TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE Boise, Idaho SOIL CONSERVATION SERVICE

March 12, 1975

TN - WOODLAND NO. 4

The following treatment of woodland harvest cutting by David Poe, Woodland Conservationist, Soil Conservation Service, Moscow, Idaho, is to better inform planners of the various harvesting methods. This information will be a valuable aid in presenting alternatives to cooperators to enable them to make final decisions pertaining to the management of their woodlands.

Thus, a specific statement can be entered into the resource conservation plan as to objectives and the actual method by which the trees will be harvested rather than just, "the trees will be harvested."

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WOODLAND HARVEST CUTTING

The reportable practice, "Woodland Improved Harvesting", Code 654, is really made up of two practices, woodland thinning or cutting of commercial stems and harvest cutting, i.e., the final crop tree cut with regeneration in mind.

"Woodland Harvest Cutting" is one of the most important practices in woodland management. The following material describes the five types of harvest cuts which can be used to successfully regenerate woodlands in Idaho.

It is important to note that the harvest cuts described denote methods of reproduction as well as harvesting. The five types of harvest cuts described are the seed tree, shelterwood, group selection, single tree selection, and clearcut.

I. Single Tree Selection

The single tree selection involves the removal of individually selected trees from a stand of timber. A succession of different age groups is present in the stand ranging from seedlings to saw logs. The largest number of the trees are in the younger age groups. When this practice is properly applied, every tree is considered as to the rate of growth, vigor, seed-producing capability, form, and overall potential for making a good forest product. The objective should be a continuous upgrading of the stand, leaving trees

with the highest potential and removing those with the least potential.

Some of the advantages and disadvantages are as follows:

Disadvantages:

1. This is the most difficult method of harvesting to apply properly and requires the assistance of an experienced technician. Most applications of this method result in a practice little different, if at all, from high grading where only the largest, fastest growing trees are removed. Properly applied, a greater number of the sapling and pole size stems are removed than saw logs.

   For the average layman, it is difficult to determine the age and growth rate of a tree without checking every tree with an increment borer.

2. It is difficult to thin stands when trees of many different sizes must be handled simultaneously.

3. It is generally not practical on steep or difficult terrain.

4. This method is only suited for producing shade tolerant species. Ponderosa pine, western larch, and Douglas-fir would eventually be eliminated from western red cedar or grand fir sites.

5. Since reproduction is in progress continually, grazing must be closely regulated to prevent livestock damage, particularly during the spring and early summer when the terminal buds are tender.

6. Logging is complicated and usually results in higher costs. A careless logging operation may also result in the destruction of a large percent of the future crop trees.

7. On grand fir, cedar, and hemlock habitat types, there would be very little forage available since a fairly full canopy would be maintained.

8. Slash disposal and site preparation are more difficult than other harvest methods.

9. The timber produced averages lower in grade than that grown in even aged stands.

10. Growth rate is the lowest on a per acre basis.

Advantages:

1. It is the most attractive method to many people.

2. It offers the highest degree of protection to the site.

3. The danger of fire may be reduced by the continuous shade.

4. Retards the growth of unwanted brush.

5. Landowners who have a need for different sized wood products such as fence posts and firewood and can do their own harvesting can effectively use this harvest method.

6. Decreases amount of slash to eliminate at any one time.

7. Blow down of trees becomes less of a hazard.

8. With large seeded species, this is a way of insuring adequate natural seed source for the site.

II. Group Selection

Group selection involves the removal of small groups of trees, creating and maintaining an uneven-aged stand. It is not easy to distinguish where a group selection blends into a small scale application of clear-cutting, shelterwood, or seed tree method. For our purposes, the group selection method will be considered as harvesting areas large enough to permit enough sunlight for the regeneration of desirable species and small enough to allow the seed from the desirable species in the adjacent forest to regenerate the entire area. An objective of group selection is the continuous upgrading of the stand.

Some of the advantages and disadvantages of the group selection method are as follows:

Disadvantages:

1. It is necessary to cover a larger area to harvest a given amount of timber and logging costs are usually increased over clear-cutting, seed tree, or shelterwood methods.

2. It may not be practical on steep or difficult terrain.

3. Grazing can be a problem since there will be regeneration in the forest much of the time and grazing will have to be closely regulated to prevent livestock damage during the time when the terminal buds are tender.

Advantages:

1. Many species of wildlife profit from the combination of forest conditions.

2. Harvesting older trees can be carried out more cheaply and with less damage to the residual stand than by the single tree selection method.

3. Next to the single tree selection, it may seem more attractive aesthetically than other methods.

4. It offers a high degree of protection to the site.

5. All species, both shade tolerant and shade intolerant, can be reproduced by this method.

6. Natural seed is abundant and close to the area to be regenerated.

III. Seed Tree Method

The area is cut clear except for certain trees left standing for the purpose of furnishing seed to restock the cleared area. The number of seed trees needed varies according to species. All trees left should be selected with care. Trees that are wind firm, capable of producing abundant seed, and of high genetic quality should be selected.

Some of the advantages and disadvantages of this method are:

Disadvantages:

1. Trees may be subjected to windthrow. Shallow soils may not be suited for this method.

2. Next to clearcutting, this method is the least attractive, particularly during the harvest operation.

3. There is little site protection.

Advantages:

1. Creates good growing conditions for most species, including shade-intolerant trees such as western larch and ponderosa pine.

2. Provides control over the species of reproduction desired.

3. The regeneration is susceptible to grazing damage for only a small percent of the rotation age.

4. Increases logging efficiency.

5. Slash disposal and site preparation are easier.

6. The size of the harvest cut can be adjusted to any size desired and may be reduced to provide for continuous income or increased to give a larger financial return.

IV. Shelterwood Method

There are a number of variations of this method. The shelterwood method described involves the removal of trees by a series of partial cuttings resembling thinnings that remove the entire stand. Because of the relatively low value of the trees and high logging costs, only two separate harvest operations are practical.

The difference between the shelterwood and seed tree methods is that in the shelterwood method the trees are needed to shade and protect the young seedlings during the establishment period and in the seed tree method the trees are only used to produce seeds.

Some of the advantages and disadvantages are as follows:

Disadvantages:

1. Trees left must be removed or they will eventually interfere with the growth and development of the reproduction.

2. It may not always be economically feasible to harvest stands of timber in two or more separate operations.

Advantages:

1. Retards excessive growth of grass and herbaceous cover while seedlings are sheltered from the drying influence of the sun, wind, and from injury by frost. It is especially helpful on hot south slopes and areas of low moisture or soil of low moisture-holding capacity.

2. It offers a high degree of protection to the site.

3. Retards the growth of unwanted brush.

4. It is more attractive than the seed tree or clearcut methods to most people.

5. Blow-down of trees is less of a hazard than the seed tree method.

6. Reproduction is usually more certain and complete than the seed tree or clearcutting because of ample seed source.

V. Clearcut Method

Clearcutting is a harvesting and reproduction method in which all trees on an area are cut. Clearcutting, without providing for a means of adequate regeneration, is not considered a forestry practice. The regeneration method requires planting unless enough seed from desirable species is dormant in the soil or available in sufficient quantities from adjacent stands of timber.

Some of the advantages and disadvantages of this practice are as follows:

Disadvantages:

1. This method is unattractive, particularly during the time of harvest.

2. Brush often results which competes with young tree seedlings.

3. Often very little protection is given to the site.

4. There will not be any merchantable timber available for many years if the entire stand is clearcut.

5. The cost of establishing reproduction is more expensive and less certain than natural regeneration.

6. The seedlings are exposed to all of the elements of the weather such as, wind, temperature, drought, etc.

Advantages:

1. This is the best method to harvest stands of timber which have undesirable or less desirable species and certain disease, insect, or mistletoe problems.

2. Slash disposal and site preparation are easier than the other methods.

3. The composition of the stand can be controlled and genetically improved planting stock can be used.

4. Logging is less complicated and less expensive than other methods.

5. Decadent stands, mistletoed or disease ridden can be cleared easily and effectively - usually removing the source of infection. Mature lodgepole pine stands are often best treated this way.

SUMMARY

Normally, landowners will not have a working knowledge of the different harvest methods.

Once it has been determined that a stand of timber needs a harvest cut, the technician must assist the landowner in selecting the best alternative for his woodland. In order to assist the landowner properly, the technician must be thoroughly familiar with the woodland, market conditions, woodland suitability groups and obtain the following information from the landowner:

1. What are the goals or objectives of the landowner for his woodlot? Some possible goals are: wildlife development, recreation, timber production, grazing, or speculation.

2. How does the landowner want his woodland to look after the harvest cut? Some landowners may want their woodlands to have many large trees and others may want many small trees or a combination of both. It is important to point out that logging is usually unattractive while in operation but, if done properly, is only temporarily unattractive.

3. In what manner does the landowner want a financial return from his investment? He may want his return on his investment in one lump sum or extended over a period of years.

4. Can the landowner do all or part of the work himself? A landowner who can do the work often increases his alternatives.

It is the responsibility of the technician to give a list of alternatives to every landowner we assist in developing a conservation plan. We should present the facts, and let the landowner make the decisions.

REFERENCES

The information in this report comes from a variety of sources including:

1. The Practice of Silviculture - 7th Edition, by David M. Smith, 1962.

2. Soil Conservation Service Forestry Handbook

3. Silvicultural Systems for the Major Forest Types of the U.S., Forest Service, U.S.D.A. Agricultural Handbook No. 445, 1973.

4. Discussions with employees of the U.S. Forest Service, the University of Idaho Forestry Professors and Foresters employed with the Idaho State Department of Lands.