



Managing Mature and Old-Growth Forests

A Position of the Oregon Society of American Foresters

The Oregon Society of American Foresters recognizes the unique characteristics and values that mature and old-growth forests provide for society. Definitions for old-growth vary and none are exact; however, these forests can include large snags and downed logs, some patchiness/openings, trees of various sizes and ages, and some relatively large, old trees. Not all forest land had or ever will achieve such conditions because of natural disturbance (e.g., wildfire, windstorms). And, as living ecosystems, trees and other vegetation in these forests can change significantly or die, thereby impacting unique habitat and other desirable features and functions.

A common perception is that actively managing old-growth is inappropriate or incompatible with other values, resulting in proposals to designate mature and old-growth forests where management is totally prohibited. ***However, even where non-timber values are primary, active management of mature and old-growth forests may be necessary to promote and sustain ecological values over time.*** This is especially true of forests in drier, fire-prone landscapes, including central, eastern and portions of southwest Oregon. Such management may include prescribed burning, tree thinning (e.g., to keep bigger trees vigorous with drought and climate change, insects or disease), and planting. Treatments may be needed periodically but there can be decades of little or no activity between periods when management is most effective.

A “one-size-fits-all” approach to mature or old-growth forest management does not address the range of unique and dynamic forest conditions in Oregon both now and in the future. ***Research and management experience show that site-specific plans are most effective in achieving and maintaining desirable forest characteristics.*** These plans should carefully consider local ecological conditions and objectives, social concerns, and policy constraints of the owners or managers. ***OSAF supports appropriate management practices, planned by experienced forestry professionals, to help achieve and maintain desired conditions and values of mature and old-growth forests for current and future generations of Oregonians.***

Issues

Concerns about mature and old-growth forests raise many issues and challenges, which highlight important differences in perceptions, values and philosophies. These issues take on added complexity with the range of questions that must be addressed to effectively identify and deal with specific mature and old-growth forests, including: 1) the definition of an old-growth forest; 2) the uses and values of these forests; and 3) the detailed objectives and allowances for their management. Disagreements about these forests have stemmed from widely varying perceptions and preferences, including: 1) the idea that nearly all pre-European settlement forests in Oregon were old-growth; 2) the idea that these forests and their benefits will persist indefinitely if left unmanaged; and 3) contrasting views about the approach or philosophy for managing mature and old-growth forests, e.g., from “preservation” to active management.

Current examples of old-growth management issues include policy directives or advocacy for specific tree diameter (e.g., 21 inches) and age limits (e.g., 120 years), at or above which no trees can be removed. Such approaches greatly oversimplify the features of old-growth forests, do not address their dynamics as living ecosystems (i.e., with components that grow, compete for resources and eventually die), and increasingly restrict management that could help maintain the health and benefits of these forests over the long term.

Background

The definition of an old-growth forest is not exact (Helms 2004) and it can vary with forest type (dominant species). Old-growth forests often have trees of various sizes and some of very large size, some patchiness, and large snags and downed wood. However, no one single attribute, be it appearance, tree age, tree size, canopy structure (foliage layers), or species composition, can consistently define old-growth. The area or size of an old-growth forest is also important because small areas may not be effective habitat for some old-growth-dependent wildlife species, whereas they may provide aesthetic and educational benefits as well as desirable ecological diversity.

The term “late-successional”¹ sometimes is used as an ecological descriptor of old-growth forests. Ecological definitions have value in that they are based on forest processes (e.g., succession and disturbance) and resulting forest structure. However, old-growth often is seen as a qualitative forest condition that can invoke awe, inspiration or even veneration. This is reflected in common descriptors of these forests, such as cathedral, heritage, or ancient. Such labels can suggest some images of old-growth forests that may not be very accurate. Lodgepole pine and aspen, for example, are not long-lived species and thus their forests may contain “old-growth” attributes that are far different from old-growth species with longer life spans (Spies 2004). A forest type and site-specific understanding of a particular forest and its associated values is more useful than an inexact label.

As a dynamic ecosystem with many natural influences, old-growth forests are constantly changing and some have a finite “lifespan,” even in the absence of human influences. In northwest Oregon, the amount of old-growth prior to European settlement has been estimated to vary from about 30 to 70 percent over time and with shifts in location (Teensma et al. 1991, Wimberly et al. 2000, Wells and Anzinger 2001, USDA Forest Service 2003). Today, approximately 6.5 million acres of mature and old-growth forests exist in western Oregon and Washington (USDA Forest Service 2003). All forests, including old-growth, will eventually succumb to natural disturbances (e.g., wildfires, windstorms, insect infestations) and then regenerate over time. Although old-growth forests can be protected from some disturbances, indefinite protection from natural influences is impossible and thus maintenance of the key values of old-growth requires planning for the next cycle and location of old-growth forests.

Historically, large trees in old-growth forests had great commercial value and their harvest supported the development of many Oregon communities. Although still valuable and prized for certain uses, large trees from old-growth forests currently are used less for timber as changes in log availability prompted most mills to retool to manufacture products from younger and smaller trees. Old-growth forests now are recognized for much broader values, including unique wildlife habitat and complexity in forest landscapes, recreation, genetic reservoirs and a reflection of natural heritage. Importantly, the diverse values of older forests, including economic benefits, are not necessarily incompatible with each other. Many of Oregon’s state forest lands, for example, are being actively managed to create habitat features of older forests for fish and wildlife diversity, while also generating mandated economic benefits to local communities. This approach has not satisfied all interests and significant pressure on both sides persists, including support for legislation, rule changes and ballot proposals for greater or lesser restrictions on harvest of older forests on state and private lands. However, a mix of forests ownerships managed for a range of forest conditions (young to old) together produce a forest landscape with high overall ecological complexity and socioeconomic value.

Forests with older trees can be found in different ownerships, each managed with unique objectives and legal requirements including specific mandates for old-growth management on federal lands. Older forests may not contain every feature of a fully developed old-growth forest, but many of them contain key elements such as large live and dead trees. Private landowners have significant leeway in setting their own management objectives and related actions, although Oregon law requires some snags and downed logs to be left in harvest areas. In general, as long as applicable regulations concerning fish and wildlife

¹ Succession is the natural, gradual supplanting of one plant community type over another, with a “late-successional” community often considered as part of a final, long-term stage before a catastrophic event (e.g., wildfire) repeats the process, initiating “secondary” succession.

habitat protection are met, private landowners in Oregon may harvest trees in older forests on their property, some of which may meet an ecological definition of old growth.

Management strategies to promote or maintain old-growth forests depend on the specific ecological goals and the environment in which the forest occurs. Mature and old-growth forests often can benefit from active management (e.g., prescribed burning, thinning, patch harvest) to emulate natural processes (e.g., wildfire, windstorms), including those altered by human needs or activities. This is particularly true in dry, fire-prone forest types in eastern, central and southwestern Oregon, forests historically dependent on Native American burning (e.g., oak in western interior valley foothills), as well as in forest plantations with limited ecological diversity. There even can be instances where substantial tree harvesting may be appropriate, particularly if some down wood and large live and dead trees are left on site. With a blend of ecological, social and economic objectives, active management strategies such as long rotations with legacy wood retention can promote key old-growth features while also providing forest products.

Importantly, thinning smaller or younger trees in old-growth stands has been shown to improve tree health and vigor (Stone et al. 1999, Latham and Tappeiner 2002, McDowell et al. 2003), thereby improving resistance to insect attacks and reducing the risk of stand-replacing wildfire. This can extend the life of existing old-growth trees and forests while other younger forests develop into an old-growth condition. Thinning in mature forests may hasten old-growth structural development (Bailey and Tappeiner 1997; Acker et al. 1998) and large trees and old-growth character have been achieved over time after heavy thinning in younger forests (Newton and Cole 1987). Where severe wildfire has consumed old-growth forests, active restoration can help ensure the timely progression towards old-growth conditions. Without reforestation and vegetation management, restoration of conifer forests in some areas may take centuries, particularly in areas of severe wildfire and plant competition.

Conclusions

Oregon's forest owners and managers have different goals that lead to a range of management approaches that promote diverse old and young forests with high ecological and social values. The overall pattern and distribution of forests is an important consideration in sustaining a broad range of values from our forests, and in providing for old-growth features and functions as forests change over time and space.

Misunderstandings and disagreements about the management of old-growth forests can be reduced by addressing key objectives and related considerations, including careful attention to local conditions and concerns. Like the management of other forests, decisions about old-growth forests will benefit from current knowledge and experience-based, site-specific management plans prepared by professional foresters and other specialists; that is, plans that carefully account for unique site conditions, detailed objectives, and important legal mandates and social concerns.

Selected References

- Acker, S.A., T.E. Sabin, L.M. Ganio, and W.A. McKee. 1998. Development of old-growth structure and timber volume growth trends in maturing Douglas-fir stands. *Forest Ecology and Management* 104:265-280.
- Bailey, J.D., and J.C. Tappeiner. 1998. Effects of thinning on structural development in 40- to 100-year-old Douglas-fir stands in western Oregon. *Forest Ecology and Management* 108: 99-113.
- Franklin, J.F., K. Cromack, Jr., W. Denison, A. McKee, C. Maser, J. Sedell, F. Swanson, and G. Juday. 1981. Ecological characteristics of old-growth Douglas-fir forests. General Technical Report PNW-118. USDA Forest Service Pacific Northwest Forest and Range Experiment Station, Portland, OR. 48 p.
- Helms, J.A. 2004. Old-growth: what is it? *Journal of Forestry* 102(3):8-12.
- Kimmins, H. 1992. *Balancing act: Environmental issues in forestry*. Univ. British Columbia Press, Vancouver, BC.
- Kohm, K.A. and J.F. Franklin, eds. 1997. *Creating a forestry for the 21st century*. Island Press, Washington, D.C.

- Latham, P., and J. Tappeiner. 2002. Response of old-growth conifers to reduction in stand density in western Oregon forests. *Tree Physiology* 22:137-146.
- Maguire, C.C. and C.L. Chambers, eds. 2005. College of Forestry Integrated Research Project: Ecological and socioeconomic responses to alternative silvicultural treatments. Research Contrib. 46, Forest Research Lab., Oregon State Univ., Corvallis.
- McDowell, N., J.R. Brooks, S.A. Fitzgerald, and B.J. Bond. 2003. Carbon isotope discrimination and growth response of old *Pinus ponderosa* to stand density reductions. *Plant, Cell Environment* 26:631-644.
- Newton, M., and E.C. Cole. 1987. A sustained-yield scheme for old-growth Douglas-fir. *Western Journal of Applied Forestry* 2(1):22-25.
- Oregon Society of American Foresters. 2008. Active Management to Achieve and Maintain Healthy Forests. Available at: <http://www.forestry.org/pdf/active.pdf>
- Puettmann, K.J., C.C. Messier and K.D. Coates. 2009. A Critique of Silviculture: Managing for Complexity. Island Press, Washington, DC.
- Shatford, J.P.A., J.D. Bailey and J.C. Tappeiner. 2009. Understory tree development with repeated stand density treatments in coastal Douglas-fir forests of Oregon. *Western Journal of Applied Forestry* 24(1):11-16.
- Spies, T.A. 2004. Ecological concepts and diversity of old-growth forests. *Journal of Forestry* 102(3):14-20.
- Spies, T.A. and S.L. Duncan, eds. 2009. Old Growth in a New World: A Pacific Northwest Icon Reexamined. Island Press, Washington, DC.
- Stone, J.E., T.E. Kolb, and W.W. Covington. 1999. Effects of restoration thinning on presettlement *Pinus ponderosa* in Northern Arizona. *Restoration Ecology* 7:172-182.
- Teensma, P.A., J.T. Rienstra, and M.A. Yeiter. 1991. Preliminary reconstruction and analysis of change in forest stand age classes of the Oregon coast range from 1850 to 1940. Technical Note T/N OR-9. USDI Bureau of Land Management, Portland, OR. 9 p.
- USDA Forest Service. 2009. Old growth revisited: Integrating social, economic, and ecological perspectives. Issue 110, Science Findings. PNW Research Station, Portland, OR. Available at: <http://www.fs.fed.us/pnw/science/scifi110.pdf>
- Wells, G. and D. Anzinger. 2001. Lewis and Clark Meet Oregon's Forests: Lessons from Dynamic Nature. Oregon Forest Resources Institute, Portland, OR.
- Wimberly, M.C., T.A. Spies, C.J. Long, and C. Whitlock. 2000. Simulating historical variability in the amount of old forests in the Oregon Coast Range. *Conservation Biology* 14:167-180.

This position statement was adopted by the Oregon SAF Executive Committee on December 10, 2010. The statement will expire December 10, 2015 unless after thorough review it is renewed by the Committee.