

Planting Plan for Redwood Mountain Grove and Adjacent Fisher Habitat

Purpose

This planting plan provides planting prescriptions, including the densities, species mixes, and distribution of those mixes across planting areas as necessary to re-establish tree seedlings in the Redwood Mountain Grove and adjacent fisher habitat, where the decision tree described and approved through the Re-establish Tree Seedlings in Severely Burned Giant Sequoia Groves and Adjacent Fisher Habitat Environmental Assessment (EA)/Finding of No Significant Impact (FONSI) demonstrates insufficient regeneration. Please see attached map of SEKI Planting Units in these areas. We will use these planting prescriptions in conjunction with internal guidance and mitigations outlined in the EA to guide on-site training of planters.

Planting Prescriptions

Common to all planting units

Planting spacing will follow the individuals, clumps, and openings pattern using a field fit approach rather than plantation style planting with set spacing. Within each planting unit, planters will plant 30% of seedlings as scattered individuals and 70% of seedlings in clumps, prioritizing microsites as described below. We will determine clump location, size, and spacing based on microsites. Clumps will typically be made of 3 – 15 individuals of the same species spaced 6 – 24 inches apart depending on the type and size of microsite (e.g., we will put more individuals in larger microsites like wet areas or along larger logs creating shade). Because seedlings planted near shade objects are more likely to die if the object combusts during a fire, roughly 20% of all seedlings (both individuals and clumps) will be planted away from combustible shade objects (e.g., we will plant by boulders and in open areas). Planting scattered individuals and clumps will naturally create openings of different shapes and sizes throughout the planting units. These openings are important in creating heterogenous stand structure rather than a homogenous structure typical of plantation planting. We will not plant in areas that are determined to have significant regeneration (final determination to be verified in the field). We will generally not plant within 50m of a living mature giant sequoia tree that is expected to provide ample seed rain within that range into the future. See attached map of SEKI Planting Units for context of these locations.

We will prioritize planting in microsites including the north side of shade/nurse objects (e.g., snags, logs, stumps, rocks), depressions (e.g., giant sequoia potholes), and wet areas (e.g., stream edges). Shrubs can either facilitate or inhibit seedling establishment dependent on environmental conditions. We will plant some seedlings directly within small shrub patches, on all aspect types, to ensure that seedlings are distributed throughout the landscape and not just on the edges of large shrub patches.

We split the landscape into five (5) landscape units (ridge, canyon bottom/drainage and northeast mid-slope <30 percent, southwest mid-slope <30 percent, southwest mid-slope >30 percent, and northeast mid-slope >30 percent) that have different planting densities (see Tables 1 and 4). We will plant at higher densities in canyon bottom/drainages and northeast aspects and lower densities on ridges and southwest aspects. Transitions zones between aspect types, canyon bottom/drainages to southwest aspects, and ridges to northeast aspects occur across the planting

units, and we will make field-based decisions on planting density in these zones (e.g., plant more individuals in a canyon bottom/drainage and fewer individuals where it transitions to a southwest aspect).

We used the dominant vegetation type, as mapped before these wildfires, to create species mixes (Tables 2 and 3). Together, we used the dominant vegetation and landscape unit to create the planting prescription for each planting unit (Table 4). We will use the attached planting unit map and a field fit approach to plant appropriate species and densities within a planting unit, as there is variation within a planting unit (e.g., transition zones, increasing or decreasing slope, different vegetation types or suitable habitat). For planting units called shrub dominant on the map, we will generally plant at a lower density (100 tree per acre (tpa)). If no snags are present within the shrub patch, we will not plant in the shrubs but rather in areas around the shrub patch, but if snags are present, then we will plant within the shrub patch. Some planting units span both the sequoia grove and fisher corridor planting areas, and we will refer to the sequoia grove boundary on the map as well as make assessments in the field to decide if and where to plant sequoias in these units. We will not plant further than 50m (distance of most seed distribution) from dead giant sequoia trees.

For giant sequoia of nonlocal genotypes, we will only plant within designated locations and mark where they are in the field. We will not mix the nonlocal genotypes throughout the entire landscape but rather have them contained to discrete identifiable locations. We will not mix seedlings of local and nonlocal genotypes at any given location (i.e. they will be planted separately from each other).

Sequoia Groves: Redwood Mountain

At 2,074 acres pre-fire, Redwood Mountain Grove is the second largest sequoia grove by area with the largest area of old growth and the most mature sequoias in the world. It is located on lands managed by Kings Canyon National Park, Sequoia National Forest, and UC Berkeley (known as Whitaker Forest). The 493 acres of Redwood Mountain Grove that burned at high severity on lands managed by the NPS will be replanted at a density of 100-250 trees per acre with different planting densities and species mixes for the six planting units (see Table 1, 2, and 4 for details).

Table 1. Planting Acreage, Density, Species Mixes and Proportions for Each Landscape Unit In Redwood Mountain Grove and Fisher Habitat Corridor

Landscape Unit	Planting Acreage (acres)	Planting Density (tpa)	Species Composition in Comparison to Table 4 Percentages
Canyon bottom/drainage and Northeast mid-slope <30 percent	230	250	More giant sequoia, white fir, and incense cedar
Northeast mid-slope >30 percent	20	200	More giant sequoia, white fir, and incense cedar
Southwest mid-slope <30 percent	214	150	Less white fir and incense cedar, more ponderosa pine
Southwest mid-slope >30 percent	93	100	Less white fir and incense cedar, more ponderosa pine
Ridge	52	100	Less giant sequoia, more Jeffery pine and ponderosa pine

Canyon bottom/drainage and Northeast mid-slope <30 percent	140	250	More white fir and incense cedar
Northeast mid-slope >30 percent	33	200	More white fir and incense cedar
Southwest mid-slope <30 percent	35	150	Less white fir and incense cedar, more ponderosa pine
Southwest mid-slope >30 percent	119	100	Less white fir and incense cedar, more ponderosa pine
Ridge	22	100	More ponderosa and sugar pine
Total	958		

Table 2. Approximate Species Mixes and Proportions for Different Vegetation Alliances

Vegetation Alliance	Giant Sequoia	Sugar Pine	Ponderosa Pine	Jeffrey Pine	White Fir	Incense Cedar
Giant Sequoia	66.67%	9.52%	4.76%	9.52%	4.76%	4.76%
White Fir – Sugar Pine	30%	25%	5%	5%	25%	10%

Fisher Habitat Corridor Adjacent to Redwood Mountain Grove

The loss of suitable habitat in the severely burned 485-acre proposed critical habitat corridor will be a barrier to fisher movement across the landscape. The Fisher Habitat Corridor will be replanted at a density of 100-250 trees per acre with different planting densities and species mixes for the six planting units (see Tables 1, 3, and 4 for details).

Table 3. Approximate Species Mixes and Proportions for Different Vegetation Alliances

Vegetation Alliance	Sugar Pine	Ponderosa Pine	Jeffrey Pine	White Fir	Incense Cedar
White Fir – Sugar Pine	30%	20%	5%	30%	15%
Ponderosa Pine – Incense Cedar	20%	40%	0%	10%	30%
Oak Alliance	40%	40%	0%	20%	0%

Table 4. Species Mix Proportions of Different Vegetation Alliances and Landscape Units for Redwood Mountain Grove And Adjacent Fisher Habitat Corridor

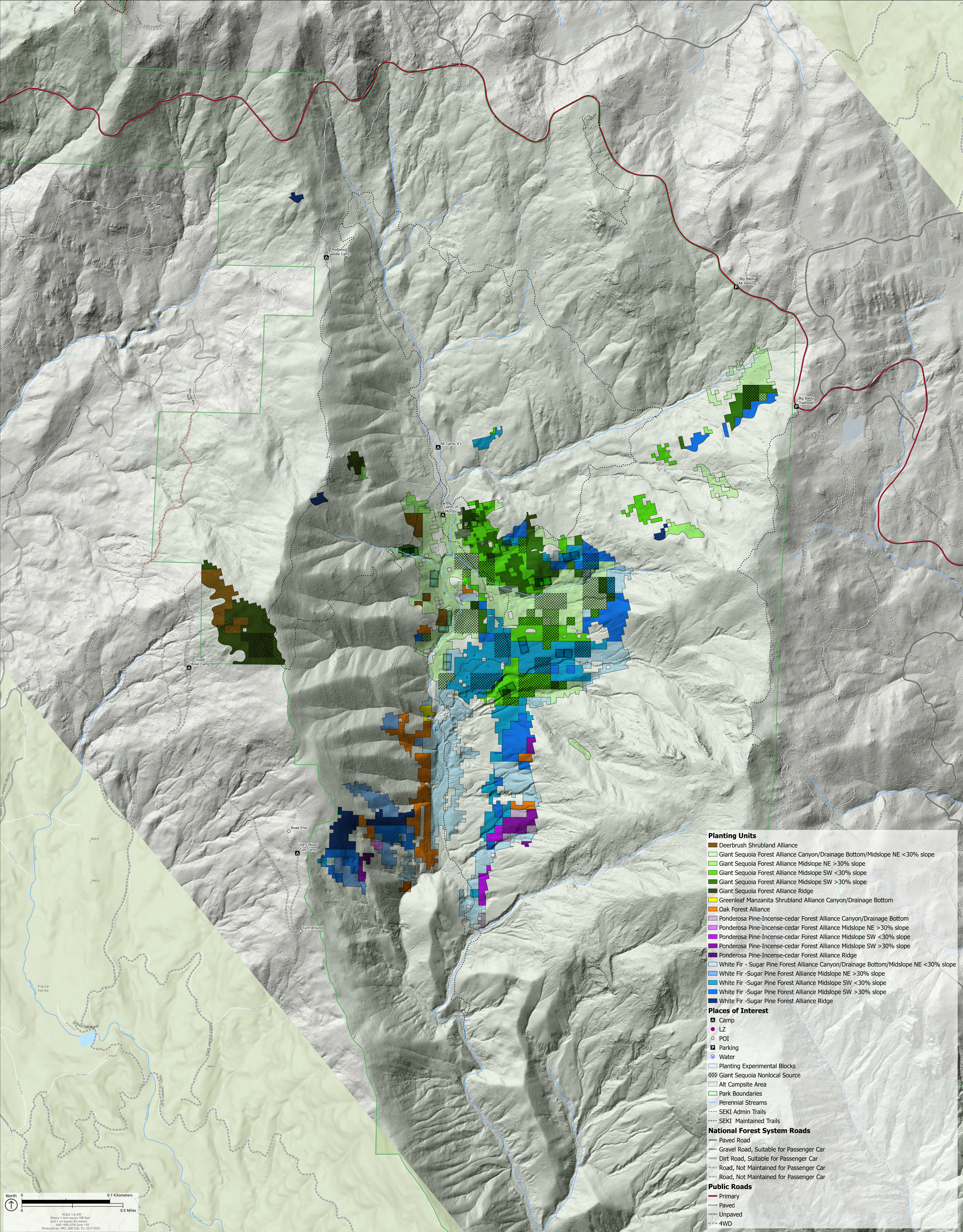
Site	Vegetation Alliance	Landscape Unit	Giant Sequoia	Sugar Pine	Ponderosa Pine	Jeffrey Pine	White Fir	Incense Cedar
Redwood Mountain Grove	Giant Sequoia	Canyon/ NE < 30	66.67%	9.52%	4.76%	9.52%	4.76%	4.76%
Redwood Mountain Grove	Giant Sequoia	NE > 30	66.67%	9.52%	4.76%	9.52%	4.76%	4.76%
Redwood Mountain Grove	Giant Sequoia	SW < 30	66.67%	9.52%	14.29%	9.52%	0.00%	0.00%
Redwood Mountain Grove	Giant Sequoia	SW > 30	66.67%	9.52%	14.29%	9.52%	0.00%	0.00%
Redwood Mountain Grove	Giant Sequoia	Ridge	52.38%	9.52%	14.29%	14.29%	4.76%	4.76%
Redwood Mountain Grove	White Fir-Sugar Pine	Canyon/ NE < 30	30%	25%	5%	5%	25%	10%
Redwood Mountain Grove	White Fir-Sugar Pine	NE > 30	30%	25%	5%	5%	25%	10%
Redwood Mountain Grove	White Fir-Sugar Pine	SW < 30	30%	25%	20%	10%	10%	5%
Redwood Mountain Grove	White Fir-Sugar Pine	SW > 30	30%	25%	20%	10%	10%	5%
Redwood Mountain Grove	White Fir-Sugar Pine	Ridge	25%	25%	20%	15%	10%	5%
Redwood Mountain Grove	Deerbrush shrubland	SW > 30	66.67%	9.52%	14.29%	9.52%	0.00%	0.00%

Site	Vegetation Alliance	Landscape Unit	Giant Sequoia	Sugar Pine	Ponderosa Pine	Jeffrey Pine	White Fir	Incense Cedar
Fisher Corridor	White Fir-Sugar Pine	Canyon/ NE < 30	30%	25%	5%	5%	25%	10%
Fisher Corridor	White Fir-Sugar Pine	NE > 30	30%	25%	5%	5%	25%	10%
Fisher Corridor	White Fir-Sugar Pine	SW < 30	30%	25%	20%	10%	10%	5%
Fisher Corridor	White Fir-Sugar Pine	SW > 30	30%	25%	20%	10%	10%	5%
Fisher Corridor	White Fir-Sugar Pine	Ridge	25%	25%	20%	15%	10%	5%
Fisher Corridor	Ponderosa Pine-Incense-cedar	Canyon/ NE < 30	0.00%	20%	40%	0%	10%	30%
Fisher Corridor	Ponderosa Pine-Incense-cedar	NE > 30	0.00%	20%	40%	0%	10%	30%
Fisher Corridor	Ponderosa Pine-Incense-cedar	SW < 30	0.00%	20.00%	55%	0%	5.00%	20%
Fisher Corridor	Ponderosa Pine-Incense-cedar	SW > 30	0.00%	20.00%	55%	0%	5.00%	20%
Fisher Corridor	Ponderosa Pine-Incense-cedar	Ridge	0.00%	20.00%	55%	0%	5.00%	20%
Fisher Corridor	Greenleaf Manzanita	SW > 30	0.00%	20.00%	55%	0%	5.00%	20%
Fisher Corridor	Oak	SW > 30	0%	40%	40%	0%	20%	0%

SEKI Planting Map

Redwood Navigation

Sequoia and Kings Canyon National Parks
National Park Service
U.S. Department of the Interior



Planting Units

- Deerbrush Shrubland Alliance
- Giant Sequoia Forest Alliance Canyon/Drainage Bottom/Midslope NE <30% slope
- Giant Sequoia Forest Alliance Midslope NE >30% slope
- Giant Sequoia Forest Alliance Midslope SW <30% slope
- Giant Sequoia Forest Alliance Midslope SW >30% slope
- Giant Sequoia Forest Alliance Ridge
- Greenleaf Manzanita Shrubland Alliance Canyon/Drainage Bottom
- Oak Forest Alliance
- Ponderosa Pine-Incense-cedar Forest Alliance Canyon/Drainage Bottom
- Ponderosa Pine-Incense-cedar Forest Alliance Midslope NE >30% slope
- Ponderosa Pine-Incense-cedar Forest Alliance Midslope SW <30% slope
- Ponderosa Pine-Incense-cedar Forest Alliance Midslope SW >30% slope
- Ponderosa Pine-Incense-cedar Forest Alliance Ridge
- White Fir - Sugar Pine Forest Alliance Canyon/Drainage Bottom/Midslope NE <30% slope
- White Fir - Sugar Pine Forest Alliance Midslope NE >30% slope
- White Fir - Sugar Pine Forest Alliance Midslope SW <30% slope
- White Fir - Sugar Pine Forest Alliance Midslope SW >30% slope
- White Fir - Sugar Pine Forest Alliance Ridge

Places of Interest

- Camp
- LZ
- POI
- Parking
- Water
- Planting Experimental Blocks
- Giant Sequoia Nonlocal Source
- Alt Campsite Area
- Park Boundaries
- Perennial Streams
- SEKI Admin Trails
- SEKI Maintained Trails

National Forest System Roads

- Paved Road
- Gravel Road, Suitable for Passenger Car
- Dirt Road, Suitable for Passenger Car
- Road, Not Maintained for Passenger Car
- Road, Not Maintained for Passenger Car

Public Roads

- Primary
- Paved
- Unpaved
- 4WD

SEKI Planting Map

Redwood Mountain

Sequoia and Kings Canyon National Parks
National Park Service
U.S. Department of the Interior

