## Klamath Falls, Oregon, Major Land Resource Area (MLRA) Soil Survey Office (SSO)

# Fire and Soil: SPSD and the Klamath SWCD Team Up to Teach

## Purpose

On November 16, 2023, Brooke Hogan, soil scientist, and Will Natividad, District Manager, Klamath Soil and Water Conservation District (SWCD), led a field visit to an area recently burnt by the Golden Fire for a class from Oregon Institute of Technology (OIT). Professor Ross Wagstaff had asked for their assistance with educating his Environmental Sciences students about wildfire, burned soils, and post-fire remediation efforts. Hogan discussed wildfire behavior, soil burn severity, and erosion risk assessments. Natividad covered post-fire remediation practices and considerations.

## Background

The Golden Fire ignited on July 22, 2023, approximately nine miles north of Bonanza, Oregon. It burned 2,137 acres. The Oregon Department of Forestry declared the fire was contained on August 1, 2023. A Burned Area Emergency Response (BAER) team was not requested for the Golden Fire, likely due to its relatively small size and preponderance of acres burned on private property versus federally owned land.

Hogan gained experience assessing soil burn severity and post-fire erosion threats by participating in one of several Erosion Threat Assessment/Reduction Teams (ETART) following the outbreak of the 2020 Labor Day Fires in Oregon. The 2020 Labor Day Fires were a group of five megafires (over 100,000 acres each) that ignited in mid-Augst to early September and burned a combined ~850,000 acres, destroyed more than 4,000 homes, and killed 11 people (Oregon Department of Forestry 2022).

*Figure 1.—Group photo with OIT students and soil scientist Brooke Hogan (far right).*

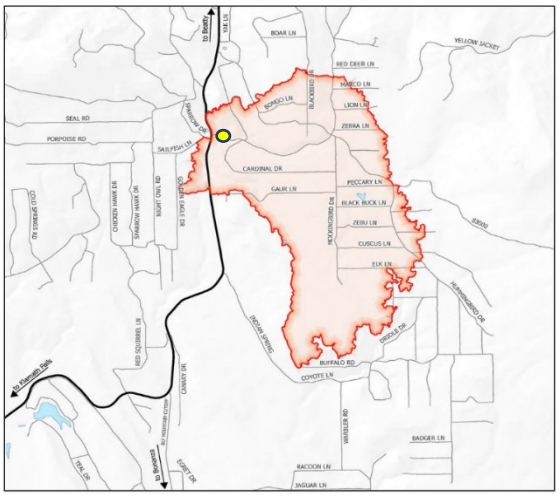


*Figure 2. —Extent of the Golden Fire. (source: Oregon Department of Forestry); yellow dot marks the approximate location of the field visit.*

## Key Outcomes

The class of five students and Professor Wagstaff met Hogan and Natividad at a spot just inside the burn perimeter (Figure 2). The site was chosen for its accessibility, diversity of vegetation mortality, diversity of soil burn severity, and absence of safety hazards.

Hogan explained fire morphology and behavior. The students learned to identify various parts and regions of a fire, such as the point of origin, head, heel, pockets, spot fires, islands, and fingers. They also learned to differentiate between types of fire behavior such as fire whirls, running, crowning, smoldering, torching, creeping, flaring, spotting, and backing.

Then, Hogan discussed the relationship between fire, fuels, and the landscape. The students used their new knowledge to describe how the fire might have behaved on the site based on topography, fuel kind, fuel arrangement, and weather conditions.

Next, Hogan led the students through the process of assessing soil burn severity indicators such as ash color and depth, presence of char, percent ground cover, soil structure, roots, and hydrophobicity. The group compared an area of low soil burn severity to an area of high soil burn severity. To synthesize all the information presented, the students discussed the differences between the two areas that may have contributed to the difference in soil burn severity.

Natividad wrapped up the field visit with a discussion regarding post-fire remediation activities and considerations. He told students about some of the remediation work that the SWCD is involved with related to streams, water quality, and erosion management following wildfire, but also explained how the best course of action post-fire is often to leave burned forestlands alone, unless the burned area poses a threat to human safety, infrastructure, or another resource such as sites of cultural significance, wildlife habitat, bodies of water, etc. Hogan explained the decision matrix that ETART and BAER teams use to decide whether intervention is necessary in the post-fire environment.

## Sources

Oregon Department of Forestry. 2022. *Forest Facts: 2020 Labor Day Fires: Post-fire challenges with invasive plants*. https://www.oregon.gov/odf/pages/publications.aspx (accessed 29 November 2023).

Oregon Department of Forestry. 2023. *Golden Fire*. InciWeb Incident Information System. https://inciweb.wildfire.gov/incident-information/or98s-golden-fire (accessed 29 November 2023).