The National Agroforestry Center (NAC) produced numerous riparian forest buffer planning tools. A buffer is a managed area of forest and vegetation adjacent to a stream, lake, or wetland, primarily to provide conservation benefits. The NAC tools help landowners optimally design riparian buffers to increase water quality, stabilize stream banks, protect from storm damage, and increase and diversify farmland income.

**FOREST HEALTH**

**Forecasting California Tree Mortality for 2017**

For the second consecutive year, researchers have produced a map of California showing the location and severity of likely tree mortality from the state’s prolonged drought and bark beetle epidemic. The 2017 forecast suggests that bark beetle-caused mortality should subside in many parts of California.

**PUBLIC HEALTH**

**Urban Forests and West Nile**

A recent study investigated risk factors.
2017 Bark Beetle Forecast for California

California experienced extremely high levels of tree mortality in 2016 because of the combined effects of drought and bark beetles. Images like the one to the right were common in the southern Sierra Nevada Range, and aerial surveys conducted by the U.S. Forest Service estimated that 102 million trees have died in California since 2010.

To help land managers anticipate the risk of tree loss ahead of these surveys, Haiganoush Preisler from the Pacific Southwest Research Station, Sheri Smith and Zachary Heath from Forest Health Protection, and Nancy Gruelke from the Western Threat Assessment Center created a forecast of the intensity and location of bark beetle-caused mortality, by analyzing historical aerial survey data and variables known to influence bark beetle success, such as precipitation and stand density.

The 2017 Forecast

The forecast is based on history of drought (amount of precipitation) and bark beetle activity in 2016. 2016 was very wet and cool.
2017 Bark Beetle Forecast for California

The 2017 Forecast

The forecast is based on history of drought (amount of precipitation) and bark beetle attacks in each 2.5’ (6.5 square mile) grid cell from 1993 to 2016. Cells with similar histories of bark beetle activity and precipitation were then grouped together into ten risk (color) groups. These risk groups (R) forecast a range of the likely number of trees expected to die from bark beetles by the end of summer 2017.

Figure 1. Legend for the map to the right. Areas of dark blue represent a low likelihood of any mortality, whereas the dark red indicates intense levels of mortality. The bars show the range of values in terms of dead trees per square mile to expect in each color category. Each cell is roughly 6.5 square miles in area. The different categories are described below.

Frog and Rancheria Project Areas
Sequoia National Forest
2017 Bark Beetle Forecast for California

Category R8

Dead trees common throughout, with mortality affecting hundreds of acres on average. This category is expected to have 570 to 1,800 dead trees per square mile.

Photo: White fir mortality from fir engraver, Modoc National Forest, 2016.

Category R9

Large areas of intense mortality. This category is projected to have between 2,000 to 14,000 trees per square mile.


Photo credits: Region 5 Forest Health Protection

2004 to 2016 Observations

The observed mortality from 2005 to 2016 is displayed in the video to the right. The last frame shows the 2017 forecast in comparison. Tree mortality in the previous year, combined with precipitation levels in the previous four years, was the best predictor of current
2017 Bark Beetle Forecast for California

Category R9

Large areas of intense mortality. This category is projected to have between 2,000 to 14,000 trees per square mile.

Photo credits: Region 5 Forest Health Protection

2004 to 2016 Observations

The observed mortality from 2005 to 2016 is displayed in the video to the right. The last frame shows the 2017 forecast in comparison. Tree mortality in the previous year, combined with precipitation levels in the previous four years, was the best predictor of current year mortality.

2016 Observations vs. 2017 Forecast

The graphic to the right displays the 2016 observed mortality (left) and the 2017 forecasted mortality (right). The forecast suggests that bark beetle-caused mortality should subside in many parts of California.
2017 Bark Beetle Forecast for California

Category R9

Large areas of intense mortality. This category is projected to have between 2,000 to 14,000 trees per square mile. Photo: Ponderosa pine mortality from western pine beetle, Southern Sierras, 2015.

Photo credits: Region 5 Forest Health Protection

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