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Silvicultural Decisions VII - Thinning vs. Selection Harvest/Regeneration

Ron Mahoney and Matthew Anderson

On numerous field trips over the last 10 years with forest managers who were responsible for the management practices being viewed, we increasingly heard reference to attaining regeneration as a goal of thinning. This erroneous notion has filtered through private forest landowners, professional managers, and many agencies and organizations, until it doesn't seem to "raise eyebrows" as it once would. This is not the result of a new and better definition and implementation of the practice, but simply misunderstanding the objectives and practices of thinning. We have also discerned that *thinning and selection methods of harvest/regeneration are often confused with each other* and accordingly misapplied to the land.

The basic objective of thinning is to regulate growing space in a stand to improve growth, enhance forest health, and recover potential mortality. Consequently, even though trees selected to leave may improve the opportunity for natural regeneration in the future, *regenerating new seedlings is not an immediate goal of thinning.* Regeneration not only increases competition for growing space, but seedlings of shade-tolerant species that will dominate on all but the driest sites are often not desired. Thinning is an extremely valuable silvicultural tool for managing both even and uneven-aged stands between the regeneration period and harvest. Although thinning is "selective management" in that some trees are cut and some are left, so is basically every other intermediate and regeneration method except for clearcutting. *Selective management* or *selective cutting* can imply various things to various audiences and can create confusion and miscommunication. Most people use these terms to distinguish something from a clearcut, but there is too much variation in this usage. Thus, these terms should be avoided and replaced with specific terms for the management option at hand.

Thinning is NOT the same as selection harvest regeneration methods that regenerate and regulate an uneven-aged or all-aged forest stand being managed under a selection system. Modern textbooks and definitions use the terms uneven-aged methods and systems to avoid confusing the selection method and system with the problematic term *selective cutting*. Uneven-aged forest management is attractive to many forest owners for a variety of reasons, but primarily because there are always some larger trees in the forest, and it tends to produce more structural diversity. Uneven-aged forests are never, at least conceptually, starting over but always *look* like a forest with an abundance of trees of different sizes and often of different species.

Developing and maintaining mixed age and species forests is somewhat artificial. Historical records show that such stands were rare in our region prior to European settlement, but became increasingly common as a result of partially cutting only the biggest, best trees along with nearly 100 years of fire suppression. Although ecological evidence continues to unfold in support of a greater preponderance of early-successional forests, there are ecologically and socially desirable features of forests with greater species and structural diversity that are sustained through uneven-aged silvicultural systems.

The most basic requirement of an uneven-aged system is developing and sustaining three or more age-classes that differ by at least 20% of the rotation age. A stand

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can be called all-aged when five or more age classes are sustained across the full age spectrum, from seedlings to the oldest trees. The other requirement of an uneven-aged system is that the oldest trees are the ones that are cut in each entry. This does not preclude thinning of younger age classes to improve health, species composition, or growth of the stand, but generally guides the major commercial harvests necessary to maintain an uneven-aged structure. Unfortunately, this requirement is commonly violated, usually by harvesting the biggest trees, which may not necessarily be the oldest.

There are two basic uneven-aged regeneration methods, single-tree and group selection. It is difficult to regenerate any but the most shade-tolerant species with single-tree selection. This method also has the greatest risk of residual tree damage, requires the most frequent logging entries, and is associated with a host of other environmental and economic concerns that make it difficult to recommend and apply. Achieving a regulated forest managed under single-tree selection also requires very sophisticated inventory and mathematical calculations. Consequently, most professional educators and published references in the Intermountain Northwest recommend the group selection method.

Group selection can be much easier to understand and apply, more economical to log, and can result in less residual tree damage and site impact. In this method, clusters of trees are removed with the intent to leave a large enough opening to regenerate the preferred species. These openings can be anywhere from a width equal to the height of the mature trees to as large as 3 acres. While group selection still targets the oldest trees, it can also target pockets of insect/disease infestation, poor growth, or less-desired species. This method should be able to develop a variety of current stand conditions into a sustainable uneven-aged system. Usually, a percentage of the stand area is harvested in groups at specific intervals called cutting-cycles. For instance, if the rotation (harvest age) is 75 years, and the cutting cycle is 15 years, 5 age-classes would result. The cutting-cycle here also equals the percentage cut at each entry, 15%. An 80 year-old stand with a 20-year cutting-cycle would have 4 age-classes, and 25% of the total stand area would be cut in each cycle.

Group selection sounds simple, doesn't it? The only contentious aspect is that some people view any groups cut larger than ½ acre as even-aged clearcuts. Non-industrial private forest owners, as well as citizens that influence public forest management, overwhelmingly favor uneven-aged management over even-aged systems, especially clearcuts. Consequently, it would seem that there would be plenty of examples to examine to see whether the group-selection method is meeting regeneration and stand structure goals. In fact, several major forest products industries with substantial forest lands have recently committed to eliminating clearcuts and going to uneven-aged management. Consequently, we were somewhat astounded to find that during the last 20 years, this method was rarely attempted, and even more rarely correctly applied.

Because of the emphasis for several decades on uneven-aged management (i.e. no clearcut, seed-tree, or shelterwood methods of even-aged management), we decided to document the results of uneven-aged methods on regeneration applied across a wide variety of forest ownerships in Idaho. We contacted federal, state, and local forest managers, tribal foresters, industrial forest managers, woodland owners, and numerous consulting foresters, and found very few instances where group selection has been attempted, and most of those did not meet the application criteria described above. In many instances, the groups were simply isolated openings with no real silvicultural objective. In others, several to many residual trees were left in the "openings", confounding regeneration objectives. Several met the initial criteria, but the groups had been planted and subsequently grazed by livestock. We have found only three good examples of forest stands where the group-selection method was correctly applied.

Group-selection is a silvicultural method that meets many of the complex desires of forest owners and concerned citizens for healthy, productive, environ-

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mentally sustainable, and socially acceptable forest conditions. Although the method is conceptually sound, we really don't know if it actually meets silvicultural objectives here in the Intermountain West. We really need to examine more stands under a greater variety of conditions to determine this.

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About the Authors: *Dr. Ron Mahoney* is an Extension Forester and Professor at the University of Idaho and *Matthew Anderson* is a graduate reasearch assistant majoring in silviculture. He received his BS in Forest Management at the Unversity of Tennessee.