STAFF REPORT

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SUMMARY

This agenda item provides an overview of the major insect, disease, and other damaging agents affecting Oregon forests in 2014, as required by Oregon Revised Statute (ORS) 527.335.

CONTEXT

The Board's 2011 Forestry Program for Oregon defines a healthy, vital forest landscape as one that maintains its functions, diversity, and resiliency within the context of natural and human disturbances and is capable of providing people with the array of values, uses, and products desired now and in the future. The Board supports protecting and improving the health and resiliency of Oregon's dynamic forest ecosystems, watersheds, and airsheds (Goal F). The Board's objectives for Goal F include promoting resilient forest landscape conditions and management practices that will lead to reductions in the adverse impacts from forest insects and diseases (Objective F.7). The Board's guiding principles and philosophies includes a commitment to continuous learning, evaluating and appropriately adjusting forest management policies and programs based upon ongoing monitoring, assessment, and research (Value Statement 11).

BACKGROUND

The annual aerial survey of Oregon forestlands for insect and disease damage began in 1947. The 2014 statewide cooperative aerial survey is the 68th year of collecting these data. Oregon's survey covers 28 million acres across all ownership categories and is one of the best long-term data sets on forest health conditions. The Oregon Department of Forestry (ODF) is also recognized nationally for developing and testing digital sketch mapping and aircraft technologies that improve information delivery and the safety of aviation personnel. Annual aerial surveys are accomplished through collaboration with the U.S. Department of Agriculture (USDA) Forest Service Pacific Northwest Region with additional funding and support provided by the U.S. Department of the Interior (USDI) Bureau of Land Management (BLM), private industrial forest landowners and cooperatives such as the Oregon State University (OSU) Swiss Needle Cast Cooperative.

A Cooperative Agreement signed in 1965 between the State Forester, the Board of Forestry, and the USDA Forest Service formalized the state and federal collaborative relationship by instructing personnel to carry out systematic surveillance and reporting of insect and disease conditions on forestlands. In addition, Oregon's Forest Integrated Pest Management Laws (ORS 527.310 to 527.370) requires that the State Forester conduct surveys to determine the presence, extent, trend, and impact of native and invasive pests as well as overall forest health.

While aerial surveys anchor Oregon Department of Forestry efforts to collect information on forest health conditions in Oregon's forests, they are not able to detect the occurrence of many agents including most root diseases and dwarf mistletoes, which can greatly affect forest health. These agents are assessed by ground surveys, which are completed annually in priority areas or as part of special ground survey projects.

In 2001, Oregon's aerial survey program detected sudden oak death (SOD) in Curry County. SOD is lethal to tanoak and poses a tremendous threat to tanoak ecosystems in Oregon. The disease also threatens commerce in the nursery and forest industries. A multi-agency group (ODF, the Oregon Department of Agriculture (ODA), USDA Forest Service, BLM, and OSU) is slowing the spread of the disease through ODA quarantine regulations and a program of early detection and eradication treatments involving the destruction of tanoak and other nearby host plants on new infested sites.

Annual aerial and ground surveys fulfill ORS 527.335 and support the following:

- Oregon Department of Forestry Key Performance Measures (KPM) #629-13: -- Damage To Oregon Forests From Insects, Diseases, And Other Agents;
- Private landowner reporting requirements for forest certification systems;
- Distribution of annual forest damage maps and data summaries to ODF Districts and other cooperators (public agencies, private forest landowners, the general public);
- Synthesis into the annual publication "Forest Health Highlights in Oregon" produced for professional foresters, other natural resource specialists, land managers, field technicians, educators and the general public (Attachment 1); and
- Incorporation into the USDA Forest Service National Insect & Disease Risk Map (NIDRM) project and forest health conditions report to the U.S. Congress.

ANALYSIS

The statewide aerial survey detected over 581,000 acres of tree mortality and other damage. The majority of tree mortality detected during aerial surveys over the last decade has been due to outbreaks of mountain pine beetle, which increased by 14% in 2014 compared to 2013. Most mountain pine beetle damage occurred in lodgepole pine stands in Klamath and Lake Counties on the Fremont-Winema National Forests and in Baker and Grant Counties on the Malheur and Wallowa-Whitman National Forests. For a summary, see *Forest Health Highlights in Oregon – 2014*, attached.

Damage by other major bark beetles, including the western pine beetle, Douglas-fir beetle, and fir engraver also increased in 2014. Mortality of ponderosa pine caused by the western pine beetle increased 91% from 2013, but was still below the 10-year average. Damage from Douglas-fir beetle (32% increase from 2013 to 26,000 affected acres) and fir engraver beetles (300% increase from 2013 to 44,000 acres) were correlated with drought conditions across the state. Damage from these beetles likely will increase in 2015, due to prolonged drought stress on host trees.

Western spruce budworm – historically, the most damaging defoliating insect in Oregon's coniferous forests – continued to be rarely observed in aerial surveys. In 2014, roughly 1,300 acres were affected by this insect compared to 79,000 acres in 2012. On the other hand, hardwood defoliation by two other insects, the western oak looper and the western tent caterpillar, increased in 2014, to 7,300 acres and 11,000 acres, respectively. While spillover defoliation and mortality of Douglas-fir was detected during oak looper outbreaks in the Willamette Valley in 2014, populations of this insect are expected to subside naturally in 2015 and thereafter.

Swiss needle cast (SNC), a native foliage disease, continued to damage Douglas-fir on the western slopes of the Coast Range. The 2014 SNC aerial survey (supported by the OSU Swiss Needle Cast Cooperative) covered 3.8 million acres and detected 586,000 acres impacted by Swiss needle cast, an increase to an all-time high for the fifth consecutive year. Growth loss due to SNC in Oregon is estimated at more than 190 million board feet per year. In addition to growth impacts, SNC alters wood properties and affects stand development.

A freezing rain event in November 2014 caused substantial top breakage and other damage in Douglas-fir and red alder in the Coast Range west of Corvallis. A special aerial survey documented 6,600 acres of damage over 250,000 acres. In many stands, more than 90 percent of the trees had breakage, causing significant losses in both current and future wood volume.

In 2014, ODF cooperated with the USDA Animal and Plant Health Inspection Service's (APHIS) Plant Protection and Quarantine program to conduct the second annual statewide trapping survey for the non-native emerald ash borer (EAB). EAB, which has yet to be detected in Oregon, has the capacity to cause widespread mortality of Oregon's native ash as well as in non-native ash species widely planted in urban and suburban landscapes. EAB is the nation's costliest invasive forest pest with over $3.5 billion in damage since its detection in Michigan in 2001. In 2014, 253 traps were placed by ODF and APHIS in locations throughout western Oregon determined to have a high likelihood of EAB introduction. No EAB were detected. Recognizing that the trapping program needed augmentation, OSU Natural Resources and Forestry Extension initiated the *Oregon Forest Pest Detector* Program in 2014 with ODF, ODA, USDA Forest Service, USDA APHIS and others serving as cooperators. The purpose of the program is to train arborists, landscapers, and others on the early warning signs of EAB and another potential invasive wood borer, the Asian longhorned beetle.

In March of 2014, ODF Forest Health staff conducted a special aerial survey for the invasive forest weed, gorse, which was first introduced to Bandon in the late 1800s. The survey covered 300,000 acres in Coos and Curry counties and mapped 6,230 acres of gorse. The purpose of the survey, which was requested by cooperators in the region, was to document areas of rapidly

growing populations to prioritize response. Gorse, which is related to Scotch broom, has many traits undesirable to both agriculture and forestry operations in western Oregon: it can quickly out shade and kill conifer seedlings; it is an undesirable forage species that can quickly invade and dominant pastures, and constitutes a wildfire hazard due to it propensity to burn. Moreover, gorse regenerates readily after wildfire or other disturbance as gorse seeds remain viable in the soil for very long periods and are conducive to spread via heavy machinery. The ODA estimates that gorse currently occupies only 1% of its potential range in Oregon with an estimated $200 million annual impact to Oregon's economy.

Sudden Oak Death

Sudden oak death continued to intensify and spread in Curry County during 2014. Thirteen (13) new infestations, all on non-federal land, were found outside of the Generally Infested Area (GIA). The GIA is an area within the quarantine where eradication treatment of infested sites is no longer required. One of the new infestations was outside the quarantine boundary, and two were within one mile of the boundary, triggering the need to expand the existing quarantine area. Funding for eradication treatments on infested sites was not sufficient to conduct treatments to the desired level (i.e., all host material is destroyed within a 300 foot radius of the infected trees)[1]. In 2015, ODA expanded the quarantine from 264 mi^2 to 519 mi^2.

Disease spread would have been greater without the ongoing SOD slow the spread program, currently funded by the USDA Forest Service's Forest Health Protection program, BLM, and State of Oregon. However, this program faces a shortage of funds for eradication treatments on new infested sites that fall outside of the GIA. The SOD slow the spread program manages the shortage by periodically expanding the GIA to remove the quarantine requirement that the infested sites must undergo some level of eradication treatment; and by altering the level of eradication treatment on sites outside the GIA to less than desired levels (i.e., cutting, piling and burning all infected material and host material within 20 to 50 feet of the infected trees). This approach results in disease intensification and inoculum build-up within the GIA increasing the rate and amount of disease spread outside the GIA. Furthermore, large numbers of dead and dying trees inside the GIA increase the risk of wildfire and property damage from falling trees.

In 2014, the Department met with the SOD Task Force[2] and agency partners to develop alternatives for how best to move forward with the SOD program. The alternatives being developed are: (1) transitioning the program's focus to learning to live with the disease; (2) continuing the slow-the-spread program under the current level of funding, (3) securing additional funds to fully fund the slow the spread program so all new infestations outside the GIA can be treated to the desired 300 foot treatment buffer, and (4) a contingency program focused on keeping SOD from entering Coos or other neighboring counties. The department is continuing the slow-the-spread program under the current level of funding, while the analysis of alternatives is completed. This decision allowed the recent expansion of the quarantine to remain at a sub-county level.

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[1] The three most outlying sites including the one outside of the quarantine did receive the desired level of treatment.

[2] Ellen Goheen (Forest Pathologist, USDA Forest Service), Everett Hansen (Forest Pathologist, OSU), Alan Kanaskie (Forest Pathologist, ODF), and Nancy Osterbauer (Plant Health Program Manager, ODA).

If SOD expands beyond the new 2015 quarantine boundary, the next quarantine area likely will be all of Curry County. Agency partners and the SOD task force are concerned that expanding the quarantine to the whole county may disrupt trade of forest and agricultural commodities; a concern that deepens should the disease spread into neighboring Coos County and impact the ability to export material from the Port of Coos Bay. On June 16, 2015 ODF, ODA and OSU jointly presented an informational update of SOD in Oregon's forests to the Oregon State Legislature, House Committee on Agriculture and Natural Resources. ODF will continue to work with agency partners and stakeholders to evaluate SOD program alternatives with the goal of selecting a preferred alternative by February 2016 for further discussion with the Governor's Office, the Board and the Oregon Legislature.

Staffing

The Forest Health Section of the Private Forests Division in 2014 consisted of Alan Kanaskie (Forest Pathologist), Rob Flowers (Forest Entomologist), Danny Norlander (Forest Health Survey and Monitoring Specialist), Wyatt Williams (Invasive Species Specialist), and Jon Laine (Forest Health Technician). The Section is supported by the Coos District SOD field office in Brookings (Ron Rhatigan and Randy Weise). In early 2015, Christine Buhl filled the Forest Entomologist position vacated by Rob Flowers and Ryan Porter joined the team as a Forest Health Technician for the 2015 summer field season. Due to Ron Rhatigan taking a SOD positon with the USDA Forest Service in Gold Beach, the SOD field office in Brookings is now led by Randy Weise with Jon Laine temporarily filling in behind Randy's promotion as ODF and agency partners evaluate future program needs.

Forest Health staff provide specialized expertise to ODF District Offices, the ODF State Forests Division, and other state agencies. Forest Health staff also provide training and subject matter expertise to Stewardship Foresters and OSU forestry extension agents and work closely with our partners to provide technical assistance, information and training to forest landowners and forest managers. Forest Health Section staff also work toward the advancement of forest health related science. Recent peer-reviewed and other publications by Section staff in 2014 include:

1) Filip, G.A., J. Biro, K.L. Chadwick, D.J. Goheen, E.M. Goheen, J.S. Hadfield, **A. Kanaskie**, H.S.J. Kearns, H.M. Maffei, K.M. Mallams, D.W. Omdal, A.L. Saavedra, and C.L. Schmitt. 2014. Field Guide for Hazard-Tree Identification and Mitigation on Developed Sites in Oregon and Washington Forests. USDA Forest Service, Forest Health Protection, Pacific Northwest Region, Portland, OR. 120 p.

2) Kamvar Z.N., M. Larsen, **A. Kanaskie**, E.M. Hansen and N.J. Grünwald. 2014. Spatial and temporal population dynamics of the sudden oak death epidemic in Oregon Forests. *Phytopathology* (*in press*).

3) **Kanaskie, A.**, E.M. Goheen, E.M. Hansen, W. Sutton, P. Reeser, N. Grünwald, R. Rhatigan, R. Wiese, and J. Laine. 2014. Sudden Oak Death in Oregon Forests: Recent Disease Intensification and Spread, and Changes to the Management Program. *In* Sutton, W., Hansen, E.M., tech. coords. Proceedings of the seventh meeting of the International Union of Forest Research Organizations (IUFRO) Working Party S07.02.09: Phytophthoras in Forests and Natural Ecosystems. November 10-14, 2014. Esquel, Chubut, Argentina.

4) **Kanaskie, A.,** E.M. Hansen, and E.M. Goheen. 2014. Recent Developments in Sudden Oak Death Management in Southwest Oregon: 2014. p. 67-76. *In* Murray, M., Comp. 2014.

Proceedings of the 62 Annual Western International Forest Disease Work Conference, September 8-12, 2014. Cedar City, Utah. (In press).

5) **Kanaskie, A**., B. Kaetzel, and A. Herstrom. 2014. Economic impact of Swiss needle cast in Oregon forests. *In*: Annual report of the Oregon State University Swiss Needle Cast Cooperative. Corvallis, OR.

6) **Kanaskie, A**. and **D. Norlander**. 2014. Swiss needle cast aerial survey in Oregon and northern California. *In*: Annual report of the Oregon State University Swiss Needle Cast Cooperative. Corvallis, OR.

7) Peterson, E. K., E.M. Hansen, and **A. Kanaskie**. 2014. Spatial relationship between *Phytophthora ramorum* and roads or streams in Oregon tanoak forests. Forest Ecology and Management 312:216–224.

8) Peterson, E.K., E.M. Hansen and **A. Kanaskie**. 2014. Temporal Epidemiology of Sudden Oak Death in Oregon. Phytopathology (*in press*).

9) Shaw, D., G. Ratikova, and **A. Kanaskie.** 2014**.** The needle and the damage done: a nuanced approach is the best treatment for Swiss needle cast on Douglas fir. The Digger. November 2014. Oregon State University. P. 25-29.

10) Shaw, D.C., T. Woolley and **A. Kanaskie.** 2014. Vertical foliage retention in Douglas-fir across environmental gradients of the western Oregon Coast Range influenced by Swiss needle cast. Northwest Science 88(1):23-32.

11) Sims, L.L., E.M. Hansen, **A. Kanaskie** and E.M. Goheen. 2015. Alder Canopy Dieback and Damage in Western Oregon Riparian Ecosystems. Northwest Science 89(1):34-46.

12) **Williams, W.I.**, J. Friedman, J. Gaskin, and A.P. Norton. 2014. Hybridization of an invasive shrub affects tolerance and resistance to defoliation by a biological control agent. *Evolutionary Applications* 7: 381-393.

13) **Williams, W.I., D. Norlander**, R. Flowers, and T. Huff. 2014. Mapping the invasive plant gorse. ODF Fact Sheet. Salem: Oregon Department of Forestry. 2 p.

14) Zhao, J., D. A. Maguire, D. B. Mainwaring, J. Wehage and **A. Kanaskie**. 2014. Thinning mixed-species stands of Douglas-fir and western hemlock in the presence of Swiss needle cast: Guidelines based on relative basal area growth of individual trees. *Forest Science*, 60(1) pp. 191-199.

15) Zhao, J., D.B. Mainwaring, D.A. Maguire, and **A. Kanaskie**. 2014. Western hemlock growth response to increasing intensity of Swiss needle cast on Douglas-fir: changes in the dynamics of mixed-species stands. *Forestry* 87(5): 697-704.

Copies are available upon request.

RECOMMENDATIONS

None. This report is provided to the Board for informational purposes.

ATTACHMENTS

(1) *Forest Health Highlights in Oregon – 2014*.