Outside edge of a meander bend. Rule Identified Landforms (RILs) must be field verified.

Understanding Slope Stability

Understanding slope stability is an important part of land management and planning timber harvest activities. From forest road planning and harvest unit layout to choosing a harvest system, the land manager must evaluate each project for the potential impact to potentially unstable slopes.

Some activities may require additional geological review by a Qualified Expert (QE) and submission of a Geotechnical Report.

- A list of qualified experts can be found on DNR's website (http://dnr.wa.gov).

FOREST PRACTICES MANUAL

- Information about potentially unstable slopes or landforms can be found in Board Manual Section 16: Guidelines for Evaluating Potentially Unstable Slopes and Landforms).
- If a proposal is operating on or could influence a Rule Identified Landform (RIL) a Geotechnical Report and State Environmental Policy Act (SEPA) Checklist will be required.

If you plan to conduct forest practices near potentially unstable slopes, evaluate your property or proposal for signs of landslide activity.

Landowners should contact a professional forestry consultant or geologist to help identify potentially unstable slopes, which may be characterized by:

- STEEP SLOPES
- AREAS WITH BARE SOIL
- UNEVEN TOPOGRAPHY
- PISTOL-BUTTED (CURVED) TREES
- CRACKS IN SOIL
- NO EVIDENCE OF OLDER STUMPS FROM PREVIOUS SLIDES
- AREAS WITH DITCHES ALWAYS HAVE DIRT FROM THE SLOPE ABOVE THE ROAD
- INCREASED SPRING ACTIVITY OR NEWLY WET GROUND
- HUMMOCKY OR UNEVEN TERRAIN
- SUNKEN OR BROKEN ROAD BEDS

◀ If you live on or near a steep slope, evaluate your property for signs of landslide movement. Pistol-butted or bent trees are warning signs of an unstable slope.

What are potentially unstable slopes or landforms?

Areas which are very steep and have the potential to be reactivated by road building or timber harvest.

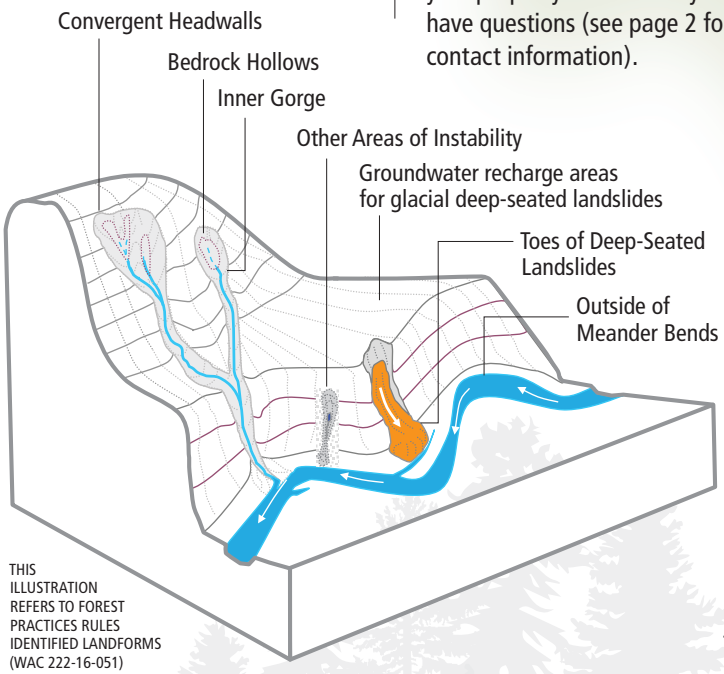
Why should I care?

If a landowner wants to remove trees in or around an unstable slope/landform, a licensed engineering geologist with 3 years of experience working on forest land, will need to be hired to walk the potentially unstable slope/landform and write a report.

Contact the Region office where your property is located if you have questions (see page 2 for contact information).

If the report states the road construction or harvest of trees in or around the potentially unstable slopes/landform could raise the risk of a landslide that has the potential to damage public resources or threaten public safety, the permit would be classified as a Class IV-Special and require a state environmental policy act (SEPA) checklist to be completed.

Most landowners choose not to conduct road building or harvest on such areas because of the threat to water, fish and wildlife, as well as human life, homes and other infrastructure.



THIS ILLUSTRATION REFERS TO FOREST PRACTICES RULES IDENTIFIED LANDFORMS (WAC 222-16-051)

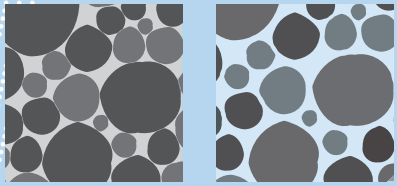
DEEP ROOT SYSTEMS GIVE STRENGTH TO SLOPES

Live tree roots strengthen slopes. After a tree is cut down, it takes between 5 and 8 years for the roots below to lose their strength. Maintain a buffer of trees between the harvested area and the edges of steep slopes.

Check online maps, such as the Washington Geologic Information Portal to see if you might live in a landslide area:
dnr.wa.gov/geologyportal

REDUCE IMPACT OF WATER ON SLOPES

When water is added to a slope, the weight increases the downward force, putting surrounding areas below the slope at risk such as fish bearing streams or existing infrastructure.

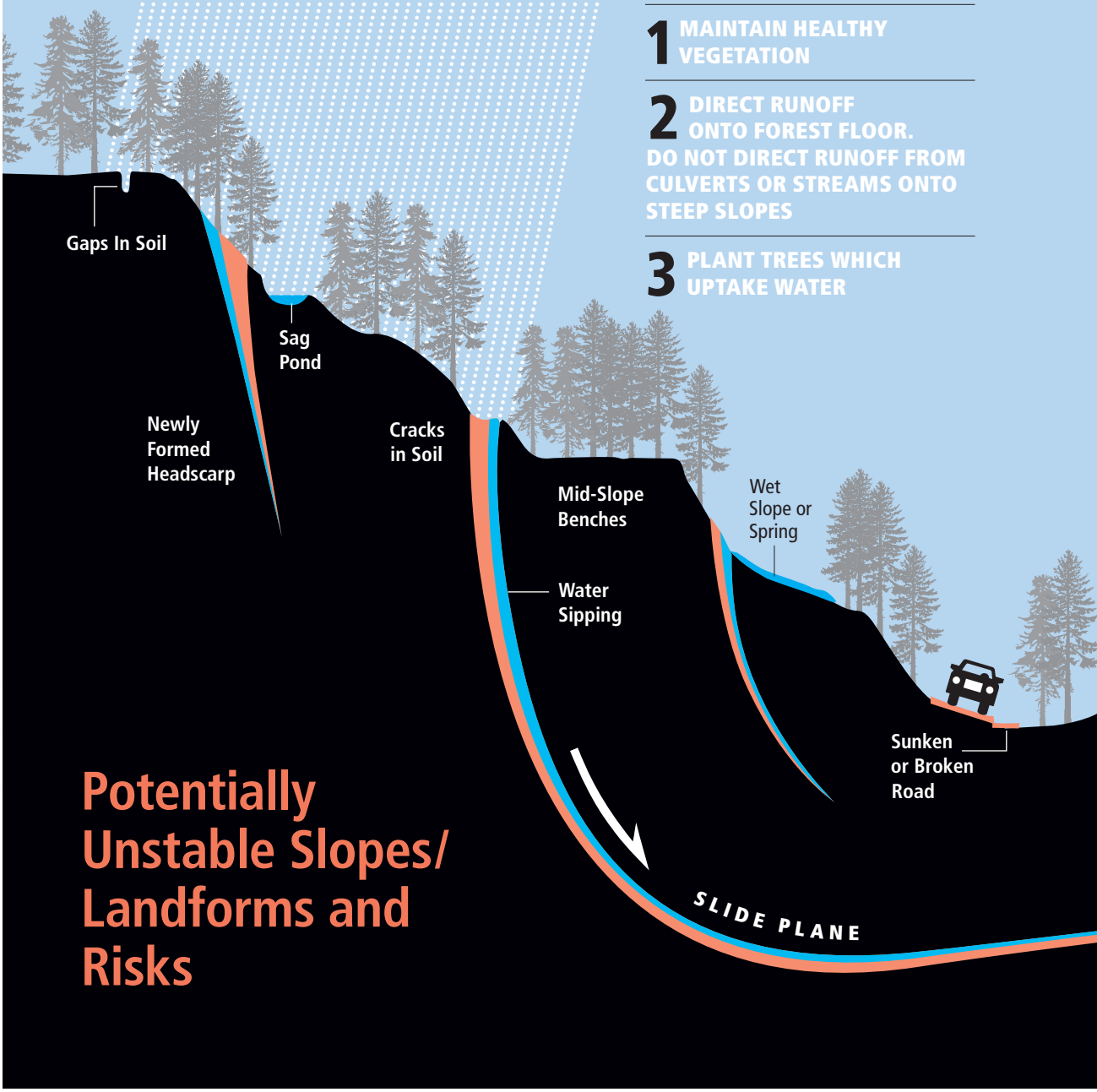


DRY SOIL
Grains touch, increasing soil strength.

WET SOIL
Grains pushed apart, reducing soil strength.

Reduce Impact of Water

1. **MAINTAIN HEALTHY VEGETATION**
2. **DIRECT RUNOFF ONTO FOREST FLOOR. DO NOT DIRECT RUNOFF FROM CULVERTS OR STREAMS ONTO STEEP SLOPES**
3. **PLANT TREES WHICH UPTAKE WATER**



Potentially Unstable Slopes/ Landforms and Risks

ADAPTED FROM ILLUSTRATION IN "A HOMEOWNER'S GUIDE TO LANDSLIDES FOR WASHINGTON & OREGON," WASHINGTON GEOLOGICAL SURVEY AND OREGON DEPT. OF GEOLOGY & MINERAL INDUSTRIES.

Reduce Your Risk

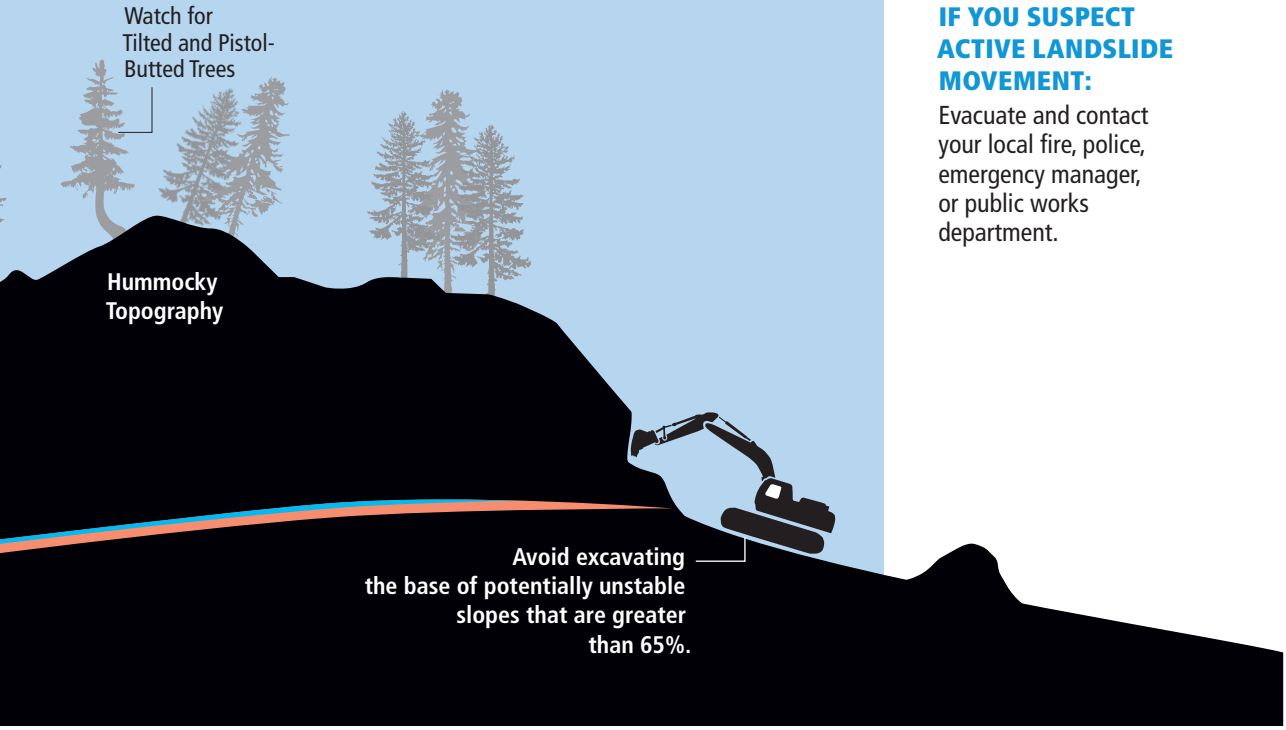
There are actions you can take as a landowner to ensure harvest is not impacted by potentially unstable slopes/landforms.

DO

- Consult with a professional forestry consultant or geologist prior to harvesting in or around steep slopes.
- If you suspect your forest practices activity will be in or around a potentially unstable slope/landform, contact a licensed engineering geologist or a geotechnical engineer for an evaluation.
- Check online maps, such as the Washington Geologic Information Portal to see if you might live in a landslide area.

DO NOT

- Do not add water to steep slopes.
- Avoid placing fill soil on or near steep slopes.
- Avoid placing road or logging debris on steep slopes.
- Avoid excavating above, in or at the base of steep slopes.



Most landowners choose not to conduct any road building or harvest on potentially unstable slopes/ landforms as this can increase risk of impacts to water, fish and wildlife, as well as houses and human life.

IF YOU SUSPECT ACTIVE LANDSLIDE MOVEMENT:

Evacuate and contact your local fire, police, emergency manager, or public works department.