

North Coastal Range and Klamath Mtns

July 17th-21st, Sep 21st-25th, Oct 12th- 14th 2015

Background: Many of California's forests are overly dense with trees and experiencing four years of exceptional drought. Tree mortality continues to increase in most areas, sometimes dramatically with an estimated more than 1.75 million trees killed in this area. This portion of the 2015 regular survey was conducted primarily along the North Coast and Coastal Range Areas as well as the Klamath Mountains and Cascade Range and includes the Mendocino, Six Rivers, Shasta-Trinity and Klamath National Forests. Surveys of this area had begun in early July 2015, but were delayed for months due to flight restrictions, smoke obscuration and safety concerns created by hundreds of fires, primarily in the Trinity area, but stretching from the Valley Fire in southern Lake County to the Gasquet Complex near the Oregon border, to the Military Fire east of Mt. Shasta. Most of the Mendocino, Trinity and southern areas were flown earlier in July. Coastal areas were flown later by request to better ascertain the extent and severity of Sudden Oak Death, however delays lasted well into October. Unlike the exceptional drought conditions occurring throughout most of the state, drought conditions in this area were categorized as only severe to extreme according to the USGS National Drought Monitor in Dec 2015. (Fig. 1)

Objective: Detect and map extent and severity of tree mortality and other damage including drought stress throughout Northwestern CA.

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Methodology: Surveyors mapped recently dead or currently injured/stressed trees using a digital aerial sketch-mapping system while flying in a light fixed-wing aircraft approximately 1,000 feet above ground level. Surveyors recorded the species of tree affected, estimated number of recently killed trees and/or any type of other damage (defoliation, dieback etc.) detected at each mapped location.

Details:

- More than 12.5 million acres were surveyed (Fig. 1, 3); primarily on the Mendocino, Six Rivers, Shasta-Trinity and Klamath NFs, Redwood National Park and many State Parks. Other areas of note include the southern portion of the Rogue River-Siskiyou NF, Wiskeytown NRA, King Range NCA, Hoopa and Round Valley Indian Reservations, industrial forest lands and smaller private lands along the northern coast, as well as privately owned oak woodlands in the Great Valley and elsewhere.
- Ponderosa pine is the most common pine species in the area and was the most commonly mapped mortality at almost 157,000 acres but was mostly scattered and at low intensities (Fig. 2, 4). Mortality of white fir (Fig. 5) and other pine species (Fig. 6, 7) was also common and also scattered. Areas with the most mortality included eastern Klamath NF, northern and eastern Mendocino NF, southern Shasta-Trinity NF and areas around Weaverville, generally correlating with where drought conditions are considered more extreme to the east.
- Mortality in young Douglas-fir/redwood plantations attributed to bear feeding damage was again widespread with an estimated 360,000 trees killed over 74,000 acres. (Fig. 8)
- Tanoak, and to much lesser extent other oak mortality, attributed to sudden oak death has been reduced as drought conditions inhibit spread of this pathogen. Mortality was common at low intensities along coastal areas with an estimated 33,600 trees killed across 4,500 acres. Areas of highest activity included east of Garberville and west of Ukiah where the pathogen has been established for many years. (Fig. 9)
- Chronic flagging caused by *Cytospora abietis* in fir was common and often severe in high elevation areas especially in the Trinity area.

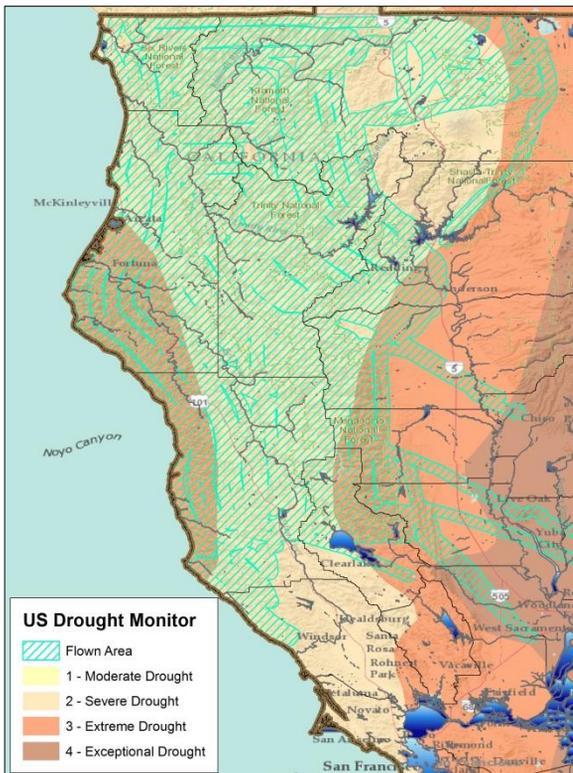


Figure 1. Flown area and drought conditions as of Dec 1st, 2015 based on USGS Drought Monitor.

Summary:
 Acres surveyed: 12.6 million
 Acres with mortality: 384,000
 Estimated number of dead trees: 1,755,000

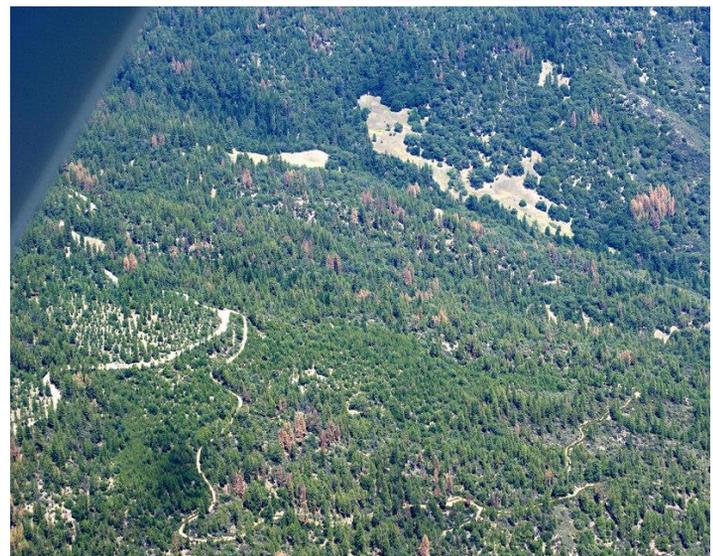


Figure 2. Scattered as well as grouped ponderosa pine mortality south of Ball Mtn. on the Grindstone Ranger District of eastern Mendocino NF.

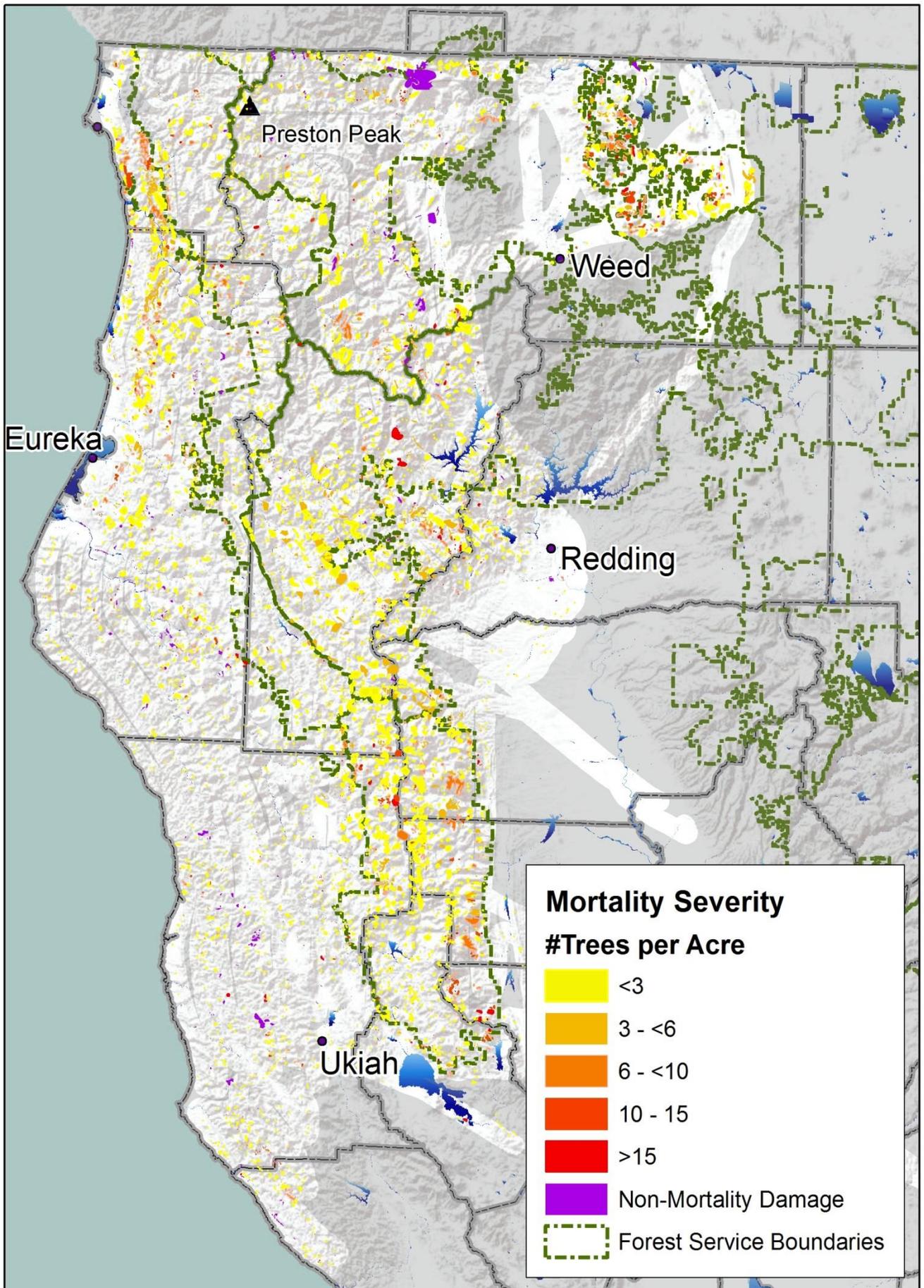


Figure 3. Map of area surveyed depicting tree mortality and other damage.



Figure 4. Ponderosa pine mortality north of Garner Mtn. on the Goosenest Ranger District, Klamath NF.



Figure 5. White fir mortality near West Haight Mtn. on the Goosenest Ranger District, Klamath NF.

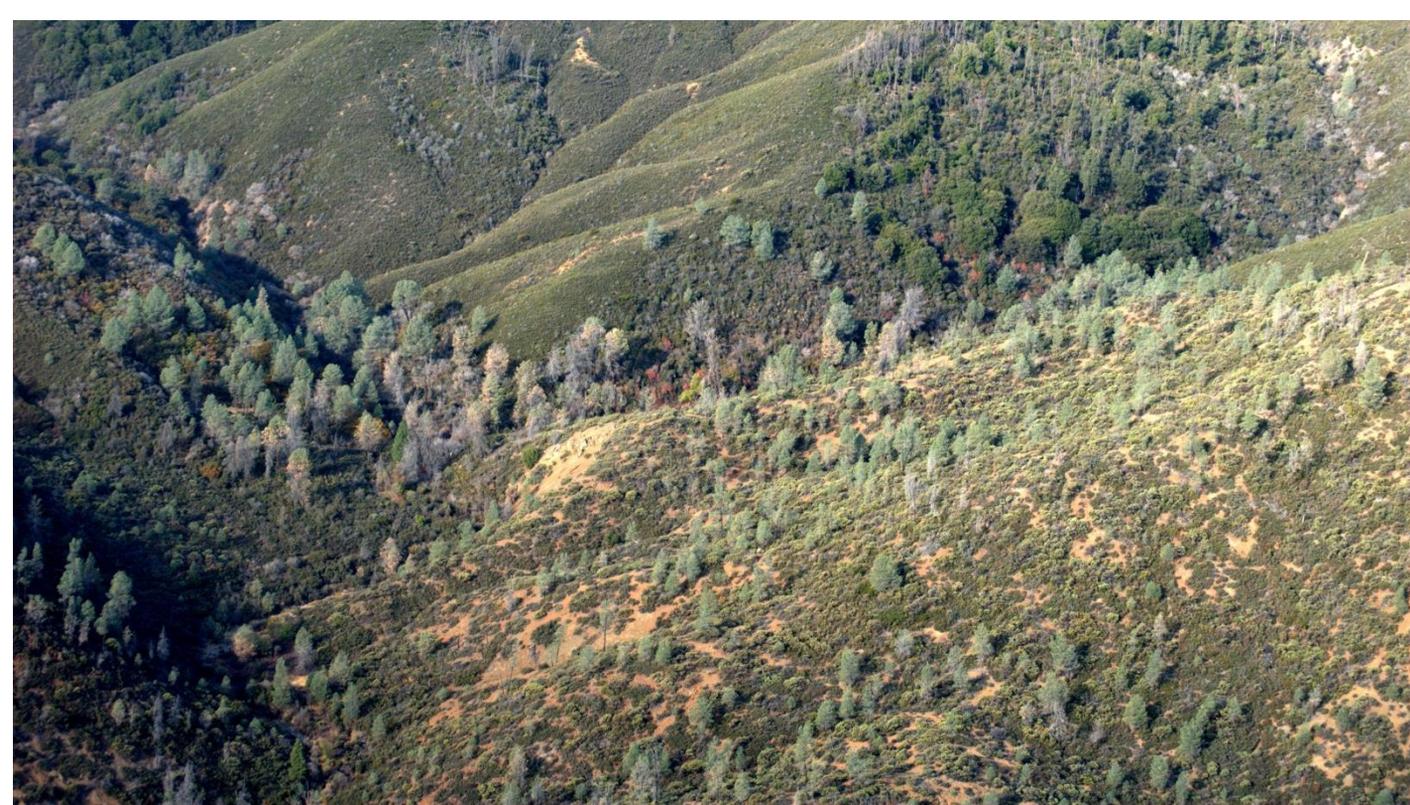


Figure 6. Gray pine mortality south of Hall Ridge on the Grindstone Ranger District, Mendocino NF.



Figure 7. Past and current knobcone pine mortality Near St. John Mtn. on the Grindstone Ranger District, Mendocino NF.



Figure 8. Past and current mortality in a young plantation Douglas-fir/redwood plantation attributed to bear feeding damage near Westport along the northern coast of CA.



Figure 9. Recent tanoak mortality likely caused by sudden oak death, east of Newport along the coast of northern CA, Mendocino County.