

Analyzing Long-Term Slope Stability within the Research Natural Area -Ashland Creek Watershed-

Shane Stiles, Melody Thueson, Narcissa Pricope PhD
Department of Environmental Studies, Southern Oregon University, Ashland, OR 97520

Saddle Slide

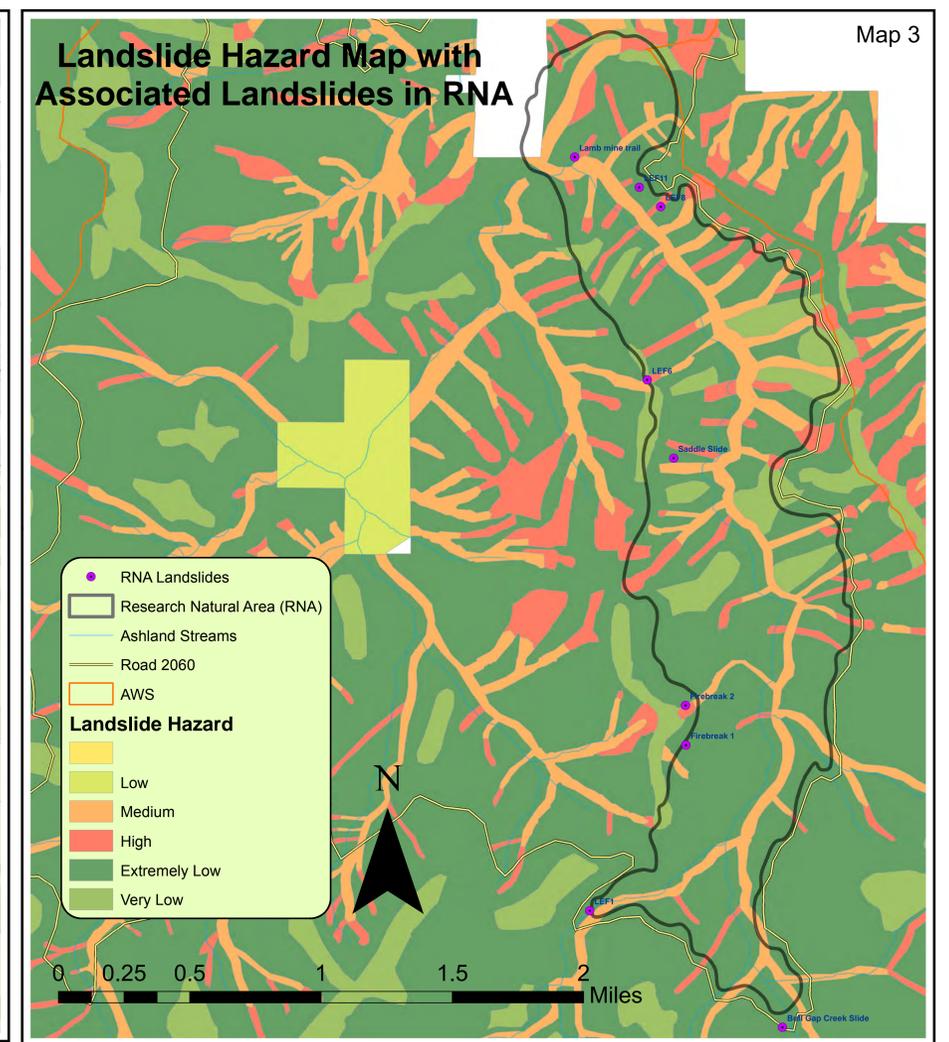
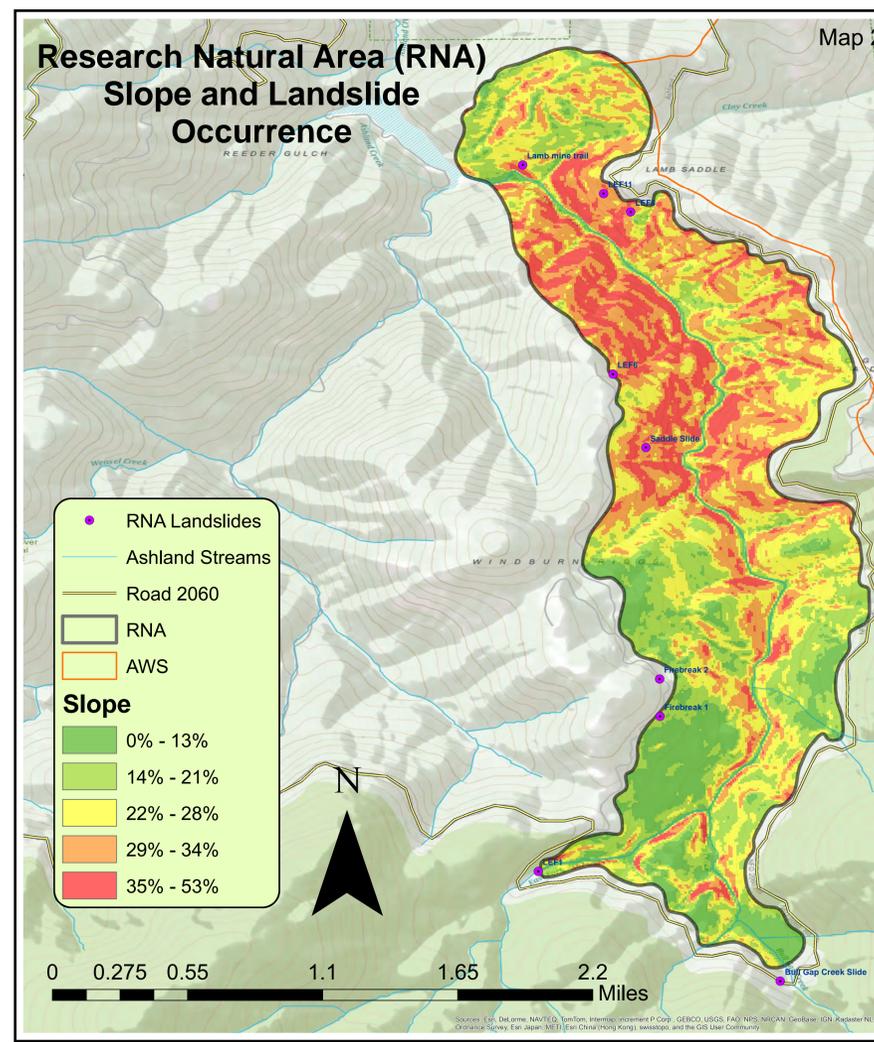
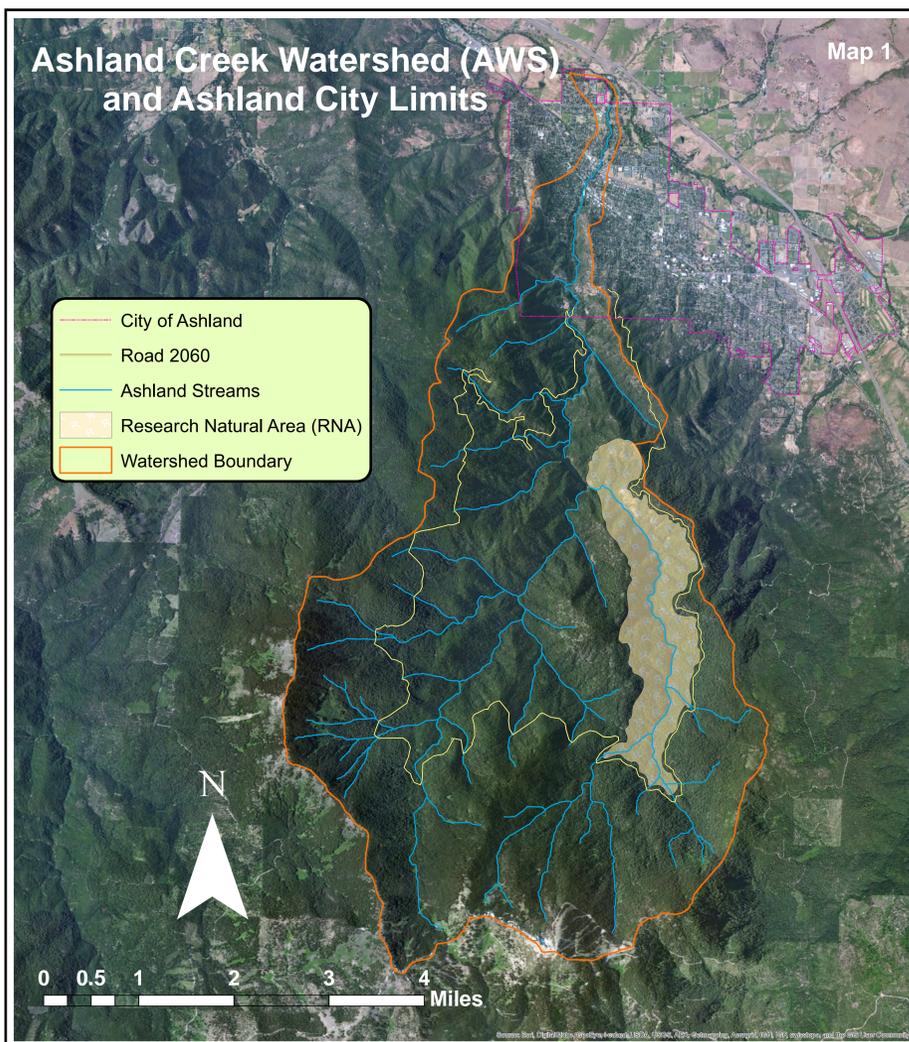


Firebreak Road #2



-History-
Ashland Creek Watershed is located in Southwest Oregon and encompasses 14,425 acres of heavily forested and steeply sloped terrain. 12,406 of these acres drain into the 850 acre-foot Reeder Reservoir, the primary water supply of Ashland, Oregon. Precipitation levels range from 20-40 inches within the watershed. Since 1861, floods in the Rogue basin have occurred with an average frequency of 8.8 years, and since 1948, localized storms in the watershed, causing extensive damage, have occurred with an average frequency of three years. (Wilson and Hicks, 1975).
The slopes are steep; the vegetation makes the soil heavy, and the sometimes sudden precipitation on the slopes create the perfect conditions for landslides to occur in the vicinity of Ashland's main water supply. In 1974 and 1997, dozens of landslide events were triggered by large amounts of precipitation on already saturated soils. After these mass wasting events occurred, United States Forest Service geological engineers Sandra A. Wilson, B.G.Hicks and Dan Sitton, documented the conditions of the landslides (Wilson and Hicks, 1975) (Hicks and Sitton, 1998). Logging and fire roads were constructed after 1952 and have increased the landslide hazards in certain areas of the watershed. Due to long term fire suppression in the watershed, many natural processes have been inadvertently altered. A lack of consistent low intensity wildfire has created an unnaturally dense forest that is highly susceptible to future fires. This buildup of vegetation mass can increase the sheer stress on the hill slope, which can increase landslide risks. Conversely, if the vegetation were completely destroyed in a wildfire, the lack of organic matter and root support would also increase the risk of a landslide. The Ashland Forest Resiliency project has been created to safely address the concern of fuel-buildup within the watershed.

Pictures reflect the Saddle Slide and Firebreak Road #2 in the RNA. Photos taken by Shane Stiles.



-Purpose and Methods-
Due to the importance of upholding the quality of the drinking water in Reeder Reservoir, it is critical to understand the current conditions of landslides in the watershed. This means that there needs to be a more accurate and dependable system in place to monitor landslides in the Ashland Creek Watershed. Current landslide maps of the Ashland Watershed do not include the location of all known landslides to have occurred during the 1974 and 1997 events. Using GPS, we have tracked nine landslides within the Research Natural Area (RNA) of Ashland Creek Watershed. We have focused on this area because, being a virtually undisturbed area of the Ashland Watershed (no thinning will occur here with the AFR project), the RNA can serve as a 'control' from the rest of the watershed. By means of the protocol established by Hicks and Sitton (1998), we are measuring and studying the slope, aspect, geology, vegetation, elevation, and distance from a road or stream of these nine slides in order to determine their effects on the potential landslide hazard. Most importantly, we will address the hazard level of each individual landslide (threat that the landslide poses to contamination of Reeder Reservoir), as well as whether or not the landslide has reactivated since its initial discovery.
We have been working with The Ashland Forest Resiliency (AFR) to layer landslides tracked in the RNA over AFR's Landslide Hazard Map (Map 3). The AFR can then use this information "in an effort to replicate the natural successional process... [when] upholding and protecting critical watershed values" when implementing controlled burns and thinning in the watershed.

Slide Name	Year	Latitude	Longitude	Slide Slope	Hill Slope	Aspect	Elevation	Type of New Growth	Vegetation Density	Reactivation Potential	Movement Type	Disturbed	Previously Logged	Road Affected	Tree Bend	Exposed Bedrock	Hydraulic Influence
Lamb mine trail	1997	42.09.117	122.42.599	42	36	S20W	3077	Oak	Moderate	Low	Earth Slide	No	No	No	Yes	Yes	Yes
Firebreak 2	1997	42.07.353	122.42.115	56	39	N45E	4622	Conifer	High	High	Earth Slide	No	No	Yes	No	No	No
Bull Gap Creek Slide	1997	42.06.282	122.41.689	47	34	N65E	4603	Conifer	Moderate	High	Slump	No	No	Yes	Yes	No	No
LEF1	1974	42.06.671	122.42.545	54	45	S80E	4571	N/A	Low	Moderate	Earth Slide	Yes	No	No	Yes	Yes	Yes
Firebreak 1	1997	42.07.221	122.42.114	42	29	S55E	4513	Conifer	Low	Low	Earth Slide	No	Yes	Yes	Yes	No	No
LEF6	1974	42.08.435	122.42.280	52	44	N55E	4310	Conifer	Low	Very High	Earth Slide	Yes	No	No	Yes	No	No
Saddle Slide	1997	42.08.175	122.42.164	53	40	E	4143	N/A	Moderate	Low	Debris Slide	Yes	No	No	Yes	Yes	No
LEF8	1974	42.09.011	122.42.217	55	31	S65W	3568	Madrone	Low	Low	Rock Slide	Yes	No	No	Yes	Yes	No
LEF11	1974	42.09.073	122.42.323	43	32	S36W	3471	Madrone	Moderate	Low	Rock Slide	Yes	No	No	Yes	Yes	No

Acknowledgements - Joni D. Brazier, Forest Soil Scientist
Rogue River - Siskiyou National Forest; Kerry L. Metten, The Nature Conservancy; Don Boucher, Rogue River - Siskiyou National Forest
Cartographers: Shane Stiles and Melody Thueson - May 7, 2013
State Plane Oregon South FIPS 3602 Feet
Lambert Conformal Conic
D_North American 1983