

Managing Douglas-fir Mortality in Western Oregon's Valley Edges: A Case Study Approach

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Background

Oregon Drought Monitor:

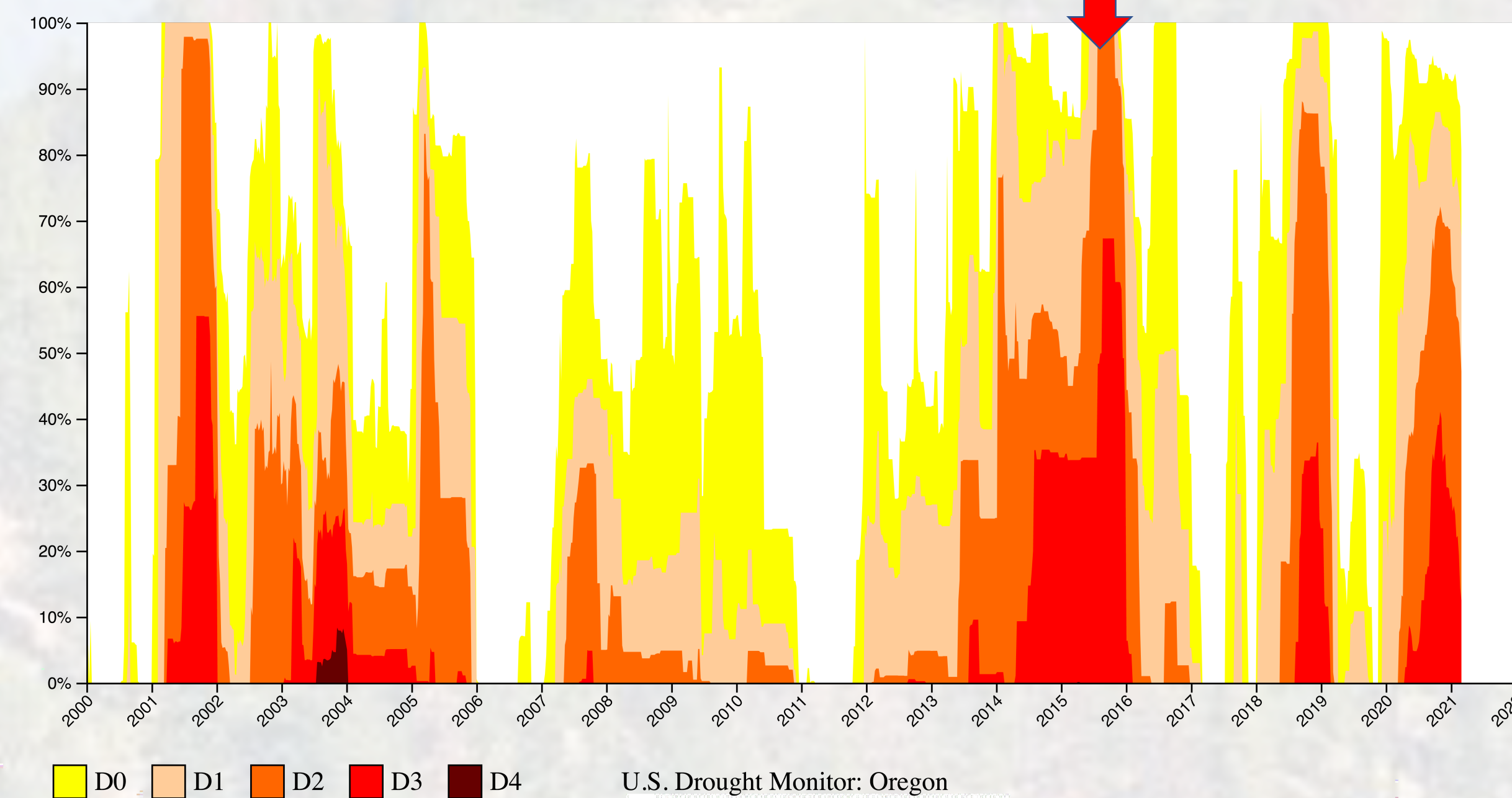


Figure 1: 20 years of drought monitoring in Oregon. Arrow indicates period of extended, extreme drought around 2015.

An increase in frequency and severity of hot, drier summers (figure 1) appears to be causing a dramatic shift in the coniferous forests of Western Oregon's valleys, especially on properties along the low-elevation edges of the valleys that are often privately owned. Douglas-fir is declining in these forests (figure 2), and many landowners are at a loss with how to manage their properties.

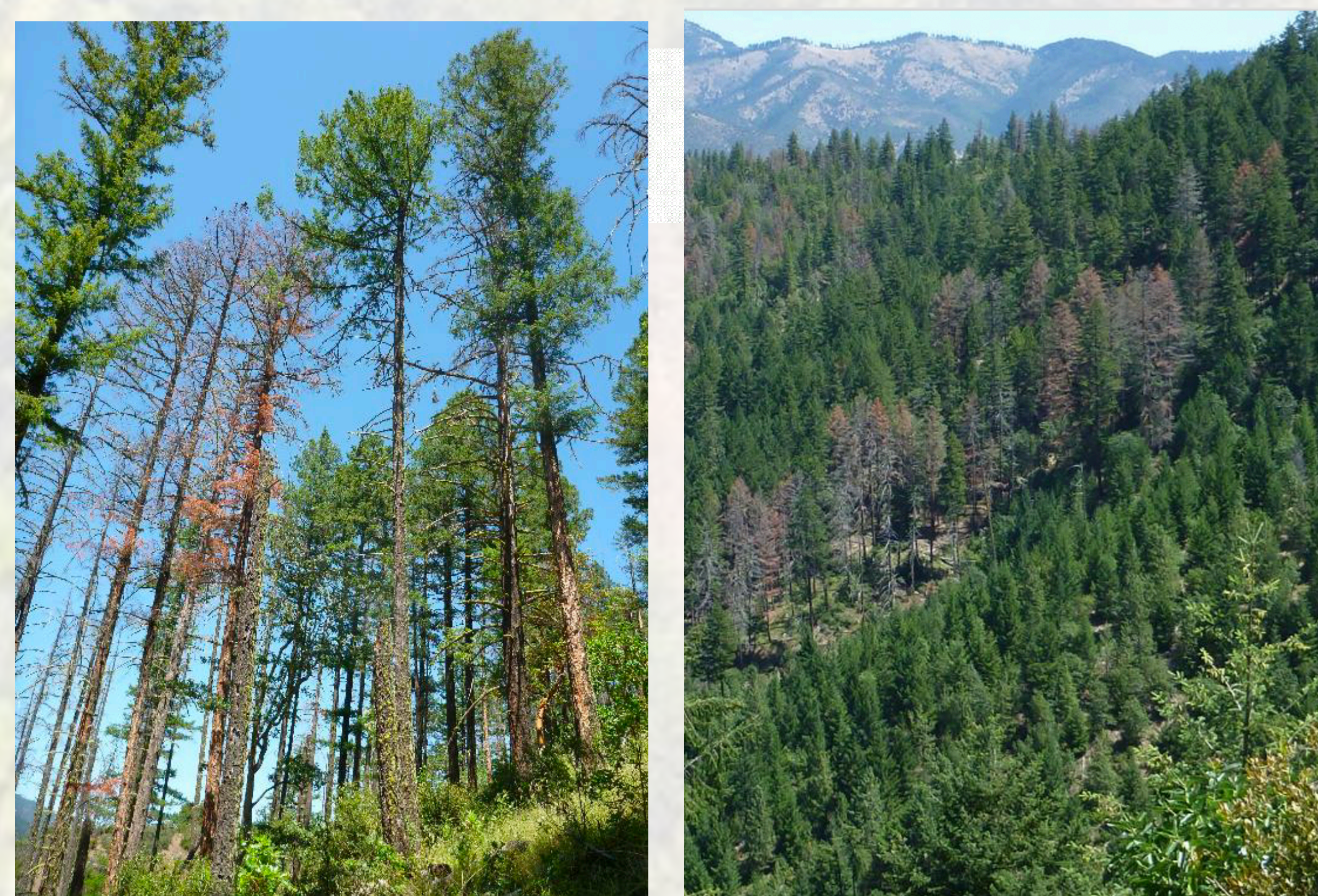


Figure 2: Photos of recent Douglas-fir mortality in the Applegate Valley of southern Oregon. PC: Bill Schaupp and Josh Bronson

Project Plan

Research Question

Based on a combination of site characteristics of an area with mortality, landowner values, and land use history, what are the most economically, socially, and ecologically feasible options for forest management in response to the mortality?

I will visit five properties in western Oregon (figure 3) with forests across a wide range of site and stand characteristics that contain recent Douglas-fir mortality. Landowners will be interviewed to collect information about their forest and the values they place in the declining stand.

I will then compile this information and create a list of management options for each case study based on the information I collected, along with a discussion about potential benefits, costs, and challenges in implementation of each option. These case studies will be made available to landowners seeking guidance on how to manage mortality on their property and encourage some deviation from the homogeneity of Oregon's Douglas-fir plantations. The process will also be documented as a guide for landowners and extension agents in other regions dealing with similar mortality issues.

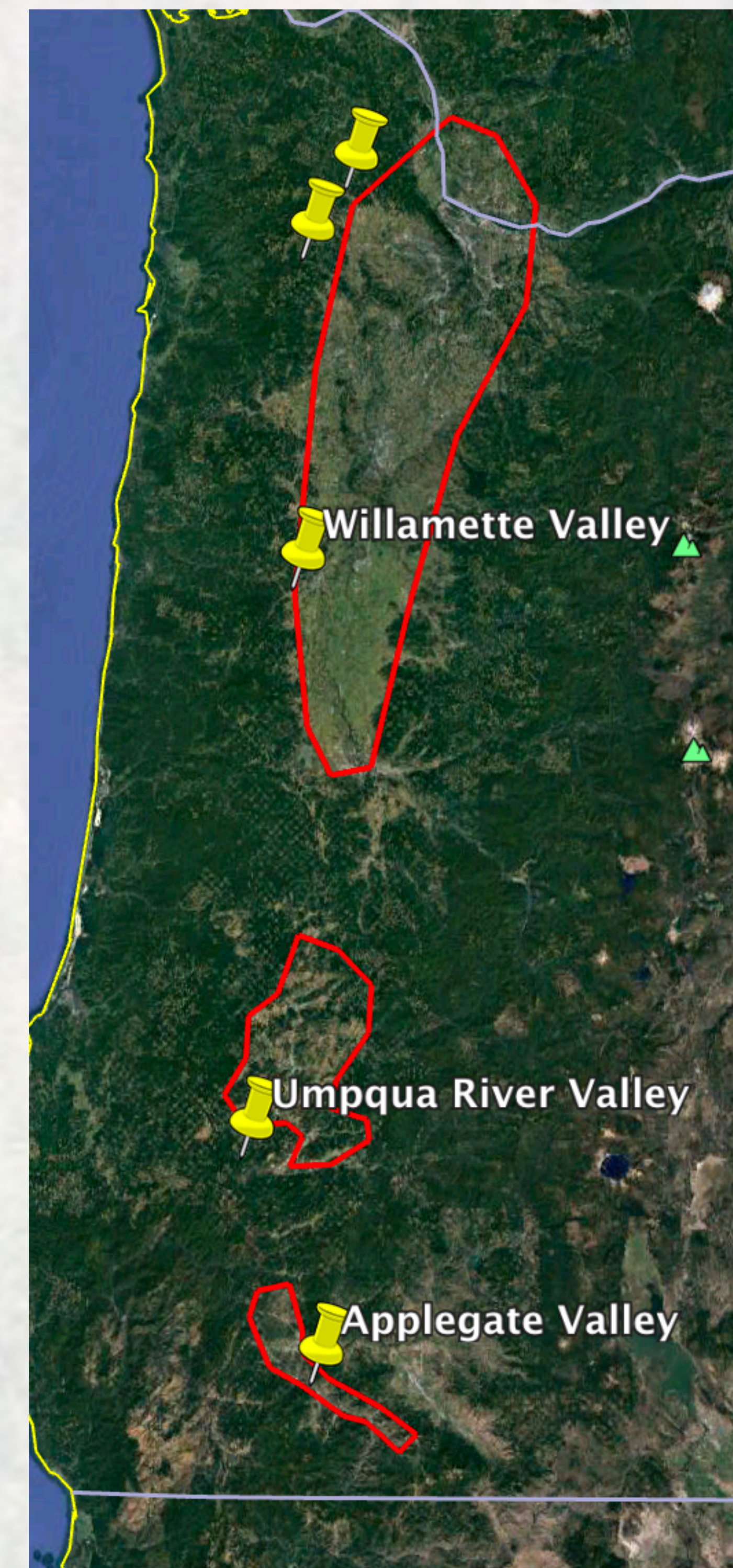


Figure 3: Map of 5 general locations of case studies on western Oregon valley edges. Valleys labelled and outlined in red.

Expected Product

Case Study Outline

Site Characteristics:

- Aspect, soil type, slope, elevation, site index, annual temperature and precipitation in the 5-year period around 2015
- Tree species composition, dominant age, number of cohorts, stand size, understory vegetation

Stand History:

- Logging history, historic species composition, fire history, disease/infestation history, grazing and other management history

Landowner's Values:

- Focus on income or partial income, and/or wildlife habitat, and/or aesthetic value, and/or recreation, or others

The Problem:

- % mortality on stand, number of acres affected, year the decline was first noticed, symptoms

The Potential Pathways:

- Based on this information, we list options the landowner has moving forward:
 - E.g. harvest trees that recently died for profit; plant Ponderosa pine, red alder, hazel, western redcedar, and others, depending on soil conditions, etc.; leave the older snags for woodpecker habitat; plant a variety of shrubs and other flowering plants and start an apiary in the forest; begin a mushroom harvesting business; and create a conservation easement.

References

Google Earth Pro V 7.3.3.7786. (July 21, 2020). Willamette Valley, OR. 44° 19' 52.83"N, 123° 20' 18.85"W, Eye alt 173.65mi. SIO, NOAA, U.S. Navy, NGA, GEBCO. Image Landsat / Copernicus. Data LDEO-Columbia, NSF, NOAA. 2021 Google.
National Integrated Drought Information System, and NOAA. (n.d.). Historical Data and Conditions. <https://www.drought.gov/historical-information?state=oregon&countyFips=41023&dataset=1&selectedDateUSDM=20100803&selectedDateSpi=20161001>.