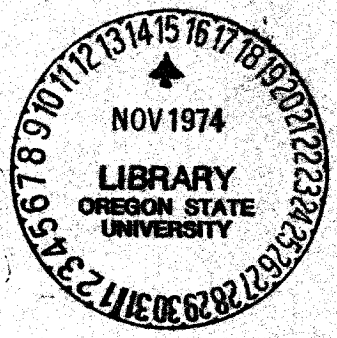
AFTER THE TUSSOCK MOTH

Salvage - Rehabilitation - Protection

A Guide for Forest Landowners

Forestry Extension



Special Report 422 November 1974

Oregon State University Extension Service

AFTER THE TUSSOCK MOTH

Salvage - Rehabilitation - Protection

A Guide for Forest Landowners

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FOREWORD

The publication "After the Tussock Moth--Salvage, Rehabilitation, and Protection: A Guide for Forest Landowners" is a cooperative effort on the part of the agencies listed below, to bring landowners information regarding salvage and rehabilitation of land and forests damaged by the tussock moth. Each of the contributors has drawn on the expertise within his respective organization as well as his own knowledge to list alternatives and make the recommendations found in this publication. This compilation should facilitate decision making, salvage operations and rehabilitation work which are necessary in this difficult situation.

Participating Agencies:

Oregon State University Extension Service

Oregon State Tax Commission

Oregon Wildlife Commission

Soil Conservation Service

State of Oregon Department of Forestry

U. S. Forest Service

Washington State Department of Natural Resources

Washington State University Cooperative Extension Service

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AFTER THE TUSSOCK MOTH

Salvage - Rehabilitation - Protection

A Guide for Forest Landowners

Timely salvage and rehabilitation of timber damaged by the tussock moth infestation of 1972-73 requires certain decisions and plans. This publication is designed to outline these decisions and to provide the basic information you need for planning. The publication discusses tussock moth damage, salvage cutting opportunities, rehabilitation and reforestation methods, protection measures, available help, and applicable state laws. All of these factors must be considered in deciding on the course of action that is best for you and your lands. For this reason, we suggest that you study all of this information before proceeding with specific actions.

What has happened

The tussock moth outbreak developed in Northeastern Oregon and Eastern Washington in 1972. About 172,000 acres were defoliated. By the end of 1973 a total of 800,000 acres had been defoliated in varying degrees. Over 100,000 acres of this are on private lands.

Douglas-fir, white fir, and subalpine fir are the preferred hosts of the tussock moth. Generally, pine and larch are not attacked. The tussock moth larvae feed on the new fir needles in the spring and move to older foliage as the season progresses. Feeding occurs from mid-May through July. Infested foliage begins to turn reddish-brown in June. By mid-July entire trees may be defoliated. Completely defoliated trees will probably not survive. Trees with defoliated tops alone may survive but are likely to develop dead tops.

The problems

Landowners with tussock moth damage may be faced with any or all of three problems:

- Dead or dying merchantable timber. Unless this timber is salvaged within two years its commercial value will be lost.

- Inadequately stocked residual stands. Reforestation in these stands may be necessary to meet land owner objectives for forest growth and yield.

- Increased fire hazard. Fire prevention and protection is needed. In some cases this may be accomplished by disposal or treatment of dead fuels.

Variation in damage

Actual damage varies with forest type and degree of defoliation.

The most important factor in individual tree survival is the percentage of foliage removed.

- Trees with heavy defoliation (more than half of the crown defoliated) will probably die. Some trees are already dead from 1972 defoliation. Merchantable trees in this category must be salvaged within two years or they will lose their commercial value. Seedlings and saplings in this category cannot be expected to recover.

- Trees with defoliated tops and with more than half of the crown remaining will probably survive but will develop dead tops. Such trees are poor growing stock. If merchantable they should be salvaged, but timing is not as critical as above.

- Trees with light defoliation (less than half of the crown defoliated) have had reduced growth but should survive. These trees are acceptable growing stock and need not be salvaged.

Damage also varies from stand to stand. Some stands have uniform damage where all trees are defoliated to about the same extent. Other stands contain scattered damage where defoliated trees are mixed with healthy trees. Scattered damage is particularly common in mixed stands of fir, pine, and larch.

The important stand factor is the number of healthy surviving trees.

Generally if the surviving healthy trees form 25% crown closure or consist of 100 or more well-spaced trees per acre the residual stand is adequately stocked. Twenty-five percent crown closure means that 25% of the ground area is covered by an imaginary vertical projection of all living tree crowns or canopies. Damaged merchantable trees can be removed by partial cutting and follow-up reforestation efforts are generally unnecessary.

Damage is more serious where fewer trees survive. If the stand is merchantable, there is an opportunity for partial cutting or clearcutting followed by reforestation. Slash

disposal and/or site preparation operations may also be necessary. Nonmerchantable stands in this condition may need similar reforestation efforts but do not provide an opportunity for salvage cutting.

Landowner decisions

You are thus faced with several decisions. These must be based on the particular damage you have experienced and your objectives in land management.

You must decide the land use that meets your objectives--forestry, range, combined forestry and range, or other land uses.

You must decide if salvage cutting is feasible and, if so, the best method of cutting. Plans for salvage cutting must be made in the near future to allow harvesting before the timber decays. Cutting plans must meet the Oregon or Washington Forest Practices Act and slash liability laws.

You must decide if reforestation is necessary. If it is you must choose the best method. Reforestation plans should be integrated with any cutting plans.

LAND USE OPPORTUNITIES

Forestry

Eastern Oregon and Eastern Washington are expected to have an increasing demand for logs as timber supplies become limited in the Pacific Northwest and the demand for wood products increases. This means that within the next timber growing cycle, the prices of east side timber will rise. This coupled with the normal increase in value due to timber growth should make forestry an attractive investment.

Range

Domestic grazing is an important land use. The estimated average grazing capacity on timberlands in Northeastern Oregon and Eastern Washington is about 7 acres per animal unit month (A.U.M.--one cow's feed for one month). The estimated average grazing capacity on dryland grazing lands in Northeastern Oregon and Eastern Washington is 4 or 5 acres per A.U.M. You should carefully consider such items as total available A.U.M.s, water sources, fences, season of use, and access when planning an intensive domestic grazing use.

Combined forestry and range

One common approach in Northeastern Oregon and Eastern Washington is to manage timberland for both domestic grazing and timber production. You must decide the degree of use for each and plan your management accordingly. Factors to be considered are season of use, grass species, grazing capacity, water, salt locations, age of animals, tree species, size of trees, and spacing of trees.

Other land uses

Other land uses include recreation, wildlife, watershed, homesite, business site and investment. All of these uses require vegetation. The type of vegetation you maintain depends on your individual needs, wants and economics as well as natural vegetation and other site factors.

SALVAGE LOGGING

Whether your choice for future land use is forest, range, or other land uses you should consider salvage logging the timber killed or damaged by the tussock moth. Unless salvaged, damaged trees will rot and lose their commercial value. Also, they may be attacked by bark beetles which will cause further deterioration. The condition of the stand governs decisions and several factors to consider are: a) when should you salvage log, b) do you have enough timber of sufficient size to sell, c) what trees to select for cutting, d) how to salvage log, and e) what to do if your trees are too small to sell.

When to salvage log

If most of the Douglas-fir and white fir in your timber stands are dead you should harvest these trees soon to 1) reduce the fire hazard and 2) avoid their decaying and thereby losing their commercial value.

Definition of a merchantable stand of timber

The minimum volume per acre which can be considered a feasible salvage harvesting operation is about 3 thousand board feet to the acre (3 m.b.f.).

Table 1 provides the estimated tree volume for each diameter class. The volume per acre is calculated by multiplying the estimated number of trees per acre in each size class times the corresponding volume estimate in Table 1. The total volume is determined by multiplying the average volume estimate per acre times the number of acres you will harvest. The total available volume is also important. A small logger may be willing to harvest a minimum total volume of 50 m.b.f. whereas a larger logger may not be willing to harvest anything less than a total volume of 200 or 300 m.b.f.

Table 1. Estimating Volume Per Acre By Tree Size Class

I Tree Diameter (Inches)	II Tree Volume (Board feet)	III Estimated Number[1] of Trees Per Acre	IV Volume[2] Per Acre
10	20		
12	50		
14	80		
16	140		
18	250		
20	300		
22	400		
24	490		
26	600		

Total Volume Per Acre[3]: _____

Total Volume[4]: _____

[1] Estimate the number of trees per acre in each size class of your stand.

[2] Multiply figures in colume II (Volume) by corresponding numbers in column III.

[3] Add figures in column IV to give total volume per acre.

[4] Multiply total volume per acre times number of acres for total volume.

If you have a tussock moth damaged stand that does not have enough volume per acre or total volume to interest a logger, you should consider salvage harvesting it yourself and selling your logs from a roadside pile. You could also harvest some of the healthy trees along with the damaged trees. By doing this you could sell enough total volume to get a logger to do the harvesting.

Any recently killed tree or any green tree with 1/2 or more of its total crown killed by the tussock moth should probably be cut. The smallest size trees being commercially harvested are 10 inches in diameter at a point 4 1/2 feet above the ground although smaller trees may be accepted by some mills.

Join forces with your neighbors and put up one large salvage operation. This could result in a higher price being paid to the landowners.

How to salvage log

If you sell your uncut trees to a logger or a mill the money you will receive per thousand board feet is called "stumpage". The stumpage value you will receive will vary with 1) the size of the area to be logged, 2)

the size of the trees to be cut, 3) the total volume to be logged, 4) the volume per acre to be logged, 5) steepness of the ground, 6) roads within the proposed logging area, 7) distance to the mill, and 8) quality of the roads to the mill. Logs piled at the roadside have a higher value than standing trees sold as stumpage.

If you plan on doing any of the work yourself make arrangements with a mill in advance to buy your logs. The appendix contains a list of mills that will buy logs. These mills may also help you locate a logger to do the work for you or a logger that will buy the timber from you.

There are several ways to log your timber: 1) Do it yourself, including cutting the trees and hauling the logs to the mill. 2) Sell your trees to a mill or a logger and let them cut your trees and haul them to the mill. 3) Cut the trees yourself and pile the logs on the roadside. Then hire a log trucker to load the logs onto a truck and haul them to the mill. 4) Hire a consulting forester to help you with your salvage logging including selling the logs and complying with forest laws.

Once you have arranged with a mill or logger to buy your trees, you should sign a contract with them. (Sample contracts are available at Oregon State University and Washington State University Extension offices and Oregon State Forestry Department and Washington State Department of Natural Resources offices.) You may also obtain technical advice from your consulting forester or the Department's Forester--see Assistance Available on page 20. Each tree to be cut should be marked with paint by you or someone representing you such as a consulting forester. Mark the trees at ground level and at five feet above ground. The paint clearly identifies the trees you want cut. The paint on the base of the tree gives you a record of trees you asked the logger to cut.

Protecting the residual stand during salvage operations

In any forest operation there will be some disturbance and damage to the residual stand. This is particularly true in areas requiring immediate salvage due to insect outbreak, where harvesting is required to remove the dead and dying material. The tasks for the landowner are to recognize the potential for damage to the stand, to minimize the damage by proper planning and control, and to leave the stand in acceptable condition for future harvests.

Numerous factors determine the amount of damage done to a stand during salvage operations. These factors may include: 1) the plan and design for salvage including skid roads, 2) the way the land lays and the soil type and vegetative cover, 3) the harvesting techniques and procedures, and 4) the concern of landowner and contractor for minimizing damage to the residual stand.

A few brief suggestions illustrate how to protect the residual stand.

> During Planning: Plan access with roads and skid trails for additional salvage, for later harvest operations, and for subsequent management. Cooperate with adjacent owners on road agreements and rights-of-way. Develop a salvage plan incorporating topography, soil information, and landowner objectives.

During Felling: Fell timber away from reproduction thickets and in the best direction for easy skidding. You should normally require low stumps (less than 12 inches) during felling, but a few tall stumps may serve as "rub stumps" to help control logs during skidding around curves.

During Skidding: Soil disturbance and soil compaction are major concerns particularly when operating on steep slopes and during wet weather. Avoid tractor skidding on steep slopes and minimize soil disturbance by well-planned skid trails. Care must be taken during felling, skidding and slash disposal operations to avoid crushing seedlings and saplings or "barking" larger residual trees. Bark scrapes are particularly serious. Barking white fir and Douglas-fir leads to heartrot within ten years. Barking pine and larch leads to reduced growth. This is simply a matter of care during logging and should be discussed with your logger. Some owners may wish to include a contract provision specifying penalties for barked trees.

During Slash Treatment: Slash remaining after salvage may bury reproduction and may present an extreme fire hazard. Fire breaks near valued timber stands, near reproduction patches, or near protected water holes or streams will reduce the fire hazard. Some landowners may wish to prune the lower branches of trees along the edge of the residual stand to reduce the hazard of fire creeping into the crowns of the remaining stand. In addition, the landowner who cannot salvage all the land in one year may wish to break up the total area by salvage operations that provide access and isolate smaller blocks of hazardous, dead crowns.

Determining property boundaries prior to salvage

Prudent landowners know and maintain their property lines and corners as described in deeds and property descriptions. On some lands, however, property lines and corners may have been obliterated. Lacking sufficient reason in the past to re-establish ownership lines, some landowners may not know the location of their property boundaries. Salvage harvesting of timber damaged by the tussock moth next to property lines may bring up boundary problems.

What are some landowner options for determining cutting lines and cooperating with adjacent landowners prior to salvage operations near property boundaries? If the property corners and lines described in deeds are known, the landowner may "freshen" the markings of the boundaries. If the property lines are not known, a single landowner or cooperating landowners may hire a re-survey to be carried out, or simple cutting line agreements may be reached with adjacent landowners.

The difficulties and legal complications of re-surveys may delay harvesting operations with loss of timber through decay and further insect damage as the survey is completed. Another option is for adjacent landowners to agree to a mutual boundary for the purpose of timber salvage only. This agreement in legal contract form or in a legally binding letter of intent will maintain the true property line which can be established at a later date. Agreements of this kind are practical ways to salvage

timber as long as they retain property lines according to deeds and descriptions and if they are in a written and legal form.

The County Surveyor in Oregon, or the County Engineer in Washington may be able to provide additional information relating to property lines.

Non-merchantable stands

If the trees on your land are too small to sell or if there are not enough trees to sell, then your future course of action depends upon why you own the timberland. In some cases the dead trees will have to be removed for rehabilitation, grazing access, or fire hazard reduction, even though they have no commercial salvage value.

REHABILITATION OPERATIONS

The most difficult decision facing any landowner with a forest stand damaged by the tussock moth is whether or not to salvage log and whether such a salvage operation is economical. This problem was discussed in detail in the previous sections. Following the salvage operation, the landowner must decide what form of rehabilitation is necessary or desirable for his chosen land use plan. The steps involved in reaching these decisions have been dealt with in earlier portions of this report. Here we will assume that you have decided to manage your land for either forestry, range, or a combination of forestry and range. Consideration of other land uses are discussed later.

REHABILITATION FOR TIMBER ONLY

Reforestation of land in Northeastern Oregon and Eastern Washington begins by asking the question: Should I establish a new stand of trees by seeding or planting? First let's consider the seeding alternatives.

Natural regeneration by seeding

This is a commonly practiced and fairly dependable method of obtaining regeneration in the mixed conifer forest which has been damaged. Land which has been salvage logged, but has approximately 25 live seed trees per acre left after salvage logging, should come back to trees without too much difficulty. Seed trees must be vigorous, windfirm, and of cone-bearing age. They should be well spaced over the area. During the salvage logging operation care must be taken to protect the leave seed trees from barking damage.

Two kinds of trees may be acceptable for seed trees, In stands where the overstory is reduced to the minimum (25 trees per acre) only the pioneer species, ponderosa pine, western larch, or lodgepole pine should be

considered as sources for natural seeding. In stands where more trees (75 trees per acre) can be left in the overstory the more tolerant white fir or Douglas-fir can be considered a good seed source provided that their seed bearing capability has not been reduced by top defoliation.

Site preparation during or following the salvage operation should be planned at the time of harvest. Piling of slash and scarification of the site to expose bare mineral soil is required to prepare a seed bed which is free of debris and competing vegetation. Adjacent standing trees should provide an acceptable alternative seed source to seed trees scattered throughout the area if the trees are within 2 tree heights of the area to be seeded. This means that openings up to 4 tree heights in diameter are acceptable provided the trees along the edge are of high vigor and capable of producing seed crops in the near future.

Artificial seeding

Artificial seeding has been attempted in Northeastern Oregon and Eastern Washington, but has had only limited and erratic success. With today's state of the art and seed availability we do not recommend it as a dependable regeneration method.

Artificial regeneration by planting

Any area which is not likely to come back to trees from natural seeding should be planted. Such areas are indicated by (1) drier sites, (2) lack of healthy seed-bearing trees and (3) lack of existing natural seedlings in the area. Two items which should be considered early when using this regeneration system are site preparation and seedling stock availability. Planting stock availability is always a critical factor in a regeneration operation, especially in this region at this time. No large volumes of seedlings from the local seed zones are available for planting in the spring of 1975. Until 1974 a large stock of local seed was not available for nursery production of seedlings. Unfavorable past experience with nonlocal strains of seed dictates only the use of local seed. The importance of utilizing only local seed sources for planting can not be overemphasized. Planting operations will have to be delayed until nursery stock of the proper seed zone is produced. This fact should reinforce the desirability of attempting to utilize natural regeneration whenever feasible, particularly in a year of a projected good seed crop.

Seedlings will be made available as soon as possible and may be purchased from one of the nurseries shown in the Appendix. There are practically no seedlings from on site seed sources in the Blue Mountains available at this time. The prospects for a good seed year in 1974 are good and seed should be collected this fall for sowing in the nursery next spring.

The planting operation

The landowner should order his seedlings as early as possible. The seedlings should be lifted from the nursery early in the spring. Planting

should be done as early as practical following the retreat of the snow line. Fall planting is not recommended. Care of the young seedlings during the period between lifting and planting is very important. If possible, they should be stored in refrigerated storage (32°-38°F seedling temperature).

Two-year old seedlings are the recommended size of stock. The cost of these seedlings should be in the range of $30-$35 per thousand and they should be planted on spacing of approximately 11 x 11 feet which will result in 360 trees per acre. Further information on the planting operation is contained in several bulletins listed in the Appendix.

Container trees of the proper seed source are not available at this time. Experience with container trees in the Blue Mountain region is limited. Several organizations are planning container tree planting on a trial basis. Planting of containerized seedlings cannot be recommended at this time for planting in the area pending the outcome of these trials.

The landowner should put together a plan which will spread the rehabilitation and reforestation project over a period of years and keep it within a scope which he can manage from a manpower and economic point of view.

Site preparation

Site preparation may be required before natural seeding or planting. For successful regeneration bare mineral soil, free of debris and competing vegetation, is required around each planted tree. For successful natural seeding about 30 percent of the ground should be exposed to bare mineral soil.

Site preparation should be planned before harvest begins so that it can be conducted during or immediately after salvage logging operations whenever possible. Land should not be allowed to lay idle over a growing season before planting. Acceptable methods of site preparation are: 1) piling and burning of slash, 2) broadcast burning, 3) cleaning the land with a brush blade, or 4) chemical control of competing vegetation. During fire season obtain burning permits from local rural fire districts or forestry offices.

REHABILITATION FOR RANGE ONLY

Range rehabilitation and improvement is based on the development of a better stand of forage plants. The grass species preferred depend on your goal. If trees are the end goal, then nonsod-forming grass should be chosen. These grasses provide less competition to re-establishing trees. If you are maintaining or converting the land to grazing land then sod-forming varieties of grasses can be used. In either case, it is better to use a mixture of several species of grasses rather than just one.

For this locality the best nonsod-forming grasses are orchard grass, hard fescues, meadow brome and Manchar smooth brome, timothy and, on drier sites, crested wheat grass. The sod-forming varieties are generally the blue grasses. The mild sod-formers are pubescent wheatgrass and intermediate wheatgrass.

Legumes that can be used are the dryland alfalfa like Nomad, Ladak and Rhizoma. Clovers that are good include yellowblossom sweet clover, white dutch clover and alsike clover. A forb that is good and grows on most any site is small burnett.

Most of these seeds are available from milling companies, feed companies or seed houses. Seed mixtures and rates are recommended in the Oregon Interagency Guide For Conservation and Forage Seedlings listed in the Appendix. Bare mineral soil is needed to successfully establish new range grass and forbs.

It is important to sow the seed by broadcasting just as soon after site preparation as possible. This should be prior to the first fall rains. A caution: fall seeded legumes are subject to winter kill. Spring seeding of legumes is therefore mandatory.

Fertilization is not generally recommended for range seedings. There are, however, several specialized situations warranting the use of commercial fertilizers. For example, former logging and skid roads, especially on the ash soils, can be treated with nitrogen and sulfur fertilizers.

Once your grasses and legumes have been seeded, it is necessary to eliminate stock use on the area for at least one growing season. Deferment for two seasons is preferred. If the new plants are used before this there is real danger that most of the plants will be uprooted, leaving you with little for your effort. Two seasons of protection give the plants time to establish a root system deep enough and strong enough to resist uprooting.

In most cases, seed and fertilizer will be applied by broadcast methods. Application by mechanical methods is limited because of steepness of the terrain or debris left from the logging operation.

REHABILITATION FOR JOINT FORESTRY AND RANGE USE

Rehabilitation for joint forestry and range use is different from that for forestry or range alone.

If tree planting is needed it should be done the first spring after the site is opened up by logging. For best tree survival grass seeding should be done in the winter following tree planting. As a second choice grass seeding may be done in the fall or winter followed by tree planting in the spring. In this case grass should be seeded lighter than normal, no more than two pounds per acre. Grass seeding should be done on all disturbed areas with 50% or more bare soil.

A heavy stand of grass will reduce tree seedling survival and growth. Pine is generally the most tolerant of grass competition and is suggested for planting. Planting of 250 trees per acre (13 x 13 foot spacing) is recommended. On any site where grasses have become established it is recommended that the grass be controlled to a 5 foot diameter around all planted trees by either scalping or herbicides. Grass should be sprayed before planting with Atrazine or Amizine. Follow the manufacturers recommendations.

WILDLIFE CONSIDERATIONS IN REHABILITATION PRACTICE

In any rehabilitation practice, considerations for wildlife should be included. Wildlife depends upon adequate habitat-food, water and cover.

Brush piles encourage small mammals and birds to use your area. These provide cover and homes for animals like the chipmunk, squirrel, rabbits and small birds at the risk of increased bark beetle populations (see page 13).

To encourage elk and deer to use your land, you can provide either food, cover, or both. Legumes should be included in your soil stabilization mix. The edge, or the boundary between timber stands and openings, is a particularly important part of animal habitat. A maximum of edge can be provided by irregular shaped logged areas, smaller openings, and cover left adjacent to openings. For specific recommendations, the Oregon Wildlife Commission or the Washington Game Department may be contacted.

FIRE PROTECTION

Tussock moth damage has resulted in an increased fire hazard. Damaged stands contain large amounts of dry fuels, including light flashy fuels which lead to rapid fire ignition and quick spread and heavy fuels which will sustain an intense, hot fire.

In the long run, rehabilitation provides the best fire protection. In the short run, extra fire prevention and reduction of fire hazard may still be required.

You should consider:

Disposal of hazard fuels by salvage logging and prompt slash disposal. Slash can be treated by piling, piling and burning, chipping, or broadcast burning. During fire season obtain burning permits from local rural fire districts or forestry offices. Snags in exposed positions should be felled.

Break-up of large areas of fuels by construction of fire breaks or lanes.

Development of water sources for fire fighting. Existing or new stock tanks or ponds with vehicle access can be used for this.

Provision of access roads for fire fighting . Be particularly cautious of any activities that can lead to fire ignition. Certain activities should be reduced or discontinued during periods of high fire danger.

Contact the State of Oregon Department of Forestry, Washington Department of Natural Resources, or United States Forest Service Ranger Station in your area for additional fire protection information.

Soil protection

One of the most important rehabilitation practices to be considered on your land after any salvage logging is the stabilization of the soil. To grow any future tree or grass crop it is necessary to keep your soil where it is. Stable soil conditions also help to maintain a higher water quality in the streams below your land.

There are several steps to follow in maintaining soil stability. The first is proper road and skid road construction. Drainage ditches, culverts and water bars should be preplanned into the road system. After logging, any disturbed soil, landing sites and skid roads with erosion potential should be seeded to grasses and legumes. Some grasses that can be used include orchard grass, pubescent wheatgrass, intermediate wheatgrass, and timothy. Technical assistance for soil stabilization can be obtained from your local county extension agent or the Soil Conservation Service.

On slopes of less than 40 per cent, the accumulated duff and understory grass will protect the soils from severe erosion hazard. Where the soil surface has been disturbed by tree removal operations or where slopes are greater than 40 percent, grass should be planted to reduce the erosion hazard. Slumping may occur in small areas where pockets of clayey subsoils are present. These areas should be disturbed as little as possible during logging or road building operations. Operations during wet weather should be restricted to prevent damage from soil compaction.

Protecting water resources

Preserving the quality of water resources is required by law. The Oregon Department of Environmental Quality and the Washington Department of Ecology have standards of water quality that must be maintained. Oregon and Washington Forest Practice Rules promote practices that maintain high water quality.

Water quality problems associated with forest practices include sedimentation, slash and debris buildup, temperature increases, chemical pollution, and streambank disturbance. These degrade water quality for human and aquatic life in several ways. Sedimentation is a problem for domestic and farm water use and it damages fish and other aquatic life by suffocation. Slash and debris in streams causes log jams and scours channels during high flow. Decaying debris will lower the oxygen available for aquatic life. Exposing streams to sunlight can cause stream temperatures to increase to levels that can reduce fish growth and may even kill fish and aquatic life. In addition, warm water cannot hold as much dissolved oxygen as cooler waters. Chemicals used such as insecticides, herbicides, rodenticides, and fertilizers may damage streams if not carefully applied. Forest operations in or too near streambeds can cause streambanks to breakdown, altering stream flow and causing serious problems to the stability of the stream.

Protection from bark beetles

Your damaged stand may attract tree killing bark beetles (fir engraver and Douglas-fir beetle). When epidemics of bark beetles occur, they generally follow some evident weakening disturbance such as droughts, logging slash and defoliation. There is little danger of tree killing bark beetles breeding or multiplying in trees under 10 inches in diameter. Basically, no work is required to prevent dangerous insects from building up high population levels in these stands.

On the other hand, merchantable or partly merchantable damaged stands could become a breeding ground for tree killing bark beetles. It is recommended that these stands be salvaged and slash accumulations be broadcast burned or piled and burned. This will prevent large populations of bark beetles from building up in fresh logging debris or in standing damaged trees and then attacking nearby healthy green trees. The above practices should be coordinated with site preparation and fire hazard reduction operations.

Animal damage control

Seedling damage by forest wildlife and domestic livestock can be a severe problem. Seedlings may be damaged or destroyed by big game animals, domestic livestock, and smaller mammals such as hares, porcupine, and pocket gophers. A chemical repellent such as thiram gives some success against hares and rabbits during the first year after application. A physical barrier for each individual pine tree is the only good protectant against porcupines and pocket gophers. Decreasing the vegetation present on a site through the use of herbicides shows some promise for reduction of pocket gopher densities.

Open strips around tree plantations may help to confine animals to the area adjacent to cover. By seeding legumes and forbs into these strips and, in some cases, fertilizing these strips, animals will use the preferred food. Small grass and legume plantings away from the tree plantation aid in enticing the animals away from the plantation.

Trampling can be a big problem and livestock should be eliminated until the trees have been in the ground three or four years. Even beyond this time cattle may browse the tips of seedlings in the spring.

OREGON FOREST LAWS AND TAXATION

Forest practices act

Forest Practice Officers are prepared to assist operators in planning operations to assure compliance. Such assistance may be obtained at the time the notification is submitted. The name and telephone number of the Forest Practices Officer is indicated on the notification form for that purpose.

Forest Practices Rules under the Oregon Forest Practices Act are designed to assure continuous timber production and to protect soil, air and water quality. Basically, the rules require you to:

> Reforest to acceptable stocking levels within six years after harvesting (25% crown closure of 11-inch trees and larger or 100 seedlings or saplings per acre or a combination thereof).
>
> Follow recommendations in road location, design, construction, and maintenance which minimize the environmental impacts on soil and water quality.
>
> Insure that logging operations provide for soil protection, adequate location of landings, skid trails, fire trails and drainage systems, adequate treatment of waste materials, and maintenance of productivity and related values. Stream protection through maintenance of stream beds and streamside vegetation is required.

Additional rules cover chemical applications and slash disposal.

A significant requirement of the Forest Practices Act is that notification is required prior to beginning the following forest operations: 1) harvesting of forest crops, 2) road construction or reconstruction, 3) site preparation, 4) application of chemicals, 5) clearing of forest lands for change to other uses, 6) slash treatment, 7) pre-commercial thinning. At the time of notification, more specific information can be obtained from Department of Forestry District Offices. Landowners should pick up a copy of the Field Guide to Forest Practice Rules to thoroughly study the legal requirements before planning or undertaking any of the above operations.

Each operation must be conducted in compliance with all rules where applicable or necessary to accomplish the purpose to which they are related, unless the operator or landowner has secured written approval from the State Forester for an alternate practice or practices which provides for equivalent or better results.

Violations carry both civil and criminal recourse. The State Forester may require repair of damage or of unsatisfactory conditions resulting from a violation in addition to penalties which courts may invoke as a misdemeanor.

Laws relating to fire protection

Oregon forest laws require that an operator or landowner make a reasonable effort (pay firefighting costs) on any fire which results from his logging activity. He is also required to provide a reasonable effort on any fire which originates in the operation during the time he is working. This includes the time a watchman is required to be on the logging site.

If the logging or other activity creates an additional fire hazard, the operator or landowner is responsible for a reasonable effort on any fire occurring in the extra hazard. Such determination must be made by the

forester, and the operator and landowner notified in writing. He is relieved of this responsibility if he reduces, offsets or abates the additional hazard in some manner. The notice of additional hazard will include methods for offsetting the hazard which the forester determines to be practicable and reasonable. Methods of reducing, offsetting or abating hazards are: burning; physically reducing the hazard by piling, scattering or other means; improvements to the site such as waterholes or fire breaks; or providing extra fire protection for the area through a cash payment to the forest protection district. Offsetting the hazard by any of these means will enable the forester to release the operator and landowner of the responsibility for fire control costs on the extra hazard area.

The determination of extra hazard is made by an evaluation of the change in fuels made by the logging activity. If fire hazard is increased as a result of the activity, a hazard is determined to exist. Conversely, if fire hazard is not increased, no hazard is determined to exist and no offset actions are required.

Any dead trees (tussock moth killed trees) are considered to be a greater fire hazard standing as snags than the slash they create when felled. Any slash resulting from the dead trees in an operation is not deemed to be additional hazard. In cases where insect damaged stands are logged, the hazard determination is based upon only the live trees cut and the fuels they contribute to the remaining hazard.

Taxation of tussock moth damaged timber

All privately owned timber is subject to two different taxes at time of harvest -- the Forest Products Harvest Tax and the Eastern Oregon Severance Tax.

The Forest Products Harvest Tax is collected by the Department of Revenue and the moneys used to aid in financing the Forest Research Laboratory in Corvallis and to maintain an emergency fund for the suppression of forest fires by the Department of Forestry. The rate of tax on privately owned timber is 11 cents per thousand board feet and is payable quarterly.

The Eastern Oregon Severance Tax is also paid quarterly to the Department of Revenue. The tax is in lieu of ad valorem property taxes on timber. Moneys collected are distributed to the counties and are used as property tax offsets. The rate of tax is 5 percent of the stumpage value of harvested timber. Stumpage values are determined by the Department of Revenue as of July 1 each year and are effective for one year. Present stumpage value for tussock moth damaged timber is about $42 per thousand board feet and this value will remain unchanged until July 1, 1975. This value will result in a tax obligation of some $2.10 per thousand board feet, net scale.

Both taxes are the obligation of the timber owner at the time of harvest. As an example, an owner who sold his timber to a mill, on either a lump sum or per thousand basis as cut, would not be responsible for the tax. The purchaser would be. If, however, the owner hired a logger to harvest his timber and deliver it to a mill, he, the owner, would be liable for the tax.

The person who obtains a permit from the Department of Forestry, which is required before timber can be harvested, will automatically receive, from the Department of Revenue, the proper forms and instructions for filing.

Weed control laws

Baker, Umatilla, Union and Wallowa counties each have created county weed control districts. These districts require certain noxious weeds be controlled. Should Canada thistle, white top, Russian knapweed or certain other weeds invade your land, you will have to control the weeds by chemical or mechanical means. For specific weeds and control requirements of your county you should contact your county weed supervisor.

Zoning laws

If you keep your land in forest, range or other agricultural uses, there will be no zoning regulations that will affect you. If you change the use or sub-divide your property, you may be violating your county zoning ordinance. The Administrator of the Planning Commission for the county in which the land is located can advise you on your zoning laws. Remember, each county has a different ordinance.

WASHINGTON FOREST LAWS AND TAXATION

Forest practices act

Washington State has recently passed a new Forest Practices Act which will take effect on January 1, 1975. Forest Practice Rules are designed to assure continuous timber production and to protect soil, air and water quality. The purpose of the present Forest Practices Act is to insure adequate restocking of harvested land.

Before engaging in any harvest or salvage logging operation, every landowner or logging operator should check with the nearest area office of the Washington State Department of Natural Resources or if within the fire protection boundaries of the National Forest, the United State Forest Service, to make sure all regulations set forth in the Forest Practices Act are complied with.

Area offices for Eastern Washington are located at:

Northeast Area Management Unit
P.O. Box 190
Colville, WA 99114
Phone: 509/684-5201

Southeast Area Management Unit
Route 3, Box 1
Ellensburg, WA 98926

Fire protection and air pollution control

The landowner should check with the nearest area manager of the Washington Department of Natural Resources or District Ranger of the U. S. Forest Service regarding questions on state fire protection and air pollution control laws and regulations.

Effects of logging on other aspects of the environment

Those who want to conduct forestry operations which require the use of surface or ground water, or the discharge of solid or liquid wastes into state waters must obtain a permit from the nearest regional office of the Washington Department of Ecology:

103 Indiana Avenue
Spokane, WA 99207

504 N. Naches Avenue
Yakima, WA 98901

The Washington State Departments of Fisheries and Game administer regulations affecting disturbances to stream channels and lakes and management of the surface waters of the state in so far as any physical change is involved. Projects relating to but not limited to channel changes, culvert construction, bridge construction, dredging, dams and obstructions, debris in stream channels, gravel removal, cross stream yarding and watershed logging including road construction, require an approval from these Washington Departments prior to the commencement of the project. These agencies also formulate provisions to protect fish, setting out conditions under which such projects may take place. Contact:

Washington State Department of Fisheries
Room 115
General Administration Building
Olympia, WA 98501
Area offices: Yakima, Aberdeen, Vancouver

Washington State Department of Game
600 N Capitol Way
Olympia, WA 98501
Area offices: Aberdeen, Ephrata, Mt. Vernon, Seattle, Spokane, Vancouver, Walla Walla, Wenatchee

Timber harvest activities are required to follow the policies, guidelines and regulations of the shorelines management act. Landowners should check with the Washington Department of Ecology before the commencement of logging operations where streamflow may be affected.

New timber and forest tax law (RCW 84.33)

The system for taxing timber and forest land in the State of Washington was changed by the 1971 1st Extra Session of the State Legislatures. The new system phased out the ad valorem tax on timber and phased in an

excise (yield) tax on timber. The excise tax requirements under the new law took effect on privately owned forest lands, October 1, 1972.

Timber Subject to Tax: All timber, standing or down on privately owned land, except that on lands classified Reforestation Lands (RCW 84.28), Forest and Forest Lands (RCW 84.32), and Christmas trees which are grown on land which has been prepared by intensive cultivation and tilling, is subject to tax.

Rate of Tax: Contact Washington Department of Revenue.

Timber Harvest Value: This is the full current value of the stumpage considering species, locations, quality, etc. Stumpage values are determined annually by the Department of Revenue.

Who Pays the Tax: The harvester pays the tax. "'Harvester,' means every person who from his own privately owned land or from the privately owned land of another under a right or license granted by lease or contract, either directly or by contracting with others for the necessary labor or mechanical services fells, cuts or takes timber for sale or for commercial or industrial use. It does not include persons performing under contract the necessary labor or mechanical services for a harvester."

Payment of Tax: Any owner harvesting timber, whether continually or intermittently, must file a return for each quarter of the year. The quarters run from January through March, April through June, July through September, and October through December. Tax returns are due in Olympia on or before the last day of October, January, April and July respectively each year. Reporting forms will be made available by the Department of Revenue.

Owners incuring less than $10 total tax liability in any calendar quarter are excused from the payment of such tax but are required to file a quarterly return.

For Additional Information: Contact the Forest Valuation Section of the Property Tax Division at the following address:

State of Washington
Department of Revenue
General Administration Building
Olympia, Washington 98504

Tax check list for woodland owners and people engaged in the business of harvesting and marketing forest products

- Washington State Taxes: Persons engaged in business are required to register with the Washington State Department of Revenue. The following taxes apply:

  Retail Sales Tax on sales made directly to a consumer.

  Business Tax on gross income from logging, hauling on private roads, milling, wholesaling, and other nonretail business.

Motor Transportation Tax on gross income from common or contract truck hauling on public roads.

Conveyance Tax on sale of timberlands or stumpage. This tax is paid by the seller.

- County Property Taxes on both real and personal property are paid annually to the county assessor.
- County Real Estate Taxes on gross selling price of timberlands or stumpage is paid to the county treasurer. The seller pays the tax.
- Federal Income Taxes are paid by regular employees, self-employed persons, and corporations. Complete information should be obtained from local offices of the Internal Revenue Service.

Weed control laws

The landowner in Washington should check with the Washington State Department of Agriculture in Yakima on his responsibilities concerning noxious weed control. All areas of Eastern Washington are not included in weed control districts.

Information on weed control is available from local county extension agents.

ASSISTANCE AVAILABLE IN OREGON[1]

State of Oregon Department of Forestry

The State Forestry Department plans to have a full time Service Forester available to assist the small woodland owner with tussock moth related problems. The Service Forester will help you in determining needs and courses of action. He will assist you in damage surveys, in salvage logging feasibility, in site preparation, in hazard reduction, in reforestation planning and other related subjects. Contact:

Service Forester
% Oregon State Forestry
Route 2, Box 2224
LaGrande, OR 97850
Phone 963-3168

Oregon State University Extension Service

County Extension Agents in each county are available to provide information on forest and range rehabilitation. Each county in Northeast Oregon

[1] The U.S. Forest Service does not provide individual assistance to forest landowners except through publications such as those listed in Appendix III.

has an agent specifically assigned to range production and management. Extension agents have access to a team of forest, range, and other agricultural specialists at Oregon State University to assist in solving specific problems. Contact:

Baker County Extension Office
P.O. Box 747
Baker, OR 97814

Umatilla County Extension Office
P.O. Box 1107
Pendleton, OR 97801

Union County Extension Office
P.O. Box 760
LaGrande, OR 97850

Wallowa County Extension Office
P.O. Box 280
Enterprise, OR 97828

State Revenue Department

Assistance or information concerning Forest Products Harvest Tax and Eastern Oregon Severance Tax may be obtained from:

Mr. Arthur Stockton
State Office Building
1901 Adams Avenue
LaGrande, OR 97850

Oregon Wildlife Commission

The Oregon Wildlife Commission will provide advice on wildlife habitat management. Contact:

Oregon Wildlife Commission
P.O. Box 339
LaGrande, OR 97850

Soil Conservation Service (SCS)

The SCS will provide technical data concerning soil types control practices to reduce erosion during salvage and rehabilitation operations. Assistance in planning and designing land use alternatives, erosion control structures and long range rehabilitation plans is available. Contact:

Soil Conservation Service
Baker, OR 97814

Soil Conservation Service
P.O. Box 477
Enterprise, OR 97828

Soil Conservation Service
LaGrande, OR 97850

Soil Conservation Service
U. S. Post Office Building
Pendleton, OR 97801

Agricultural Stabilization and Conservation Service (ASCS)

The ASCS administers the Federal Rural Environmental Conservation Program which provides cost-sharing for tree planting, timber stand improvement and other activities similar to those provided by the former REAP program. Contact your local ASCS Office:

LaGrande, OR 97850

Enterprise, OR 97828

Pendleton, OR 97801

Local consulting foresters

There are several local consulting foresters who could be hired to perform various professional forestry services. They are:

Frank Blizard
P.O. Box 303
Union, OR 97883

Herman Dill
4134 SW Perkins Ct.
Pendleton, OR 97801

Wayne Harris
P.O. Box 566
Pendleton, OR 97801

Don Healy
% Boise Cascade
P.O. Box 610
LaGrande, OR 97850

Robert Jackson
Box 316
Joseph, OR 97846

Leland Myers
Box 548
Sumpter, OR 97877

Other consulting foresters

The Oregon State Forestry Department maintains a current directory of statewide forestry consultants. It lists professional foresters who would be willing to work on small private woodlands in Northeastern Oregon.

Local mills foresters

In addition, in Appendix I is a list of local mills, most of whom have foresters, willing to look at possible salvage harvest areas.

ASSISTANCE AVAILABLE IN WASHINGTON[1]

Washington State Department of Natural Resources

Assistance with tussock moth related problems is available from the Washington State Department of Natural Resources.

Northeast Area Management Unit
P.O. Box 190
Colville, WA 99114
Phone: 509/684-5201

Southeast Area Management Unit
Route 3, Box 1
Ellensburg, WA 98926

To contact the farm forester in your area call: Zenith 7000 (toll free).

Washington State University Cooperative Extension Service

County extension agents in each county are available to provide information on forest and range rehabilitation. Extension agents have access to a team of forest, range, and other agricultural specialists at Washington State University to assist in solving specific problems. Contact:

County	Address
Asotin	Ag. Building, Asotin 99402
Chelan	Courthouse, Wenatchee 98801
Columbia	Federal Building, Dayton 99328
Ferry	Courthouse, Republic 99166
Garfield	Courthouse, Pomeroy 99347
Kittitas	213 Courthouse, Ellensburg 98926
Lincoln	Box 399, Davenport, WA 99122
Okanogan	Courthouse, Okanogan 98840
Pend Oreille	Federal Building, Box 489, Newport 99156
Spokane	Courthouse, Spokane 99201
Walla Walla	Courthouse, Box 536 Walla Walla 99362

Washington State Game Department

The Washington State Game Department will provide assistance in wildlife habitat management. Contact:

Washington State Game Department
600 N. Capitol Way
Olympia, WA 98501

[1] The U.S. Forest Service does not provide individual assistance to forest landowners except through publications such as those listed in Appendix III.

Regional Offices:

8702 Division Street
Spokane, WA 99218

2925 E. Isaacs
Walla Walla, WA 99362

Soil Conservation Service (SCS)

The Soil Conservation Service has a state forester in the Spokane office to provide technical data concerning soil types control practices to reduce erosion during salvage and rehabilitation operations. Assistance in planning and designing land use alternatives, erosion control structures and long range rehabilitation plans is available. Contact:

Soil Conservation Service
State Office
Courthouse
Spokane, WA 99201

Eastern Washington consulting foresters

There are several local consulting foresters who could be hired to perform various professional forestry services. They include:

V. E. Anderson
13008 Maxwell
Spokane, WA 99216

John H. Ayres
Box 535
Twisp, WA 98856

Wes Slaughter
1865 Hillbrook Drive
Walla Walla, WA 99362

Walker and Associates, Inc.
Prefontaine Building
Seattle, WA 98101
and
Spokane International Airport
Spokane, WA 99219

APPENDIX I: List of Local Mills

OREGON[1]

Softwood Sawmills

Athena Timber Company
P.O. Box 206
Athena, OR 97813
503/566-3574

Blue Mt. Forest Products
P.O. Box 1161
Pendleton, OR 97801
503/276-4304

Boise Cascade Corporation
P.O. Box 610
LaGrande, OR 97850
503/963-3141
or
P.O. Box E
Joseph, OR 97846
503/437-2011
or
Box 97
Elgin, OR 97827
503/437-2611

John Croghan
Route 2, Box 71
Elgin, OR 97827
503/437-3371

Ellingson Lumber Company
P.O. Box 866
Baker, OR 97814
503/523-5841

Max Gorsline and
Bob Stubblefield
407 E 5th
Enterprise, OR 97828
503/426-3043

Harris Pine Mills
P.O. Drawer 1168
2203 SW Court Pl.
Pendleton, OR 97801
503/276-1421

Hoff Lumber Company
P.O. Box 1031
Baker, OR 97814
503/523-4476

Little Beaver Lumber Company
%Ernie Wilmot
P.O. Box 575
Elgin, OR 97827
503/437-3662

Louisiana-Pacific
P.O. Box Drawer AA
Pilot Rock, OR 97868
503/443-2261

Wm. Peacock
Alicel Route
Cove, OR 97824
503/963-5610

Ronde Valley Lumber
Box 565
Union, OR 97883
503/562-5151

Alfred Slemp
Box 177
Union, OR 97883

Starner Lumber Company
Lostine, OR 97857
503/569-2444

[1] A list compiled by the State Forestry Department

Post and Poles

Ken Running
Wallawa, OR 97885
503/886-3801

David Monsche
Route 1, Box 3
Joseph, OR 97846

WASHINGTON[1]

Softwood Sawmills

Asotin County

J. B. Lumber Company, Inc.
P.O. Box 231
Clarkston, WA 99403

Columbia County

Thompson Sawmill
1424 S. 4th Street
Dayton, WA 98632

Ferry County

Brauner Lumber Company
Route 2
Kettle Falls, WA 99141

Brown Lumber Company
P.O. Box 28
Curlew, WA 99118

Roy H. Hathaway Lumber Company
Route 1, Box 39
Republic, WA 99166

Hilderbrant Implement
Box 174
Republic, WA 00166

Matney Lumber Company
Kettle Falls, WA 99141

Nelson Lumber Company
P.O. Box 189
Curlew, WA 99118

San Poil Lumber Inc.
P.O. Box 357
Republic, WA 99166

Windsor Lumber Company
P.O. Box 6
Malo, WA 99150

[1] A list compiled by the Washington State Department of Natural Resources

Grant County

Biles-Coleman
Box 273
Omak, WA 98841
Mill Location: Coulee Dam, WA 99116

Kittitas County

Andy Bator
Route 2
Cle Elum, WA 98922

Cabin Creek Lumber Company
P.O. Box 97
Easton, WA 98925

Klickitat County

Layman Lumber Company, Inc.
P.O. Box 12
Goldendale, WA 98620

Mt. Adams Timber Products
P.O. Box 206
Bingen, WA 98605

SDS Lumber Company
P.O. Box 266
Bingen, WA 98605

St. Regis Klickitat Operations
Klickitat, WA 98628

Woodruff Brothers Lumber
Wahkiacus, WA 98670

Lincoln County

Lincoln Mill Corporation
Box 273
Omak, WA 98841
Mill Location: Lincoln, WA 99147

Okanogan County

Biles-Coleman Lumber Company
Box 273
Omak, WA 98841

Biles-Coleman Lumber Company
Box 273
Omak, WA 98841
Mill Location: Twisp, WA 98856

Landreth Timber Company, Inc.
P.O. Box 505
Tonasket, WA 98855

P & M Lumber Company, Inc.
Route 1
Winthrop, WA 98862

Donald Tobies
Pine Creek Rt.
Tonasket, WA 98855

Zosel Lumber Company
Box 580
Oroville, WA 98844

Pend Oreille County

Little's Wood Specialty Plant
Route 4, Box 82-A
Newport, WA 99156

Louisiana-Pacific Corporation
P. O. Drawer I
Coeur d'Alene, ID 83814
Mill Location: Ione, WA 99134

Ponderay Lumber Company
Route 3
Newport, WA 99156

Spokane County

Mike Burdette
Route 2
Dear Park, WA 99006

Long Lake Lumber Company
P.O. Box 3344
Spokane, WA 99220

Reames Sawmill
Chattaroy, WA 99003

Stevens County

Arden Lumber Company
P.O. Box 391
Colville, WA 99114

Avey Brothers
Kettle Falls, WA 99141

John Chopot Lumber Company
Route 2
Colville, WA 99114

Harvey Creek Lumber Company
Cedonia, WA 99108

Hunters Lumber Company, Inc.
Box 67
Hunters, WA 99137

Jump-Off Lumber Company
SIO Lincoln Building
Spokane, WA 99201
Mill Location: Valley, WA 99181

McKern Brothers
Route 1, Box 12
Rice, WA 99167

Ross Pallet Shop
Route 2, Box 85
Chewelah, WA 99109

Springdale Lumber Company
Springdale, WA 99173

Vaagen Brothers Lumber, Inc.
P.O. Box 266
Colville, WA 99114

Webley Lumber
Box 253
Marcus, WA 99151

Zebra Brothers Lumber Company
Route 1
Addy, WA 99101

Walla Walla County

Christensen Lumber Company
1104 N 12th
Walla Walla, WA 99362

E. W. Craik Lumber Company
Box 1242
Walla Walla, WA 99362

Louisiana-Pacific
P.O. Box 1575
Walla Walla, WA 99362

Yakima County

Boise Cascade Corporation
P.O. Box 51
Yakima, WA 98907

Layman Lumber Company
Box 235
Naches, WA 98937

White Swan Lumber Company, Inc.
P.O. Box 431
White Swan, WA 98952

Plywood and Veneer Plants

Kittitas County

Lycol Veneer Company
Box 47
Roslyn, WA 98941

Klickitat County

Bingen Plywood Company
P.O. Box 266
Bingen, WA 98605

Okanogan County

Biles-Coleman Lumber Company
Box 273
Omak, WA 98841

Spokane County

Boise-Cascade Corporation
P.O. Box 51
Yakima, WA 98907
Mill Location: Spokane, WA 99220

Stevens County

Boise-Cascade Corporation
P.O. Box 51
Yakima, WA 98907
Mill Locations: Kettle Falls, WA 99141
and
Ford, WA 99013

Yakima County

Boise-Cascade Corporation
P. O. Box 51
Yakima, WA 98907

Post, Poles and Piling

Pend Oreille County

Poles, Inc.
P. O. Box 3505-TA
Spokane, WA 99220
Mill Location: Newport, WA 99156

Spokane County

B. J. Carney and Company
326 Peyton Building
Spokane, WA 99201
Mill Location: Yardley, WA

Stevens County

B. J. Carney and Company
326 Peyton Building
Spokane, Wa 99201
Mill Location: Northport, WA 99157

Post and Poles, Inc.
P. O. Box 323
Colville, WA 99114

Spokane Tribal Wood Products
Box 86
Wellpinit, WA 99040
Location: Ford, WA 99013

Fencing Material

Longlake Lumber Company
E. 2302 Mallon
Spokane, WA 99201

Matney Lumber Company
Kettle Falls, WA 99141

Peoples Lumber Company
E. 1907 Francis
Spokane, WA 99207

Pulp and Board

Spokane County

Inland Empire Paper Company
Millwood, WA 99212

Walla Walla County

Boise-Cascade Corporation
P.O. Box 500
Wallula, WA 99363

Bark Products Producers

Lumber By-Products Company
E. 3030 Mission
Spokane, Wa 99202
(Bulk and Bagged Mulch)

Moore-Perma-Mulch
N 918 Carnaham Road
Spokane, WA 99206
(Mulch)

Oroville Bin and Pallett
Oroville, WA 98844

Spokane Moulding Corporation
Spokane, WA 99219

Ross Pallet and Bin
Route 2, Box 158
Chewelah, WA 99109

G and M Woodcraft
Box 205
Wallula, WA 99363

Able Fabricators
P.O. Box 5274
Spokane, WA 99210
(Laminated Beams)

APPENDIX II: Tree Nurseries[1]

The following nurseries are sources of seedlings for planting in the Blue Mountains Region.

John Kirk Nursery
Box 103
Cashmere, WA 98815
509/782-1954

Fantasy Farms Nursery
Route 2
Lenore, ID 83541
208/486-7596

Moses Lake Soil and Water Conservation District Nursery
316A Chestnut Street
Moses Lake, WA 98837
509/765-3261

Mountain Home Nursery
De Borgia, MT 59830
406/678-4221

In addition, either the Bend or Coeur d'Alene Nursery will be contracted by the State of Oregon Department of Forestry to grow seedlings which can be purchased by private individuals. For further information contact the State Forestry Department.

[1] For other nurseries see Forestation Notes No. 22, USFS, Division of State and Private Forestry, P.O. Box 3622, Portland, OR 97208 and "Where to get Trees to Plant in Washington," Washington State University Cooperative Extension Service Publication 3594, May, 1974.

APPENDIX III: Helpful Publications

Salvage

Building Woodland Roads - Washington State Extension Service PNW #125.

Field Guide to Oregon Forest Practice Rules - Oregon State Board of Forestry.

Salvage - Its Role in Forest Management - Washington State Extension Service PNW #119.

Steps Involved in Harvesting Forest Products in Oregon - Oregon State Board of Forestry.

Timber Sale Agreements - Washington State Extension Service PNW #65.

Timber Sale Agreement and Contract Guides - Oregon State Board of Forestry.

Your Forest Slash Responsibility - Washington State Extension Service EC #376.

Rehabilitation

Adaptation Tests of Trees and Shrubs for the Intermountain Area of the Pacific Northwest - Washington State Extension Service XC #450.

Planting Forest Trees in the Pacific Northwest - Oregon State Extension Service PNW #120.

Plant Your Trees Right - Oregon State Extension Service PNW #33.

Reforesting Cutover Woodland in the Pacific Northwest - U.S. Forest Service How-to-do-it-Guide #11.

Reforestation - Oregon State Board of Forestry.

Tree Seedling Order Blanks - Oregon State Board of Forestry.

Trees for Oregon Woodlands - Oregon State Board of Forestry.

Grazing

Woodland Grazing Management - U.S. Forest Service How-to-do-it-Guide #7.

Oregon Interagency Guide for Conservation and Forage Seedlings - Soil Conservation Service Publication.

Other Publications

Guide to Regulations Affecting Harvesting and Marketing Forest Products in Washington. Available for the Washington State Department of Natural Resources.

Forest Products Directory 1973 State of Washington. Available from the Washington State Department of Natural Resources.

Grasses and Legumes for Soil Conservation in the Pacific Northwest and Great Basin States. Agriculture Handbook No. 339. Soil Conservation Service. U.S. Department of Agriculture.

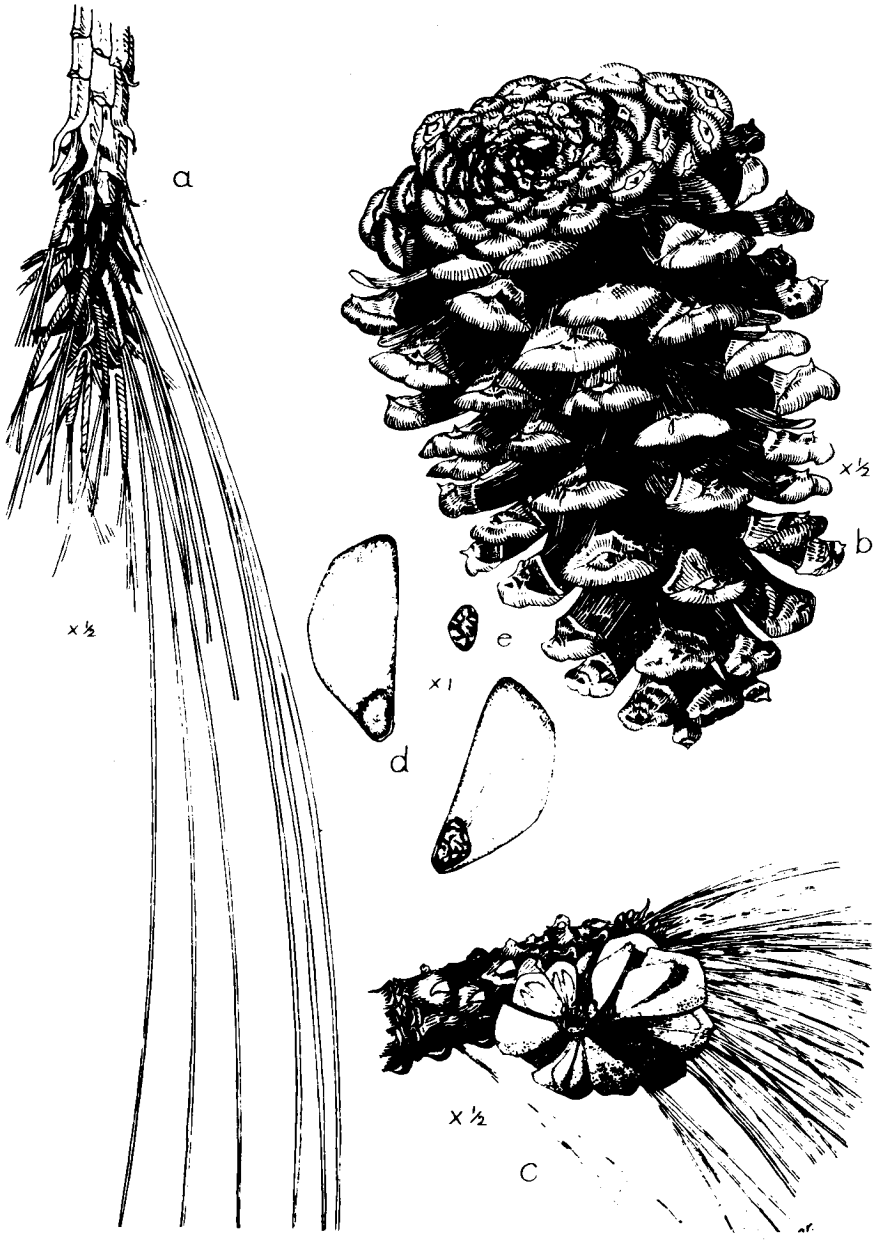
APPENDIX IV: Important tree species in the Northeast Oregon and Eastern Washington Forests

Two of the four important tree species in the forests of this area can be damaged by the tussock moth. Douglas-fir (Psuedotsuga menziesii (Mirb.) Franco.) and white fir are both susceptible to damage from the insect. We have used the term white fir to include Abies concolor (Gord. & Glend.) Lindl. and Abies grandis (Dougl.) Lindl. These two species of true-fir are difficult to distinguish from one another and hybridize within the area. The other two species ponderosa pine (Pinus ponderosa Laws.) and western larch (Larix occidentalis Nutt.) are not susceptible to lethal defoliation. Occasionally in late stages of insect feeding where insect populations are extremely high some damage can occur but it almost never kills these species.

Diagrams on the following pages show the important species characteristics.

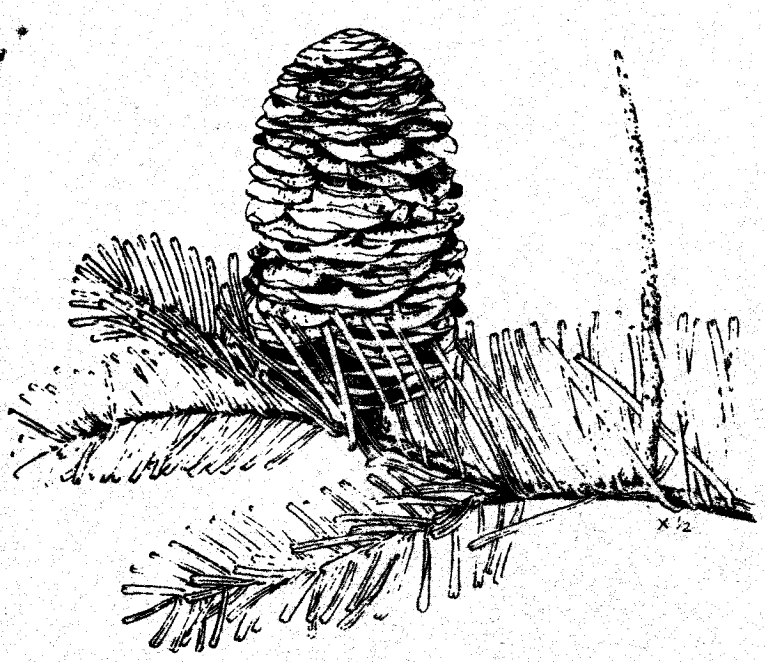
NOT SUSCEPTIBLE

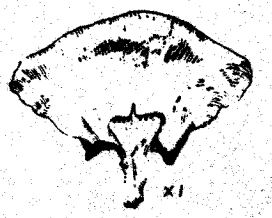
WESTERN LARCH



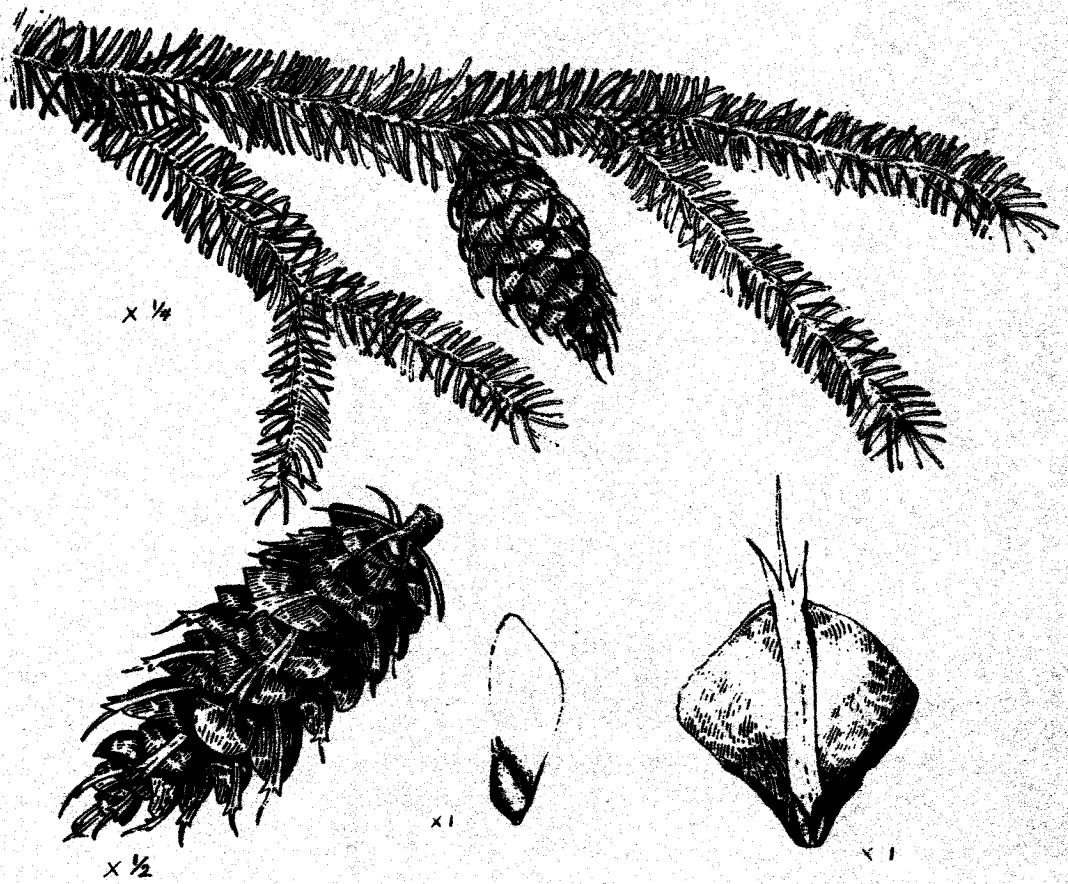
PONDEROSA PINE

SUSCEPTIBLE

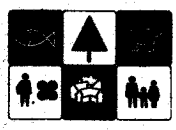




WHITE FIR



DOUGLAS FIR



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