



Oakville Case Study: Pre-Commercial and Variable Density Thinning

Quick Facts

Location:

Near Oakville,
Washington (Grays
Harbor County)

Property Size:

30 acres

Forest Type:

Mixed conifer-hardwood

Soil Type:

Centralia Silt Loam

Stand Age:

~30 years

Primary Objectives

- Generate sufficient income to cover all forest ownership and management costs and provide modest dividends to owners.
- Manage forest in trust as an investment and legacy for the family such that it provides opportunities for recreation, livelihood and periodic dividends.
- Conserve and enhance wildlife habitat.
- Manage forest using uneven-aged silvicultural methods to improve structural and biological diversity and sequester carbon.
- Increase forest resilience by reintroducing tree species better adapted to anticipated climate conditions.

Stand and Site Description

Located near Oakville, Washington, this 20-acre forest consists largely of a mixed Douglas-fir and red alder stand that was established following clearcutting in 1994. Although Douglas-fir was planted throughout the site, it now persists mainly on upper slopes and drier areas, while red alder has colonized lower and wetter sites, competing aggressively with the fir. Throughout the forest, older trees from the prior generation were retained in

small groups and as individuals, and represent the full complement of native species typical for this site, including: western redcedar, western hemlock, Douglas-fir, big leaf maple and red alder.

The property is situated on soils classified as Centralia Silt Loam, which are deep, fertile, and highly productive.

Beginning Conditions

In 1994, the previous landowner clearcut a 60 – 70 year old Douglas-fir dominated stand that covered approximately 26 acres of the property. Douglas-fir seedlings were replanted across the entire harvest area the following winter at ~350 TPA. When the current landowners began managing the forest, it was overstocked – the canopy was closed, limiting light to the forest floor and resulting in low species diversity in the understory. The uniformity of the stand and its dense spacing also posed risks for fire, disease, and windthrow. These conditions prompted the landowners to adopt ecological forestry practices to increase forest health and reduce long-term risk. With technical assistance from NNRG, the landowners have developed a plan focused on ecologically-based commercial thinning and long-term timber production, restoration of wildlife habitat, carbon sequestration, and reintroducing tree species better adapted to anticipated climate conditions.

The long-term desired future condition is a working forest that produces both high quality forest products and optimal wildlife habitat and ecosystem services. A key strategy for ensuring long-term economic and ecological resilience is managing for diversity in tree species, age classes, and timber products. By avoiding reliance on a single species or age cohort, the forest will be less vulnerable to large-scale disturbances such as windstorms, pests, and disease. This vision does not aim to recreate historical conditions, as climate change and other human and environmental factors may no longer sustain the forest compositions of the past.



Thinned Douglas fir stand



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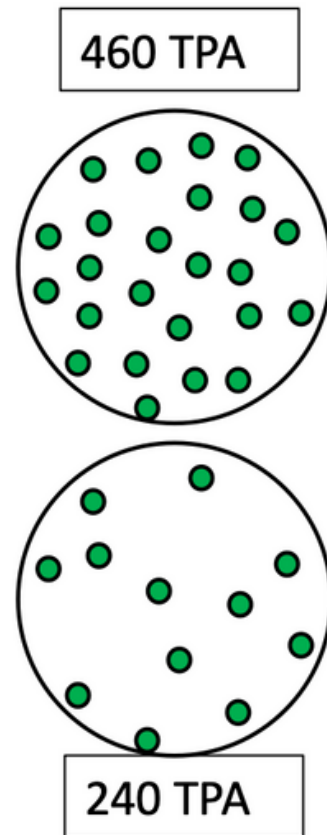
Prescriptions

To achieve this desired future condition, the forest has been managed using uneven-aged management strategies that promote stands containing multiple species and ages of trees. Management activities have also encouraged both vertical and horizontal structural diversity, leading to multiple canopy layers and an increasingly complex forest structure.

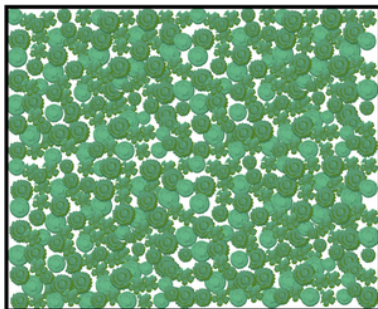
Prescribed treatments include:

Pre-commercial thinning

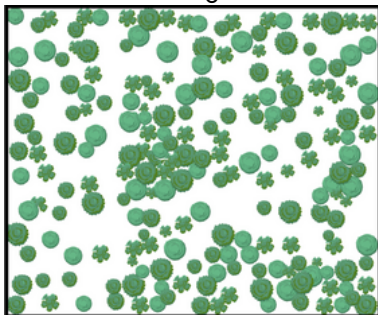
In this forest, pre-commercial thinning was prescribed for stands that exceeded 350 TPA after canopy closure. The dense canopy in these stands caused the live crown ratio to drop below 30%, suppressed understory vegetation, and contributed to suppression-based mortality. In order to keep these stands in optimal growth, and to minimize the risk for natural disturbance, they were pre-commercially thinned. Thinning reduced the average stand density to 240 - 280 TPA.



Before and after pre-commercial thinning



Before thinning



After VDT - unthinned, moderately thinned, and heavily thinned patches.

Variable density thinning

Variable density thinning (VDT) is prescribed for this forest approximately 15 years after pre-commercial thinning, or when stand age reaches 30 years and average tree diameters reach 10" - 12" DBH. VDT will occur every 15 years thereafter. During each VDT entry, approximately 30 percent of the canopy trees will be removed. VDT involves varying the thinning intensity to produce a mosaic of unthinned, moderately thinned, and heavily thinned patches. This strategy helps generate a more complex forest structure by promoting tree growth at different rates, and encourages understory development through a diversity of species, a variety of patch types, and growth of tree seedlings and saplings.



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Before and After

Following the first thinning, the forest's appearance shifted noticeably. The increased light to the forest floor allowed for a flush of native understory plants, and retained trees showed increased crown expansion and improved growth rates within the first two growing seasons. The patchy, irregular nature of the thinning also began creating a more naturalistic stand structure that mimics forest disturbances.

In the coming years, the forest is expected to continue developing greater resilience to drought and disease due to reduced competition and increased species and structural diversity. Wildlife such as birds and small mammals have already responded to the increased habitat variety created by understory development.

Cost-Share Funding

Over the years, the landowner has applied for and received Environmental Quality Incentives Program (EQIP) funding for a variety of forestry projects. These include:

1. Pre-commercial thin (20 acres)
2. Underplant hardwood stands with shade tolerant conifers (10 acres)
3. Planted wildlife forage shrubs in gaps in forest

The landowner has applied for funding through the Conservation Stewardship Program to support the ongoing conservation practices being implemented on this land. These practices include:

1. Thinning of dense areas and storm-damaged trees
2. Planting conifers that will sequester carbon
3. Planting trees & shrubs to restore native plant communities
4. Maintaining forested riparian buffers along seasonal streams
5. Improving wildlife habitat through habitat piles, nesting boxes, downed logs, snag creation and forage planting.



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