

GROUP SELECTION

An Alternative For Management Of Small, Privately Owned Woodlands

In Tennessee



Tennessee

Division Of Forestry

GROUP SELECTION: An Alternative for Management of Small,
Privately-Owned Woodlands in Tennessee 1/

The Need for Alternative Management Schemes: Projections indicate that an increasing proportion of the Nation's timber and other forest amenities will necessarily have to come from non-industrial private lands. Most forest landowners recognize the wisdom in managing their woodlands, but few are knowledgeable about up-to-date forestry practices. They need forest management alternatives that provide adequate natural regeneration, serve wildlife needs, and protect the environment. But landowners also seek management strategies that are visually acceptable. The method chosen should consider the landowner's management objectives, the amount of forest land available, timber markets, and other factors.

Unfortunately, alternative management methods available to private landowners are few, and, for the most part, unacceptable to landowners, foresters, or both. Almost everyone agrees, however, that high-grade cuttings and diameter limit logging are unsightly and destructive.

Landowners like the idea of "selective cutting," but most foresters maintain that single-tree selection management doesn't work well in southern hardwoods. The small, temporary openings created during harvest cuttings fail to provide sufficient light for satisfactory regeneration and development of preferred species, such as oak, ash, and yellow poplar. The few trees that regenerate after selective cutting operations are either commercially worthless understory species or trees of low potential value. Selective cutting also provides limited wildlife habitat improvement and diversity.

Although forestry research and practice show that the clearcutting method of regeneration is an effective and environmentally sound silvicultural tool when properly applied, this method is unacceptable to most private landowners. Opinions and perceptions are based primarily on pictures and reports of large clearcuts in the American West and on most forest industry lands. Objection is based mainly on the visual impact of newly clearcut areas, which is often mistakenly perceived as destructive for tree growth, useless for wildlife and the cause of severe erosion. So although clearcutting may be appropriate for some landowners, alternative methods are needed that meet the management objectives of owners of smaller wooded tracts.

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The Group Selection Method: One alternative is the group selection method. Under this method, a cycle of harvest and regeneration cuttings and intermediate cultural practices is prescribed which can assure an even flow of products and maintenance of productive wildlife habitat. When fully implemented, this method results in a multi-age woodland consisting of many small variously shaped, even-aged groups. Timber management is regulated by forest area.

Group selection can work well on average size tracts, those that range from 80 to 200 acres. This method may also be successful on as few as 50 acres and on tracts larger than 200 acres. Group selection is usually not be practical on smaller tracts unless the harvest interval is drastically increased to 30 or 40 years. As for any logging operation, timber volumes and values must be sufficient to make logging economical.

Designating the Management Unit: The first step in applying the group selection method is to establish management units, i. e., gross forest areas, within which groups will be created. Management units may consist of single, contiguous areas or several smaller areas that can be managed as a unit. In either case, forested areas which comprise the management unit should be as similar as possible with respect to site capability, forest type, and timber age, size, and stocking. Although groups may be delineated on timber sale maps, the landowner's forest management plan map should simply show locations of management units.

Establishing Rotation Length and Harvest Interval: The next step in implementing group selection management is to establish a rotation age for the timber type to be managed. Eighty (80) years is the suggested rotation length for upland hardwoods on most sites; however, rotation length may be adjusted based on the landowner's objectives, timber type, and other factors. For bottomland hardwoods, upland hardwoods on very high sites, and pine, a rotation of 60 years may be appropriate.

Under the group selection method, one-fourth ($1/4$) of the gross woodland area would be harvested and naturally regenerated every 20 years for 80-year rotations. If enough forest land were available, harvest/regeneration cutting intervals could be reduced to 10 or even 5 years. Shorter cutting intervals can furnish landowners more frequent income and provide better wildlife habitat diversity.

For 60-year rotations, one-third ($1/3$) of the management unit would be harvested/regenerated every 20 years or one-sixth ($1/6$) every 10 years.

For stands currently approaching maturity, harvest intervals may be accelerated to capture the loss of value resulting from damage and mortality likely to occur in groups scheduled for harvest and regeneration at a later time. For example, it may be advisable to schedule harvest and regeneration on a 10 year interval in a 70-year old stand (normally grown on an 80-year rotation). In this case, harvest of the latest scheduled groups would occur 30 years hence when the trees are 100 years old rather than in 60 years, when the trees would be 130 years old. Following regeneration of the oldest groups, the harvest/regeneration interval would be rescheduled at 20 years to achieve the 80-year rotation target.

Group Size and Group Size Range: The size of groups may vary, but one (1) acre should be considered minimum for practical purposes. The minimum width of groups should be at least twice the mature height (about 200 feet) of the adjacent timber, the space needed to permit satisfactory regeneration and development of new seedlings and sprouts.

Any one of several group size range schemes may be chosen depending on the amount of woodland area available for management, wildlife habitat needs, and landowner preference. Some possibilities include the following:

<u>Range of Group Size</u>	<u>Average Size Group</u>
1 to 3 acres	2 acres
1 to 5 acres	3 acres
3 to 7 acres	5 acres
5 to 9 acres	7 acres

Harvest Acreage: The total acreage (allowable cut) scheduled for harvest during each cutting interval is determined by dividing the gross woodland area by the number of harvest cuttings in the rotation. The number of groups to be harvested can be calculated by dividing the allowable cut acreage by the average group size.

Planning for Timber Harvesting Operations

Visual Buffers: If desired, visual buffer zones 25 to 100 feet wide can be established adjacent to roads, fields, and homesites to reduce the visual impact of harvesting operations. Individual trees within buffers that would not be expected to live until the next harvesting operation can be cut when groups are harvested.

Log Landings: The first step in planning harvesting operations is to choose and designate log landings to which logs can be skidded for loading onto trucks for transport from the woods. The forester will choose almost level sites above and as far as possible from streams for protection of water quality.

The number of log landings should be minimized, but a sufficient number will be designated to ensure that in the future the entire management unit can be served throughout the rotation, not just groups harvested during the first cutting operation. Skid trails should not exceed 800 to 1,000 feet. Boundaries of log landings will be marked with flagging tape.

Haul Roads: Construction of new haul roads to provide access to log landings from public roads should be avoided. When needed, however, the total length of roads should be minimized by utilizing existing roads rather than building new ones. The forester will mark the center lines of haul roads to assure proper location. Best management practices (BMPs) for construction of roads should be used to reduce erosion and prevent water pollution.

Skid Trails: After groups are delineated, the forester will mark the center lines of skid trails to assure their proper location.

Locating and Delineating Groups: Before going to the woods, the forester will designate tentative group locations by placing pencil dots on the map to assure good dispersion throughout the management unit.

Later, when the woodland is examined, the forester will visit each tentative group center and mark group boundaries with flagging tape. Boundaries of groups will be determined mainly by the topography and natural features, such as ridge tops, streams and major drains, and man-made boundaries such as property lines and public roads. Group boundaries will be randomly shaped to appear "natural" and conform to the prevailing land form. Sharp corners and geometric shapes such as perfect circles and rectangles will be avoided.

Groups will also be located so that timber can be skidded away from streams and major drains, instead of crossing them, to prevent erosion and water pollution. For the same reason, groups are never allowed to straddle streams and large drains. Roads, log landings, and skid trails will be excluded from groups whenever possible.

The distance between groups should be at least twice the height of the mature timber (at least 200 feet) to permit establishment of new groups in the future.

For practical reasons the "allowable cut" acreage need not be exact. As a rule of thumb, the actual combined area in groups may vary up to 20 percent from the calculated allowable cut without disturbing the management scheme.

Marking Timber for Sale: The forester will mark all marketable trees within groups and log landings. If desired by the landowner, 1 to 3 dead snags or live cull trees per acre may be left as perch and den trees for birds and other wildlife. A limited number (2 to 5 per acre) of flowering trees such as dogwood or other trees may also be left without interfering with development of natural regeneration. A summary of the timber volumes marked will be furnished to the landowner.

Is Thinning Needed?: In some cases thinning may be needed in areas of the management unit not yet delineated within groups to maintain or increase growth of crop trees. In other cases, harvest of mature trees that may not survive the interval between harvests should be considered. In such cases, the forester will mark such trees for cutting when the timber in groups is marked.

Caution should be exercised in making a decision to thin outside designated groups. Full stocking of trees should be maintained in the woodland to capture maximum timber volume growth and quality. The forester will determine whether stocking is sufficient to justify thinning.

Coordination With Loggers: Few loggers are familiar with the group selection method; so close coordination is critical to carry out the initial harvest cutting as planned. Landowners should discuss and emphasize the following important points with prospective buyers before closing the sale:

- * the harvesting scheme, i.e., cutting only the trees marked in groups and log landings, harvesting at intervals, and thinning (if needed) outside delineated groups;
- * requirements concerning locations of access roads, skid trails, and log decks; and,
- * application of BMPs to minimize erosion and protect water quality.

Later, after the timber is sold, and preferably before logging begins, the landowner should visit the site with the logger and discuss protection of the property, residual timber, soil, and water quality during the logging operation. Frequent visits to the logging site to insure compliance are also important.

Protecting the Environment

Retirement of Log landings, Skid Trails, and Haul Roads: Log landings, skid trails, and haul roads should be retired as soon as possible after logging is finished. Timber sale contracts should require loggers to smooth and reshape landings, haul roads, and skid trails. Water bars should be installed on roads and skid trails to divert water off the road surface into the adjacent woods.

Disking or scarification is usually needed to break up the compacted surface layer of roads, trails, and landings to provide a proper seed bed for vegetation. To further prevent soil movement and possible water pollution, landings, roads, and trails should be revegetated with plant materials found in the Forestry BMP Handbook or with wildlife plants recommended by the Tennessee Wildlife Resources Agency.

After the logging operation, roads should be closed for use, especially during wet weather, to prevent rutting and erosion.

Assuring Future Forest Productivity

Site Preparation for Natural Regeneration: After all merchantable timber has been harvested, groups should be prepared for natural regeneration. All live trees larger than 2 inches in diameter should be cut with a chain saw as close to the ground as possible. Exceptions are previously marked perch and den trees, snags, or flowering trees. Live trees left for perches and dens should be deadened by girdling or herbicide injection. Residual trees of unwanted species may also be deadened by herbicide injection to prevent sprouting.

In some cases, numerous worthless trees of small diameter may be more cost effectively controlled by "thin-line" or soil applied herbicides. However, care should be taken to choose herbicides that are effective for controlling specific tree sizes and targeted species. Follow BMPs for herbicide use found in the Forestry BMP Handbook.

Crop Tree Release Thinning: To minimize management costs, no more than one pre-commercial thinning should be conducted in groups during the rotation for release of crop trees in groups. This treatment is usually most effective at age 25 to 35 when dominant and codominant crop trees are easily distinguished from their inferior neighbors, natural pruning has progressed to a point at least 17 feet above ground, and trees are vigorous enough to respond to release or maintain acceptable growth.

When crop tree release is needed, refer to the Division of Forestry's Technical Forestry Bulletin No. 7, Timber Stand Improvement by Crown Release of Crop Trees in Pole-Size Timber.

Commercial Thinning: Later in the rotation one or more commercial thinnings may be conducted in groups before the final harvest cutting. Such thinnings will depend upon whether markets are available for pole-size trees and small sawtimber and whether the volume and value of "thinner" trees are sufficient to make logging economical. Such thinnings may be conducted either when other groups are harvested/regenerated or during the intervals between harvest/regeneration cuttings.

Advantages and Disadvantages

Advantages of Group Selection: Application of the group selection method can:

- provide a sound, flexible scheme of regulated management of small woodlands that will enable private landowners to achieve a variety of management objectives;
- provide landowners regular periodic income from the sale of timber;
- achieve full stocking of trees in harvested groups by natural regeneration;
- assure that newly regenerated trees are free to grow and develop in full sunlight, unhampered by excessive shade;
- create a diversity of age classes within the woodland which can help maintain a diversity of forest dwelling species, for example, deer and squirrel, whose habitat requirements differ widely;

- create conditions favorable for a variety of outdoor recreation activities including hunting, hiking, etc., which are compatible with other management objectives;
- minimize the adverse visual impact of timber harvesting by limiting the size and varying the shape of groups and by establishing visual buffers;
- enhance the visual value of flowering trees, fall coloration, and vistas by limiting the size and varying the shape of groups; and,
- increase the utility of haul roads, skid trails, and log landings for wildlife, recreational activities, and landowner access.

Disadvantages of Group Selection: Although group selection offers landowners many attractive features, the method has certain disadvantages, especially when compared to the clearcutting method:

- administration may be more complicated, time consuming, and expensive;
- more roads and skid trails may be needed for management activities;
- growth and development of natural regeneration around group edges may be somewhat limited by the shade of adjacent trees; and,
- habitat for certain wildlife species may be slightly less productive in "edge" areas due to partial shade of adjacent trees.

Theoretical Schedule of Management Scheme: Landowners may have difficulty visualizing group selection management activities projected over time. The following section presents a theoretical schedule of harvesting and cultural treatments for group selection in a typical management unit for a 70-year period, but the schedule could be projected for any period of time.

It should be emphasized that such a schedule need not be rigid. Flexibility must be maintained to enable landowners to take financial advantage of market "highs," thin overstocked stands when needed, and respond quickly when storms or pests damage timber.

In any case, the group selection method provides a logical schedule of management activities that can yield a variety of forest benefits and values to private landowners for themselves and posterity.

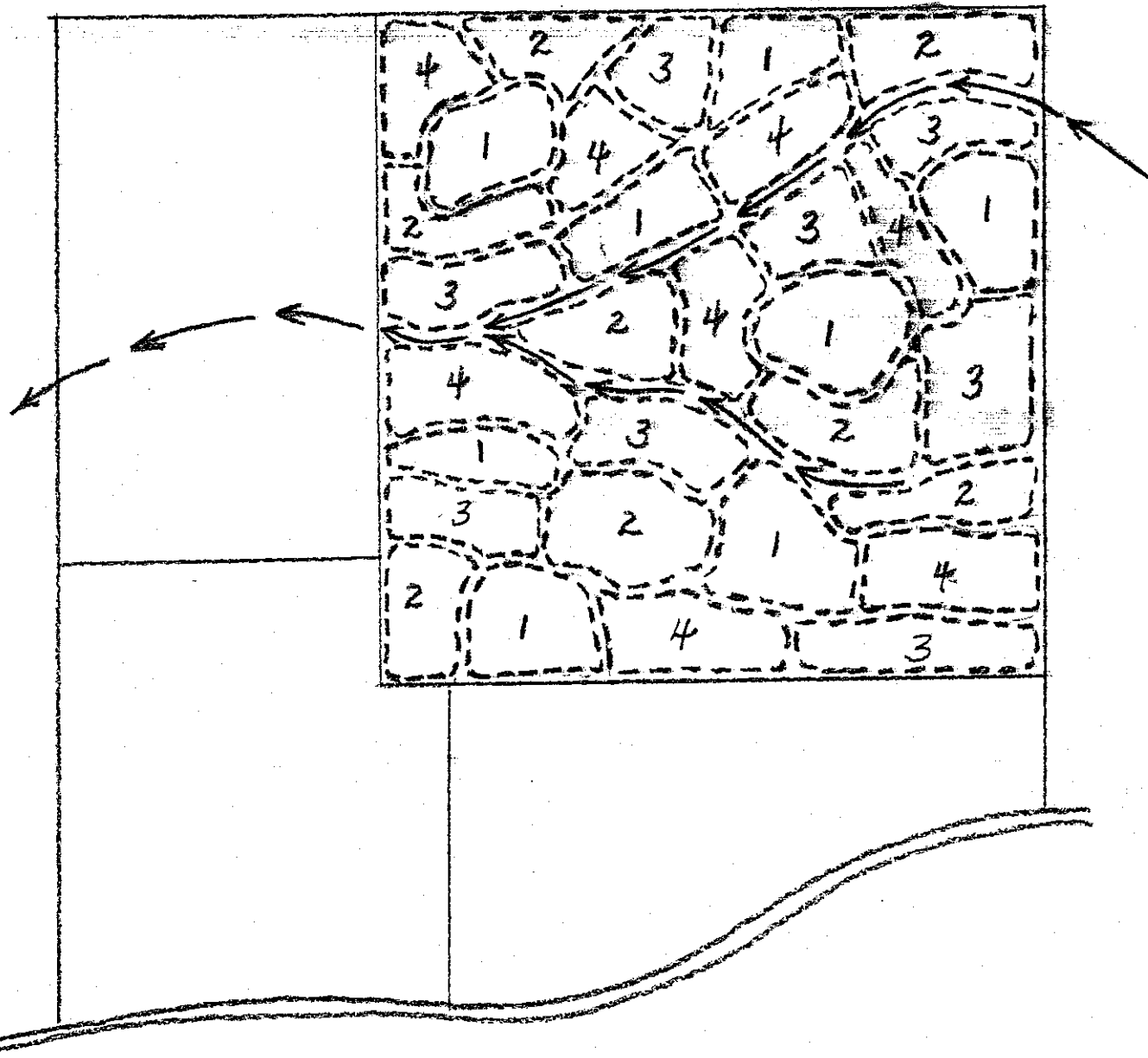
THEORETICAL SCHEDULE OF HARVESTING AND CULTURAL TREATMENTS
FOR GROUP SELECTION MANAGEMENT

Approximately one-fourth (1/4) of the total woodland area will be harvested and regenerated every twenty years. Harvest cuts will be in 1 to 3-acre groups. The woodland will produce a constant flow of forest products and provide high quality habitat for a wide variety of wildlife species if managed according to the schedule.

Intermediate cultural treatments such as pre-commercial and commercial thinnings, vine control, etc., would be conducted when feasible or as-needed. Such activities are bracketed to indicate that the schedule may vary.

<u>Year</u>	<u>Management Action</u>
1990	Harvest 1/4 of total woodland area in 1 to 3-acre groups - Conduct site preparation for natural regeneration in harvested groups - [Conduct vine control in uncut area outside groups.]
2000	[If needed, thin timber in all remaining uncut areas, or defer thinning until the second group selection harvest/regeneration cutting in 2010.]
2010	Harvest 1/4 of total woodland area in groups - Conduct site preparation for natural regeneration.
2020	[Conduct crop tree release thinning (pre-commercial) in groups harvested/regenerated in 1990.]
2030	Harvest 1/4 of total woodland area in groups - Conduct site preparation for natural regeneration.
2040	[Conduct crop tree release thinning (pre-commercial) in groups harvested/regenerated in 2010.]
2050	Harvest last 1/4 of total woodland area in groups - Conduct site preparation for natural regeneration.
	Conduct commercial thinning in groups harvested/regenerated in 1990.
2060	[Conduct crop tree release thinning (pre-commercial) in groups harvested/regenerated in 2030.]

Harvest/regeneration cuttings, pre-commercial thinnings, and commercial thinnings would be carried on indefinitely by projecting the schedule above. The exact timing of cuttings and other cultural measures would vary, depending upon timber markets, growth rates, and other factors. Flexibility to modify the schedule should be maintained.



TENNESSEE DIVISION OF FORESTRY

HARVEST/REGENERATION SCHEDULE

<u>GROUPS</u>	<u>YEAR</u>
1	1990
2	2010
3	2030
4	2050

ACREAGE DATA AND BOUNDARIES ARE APPROXIMATE.

OWNER _____ EXAMPLE _____
 NAME OF TRACT _____
 COUNTY/CITY _____
 DRAWN BY _____
 DATE _____
 AERIAL PHOTO NO. _____
 SCALE 1" = 417'
 TOTAL FOREST ACREAGE 64 acres

STREAM: ← ←