



# 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.**

**The geology, terrain and climate of the Oregon Coast Range and western Cascades create significant landslide hazards in some locations. Land use practices, including forest management and construction of highways, homes and power lines can affect landslide occurrence in unstable terrain. Unfortunately, landslide hazards exist in such terrain whether or not such practices occur, and the exact location and timing of landslides cannot be accurately predicted. Identification of hazardous locations for people and property as well as approaches for reducing the presence of people and structures in unstable areas are important policy considerations. Given the local scale of existing hazards, a broad ban on forest management activities on steep slopes would impact many landowners and their important economic contributions, while offering limited benefits to the public.**

**OSAF supports 1) Carefully designed monitoring and research to further study landslide occurrence and both natural and human influences; 2) continued efforts by professionals with appropriate expertise to interpret current research and field experience and identify and implement management measures (e.g., silviculture and harvest systems, road location and design) that reduce landslides and their impacts, and 3) public policy efforts to reduce landslide impacts through diverse measures that address not only forest management, but also other practices on forest lands, hazard warnings and land use planning.**

**Issue** Public awareness and concern about landslides on forest lands in Oregon increases noticeably when major storms (e.g., in 1996) trigger slides that harm people, structures or natural resources. It is not unusual to hear claims that forest practices cause many of these landslides, and some calls for further 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 infrequent extremes provide the most vivid memories. In early 1996, 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. Tragically, 5 people were killed by landslides during the November storm.

A public debate followed, including some who blamed clearcutting and road construction on steep slopes. In response to both public concerns and information needs, several agencies evaluated storm damage on forest lands. In 1997 and 1999 the Oregon legislature passed bills (SB 1211 and SB 12) that directed both immediate and future changes in forest practice and other regulations. After further study by the Oregon Department of Forestry and a technical advisory team, in 2002 the Board of Forestry approved additional rules to reduce landslide problems related to forest roads and timber harvesting.

**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 primarily have used aerial surveys that have seriously underestimated landslides in 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 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.

A broad ban on timber harvest and road construction on steep slopes would be very costly to many forest landowners and significantly impact their important contributions to our state and local economies. 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.

Landslides will continue to occur in Oregon. It remains vital to increase and apply our expanding knowledge and experience with landslides 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, so that informed decisions and cost-effective policies can follow.

## **Selected References**

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*This revised statement was approved for a 1-year extension beyond its expiration date of December 6, 2007 by the OSAF Executive Committee. The statement will expire on December 6, 2008, unless after thorough review, it is renewed by the OSAF Executive Committee.*