

GENERAL INSTRUCTIONS FOR MARKING TIMBER ON THE
 _____ NATIONAL FOREST¹

The following general rules, to be varied at the discretion of the Forest officers in charge, should serve as a guide in marking timber on the _____ National Forest. These rules are supplementary to the General Instructions on page 82 of "The Use Book."

Pure Lodgepole Pine Stands

Selection Cutting

In selection cuttings, the aim should be either to thin the stand very lightly and only to such a degree as will make the remaining trees become more wind firm eventually and allow of second cutting at an early date, or to remove nearly all the mature and undesirable individuals, which would leave, ordinarily, only enough trees to form the basis for a future cut. Between these two extremes there are many gradations, and the exact extent of cutting to be adopted in a particular sale depends on the judgment of the Forest officer in charge.

As the name implies, the selection cutting depends for its success on the careful and judicious choice of the trees to be removed. It is applicable in uneven-aged stands of lodgepole pine, except where the danger from windfall is excessive, in even-aged stands where most of the trees are too small to admit of a strip system, in even-aged stands where the cutting is to be very light in order to secure a second cut within a short time, in all stands where the cutting is merely designed to remove diseased or otherwise affected individuals.

In the case of uneven-aged stands, the trees to be left should be young and thrifty and carefully selected for their windfirmness. The seed-bearing quality of the trees is only a secondary consideration in lodgepole stands, since the necessity of guarding against windfall results in leaving too many trees for the purpose of securing the best regeneration by natural reseeding. In marking stands of this character, therefore, bear in mind the danger from windfall, the basis for a future cut, and, the removal of all undesirable individuals.

Where there is a choice between trees to be left, favor straight, clean individuals having the best crown development. Trees left should be spaced as evenly as possible. Where the cutting is heavier, the grouping of trees may be advantageous, since the individual tree is thus better able to resist windfall.

Mark heaviest on northern slopes and moist situations, and very lightly on dry, exposed situations. Mark heavier near the bottom of slopes and more lightly toward the top.

¹ This document was transcribed from a photocopy of the original, which is located in the Supervisor's Office Silviculture Library Archives. To the greatest extent possible, this version is an exact duplicate of the original text.

Where the situation is exposed or the present stand naturally open, marking should be most careful if, indeed, it be found that any trees can be spared. Small patches of isolated timber and solitary trees should not be marked for removal.

In even-aged stands which are too immature to admit of a strip system, and in even-aged stands where the cutting is to be very light in order to secure a second cut within a short time, a modification of the selection system is indicated, in the nature of thinnings. This method of cutting is especially desirable where the danger from windfall is marked, since it removes only overmature, suppressed, defective, and diseased trees in order to make room for more thrifty and hence more windfirm trees. A thinning should never be heavy enough to break the crown cover permanently; in general no openings should be made in the crown cover which will not be fairly well filled long before a second cutting will be made. In stands of equal density the thinning may be heavier on deep, moist, and fertile soils than on shallow, dry, and poor soils, since on the former the more rapid growth will close up the crown space in a shorter time.

If any part of the stand is much exposed to severe winds, great care should be taken not to open it so much as to cause danger from windfall.

The main object in thinning a stand is to improve its character by the removal of all helplessly suppressed, defective, or diseased trees, and of such large individuals left from a previous stand which limit the upper crown space and retard the growth of the more promising young trees.

Where this last consideration is the main purpose of the cutting, the removal of all affected trees is the first consideration. Mark all trees infested by insect enemies and all trees infected by fungous diseases, provided the trees so marked are merchantable for any purpose. In sales of saw timber only, any such trees should be marked if it will make one sawlog. Logging and brush disposal should be so conducted as to entirely remove any danger of the evil's spreading.

The diseases and defects which may be looked for are dry-topped trees, trees attacked by fungus or insects, or injured by lightning, and trees barked by animals or by rubbing, and trees with cat-faces or frost cracks.

Clean Cutting in Strips

In even-aged stands of lodgepole where, as is usually the case, there is danger of windfall, and where the markets are such as to permit this kind of cutting, it is usually desirable to cut clean strips, leaving the alternate strips uncut or merely thinned of defective and over mature trees. This method of cutting is most successful when a complete utilization of timber can be secure. Where there is a market for only sawlogs, clean cutting is applicable only in very even-sized stands.

Everything merchantable should be removed from the clean-cut strips. In any case only defective and overmature trees should be removed from the timbered strips. If there is great danger of windfall, it will be best to leave the timbered strips intact.

The strips may run with the slope where there is no danger of snowslides or of erosion. Otherwise they should run along the slope or diagonally to it. They should rarely exceed 100 feet in width. All brush should be piled and all trees thrown within the strips which are cut clean. Ordinarily the strips left should be of the same width as the strips cut.

Pure Yellow Pine Stands

In marking pure stands of western yellow pine four broad rules should be borne in mind, and adapted to meet specific local conditions.

1. Leave all young trees unless plainly undesirable from serious unsoundness or overcrowding, and in general all thrifty trees which will plainly be much more valuable at the time a second cut may reasonably be expected in from thirty to fifty years.
2. Never make an opening of more than one quarter of an acre in the forest, not enlarge a natural opening of a greater size, even if the only trees available for seed are mature and partially unsound, unless good reproduction is already well established.
3. Before marking any trees for removal be sure that it is not needed for seed. Young, thrifty yellow pines or large thrifty "black Jacks" with full crowns make the best seed trees, and enough trees of this kind to seed up the area should be left. This usually means from two to five to the acre, the number varying with the seed-bearing capacity of the trees. If young trees are just beginning to bear cones are left, at least five are needed to the acre. From two to four seed trees are enough if they are old and have large, spreading crowns and are windfirm. The trees left should, wherever possible, be distributed in small groups. This makes them more secure against windfall, and conforms to the grouping tendency of the western yellow pine. Leave enough seed trees even where the seedling growth is good, in order to insure reseeding in case of fire.
4. When a sale area includes enough thrifty timber to make it possible to leave from 1,500 to 2,000 board feet of merchantable timber per acre with too far reducing the present cut, this amount should be left standing to furnish the basis for an early second crop. Sales should not be made from areas on which the stand is very thin, and it is evident that reproduction will not follow. Furthermore, sales in which it will be necessary to cut too large a percentage of the stand in order to make a logging operation profitable should not be considered.

If these rules are carefully observed the result will be that not seed trees and reproduction only, but an existing forest, will be left standing and the chances for reproduction greatly increased, since forest conditions are much less disturbed.

In marking small material in dense stands, consider how much space and light the most thrifty trees need, and mark the trees which now crowd them. Aim to leave the remaining stand sufficiently dense to produce good say-timber trees in the future.

Mixed Stands of Lodgepole Pine, Engelmann Spruce

And Other Species

In mixed stands of different species, market values and future demands upon the Forest must be considered in selecting the species to be favored; usually, however, that species should be favored which seems to grow best under the existing conditions. In moist soils Engelmann spruce should be favored as against other species. Favor lodgepole pine over Engelmann spruce where soils are sterile and drier. Leave Douglas fir where there is danger of windfall, and favor this species wherever it seems to make a better timber than lodgepole pine. Mark for removal all balsam and white fir which contain at least one merchantable log and are not needed for seed or protection.

Spruce

Engelmann Spruce should be encouraged wherever it grows better than other species in the mixture. This may best be done by leaving spruce wherever there is a choice between it and an equally good tree of a different species. In ordinary spruce stands seed trees are not needed, the aim should, rather, be to remove only overmature, suppressed, defective, and diseased individuals, marking with a view to improving the stand in composition, by increasing the percentage of spruce and leaving enough trees to protect the soil against drying out, which is injurious to spruce, and to form the basis for a future cut. In order to avoid windfall, the trees left should be spaced as evenly as possible.

Douglas fir

Since Douglas fir is the most windfirm of the species occurring in mixture with lodgepole, it should be especially favored on exposed situations. This species characteristically occurs either scattered singly in mixture with other trees, or in small dense groups.

Where the former condition prevails, it will be necessary to leave seed trees—spaced as evenly as possible—selecting for the purpose vigorous, well-formed individuals.

In marking the small dense groups, the aim should be to make a thinning, removing only the undesirable trees and leaving the stand in a better condition for rapid growth. This method of marking will usually secure the desired reproduction, since in the Rocky Mountains the all-important factor governing Douglas fir reproduction is apparently that of moisture.

In situations naturally well adapted to it, Douglas fir should be given the preference, in marking, over other species.

Balsam and White Fir

Balsam and white fir should not be left in mixture with better species. In cold deep gulches where either grows to good size and spruce is wanting, they may be left. Leave the firs only where needed to protect the watershed, or for seed in default of better species. All trees which will cut one merchantable log should be marked for removal, and the destruction of balsam and white fir reproduction should be permitted in logging operations, but only where reproduction of more valuable kinds may reasonably be expected to take its place.

General Rules

Where the present stand is naturally open or the situation is exposed, marking should be most careful, if indeed it be found that any trees at all can be spared.

Around openings it is well to leave a belt of windfirm trees. If they are needed for seed or protection, small patches of isolated timber and solitary trees, even though merchantable or defective, should not be marked for removal. If not needed small patches of trees which are merchantable now and which would be isolated and unmerchantable after the cutting in any sale is completed, should be marked unless it is clearly unreasonable to ask the purchaser to remove them.

Trees on top ridges, knolls, upper slopes, and other prominent places will seed up larger areas than if located in the bottoms of draws and gulches and other places where the seed is restricted in its distribution, but the fact that their location makes them more liable to windfall must be considered.

All trees infested by insect enemies and all trees infected by fungous diseases should be marked, provided such trees are merchantable for any purpose.

There are frequently large, limby trees with wide-spreading crowns which occupy more than their share of space in the stand. Their shape makes them of little value for lumber and they should be removed wherever possible.

Along lake or river fronts, the brink of canyons, important from a scenic standpoint or important public highways, or wherever the Forest has a distinct scenic value, or is used as a public pleasure resort, the marking should be very light, aiming to improve the appearance of the forest by removing only dead, dying, defective, and unsightly trees. A grove-like effect should be secured. Along public highways no thrifty trees should be marked in a strip at least a hundred feet on each side of the road.

In areas all ready cut over, marking should be very light and only those trees taken which it is obvious are not needed for seed or protection, and which will not be more valuable at the time when a third cut may reasonably be expected.

A diameter limit should never be rigidly adhered to, since it is invariably productive of poor results. It should be varied at the discretion of the Forest officer, who should always bear in mind that the continuous existence of the forest and the protection of the watershed area are of the first importance. Thin-crowned, unsound, or diseased trees should not as rule be left, since they will not live until the next cutting, nor should thrifty, rapidly-growing trees, which, although merchantable now, can be cut more profitably later, be marked. If there is any doubt mark conservatively, rather than too heavily and with a view to a second cut.

Owing to the great importance of marking, it should be done slowly and thoroughly. Too large an area should not be marked at first. A Forest officer should study the silvical condition of the stand, and bear in mind the demands both present and future, to be made upon the Forest. Decide first what trees should be left, and then mark those to be removed. Study results after cutting has begun.

Where possible the marking should be done by a Forest Assistant or under his direct supervision. Where this is impracticable the marking should, if possible, be inspected by a technical man at frequent intervals. The work of marking should be at a season when it can be done most economically.

When in doubt whether a defective tree contains merchantable material, mark it.

When in doubt whether a tree is needed for seed or protection, or is a proper tree to leave for the future crop, leave it.