

## Logging



# Logging Woodland Properties

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This publication is designed to help you as a landowner develop information on timber harvesting on your land. Although you may use it alone, you'll find it works best with the slide-tape program called *Timber Harvesting Options* and Extension Circular 858, with the same title. Both of these resources are available at county Extension offices or from the Forestry Media Center, College of Forestry, Oregon State University, Corvallis 97331.

### Land management objectives

Make a list of your land management objectives for your woodland area and establish priorities for each objective. If you have different objectives for two or more separate areas, do a worksheet for each area. Clearly explain your objectives and priorities to the logger. Land management objectives for specific areas often come from a more intensive plan for your entire property.

Examples of objectives are: to maximize dollar return from the stand; to place the stand in good condition for future growth; to protect the immature timber while removing residual old-growth trees.

Other land management objectives compatible with timber harvesting might include enhancing the wildlife habitat in a given area, removing all dead and dying material, enhancing recreation, and removing trees in a prescribed manner for a homesite. The important point is that you should *write out* these objectives for the logger's evaluation and comment.

Probably the most common objective of landowners is to maximize net return to the landowner. Other land management objectives are possible, however, through planned logging and a clear contract. It is worth the effort to discuss your (landowner's) objectives with the logger in order to reach a mutual agreement.

### Desirable performance categories of logging

These categories are expressions of the way you want the logging conducted on your property. The following is a brief description of these performance categories, how you might measure them, and their possible effects on the logging operation.

- **Timber size** affects the size of logging equipment that might be used. The logger must have some idea of the maximum log size and, if possible, the average log size for a given

area. The logger then can determine what kind of logging equipment to use and can identify likely cost impacts. For example, it usually is more costly to harvest smaller timber than larger timber.

You can measure the maximum timber size either as an estimate of the diameter of the largest log or from the diameter breast height of the trees (diameter of a tree measured at 4½ feet off the ground). Special tape measures that encircle the tree and read diameter directly are available. The woodland stick, available through county Extension forestry agents, also might provide a sufficiently accurate estimate of diameters.

For the logger, the weight of the log is the most significant variable. Log weight influences the load-carrying capability of ground-based equipment and cable equipment. Landowners may have difficulty estimating log weights, but loggers can relate the way their equipment will handle logs if the species, stand conditions, and log or tree size are made available.

- **The production potential** is related to the landowner's schedule and what the daily production must be in order to complete the job as required. The production potential of logging operations certainly can vary; landowners need to state their requirements.



If landowners want timber to be harvested by a specific date to avoid snow or impending rains that would make the roads impassable, the production potential required would be considered high.

On the other hand, if time is not a factor, the landowners may even consider horse logging, a low-production harvesting system. Horses may yard only a truckload of logs every 2 or 3 days.

• **Cost of production.** There are different costs associated with each logging system. Some systems may operate within the full range of costs; others typically may operate at the high or low end of the scale. You must decide what production costs are acceptable, and agree on them with the logging contractor. If you make special demands on the logger, such as extra slash cleanup to meet land management objectives, you must be willing to accept the costs of production as medium to high.

On the other hand, if your concern is to maximize the dollar return from the timber harvesting activity, you would agree on a low cost of production. The landowner's return is based on the difference between what it costs to harvest the timber and the price of logs at the mill.

• **Silvicultural systems.** You need to determine the area in each of these systems (clearcuts, partial cuts,

thinnings, etc.) that will be applied on a piece of land. In small timber, you should identify the area in a thinning operation to the nearest 5 acres. The same is true for partial cuts or clearcut operations. If you are not familiar with your woodland property, you can determine acreage figures from maps or from aerial photos, or you can estimate them by walking the area.

• **Topography limitations.** One of the greatest determinants of logging feasibility is the ground slope. The ground slope can be classed roughly as "between 0 and 35 percent," "between 35 and 70 percent," and "more than 70 percent" in steepness. Percent slope is a measure of the steepness based on the amount of rise per given unit of horizontal distance. On a 35-percent slope, the slope increase is 35 feet of elevation for every 100 feet of horizontal distance (Figure 1). This ratio is multiplied by 100 percent to obtain a percent slope estimate.

The logger needs to know what kind of slope classes are found on the area, and the number of acres in each slope class. A different combination of logging systems would be used if the mixture of slope classes were, on one hand, 5 acres of 0 to 35 percent, and 40 acres of 35 to 70 percent, than if the figures were reversed. Those slopes should be in percent as well.

In addition to the slope criteria, there are areas that present unique topographic difficulties, especially for cable yarding systems. You should identify topography similar to the conditions in parts C and D of Figure 2, and bring these potentially difficult areas to the attention of the logger.

Deflection is the sag in the cable above the ground and is necessary for the skyline to carry the weight of the logs. The more deflection, or sag, the more logs the skyline can carry.

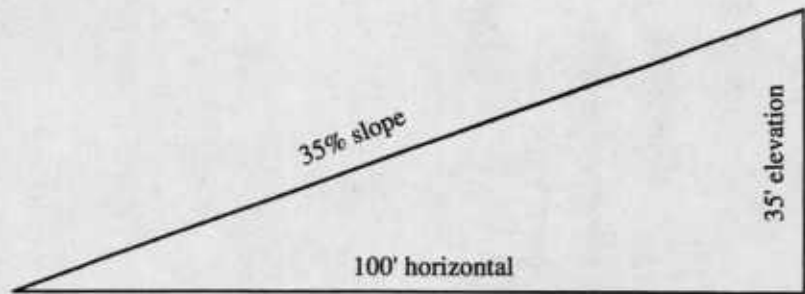


Figure 1.—Computing the percentage of ground slope.

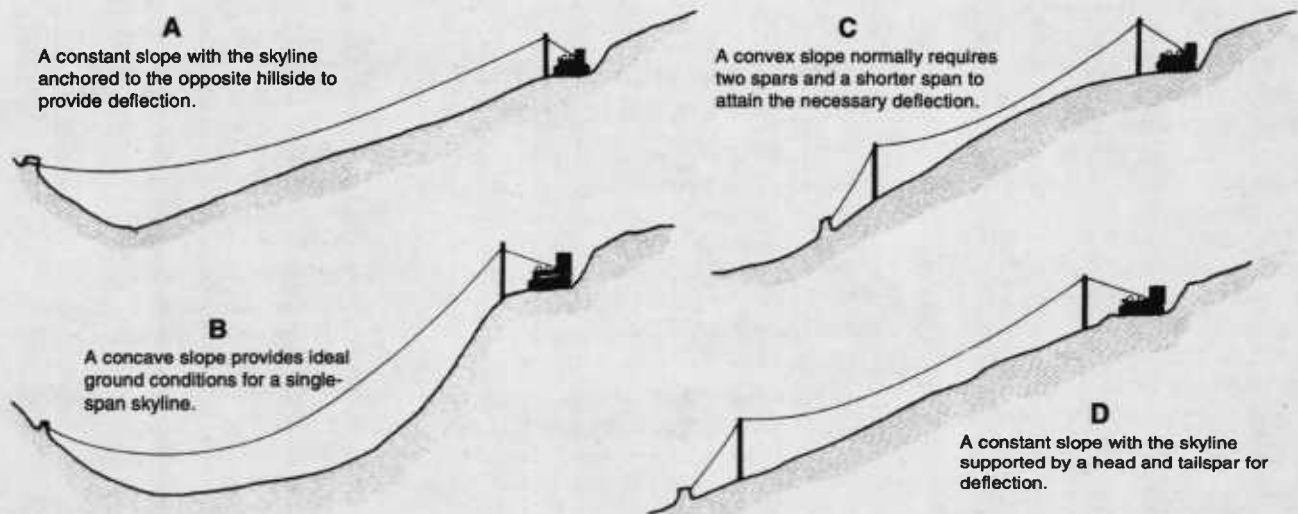


Figure 2.—Typical single-span skyline conditions: A and B show reasonable conditions for skyline deflection; C and D indicate the need for additional skyline planning by the logger. Adapted from Binkley and Studier, Cable Logging Systems (U.S. Forest Service, Region 6, 1975).

## Woodland Worksheet

### Acceptable Woodland Owner Preferences for Logging Performance Categories

Woodland owners should be able to complete the form below with the accuracy to the limits specified. Write the land management objectives for the area in terms of priorities given to each objective.

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Performance category	Class or accuracy
<b>Timber size:</b>	
Maximum log size -----	Dbh ±2"
or weight -----	lb ±100 lb
Average log size -----	Dbh ±2"
or weight -----	lb ±100 lb
Production potential -----	L, M, H
Costs of production -----	L, M, H
<b>Acres in each silvicultural system:</b>	
Thinning -----	±5 acres
Partial cut -----	±5 acres
Clearcut -----	±5 acres
<b>Topography limitations:</b>	
Acres in slope classes	
0-35% -----	±5 acres
35%-70% -----	±5 acres
greater than 70% -----	±5 acres
Are there areas of topographic difficulty similar to those shown in parts C and D of Figure 2? -----	Yes or No
<b>Road access requirements:</b>	
Roads to build? -----	Stations of 100'
Maximum skid distance -----	±100'
Average skid distance -----	±100'
<b>Stream protection:</b>	
Class of stream -----	Class I or Class II
Class of protection required -----	H, M, L
<b>Stream crossing required:</b>	
Need prepared crossings? -----	Yes or No
Need to suspend logs? -----	Yes or No
<b>Site disturbance:</b>	
Acceptable landing size (diameter or dimensions) - -----	±100'
Owner concern for residual stand damage -----	High or Low
Level of slash cleanup required -----	L, M, H
Acceptable level of disturbance -----	L, M, H
Owner requirement date for harvesting completion: ---	Date

• **Road access requirements.** On some woodland properties, roads already in place may be adequate for harvesting activities. On other properties, the roads may have to be built into the harvesting area. Determine road requirements in advance, and specify in a written contract the road construction part of the operation. If there are roads to build, specify the number of stations in advance. (A station equals 100 feet of horizontal distance.)

Once the roads and landings are located on a map or on the property, determine the maximum skid distance from the map or from actually pacing the distance on the ground. The maximum skid distance is the distance that the farthest log would be hauled to the landing. This distance is important to determine the line lengths for cable logging systems.

For ground skidding systems, this distance helps the logger estimate production and cost. Once you determine the maximum skid distance, try to estimate the average skid distance to find the distance that most logs would have to travel to the landing. Estimate an average distance for each landing area.

• **Stream protection.** Landowners have major obligations for stream protection under the Oregon Forest Practices Act. The first step is to determine the class of stream on the property. You can do this by taking a map or aerial photo, with a legal description of the property, to the State Forestry Department Offices. They'll match your map or description to their maps of stream classes.

Once you know the class of the stream, you can identify the type of protection needed. This will reflect both legal requirements and your

objectives as the landowner. If operations are near a Class I stream, the type of protection should be high.

If operations are near a Class II stream, some additional stream protection may be required to protect values that you have identified—such as a recreational area. In addition to the overall amount of stream protection, there should be some statement about stream crossings.

If streams must be crossed with ground skidding equipment during the course of the operation, you should specify whether prepared crossings are needed. In the case of cable logging systems, specify whether it is necessary to suspend the logs fully over the stream area, or if partial suspension is permissible. The State Forestry Department can help determine these requirements.

• **Site disturbance.** This is a collective term that describes the way the land is treated during the harvesting operation. Landings and skid trails can become less productive, or even nonproductive, from soil impacts. You should indicate the acceptable number and sizes of landings and skid trails desired. In addition, state your concern for damage to the residual stand. If the stand is to be clearcut, there should be no major concern for residual stand damage, unless advanced regeneration requires protection. If a thinning operation is planned, as an owner you will be concerned about residual stand damage because these are the trees on which you are investing your efforts for future growth.

Specify the level of slash cleanup you require and identify it as a per-acre dollar cost in the contract if possible. Some landowners may be satisfied with a low-level slash

cleanup that meets the Forest Practices Act requirements and fire protection requirements. If there are other objectives for the property, landowners may wish to have substantial slash cleanup done at this time to enhance recreation or aesthetic values.

You also should state the acceptable level of soil disturbance—that is, the amount of soil exposed by a harvesting operation. If you do not wish certain areas disturbed by logging, identify these on the ground. The logger normally will try to minimize soil disturbance and meet Forest Practices Act requirements.

• **Availability.** You should review your objectives and specify when the harvesting should be completed. If you want to harvest as soon as possible, the number of harvesting options will be restricted to those available. With a longer planning horizon for logging, a wider range of harvesting options and loggers may be available. It is unusual, however, to find balloon or helicopter logging done on private woodland properties under most circumstances.

## Summary

Consider the described performance categories, or your woodland owner preferences, a beginning for discussion with the logging operator to arrange a mutually acceptable logging job. They are, by no means, the only performance categories or individual preferences that you might raise with the logger. The planning efforts described here should provide a sounder basis for selecting a timber harvesting option.

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*The Woodland Workbook* is a collection of publications prepared by the Oregon State University Extension Service specifically for owners and managers of private, nonindustrial woodlands. The Workbook is organized into separate sections, containing information of long-range and day-to-day value for anyone interested in wise management, conservation, and use of woodland properties. It's available in a 3-ring binder with tabbed dividers for each section.

For information about how to order, and for a current list of titles and prices, inquire at the office of the OSU Extension Service that serves your county.

This publication was produced and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Extension work is a cooperative program of Oregon State University, the U.S. Department of Agriculture, and Oregon counties.

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