

Douglas-Fir Mortality



Overview

Douglas-fir dieback in Oregon has become increasingly common in areas where it was previously thriving. The highest intensity dieback has been concentrated in southern Oregon and more recently throughout the Willamette Valley. Much of this dieback is occurring due to increasing drought stress due to climate change. These drought-stressed trees are then finished off by opportunistic insects such as the Douglas-fir beetle (a type of bark beetle) and the flatheaded fir borer. Some of these dieback sites had previously successfully supported Douglas-fir for many years; however, temperature is increasing and precipitation is decreasing too quickly for local stocks to adapt.



Site features that increase or compound the impact of drought include:

- Soil type: thin, rocky, porous, or poor-quality soils that do not retain sufficient moisture
- Exposure to the elements: trees located along edges, ridges, or south-facing slopes are exposed to more sun, wind, snow/ice damage
- Site use history: prior Christmas tree, agriculture, or grazing use at a site result in more compacted or reduced organic soil depth.
- Site location: fringe habitat that is better suited for more drought-tolerant species, such as oak and pine.

The ODF and U.S. Forest Service joint publication, [2024 Oregon Forest Health Highlights](#), reports the following aerial detection survey statistics based on the 28 million acres of forestland surveyed in Oregon:

- 84,000 affected acres of tree mortality statewide across all tree species, from all abiotic (environmental) and biotic (insects and diseases) agents
- The majority of tree mortality (~79,000 acres) across the state is from drought and opportunistic native beetles
- Some of the most significant insect activity observed resulted from drought followed by opportunistic insects such as flatheaded fir borer which consisted of approximately 10,000 observed acres of Douglas-fir in southern Oregon and parts of the Willamette Valley that have suffered from years of drought stress, with some growing in poor soil or sites.



Responding to Douglas-Fir Mortality

Droughts will continue to stress Oregon's forestlands. Recommendations to help forestlands adapt include:

- Reducing tree density to increase moisture availability at better quality sites.
- Shifting toward more drought-adapted Douglas-fir seedlots/genotypes at moderate sites.
- Shifting species away from Douglas-fir to more drought-tolerant species at poor quality and fringe sites.

ODF foresters provide free technical assistance to private forest landowners. You can find your local forester using the [Find a Forester](#) tool on ODF's website. ODF foresters, working alongside forest entomologists and pathologists, can help landowners identify forest pest problems and develop strategies to manage pests. This may include developing a site-specific plan to meet management objectives or help navigating financial assistance programs to help private forest landowners obtain their goals for responsibly managing natural resources.

Additional Information & Resources

The ODF Forest Health Unit helps maintain and improve the health of Oregon's private and state-owned forests. Our forest health professionals conduct aerial and ground surveys to monitor forest insects and tree diseases. They provide technical advice and training in the use of integrated pest management principles to help professional foresters and landowners meet their management goals and objectives.

Fact sheets, which include best management practices for landowners:

- [Drought Stress in Conifers](#)
- YouTube Video series on Bark Beetle: [Part 1](#), [Part 2](#) and [Part 3](#)
- [Douglas-fir Beetle Forest Health Fact Sheet](#)
- [MCH for Douglas-fir Beetle Forest Health Fact Sheet](#)
- [Slash Management for Bark Beetle Prevention Forest Health Fact Sheet](#)
- [Flatheaded Fir Borer Forest Health Fact Sheet](#)
- [Douglas-fir Pole and Engraver Beetles Forest Health Fact Sheet](#)



A comprehensive guide on the issues, management practices and relevant resources is in development and will be posted to the [ODF Forest Health webpage](#) when complete.

