

Management of Giant Sequoia in the National Forests of the Sierra Nevada, California¹

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Abstract: The Forest Service avoided positive management activities within giant sequoia (*Sequoiadendron giganteum* [Lindl.] Buchholz) groves after heavy early logging on private lands caused adverse public reaction. However, since 1975 timber sales and prescribed burning have been conducted to encourage giant sequoia regeneration and increase tree vigor. General management direction is contained in supplements to the Forest Service Manual. Management strategies for individual groves will be finalized through the Land Management Planning process, now underway.

In the mid 1960's many people within the Forest Service began to recognize the need for positive management in stands containing giant sequoia (*Sequoiadendron giganteum* [Lindl.] Buchholz) trees. This need was indicated by two different observations on National Forest lands:

1. The "groves" were being overtaken by white fir (*Abies concolor* [Gord. and Glend.] Lindl.), and did not appear to be reproducing naturally with giant sequoia.

2. Giant sequoia typically occupied the better timber growing sites, and there were opportunities for increasing timber productivity on National Forest land.

The first observation led to the altruistic decision that the Forest Service should not stand by and watch the giant sequoias, especially spectacular individuals, just pass out of the picture. The second led to a strictly pragmatic decision to manage the groves for timber production. As discussed below, the Forest Service management policy for giant sequoia now accommodates both of these decisions.

About 5 years lapsed between the first serious consideration of management needs and the first specific Forest Service Manual direction (U.S. Dep. Agric., Forest Serv., 1970). Another 5 years lapsed before any projects designed specifically for giant sequoia management were initiated. Even though it is not uncommon to find a delay of 10 years between concept and execution of any new idea, there was some justification for the delay on this issue. In the first place there was a lingering memory of adverse public reaction to heavy logging around the turn of the century, and a desire to avoid reawakening that controversy. Related to the potential for public reaction was a reluctance to begin artificial regeneration of giant sequoias outside of the naturally occurring groves for two reasons: (1) Planted trees might grow into controversial groves where further management would be

curtailed; and (2) the wood of older trees was known to be brittle and not much good for lumber---investments from a strictly financial point of view did not make much sense. Thus the Forest Service was aware of the need to manage giant sequoia but unsure about how to begin.

Finally, in 1975 the Forest Service initiated a prescribed burn designed to reduce fuel loading and provide seedbed for giant sequoia regeneration in the Bearskin Grove (a stopping point on the field trip for this workshop. See handout in *appendix*). This particular project was undoubtedly influenced by observations on the prescribed fire research and project work conducted by the National Park Service on nearby Redwood Mountain. Encouraged by the success of the Bearskin burn, the Forest Service then decided to make a modest attempt at logging within the same grove.

Since then, four timber sales that included 60 acres (24 ha) within four groves on the Sequoia National Forest have been completed. All silviculture prescriptions have been directed towards the general goals of preserving existing "specimen" trees and perpetuating the species. Specific prescriptions were for seed tree harvesting with underplanting. In some cases the seed trees were sequoias only, in others mixed conifer species were left as well. At the time this workshop was held, four timber sales were under contract with 250 acres (100 ha) of harvest within four more groves. Prescriptions included seed tree, shelterwood, sanitation and thinning. Five timber sales in the planning stage propose harvests within giant sequoia groves.

Future management of giant sequoia depends on the outcome of the National Forest Land Management Planning effort. The Land and Resource Management Plan for the Sequoia National Forest is expected to be finalized in May 1987. However, of the approximately 14,000 acres (5700 ha) of forest land classified as giant sequoia type, a significant share probably will be managed to stress continuation of natural processes. The obvious candidates for this "preservation" category are groves located within wilderness areas, those that are unique geographically---such as Placer Grove in the extreme north end of the range, and those that deserve special administrative recognition---such as the Calaveras Big Tree National Forest established by act of Congress in 1909. Most of the 14,000 acres probably will be assigned to a management objective that stresses protection of large old trees and perpetuation of the species, but allows positive management actions to emphasize selected resource values. This category of management is defined as "non-intensive" in the Forest Service Manual supplement shown in the Exhibit attached. It accommodates the need for recreational developments in areas such as the Belknap Grove in the Tule River drainage of the Sequoia National Forest. It also allows for vegetation manipulation, including cutting trees and use of herbicides, to open up views of "specimen" trees or to prepare sites for regeneration. The key to non-intensive management action, then, is the selection of resource values to be emphasized.

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Finally there are tens of thousands of acres of National Forest land on the west slope of the Sierra Nevada that would surely support good growth of giant sequoia if the species were planted there. The Forest Service has already begun introducing giant sequoia onto these sites as a component of the mixed conifer forest, and will manage most of it like any other species---primarily for timber production. This "intensive" category of management also applies to all or portions of about 1,000 acres (400 ha) where all of the large old trees were removed in early logging; although reconstructing natural conditions on some of this area may prove desirable.

Most of the philosophy and activities described above pertain to the Sequoia National Forest. It contains about 90 percent of the naturally occurring groves on National Forest land and more than 90 percent of the area they occupy. However, the unique characteristics of the species have also been recognized in other places. On all National Forests in the Sierra Nevada giant sequoias have been planted from time to time, as they have on

several other forests in California. In fact, if interest in the species were measured by the amount of seed stored in the Forest Service seed bank at Placerville, then the San Bernardino National Forest runs a close second to the Sequoia. On the San Bernardino about 5,000 to 10,000 seedlings are planted each year, and at least one instance of natural regeneration from some of the early plantings has been observed.

On all National Forests within the natural range of giant sequoia it is generally considered to be a legitimate species for management in the mixed conifer forest type. The Forest Service is clearly committed to the management of giant sequoia. Now it is a question of precisely how and where it should be managed.

REFERENCE

U.S. Department of Agriculture, Forest Service. Supplement No. 91 to Forest Service Manual; Title 2400, Timber Management, Chapter 2405, Multiple Use Coordination. San Francisco, CA: Pacific Southwest Region; 1970.

TITLE 2400 - TIMBER MANAGEMENT

2471 - HARVEST CUTTING

Giant Sequoia Groves. The giant sequoia (*Sequoiadendron giganteum*) is remarkable for its great size and long life. Due to the limited occurrence of old, large giant sequoia trees and the aesthetic value of the species, they warrant special treatment.

The management objectives for stands of giant sequoias shall be established by Management Category. The general objectives shall be the perpetuation of the species, the maintenance and preservation of "specimen" trees, and sequoia, live or dead, that has mature characteristics such as: columnar form of stem, deeply furrowed bark, lower stem free of limbs, red bark, etc. In addition, it must be
-older than 150 years and larger than eight feet in diameter at six feet above ground level. To effectively meet the above objectives, the compatible practices are recognized by Management Category: -

1. Preservation. This Management Category will be reserved for those stands or groves of present or potential high aesthetic or scientific values. Although this designation is generally restricted to large prominent groves, it may also apply to one, or a few, "specimen" trees, the protection of which is desirable because of unique size or location. It may also apply to Research Natural Areas or Botanical Areas.

Groves or stands selected for Preservation management shall have their exterior boundaries posted. No major activities that would be potentially harmful to the giant sequoia trees, such as campground or road construction, or timber cutting, will be permitted. Activities shall be limited to those needed to perpetuate the "specimen" trees and the natural conditions of the associated trees and ground cover, or to improvement such as foot trails to provide for public access. Dead and down giant sequoias shall be left in place. Deviation from these restrictions may be made only with the written approval of the Forest Supervisor.

2. Non-intensive. Mixed conifer stands which contain large, old growth (older than 150 years) giant sequoias as a component and which have not been designated and approved for Preservation will be given special treatment to preserve the old growth giant sequoias in the stand.

The objectives of management shall be to perpetuate the species, improve stand vigor, and develop replacement "specimen" trees. Management flexibility is allowed so that selected values may be emphasized, provided these objectives are met. Values selected for emphasis may vary between groves, and between stands within the same grove.

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Silvicultural prescriptions shall be prepared for each stand to meet the objectives of non-intensive management as qualified by management emphasis. Any silvicultural system, even-aged or uneven-aged, may be used which will meet the objectives and the appropriate emphasis. Clearcutting of whitewoods to promote mixed species reproduction and thinning of giant sequoias to improve vigor and size are approved practices. Use of prescribed fire and all techniques for manipulating vegetation are also approved practices in these stands.

No "specimen" giant sequoia is to be cut or damaged. Management activities shall be conducted in a manner to insure protection of these trees from root damage, undue exposure to windthrow, or unacceptable damage which might occur from other trees felled into or against them. Deviation from these constraints shall be allowed only upon the approval of the Forest Supervisor.

3. Intensive. These are areas of National Forest land (primarily those acquired after logging) that support either pure stands of giant sequoia saplings, poles or large young trees, or mixtures of young giant sequoias and other species. In addition, there are areas that are outside of the present natural range of the species which, due to site quality or location, are capable of growing giant sequoias. There are no restrictions on management activities in these stands other than to promote expansion of the giant sequoia range where possible.

*-Giant Sequoia Grove Management.

1. Policy:

a.) A giant sequoia grove will be analyzed in its entirety prior to planning any timber sale or other activity that will affect the given grove.

b.) The need for a separate Grove Management Environmental Assessment (E.A.) will be determined at the time of scoping for the Position Statement. If no significant public issues are identified, the Grove Management Analysis may be included in the Compartment or Timber Sale E.A.

2. Grove Management Analysis:

The Grove Management Analysis will identify areas suitable for:

- a. Preservation Management
- b. Non-Intensive Management
- c. Intensive Management

The rationale for the allocation into each category will be documented. Also, the proposed management emphasis for Non-Intensive areas will be noted along with the reasons for the emphasis.

Detailed prescriptions will be developed by the project E.A.'s; i.e., Timber Sale or Compartment E.A.

The following criteria are established for determining the management direction in giant sequoia groves, or portions thereof.

1. Preservation:

All groves in wilderness areas are in this category. Groves outside of wildernesses should have at least one of the following attributes:

- a. Comprised of unique specimens, groups, or eco-systems.
- b. Offer outstanding recreational opportunities.
- c. High public use or interest.
- d. Adjacent to developed Recreation Sites or Wilderness Areas.
- e. Unique features such as tallest, etc.
- f. Second growth stand designated as replacement preservation grove.

Since the theme of preservation management is to allow natural environmental processes to operate, this management category is not necessarily limited to isolated or pristine groves.

2. Non-Intensive Management:

All grove areas not classed as Preservation or Intensive Management will fit into this category. The management emphasis will be identified; e.g., recreation, timber management, etc.

3. Intensive Management:

Lands meeting the following criteria may be considered for intensive management:

- a. Second growth giant sequoia stands that have resulted from previous harvest; or
- b. Planted giant sequoia stands.

Second growth and planted giant sequoia stands are not precluded from being considered for Preservation Management or Non-intensive Management.

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