

# CONSERVATION ON STEEP SLOPES



Steep slopes are common in our area. Heavy winter rains can saturate soils. When water pressure builds between soil particles, the soil can liquefy and trigger a landslide on steep slopes.

## Start with the Basics:

### ☐ Signs of Soil Movement

Soil movement occurs so slowly that on a daily basis you may not notice it, until a landslide occurs. Watch for these tell-tale signs of soil movement.

- “Pistol-butted” trees - trees whose trunks curve as soil moves slowly downhill
- Cracks in the soil at the top of a steep slope
- Slumped or sunken area
- Historical landslides. Site specific information can be found by entering your address into the interactive map at [www.oregongeology.org/slido](http://www.oregongeology.org/slido)



“Pistol butted” tree



Soil cracks

### ☐ When to Call a Specialist

Conservation planners at Clackamas Soil and Water Conservation District provide technical assistance for erosion problems; however, some issues require the assistance of an engineer.

- If you notice any of the signs above or are in a high landslide probability area, call a geotechnical professional for advice.
- When planning projects such as retaining walls, drainage improvements, excavations, or terracing be sure to get professional advice and any permits required by your city and/or county building codes.



Slumped soil

### ☐ Best Management Practices for Living on a Slope

Factors contributing to slope instability may not always be under your control, but here are some practices that you can implement to help stabilize slopes on your property. Remember, safety is very important near steep areas. Place visual or physical barriers (fencing) above areas where there are steep drop-offs.

- Avoid removal of vegetation from steep banks, as plant roots help increase stability.

## □ **Best Management Practices for Living on a Slope (continued)**

- If removing invasive weeds (e.g. ivy, blackberry, Scotch broom), do so during dry months and plant native shrubs and/or grasses to keep vegetation on slopes. Native shrubs are often good choices because they are deep rooted and weigh less than trees that can overload a slope.  
<http://www.ecy.wa.gov/programs/sea/pubs/93-30/table3.html>
- Direct any surface water away from the top of the bluff, for instance water coming from roofs or paved surfaces (do not direct excess water onto a neighbor's property).
- Never drain pipes onto steep slopes. Outlet drain pipes in flat, stable areas, ditches, or waterways. Use velocity disrupting rock or other material at the outlet to avoid scour and erosion.
- Minimize surface irrigation, e.g. overwatering lawns.

## □ **Evaluate Your Slope**

Consider the steepness of your slope before you make an action plan so you start off headed toward success.

According to the California Watershed Recover Project led by the USDA Natural Resources Conservation Service\*, the steepness of your slope should dictate the actions taken to prevent erosion. Here are their recommendations:

For slopes less than 33%, controlling runoff with plant material often has a good chance of success. Mulch cover of up to two inches deep with plantings or alone breaks rain impact.

If your slopes are 33% to 50%, planting is possible, but using erosion control fabric or other erosion control material may be a good idea. These products hold the soil in place until the root system of the new plants are able to do the job. Possible geotechnical engineering required.

All slopes greater than 50% will require structures or special techniques for stabilization. Contact an engineer or geotechnical specialist.

Good advice for anyone with a slope is to watch your irrigation practices. Provide plants the water they need, no more. Native plants, properly selected for the site, should only need water until established. Well established plants are usually able to survive with normal rainfall, except in cases of excessive heat.

### **Helpful resources:**

#### **A Homeowner's Guide to Landslides for Washington and Oregon**

- [http://file.dnr.wa.gov/publications/ger\\_homeowners\\_guide\\_landslides.pdf](http://file.dnr.wa.gov/publications/ger_homeowners_guide_landslides.pdf)

#### **Boskey Dell Natives - Erosion Control**

- <http://www.boskydellnatives.com/erosioncontrol.htm>

#### **Erosion and Sediment Control Manual**

- <https://www.portlandoregon.gov/bds/article/192327>

#### **Landslide Hazards in Oregon**

- <http://www.oregongeology.org/pubs/fs/landslide-factsheet.pdf>

#### **Permanent Erosion Control Measures**

- <https://www.portlandoregon.gov/bds/article/93115>

#### **\*Prevent Soil Erosion on Your Property**

- [https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs144p2\\_063808.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_063808.pdf)

#### **Sound Native Plants - Species Selection Guide**

- <http://soundnativeplants.com/nursery/species-selection-guide/> (select "Plants for Steep Slopes" tab at the bottom of the page)

