

# Reducing Hazardous Fuels on Woodland Properties:

## DISPOSING OF WOODY MATERIAL

M. Bennett and S. Fitzgerald

Oregon State UNIVERSITY **OSU** College of Forestry

### Introduction

*Hazardous fuels reduction involving some form of thinning frequently generates large amounts of woody residues such as small diameter logs, tree tops, branches, and the like. This publication discusses several options for economically and effectively utilizing and disposing of this woody material.*

### Utilization

During fuels reduction thinnings, trees are felled, limbed, and bucked into logs of varying lengths. The logs can often be utilized rather than left in the woods or piled and burned. Small log utilization includes the sales of commercial products, such as sawlogs, posts and poles, and as well as production of firewood and other materials for home use. Some thinnings may pay for themselves or even generate a profit. However, most thinnings done for fire hazard reduction, will entail a cost. This will vary considerably depending on the difficulty and size of the job and the amount of merchantable material available. Sale of products may help offset these costs.

### Sawlogs

Markets for small diameter logs vary considerably with the locale and current economic conditions. Merchantable sawlogs generally must be

at least 5" diameter at the small end (inside bark) and 12' long, though longer logs are much preferred. Typically, a standing tree must be at least 8" in diameter at chest height to generate a sawlog. Sawlogs are typically sold by the board foot or ton.

The expense of handling small sawlogs – bucking, yarding, sorting, and loading – is considerable. In recent years, a variety of small-scale, low impact logging equipment has been developed which permits more efficient processing of this material. To make the effort worthwhile for an operator, you should have about 1 truckload or more of logs and approximately a week's worth of work to justify the cost of moving in equipment.

Selling forest products, even in small amounts, involves a variety of considerations such as filing a "harvest notification" with the Oregon Department of Forestry and taxes. See the references section for related publications.

### Posts and poles

Some areas have markets for posts and poles that permit sale of logs down to 2"-3" diameter (small end, inside bark). Small diameter poles can also be used for home projects such as fences and deck supports. Peeling the bark off of the poles helps preserve them.

### Firewood

Much of the small diameter material that isn't suitable for sawlogs or posts and poles can be turned into firewood for sale or home use. Hardwoods are preferred, with Douglas-fir, lodgepole pine, and western larch as the first choices among conifers.



Figure 1. Milling small diameter logs.

### Cutting Lumber with a Portable Sawmill

Another option is to hire out a portable sawmill operator (figure 1). The mill can produce lumber from your logs for home use from small sawlogs. Mill operators generally charge by the hour or board foot.

# Slash Disposal

Once you have utilized all the material that is practically and economically possible, the next issue is to treat the remaining woody residue, known as slash. Left untreated, slash can pose a significant fire hazard. In fact, following a thinning harvest, you may be required to reduce the slash as part of Oregon's forest protection laws. You should check this out with the Oregon Department of Forestry.

## Cut and Scatter

With this technique, understory trees, branches, brush, and other ladder fuels are simply cut, sectioned into smaller pieces, and scattered across the site (figure 2). Larger logs may be removed and utilized. The objective is to reduce to overall fire hazard by reducing ladder fuels. However, cut and scatter does not eliminate fuels – it just redistributes them. Cut and scatter typically increases the total amount of surface fuels, and also creates a continuous layer of fuels across the ground.



Figure 2. Pre commercial thinning with limed and lopped slash.

Although ladder fuels are reduced, overall fire hazard may be increased initially (figure 3). Then, as the material decays over time, the fire hazard declines. A common problem in dry forests is that slash accumulations may take a decade or more to decompose to the point where they no longer pose a significant fire hazard.

**Thus, cut and scatter should only be used where ladder fuels and slash loads are light.**



Figure 3. Excessive slash load. Should be piled and burned.

Contact with the soil surface speeds decomposition. Depth of the slash is also important. A shallow, compact fuel bed will generate lower flame lengths in a fire than a deeper, more loosely packed fuel bed.

While cut and scatter is often used for non-commercial thinning of ladder fuels (e.g., small understory trees and saplings), it is also used to treat tops, branches, and other non-merchantable material generated in commercial thinning operations.

## Guidelines

- Cut material into small pieces and scatter to a depth of 12” or less.
- Cutting material in the fall provides more time for it to break down before the next summer's fire season.
- Do not use this method of slash disposal within your home site's defensible space (e.g. within 30 to 100 feet).
- Use this method in low density stands where existing surface fuel loads or ladder fuels are light, where decomposition will proceed rapidly, and where a potential short term increase in fire hazard is acceptable.

## Pile and Burn

With this technique, the material to be treated is cut, placed in piles, and burned. Hand piling is frequently used on steeper slopes and other areas inaccessible to heavy equipment, or on jobs too small to justify the move-in costs of equipment. Hand piling is also used in dense stands where equipment is difficult to maneuver, or where the risk of damage to remaining trees or to the soil is unacceptable. Hand piling is generally limited to material less than 6” in diameter.

Small dozers have traditionally been used for machine piling. Dozer piling should be done only when soils are dry or frozen, to minimize the risk of compaction, and care must be taken not to rub the bark off leave trees, especially in spring. Use a toothed brush blade if possible to help keep soil out of the pile.

Other mechanized slash piling options include small tracked machines with booms and grapples. These and other mechanized slash and fuels reduction methods are addressed in the companion fact sheet, “*Hazardous Fuels Reduction on Woodland Properties: Mechanical Treatments.*”

## Pile Burning

This treatment is very effective at reducing slash to acceptable levels (*figure 4*). With pile burning, you have the option to cut, pile, and immediately burn (“swamper burning”); or cut, pile, cover and burn later in the wet winter months.



*Figure 4. This stand in SW Oregon was thinned and hand piled.*

There are significant risks in pile burning. A landowner may be held liable if a fire escapes and becomes a wildfire when burning restrictions and regulations are not followed. Burning usually leaves large, blackened circles and may cause scorch damage to other trees and vegetation if piles are too close or piles are burned too hot. Burning piles on warm, windy days poses escape risks. Piles may smolder for days or even weeks, roaring back to life in windy, warm weather, even during winter.

### Guidelines

**Prior to constructing hand piles,** determine the location and placement of each pile.

- Look for an open area away from structures, firewood, propane tanks, power lines, and hazardous materials.
- Place piles at least 10 to 20 feet away from trees, snags, brush and downed logs.
- Place piles at least 50 feet from streams and drainages. Avoid placing piles in ditches.

### Construct hand piles with burning in mind.

- Place small branches, twigs, and brush less than ½ inch in diameter at the bottom of the pile to provide “kindling” for easier ignition and better consumption of the larger material.
- Lay limbs and stems parallel and in the same direction to minimize “air pockets.”
- When piling on a hill side place material parallel to the slope to prevent the pile from rolling.

- Pile sizes can vary but should be at least 4 feet in diameter and 4 feet in height (*figure 5*).

**Cover hand piles if material is not going to be burned immediately.**

- Covering hand piles allows for more opportunities to burn during rainy or wet periods and provides a dry ignition spot.



*Figure 5. Burn pile properly piled. It will be ignited when pile has dried but the surrounding forest is wet.*

- Cover handpiles when the pile is about 80 percent complete. Place cover on pile and add additional material on top to hold cover in place.
- Remove cover prior to burning.

### Burn piles only when conditions are safe.

- Prior to burning, obtain a burn permit through your local fire department.
- Burn hand piles when burning restrictions are lifted, conditions are wet or rainy with little or no wind, and during daylight hours.
- Have a shovel and water nearby and ready to use.
- Check carefully to make sure the piles are out before leaving the area.

## Chipping

Chipping can be a very effective method of slash disposal. A layer of chips a few inches deep spread across the ground poses relatively little fire hazard. Chipping results in a neat appearance, and the material can serve as mulch, holding soil moisture, covering exposed soil, and inhibiting the germination of weeds. Depending on moisture levels and the depth of the chips, they may decompose rapidly or slowly. There is no evidence that chips spread over the soil surface “tie up” nitrogen in the soil. However, chips may inhibit the growth of some ground vegetation. There is also some indication that organic chemicals leached from the chips may inhibit the activity of soil organisms, but little is known about this phenomenon.

Chipping is well suited to homesite and defensible space work. However, chips should not spread to a depth of more than a few inches, should not be used at all around the foundation of the home.

Many contractors, including arborists and tree service companies, have large chippers that can process relatively large diameter material efficiently. Homeowners can also rent chip-

pers, but the machines are usually smaller and productivity is much lower. In general, chipping is very labor intensive and costly. Most of the labor is involved in dragging the material to the chipper and feeding it by hand. The material can also be piled first and the chipper moved around to each of the piles. Chipping requires fairly level ground and good access, since most chippers are towed by a truck or tractor.

Self-propelled, whole tree chippers have also developed and may be available for contract work in some areas. (figure 6)



Figure 6. Whole-tree chipper in pine stand.

## Haul Away

Slash may be carried to a dumpster or a pickup bed and hauled away. This is labor intensive and best suited for relatively small amounts of material near homesites, where there is good access. The material can be hauled to a landfill or other disposal site. Some counties have “free days” where residents can bring in slash and debris for free. Contact your local landfill folks. Some locales may have biomass power facilities that offer slash disposal for free or a low fee. There is increasing interest in using woody residues for commercial power production. Currently, however, this is not economically feasible in most areas.

Table 1. Summary of Woody Material Disposal Options

Considerations	Utilization	Cut and Scatter	Cut, Pile & Burn	Chip	Haul Away
Objective & effectiveness	Remove small logs: sell when feasible to offset treatment costs. Follow with slash treatment.	Reduce ladder fuels and redistribute fuel load. Not as effective as other treatments.	Remove woody residue generated in thinning; reduce ladder and surface fuels; very effective.	Reduce ladder and surface fuels; effective.	Remove woody residue generated in thinning; reduce ladder and surface fuels; very effective.
Near Home?	Yes	No	Yes	Yes	Yes
Riparian zone?	Maybe	Yes	Maybe	Maybe - depends on access.	Yes
Slope	All – ground-based, mechanized log handling equip. usually limited to slopes <40%	All	All	<40%	Flat
Equipment needed	Small log handling equipment, e.g., ASV	Chainsaw	Can be done by hand or using equipment.	Chipper	Truck
Site disturbance	Varies	Little	Some; can be considerable with mechanized piling.	Little	Little
Contract Cost Range Acre	Highly variable	\$25 - \$45	\$275 - \$1,500 (major cost is piling)	\$500 - \$1,500	Highly variable
Advantages	Can offset treatment costs.	Cheap and easy to implement.	Very effective slash/fuels reduction method.	Effective; neat in appearance.	Effective; neat in appearance.
Disadvantages	May not be feasible; costs may greatly exceed benefits.	Less effective than other treatments - the fire hazard may remain for several years.	Labor intensive and costly.	Labor intensive and costly.	Labor intensive and costly.

The authors are respectively, Forestry Agent, Southern Oregon Research and Extension Center, 569 Hanley Road, Central Point, OR 97502, and Area Extension Forester, OSU Extension Service, 1421 S. Hwy 97, Redmond, OR 97756