

2023 HIGHLIGHTS OF TREE MORTALITY FROM INSECTS AND DISEASES AS SEEN BY AERIAL SURVEY

Approximately 38.2 million acres surveyed in California

PACIFIC SOUTHWEST REGION

CALIFORNIA PINES

WESTERN, MOUNTAIN, and JEFFREY PINE BEETLES

- Native insects which attack several pine species
- Pine mortality remains greatly elevated (~6x background levels)
- Pine beetle-caused mortality **made up 11%** of detected mortality in California in 2023
- ★ Working across ownerships and landscapes to improve resilience to insects, diseases, and wildfire

CALIFORNIA OAKS

GOLDSPOTTED OAK BORER

- Invasive insect which attacks several western oak species
- First identified in San Diego County in 2008; **now present in 4 additional counties**
- GSOB-caused mortality from aerial survey has declined in recent years
- ★ Monitoring and treating high value individual trees



HAWAI'I 'ŌHI'A

RAPID 'ŌHI'A DEATH (ROD)

- Continues to significantly impact all districts of Hawai'i Island, with further spread on Kaua'i and O'ahu
- Incorporating remote sensing of high-resolution satellite imagery to map the extent of ROD
- Researching effects of storm events, ambrosia beetles, and feral hoofed animals on disease spread
- ★ Implementing management techniques to monitor and suppress ROD
- ★ Developing an 'ōhi'a resistance program

CALIFORNIA OAKS

SUDDEN OAK DEATH (SOD)

- Exotic tree disease which kills several oak species and tanoak in particular in coastal forests
- SOD spreads primarily during wet spring events
- New SOD-caused mortality has been **significantly reduced** in recent years due to drought.
- ★ Cooperating with Tribes and other partners to evaluate tanoak for resistance against SOD

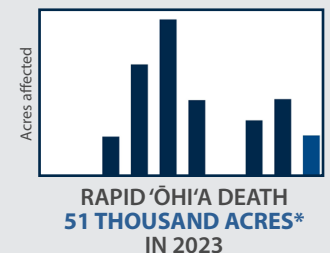
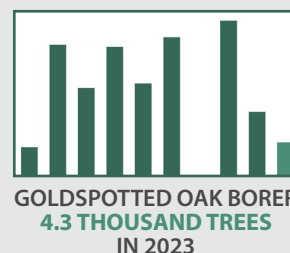
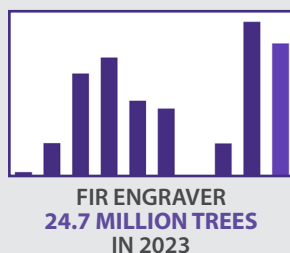
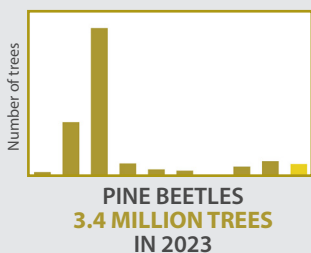
CALIFORNIA FIRS & DOUGLAS-FIR

FIR ENGRAVER (FEB)
FLATHEADED FIR BORER

- FEB is a native insect significantly impacting California red fir and white fir
- FEB-caused mortality **made up 84%** of detected mortality in California in 2023
- Flat headed fir borer is a native insect attacking Douglas-fir; it **made up an additional 3%** of detected mortality in California in 2023
- Douglas-fir tussock moth severely defoliated 9,600 acres in the northern Sierra Nevada Range but has not yet caused tree mortality
- ★ CCI funding helps improve resilience in CA forests, including where firs grow

☆ An action the US Forest Service is taking.

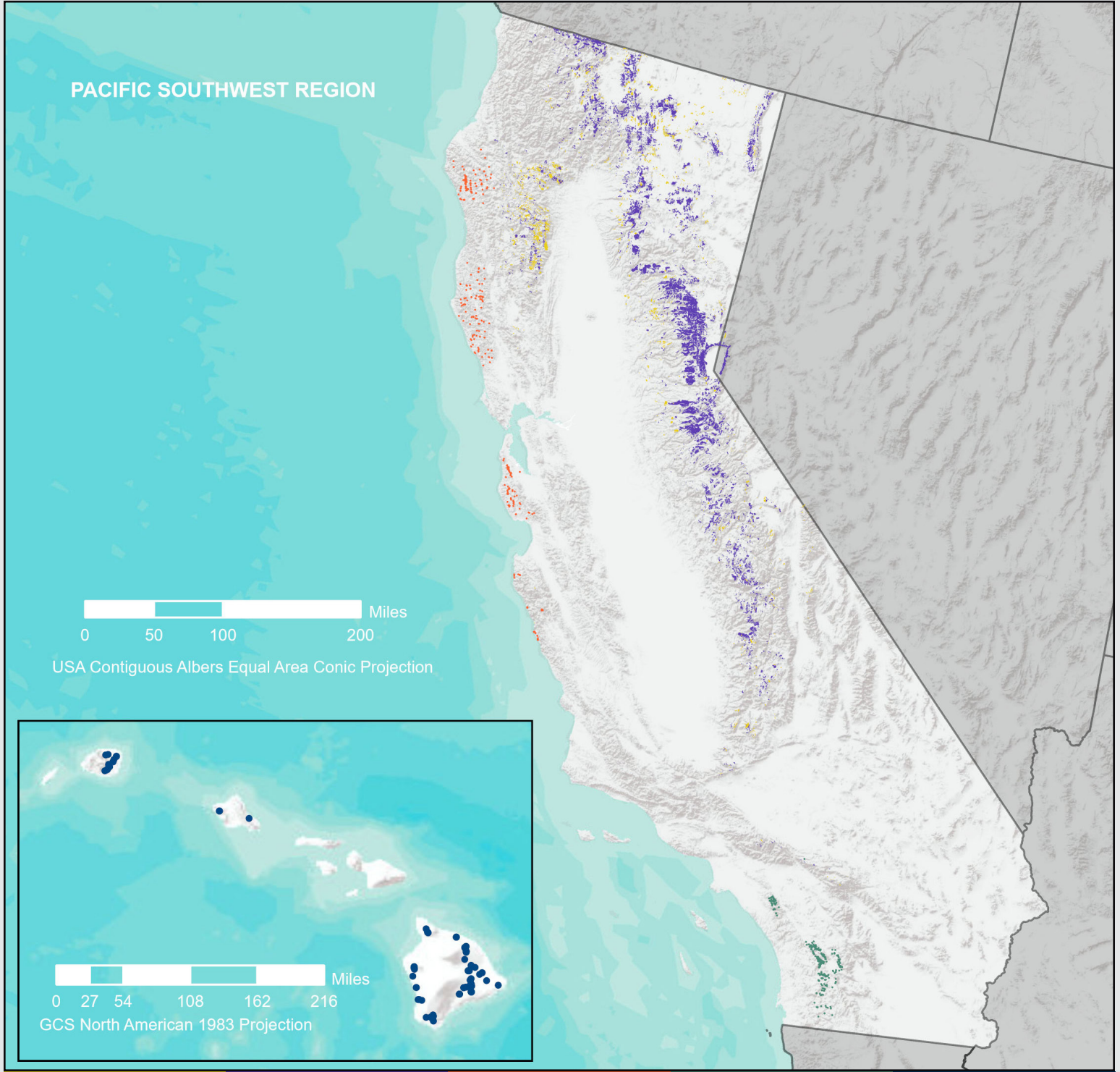
TREE MORTALITY SURVEY TRENDS 2014 - 2023



Note: The units of measurement of mortality for above charts vary by pest. No statewide data for California available for 2020 due to COVID-19 precautions.



2023 INSECT AND DISEASE SURVEY



- Pine beetles
- Fir engraver
- Sudden oak death
- Goldspotted oak borer
- Rapid 'ohi'a death