



SOUND
NATIVE
PLANTS

Role of vegetation in slope stability

Vegetation helps stabilize slopes in numerous ways. There is really no reason not to plant native species when revegetating or enhancing slopes. Native plants provide wildlife habitat, are adapted to our native soils, local weather and hydrology and are beautiful and diverse besides. See our information sheet on 'Indicators of potentially unstable slopes' for more information on slope stability.

Interception

Erosion occurs when rainfall dislodges soil particles and carries them off a slope, forming rills and gullies that can trigger landslides. Raindrops hitting the soil surface can also seal the soil particles and make a crust that prevents infiltration and creates runoff. Trees and shrubs intercept precipitation before it hits the soil surface. Most of the intercepted precipitation evaporates back into the atmosphere, and the moisture that drips off the plants causes little soil damage because it has less force. It's a good idea to include evergreen trees in slope plantings because conifers intercept more moisture than deciduous trees, especially in the rainy season when deciduous plants have lost their leaves. Leaves and branches that fall from the plants shield the soil surface from rain drop impact, slow the movement of water across the soil surface, and encourage rainfall to soak into the soil.

Dewatering

Soil saturation can trigger erosion and landslides. Plants improve slope stability by removing water from the soil. Plants use water, absorbed through their roots, to perform basic metabolic processes such as photosynthesis. Plants release absorbed water to the atmosphere, by transpiring through pores on the leaves, much as a person sweats. Transpiration cools the plant and helps transport minerals up the stems. The rate of transpiration varies greatly, depending on the plant species, weather, and other factors. A single tree can transpire hundreds of gallons on a hot, dry day.

Soil reinforcement

Roots physically reinforce soils, resist erosion, and increase infiltration of water into the soil. Roots form physical pathways (little tunnels) that help water infiltrate the soil. Deep, woody roots lock the soil layers together, and lateral roots connect many plants into an interlocking grid. Fine feeder roots form a network through the upper soil layer, preventing surface erosion. Groundcovers and grasses have relatively shallow roots and low biomass, so they prevent surface erosion only, and do not stabilize deep soil. Trees possess deeper roots than shrubs and are essential for slope plantings. Puget Sound bluff soils often feature porous sandy, gravelly soil overtopping dense, clayey glacial till. Rainfall saturates the upper soils and then seeps laterally over the glacial till, causing slides. Deep tree roots penetrate into the compacted layer and help tie the layers together, preventing slides. Tree roots occurring at the crest and toe of a slope help to prevent wasting in these susceptible areas where larger slides often start.

Ecologically healthier overall

Vegetation actively decompacts soil through the expansion of the root systems and the addition of organic matter to the site. Water absorbs more readily into uncompacted soil. Vegetation also encourages soil fauna to thrive. Soil fauna, such as microorganisms, insects and worms, condition the soil as well. The cumulative impacts of these organisms result in healthier soil that is more resilient during storm events.

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