Agenda Item No.:	2
Work Plan Title & #:	Forestry Program for Oregon Implementation – Issue 1
Objective # & Title:	Lessons Learned – 2007 Flood Events
Date of Presentation:	March 5, 2008
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SUMMARY

A powerful storm from the Pacific Ocean barreled into northwest Oregon and southwest Washington on Sunday, December 2 and Monday, December 3, 2007. Both states were battered with sustained winds of more than 100 miles per hour, and intense rain that caused a rapid rise in and flooding of rivers within the affected area. Wind-damaged timber was heavily concentrated in Clatsop County, resulting in approximately 370 million board feet of timber being damaged. An additional 100 million board feet of non-sawlog material was damaged. Flood-related forest issues (e.g.; debris slides and log jams) were concentrated in Tillamook, Clatsop and Columbia counties.

The Department fielded an Emergency Management Team (storm team) to assist the three counties with assessing the impacts of the storm.

Some days after the storm, on Tuesday, December 11, a "dam break flood" occurred that closed Highway 30 and damaged several homes and other buildings. This event triggered local concern about the risk of similar events and created considerable interest about the causes. In this particular case, a series of factors may have combined to cause an old fill that was originally a railroad trestle to fail. The Department continues to work with the affected counties and landowners to address the issues created by this event. As a result of the experiences and assessment, a number of lessons have been learned that deserve further attention in the Department's and the Board's future work.

CONTEXT

The storms of December 2 and 3 brought severe wind and rain. Wind gusts in excess of 100 mph were reported as far south as Lincoln City. Wind gust reports on the northern Oregon coast included 129 mph at Bay City, 114 mph at Cape Mears, and 104 mph at Rockaway Beach. Away from the coastal headlands winds were only slightly less strong and included reports of 91 mph at Mt. Hebo and 74 mph at Cedar Remote Automatic Weather Station (RAWS). Data compiled by Oregon Climate Service suggests that the 2007 storm may be the longest-lasting high-wind event on record for the west coast. The Columbus Day storm lasted only about two to three hours in most locations, but sustained high wind lasted nearly two days during the 2007 storm, except for a few brief lulls.

Heavy rainfall was received during this period over much of northwestern Oregon. From Dec 1 through 3, over 10 inches of rain fell at a number of Coast Range sites, including South Fork RAWS (12.71"), Cedar Mountain RAWS (12.19"), Lees Camp (14.50"), Vernonia (11.00"), and

Fall City (10.70"). Rainfall in the interior was lighter but precipitation totals above 5 inches were recorded at some Cascade foothill stations. Detroit Lake reported 6.39", while Log Creek RAWS to the west of Mt. Hood received 11.23 inches of rain.

Flooding occurred on a number of northwest Oregon streams. Floods reached levels that National Weather Service identifies as "Major Floods" on the Nehalem River (10.4 ft above flood stage) and the Wilson River (7.5 ft above flood stage). Flooding was also reported on the Trask River, Siletz River, the Alsea River, Siuslaw River, Mary's River and other streams on the Coast Range side of the Willamette Valley.

The Governor declared a state of emergency and authorized the use of state resources to help communities suffering from the effects of severe weather. The Governor formalized the declaration with an executive order, and ordered the staffing of the Emergency Coordination Center (ECC), located at the Anderson Readiness Center in Salem. The ECC provided support for county efforts and helped coordinate emergency responses. As damage reports came in, and statewide mobilization of emergency services coalesced, the Governor requested that the Department become integrated into the Office of Emergency Management and the county's Emergency Operation Centers. A federal disaster declaration soon followed, allowing the Federal Emergency Management Agency to provide assistance to Oregon and its affected citizens.

On December 9, 2007, the Oregon Department of Forestry dispatched a team of foresters and support staff to the northern Oregon coast to help counties and landowners solve problems with blown-down timber, woody debris, and other forest-related effects of the storm.. At the request of the affected counties, the storm team helped assess problems, and facilitated the removal of trees and woody debris. The storm team was demobilized on Tuesday, December 18. The Executive Summary of the storm team's report is Attachment 1. The full report can be found at http://egov.oregon.gov/ODF/TimberBlowdown.shtml

The Department continues to make field staff available to assist with a variety of issues of high priority, and has streamlined notification processes. Ongoing work includes:

- Identifying trees that are still standing but might be hazardous;
- Helping landowners determine if they can derive economic value from fallen timber;
- Working with other public agencies to facilitate the storing of downed logs that may later be placed into streams as part of stream-enhancement projects;
- Restoring damaged infrastructure on state-owned forests;
- And preparing salvage plans for state timber.

The Department is also working with the other natural resource agencies to evaluate issues that arose from this event that might need to be addressed through legislative or budgetary actions.

Landslides and debris flows

On December 6, a landowner near Clatskanie, in northern Columbia County, notified the Department of a number of road-related failures and other storm impacts. At one site, a large fill had impounded a substantial volume of water on Eilertsen Creek. The landowner warned downstream homeowners of the potential hazard. ODF Stewardship foresters and geotechnical experts worked with the landowner and other agencies to reduce the pressure on the fill and to prepare for its possible failure. Despite those efforts, On December 11, the fill collapsed and released the water and debris in a dam-break flood. The flood moved at about 30 to 45 mph and engulfed the evacuated residences and crossed the highway. The landowner's vigilance and the cooperative work with other agencies, including the Oregon Department of Transportation and

local sheriff and other authorities, allowed for closure of the highway and evacuation of residences before the slide occurred.

Steep slopes, heavy rain, flooded streams and possibly previous harvesting and road drainage – all came into play in this event, which received considerable media attention. However, a major factor was the legacy of the old railroad fill.

What is known is that many slides occurred in this area due to the storm. Two of these slides occurred in draws that feed into Eilertsen creek above the railroad fill. These slides occurred on lands owned and managed by the OSU College of Forestry. One slide came from a 15-year-old stand that had previously been clear-cut, and the other from a five-year-old stand. Both stands were reforested as required by Oregon's Forest Practices Act. State and private geotechnical professionals are working to understand the likely causes of these slides and the likely depositional zones.

At some point, the drainage in the railroad fill ceased to function resulting in a pond nearly 40 feet deep. The fill material eventually became saturated and could not withstand the pressure of the water in the pond. This kind of failure is technically called a "dam-break flood."

After this event, the Department assessed other nearby areas to determine the potential for more slides. One additional railroad fill blockage was found and mitigated.

BACKGROUND AND ANALYSIS

The Department's use of the "Incident Command System" structure to respond to the counties' request demonstrates the value of the system in non-fire emergencies. Through declarations and actions of the Governor and the Federal Emergency Management Agency, the Department will be reimbursed through federal funds for much of its cost in providing assistance. However, the capacity of the state to offset the remaining costs is limited. Legislation to establish a state emergency recovery fund has been introduced in the Legislature's February special session.

The assessment developed by the Department's incident team allowed counties and state agencies to address a range of issues more effectively. The interaction of the Department with other agencies facilitated addressing issues especially related to log jams and other impacts that are viewed on one hand as "damage" and on the other hand as valuable habitat. For example, jams can be a major risk to infrastructure, but they are also important for the creation of future fish habitat. The assessment report identified a number of technical and policy issues that need to be addressed to better address or avoid problems in the future. These issues are fully listed and discussed in the team's report. Some of the key issues include:

- Homes exist and continue to be built or rebuilt in areas inherently at risk from landslides. Landowners may not be fully aware of the risks and so cannot evacuate or take other precautions before or during storm events.
- Lack of awareness about Oregon's debris flow warning system and its limitations, and lack of public awareness that high-intensity rainfall and flooding was impending
- The complex permitting process involving multiple jurisdictions on removal of debris in streams can delay or prevent action
- Limited financial resources and field staff (across all entities) to address workload associated with damage repair and salvage operations could slow recovery efforts. Shortage of technical experts to advise small landowners in dealing with storm damaged timber and Geotechnical issues.
- High fills mostly due to legacy railroad grades may not be safe from dam-break floods

- If salvage does not occur, or is only partial, forest health and fire hazard issues may develop because of the large amount of damaged timber.
- Low markets and high harvest costs create disincentive to remove downed material
- Quantity of non-sawlog material may exceed current capacity and market.

The Department is currently evaluating issues identified in the assessment and is completing an action plan addressing those issues. The action plan further clarifies the issues, identifies high priorities for the agency, and develops a course of further actions where appropriate. The Department identified eight high priority issues, listed above. The remaining issues were grouped into those where the Department has primary jurisdiction and those where other organizations have primary responsibility. The action plan separates issues as either operational and/or policy, and identifies ongoing and future actions needed to address each one.

Landslides and debris flows

The public and media reaction to the Highway 30 slide has been to ask "what caused it?" The basic cause of slope failures is relatively simple: inadequate frictional strength on the surface between partially decomposed rock and more solid underlying rock. Failure usually occurs when the pore water pressure of the slope is elevated during a significant storm event.

While the basic cause is simple, frictional strength can be reduced or pore water pressure elevated by a number of mechanisms. In the Highway 30 slide, some blamed logging as the key cause of the failure. Concern about logging practices is important. Applying techniques to reduce undesirable changes in slope stability is now a matter of practice. However, equally important in this debate is addressing the perception that landslides are "unnatural." Landslides are one natural process of erosion, and a major process throughout large portions of our mountainous terrain.

Unfortunately, many people are unaware of their exposure to these landslide risks. Many people live in the path of landslides or debris flows and do not know it. Most people have no idea how to react during intense storms that may cause landslides. In addition, many people assume that most landslides are "caused" by human activity rather than part of the natural geologic process.

The "further review area" maps specified by SB 12 that are needed to better inform homeowners and the public about locations at risk of landslides have not been adequately developed and made accessible to the public and local government. LIDAR technology can greatly enhance the quality of information related to these risks. The issue of the lack of availability of these maps has been picked up by the media.

Specific to the Highway 30 Eilertsen Creek landslide, the Department has implemented an evaluation process to:

- Establish a clear timeline of the events leading to and following the dam-break flood;
- Evaluate the administration of the Forest Practices Act (FPA) on lands surrounding the dam-break flood;
- Evaluate FPA compliance and landowner responsibilities; and
- Evaluate the causal factors and relative contributions of each (this will include analyses using geotechnical expertise from ODF and from a consulting engineering geologist).

A Highway 30 Eilertsen Creek landslide evaluation report will be completed by March 5. The findings will be discussed with the Board at that meeting.

RECOMMENDATION

During its November 2007 meeting, the Board provided direction on actions the Department should pursue related to public safety and landslides.

This direction remains appropriate. In particular, the Department will continue to work with the Oregon Department of Geology and Mineral Industries, and others, to more rapidly implement further review area maps. Additional recommendations are also likely to be made in regard to potential consideration of railroad and other fill hazards.

NEXT STEPS

Completing the report on the circumstances surrounding the landslides, fill failure and resulting debris flow that affected homes and closed Highway 30 is planned prior to the March 5, 2008 meeting. This report will be a public document and available to all interested parties. Until that report is released, it should be emphasized that knowledge of the circumstances related to this event is preliminary.

The storm team report provides a series of recommendations that will require interagency actions. This report has been provided to the other agencies and Governor's Office. The Department will continue to work with the other natural resource agencies to evaluate issues and make recommendations to the Governor's Recovery Team.

ATTACHMENTS

(1) Executive Summary of "Forest and Debris Recovery Final Report Winter Storm - December 2007"

(2) Backgrounder "ODF: Landslides and debris flows"