

# Reducing Hazardous Fuels on Woodland Properties:

## THINNING

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### Why Thin?

Thinning is one of the most powerful forest management tools available to landowners for achieving a wide range of goals and objectives. Thinning influences tree growth rates, economic potential, species composition, resistance to insects and disease, quality of wildlife habitat, forage production and visual appearance of a stand of trees. Another very important purpose for thinning can be added to this list: increasing the ability of a forest to survive wildfire.

Aggressive fire suppression over the last 100 years has caused many forests to become much more dense than they were before European settlement. As a result, in Oregon today, more than 80% of the forests are at dangerously high risk of severe wildfire. It's not a question of if a fire will occur, but when.

Thinning forests is simply the process of and removing excess trees that can lead to poor vigor and increased fire risks and then retaining and managing trees that will serve to meet your goals and objectives.

### Ladder Fuels.

In many unthinned forests, smaller trees have branches extending to the ground that can easily catch on fire. When this happens, the small trees act as 'ladder fuels,' carrying the fire up into



the crowns of the big trees (Figure 1.) In this way, a low intensity fire on the ground can quickly develop into an uncontrollable wildfire.



Figure 1. Thick Stands with Ladder Fuels – High Fire Risk

# Which Trees are Selected?

“Low” thinning leaves mostly the larger, dominant trees in the forest which are usually the healthiest and most vigorous (Figure 2). Smaller, less vigorous trees, and those with poor form are removed. Low thinning, combined with slash treatments, can greatly reduce fire hazard.

# How does thinning affect fire behavior?

Low thinning increases the ability of a forest to survive wildfire by: (Figure 3,4)

- Leaving larger trees, whose thick bark and high branches protect them from ground fire.
- Removing small trees and other ladder fuels, so the distance between the ground and lower live branches is increased. This makes it harder for a surface fire to move up into the tree canopy and become a crown fire.



Figure 3. (Above) Unthinned commercial Douglas-fir.



Figure 4. (Right) Same stand after thinning.

- Increasing the distance between tree crowns, to make tree-to-tree crown fire less likely.

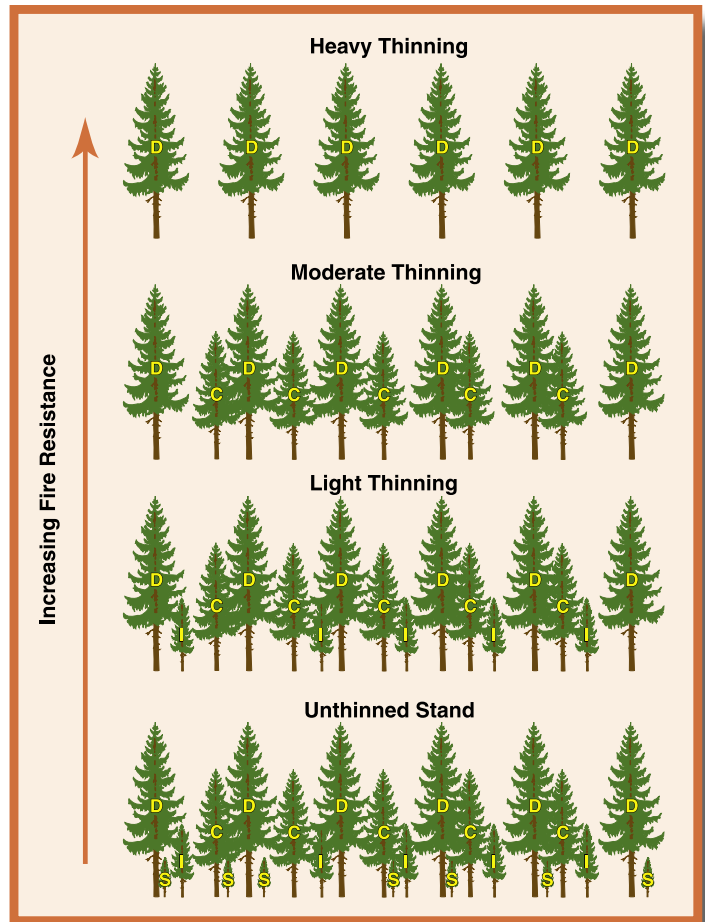


Figure 2. Thinning from below removes fuel and reduces fire risks.

Thinning can also greatly increase the amount of fuels on the ground (small branches and the like) called slash, which can substantially increase fire risk unless treated (Figure 5). In fact, following a thinning harvest, you may be required to reduce the slash as part of Oregon’s forest protection laws. See the fact sheet in this series on “Slash Treatment Options” for more information on dealing with this problem.



Figure 5. Heavy slash after a thinning.

# How is thinning done?

A wide variety of equipment is used in thinning. Crews equipped with chainsaws are highly versatile and can handle thick or sparse stands, flat or steep ground in all kinds of weather. Caterpillar tractors, skidders, farm tractors and even horses and all-terrain vehicles are used to skid timber and small trees that has been felled with a chainsaw.

Mechanical harvesting machines that fell trees, remove limbs and cut the stems into specified merchantable lengths are sometimes utilized instead of a worker with a chainsaw (Figure 6). In some mechanical operations, whole trees are skidded to central work areas, or landings, and processed. This helps remove much of the slash from the woods and creates a ‘clean’ appearance. In others, trees are limbed and bucked in the woods, which leaves more nutrients on the site but also more slash and more fire hazard, which has to be dealt with to conform to forest practices laws.



Figure 6. Mechanical harvester in young Douglas-fir stand.



Figure 7. (Above) ATV with “log arch”. Example of light duty harvesting equipment for smaller diameter logs.

Figure 8. (Right) All Surface Vehicle (ASV) with slash buster head thinning young Western Larch stand.



Several new types of small scale, “light touch” harvesting equipment have been developed that work well on small tracts (Figure 7 and 8). Stand conditions, topography and landowner objectives will help determine which equipment combination will work best. Some thinning operations will pay for themselves or even generate a profit if sawlogs are generated and sold to a mill. In

most thinnings done for fire hazard reduction, however, there will be a cost. This will vary considerably depending on the difficulty and size of the job. Some costs can be offset through cost-share programs, and through utilization of some of the thinned material. See the fact sheet in this series on “Slash Treatment Options” for more information.

Thinning will often leave large amounts of slash on the ground which is both unsightly and, if left untreated, creates a very high fire hazard. But when the thinning work is combined with follow-up slash treatments, such as hand piling and burning, the end result looks good and the fire hazards are far less.



Figure 9. A rubber-tired skidder removing commercial trees from the woods.

## Conclusion

There are many good reasons to thin stands of trees and landowners have tremendous flexibility in how a thinning may be performed in order to meet their specific goals and objectives. But remember, when wildfire is a high risk to your property, it's likely not a question of whether or not to thin, only how.

Table 1. Summary of Thinning Considerations in Hazardous Fuels Reduction.

Item	Options
	Reduce fuel loads, improve stand vigor. Highly effective.
Other Treatment Required?	Pile/burn slash, prune.
Near home?	Yes, but caution needed.
Equipment needed	Chainsaw, pruning/pole saw, slash buster for removing small, unmerchantable stems and pruning branches. Commercial size timber has many choices available: ASVs, horses, tractors, skidders, mechanical harvesters, cable yarders.
Suitable Vegetation types	Conifer forests.
Topography limit	Varies with equipment choices. Some machines will work on very steep topography.
Riparian zone?	Within limits of the Oregon Forest Practices Act.
Production potential	Variable; depends on stem size, density, topography and equipment choices.
Cost range	Pre commercial thin with slash disposal can cost from \$100 to \$800 per acre. Commercial harvesting can cost from \$100 to \$250 per thousand board feet, much higher with additional slash treatment work.
Site disturbance	Minimal to extensive depending on operator skill and equipment used.
Insects/disease	Thinning activities can stimulate problems with destructive insects and diseases. Check with local Oregon Department of Forestry or OSU Extension Forester on potential risks in your area.
Maintenance	Thin again when stand becomes over crowded. PCT may be required if dense regeneration becomes established after thinning.

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