

**Excerpts from the DRAFT
Density Management Studies
Status Report**

by

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The Bureau of Land Management's Density Management Studies are a group of twelve studies implemented since 1994 to test whether innovative silvicultural treatments can accelerate development of late-successional characteristics in managed forests.

Collaborators include the United States Department of Agriculture's Pacific Northwest Research Station (PNW) and researchers affiliated with Oregon State University (OSU), the Cooperative Forest Ecosystem Research Program (CFER) and the Pacific Northwest Mycology Service.

Forest stand density management, referring to the removal of some trees to increase spacing and accelerate growth of remaining trees, is used to open the forest canopy for selected trees, to maintain understory vegetation, or to attain later-successional characteristics for biological diversity. The Density Management Studies (DMS) are designed to provide the BLM with a basis for making decisions about future forest management. They allow the BLM to create an array of stand conditions and then evaluate progress toward a desired future condition.

The genesis of the project occurred in 1992 in response to new management questions about providing late-successional structure and habitat on BLM-administered lands in western Oregon. The concept of developing late-successional forest habitat from young managed stands became part of the Record of Decision for the Northwest Forest Plan (NFP)¹. This study is a first attempt at implementing the types of forest stand density management treatments referenced in the Recovery Plan for the Northern Spotted Owl (1992),² the Northwest Forest Plan,³ and the BLM's Resource Management Plans (RMPs)⁴. This management

¹Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl, U.S. Department of Agriculture, Forest Service, and U.S. Department of the Interior, Bureau of Land Management (Portland, OR, 1994) p. C-12.

²Tappeiner, J.C. et al., Managing Stands for Northern Spotted Owl Habitat, Appendix F, Final Recovery Plan for the Northern Spotted Owl, U.S. Fish and Wildlife Service (Portland, OR, 1992).

³Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl, U.S. Department of Agriculture, Forest Service, and U.S. Department of the Interior, Bureau of Land Management (Portland, OR, 1994).

⁴Coos Bay District Record of Decision and Resource Management Plan, U.S. Department of the Interior, Bureau of Land Management (North Bend, OR, 1995), p. 19.

Record of Decision and Resource Management Plan, U.S. Department of the Interior, Bureau of Land Management (Eugene, OR, 1995), p. 30.

Salem District Record of Decision and Resource Management Plan, U.S. Department of the Interior, Bureau of Land Management (Salem, OR, 1995), p. 2-28.

represents a change from previous even-aged management in that it requires the regeneration of conifers and hardwood species beneath an overstory of conifers and/or hardwoods; and calls for manipulation of forest canopy density to accelerate growth of large trees, provide snags and logs on the forest floor, and help understory trees survive and grow. Several thinning and shelterwood regeneration case studies identified ways of obtaining these objectives, but these results needed verification and monitoring in time over the 70+ Douglas-fir plant associations in western Oregon.

In June 1995 and May 1996, the Regional Ecosystem Office concluded that a review of the study by the Research and Monitoring Committee did not identify any unacceptable risks to the objectives of the standards and guidelines of the NFP. The first two initial thinning study sites were harvested in November of 1997, and the first group of monitoring plots was installed and measured by September of 1998.

- **Purpose**

This research will contribute to the regional interagency effort to produce, document, and verify scientific knowledge needed to successfully implement the NFP. The purpose of the Density Management Initial Thinning and Rethinning Studies is to determine how to manage 40-70 year-old forest stands to accelerate development of late-successional characteristics.

The NFP⁵ notes that the **structure and composition** of LS/OG forest ecosystems generally include four major structural attributes:

- live large trees;
- standing large dead trees (snags);
- large fallen trees on the forest floor; and
- large logs in streams.

Additional important elements include:

- multiple canopy layers, smaller understory trees, canopy gaps and patchy understory; and
- a variety of conditions within various vegetative types, disturbance regimes and developmental stages.
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Comment: Is this really the best place for this???

Record of Decision and Resource Management Plan, U.S. Department of the Interior, Bureau of Land Management (Roseburg, OR, 1995), p. 29.

⁵Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl, U.S. Department of Agriculture, Forest Service, and U.S. Department of the Interior, Bureau of Land Management (Portland, OR, 1994) p. B-2.

Ecological processes essential for development and maintenance of late-successional forests, and/or ecological diversity include:

- tree growth and maturation;
- tree death and decay of large trees;
- changes in canopy gaps in various strata of vegetation;
- establishment of trees and shrubs in gaps or below the canopy; and
- growth of multi-story layers.

The results of these studies may help in the development of improved prescriptions for meeting restoration and/or habitat diversity goals while sustaining forest productivity.

By replicating forest stand density management studies across many sites and monitoring for stand growth and structure development, the responses of selected taxa to forest management can be documented. Important taxa for monitoring include amphibians, arthropods, and nonvascular and vascular plants. Experience gained by monitoring these forest stand density management studies can be applied to the monitoring and adaptive management called for in the NFP.

These studies will establish a group of active, recognized study sites on BLM-administered land where complementary research and monitoring activities can be conducted. Study sites will remain as recognized research areas for at least thirty years. Study sites may be used to show a variety of structural features such as leave islands, canopy gaps, remnant overstory trees, and multiple understory layers. Results from this group of studies will influence future forest management on land covered by the NFP.

There are also ten collaborative studies. These studies are related to the riparian or upland portions of the DMS. They have been implemented within, or adjacent to the Initial Thinning and Rethinning study sites. This work is conducted by non-BLM researchers and may or may not be funded by the BLM.

In these collaborative studies, research will be conducted on selected NFP Survey and Manage taxonomic groups (e.g. lichens, bryophytes and amphibians) as well as the effects of forest stand density management in riparian areas on microclimate and riparian-associated species.

The objectives of these collaborative studies can be broadly characterized as habitat and species response monitoring:

- inventory and monitor the response of macrofungal species, aquatic vertebrates and their habitats to various forest stand density management treatments;
- measure the response of birds, tall shrubs and tree regeneration to different levels of thinning;
- characterize the arthropod community of headwater streams and the range of variability of lichen diversity in young managed stands; and

- identify the effects of thinning on riparian microsites and microclimate.

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The species surveys conducted during these studies will provide information about the use of, and persistence in, young managed forests by these taxonomic groups. This may yield information on how to effectively buffer known sites of Survey and Manage or other sensitive species.