering the site.

2) Follow the Flow – Will Sediment and Phosphorus likely Reach the Lake?

Then, if there is considerable likelihood of soil erosion at the site, evaluate whether sediment eroded from the site will likely reach the lake either directly, or via a stream, ditch, or channelized flow. 'Follow the flow' and estimate the likely path runoff will follow to reach the lake.

Given the flow path, will sediment and phosphorus likely reach the lake or will most be deposited on the land surface before reaching the lake?

Considerations:

- Position of the erosion site within the surrounding landscape (topography);
- Proximity of the erosion site to a ditch, channel, intermittent stream, stream or lake;
- Gradient between the erosion site and where runoff flows in a ditch, channel, intermittent stream, stream or lake - steep gradient flow path means fast water, sediment delivery is higher; a flat gradient flow path means slow water, sediment delivery is lower;
- Contributing land area, runoff volume - large volume, sediment delivery is higher; low volume, sediment delivery is lower;
- Sheet Flow or Concentrated Flow. Sheet flow has less energy, so sediment may be deposited only a short distance away. Concentrated flow has more energy and may transport sediment long distances; and
- Visible signs of sediment movement or sediment deposition.

Note: If the eroded sediment and phosphorus makes its way to a channel, ditch or stream or ditch that goes to the lake, this is considered reaching the lake.

Lake Watershed Survey

REMINDER: Only write up if there is likely transport of sediment or phosphorus into the lake.

Sector & Site _____ Date _____ Surveyor Initials _____

Location (house #, road, utility pole #) _____

Building Color _____ Landowner Name _____

Tax Map & Lot _____ Talked to Landowner? _____

Flow into Lake via (check ONE): Directly into Lake Stream Ditch Minimal Vegetation

Note: If flow does not make it into lake, do not fill out a form. It would not be considered a site.

GPS Coordinates in _____

— . °

Latitude/Longitude Decimal

. °

Degrees (NAD83 or WGS84)

Land Use/Activity Circle <u>ONE</u>	Description of Problems Circle ALL that apply	
State Road Town Road Private Road Driveway Residential Commercial Municipal / Public Beach Access Boat Access Trail or Path Logging Agriculture Construction Site OTHER:	Surface Erosion Slight Moderate Severe Culvert Unstable Inlet / Outlet Clogged Crushed / Broken Undersized Ditch Slight Erosion Moderate Erosion Severe Erosion Bank Failure Undersized Road Shoulder Erosion Slight Moderate Severe Roadside Plow/Grader Berm	Soil Bare Uncovered Pile Delta in Stream/Lake Winter Sand Roof Runoff Erosion Shoreline Undercut Lack of Shoreline Vegetation Inadequate Shoreline Vegetation Erosion Unstable Access Agriculture Livestock Access to Waterbody Tilled Eroding Fields Manure Washing off Site OTHER:

Slope: Flat Moderate Steep **Size of Area Exposed or Eroded** (length & width): _____

Site is linked to another: Cause of Site # _____ Result of Site # _____

Recommendations		
<p>Culvert</p> <ul style="list-style-type: none"> Armor Inlet/Outlet Remove Clog Replace Enlarge Lengthen Install Plunge Pool <p>Ditch</p> <ul style="list-style-type: none"> Vegetate Armor with Stone Reshape Ditch Install Turnouts Install Ditch Install Check Dams Remove debris/sediment Install Sediment Pools <p>Other Suggestions:</p>	<p>Roads / Driveways</p> <ul style="list-style-type: none"> Remove Grader/Plow Berms Build Up Add New Surface Material <ul style="list-style-type: none"> • Gravel • Recycled Asphalt • Pave Reshape (Crown) Vegetate Shoulder Install Catch Basin Install Detention Basin Install Runoff Diverter <ul style="list-style-type: none"> • Broad-based Dip • Open Top Culvert • Rubber Razor • Waterbar <p>Construction Site</p> <ul style="list-style-type: none"> Mulch Silt Fence / EC Berms Seed / Hay Check Dams 	<p>Paths & Trails</p> <ul style="list-style-type: none"> Define Foot Path Stabilize Foot Path Infiltration Steps Install Runoff Diverter (waterbar) <p>Roof Runoff</p> <ul style="list-style-type: none"> Infiltration Trench @ roof dripline Drywell @ gutter downspout Rain Barrel <p>Other</p> <ul style="list-style-type: none"> Install Runoff Diverter (waterbar) Mulch / Erosion Control Mix Rain Garden Infiltration Trench Water Retention Swales <p>Vegetation</p> <ul style="list-style-type: none"> Establish Buffer Add to Buffer No Raking Reseed bare soil & thinning grass

Impact: Circle one choice in each column, add the three selected numbers together, and then circle the site's corresponding impact rating (high, medium, or low).

Type of Erosion	Area	Buffers and Other Filters	IMPACT
Gully - 3	Large - 3	No filter, all channelized direct flow into lake or stream - 3	<u>High:</u> 8-9 pts
Rill - 2	Medium - 2	Some buffer or filtering, but visible signs of concentrated flow and/or sediment movement through buffer and into lake - 2	<u>Med:</u> 6-7 pts
Sheet - 1	Small - 1	Significant buffer or filtering* - 1	<u>Low:</u> 3-5 pts

* Confirm there is likely sediment/runoff delivery. If not, do not write up as a site.

Cost to Fix

High: Greater than \$2,500
Medium: \$500-\$2,500
Low: Less than \$500

Technical Level to Install

High: Site requires engineered design
Medium: Technical person should visit site & make recommendations
Low: Property owner can accomplish with reference materials

Potential Youth Conservation Corps project? Yes No

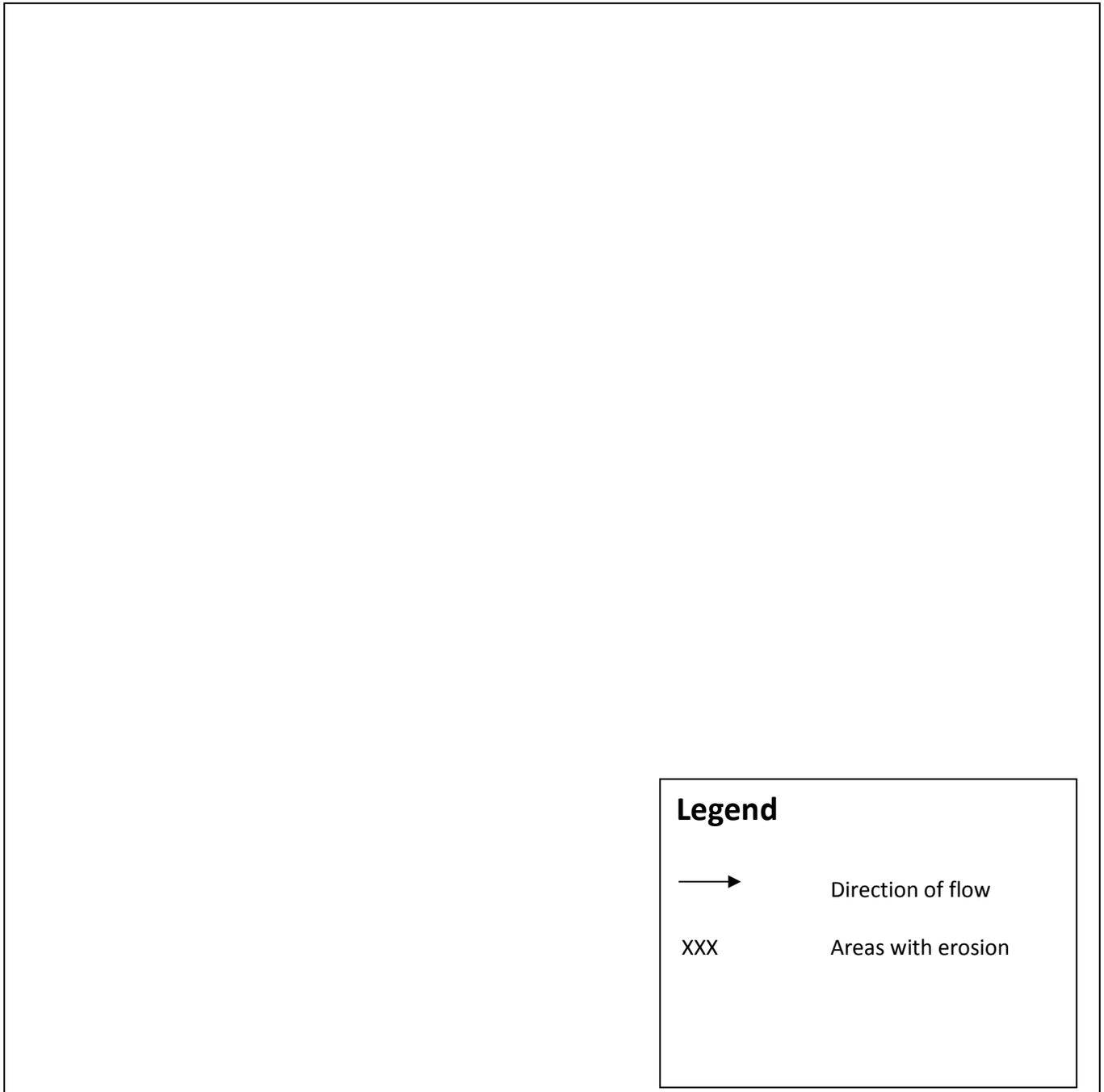
Lake Watershed Survey

Site Sketch Sheet (optional)

Sector and Site #: _____ Surveyor Initials: _____

Date: _____

Think of this as a zoomed in aerial view of the site. Include and label nearby identifying features such as lake, stream, buildings, roads etc. Sketch the recommendations using a different color or drawing technique.



Legend

→	Direction of flow
XXX	Areas with erosion

Guidance on Filling out Lake Watershed Survey Field Forms

Remember, only erosion sites which are a source of sediment which is likely to enter the lake should be documented as a problem site using this form. See the below section 'Flow into Lake via' or the "Lake Watershed Survey Site Guidelines" for more details on determining whether to write up an erosion site as a problem site or not. The "Lake Watershed Survey Site Guidelines" may also be useful to bring into the field to use as guidance.

Each identified NPS site is documented on a form depending on what is observed in the field. Volunteers should fill out all sections of the field sheet for each site according to the following guidance:

Sector and Site - Sites are numbered by the designated sector number and the number of sites encountered in each sector. For example, if a group surveys Sector 2, the first site that they document should be labeled 2-1. This number should also be recorded on the field maps, sketch sheet and in the photograph (using the photo ID number).

Location & Building Color – Surveyors should provide detailed information to identify the site location. If the problem is located on a private driveway or residential area, the road name and house number should be provided. In many cases, however, the house number is not clearly marked. In this case, other information should be included (e.g., 3rd house on the right, between #7 and #9). House color should also be noted for problems associated with private properties (e.g., red with white shutters).

Landowner Name – Landowner name should be documented if available. This information helps make landowner contact for future mitigation efforts, and oftentimes landowners are interested in learning if there was a problem on their property. Landowner name might be clearly posted on a mailbox or house sign, and volunteers often know the names of their neighbors. If tax map and lot information is available, this is another way to obtain landowner names.

Tax Map and Lot – If possible, each survey team should have town tax maps of their assigned sectors. As sites are identified, surveyors should note the site number directly on these maps as close to the actual location as possible. This will serve as a way to cross check the accuracy of the GPS points.

Talked to Landowner? – Surveyors should knock on the door of all private homes prior to surveying the property. If someone is home, surveyors should remind them about the watershed survey and letters that notified them about the project. They should confirm that they agree to have their property included in the survey. If contact is made with the landowner, 'Yes' should be entered in this field with any relevant comments about the interaction (e.g., supports effort, would like more information about plants). If no one is home, 'No' should be entered in the field.

Flow into Lake via – Check the one box that best describes where the eroded sediment from a site goes. This field is used as a reminder to follow the flow of the erosion to determine where it goes, and to only write it up as a site if it likely makes it into the lake either directly, via a stream, via a ditch, or thru some vegetation. This field is also used to help determine the

potential impact to the lake. Note: Check **Minimal Vegetation** if the sediment washes into a vegetated buffer next to the lake or a stream but it is likely that some sediment or phosphorus will still reach the lake. This would still be considered a problem site. However, it should not be written up as a site if the eroded sediment washes into a large, vegetated buffer without a clear connection to the lake or a feeder stream.

GPS Coordinates – GPS coordinates will be recorded for all point and line data. If the sites will be mapped using ArcMap or Arc Info, data will be collected in UTM Zone 19 projection. If sites will be mapped using Google Earth or Google Map, latitude and longitude (in decimal degrees) should be collected.

Land Use/Activity – Circle one land use that best describes the site. If it is not clear whether a road is town or private, circle both and place a ‘?’ next to the entry. Circle ‘Residential’ if the problem is located on a residential property, but it is not the driveway. The ‘Beach Access’, ‘Boat Access’, and ‘Trail’ categories are usually areas with unclear ownership that are used by many parties. Trails are typically ATV trails through the woods. Typically, Boat Access areas are shared right-of-ways that appear to be used primarily to launch boats. Beach access areas are typically shared right-of-ways that appear to be used primarily for swimming, lounging activities. Construction sites are areas undergoing new home construction or major renovations with extensive bare soils due to excavation activities. Municipal / Public areas include public beaches, parks and parking areas owned by a municipality.

Note: Erosion problems that cross multiple land uses should be documented as two separate sites on two separate sheets. For example, a problem that starts on a private road and continues onto a private residential area should be designated as two different sites. Also, if there is a problem noted on one property’s driveway **and** the same property’s adjacent yard, this should also be documented on two field sheets.

Description of Problem – The problems observed at each specific site should be documented by circling all the characteristics that apply. Circle only the items listed under each bold faced category. The bold faced categories should not be circled; they are listed to prompt surveyors to think about potential problems with a given land use (e.g., culvert, ditch, road shoulder).

Surface Erosion categories (slight, moderate or severe) should be circled for soil erosion sites that are not covered in one of the following categories. This usually applies to erosion on areas including residential lands and road surfaces. However, if there is soil erosion along a road shoulder, surveyors should circle only the appropriate selection under the **Road Shoulder Erosion** category.

Three categories (**Surface Erosion, Ditch Erosion, Road Shoulder Erosion**) include **Slight, Moderate** and **Severe** options. In general, these can be differentiated as follows. Slight Erosion should be selected for areas with sheet erosion – bare soil without any small channels or rills cutting through the soil. Areas with Moderate Erosion have small rills and channels carved through the soil. Severe Erosion includes larger gully erosion – channels with significant soil movement that are large enough to step into.

Size of Area Exposed of Eroded – Enter the approximate width and length of the site (e.g., 12' x 10'). Surveyors should measure their pace at the beginning of the field session. Site measurements can then be approximated by pacing the eroded area. If there are two discrete eroded areas on a property or road segment, they can either be entered separately (e.g., 12' x 10' and 75' x 5') or lumped together. If the dimensions of two eroded areas are similar, it makes sense to lump them together. For example, if there is erosion in the ditches on both sides of a road that measures 100' in length and each ditch is 4' wide, the **Size of the Area Eroded** could be listed at 100 x 8'.

Site is Linked to Another – Oftentimes, a problem on one land use is connected to the problem on an adjacent land use. If this is the case, list the site number of the related site. For example, runoff from a private road flows down an adjacent driveway. This should be noted, since the driveway might not be able to be fixed without first addressing the problem on the private road.

Recommendations – Circle all the possible BMPs that might be able to fix the erosion problems at each site. Circle only the items listed under each bold faced category. The bold faced categories should not be circled; they are listed to prompt surveyors to think about potential BMPs for each given land use (e.g., culvert, ditch, road shoulder). The recommendations, **Add New Surface Material** and **Install Runoff Diverters** can be circled, but there are also bulleted options under each of these headings if it is clear which sub-option would be most suitable.

Impact Rating – The impact rating is an indicator of how much soil and phosphorus erodes into the lake from a given site. The impact is selected based on the amount of buffer or other filter, slope, size and severity of the eroded area, and amount of soil eroded. Use the point system to help consider these factors and determine the site's impact rating.

Select one choice and corresponding points for each of the categories 'Type of Erosion,' 'Area,' and 'Buffers and Other Filters,' and then add your three selected numbers together for the impact score. Circle the site's impact rating.

For example, a large eroded area with gully erosion and direct flow into the lake would be 9 points and rated as High Impact. A small patch of bare soil undergoing sheet erosion next to the lake without any buffer would be 5 points and rated as Low Impact. Many times sites do not clearly fit into these categories, so the survey team discusses the impact rating factors of a site and decides upon the best fit.

If a site has significant deposition in a vegetated area, be sure to confirm there is likely some sediment/runoff delivery into the lake. If there is not, the erosion site should not be documented as a problem site.

Cost Rating – The cost rating for each identified erosion site is based on the number and types of recommendations selected at the top of the page. Low Cost would be selected for small residential sites that only need a few low cost BMPs such as mulch, runoff diverters, seed/hay, drywells or a small buffer. Most road-related BMPs tend to be more expensive. If heavy equipment is needed to install several recommended BMPs, the project would probably be a High Cost. As with the Impact Ratings, many sites do not clearly fit into these categories. Oftentimes, a survey team discusses the impact rating of a site and decides upon the best fit.

Appendix L: Post-Survey Letter to Landowners Sample



Wilson Lake Association
PO Box 162, Acton, ME 04001
Insert email and/or phone number

Owner
Address
Town, State, Zip

April 20, 2010

Dear Owner:

As you may remember, the Wilson Lake Association, in partnership with the Maine Department of Environmental Protection, Acton Wakefield Watersheds Alliance (AWWA) and York County Soil and Water Conservation District (YCSWCD), conducted a survey of property in your area in April, 2009. The purpose of this survey was to identify areas of erosion, non-vegetated soil, roadway and driveway deterioration, and other problems that contribute sediment into Wilson Lake. This sediment carries nutrients that are causing premature deterioration of our lake.

Considerable effort on the part has been expended to visit every property in the watershed. Data from properties and roadways with erosion issues was collected and reviewed, and solution strategies were developed for each site. This information has been organized and presented in a final report which is available at www.yorkswcd.org.

Attached is a Summary Fact Sheet of the survey findings, specific recommendations for your property and Fact Sheets that address the issues identified on your land. It is our sincere hope that you will consider the importance of the lake you have in front of your property, read the materials and make recommended improvements. You will probably find many simple things you can do as a property owner to reduce sedimentation from entering and deteriorating our lake. You may also get advice and/or help from Wilson Lake Association, AWWA and/or York County SWCD. Contact information for each group is listed on the Summary Fact Sheet.

Please understand that you are *not required* to take these actions, and no penalties or fines will be levied if you do not follow these recommendations. Rather, it is hoped that you will do so in order to protect the long-term health of Wilson Lake. Actions taken now will prevent further deterioration of water quality, decrease in fisheries, decline in property values and spread of invasive plants species such as the variable-leaved milfoil.

The WLA is currently investigating the availability of grants to help with remedial efforts on many of the large impact sites. Over the coming year, funds may be available to help with some of these sites that need to be completed to protect the health of the lake. WLA will strive to keep you informed of the status of the grant process and programs that may be helpful. Be sure to read your Newsletter when it arrives and attend our annual meeting held in July each summer.

Thank you in advance for your concern about the water quality of Wilson Lake.

Sincerely,

Teg Rood, President Wilson Lake Association

Wilson Lake Watershed Survey Committee:

Jeanne Achille
Glenn and Betty Wildes
Celia Thibodeau
Linda Schier (AWWA)

Joe Anderson (YCSWCD)
Wendy Garland (MEDEP)
Patrick Marass (MEDEP AmeriCorps)

Summary of Recommendations Noted for Address

The volunteers who visited your property found the following conditions that need to be addressed:

In order to correct this problem, we would like to recommend that you install the following Conservation Practices that are proven ways to solve erosion issues:

Fact Sheets Included:

If it appears that the problems and suggestions described above do not apply to your property, please give us a call or send an e-mail (list at least one email). While considerable care was taken using the Town's tax maps to identify properties and their owners, it is possible that mistakes were made and this has been sent to you in error. However, there are probably things you can do to reduce soil transport off your property even if your property is not listed in the survey.

Appendix M: Post-Survey Newsletter Article Sample

2002 Watershed Survey Complete

The primary purpose of the watershed survey was to identify and prioritize existing sources of polluted runoff, particularly soil erosion sites in the Forest Lake Watershed. Equally important was to raise public awareness of the connection between land use and water quality and inspire people to become active stewards of the watershed. This information will be used as a component of a long-term lake protection strategy and to make general recommendations to landowners for fixing erosion problems.

On May 11, 2002, volunteers were trained and later broke into teams and surveyed five sectors on Forest Lake. The teams identified a total of 112 sites where polluted runoff occurs. A total of five land use types were associated with the identified sites; Beach Access, Boat Access, Driveways, Residential and Private Roads. Sites were also ranked according to three criteria:

Technical level to install **describes the degree of technical expertise needed to address a problem.**

- ◆ **Low-tech level requires little or no specific technical assistance**
- ◆ **Medium-tech level needs to be visited by a technical expert who can make recommendations.**
- ◆ **High-tech level requires an engineered design.**

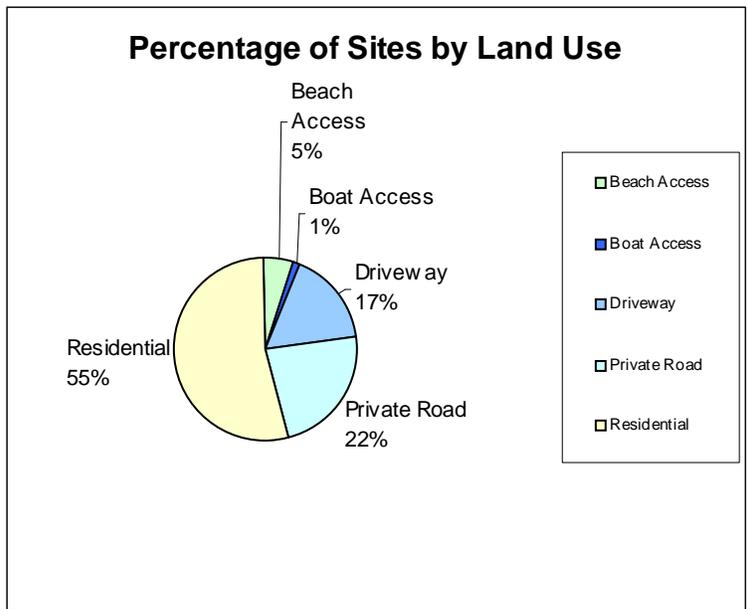
Impact **was assigned by considering factors such as the size of disturbed area, slope, soil type, amount of soil that's eroding, proximity to water or buffer, and size of buffer.**

- ◆ **Low-impact eroding sites are those with limited transport offsite**
- ◆ **Medium-impact sites where sediment is transported off-site, but the erosion does not reach a high magnitude.**
- ◆ **High-Large sites where there is significant erosion that flows directly into a stream, lake or ditch**

Cost

- ◆ **Low-cost** sites were estimated to cost less than \$500 to fix.
- ◆ **Medium-**\$500 to \$2,500 to fix
- ◆ **High-**\$2,500 to fix

Totals for Forest Lake Survey Sites				
Total Number	Type	Impact		
		High	Medium	Low
6	Beach Access Sites	2	3	1
1	Boat Access			1
19	Driveway	2	5	12
25	Private Road Sites	4	4	17
61	Residential	3	14	44
112		11	26	75



With a few exceptions, virtually all of the sites identified in the survey are significant to one degree or another. The cumulative effect of many “low” and “medium” impact sites can exceed that of any one “high” impact site.

Appendix N: Post-Survey Press Release Sample



York County Soil & Water Conservation District
8 Waterboro Road, P O Box 819, Alfred, ME 04002-0819
207-324-7015, fax: 207-324-4462, e-mail: debbie-st-pierre@me.nacdn.net.org

April 13, 2011

PRESS RELEASE

#####

Kennebunk Pond Watershed Survey Completed

Kennebunk Pond Association volunteers and York County Soil & Water Conservation District (SWCD) recently completed a watershed survey of Kennebunk Pond. The primary purpose of the watershed survey was to identify and prioritize existing sources of polluted runoff, particularly soil erosion sites in the Kennebunk Pond Watershed. Equally important was to raise public awareness of the connection between land use and water quality and inspire people to become active stewards of the watershed. This information will be used as a component of a long-term lake protection strategy and to make general recommendations to landowners for fixing erosion problems.

On May 18, 2002, volunteers were trained and later broke into teams and surveyed five sectors on Kennebunk Pond. The teams identified a total of 67 sites where polluted runoff occurs. A total of eight land use types were associated with the identified sites: Beach Access, Boat Access, Driveways, Seasonal and Year Round Residential, Private and State/Town Roads and construction sites. Sites were also ranked according to three criteria:

Technical level to install describes the degree of technical expertise needed to address a problem.

- ◆ **Low-tech** level requires little or no specific technical assistance
- ◆ **Medium-tech** level needs to be visited by a technical expert who can make recommendations.
- ◆ **High-tech** level requires an engineered design.

Impact was assigned by considering factors such as the size of disturbed area, slope, soil type, amount of soil that's eroding, proximity to water or buffer, and size of buffer.

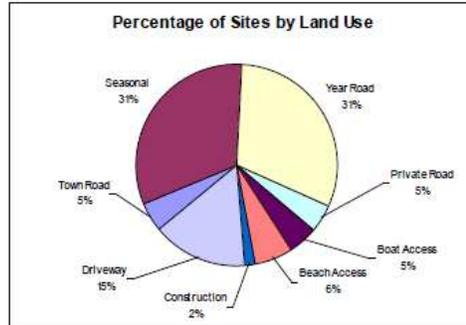
- ◆ **Low-impact** eroding sites are those with limited transport offsite
- ◆ **Medium-impact** sites where sediment is transported off-site, but the erosion does not reach a high magnitude.
- ◆ **High-Large** sites where there is significant erosion that flows directly into a stream, lake or ditch

Cost

- ◆ **Low-cost** sites were estimated to cost less than \$500 to fix.
- ◆ **Medium-**\$500 to \$2,500 to fix
- ◆ **High-**\$2,500 to fix

Key Findings:

- ◆ Most of the problems were found on residential properties and driveways.
- ◆ About 12% of the problems may be causing a significant impact to the pond.
- ◆ Most of the problems can be fixed with little expense or technical expertise. Plants, mulch and other simple solutions can go a long way towards protecting the pond.
- ◆ There is a manageable number of problems.



With a few exceptions, virtually all of the sites identified in the survey are significant to one degree or another. The cumulative effect of many “low” and “medium” impact sites can exceed that of any one “high” impact site.

Volunteers are the key to the success of a survey. KPA is a very active lake association who informed residents of the upcoming survey, conducted the survey, assisted with report format and content and are now planning next steps. KPA is committed to improving the water quality of Kennebunk Pond.

The survey was funded in part by Maine Dept. of Environmental Protection through a US Environmental Protection Agency Nonpoint Source Grant under Section 319 of the federal Clean Water Act.

For more information on this report or how to conduct a watershed survey, contact Debbie St Pierre at York County Soil & Water Conservation District at 207-324-7015 or via email at debbie-st-pierre@me.nacdnet.org.

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Please print in the week of September 1, 2003. Thank you.

Appendix O: Site Tracking Template

Guidance on site tracking and online map making is available from Maine DEP DWM.

Site #	Land Use	Location*	Description of Problem	Landowner name & contact info.	Date Identified	Before Photo**	Pollutant Loading (tons/yr)	Year Fixed	Description of Work Completed	After Photo**	Funding Source	Grant Cost	Match	Date Inspected	Followup Action Needed?
1PR	Private Road	Insert address	Ditch backslope failing; runoff from road flowing into stream.	Insert landowner name, phone and/or email	2002 Watershed Survey		2.2	2003	Slope cut back, stabilized with ECM and planted with junipers. Ditch and settling basin installed.		Phase I Grant Project	\$2,146	\$1,922	8/19/2008	Send annual reminder email to landowners to cleanout basin. Inspect again in 2011.
3R	Residential	Insert address	Erosion along roof dripline, lack of buffer and bare soil on sitting area.	Insert landowner name, phone and/or email	2002 Watershed Survey		0.2		Landowner Tech assistance visit on 6/13/04.			NA	NA		Follow up with landowner to see if work done.
4R	Residential	Insert address	Shoreline erosion, lack of buffer and erosion on path to lake.	Insert landowner name, phone and/or email	2002 Watershed Survey		0.4								
NA	Driveway	Insert address	Severe driveway erosion with direct flow to lake.	Insert landowner name, phone and/or email	5/2/04 YCC tech assist visit		0.5	2004	Added new surface material and installed two rubber razors.		YCC Site	NA	\$550		
11R	Residential	Insert address	Slight surface erosion; Lack of shoreline buffer	Insert landowner name, phone and/or email	2002 Watershed Survey		NA	2005	YCC installed 20 native shrubs and 5 yards ECM along shoreline.		YCC Site	NA	\$350		
* Location could include GPS coordinates (in separate columns) and/or map and lot number															
** Photos could be hyperlinks to location on the computer, small thumbnails or weblinks to Picasa-type online photo storage															
Some of the columns typically in watershed survey spreadsheets															
New Columns to add or consider adding to watershed survey data table															

Appendix P: Publications

Unless noted otherwise, all of the following are available at:
www.maine.gov/dep/land/watershed/materials.html

Buffer Publication Resource List.

This document lists publications available in Maine regarding lake buffers, including a description of each publication, a small color photo of each publication cover, contact information, and links to electronic versions if available.

Conservation Practices for Homeowners.

Series of 24 fact sheets from DEP and the Portland Water District, profiling common conservation practices that homeowners can use to protect water quality. The fact sheets include detailed instructions, diagrams and color photos about installation and maintenance.

Gravel Road Maintenance Manual: A Guide for Landowners on Camp and Other Gravel Roads.

This 2010 update of the Camp Road Maintenance Manual provides camp road owners, contractors, and others with information on maintaining and improving unpaved gravel roads. Includes troubleshooting guide, practical tools and detailed diagrams on ditching, crowning, road surface materials, and other road maintenance practices, as well as checklists and other guidance.

Lake Camp Road Report. (www.maine.gov/dep/land/2009/camp_roads.pdf)

This DEP report to the 2009 Legislature provides an evaluation of ways to reduce the impact of camp roads, driveways, and boat launches on lake water quality. The report includes an overview of camp road, driveway, and boat launch issues, descriptions of existing resources and programs, and identified needs and associated strategies.

Lake Report: An Evaluation of Ways to Protect or Improve Lake Water Quality by Addressing Development Impacts. (www.maine.gov/dep/land/2008/lake_report.pdf)

This DEP report to the 2008 Legislature addresses ways to improve lake water quality. The report includes descriptions of existing regulatory and non-regulatory efforts to protect lake water quality, ongoing threats to Maine lakes, and an analysis of lake protection issues such as camp roads.

LID Guidance Manual for Maine Communities - Approaches for Implementation of Low Impact Development at the local level (2007).

The purpose of this guidance manual is to help municipalities implement Low Impact Development (LID) practices on small, locally permitted development projects. This manual provides a recommended set of low impact development (LID) standards and guidance on implementing LID practices to comply with those standards.

Phosphorus Control in Lake Watersheds: A Technical Guide to Evaluating New Development. (www.maine.gov/dep/land/stormwater/stormwaterbmps/index.html - see Vol II)

This guidebook, updated in 2008, is a tool for towns to use for regulating development and phosphorus export to lakes. The method calculates how much phosphorus may be allowed to be exported and is based in part on an assessment of how much of the watershed has been and is likely to be developed.