



Oregon

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MEMORANDUM

SUBJECT: 2011 Statewide Aerial Survey Summary – Eastern Oregon Area
TO: Survey Cooperators and Interested Parties
FROM: Rob Flowers, Alan Kanaskie, and Mike McWilliams
DATE: February 22, 2012



"STEWARDSHIP IN FORESTRY"

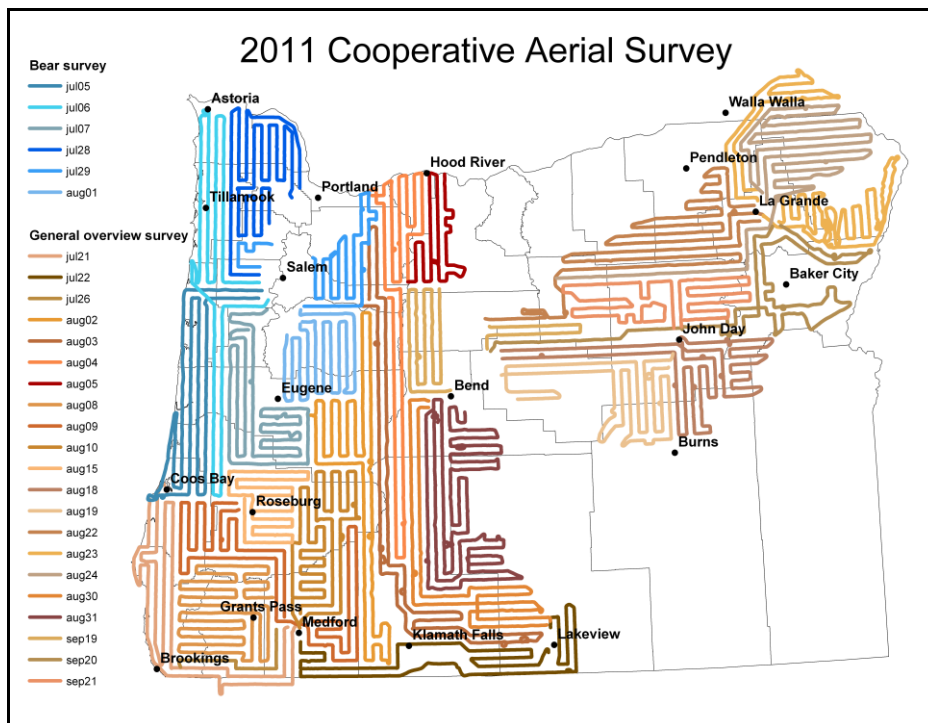
The following information provides the approximate location and size of areas with tree damage and mortality detected in the 2011 statewide aerial survey. Also included are descriptions of the major damage agents and comparisons to recent trends. Regional aerial survey maps and geospatial data are also available at:

Statewide Aerial Detection Survey Quad Maps: www.fs.usda.gov/goto/r6/fhp/ads/maps
Statewide Aerial Detection Survey Data: www.fs.usda.gov/goto/r6/fhp/ads/data

Survey Description and Objectives:

The statewide aerial survey covers more than 28 million acres million acres and is flown each summer and fall, as this is the optimal time to detect tree signatures (changes in foliage color) associated with damage that occurred the previous year (Figure 1).

Figure 1: Coverage area and flight lines for the 2011 statewide aerial survey of forest lands.



The survey aircraft flies a grid pattern at an altitude of 1,000-1,500 ft above the ground, with flight lines 4 miles apart. A digital sketch-mapping system is used, consisting of a touch-screen computer linked to a GPS receiver, which allows observers to locate and record affected areas in the form of polygon figures.

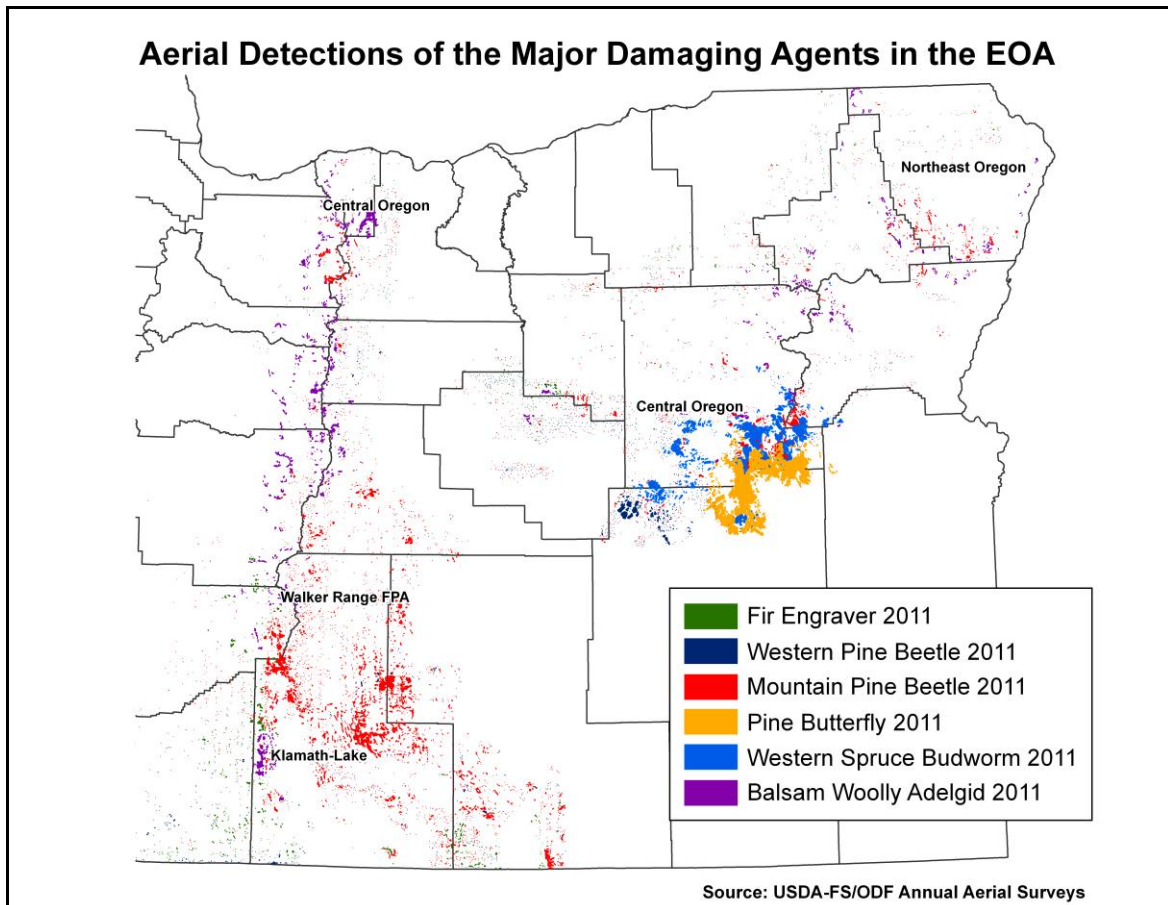
The areas mapped designate approximate damage boundaries and are coded with the suspected agent and an estimate of the number of trees affected. In areas where damage is severe, the number of affected trees per acre is estimated (1A=1 tree per acre). A key is located on each map to describe the damage agent and primary host(s) for each of the codes.

For the summary information provided here, each category or agent is described by the total number of acres over which tree mortality or other damage is occurring. Current year results are provided as part of the 25-year trend. Aerial surveys are designed to provide estimates only and cannot precisely quantify damage or confirm that specific agents are present; this can only be done by ground surveys.

Survey Results for the Eastern Oregon Area (EOA):

In 2011, more than 923,000 acres in the EOA was observed to contain tree mortality or other damage at levels sufficient to be detected by aerial surveys (Figure 2).

Figure 2: The major damaging agents in the 2011 aerial detection survey of the EOA.



The area over which tree mortality or other damage was observed during aerial surveys is summarized here by ownership (Figure 3) and forest protection district (Figure 4). The majority of the affected area this year appeared to occur on USFS ownerships, and was observed within the Central Oregon district. Overall values represented a significant increase relative to the previous year, but levels remained below the 25-year average.

Figure 3: Tree mortality and damage in the EOA detected during aerial surveys, 1987-2011.

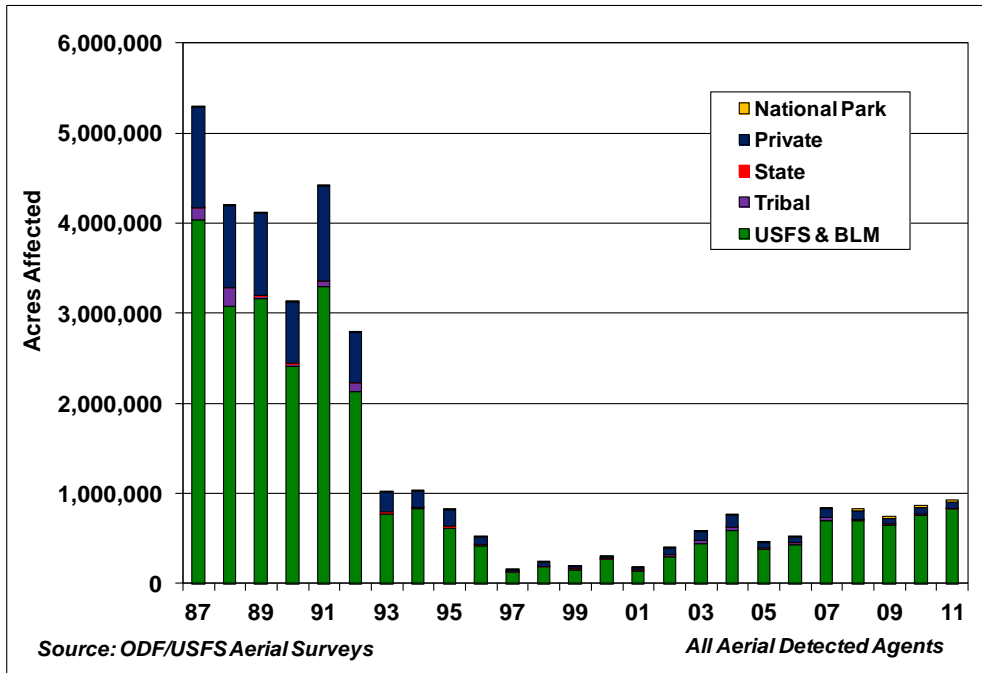
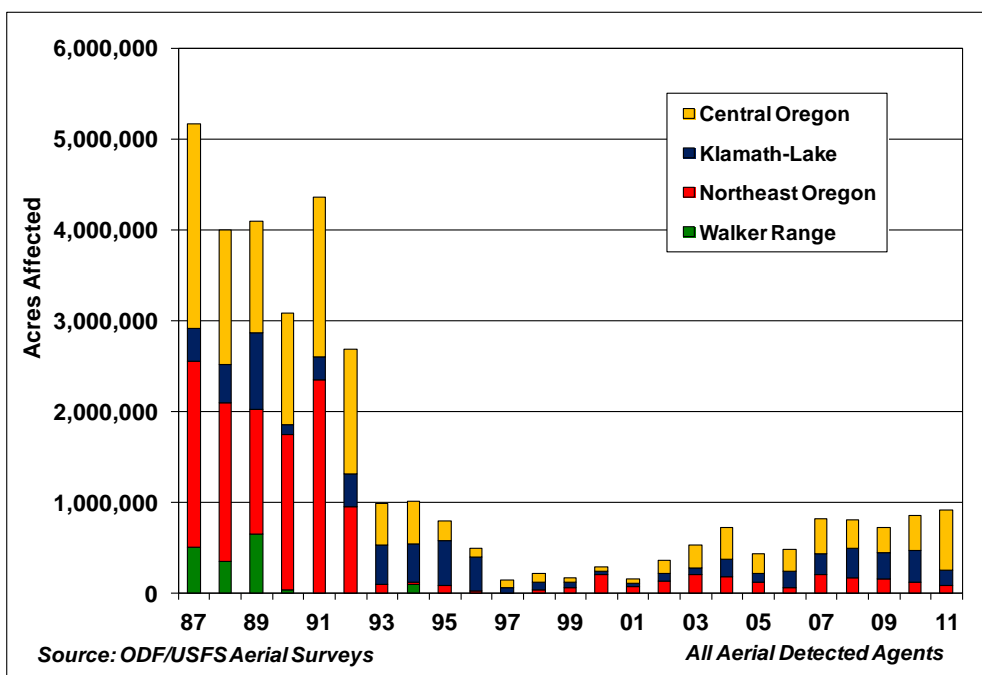
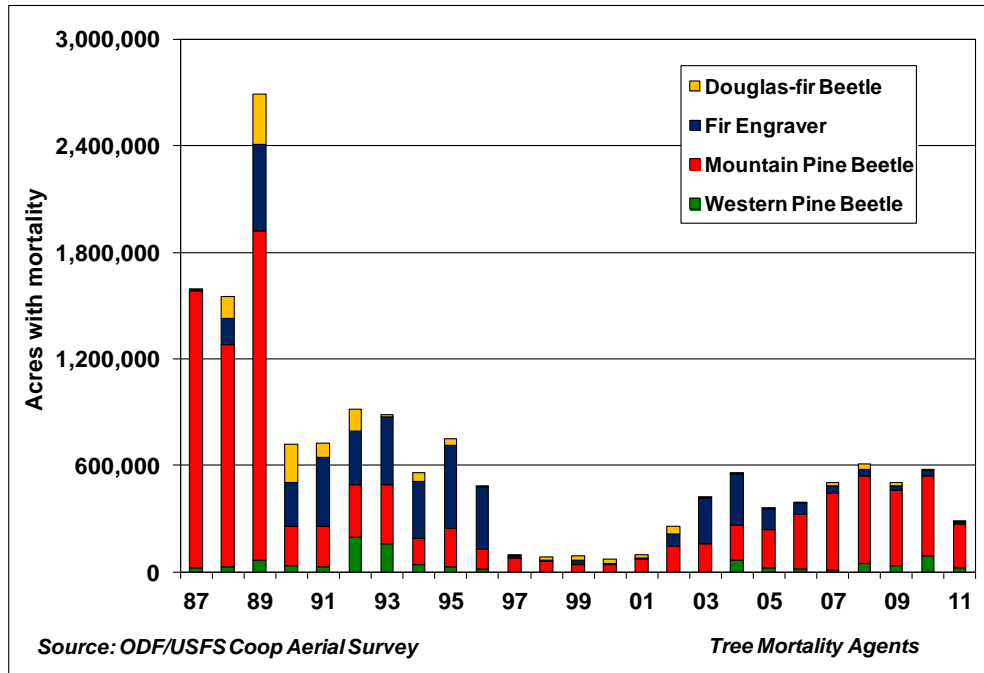


Figure 4: Tree mortality and damage in the EOA detected during aerial surveys, 1987-2011.



Over the last 25 years of the statewide aerial survey, the majority of the tree mortality observed in the EOA has been attributed to bark beetles; although other agents, such as root diseases, are often present (Figure 5).

Figure 5: Bark beetle damage detected by aerial surveys in the EOA, 1987-2011.

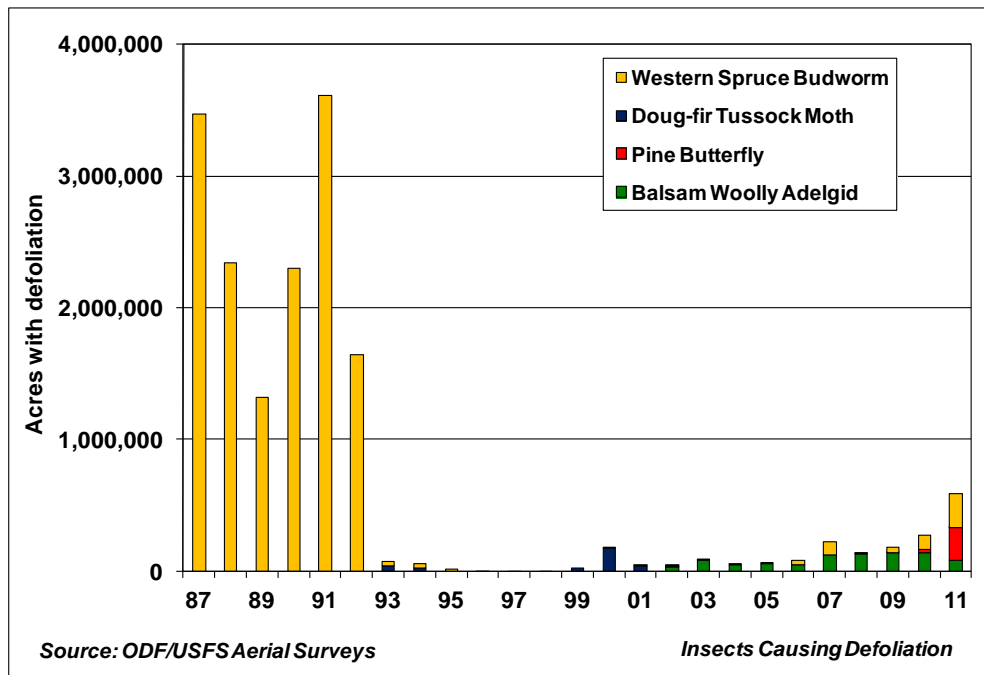


The most significant bark beetles in the EOA are the mountain pine beetle (MPB), whose outbreaks have historically covered millions of acres in the western US, as well as the fir engraver (FE), western pine beetle (WPB), and Douglas-fir beetle (DFB). While these latter bark beetles have outbreaks of lesser extent and shorter duration in comparison to MPB, they can still cause significant tree mortality when they occur.

While areas of MPB damage are still being detected along the crest of the Cascades and in remaining, susceptible areas of the EOA, overall damage appears to be on the decline due to cumulative losses of mature lodgepole pine stands, which are needed to sustain large outbreaks. Declines also occurred this year for WPB and FE, relative to the previous year. Outbreaks of these beetles are often associated with sustained, below-average moisture levels, which have been less common overall of late. Damage by WPB this year was most notable where tree injury occurred in association with fires in the Central Oregon district. Damage by DFB was relatively low across the area in 2011, and damage by each of these bark beetles remained below their 25-year averages.

The primary insect defoliators in the EOA historically include both needle-chewing and sap-feeding insects. Sap-feeding by some insects on branches and buds can cause localized tissue death and result in significant needle loss in much the same way as needle-chewing insects. Outbreak occurrence with many of these agents is highly variable and can occur at widely-spaced, irregular intervals that may be decades apart. The most significant defoliator damage in recent history resulted from a large outbreak of the Western spruce budworm (WSB) in the late 1980s to early 1990s (Figure 6).

Figure 6: Insect defoliator damage detected by aerial surveys in the EOA, 1987-2011.



Since 2005, increased activity of WSB has occurred in Central Oregon, primarily within the Malheur and Ochoco National Forests. Its preferred hosts include Douglas-fir, true firs, and Engelmann spruce, and while defoliation intensity to this point has been described by surveyors as low-to-moderate, some understory mortality and top-kill of overstory trees has been reported where defoliation has occurred over several consecutive years. In 2011, the largest known outbreak of pine butterfly in Oregon, at over 250,000 acres, was also observed. Much of the damage occurred near areas also affected by WSB, but in contrast, over 90% of the ponderosa and lodgepole pines affected by pine butterfly were described in the “high” defoliation category and some tree mortality may occur. Observational evidence suggests that the outbreak will collapse in 2012, and monitoring plots will be installed this year to assess impacts over 3-4 years.

In addition, the balsam woolly adelgid (BWA), a long-established, non-native sap-feeding insect also continued to cause widespread damage to true firs. The most significant impacts currently are in high-elevation subalpine fir. This insect virtually eliminated grand fir in some areas of Western Oregon in the 1950s and 1960s, following its initial introduction.

Increased defoliation by the Douglas-fir tussock moth (DFTM) was also observed in the Northeast Oregon district in 2011. Defoliation was described by aerial surveyors as low intensity on over 1,200 acres, but follow-up ground surveys indicated that DFTM lifestages were abundant in surrounding areas. Detections were primarily within the Wenaha-Tucannon Wilderness of the Umatilla National Forest, with areas of larger defoliation extending north into Southeast Washington.

Pine Butterfly on OPB Field Guide: www.opb.org/programs/ofg/segments/view/1807
 DFTM News Release: www.oregon.gov/ODF/newsroom/newsreleases/2012/NR1205.shtml

Survey Discussion

The summary provided here is general and we realize it may not represent trends at a more localized level due to the limitations of the survey methods, and because only damage that is readily visible at the time of the survey is recorded. Attempts are made to coordinate flights with peak visibility of the major agents, but this is often confounded by weather, fires, or other factors.

As we are only able to conduct limited ground surveys each year, we would appreciate any feedback in regard to the information provided here. Please contact us with any questions regarding this summary, the enclosed maps, or additional products.

Acknowledgements

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ODF Forest Health Website: <http://www.oregon.gov/odf/privateforests/fh.shtml>