A Strategy for Improving the Health of Our Watershed: The Coos Water Quality Outreach Plan

September 2003
By Miranda Shapiro
Coos Watershed Association
Acknowledgements

I would like to extend my sincere appreciation to the many individuals who gave their time and energy to this project. These include, but are not limited to: Gail Glick Andrews, Pam Blake, Dan Brelage, John Craig, Jamie Fereday, Beryl B. Fletcher, Scott Gallagher-Star, Tom Gaskill, Marty Giles, Heath Hampell, Brett Harris, Mark Healey, John Herbst, Bessie Joyce, Jessica Leahy, Ellen Lyon, Mike Mader, Joan Mahaffy, Amy Peters, Alan Ritchie, Sue Powell, Rob Schab, Bud Schmidt, Shandra Shribbs, Steve Skinner, Terry Strange, George Tinker, Carol Ventgen, Sandy Whittaker, Nikki Whitty, Jan Willis, and Jordan Zinograd. This effort would not have been possible without the great insights and creative ideas of the people from this unique and beautiful area. The Coos Watershed Association Board deserves thanks for their support during the creation of this document. I would also like to thank Jon Souder, who was a great mentor and the catalyst of this project. Special thanks goes to the Oregon Department of Environmental Quality for funding this plan.
# Table of Contents

Introduction .......................................................................................................1
Purpose .........................................................................................................1
Background....................................................................................................1
Methodology ..................................................................................................2
Organization of Plan ......................................................................................2
General Outreach Methods ...........................................................................2
   General Outreach Methods – Short-term projects .........................................3
   General Outreach Methods – Long-term projects ...........................................4
Schools ..........................................................................................................5
Libraries ........................................................................................................7
Rural Residential ............................................................................................8
   Introduction ...............................................................................................8
   Drinking Water ..........................................................................................8
   Bacteria .....................................................................................................9
   Outreach Tools for Septic Issues ...............................................................9
   Toxic Waste ..............................................................................................10
   Noxious Weeds .........................................................................................11
   Groundwater ............................................................................................11
   Groundwater Stewardship in Oregon ..........................................................12
   Temperature ..............................................................................................12
   Sedimentation ...........................................................................................13
Urban ..............................................................................................................13
   Initial Outreach Projects for Urban Sector ................................................13
   Storm Water .............................................................................................14
   Bacteria ....................................................................................................15
Agricultural ......................................................................................................16
Funding ...........................................................................................................17
Evaluation .......................................................................................................19
Conclusion .......................................................................................................23
Recommendations ..........................................................................................23
Resources ........................................................................................................24
Appendix A: Lower Pony Creek Potential Action Plan ....................................30
Endnotes .........................................................................................................33
Introduction

Purpose

The overall objective of this project is to improve water quality in the Coos watershed. There are many public services that benefit from improved water quality including recreation, residential water supply, and aquaculture. Enhancing water quality also helps restore fish populations, functioning wetland systems, and the local economy. The Coos Estuary supports the largest commercial oyster production in the State of Oregon. The purpose of this plan is to prescribe education and outreach that will improve water quality in the Coos watershed. Increasing public involvement and improving understanding through education and outreach is essential to achieving this objective.

A watershed council is an effective vehicle for outreach in Coos Bay. In 2000, in a survey conducted by the Pacific Northwest Coastal Ecosystems Regional Study (PNCERS), the majority of Coos Bay residents were unsure about the water quality in their bay. In addition, the survey respondents cited existing partnerships between governments and citizens, such as watershed councils, as the most influential to them when making decisions about natural resource management.

Background

This plan is focused on the Coos Watershed, which is located in Coos County in the South Coast area of the Coast Range Ecoregion. Coos Bay is the largest estuary on the Oregon Coast, with an area of approximately 55 square kilometers of surface water at high tide. The Coos Watershed covers approximately 1,518 square kilometers, three major forks drain into Coos Bay (South Fork Coos River, East Fork Milllicoma River, and West Fork Milllicoma River); and another 11 tributaries drain directly into Coos Bay. Waterways that drain directly into Coos Bay are defined as Direct Bay tributaries. Land use in the Direct Bay tributary watersheds includes: forest 67%, urban (or urban-like) 10%; coastal/estuarine 8%, rural residential 7%, and agricultural 6%. The human population of the area has decreased during the past ten years as a result of declining employment in the traditional sectors of wood products and fishing. Property ownership along the Direct Bay tributaries is overwhelmingly (86%) private, with another 7% owned by local and state governments, and the remaining 7% by the federal government.

Direct Bay tributaries are an important source of water into the Coos Estuary. These tributary streams are generally between 3 to 15 miles in length. The variety of land uses include urban- including the cities of Coos Bay and North Bend, rural residential- served by septic tanks, and traditional agricultural operations. Most land surrounding tributary headwaters is used for timber production, with ownership by large private corporations, public agencies, or smaller non-industrial forest owners. As mentioned previously, the Coos Estuary
supports the largest commercial oysters-growing area in Oregon. Oyster beds are generally located in the main bay, on intertidal flats near the inputs of Direct Bay tributaries. The five major commercial oyster growers produce about 60,000 bushels per year valued at $1.8 million. In addition, the Oregon International Port of Coos Bay is the second largest in Oregon in terms of tonnage shipped (principally wood products). Charleston, at the entrance of Coos Bay, is a traditional fishing and fish-processing community. Both water and shore-based recreation is supported by state parks and other public lands including Sunset Bay State Park, the Oregon Dunes National Recreation Area, and South Slough National Estuarine Research Reserve.

Methodology

In developing a water quality outreach plan (WQOP) I reviewed best practice models and strategies for outreach on water quality both in Oregon and throughout the U.S. I conducted interviews with natural resource agency personnel, outreach specialists, and other Oregon watershed councils which generated some excellent ideas and outreach methods. In conjunction with the above interviews, I met with potential partners for this effort, which included representatives from cities, county commissions, libraries, schools, sanitary districts, tribes, agriculture, aquaculture, local nonprofit organizations, government agencies, and local residents. I then identified and evaluated water quality concerns and outreach methods. Finally, I analyzed my findings and made recommendations.

Organization of Plan

This WQOP begins with a discussion of general outreach methods, school outreach, and the role of libraries. The plan is then divided into three sections in order of priority: 1) rural residential, 2) urban, and 3) agricultural. The “General Outreach Methods” section covers outreach methods appropriate for all three groups. For each specific-group section, water quality concerns are identified and methods of outreach to respective target populations are outlined, followed by recommendations and a resources page.

General Outreach Methods

There are a variety of general education and outreach methods to help improve water quality in the Coos Watershed. In selecting the most effective methods, it is important to start with short-term projects that are easy to implement and have a high success rate. These successes will help galvanize support in the community and encourage future collaborations and potential funding for long-term projects. Examples of initial short-term projects are:
Drains to Bay
Coordinate a stencils project. This is an inexpensive project that makes protecting our waterways fun for both youth and adults alike. For information go to the Environmental Protection Agency’s website and click on “Adopt Your Watershed” or go directly to the page on storm drain stenciling project guidelines at: http://www.epa.gov/adopt/patch/html/guidelines.html. Potential partners in this effort are cities, K-12 schools, community colleges, Northwest Steelheaders, youth groups, and service organizations such as Southwest Oregon Youth Association (SWOYA), Eagle Scouts, and Girl Scouts. Funding for this project is relatively easy as the materials could be donated by paint stores and printing shops. Stencils can be obtained from Earthwater Stencils. 4425 140th Avenue SW, Dept. V, Rochester, WA 98579-9703; phone 360/956-3774; fax 360/956-7133; website http://www.earthwater-stencils.com/index.htm.

Local examples of best practices
A map highlighting these sites and including information on how local residents and visitors can visit them would be a valuable educational tool. Examples might include: the North Bend planned installation of a natural gutter on 16th street (helps direct water runoff); the pervious parking lot at Millicoma Middle School (using EcoPavers that help direct runoff); the Coquille Indian Tribe’s bioswale separating their housing development from the organic cranberry bogs; and the Oregon Institute of Marine Biology detoxifying formaldehyde for safe disposal. The map could be developed by the Coquille Indian Tribe’s Geographic Information Systems (GIS) lab by a student or by an intern at the Coos Watershed Association, which has access to GIS and other necessary technology. In addition, the Fred Meyer Foundation supports youth activities and could be a potential funding source for this project.

Coos Regional Trails Partnership (CRTP)
The partnership is currently focusing on water trails to educate recreationalists (i.e., surfers, windsurfers, beachcombers, clammers, kayakers, canoeists, hikers, birders, pinickers, and photographers) on the importance of preserving and enhancing water quality. The CRTP recently completed a map of water trails in the area. As improving water quality is important to recreation this would be a valuable collaborator. Visit the CRTP website at http://www.coostrails.com. Potential partners include the Oregon Youth Conservation Corps, Northwest Youth Corps, AmeriCorps and the Bay Area Sportsman’s Association. A local Rotary Club could be a project funder.

Pony Village Mall
The stage at the mall is an ideal setting for public outreach. For example, mall goers could be informed about the importance of ponds and reservoirs with regards to water quality. These wetlands attract wildlife and break down toxins. Sample outreach ideas include a skit with individuals portraying affected wildlife and plant species or a slide show. This could potentially be low cost as the use of the stage could be donated.

Silkscreen of the Coos Watershed Map
A functional and beautiful peace of art would identify rivers and streams in the watershed. The Coos Watershed Association could make the design available for consumer items such as t-shirts, hats, bandanas, etc. Restaurants may be interested in
using the design on placemats. This last idea was originally proposed by another watershed council and it won the small grant award at the Oregon Watershed Enhancement Board conference in 2002. Table tents are another educational vehicle. Other venues for laminated placemats are stores that sell supplies for sports fishing and oyster harvesting and the counter at planning offices. Identifying the names of our waterways will provide the community with a greater sense of ownership and promote better treatment. This could also be an important fundraising tool.

**General Outreach Methods – Long-term projects**

Fueled by the successes of several short-term projects, the public will be more likely to support and help achieve project activities with a longer timeline. These projects discussed below will take more time and energy, but will also have longer lasting positive impacts on water quality in the area.

© **Community Based Water Testing Program**

Develop this program as a great way to involve watershed residents of all ages. This ongoing effort can help identify baseline water quality as well as sudden changes in a specific area. The Puget Sound Action Team is a good example of a community that is engaged in water quality monitoring that uses volunteers (see http://www.psat.wa.gov/index.htm). One could also look into Estuary–net Project; their curriculum is on-line at http://inlet.geol.sc.edu/estnet.html, click on “Water Quality Monitoring.” In addition, the Coast-Net program, developed by Hatfield Marine Science Center, has been on-going since 1995 (see http://secchi.hmsc.orst.edu/coastnet/index.html). After a start-up grant from one of the sources in the funding section discussed below, combining local fundraising activities with contributions from business and organizations would help ensure the continued funding of these types of projects.

© **Water Quality Badges**

This is a great way to involve youth in water quality activities and reward their efforts in both individual and team projects. The 4-H program is a good potential partner in this project. Talk to 4-H leaders to find out about badges connected to water quality and how to incorporate this into their existing program. The EPA has a program called “The Water Drop Patch Project” that focuses on girls’ efforts to improve water quality. Information on this project is located on the EPA website at http://www.epa.gov/adopt/patch/. Other related organizations to work with are the Boy Scouts, Girl Scouts, and Camp Fire USA.

© **Coos Watershed Association 10-year anniversary**

Do outreach in conjunction with this event and annual events like National Water Monitoring Day. Including outreach on how to improve water quality at annual events is a nice way to celebrate solutions and be a consistent reminder of how the public can get involved. Festivals and anniversaries are a great way to create excitement. The information learned can be passed on to others when it is presented in such forms as stories and one-act plays. Information on upcoming annual events can be placed in the “Oregon Watershed Weeks,” published by For the Sake of the Salmon, which lists watershed events every year. For more information, go to http://www.watershedweeks.org.
In addition, an anniversary would be a great time to initiate a **membership drive**. Members would receive information and education on water quality issues and thereby be a potential volunteer pool as well as provide additional funding for water quality educational activities through membership dues.

Marketing the projects and activities noted above is vital to recruiting and encouraging public participation. Potential marketing techniques include writing news releases for local newspapers, placing ads in classified sections of the newspapers, and using existing databases for mass mailings.

**Schools**

Educating youth now about the importance of water quality instills ideas early that the child will carry on to adulthood and also has a ripple effect of educating their parents and other relatives and friends. Schools are an effective partner in educating youth and the community at large about water quality issues. Expanding curriculum to include more information on water quality concerns will go a long way towards helping resolve related problems discussed in earlier sections of this plan.

Based on information obtained through discussions with instructors from schools within the Coos watershed; the main issue is increasing the number of students that gain exposure to existing water quality curriculum. This is not to say that new curriculum would not serve to improve students understanding of water quality issues, but the first step is to broaden the base of students receiving curriculum with some basic lessons relating to water quality. Workshops and trainings for teachers on how to incorporate water quality curriculum is a great place to start.

Workshops and trainings would incorporate existing lessons and field activities, encouraging other instructors to include this information in their curriculum. Students at Southwestern Oregon Community College could assist with workshops and mentoring students. Another potential partner is the Oregon Institute of Marine Biology (OIMB). Contact information for instructors noted below is available in the Resources section of this document. Examples of lessons/activities include:

- **Water testing and analysis**
  These low-cost methods to test water bodies include equipment, techniques, and sampling plans. The Coast-Net program, developed by Hatfield Marine Science Center, has been on-going since 1995 (see http://secchi.hmsc.orst.edu/coastnet/index.html). Though the Coastnet and Rivernet programs are no longer grant funded, several schools including Marshfield High School are still participating in these water quality monitoring programs. For more information, see http://secchi.hmsc.orst.edu/coastnet/ and http://secchi.hmsc.orst.edu/nwrivernet/. (Local contact, George Tinker)
Stream Scene
Students trace a watershed on two streams to learn about watersheds. Materials are available from the Oregon Department of Fish & Wildlife at PO Box 59, Portland, OR 97207 or (503) 867-4741 (local contact, Oregon Department of Fish and Wildlife)

“Protecting Coastal Waters: A Community Approach.”
This video describes a situation on the Coquille River where the Oregon DEQ found high temperatures and low dissolved oxygen and developed solutions with agricultural agencies and land owners. The project was developed by Krystyna Wolniakowski of the Oregon DEQ, produced by Independent Video Services, and written by Jerry Joffe, K. Wolniakowski, and Bob Bailey. (Local contact, Jamie Fereday)

Surf Rider Foundation
A national foundation whose mission is to maintain clean water for quality recreation. George Tinker’s class is employed to measure total coliform and E-coli monthly in the surf at Cape Arago, Sunset Bay, and Bastendorff beaches. Besides the bacterial levels, the class also records water temperature and salinity data. They enter the results of their analysis on the Foundation’s web page, which is maintained for 20 coastal states. Oregon and Washington are the only two states on the coast that do not have coastal water quality standards in place. The Surfrider foundation is funding this project to demonstrate the need for coastal water quality standards on the Oregon Coast. Oregon is currently setting up standards for bacteria counts in beach water. It would be great for other science classes to get involved in this effort so as to reach a larger number of students and more sites. (Local contact, George Tinker)

It is important to help teachers access educational materials on water quality. One step is to provide a "Water Quality Trunk" or kit to the Educational Service District for teachers, including videos, flyers, and other visual pleasers. Creating a speaker resource list for schools identifying professionals in the community willing to give presentations in schools is another. This list of speakers should provide information concerning age of target audience and topics. A third step is to identify individuals and or organizations that are willing to provide field trip sites and topics. For other ideas on water quality curriculum and activities, see the Resources section of this document. An important source of funding for these efforts is the Meyer Memorial Trust’s Support for Teacher’s Initiatives Program. For more information, see the Funding section below.

A second priority in advancing education of our youth on water quality issues is to collaborate with the South Slough National Estuarine Research Reserve during their “Watershed Tour.” During this annual event, youth are invited to participate in activities related to promoting a healthy watershed. This would be a great field activity for students to get out of the classroom and learn about water quality in a fun and relaxed atmosphere. For more information contact Sue Powell, South Slough National Estuarine Research Reserve, at (541) 888-2581 ext. 304.
Libraries

Libraries are a wonderful resource for outreach opportunities because almost everybody in the community uses their services at one time or another. This is an outlet that can reach rural residential, urban, and agricultural constituents. Both Coos Bay and North Bend libraries are willing partners in helping to provide information on water quality issues. Outreach in libraries can be in the form of:

- **Posters**
  North Bend will put up posters in library; Coos Bay does not have designated wall space.

- **Events/meetings**
  Both libraries are willing to hold events/meetings in their conference rooms at no charge. North Bend has two conference rooms, one will accommodate small gatherings and displays and a larger conference room that will hold up to 100 people with kitchen facilities, TV, VCR, DVD, and a screen for slide shows. Coos Bay Library has a small conference room with a sink and allows food and drink.

- **Racks or spinners**
  North Bend is willing to provide a rack or spinner to hold information on water quality issues. Coos Bay has a credenza near the entryway to hold information for a limited duration and has a policy of not supplying additional racks though they may be open to revising this policy.

- **Display cases and community bulletin boards**
  Both libraries are willing to place information in their display cases and have community bulletin boards to advertise local events and activities.

- **Storytelling hour**
  Both libraries are willing to incorporate water quality themes at storytelling hour for kids.

- **Presentations**
  North Bend and Coos Bay hold a variety of volunteer group meetings which are great opportunities to present information on water quality. Groups must be contacted in advance.

- **Website links**
  Both libraries are willing to link to more information on water quality. Libraries are a great place to surf the web and find out information on water quality. One idea is to produce a list of web sites that have information on water quality.

In addition, North Bend Library has agreed to work together with the Coos Watershed Association to develop outreach materials. North Bend would also greatly appreciate donations of books and videos on water quality issues as their current holdings are out of date.
Rural Residential

Introduction

Targeting outreach on the water quality concerns of rural residential areas in the Coos watershed is the top priority of this plan. Issues relating to water quality in rural residential areas include drinking water, bacteria, toxic waste, noxious weeds, groundwater, temperature, and sedimentation. Many, if not all, of these issues also relate to water quality in urban and agricultural areas. Thus, the above concerns will also be discussed in other sections, though the outreach methods to help solve these water quality issues may change.

Drinking Water

The importance of clean drinking water is something everyone can understand and is easy to promote. Thus, educating the public about importance to clean drinking water is a powerful tool, which can be linked to other water quality issues such as groundwater. A first order of priority is to utilize the resources of the Oregon State University Well Water Program coordinated by Gail Glick Andrews [(541) 737-6294 or http://wellwater.orst.edu/]. The Well Water Program’s motto is “Protecting the groundwater that provides our drinking water through education.” The Program includes information on:

© Home Assessment System
Provides worksheets for farmers and ranchers that identify potential risks to a person’s drinking water supply on areas such as a well, septic system, pesticide storage, petroleum storage, manure management, and more.

© Real estate
What one needs to know when buying or selling a home with a well and septic tank.

© Hazardous materials
Reducing risks to groundwater from hazardous materials.

© Lawn/garden
Lawn and garden practices to protect groundwater.

The Well Water Program also holds workshops and classes for rural residents presented by Gail Glick Andrews in the areas of well water, septic tanks, water testing, use of chemical products, and groundwater friendly gardening. The workshops are affordable and on a sliding scale. Andrews is willing to travel to a rural area for the workshop if eight or more people are in attendance. One requirement of the workshop is that each attendee donates their time as a volunteer to educating others about the information learned in the workshop in the form of a project. Providing a workshop to residents of the Coos
watershed is an important first step to educating residents on groundwater protection. Funding to provide scholarships for this workshop could come from private donations from businesses and organizations in the area. Recognition of these contributions could come in the form of press releases and articles to local newspapers.

Another priority is to educate and inform the public about the availability of periodic testing of wells as an important tool to ensuring the safety of a resident’s drinking water. Marshfield High School teacher George Tinker’s science class is currently offering this service called the “Pirate Water Testing Service.” His class is offering advisory testing while waiting to see if certification is possible. If there is an issue with the quality of the drinking water after testing the student will give the rural landowner a Department of Health pamphlet to help them if they do have problems. The State Department of Health is a great resource for information on drinking water. For more information contact Dave Leland at the Oregon Health Division, Department of Human Services Drinking Water Program at (503)731-4010 or visit their web site at http://www.ohd.hr.state.or.us/dwp. For more information on the Pirate Water Testing Service, call George Tinker at (541) 267-1405. This is a great way to educate students on how to analyze test results and work with the public, while providing residents with an important service.

**Bacteria**

Protecting our waters from the detrimental effects of bacterial contact from human, pet, livestock, and wildlife waste will go a long ways to improving the water quality of the Coos Watershed. One of the prime contributors are leaking septic systems from residents who are not connected to the cities of Coos Bay, North Bend and Charleston’s sewage treatment plants. According to Sandy Whittaker of the Charleston Sanitation District, the long-term solution to this problem is to extend connections to these residents who are not currently serviced by cities.³ The short-term solution is to educate septic users on the importance of regular maintenance on their septic systems and the provision of loans to facilitate repairs or installation of new systems when necessary.

The Department of Environmental Quality (DEQ) State Loan Revolving Fund Program through Coos County will do just that. This fund will place a lien on the applicant’s property in exchange for a loan to either update or install a septic system. The Coos Watershed Association has already agreed to help with outreach for this project. The areas eligible for loans are Tenmile Lake and South Slough. Thus, the Tenmile Watershed Association is an important partner in this effort. Other outreach tools for educating the public on septic issues in order of priority include:

**Outreach Tools for Septic Issues**

© **Letter**
Construct a letter to be sent to septic users that reminds them of their last date of maintenance and what currently or in the future will be needed in terms of maintenance.
This letter could be distributed by septic installers who have records and information on their clients.

© **Septic education kit**
Available for use at the South Slough National Estuarine Research Reserve (SSNERR).

© **Brochure**
Tenmile Watershed Association has an educational brochure that could be adapted for use with residents of the Coos watershed.

© **Resource**
Materials and information available on the Washington Sea Grant website at http://www.wsg.washington.edu/outreach/mas/water_quality/septicsense/septicmain.html. Teri King, a marine water quality specialist, is the recommended contact for this agency.

Potential partners for outreach and education on bacteria as it related to water quality include the Oregon Department of Environmental Quality; Tenmile Watershed Association; Coquille Watershed Association; Coos County commissioners; Charleston Sanitation District; Coos Bay-North Bend Water Board; Coos Watershed Association; septic installers; and area residents of Tenmile Lakes, South Slough and residents near Kmart who are connected to city water but not city septic. Funding for these efforts could potentially come from the State Loan Revolving Fund Program.

**Toxic Waste**

Preventing the contamination of our waterways from toxic waste is an important component in improving water quality of the Coos watershed. Many residents of the Coos area don’t realize the effects of dumping hazardous materials into the bay or adjoining rivers and streams. Others indirectly pollute these water bodies by allowing toxic waste in forms such as old paint cans and decaying lead batteries. These chemicals slowly leach into the soil until they are absorbed into the groundwater, which then makes its way to our waterways.

There are several outreach methods that can educate the public about the dangers of toxic waste when it comes to water quality and also help them dispose of these materials in a safe manner. The first project recommended in this effort is to hold a “**DEQ Hazardous Waste Collection Event**.” This is a free event where area residents can properly dispose of their hazardous wastes by bringing them to a pre-selected site (usually in a parking lot at a school). Applications are accepted by DEQ on an annual basis. To get an application, contact 1(800) 732-9253.

Providing education about **recycling** is another key to reducing the impact of toxic waste in our waterways. For example, oil can be recycled at the Coos Bay Transfer Station and most gas stations. Developing a sheet which outlines different waste materials and where they can be recycled and distributing them at planning offices, libraries, and other public areas would help the public’s
awareness of solutions to this issue. Recycling centers may help provide information and printed materials for this project.

**Noxious Weeds**

Another water quality concern is noxious weeds, which crowd out other native riparian vegetation that can provide shade and lower temperatures in our waterways. Education on identification of noxious weeds is key to ensuring that people don’t unknowingly plant or help increase their area of distribution.

A great way to learn more about noxious weeds is to participate in their removal. Getting a group of volunteers to work with an expert on noxious weed removal would be a great way to educated and help eradicate noxious weeds. In the Coos watershed these invasive plants include Common Reed, English Ivy, False boxwood, Fennel, Field Bind, Himalayan Blackberry, Japanese Knotweed, Manroot, Purple Loosestrife, and Scotch Broom.

Steve Skinner, President of the Downtown Association of North Bend, is currently working with Craig Cornu of South Slough National Estuarine Research Reserve (SSNERR) to obtain county funding to help facilitate the removal of noxious weeds. Outreach will be an important component of this effort. Potential partners are Coos County Soil and Water Conservation District, Shutter Creek Correctional Institution, Boy/Girl Scouts, service organizations, county work crews, school science classes, conservation corps, job corps, private volunteers, railway, Oregon Department of Transportation, and private landowners. Shutter Creek inmates cost $150 a day for a crew of ten and may require a port-a-potty, which costs $50 a day. All other partners would participate on a voluntary basis, but may require some tools and a port-a-potty. Other potential partners include Bob Raper, Coos Bay District Bureau of Land Management, Amy Peters, Oregon State University Extension, Bessie Joyce, Coos Soil and Water Conservation District, and the Coos County Weed Advisory Board.

**Groundwater**

Groundwater is a vital component of water quality. Groundwater is used for drinking water, agriculture, industry, and provides water for streams. Providing education on tribal solutions to groundwater issues would be great way to show the public examples of successful solutions at a local level. The Coquille Indian Tribe is tilling and seeding skid trails to promote higher infiltration and more groundwater recharge of streams. Partnering with the Coquille Indian Tribe to present this information would be a great way to kick off outreach relating to groundwater. The Pew Charitable Trust funds projects in the environment and education and could be a good funding source for this initiative. More information is located at http://www.pewtrusts.com/grants/index.cfm?image=im3

Groundwater Stewardship in Oregon is a great online resource for learning more about the importance of groundwater and ways to protect it as a resource,
located at http://groundwater.orst.edu/. This website offers a variety of outreach tools (click on “community action”) including:

**Groundwater Stewardship in Oregon**

- **Groundwater model**
  Available for loan at a DEQ regional office, the OSU Well Water Program, or the Soil and Water Conservation District.

- **OSU Well Water Publications**
  Download and print at http://wellwater.orst.edu/.

- **Nitrate screening**
  Offer free nitrate screening of well water using materials provided by the OSU Well Water Program.

- **Workshop**
  Contact the OSU Well Water Program to provide a workshop for rural residents (for more information, see the above section on drinking water)

- **Groundwater Festival**
  Hold a groundwater festival. A publication entitled “Making Waves: How To Put On A Water Festival” can help provide direction and ideas for organizing a festival and is available through the Groundwater Foundation at (800) 858-4844.

**Temperature**

Water temperatures are affected by stream flows, water depth, shading of the stream channel, and recharge from available groundwater. High water temperatures can adversely affect fish populations and can be detrimental to water quality such as increasing levels of nutrients like algae blooms. A good method of outreach is utilizing volunteers to improve riparian habitat through tree planting projects. One source of information on how to do this is “Restoring the Riparian Area: A Landowner’s Guide” created by Washington Fish & Wildlife. This publication provides information on planting trees and other plants to restore riparian areas.

The United States Department of Agriculture’s (USDA) Farm Service Agency and Natural Resources Conservation Service have several cost-sharing programs to help offset the financial burden of doing restoration work for private landowners. Examples of these programs are the Conservation Reserve Program (CRP) and Conservation Reserve Enhancement Program (CREP), Forest Land Enhancement Program (FLEP), the Environmental Quality Incentives Program (EQIP), the Wildlife Habitat Incentives Program, and the Wetland Reserve Program (WRP). For more information, see their web site at http://www.fsa.usda.gov/ or http://www.nrcs.usda.gov/ and click on “Services/Programs.” Outreach is needed to let private landowners know that these financial assistance programs exist.
Stream depth is affected by the amount of silt deposited into streams from adjacent banks and hillsides by surface runoff. Water quality concerns regarding sedimentation processes include shallow stream channels and plugged culverts. Both shallow stream channels and plugged culverts increase flooding and allow vegetation to encroach into a stream, which can cause flooding by impeding water flow. Sedimentation can also damage fish habitat, suffocating fish eggs and reducing quality of gravel beds where salmon spawn.

Educating the public on tribal solutions to sedimentation issues would be a great way to show successful solutions from people living in the area. For example, the Coquille Indian Tribe is in the process of repairing three failed culverts, which will decrease sedimentation in those areas.

A valuable educational resource on sedimentation is the publication “Oregon Small Acreages Conservation Tool Box.” This document is available at the Coos Watershed Association and includes information on areas such as protecting stream banks from erosion, septic tank basics, constructing a pond, providing stock water in fields and near streams, managing weeds in pasture, and managing streamside areas with buffers. Some of the USDA Financial Assistance Programs such as Conservation Reserve and Enhancement Program and the Environmental Quality Incentive Program could help fund these efforts.

Urban

The second priority of the WQOP is to address urban areas of the Coos watershed. This section of the WQOP is based on the Lower Pony Creek Watershed Assessment and Potential Action Plan as the focus of this report are water quality issues such as fish habitat, temperature, water control infrastructure (tide gates), and flooding. The potential action plan is a valuable source for outreach as it breaks down solutions to water quality issues under the headings of public short-term actions, public long-term actions, private actions, and personal actions. Discussions with representatives of the cities of Coos Bay and North Bend indicate they support this document and the actions items contained within. For a complete list of action items see Appendix A.

The first outreach and education projects to implement in the urban sector, as in any sector, are those that are inexpensive and have a high potential for success as discussed previously. Below are recommendations for initial projects to kick off the implementation of this section of the WQOP.

Initial Outreach Projects for Urban Sector

© Display racks
Provide display racks in city planning offices and libraries with existing literature on a variety of water quality issues. For example, a great material to place in planning departments and libraries is the “50 Ways to Love Your River” Guides. This guide
shows 50 ways that the public can alter their behavior in order to reduce non-point source pollution. A potential funding source for this is the Oregon Watershed Enhancement Board’s grants program.

- **Water quality checklist**
  Develop a checklist for street crews and park crews that cities could use to safeguard against municipal practices that could adversely affect water quality.

- **Commercial slide**
  Develop an educational message on water quality to put on a free commercial slide at local movie theatres. The message could be created through a contest in the schools and the winner would get recognition on the slide.

- **Bay Area Chamber of Commerce**
  Work with the Chamber to present information and outreach on water quality utilizing their committees on small business and tourism. The tourism committee is currently working on a Charleston to Bandon tour route, which starts at the mouth of Coos River and ends at lower Coquille River. They need to develop marketing and interpretation for the route which could be an opportunity to include some information and education regarding water quality. The contact for this project is Marjorie Whitner. Rob Schab, Coos Bay-North Bend Water Board, is interested in conservation and could help with things like interpretive sign development.

  An important long-term project to help improve water quality is the implementation of **city ordinances**. Organizations like the Coos Watershed Association could draft model ordinances that may then be adapted by cities to fit local conditions, saving city staff time on development. The Lower Pony Creek Watershed Assessment and Potential Action Plan outlines several ordinances that could be implemented by cities. A funding source for this project could be the Oregon Department of Environmental Quality. Potential ordinances include:

  - **Stormwater**
    Control of stormwater runoff from impervious surfaces.
  
  - **Vegetation**
    Riparian vegetation to shade streams and protect streambanks from erosion.

  - **Pet waste**
    “Pooper Scooper” ordinance to reduce fecal coliform pollution.

In order to prioritize which ordinances to develop first it would be important to meet with representatives of the cities in making this determination.

**Storm Water**

Due to an increase in impervious surfaces and reductions in vegetative cover, watershed functions in the Pacific Northwest have deteriorated. In urban areas where impervious surfaces are increased and streams are confined to
narrow channels; issues of flooding, erosion, and water temperature increases are exacerbated. Storm drain systems are built to direct, store, and control surface runoff to prevent flooding. However, currently storm water systems in the Coos watershed are receiving more input than they can handle and are contributing to instead of preventing flooding.

The first step to limiting stormwater runoff is to educate the public on utilizing pervious surfaces in parking lots and driveways, thus decreasing polluted runoff from entering our waterways. Pervious surfaces decrease project costs by reducing or eliminating drainage and retention systems required by impermeable pavements and reduces cost of compliance with many stormwater regulatory requirements.6 These surfaces are capable of supporting heavy-duty vehicular loads. The City of Coos Bay could help identify groups that would be good to target for outreach in this area such as the Homeowners Association, and real estate companies. A good source for information on pervious surfaces and success stories is the Nonpoint Education for Municipal Officials (NEMO) website at http://nemo.uconn.edu/. This is an educational program at the University of Connecticut that addresses the relationship of land use to natural resource protection for land use decision-makers.7 NEMO provides information on a variety of pervious surfaces and examples of their use including Ecostone, Turfstone, and Hexagonal Interlocking Panels. These materials can be also be used on crosswalks, yards, patios, sidewalks, landscaping, courtyards, and storage areas. The City of Bend, Oregon utilized UNI-Décor interlocking concrete pavers in their streetscape improvement project encompassing a 13-block area that includes specialty shops, boutiques and cafes known as “The Village.”

Another important outreach method that can reduce flooding and polluted runoff is to provide information on how to disconnect downspouts and remove gutters while directing the water to a rain barrel or vegetated areas. For more information see the NEMO website noted above or the guide on “50 Ways to Love Your River”, information located on Resources page.

The third step is to provide information on Best Management Practices for Dental Waste. The Oregon Dental Association website at www.oregondental.org provides information on best management practices for dental waste including recycling information with a list of recyclers for individual types of waste such as lead foil and amalgam. It also provides more detailed information on each type of waste, the dangers, and proper disposal methods. These practices are currently voluntary but could become regulatory. A local contact for this effort is Dr. Thomas Holt, President of Southwestern Oregon Dental Society, at (541) 267-4314.

Bacteria

Similar to rural areas leaking septic systems, though not as predominant in urban areas, can also produce bacterial problems. For example, city residents of Coos Bay who are connected to city water but not city sewer. For septic education, please see the above discussion in the rural residential section. One
of the sources of bacteria not mentioned in the rural residential section of this plan is pet waste. This is a large contributor to bacterial contamination of our bays, rivers, and streams. Outreach methods for pet waste include:

© Outreach program
Developing an outreach program to inform the public about water quality effects of pet wastes.

© Pet waste ordinance
Creating a draft “Pooper Scooper” ordinance modeled after ordinances from other municipalities to facilitate the creation of ordinances by cities in the Coos Watershed as mentioned above.

Agricultural

The final section of the WQOP is agricultural. The basis for this section is the Coos and Coquille Area Agricultural Water Quality Management Plan (Coos and Coquille AgWQM Plan). This plan was developed by the Coos and Coquille Local Advisory Committee and the Oregon Department of Agriculture with assistance from the Coos County Soil and Water Conservation District (SWCD). This plan “identifies ways to reduce agricultural pollution in the Coos and Coquille area.”

The plan also states that, “Public education will be a major step to improve water quality.”

This WQOP aims to be compatible with the Coos and Coquille AgWQM plan to avoid overlap. Water quality issues noted in the Coos and Coquille AgWQM Plan include algae or aquatic weeds, bacteria, chlorophyll a, dissolved oxygen, habitat modification, pH, sedimentation, temperature, and toxics. As the Coos and Coquille AgWQM Plan covers all of the main issues necessary to improving water quality in agricultural areas, this WQOP will serve to identify several effective outreach methods to help inform the agricultural community on these issues.

In talking to professionals in the field, there are a variety of existing sources of media and other publications available to distribute information on this topic. Sources include:

© Newsletters
Coos County Soil and Water Conservation District and the U.S. Department of Agriculture’s Farm Service Agency Newsletters.

© Database
Coos County Soil and Water Conservation District’s (SWCD) database of agricultural landowners can be utilized for mass mailings.
**Meetings**
Producer and related organizational meetings such as Farm Bureau meetings, sheep growers, Livestock Association, Oregon Cranberry Alliance, granges, and Oregon State University extension.

One of the most effective methods of outreach addressing water quality improvements for the agricultural community is through connecting peers within a watershed. Pam Blake from the local field office of the Oregon Department of Environmental Quality gave a story about a meeting where an individual was being difficult and contrary. During the discussion one older man asked, “You mean this is going to affect my grandchildren?” When Pam said yes, the older man immediately went to talk to the contrary man to explain the importance of water quality. This example shows how individuals from the community, such as neighbors, can be great educators.

Conducting neighborhood meetings where a farmer/landowner hosts a gathering is another outreach method. This is a non-aggressive and comfortable approach to talk about problems and solutions as they relate to agricultural water quality management. Fact sheets could also be provided at this time such as the Oregon Plan outreach pamphlets, which describe how different groups can restore clean water. Written materials on best management practices for agricultural landowners such as the pasture pump and riparian buffer strips could also be provided. All materials distributed should maintain a positive focus and not be blaming. This would be an inexpensive outreach method as the only cost would be the food and local grocery stores might be willing to make food donations.

One effective outreach method would be to hold a picnic on the weekend and include a discussion of water quality management including visual materials to bring the point home. An example of this is the “Wet and Wooly Farm Tour” in Curry County. This could be combined with tours of different ranchers and farmers to look at sites for projects and identify best management practices. The costs of this project would be food and vans. One potential source of funding for this project could be the U.S. Fish and Wildlife environmental grants program.

**Funding**

In order to implement the contents of the WQOP, it is helpful to identify funding sources. The following are foundations and state agencies that fund efforts related to water quality:

**National Oceanic and Atmospheric Administration (NOAA)**
Projects funded through the Community-based Restoration Program Grants are expected to have strong on-the-ground habitat restoration components that provide educational and social benefits for people and the communities that will benefit living marine resources, including anadromous fish for NOAA trust resources. Contact: Robin J. Bruckner or Alison Ward at (301) 713-0174, or by e-mail at
Robin.Bruckner@noaa.gov or Alison.Ward@noaa.gov or visit the website at http://www.nmfs.noaa.gov/habitat/restoration/funding.html.

**Oregon Watershed Enhancement Board Watershed Education**
These grants include funding for education/outreach coordination, education/outreach materials, and training and outreach events. Examples of funded projects can be found on their website at http://www.oweb.state.or.us/grants/index.shtml.

**Oregon Department of Environmental Quality**
The Nonpoint Source Pollution 319 Grants include funding for education which it defines as “the delivery of information about watershed functions, values, conditions, responses, and management techniques; offered to land managers and the general public; intended to direct attitudes, beliefs, and actions toward improved watershed management practice.” Section 319 funds can only cover 60% of the project’s total cost. DEQ expects approximately $2,000,000 for 2003 projects. More information is located at: http://www.deq.state.or.us/wq/nonpoint/wq319gt.htm.

**Meyer Memorial Trust**
This includes General Grants which support organizations and programs in arts and humanities, education, health, social welfare, and a variety of other fields. There are no limitations on the size or duration of the grants that may be requested. In reviewing requests, the Trust looks for proposals that have the promise of broad-scale or long-term impact on significant issues. The Small Grants program provides grants from $500 - $12,000. Application deadlines are January 15, April 15, and October 15. The Small Grants program is intended to fund small grants, not portions of a large grant. The Support for Teacher’s Initiatives program provides grants to individual teachers and teams of teachers in public and private elementary and secondary schools, for projects intended to stimulate more effective classroom learning. The maximum amount of a grant is $2,000 for an individual teacher, and $7,000 for a team of teachers. To qualify for the maximum amount, applicants must secure matching funding from other sources. The annual deadline is February 1st. More information is available at http://www.mmt.org/grantsprograms.html.

**Ford Family Foundation**
This grants program focuses on rural education and rural civic and community enhancement. Rural Education Grants are made primarily for projects and programs that focus on improving the quality of teachers in grades K-12. Grants for Rural Civic and Community Enhancement occasionally fund grant requests for special community performances, events, and festivals. The Foundation will respond to the pre-application and attachment within four weeks. More information is located at http://www.tfff.org/guidelines.html.

**Pew Charitable Trust**
The mission of the Environment program is to promote policies and practices that protect the global atmosphere and preserve old-growth forest, wilderness, and marine ecosystems. The Trust funds projects in the environment and education through its Conservation of Living Marine Resources Program. The median size of grant last year was $300,000. Smaller grants are made in programs that work closely with community-based and direct-service organizations; larger grants are made in programs that work with larger organizations such as research, academic, and health institutions. Proposals

Fred Meyer Foundation
Provides Youth Development Grants that build and enrich self-esteem, focused on helping kids learn to be good citizens within our communities and Environmental Programs that bring awareness, education, and action to Fred Meyer communities. Deadlines are January 15, April 15, July 15, and October 15. Send letter of inquiry. Allow 4-6 weeks for inquiry to be processed. For more information, see http://www.fredmeyer.com/corpnewsinfo_charitablegiving_art4_foundation.htm.

Resource Assistance for Rural Environments (RARE)
“The mission of the Resource Assistance for Rural Environments (RARE) Program is to increase the capacity of rural communities to improve their economic, social, and environmental conditions, through the assistance of trained graduate-level members who live and work in communities for one year. Qualified college graduates and graduate-level students who are selected as RARE members assist communities and agencies in the development and implementation of plans for achieving a sustainable natural resource base and improving rural economic conditions.” This includes designing a citizen involvement program for a watershed council. Those interested in participating in the RARE program should contact: RARE Opportunities, 1209 University of Oregon, Eugene, OR, 97403-1209. Phone (541) 346-2879; Fax (541) 346-2040; e-mail RARE@darkwing.uoregon.edu, website http://darkwing.uoregon.edu/~rare/.

Secure Rural School Act
This act invests in creating additional employment opportunities which include restoring and improving land health and water quality. Some objectives are watershed restoration and maintenance, restoration, maintenance and improvement of fish habitat, and control of noxious and exotic weeds. Deadlines vary so contact your local BLM office at (541) 756-0100 or United States Forest Service sponsor for current deadline. For more information, see http://www.oweb.state.or.us/directory/documents/securerural.pdf.

Laura Jane Musser Fund
The foundation offers support in building a community-based approach to solving environmental problems and encouraging environmental stewardship. Projects will be considered if they have a significant use of volunteers in their activities and take a grassroots approach to problem solving. Preference will be given to projects that propose activities and solutions that are replicable; have a ripple effect - leverage other resources; and are the result of a demonstrable, broad-based community consensus. Funding: up to $35,000. For more information, see http://www.musserfund.org/environmental.htm.

Evaluation

Evaluation is an important component of an effective outreach plan. Thus, it will be important to obtain feedback during and after the implementation phase of the outreach methods discussed above. This feedback can be provided in a variety of formats such as a survey, questionnaire, focus group, or meeting.
Another method of evaluating project success is the identification of goals and objectives, desired outcomes, benchmark timelines, and performance measures of the WQOP. This will help measure expectations against results and contribute to the attainment of goals and objectives on future projects.

<table>
<thead>
<tr>
<th>Goals &amp; Objectives</th>
<th>Desired Outcome</th>
<th>Project Activity</th>
<th>Community Partner(s)</th>
<th>Timeline</th>
<th>Deliverables</th>
<th>Estimated Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build Organizational Capacity</td>
<td>Gained community support</td>
<td>Create executive committee</td>
<td>Participants in the development of WQOP</td>
<td>Meeting quarterly over two years</td>
<td>Create 8-10 member executive committee</td>
<td>Staff time (48 hrs) = $936</td>
</tr>
<tr>
<td></td>
<td>Secured stable funding</td>
<td>Build dependable relationships with funders</td>
<td>See Funding section of WQOP</td>
<td>September 2003 – June 2004</td>
<td>Receive funding from 3 sources</td>
<td>80 hrs = $1,560</td>
</tr>
<tr>
<td>Avoided duplication of effort</td>
<td>Collaborate with existing groups working on similar issues</td>
<td>SSNERR, SWCD, OCEAN11, OSU extension, watershed councils, youth groups, CRTPI2</td>
<td>Ongoing</td>
<td>Talk bi-weekly with collaborative partners and meet quarterly. Attend one conference related to subject matter.</td>
<td>2 hrs/wk staff time (192) = $3,744</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&amp;2</td>
<td></td>
<td></td>
<td>Travel: $750</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Promote identification of streams in the Coos Watershed</td>
<td>Create t-shirts, bandanas, and hats with prints of the Coos Watershed identifying streams</td>
<td>Print shops, clothing stores, sponsors for festivals and events</td>
<td>June – November 2004</td>
<td>Distributed 200 prints of the Coos Watershed in the form of bandanas, t-shirts, hats</td>
<td>Cost of Silkscreen printing $6 t-shirt, $3-5 bandana, $8-9 hat $600 (100 t-shirts) + $200 (50 bandanas) + $425 (50 hats) = $1,225 + staff hrs (40) = $780</td>
</tr>
<tr>
<td>Deliver educational messages successfully</td>
<td>Utilized educational techniques that address various learning styles and abilities</td>
<td>Train staff and volunteers in plan concepts and implementation</td>
<td>SOLV, SWOYA, Downtown North Bend Association, BACC22, Libraries, Cities</td>
<td>June 2004 – September 2004</td>
<td>Held 3 trainings in various locations of Coos Watershed reaching 55 people</td>
<td>Cost of Silkscreen printing $6 t-shirt, $3-5 bandana, $8-9 hat, 50 bandanas, 100 t-shirts, staff time</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4 hours of SOLV training at 19.5/hr = $78, mileage $52, $20 x 3 = $60, supplies ($60) = $135 + staff hrs = $780</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessed participant attainment of learning objectives and adapted accordingly</td>
<td>Obtain feedback during all phases of project</td>
<td>Educational Service District</td>
<td>Dates various (at the end of each project activity)</td>
<td>Analyze results of participant evaluation forms. Make changes to outreach methods.</td>
<td>Staff time – 114 (6 hrs per activity) hrs. = $2,223</td>
<td></td>
</tr>
<tr>
<td>Involved community members of all ages</td>
<td>Establish a wide diversity of networks</td>
<td>Tribes, schools, cities, BACC, newspapers, Rotary, churches</td>
<td>Ongoing</td>
<td>Publicize outreach activities in 2 venues for each age group (youth, adults, and seniors)</td>
<td>Various (PH cost included within each project activity) $135</td>
<td></td>
</tr>
<tr>
<td>Moderate stormwater impacts on water quality</td>
<td>Reduced water quality impacts from stormwater discharge</td>
<td>DEQ Hazardous Waste Collection Event</td>
<td>DEQ, schools, cities, churches, TV stations</td>
<td>March – June, 2005</td>
<td>Collect waste from 250 households</td>
<td>Staff time to organize volunteers = 18 hrs + $351</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drains to Bay stencils</td>
<td>SWOYA, Northwest Steelheaders, girl and boy scouts</td>
<td>August - October, 2004</td>
<td>25 storm drains stenciled in Coos Bay, North Bend, Charleston</td>
<td>Stencil = $30, 2 stencils Safety and Zone marking latex Paint = $16.21 a gallon, staff 48 hrs = $936, in - kind commercial sprayer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pet waste outreach program</td>
<td>Cities, pet shops, neighborhood associations, libraries, animal shelters</td>
<td>June 2005 – June 2006</td>
<td>Reach 300 pet owners of cats and dogs and other domestic animals</td>
<td>384 hrs of staff time = $7,488 printing - $300, $7,588 gas - $234</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promote use of pervious surfaces</td>
<td>Millicoma Intermediate School, NEMC15, cities, construction co.’s</td>
<td>December 2005 – January 2006</td>
<td>Resource materials on racks in city planning offices, home building associations - provided to 300 residents, construction co.’s, meetings with public works staff, building permit staff</td>
<td>Resource materials donated from companies $324 (in-kind), Delivery - $ hrs staff time 35 - $682.5, mileage $35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goals &amp; Objectives</td>
<td>Desired Outcome</td>
<td>Project Activity</td>
<td>Community Partner(s)</td>
<td>Timeline</td>
<td>Deliverables</td>
<td>Estimated Costs</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------</td>
<td>------------------</td>
<td>----------------------</td>
<td>----------</td>
<td>--------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>City water quality ordinances</td>
<td>Coos Bay, North Bend, other cities in U.S.</td>
<td>January – May 2006</td>
<td>Developed two water quality ordinances approved by Coos Bay and North Bend</td>
<td>City staff time – (in-kind) researching model ordinances - $780 ($60 hrs staff time) + $40 mileage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide information for business owners</td>
<td>Local businesses, BACC, cities, libraries</td>
<td>Spring 2004</td>
<td>Distributed information to 40 businesses in Coos Bay, North Bend, and Charleston, BACC</td>
<td>Printed materials $240, Delivery $780-60 hrs of staff time ($1,170) plus $75 mileage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information on recycling of oil, batteries, computers, ...</td>
<td>Gas stations, Coos Bay Transfer station, nonprofit computer recyclers</td>
<td>December 2004</td>
<td>Distribute recycling sheet at 2 libraries and 2 city planning offices reaching 200 residents</td>
<td>300 copies of information = $300 Staff time - $468 – 24 staff hrs Mileage – 16 trips $x 5 = 80 miles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide education on installation/maintenance of on-site systems</td>
<td>Reduced bacteria and nutrient loading in groundwater and waterways</td>
<td>Well Water Workshops (wells and septic systems)</td>
<td>Coos SWCD, OSU Well Water Program</td>
<td>Fall 2003</td>
<td>Hold 2 workshops on wells and septic systems in Coos Bay/North Bend and Charleston with 30 participants</td>
<td>Already funded through previous 319 grant.</td>
</tr>
<tr>
<td>DEQ State Revolving Loan Fund for Septic Systems</td>
<td>Coos County, Tenmile Watershed Assoc., SISNERF, Shorebank Enterprise Pacific</td>
<td>June 2004 – June 2005</td>
<td>Inform public through 1 mailing, 3 articles, 5 newsletters and a commercial slide at 2 movie theatres reaching 300 residents</td>
<td>Staff time = $84 hours ($11,232) mailing $564 = $11,796 mileage - $284</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inform septic users about maintenance needs</td>
<td>Septic installers and repairmen, Real estate agents</td>
<td>January - February 2005</td>
<td>Distribute letter to 3 or 4 septic installers and repairmen, reaching 95 residents</td>
<td>Staff time- 18 hrs at 19.5/hr –$351, printing $95 Mileage – $45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide education on household use of lawn, garden, and household chemicals</td>
<td>Reduced lawn, garden, and household chemicals in waterways and groundwater</td>
<td>Workshop on groundwater friendly gardening and use of chemicals</td>
<td>Master gardeners, OSU Well Water Program, Oregon Environmental Council</td>
<td>June 2005 – November 2005</td>
<td>Held 2 workshops with a total of 30 attendees</td>
<td>Printing costs, ads $50 in four papers - $200, press article, mailer $564 Staff 72 hrs $1,404 – mileage - $90</td>
</tr>
<tr>
<td>Provide information on lawn and garden practices</td>
<td>Local businesses, landscapers, National Coalition for Alternatives to Pesticides, city planning offices, libraries</td>
<td>June 2005 – November 2005</td>
<td>Provide information to 7 landscapers, 15 related businesses, and 500 households</td>
<td>$1 a household prep, follow up, actual site visit $500 (prep) + $50 mileage – 44 staff hrs $658</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promote use of innovative best practices for improving water quality</td>
<td>Expanded knowledge and use of best practices for reducing non-point source pollution</td>
<td>Video: “Protecting Coastal Waters: A Community Approach</td>
<td>K-K Schools Libraries</td>
<td>August 2005</td>
<td>Provide copies for Coos Bay/North Bend libraries and 3 other schools</td>
<td>1 or 2 days, cost of video $45 plus reproduction costs= $75 + $112.5 + $312 (16 hrs staff time) = $424.5, mileage = $25</td>
</tr>
<tr>
<td>Promote use of innovative best management practices</td>
<td>Coquille Indian Tribe, City of North Bend, OIMB, ...</td>
<td>December 2005 - March 2006</td>
<td>Promote local examples of best practices through a map of site descriptions reaching 450 people</td>
<td>Staff time = 48 hrs ($936) plus, $900, plus mileage - $60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promote best management practices for dental waste</td>
<td>Southwestern Oregon Dental Society, Dentists</td>
<td>November 2005</td>
<td>Distribute recycling information to 30 dentists in area</td>
<td>30 hrs of staff time = $585 Printing = $30 Mileage, $45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water quality project tour</td>
<td>Coos SWCD, Coquille and Tenmile Watershed Associations, landowners</td>
<td>March 2005 – September 2005</td>
<td>Condu&lt;ref&gt;ct a one-day tour to 3 project sites during CWA 10-year anniversary celebration reaching 45 people</td>
<td>North Bend Bus Company 756-4025, $50/hr, $30/hr. waiting $21 permit, $291, preparation, lunch $8/person, day, ($405) 1200 people mailing postage $330, printing = $234 mailers 4 ads in paper ($200) (70 lb. Paper – 1,333 copies= $294 + 84 hrs ($1638) (staff time) + $291 (bus), mileage – $105</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goals &amp; Objectives</td>
<td>Desired Outcome</td>
<td>Project Activity</td>
<td>Community Partner(s)</td>
<td>Timeline</td>
<td>Deliverables</td>
<td>Estimated Costs</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------</td>
<td>------------------</td>
<td>----------------------</td>
<td>----------</td>
<td>--------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Enhance water quality monitoring in the Coos Basin</td>
<td>Expanded awareness and information on condition of the Coos basin</td>
<td>Continue Coastnet Program in K-12 schools</td>
<td>North Bend Middle School, Marshfield High School, OSU</td>
<td>January 2006 – December 2006</td>
<td>Create hub for Coastnet program and involve four classrooms</td>
<td>George Tinker for costs, Talk to Vicki Osis, Jamie Fereday, Richard Shultz (North Bend High School)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Community-Based Storm Event Sampling Program – best is if its been dry before the storm. Program test 8 days in a row in 17 mouth tributary and bay sites to see what it contributes to bay (400 samples) November and Spring</td>
<td>DEQ, North Bend Middle School, Marshfield High School, Coos SWCD, South Coast Watershed Council, EPA</td>
<td>January 2006 – December 2006</td>
<td>Create volunteer group of 20 individuals who test twice a year during storm events in 17 sites</td>
<td>Staff time = $7,488 (staff time at 1da/wk for a year, (384 hrs) materials, ($2,219.25) in kind from Marshfield, (training and materials could be provided by DEQ), pr = $200 ads, press articles - $78 staff time $6 for re-agents (if you already have the other ($6 x 17 x 2) = ($204) equipment that Marshfield has. Mileage = $180 + $104 = $284</td>
</tr>
<tr>
<td>Increase student’s access to nonpoint source pollution curriculum</td>
<td>Enlarged number of students with knowledge of nonpoint source pollution issues</td>
<td>The Stream Scene: Watersheds, Wildlife and People. A comprehensive watershed based education curriculum package designed to bring schools and communities to the resource. (300 pages) ($32.00)</td>
<td>K-12 Schools</td>
<td>November – December 2004</td>
<td>Reach 100 students in four schools</td>
<td>Printing, discussions with teachers, 10 copies, 4 schools - $195 (staff time teachers) + $78 (prep time) = $273 + $195 hrs + $78 follow up = $320 (materials) Mileage = $50 29 staff hrs</td>
</tr>
<tr>
<td>Water quality trunk for schools</td>
<td></td>
<td></td>
<td>Educational Service District, K-12 schools</td>
<td>October 2004 – January 2005</td>
<td>Materials in trunk kit will be utilized by four schools in Coos Bay/North Bend reaching 350 students</td>
<td>4 Videos - 16 x $40.00 = $640, printed materials - $500, 4 nitrate kits- $200, $450 models, Curriculum – printing – $200 plus staff time 60 hrs, mileage = $75</td>
</tr>
<tr>
<td>Speaker resource list for schools</td>
<td></td>
<td></td>
<td>Educational Service District, K-12 schools, SWOCC</td>
<td>June – September 2004</td>
<td>Provide resource list to 10 schools reaching 500 students</td>
<td>Staff time (42 hrs) = $819, printing $60, gas = $65</td>
</tr>
<tr>
<td>Water Quality Exploration Tour</td>
<td></td>
<td></td>
<td>OSNERR, K-12 schools,</td>
<td>November 2004 – June 2005</td>
<td>Conduct a one day tour to four sites involving 70 students</td>
<td>Total Budget $2,907</td>
</tr>
<tr>
<td>Water Quality Badges</td>
<td></td>
<td></td>
<td>K-12 schools, boy scouts, girl scouts, Campfire USA, SWOYA, eagle scouts</td>
<td>November – June 2005</td>
<td>Reward 15 students with water quality badges</td>
<td>Coordinator - .20 fte = $7,488</td>
</tr>
<tr>
<td>Expand awareness of noxious weeds</td>
<td></td>
<td></td>
<td>Helped control noxious weeds in Coos Watershed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noxious weed identification Guide Book</td>
<td></td>
<td></td>
<td>Coos County Weed Advisory Board</td>
<td></td>
<td></td>
<td>Printed and distributed 1,000 copies of guide book</td>
</tr>
</tbody>
</table>
| Noxious weeds removal days | | | Northwest Youth Corps, AmeriCorps | | | Mobilized 2 crews to work on 2-4 sites | Ages 16-19: 440/hours a week $6.55 - $12.96/hr.
Conclusion

Public education is a vital component to improving water quality in the region. Education and outreach can provide powerful tools in this effort to engage rural, urban, and agricultural constituents in creating healthier waterways. There are many public incentives to improving water quality including clean drinking water, flood protection, recreation, and aquaculture. Fish health is another concern that is greatly affected by water quality. It is essential that we deal with water quality in a holistic manner that deals with all the concerns and their relations to each other in order to improve water quality in the Coos watershed.

Recommendations

Due to the factors such as funding and time constraints, this is in no way a comprehensive study of water quality marketing. Thus, there are several areas in need of future research. These include:

⊙ Gather information on septic systems for live-in boats. Harbormaster Don Yost is the contact on this issue.

⊙ Locate document on the failures of outreach by Ross and Associates. Contact for this is Pam Blake with the Department of Environmental Quality.

⊙ Research feasibility of the Keep Coos County Clean Campaign, a project developed by North Bend Downtown Association President Steve Skinner.

⊙ Gather information on nonpoint source pollution tax incentive.

⊙ Create ranking of solid waste in terms of impacts on water quality.

⊙ Identify outreach methods of oyster farmers.
Resources

Educational Resources

Instructors/Schools

Peggy Thornton, Blossom Gulch Elementary School, (541)267-1340
Talley Johnson, Millicoma Intermediate School, (541)267-1466
Erica Hutcherson, North Bend Middle School, (541)751-7272
Judy Moyer, North Bend Middle School, (541)751-7272
Jamie Fereday, Sunset Middle School, (541)888-1242
Ellen Lyons, Marshfield High School, (541)266-7376
George Tinker, Marshfield High School, (541)267-1405
Norm Devereux, Coquille High School, (541)396-2163
Gail Glick Andrews, Program Coordinator, Oregon State University Well Water Program, (541) 737-6294, http://wellwater.orst.edu
Oregon Institute of Marine Biology (OIMB), (541)888-2581, www.uoregon.edu/~oimb/
Southwestern Oregon Community College (SOCC), 1(800)962-2838, www.socc.edu
Upward Bound Program, Corey Fox, (SOCC), (541)888-7103, cfox@socc.edu.
Science Fair, SOCC, John Berman, Technology Coordinator, (541)888-7271 ext. 7271
Vicki Osis, Hatfield Marine Science Center, Oregon State University, (541)867-0257, vicki.osis@oregonstate.edu, http://hmsc.oregonstate.edu/edprog.html

Curriculum

Adopt-A-Stream, Martha Cleo at (206) 388-3313 or Adopt-A-Stream Foundation P.O. Box 5558, Everett, WA 98206
4-H Wildlife Stewards, Youth Development Program, Oregon State University, (503)725-2044, 211 SE 80th St. Portland, OR 97215
Brandt Goose Study: International Black Brandt Good Monitoring Project, Middle School Curriculum Guide for Teachers. Materials available at the South Slough National Estuarine Research Reserve at (541)888-5558
Coastnet, Oregon State University, http://secchi.hmsc.orst.edu/coastnet/
Stream Scene, Oregon Dept. of Fish & Wildlife at PO Box 59, Portland, OR 97207 or (503)867-4741
Rivernet, Oregon State University, http://secchi.hmsc.orst.edu/nwrivernet/

Materials

“Laboratory and Education”.
BNT Promotions, for silkscreen of Coos Watershed map, 756-7142,
Heidi Proett, heidi@bntpromo.com, richardsoncap.com, bntpromo.com
Willamette Greystone Inc., “concrete pavers”, (541)756-6413, 515 California St.,
North Bend, OR 97459, www.willamettegraystone.com
Lighthouse Landscape, Nathan Clausen, installation of concrete pavers,
(541)269-3909, (541)297-2960 (cell)

Organizations

Estuary-Net Project, (supports the development of coastal nonpoint
source pollution education programs), http://inlet.geol.sc.edu/estnet.html
National Science Teacher Association, www.nsta.org
Nonpoint Education for Municipal Officials (NEMO), University of Connecticut,
http://nemo.uconn.edu/ (Click on “Reducing Runoff” and then on “Case
Studies”; Also click on “Publications and Reviews” which includes fact sheet,
educational videos, technical papers, and more)
South Coast Science Teacher’s Group
Unified Sewage Agency of Washington County Oregon, (503)648-8621

Governmental Resources

County

Nikki Whitty, Coos County Commissioner, (541)396-3121 ext. 225
Curry County Watershed Education Program

Cities

Suzanne Baker, Community Services Director, City of Coos Bay,
(541)269-8918
Rob Schab, Director, Coos Bay-North Bend Water Board, (541)267-3128
Steve Skinner, President, Downtown Association, North Bend,
(541)756-2843
Scott Gallagher-Star, North Bend Library, 756-0400
Patricia Stevens, General Manager, Charleston Sanitation District, (541)888-3911
Carol Ventgen, Coos Bay Library, (541)269-1101
Jan Willis, City Manager, City of North Bend, (541)756-8536
Public Agencies

Pam Blake, Oregon Department of Environmental Quality, (541)269-2721
John Craig, U.S. Army Corps of Engineers, (541)269-2556
Bessie Joyce, Outreach Specialist, Coos Soil & Conservation District, (541)396-2841 ex. 34
Walt Shearard, CREP Technician, Coos Soil & Water Conservation District, (541)396-2841 ex. 28
Tom Gaskill, South Slough National Estuarine Research Reserve, (541)888-5558
Sue Powell, South Slough National Estuarine Research Reserve, (541)888-2581 x304
Brett Harris, Farm Service Agency, (541)396-4323
Hazardous Waste Collection Events, Department of Environmental Quality,
   Maggie Conely, (503)229-5106 or Abby Boudouris, (503)229-6108
Teri King, Washington Sea Grant, (360) 427-8437,
Dave Leland, Oregon Health Division, Department of Human Services Drinking Water Program at (503)731-4010, www.ohd.hr.state.or.us/dwp
Oregon Watershed Enhancement Board, (503)986-0178,
   http://www.oweb.state.or.us
Amy Peters, Oregon State University Extension, (541) 396-3121 ext.240
Tom Purvis, Natural Resource Conservation Service, (541)396-2841
Tom Rumrich, Oregon Department of Fish & Wildlife, (541)888-5515

Nonprofits

Local

Coast to Crest Interpreters League, P.O. Box 814, Coos Bay, OR 97420
Coos Regional Trails Partnership, www.coostrails.com
Jennifer Hampell, Coquille Watershed Association, (541)396-2229
Shirley Liberante, Director, Bay Area Chamber of Commerce
   (541)269-0215
Trish Mace, Oregon Coastal Environmental Awareness Network, (541)888-5617
Mike Mader, Tenmile Watershed Association, (541)759-2414
Jon Souder, Coos Watershed Association, (541)888-5922
Adam Zimmerman, Mid-South Coast Programs Coordinator,
   Shorebank Enterprise Pacific, (541)572-5172

State

Boys and Girls Club of Southwest Oregon (SWOYA), Dennis Gould, (541)267-
Northwest Youth Corps, (541)349-5055, www.nwyouthcorps.org
Stop Oregon Litter and Vandalism (SOLV), (503)647-0159

National

AmeriCorps, Oregon Commission for Voluntary Action and Service, Kathleen A. Joy, (503)725-5903, ocsc@pdx.edu
www.nwrel.org/ecc/ameri corps/states/oregon
Boy Scouts of America, Brent Harty, (541)756-5126, chinookkwacoma@hotmail.com
Camp Fire USA, Patty Horbatiuk, (541)266-0844, campfire@harborside.com
www.campfire.org/
Girl Scouts- Western Rivers Council, Tricia Stewart, (541)756-4626, tstuart@wrgirlscouts.org
Environmental Protection Agency, www.epa.gov
National Coalition for Alternatives to Pesticides, (541)344-5044, www.efn.org/~ncap
Northwest Steelheaders, John Ward (541)269-5209
South Coast Head Start, Dale Helland, (541)888-3717, www.schs.net

International

Soroptimists International, Myra Powers, (541)269-1666,

Private Organizations

Beryl B. Fletcher, Oregon Dental Association, 1(800)452-5628, www.oregon dental.org
Dr. Thomas Holt, President of Southwestern Oregon Dental Society, (541) 267-4314
Don Yost, President, Charleston Merchants Association, (541)888-2548
Aquaculture

Heath Hampell, Oyster Grower, Chucks Seafood, (541)888-5525

Tribes

Mark Healey, Watershed Coordinator, Coquille Indian Tribe, (541)756-0904
John Herbst, Confederated Tribe, (541)888-9577

Online Resources

Elaine Andrews (608)262-0142


Fact Sheets: www.deq.state.or.us/pubs/factsheets.asp (see water quality fact sheets)

Hazardless Home Handbook: www.metro-region.org/article.cfm?articleid=574

Missouri Department of Natural Resources: www.dnr.state.mo.us/oac/index.html

Monterey Bay National Marine Estuary Water Quality Program Plan

Nonpoint Source Pollution Guidebook and see “grants” and go to “examples of funded projects”, then click on Upper Rogue Watershed – Education and Outreach. Oregon Watershed Enhancement Board: www.oweb.state.or.us/publications/index.shtml (see “publications” -)

Oregon Forest Resources Institute:
http://www.oregonforests.org/content/home.asp

People for Puget Sound: www.pugetsound.org

Puget Sound Action Team: www.psat.wa.gov/index.htm

Septic systems, success stories, articles. Oregon Department of Environmental Quality: www.deq.state.or.us (see “septic systems” and “success stories” and “publications” e.g. protecting Oregon’s water quality).

Small Quantity Hazardous Waste Generator and Citizen’s Guide to Groundwater Protection and Fact Sheets on non point source pollution. Environmental Protection Agency: www.epa.gov. (see)
Tennessee: www.state.tn.us/environment/water.htm

University of Minnesota: wrc.coafes.umn.edu/outreach/ag-and-wq.htm

University of Missouri Outreach and Extension

Washington Sea Grant: www.wsg.washington.edu. Teri King (360)427-9670

Wastewater Protection Month, U.S. Environmental Protection Agency: http://cfpub.epa.gov/npdes/wastewatermonth.cfm#customize

Watershed Stewardship Education Program: www.seagrant.orst.edu/wsep/index.cfm (see publications, etc.)

Well Water Program at Oregon State University: wellwater.orst.edu/index.htm (see tools: personal well water system check up; 12 simple things you can do to protect your well water)

Wisconsin Sea Grant: www.seagrant.wisc.edu/outreach/water_quality/index.asp
Appendix A: Lower Pony Creek Potential Action Plan.

<table>
<thead>
<tr>
<th>Action Item</th>
<th>Who</th>
<th>Estimated Cost</th>
<th>Potential Funding Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PUBLIC SHORT-TERM ACTIONS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Selectively manage beavers.</td>
<td>ODF&amp;W</td>
<td>4-5 hours public works staff per dam $50/hr.</td>
<td></td>
</tr>
<tr>
<td>2. Remove sediment from the culverts under Waite Street and Newmark Ave.</td>
<td>City of North Bend</td>
<td>8-foot span bridge across, 32 feet wide. $40,000 - $50,000</td>
<td></td>
</tr>
<tr>
<td>3. Carefully remove vegetation from Pony Creek that impedes water flow.</td>
<td>City of Coos Bay City of North Bend Private Landowner</td>
<td>¼ mile of stream, disposal of vegetation on-site ($1,000/mile)</td>
<td></td>
</tr>
<tr>
<td><strong>PUBLIC LONG-TERM ACTIONS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Public Education.</td>
<td>CWA SSNERR DEQ</td>
<td>$5,000 - $50,000</td>
<td></td>
</tr>
<tr>
<td>a. Develop and provide fact sheets about good practices</td>
<td>Schools City of Coos Bay City of North Bend</td>
<td>Printing and distribution</td>
<td></td>
</tr>
<tr>
<td>b. Label storm drains to discourage dumping of pollutants.</td>
<td>Schools City of Coos Bay City of North Bend</td>
<td>Stencil ($30) Paint $16.21 a gallon, staff= $195</td>
<td></td>
</tr>
<tr>
<td>c. Develop outreach program to inform the public about water quality effects of pet wastes.</td>
<td>CWA SSNERR</td>
<td>.25 fte; $10,000 expenses</td>
<td></td>
</tr>
<tr>
<td>2. Ordinance Building.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Control of sediment during development activities.</td>
<td>City of Coos Bay City of North Bend</td>
<td>$500-$600 (City of North Bend); $2,000 - $5,000 (City of Coos Bay)</td>
<td></td>
</tr>
<tr>
<td>b. Control of stormwater runoff from impervious surfaces.</td>
<td>City of Coos Bay City of North Bend</td>
<td>“ “</td>
<td></td>
</tr>
<tr>
<td>c. Riparian vegetation to shade streams and protect streambanks from erosion.</td>
<td>City of Coos Bay City of North Bend</td>
<td>“ “</td>
<td></td>
</tr>
</tbody>
</table>
3. Public Infrastructure Improvement.

| d. “Pooper Scooper” ordinance to reduce fecal coliform pollution. | City of Coos Bay  
City of North Bend | “ “ |
|---|---|---|

3. Public Infrastructure Improvement.

<table>
<thead>
<tr>
<th>3. Public Infrastructure Improvement.</th>
<th>City of North Bend</th>
<th>$40,000 - $50,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Replace the tide gate at Crowell Lane.</td>
<td>City of North Bend</td>
<td>$40,000 - $50,000</td>
</tr>
</tbody>
</table>
| b. Control storm water discharge in the Newmark Boulevard area. | City of Coos Bay  
City of North Bend  
Large Landowners | Cost of retention basin, ditches with vegetation, create a wetland, or bio-swale = $24,350 |
| c. Increase stream capacity in the Woodland Dental Medical Complex area. | Army Corps of Engineers,  
City of North Bend | Create a wetland (south of Newmark) = $24,350 |
| d. Identify municipal practices that adversely affect water quality. | City of Coos Bay  
City of North Bend | Checklist Development – $195 Staff time - |
| e. Release water from reservoirs to more closely mimic historic basin hydrology. | CB/NB Water Board | $500,000 materials |

**PRIVATE ACTIONS**

1. Use pervious surfaces for driveways and little-used areas such as overflow parking lots and limited-use roads.

| 1. Use pervious surfaces for driveways and little-used areas such as overflow parking lots and limited-use roads. | Large Landowners & Managers | Concrete Pavers- Retail $1.95/sq. foot  
Contractor $1.67 sq. foot  
Installation- Approximately $6 sq foot |

2. Construct water retention and flow dissipation structures in areas that produce excess storm runoff.

| 2. Construct water retention and flow dissipation structures in areas that produce excess storm runoff. | Large Landowners  
City of Coos Bay  
City of North Bend | $1,000 - $100,000 (acquisition of property) + removing fill on site for $10,000 (acre of materials) |

3. Stabilize sediment on hillsides and stream banks.

| 3. Stabilize sediment on hillsides and stream banks. | Individual Landowners | $110/acre |

4. Plant vegetation along riparian areas.

| 4. Plant vegetation along riparian areas. | Individual Landowners | $4,369/acre |

**PERSONAL ACTIONS**

1. Reduce surface runoff into storm sewers and streams.

| 1. Reduce surface runoff into storm sewers and streams. | Individual Landowners | Inexpensive $2,000/house |
2. *Control surface runoff and erosion on steep slopes.*  
   | Individual Landowners | Private, public relations= $487.5, 25 staff hours |

3. *Remove pet feces from yards, parks, and walkways.*  
   | Individual Landowners | Pooper scooper kit $14.36 - $30.00 plus P.R. 60 hours of staff time = $1,170 |

4. *Properly dispose of used oil and other wastes.*  
   | Individual Landowners | Recycle @ transfer station for free, public relations= $97.5 – 5 staff hours |

5. *Control runoff of lawn chemicals.*  
   | Individual Landowners | $5 a household prep, follow up, actual site visit $375 (prep) + $195 (site visit businesses) + 156 (site visit landscapers) + 58.5 (follow up) = $784.5 |
Endnotes

1 This survey distributed by the Pacific Northwest Coastal Ecosystems Regional Study (PNCERS) demonstrates the need for outreach on water quality. A research and outreach program focused on coastal management issues and needs, PNCERS aims to help users and managers of coastal resources better understand the effects of human activities.

2 Definition of bioswale: A broad open channel lined with grass vegetation, which acts as a filter to remove pollutants from runoff. A bioswale is usually trapezoidal with a flat bottom. Source: <http://dnr.metrokc.gov/wlr/stormwater/Checklist.htm>

3 Sandy Whittaker is no longer working as director of the Charleston Sanitation District.


6 Taken from Unilock Fact Sheet on “Features of the Ecoloc Paving System”.


10 RARE website at <http://www.uoregon.edu/~rare/what/what.htm>.

11 Oregon Coastal Environmental Awareness Network

12 Coos Regional Trails Partnership (see Resources section)

13 Stop Oregon Litter and Vandalism (see Resources section)

14 Bay Area Chamber of Commerce (see Resources section)

15 Nonpoint Education for Municipal Officials (see Resources section)