

## Aerial Detection Survey – April 8<sup>th</sup>-10<sup>th</sup>, 2015

**Background:** California is in its third year of drought. In 2014, a large increase in tree mortality was observed, especially in the Central Coast and Southern Sierra Ranges. Ground observations noted a continued increase in mortality after the 2014 surveys were flown in July. An early season aerial survey was conducted in the spring of 2015 in response to the continuing drought and the resulting tree mortality. Another early survey over the Southern Sierra Range is scheduled for the week of April 13th.

**Objective:** Detect and map extent and severity of tree mortality which occurred after the 2014 aerial surveys in Southern California Forests.

**Surveyors:** J. Moore, Z. Heath, T. Short

**Dates:** April 8<sup>th</sup>-10<sup>th</sup>, 2015

**Methodology:** Recently dead or injured trees were mapped visually by a surveyor using a digital aerial sketch-mapping system flying in a light fixed-wing aircraft approximately 1,000 feet above ground level. The surveyor recorded the number and species of affected trees and type of damage (mortality, defoliation, etc.) at each mapped location.

**Details:**

- More than 4.2 million acres were surveyed; covering the majority of the Cleveland, San Bernardino, Angeles and Los Padres National Forests. Pinnacles National Monument and nearby private lands were also surveyed. See Figures 1,2,6 and 13.
- On the Descanso RD of the Cleveland National Forest, a substantial increase in pine mortality over much of the Laguna Mountain area was observed. As the black oak were still leafing out at the time of the survey, no attempt to map gold-spotted oak borer-related mortality was made. See Figure 3.
- Only relatively low levels of mortality were observed on the Palomar and Trabuco Districts. A large area of scattered live oak mortality, possibly from gold-spotted oak borer, was seen south of the Palomar Ranger District. Figure 4.
- On the San Bernardino NF, increased pine mortality was observed in the Idyllwild and Thomas Mountain areas of the San Jacinto District. See Figure 5.
- On the Angeles National Forest, large areas of fairly intense live oak mortality were observed along the southern extent of the Forest. See Figure 7. Pine mortality also continued along the northern ridges of the Forest at light to moderate levels.
- On the main division of the Los Padres NF, expanded severe mortality was observed in areas around Mt. Pinos and Frazier Peak. See Figures 8–12.
- On the Monterey District, pine mortality was common. See Figures 14 and 15. However, a decrease in sudden oak death-related mortality was mapped, likely a result of the drought conditions. See Figure 16. Additionally, low levels of Santa Lucia fir mortality was witnessed in most places it occurs.
- On private lands north of Pinnacles National Monument, extensive areas of Coulter and gray pine mortality, as well as live oak mortality, was observed for the third year in a row. See Figures 17-20.

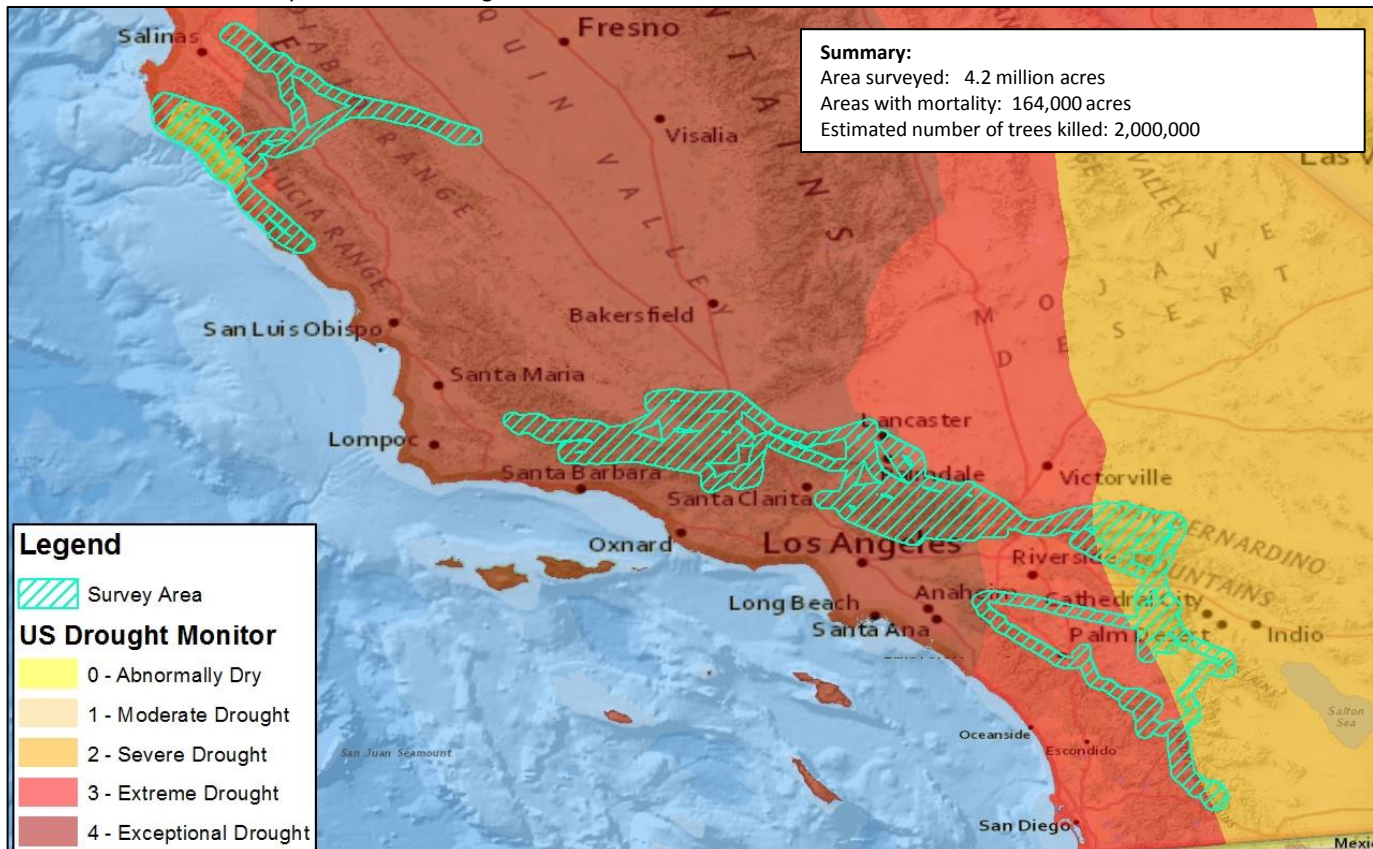


Figure 1. Flown area and mapped tree mortality and damage.

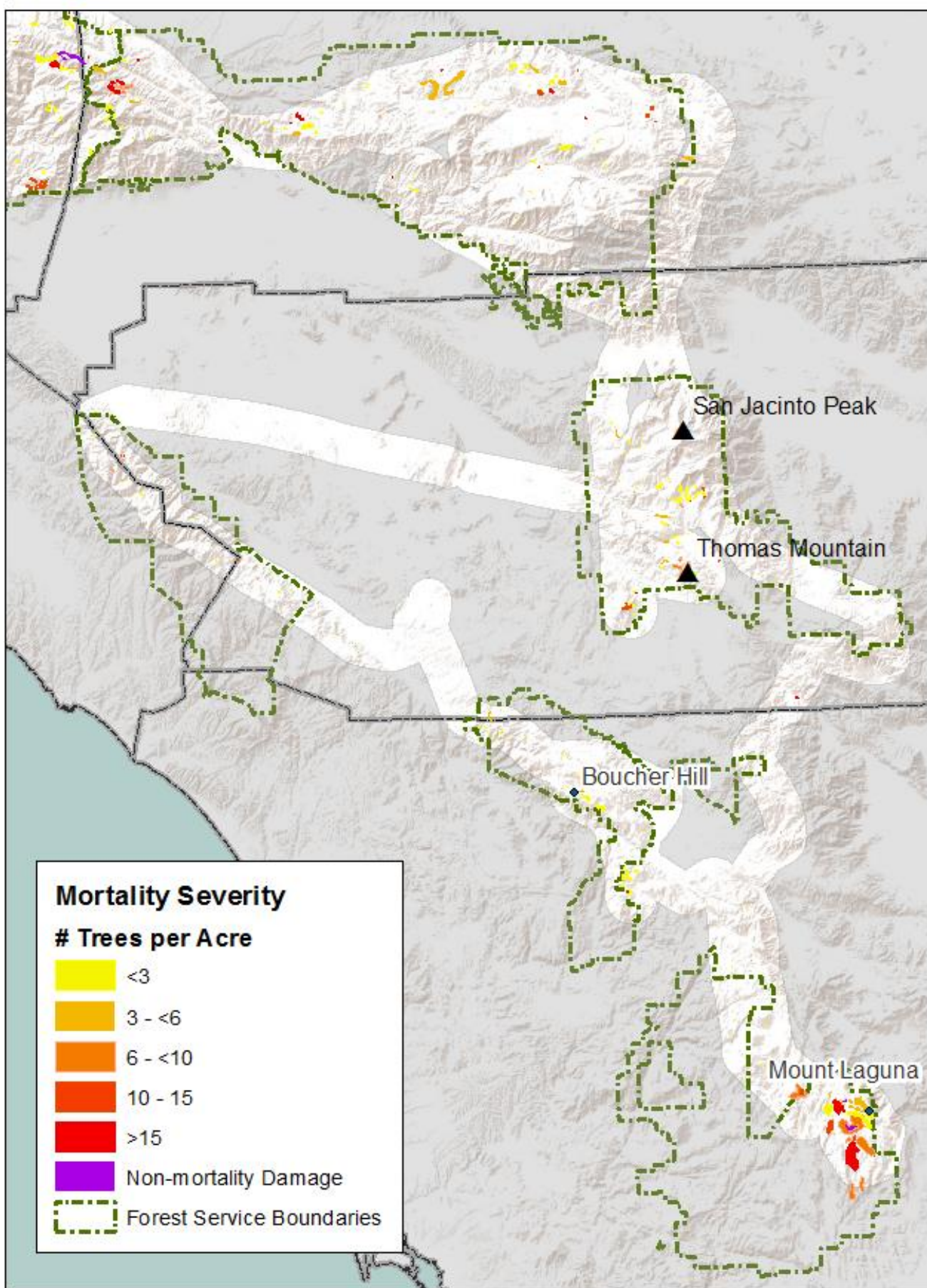


Figure 2. Flown area and mapped tree mortality and damage on and around the Cleveland and San Bernardino National Forests.



Figure 3. Scattered Jeffrey pine mortality (foreground) on Laguna Mountain on the Cleveland NF, with a recent fire scar in background. Gray trees are dormant black oak or possibly dead oak.



Figure 4. Live oak mortality south of Palomar Ranger District on the Cleveland NF.



Figure 5. Pine mortality on the San Bernardino National Forest, south of Idyllwild.

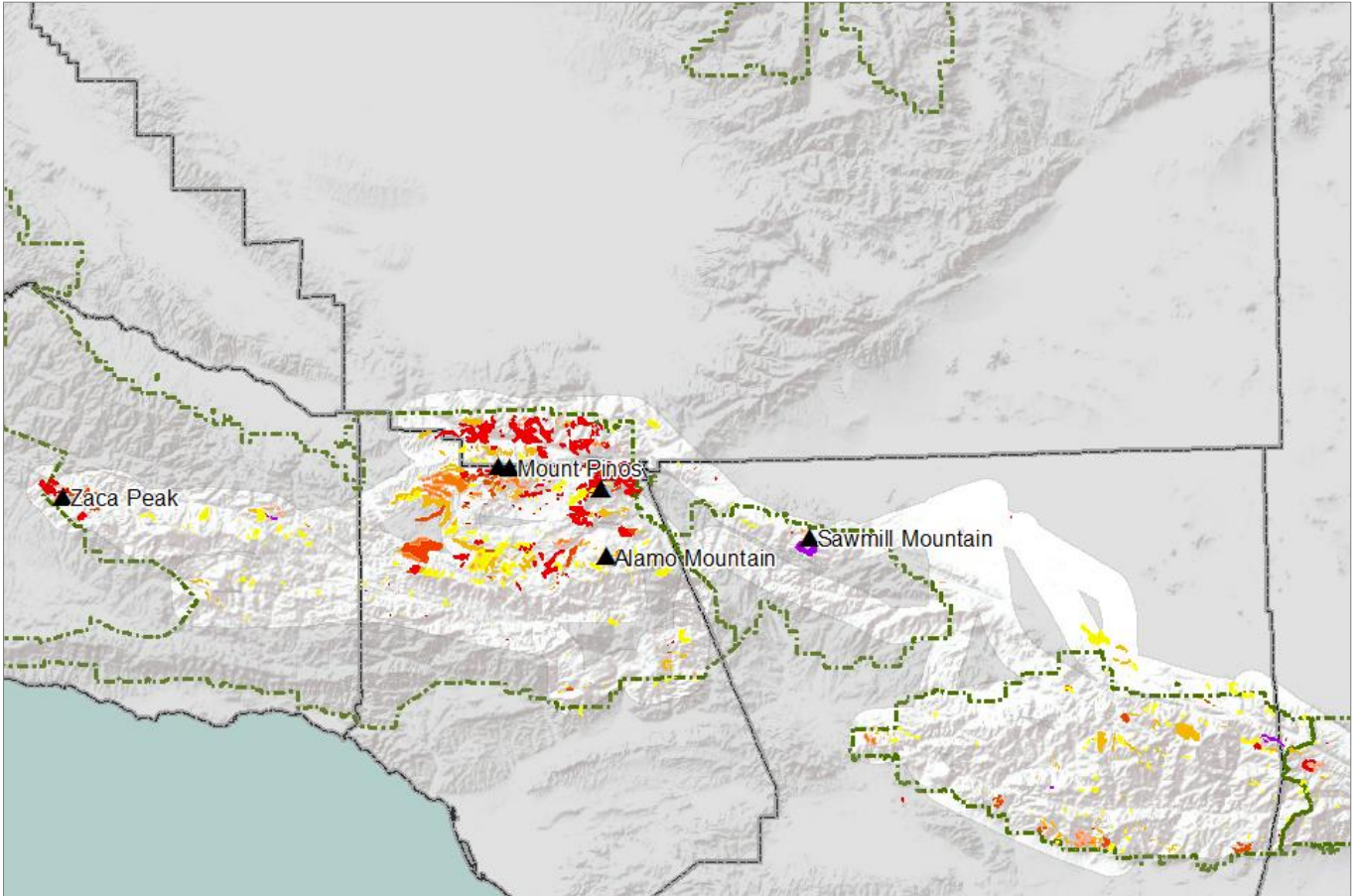


Figure 6. Flown area and mapped tree mortality and damage on and around the Angeles and southern Los Padres National Forests.



Figure 7. Live oak mortality on the Angeles National Forest, east of Santa Clarita.



Figure 8. Recent as well as older pinyon mortality near Mt. Frazier on the Mt. Pinos RD of the Los padres NF. Also note that green trees are discolored and symptomatic of drought stress.



Figure 9. Mixed pine mortality on the Los Padres National Forest, north of Frazier Park.



Figure 10. Pinyon pine mortality on the Los Padres National Forest, southwest side of Frazier Peak.



Figures 11, 12. Pine mortality near Figueroa Mountain on the Santa Lucia RD Los Padres NF.

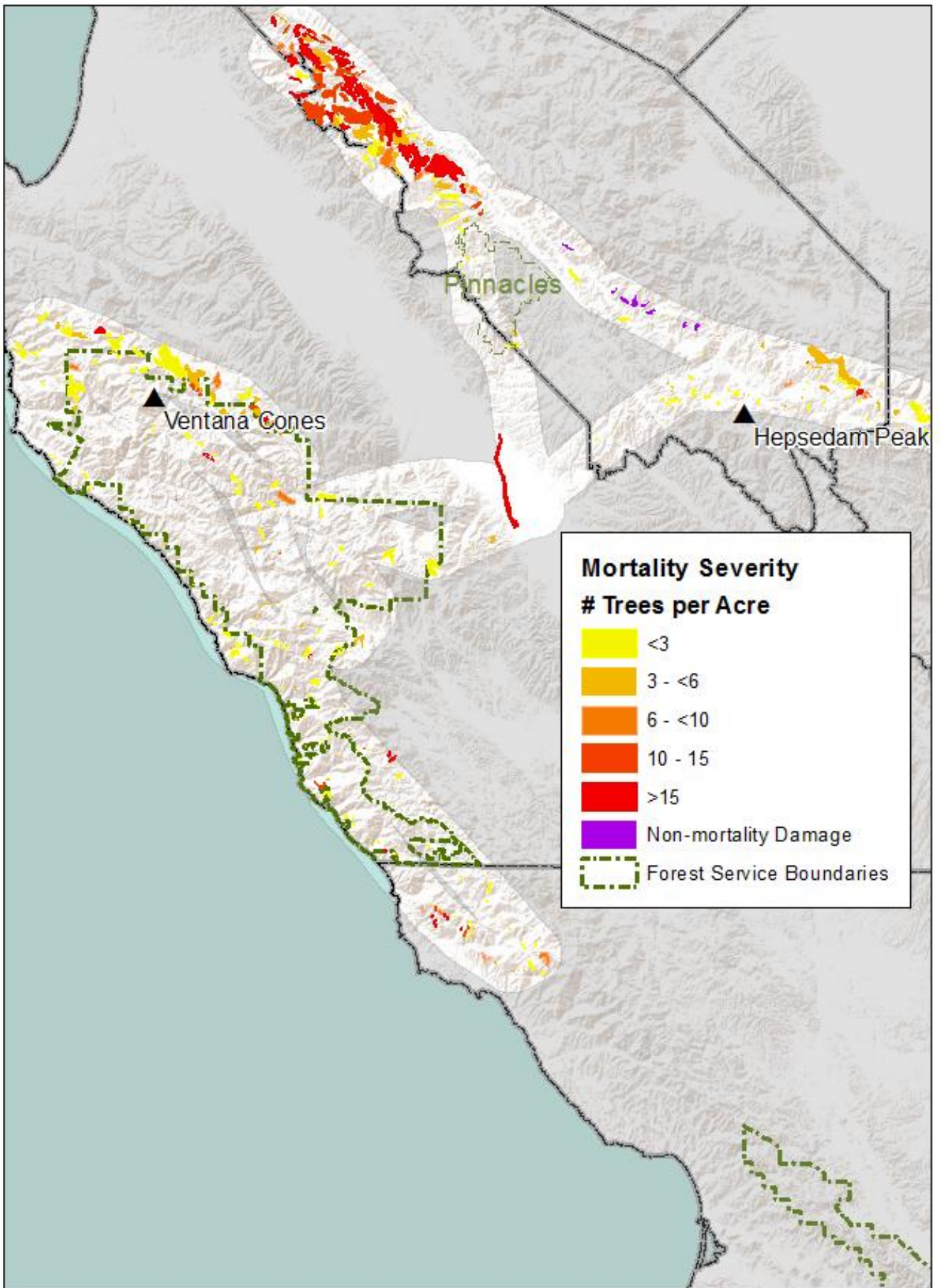


Figure 13. Flown area and mapped tree mortality and damage on and around the Monterey District of the Los Padres National Forest and the Pinnacles National Monument.





Figure 14, 15. Pine mortality on the Monterey Ranger District, Los Padres National Forest.



Figure 16. Tanoak mortality, probably from sudden oak death on the Monterey Ranger District.



Figure 17. Pine mortality in a plantation north of Pinnacles National Monument.



Figure 18. Live oak mortality north of Pinnacles National Monument.



Figure 19. Pine mortality, north of Pinnacles National Monument.



Figure 20. Pine mortality north of Pinnacles National Monument.