



Landslides on Forest Lands

A Position of the Oregon Society of American Foresters

The Oregon Society of American Foresters (OSAF) recognizes that landslides on forest lands represent a complex scientific, land management and public policy issue. Although sometimes harmful to people or property, landslides often reflect natural processes that can have some ecological benefits. Given such complexities, OSAF supports: 1) reducing landslide damage through expanded efforts that follow the “shared responsibility” concept mandated by the Oregon Legislature (Senate Bill 12), including measures that address land use planning, hazard warnings, and forest and other practices; 2) continued efforts by professionals with appropriate expertise and experience to interpret both current science and on-site factors to identify measures that effectively reduce landslides and their impacts; 3) carefully designed monitoring and research to further study landslide occurrence, influences and effects.

The geology, terrain and climate of the Oregon Coast Range and western Cascades create significant natural landslide hazards, and the occurrence of some landslides can be affected by land use practices, including forest management and construction of highways, homes and power lines. However, most landslide hazards exist whether or not such practices occur and the exact location and timing of slides cannot be accurately predicted. Thus, the identification of hazardous areas for people and property, and ways to reduce their proximity to these areas, are important policy considerations. A broad ban on forest management activities on steep slopes would not effectively eliminate existing landslide hazards.

Issue Public awareness and concern about landslides on forest lands in Oregon increases noticeably when major storms (e.g., in 1996, 2007) trigger slides that impact people, structures or natural resources. It is not unusual to hear claims that forest practices caused these landslides, with calls for increased restrictions on such practices. Policy and decision makers will continue to be challenged to address public concerns when the complexity of the problem offers very few simple, fail-safe and economical solutions.

Background Oregon weather normally is moderate, and its extremes provide the most vivid memories. In early 1996, an above average snowpack, torrential rains and very wet soils led to the worst flooding in over 30 years in western Oregon. Another record setting storm occurred in November 1996. Some streams experienced flood levels that occur only once or twice per century. These storms triggered landslides that caused heavy damage to roads and other structures built within the paths of the landslides. Tragically, 5 people were killed by landslides during the November storm.

A public debate followed, including some who blamed steep-slope clearcutting and road construction. In response to public concerns, several agencies evaluated the storm damage and the Oregon legislature passed two bills (Senate Bills 1211 and 12) that directed changes in forest practice and other regulations. After further studies by the Oregon Department of Forestry and a technical advisory team, the Board of Forestry approved additional rules to reduce landslide problems related to forest roads and timber harvesting. Other major storms that triggered some significant landslides in Oregon and Washington in 2005 and 2007 led to renewed interest in the issue of slope stability on forest lands. Such interest can be expected whenever infrequent large storms (e.g., “10-year” or greater events) trigger some significant landslide activity.

Findings and Conclusions Studies have shown that land management activities, such as timber harvest and road construction, can influence the occurrence and size of landslides in some locations. However, these studies often have used aerial surveys that have seriously underestimated landslides in unlogged forested areas where canopy cover obscures landslides. More reliable ground surveys have shown that landslide

occurrence in areas harvested within the previous 10 years was about 1.5 to 2 times higher than in forested areas. Expectations are less clear beyond this initial post-harvest period, because prompt reforestation is required by Oregon law, and some surveys of young forests (10 to 100 years) have shown fewer landslides than in older (>100 years) forests.

Forest roads generally have been more important than timber harvest as a management influence related to destructive landslides. However, during the past two decades, key changes in road design, location and maintenance have been made to reduce such landslides. In addition, advanced timber harvest systems can reduce the need for logging roads. Both research and considerable field experience indicate that such improvements have significantly reduced landslide impacts. Continued emphasis on forest roads is needed, especially older roads that may need to be upgraded to current standards or decommissioned.

Landslides are a natural process that can have some positive ecological benefits, such as renewal of supplies of large woody debris and gravels that are necessary for healthy aquatic systems. In particular, the Oregon Coast Range and western Cascades have areas where geology, steep terrain, and high rainfall naturally combine to favor landslide processes. Even within these areas, however, landslide characteristics vary greatly among specific locations, and thus only a small portion of the landscape carries a significant risk of slide occurrence at any point in time.

When damaging landslides occur on forest lands it is not unusual to hear appeals for a broad ban on timber harvest and road construction on steep slopes. However, such a ban would be very costly to many forest landowners and impact their contributions to state and local economies. Moreover, such a ban would reduce some landslides in the near term but not eliminate them over longer periods.

While much is known about landslides, it remains very challenging to accurately predict where and when landslides will occur. Additional knowledge from carefully designed monitoring and research programs will improve our ability to predict landslides and their impacts and to apply this knowledge effectively to policy and land management decisions. However, homes and other structures still exist in hazardous locations and some continue to be built or sold without recognizing or disclosing such hazards. Such situations can trigger restrictions on forest management upslope, but this step alone does not necessarily improve public safety.

Landslides will continue to occur in Oregon. It remains vital to increase and apply our expanding knowledge and experience to reduce human influences on landslide occurrence and their negative impacts. This includes educating policy makers and the public about the wide nature and complexity of landslide and land use issues, and well-informed decisions that reflect the full scope of "shared responsibility" (Senate Bill 12) needed to effectively reduce landslide risks.

Selected References

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This revised statement was approved on January 13, 2009 by the OSAF Executive Committee. The statement will expire on January 13, 2014, unless after thorough review, it is renewed by the OSAF Executive Committee.