SOUND NATIVE PLANTS

Native soils of western Washington

Soils are the building blocks of any healthy ecosystem. It all begins with soils. Soils make plant life possible by providing water, nutrients, oxygen and physical support. Healthy soils are teeming with microorganisms, such as fungi, bacteria and nematodes, as well as insects large and small. For the most part, soil fauna are beneficial, controlling plant pests, breaking down organic material and binding and biodegrading some chemical pollutants. This fauna provides a rich food source for wildlife while soil itself provides places for nests and burrows. Undisturbed soils better infiltrate stormwater, allow for greater plant root development and filter out a greater degree of chemical and organic contaminants. Our native soils were formed from a variety of parent materials derived from volcanic eruptions, glacial processes, and bedrock weathered in place or a combination of these processes.

Mudflows from volcanoes formed some of the soils of western Washington. These soils have an upper layer of fertile loam high in organic matter, and an underlying layer of denser, rocky material. Often, these soils drain poorly but they can be highly productive. Soils throughout Washington may contain a layer of volcanic ash (also known as tephra). Volcanic ash can compact over time and form a "hardpan", resulting in a perched water table or decreased infiltration rates. Weathered volcanic ash increases soil fertility and may increase water-holding capacity.

Glacial soils fall into three, general categories: lacustrine, outwash and till. Lacustrine soils are derived from ancient glacial lakebeds. These soils are higher in silt or clay content than other glacial soils, resulting in higher water-holding capacities, lower drainage and higher fertility. Lacustrine soils are more susceptible to erosion than till or outwash because of their fine texture. Streams flowing from glaciers deposited outwash soils. Water of varying speeds deposits particles of different sizes, sometimes resulting in distinct layers of gravel, sand, and rock in the soil profile. Usually, glacial outwash soils drain rapidly and have low organic matter content. Puget Sound prairies formed on glacial outwash. Some glacial outwash soils contain a layer of wind-deposited silt that increases their moisture-retaining capacity and fertility. Glacial till was deposited directly by glaciers and often results in a sandy, rocky soil that is well drained but shallow. Glacial till that was laid down beneath glaciers is known as basal till and has a dense, compacted layer, locally known as a "hardpan", at a depth of about 18-36" that can extend more than 10'. This hardpan is often impenetrable to both plant roots and infiltrating water, forming a perched water table. Because of this, sites with basal till soils often drain poorly. If the hardpan is very shallow the soils may not be able to support trees or more deeply rooted plant species.

Western Washington's older soils are weathered from bedrock in place. These soils are quite different from the soils described above. Such soils usually have a finer texture, and in general, are more highly developed. Our youngest soils are those deposited by floods, resulting in layers of particles of similar size (much like glacial outwash).

Depressions in any of these soil types can collect and hold water, forming wetlands over time, which changes the soil structure and type. Wetlands are common in low-lying areas underlain by basal till, because of the perched water table. For more information on wetland soils, see our Wetland Delineations information sheet. A soil test can help determine soil type, organic matter content, and nutrient levels. Send soil samples to analytical soils laboratories (see this Washington State University Cooperative Extension publication for contact information: wsprs.wsu.edu/AnalyticalLabsEB1578E.pdf). Testing for pollutants is not routine; be sure to ask about special sampling procedures and additional costs if pollutants are a concern. Watch for a future information sheet on how to analyze soil samples.

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