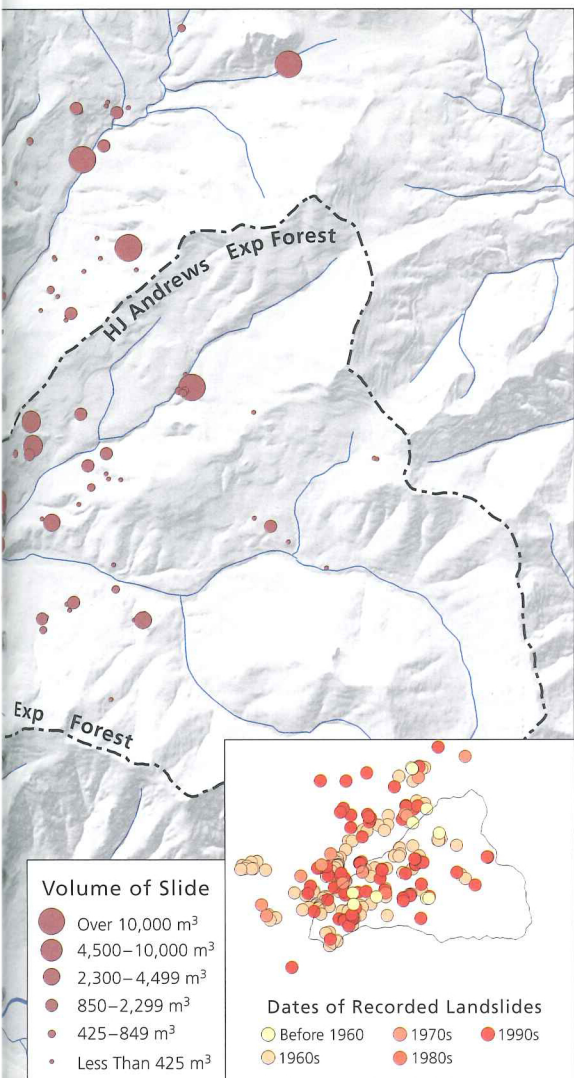


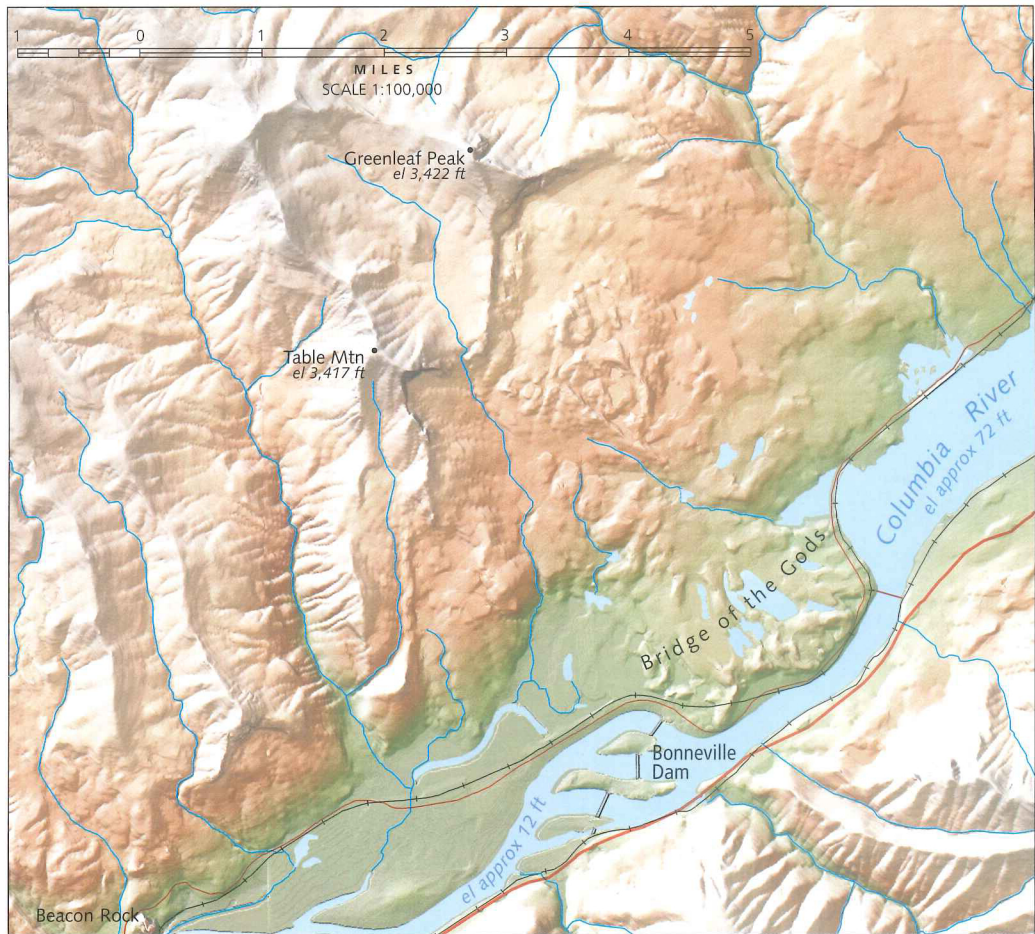
The role of earthquakes as a triggering mechanism is not well understood but is certainly important. Continuous shaking during an earthquake may cause liquefaction of clay soils, a condition in which even very slight slopes can flow, and steep slopes fail spectacularly. Slides commonly involve more horizontal movement than vertical drop, a characteristic illustrated by the enormous Bonneville Slide, discussed at lower right. A slide on this scale is a rare event on the historical time scale, if not on the geological time scale, but smaller slides are frequent.

A 50-year record of small rapid landslides (as distinguished from gradual earth movement) in the U.S. Forest Service's H. J. Andrews Experimental Forest reveals high frequency in areas of steep slopes, clay-rich soils and rapid snowmelt. Upper elevations at this site have more stable soils and more persistent snowpacks, so landslides are less common despite locally steep slopes. Most inventoried landslides occurred during only three storms. Landslides have varied ecological effects, disturbing riparian ecosystems but also creating complex stream habitats.

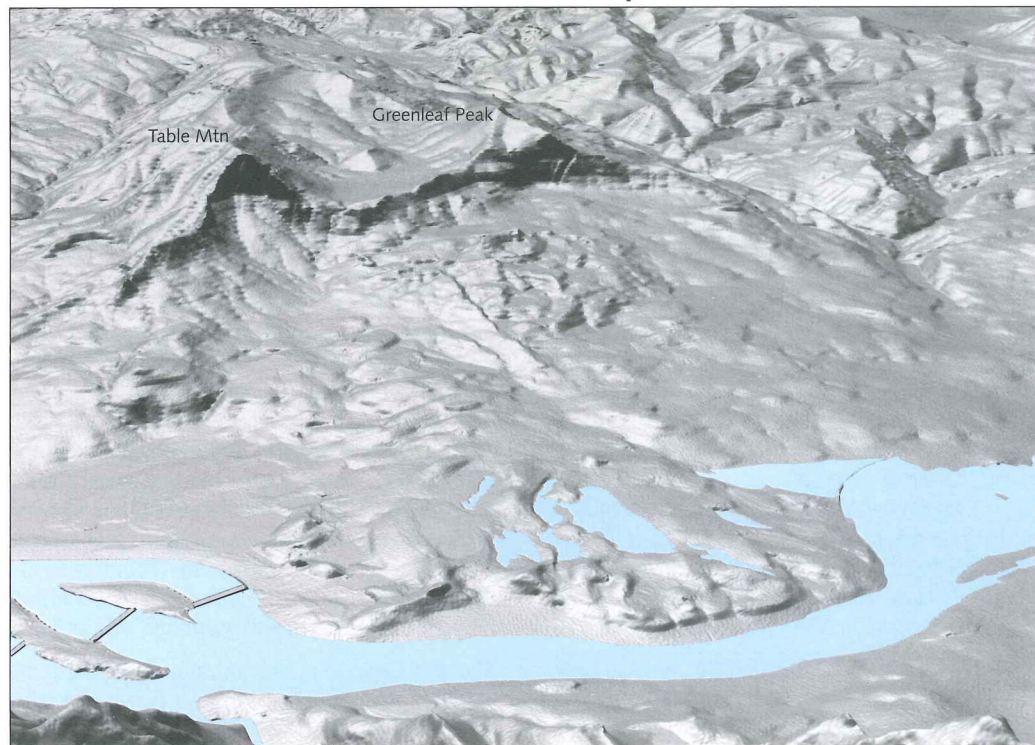
Recorded Landslides in the H.J. Andrews Experimental Forest and Adjacent Area



Bonneville Slide, Overhead View



Bonneville Slide, Oblique View



Bonneville Slide

The massive Bonneville Slide collapsed into the Columbia River around 1700, at the time of the last big subduction earthquake (see pages 138–139). The 14-square-mile slide pushed the river southward and temporarily blocked it with a 200-foot-high land bridge, described in regional Indian legend as the Bridge of the Gods. Ancient ash and mudflow layers lying beneath the Columbia River basalts erode easily, and glacial flooding has removed the supporting “toes” from the base of steep slopes, so landslides are common in the area. Most are on the older, less stable north side of the gorge. The Bonneville Slide illustrates on a vast scale the landforms of many smaller slides: a sheer exposed upper face, surprising horizontal extent, and hummocky surface of low rounded mounds and shallow depressions.