

Evolving Silviculture on PNW Federal Lands

BY SAMANTHA CHANG

The management of federal lands in the Pacific Northwest continues to adapt to meet multiple-use objectives and public needs across the wide range of social and ecological settings found in our region. The USDA Forest Service and USDI Bureau of Land Management together manage over 22 million acres of National Forest System and O&C lands in Oregon and Washington, and 5 million acres of designated Wilderness. The scale and range of these public lands, from high desert to coastal rainforest, require an equivalent range of silvicultural treatments to meet present and future needs.



More than just trees

There is increasing emphasis on the capacity of forest management activities on federal lands to help meet a variety of objectives in addition to providing timber and supporting jobs in the local economy. As clearcut regeneration has decreased, commercial thinning in previously harvested areas has become the primary method of meeting timber targets. Over the last decade commercial thinning has made up 73% of the total harvest area on national forests in the Pacific Northwest Region, averaging nearly 25,000 acres annually. The form commercial thinning takes in a silvicultural prescription can vary, depending on the goals of the treatment.

Forest health, resilience to fire, and wildlife habitat are of increasing



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This photo is taken from a landing in a “focus tree” thinning unit harvested with downhill skyline logging. The pattern of sunlight on the forest floor illustrates the impact of the variable density spacing on creating edge effect and stimulating understory growth for habitat improvement.

importance in the types of treatments applied and where they are prioritized on the landscape. Selective thinning can be used to remove species of trees that are highly susceptible to insects or disease. Fuels reduction may be a higher priority near communities and other high-value areas, based on risk assessments. Variation of residual density or incorporation of small openings can improve habitat value by increasing deer or elk forage or increasing food sources for neotropical migratory birds with fruit-producing understory plants or hardwood species that support birds that feed on insects.

Thinning in riparian areas can help restore stream structure by improving residual growth rates to increase the

availability of large woody debris over time. Traditional tribal uses can be supported by enhancing growing conditions for culturally important plants, some of which benefit from prescribed fire or require early seral conditions to thrive. As described in the article on the Pinchot Partners, huckleberry enhancement projects are now underway on several national forests.

Case study in variable density

The commercial thinning prescription featured here is just one of many types of treatments being applied on federal lands in the Pacific Northwest that integrate multiple land management objectives with timber harvest. The Finney Adaptive Management Area on the Mt. Baker-Snoqualmie National Forest in western Washington is one of several Adaptive Management Areas designated on national forests by the Northwest Forest Plan, where different technical and social approaches to achieving desired ecological, economic, and other social objectives could be tested. It includes mid-elevation stands that were clearcut in the 1960s, which are now dense single-story mixed conifer with little or no



503-684-8168
1-800-783-6818
11825 SW Greenburg Road, Suite 200
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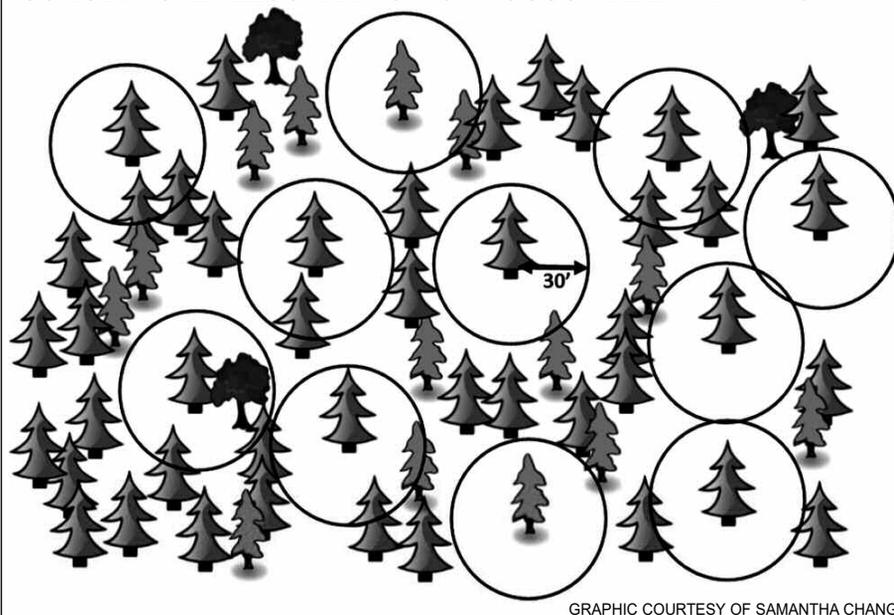
understory vegetation. Goals for this area, which is also allocated as Late Successional Reserve, are to protect and enhance conditions of late-successional and old-growth forest ecosystems and serve as habitat for associated species—primarily the federally listed northern spotted owl and marbled murrelet.

The treatment objectives were to accelerate the development of structural complexity by growing larger trees that can provide larger future snags for cavity-nesting spotted owls, increase branch diameters to provide nesting platforms for marbled murrelets, increase tree species diversity, create multi-layered canopy structure, and increase understory vegetation to benefit a range of wildlife. Additional objectives of the silvicultural prescription were to create maximum complexity with minimal marking and make implementation as simple as possible.

The marking crew was instructed to select and mark 10 trees per acre (about 66 feet apart on average) based on species preference (Douglas-fir or western hemlock), large diameter, and general good health and vigor. In practice, the marked trees were referred to as “focus trees,” as in focus on the trees with the best potential to grow large branches (nesting platforms). Quality is more important than precise spacing. All merchantable trees within 30 feet of a marked tree are cut. Trees outside of 30 feet are not cut, unless necessary for skid trails or skyline corridors. Hardwoods and minor species are not cut to maintain species diversity. Target relative density is 30, slightly below typical targets for commercial thinning with full site occupancy.

The spacing of focus trees creates a mosaic of semi-connected small openings and dense, unthinned areas of varying shapes and sizes throughout the stand, while also allowing sufficient space for felling and yarding with minimal hang-ups or damage to residual trees. The focus trees and those on the edges of the cut radius receive more light and growing space, allowing increased bole and branch diameter growth, which should increase the availability of nesting structure over time. Additional light to the forest floor will increase understory vegetation

CONCEPTUAL ILLUSTRATION OF FOCUS TREE THINNING



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and shade tolerant tree regeneration. Epicormic branching on Douglas-fir either marked or left between the cut radius of marked trees should increase the number of platforms for wildlife and epiphytes, providing a structural element found in late successional forests.

A timber sale implementing this prescription started in 2016, producing logs for nearby mills and supporting dozens of jobs in the local area. Easy identification of the marked focus trees, and ability to maneuver ground-based harvesting equipment within the semi-connected openings, simplified harvesting operations and sale administration compared to labor-intensive and sometimes complicated diameter and spacing requirements (designation-by-description, or DxD) typical on westside national forests. Per acre volume is slightly higher in the focus tree units than DxD due to lower target density and thinning throughout the diameter distribution, which adds to purchaser satisfaction.

The only constant is change

It is becoming unfortunately routine to hear that the 10-year average for acres burned in a fire season has been again exceeded, and that fire seasons are growing longer or never ending within the year for some areas of the west. While fires are setting records, the effects of changing climate are showing in more frequent

drought and patterns of tree mortality across landscapes. Managing stand density and maintaining species diversity are key to increasing resilience to insects, diseases, and drought by reducing growing stress for remaining trees and susceptibility of the stand to species-specific damage agents. As forest managers are asked to meet increasingly complex objectives for timber, habitat, and forest health, silviculturists need all the tools in their toolbox to recognize and find solutions for these issues.

The challenges of the increasing scale, severity, and frequency of fire and forest pathogens, combined with increasing recreation demands on public lands and development in wildland-urban interface, require that federal land managers and foresters step up and keep focused on what we can do to develop resilience, adapt to changing conditions, and use our communication skills to educate and inform the public on the benefits of active forest management. ♦

Samantha Chang is a silviculturist for the USDA Forest Service, Mt. Baker-Snoqualmie National Forest, and currently serves on the Washington State SAF Executive Committee. She can be reached at 360-436-2309 or schang@fs.fed.us.
