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Columbia River Estuary Study Taskforce
750 Commercial Street, Room 205
Astoria, OR 97103
503-325-0435
www.columbiaestuary.org

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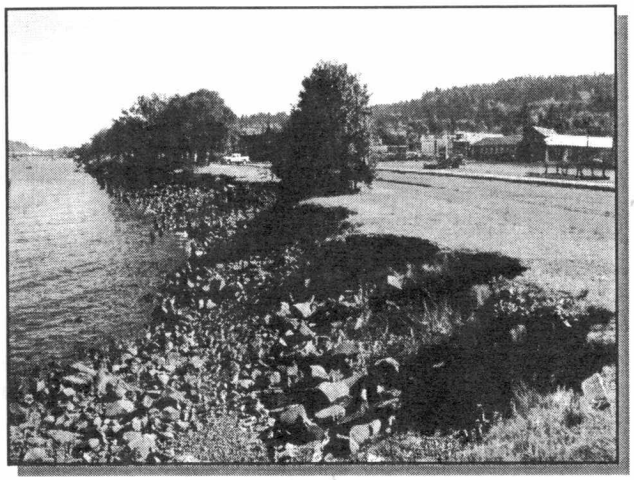
Natural Resource Information Brochure Series

Erosion Control



Erosion Overview
Streambank and Shoreline Erosion
Construction-site Erosion
Sample Erosion Control Plan
For More Information

December 2003

EROSION OVERVIEW

This brochure will focus on two types of erosion:

Streambank/Shoreline Erosion

Erosion along rivers/streams, estuaries, and the ocean front.

Construction Site Erosion

Erosion that originates as a result of construction at development sites.

What is erosion?

Erosion is a natural process by which wind or water can impact the soil surface and remove sediment. Soil particles can be dislodged by the impact of falling rain, the overland flow of water, wave action along shorelines, or by the wind.

The rate of natural erosion processes generally proceed slowly but can vary due to damaging natural events (trees uprooted in a storm, flooding, etc.). Natural systems have evolved to adjust to infrequent fluctuations in the rate of erosion.

Land disturbance, vegetation clearing, grading, paving, and other human activities can also accelerate erosion. A constant increase in sediment levels can disrupt the balance of the natural system.

What impacts the rate of erosion?

The rate of soil erosion depends on a variety of factors, including the following: the type of soil, the climate, the presence/absence of vegetative cover, the topography, and surrounding land management practices.

Effects of Erosion

Excess sediment in streams and streambank/shoreline erosion can cause the following impacts:

- Loss of property;
- Threatens near shore buildings and other structures;
- Degrades aquatic and riparian habitats;
- Reduces water clarity, light penetration and plant productivity;
- Causes warming of the stream/river;
- Releases nutrients which could stimulate undesirable plant and algae growth;
- Affects fish feeding, spawning, and gill function;
- Changes bottom substrate, reduces channel capacities, increases flooding.

STREAMBANK & SHORELINE EROSION

What can be done?

There are different methods for addressing erosion along a streambank or shoreline whether is it natural or human-induced. These methods can be applied at a watershed or a private property scale.

Basic Prevention

The best way to control streambank and shoreline erosion is to take basic measures to prevent it. These actions include: preservation of naturally occurring rocks and vegetation; and, the avoidance of major construction immediately adjacent to streambanks and shorelines.

Vegetation Plantings

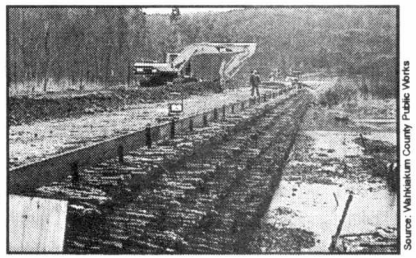
Plants can help to control erosion by shielding exposed soil and by holding soils in place with their complex root systems. Root systems also help to control the infiltration rate of the water into the soil. Additionally, streamside vegetation positively impacts the stream by contributing organic materials (fallen leaves, branches, etc) and shading the stream. Emergent aquatic plants can stabilize bottom sediments and dampen wave action.

Protective Structures

Structures include rip-rap, bulkheads, gabions, sandbags. These methods are often visually unappealing, require use of heavy equipment and engineering technical expertise. These methods may be more prone to failure and are costly. However, they are successful at stabilizing streambanks and guarding against erosion.

Bioengineering/Integrated Methods

Integrated methods employ a combination of protective structures and vegetation. An example is the planting of willows interspersed with riprap or other hardened structures. The rock provides immediate resistance to erosion and the willows, when their roots are established, bind together the rocks and underlying soil. The vegetation provides a more natural looking shoreline and streambank or shoreline habitat.



Source: Wahkiakum County Public Works

A bioengineered shoreline stabilization project in Wahkiakum County, WA using willow branches.

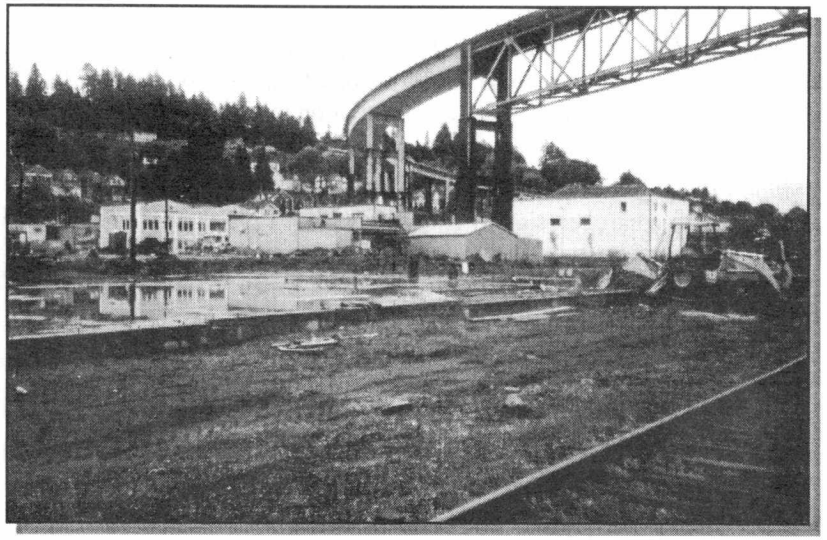
Regulatory Requirements

State and Federal permits will be required for most structural streambank or shoreline erosion control projects along streams, rivers, wetlands or any area below the line of Ordinary Higher High Water (please refer to the "Wetland Permitting" brochure for more information). For projects along the ocean shore, permits are required from Oregon State Parks and Recreation Department.

Please check with your local jurisdiction to see what local permits may be required.

CONSTRUCTION-SITE EROSION

Erosion from construction sites is a major source of non-point source pollution. The most effective way to deal with soil erosion from construction sites is to prevent it from happening in the first place.



What can be done?

Site specific erosion caused by human disturbance can be minimized if new developments employ a variety of **Best Management Practices** (BMPs) designed to help prevent erosion. Some examples of BMPs are:

- Save vegetation to minimize bare soil areas that will be easily eroded;
- Confine vehicle traffic on the building site to minimize ground disturbance;
- Avoid winter or rainy season construction, when feasible;
- Use gravel driveways under laid with geotextile fabric, silt fencing, straw and/or mulch to reduce the impact of rain on exposed soil, minimize overland flow of storm water and allow settling out of sediment;
- Avoid major soil disturbance within 100 feet of surface water;
- Phase clearing of the building site to minimize areas exposed to erosion;
- Keep soils off of streets and clean-up any sediments that accumulate on the street.

CONSTRUCTION-SITE EROSION

An **erosion control plan** outlining appropriate erosion control methods should be developed prior to construction. Check with you local jurisdiction to determine whether they require an erosion control plan. Developing an erosion control plan can be a simple process that includes a drawing of the construction site, noting slopes and drainage flow, and adding in erosion control measures.

The erosion control plan should include a variety of best management practices. For instance, an erosion control plan could include the following:

- Save as much vegetation as possible;
- Use erosion control matting on steep slopes;
- Use straw mulch on shallow slopes;
- Install silt fencing immediately following any grading and maintain until vegetation is established on the slope;
- Create gravel drive, under laid with geotextile fabric, for vehicular traffic and maintain throughout construction;
- Place biofilter bags or gravel around storm drains to slow and filter runoff from job site before it enters storm drains;
- Revegetate bare soil as soon as possible.

Where can I buy erosion control materials?

Some local vendors are:

- City Lumber (2142 Commercial Street, Astoria)
- Lumberman's Building Center (8408 Frontage Road, Seaside)

Numerous vendors in the Portland metro area also stock erosion control materials.

For a complete listing of material vendors and installers, contact the Columbia River Estuary Study Taskforce (CREST).

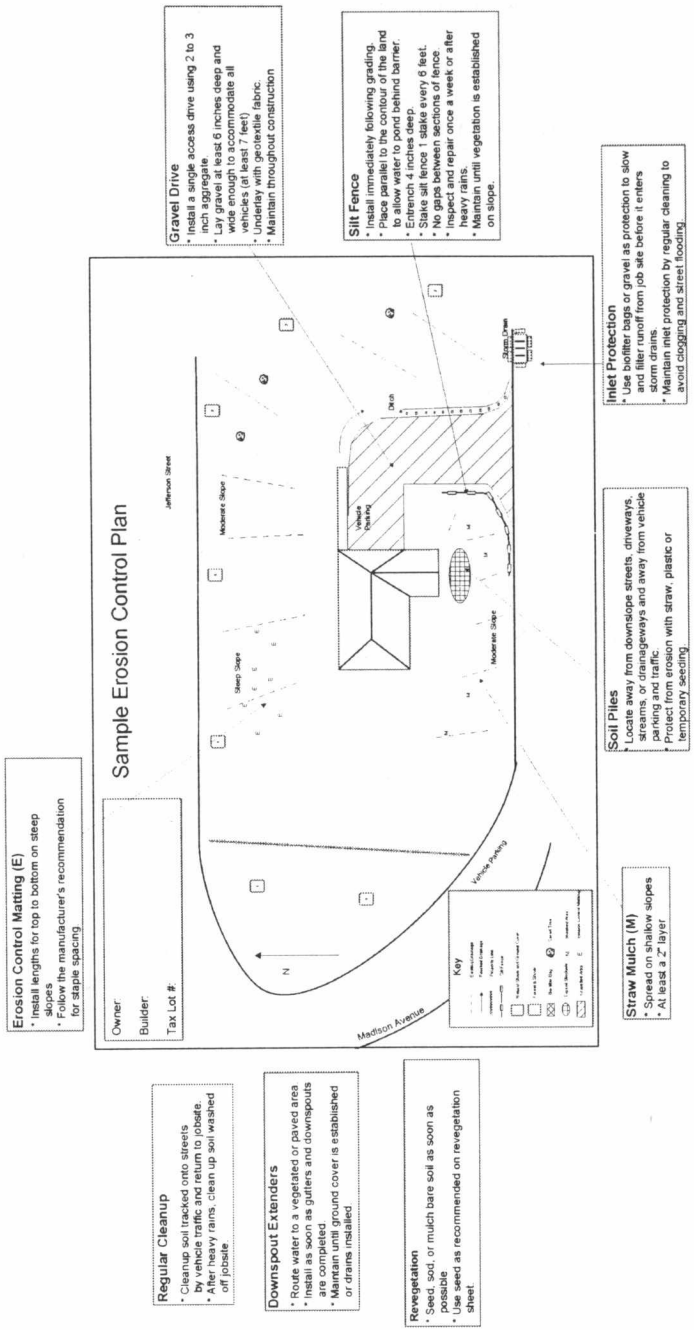
Regulatory Requirements

The Environmental Protection Agency (EPA) has adopted regulations requiring that National Pollution Discharge Elimination System (NPDES) permits be obtained for construction activities, including grading, clearing and excavating, that disturb one or more acres of land. The Oregon Department of Environmental Quality (DEQ) has developed the NPDES Storm Water Discharge General Permit 1200-C to cover these activities.

Please check with the local jurisdiction to see what types of local grading or erosion control permits may be required.

SAMPLE EROSION CONTROL PLAN

Erosion Control Site Plan: Indicates location of project, surface water flow, nearby water bodies/drainages, and techniques to reduce erosion from the site.



FOR MORE INFORMATION

Sources of Information

Your local jurisdiction's Planning Department (Clatsop County, Astoria, Cannon Beach, Gearhart, Seaside, Warrenton) is a good source of information.

CREST. *Erosion Control Guidance.*

Oregon Department of Environmental Quality. November 2002. *NPDES Storm Water Regulations for Construction Activities.*

Oregon Department of Environmental Quality. December 2002. *Guidance Document for Preparation of the NPDES Storm Water Erosion and Sediment Control Plan For Construction Sites of One to Five Acres of Disturbed Ground.*

Oregon Department of Environmental Quality. December 2002. *Sample Storm Water Erosion and Sediment Control Plan For Construction Sites of One to Five Acres of Disturbed Ground.*

Oregon Department of Environmental Quality. January 2003. *Best Management Practices for Storm Water Discharges Associated with Construction Activities.* DEQ Northwest Region Document.

Oregon Parks and Recreation Department. Regulatory Program. www.prd.state.or.us/regulatory.php

Warren, Robert. March 1999. *Streambank Landowner Handbook.* Astoria: Columbia River Estuary Study Taskforce (CREST).

Contacts

Columbia River Estuary Study Taskforce (CREST)
750 Commercial Street, Room 205
Astoria, OR 97103
(503) 325-0435

Department of Environmental Quality
811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229-5696
www.deq.state.or.us

Parks and Recreation Department
1115 Commercial Street, NE
Salem, OR 97301
(541) 867-3340