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Using Rock for Sustainable Trail Development at Reiter Foothills Forest

As part of the trail design for Reiter Foothills Forest, the Washington State Department of Natural Resources (DNR) will be using rock—as needed—for surfacing the new motorized trails. Rock surfacing helps reduce the potential for resource damage, protects water quality, allows for the maximum season of use, and decreases the costs to maintain the trails.

We don't expect that every section of every trail at Reiter will need to be rocked. Engineers and planners will determine how much rock and where it will be applied in the field as they stake out each trail. Trail segments that have enough native rock in the soil to be stable will remain native surface. When using rock, our goal is to avoid resource damage such as trail braiding, soil compaction, erosion, and sediment delivery.

Trail Braiding and Soil Compaction

Rock provides a stable base for trails and helps prevent soil loss and erosion. Rock reduces the potential for rutting and trail braiding. Without a stable base on a trail system, the wear and tear of wheeled vehicles across native soils forms trenches, compacts the soils, and exposes tree roots. On flat areas where ruts puddle up, riders often go around the puddles resulting in the trails getting wider and wider. As this trail braiding occurs, it can develop into large flat areas with puddles, compacted soils and damaged trees. Rock will help to prevent these types of impacts.

Erosion and Sediment Delivery

As trail slope increases, so do erosion issues, surface drainage flow, trail rutting and the potential for sediment delivery into streams. On steeper ground rock helps keep the native soils in place and reduces the erosion potential. When rutting occurs on steeper ground trenches form, which channel water down the hillside when rainy. Once formed, trenches tend to get worse and deeper over time, especially in the wet season. Applying rock to the trail surface on steep slopes can effectively reduce the potential for erosion by significantly decreasing rutting and soil displacement.

Extending Use through Many Seasons

In general, the need for rock varies depending upon soil type and climate. In Washington, the west side of the state is much more prone to erosion issues compared with the eastside. This is due to the amount of rainfall in the area, soil moisture levels, and subsequently more water on trails. Many of the soils in Reiter Foothills Forest are vulnerable to rutting and compaction when wet. The forest area gets approximately 100 inches or more of precipitation each year. The rock surfacing will help make these areas passable during the rainy season and allow for potential use all year.

Funding

Once Reiter Foothills Forest re-opens, DNR anticipates high levels of use. In addition, DNR continues to struggle to obtain stable funding for maintaining recreational trails and facilities statewide. While no trail system is maintenance free, DNR strives to design durability into all new construction projects. Trails and facilities are designed so that they will require as little long-term maintenance as possible. In general, funding is more readily available for new development than for maintenance.

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Sustainable Trail Design

Using rock as a surfacing material is just one of many considerations DNR uses when designing sustainable trails. We incorporate other technical criteria such as:

- Planning the trails in good locations based on the natural features and topography in an area.
- Trail running grades and layout.
- Drainage control features (such as rolling dips).
- Trail outsloping or crowning.
- Type of construction (full bench, ¾ bench, turnpike, etc).

In Western Washington, water, and how it is planned to flow on, across, or underneath a trail remains one of the most critical design considerations for sustainability and resource protection.

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