

**GENERAL INFORMATION:**Project Title: Redwood Meadow Emergency Restoration for Sequoia ProtectionProject Duration: 1-3 years*(For longer projects, review the MRA yearly to determine accuracy. Prepare a new MRA if the project is modified, new prohibited actions are proposed, or at a minimum every 5 years.)*Date Submitted: October 7, 2022Project Proponent: Leif Mathieson

Contact Information: \_\_\_\_\_

Tracking Number (Office Use Only): 2022MRA13**STEP 1:****Determine if any administrative action is necessary.****Description of Situation:** What is the situation that may prompt administrative action? What is the reason that you are proposing an action (or actions) in wilderness? Do not describe the action itself. Rather, describe the desired goal or outcome.

Fire is a frequent historic occurrence in the Giant Sequoia, mixed conifer forest type. Per USGS research throughout the Sierra Nevada in Giant Sequoia and mixed conifer woodlands, extensive study on local vegetation structure, and tree ring fire studies, the fire return interval ranges from 1-26 years throughout the Sierra Nevada with an average return interval of 15 years, and yet, the NPS has no known fire history for the Redwood Meadow area of the Middle Fork of the Kaweah, meaning the area has missed at least 8 cycles of fire return on the landscape.

Due to a combination of this lack of fire history (i.e., fire suppression), the last ten years of persistent drought, and increasing temperatures throughout California, the Redwood Meadow area has an unnaturally high understory tree density, surface fuel accumulations, and low fuels moistures – conditions that have recently shown to be of significant threat to sequoias and the surrounding forest. Over the last seven years, the NPS and other land managers in the Sierra Nevada have witnessed high-severity fire effects that have been able to kill thousands of sequoias—a species that, until recently, was thought to be incredibly resilient to fire—when presented with high surface and ladder fuels on the ground, such as that within the Redwood Meadow area. In the last two years alone, 13-19% of all sequoias have been killed or are now dying following high-severity fire.

In light of recent fire effects to giant sequoia and sequoia groves across the species range, it is apparent that sequoias are at imminent threat from high intensity wildfire caused by a combination of over 100 years of fire suppression, the last ten years of persistent drought, and increasing temperatures throughout California which have resulted in increased understory tree density, surface fuel accumulations, and low fuels moistures.

Given the loss of a natural fire regime and an unnatural buildup of surface and ladder fuels within the Redwood Meadow area, Sequoia and Kings Canyon National Parks are proposing emergency fuels reduction within Redwood Meadow Grove, Little Redwood Meadow Grove, and Granite Creek Groves and the surrounding forest to protect individual trees and the groves from the potentially devastating effects of high intensity fire. The goal of action in these sequoia groves is to reduce the risk that high intensity wildfire will kill additional monarch sequoias in park wilderness, and to increase forest resiliency.

See accompanying Decision Memorandum to Support Emergency Activities for Fuels Reduction Efforts to Protect Sequoia Groves in Sequoia and Kings Canyon National Parks from the Devastating Effects of High-Intensity Fire for additional context and background.

**A. Options Outside of Wilderness:** Can actions taken outside of wilderness adequately address the situation and meet project goals

**Explain:** There is no action outside the wilderness that could address the need to reduce fuel loads in Redwood Meadow Grove, Little Redwood Meadow Grove, and Granite Creek Groves, as these groves in wilderness.

**B. Valid Existing Rights or Special Provisions of Wilderness Legislation:** Explain why action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws)? Cite law and section. *If not necessary to meet existing rights or provisions, write NA.*

**Explain:** NA

**C. Requirements of Other Legislation:** Explain why action necessary to meet the requirements of other federal laws? Cite law and section. *If it is not necessary to meet requirements of other laws, write NA*

**Explain:**

The NPS Organic Act of 1916, Section 1, provides that the fundamental purpose of the National Park Service, "is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Further, the parks' enabling legislation (26 Stat. 478, 16 USC41) (September 25, 1890) calls for the protection of sequoia trees as "wonders of the world".

“Whereas, the rapid destruction of timber and ornamental trees in various parts of the United States, some of which trees are the wonders of the world on account of their size and the limited number growing, makes it a matter of importance that at least some of said forests should be preserved: There Be it enacted by the Senate and House of Representative of the United States of America in Congress assemble, That the tract of land in the State of California....is hereby reserved and withdrawn from settlement, occupancy, or sale under the laws of the United States, and dedicated and set apart as a public park, or pleasure ground, for the benefit and enjoyment of the people...”

In the last 24 months alone an estimated 13-19% of all sequoias range-wide have been killed or are dying because of high intensity fire. There is no known fire history for Redwood Meadow, however, fire ecologists estimate the area has missed roughly eight fire cycles and the risk of fire adversely affecting these groves is therefore high. Given that wildfire could strike these groves at any time, action is necessary to prevent potential impairment of park resources for whom the parks were established to protect.

**D. Wilderness Character:** Describe why action is necessary to preserve one or more qualities of wilderness character? *If not necessary for the preservation of a given quality write NA.*

**Untrammeled:** NA

**Undeveloped:** NA

**Natural:** Action is necessary to restore and maintain the natural fire cycle, reduce fuel loads, and increase the resiliency of a forest generally at risk from changing climatic conditions. Without action, the fire return interval will continue to lengthen, and additional surface and ladder fuels will continue to accumulate within the Redwood Meadow Groves until an ignition (wildfire) occurs. Because these groves are already far beyond the natural fire return interval, and because a naturally ignited fire does not allow managers to control the prescription for fuel and soil moisture, high severity fire is likely to result from any natural ignitions. Any additional – and potentially preventable – loss of monarch giant sequoias, let alone entire groves, would represent an unacceptable loss for the parks’ namesake, for the natural quality of wilderness where they serve as an integral component, and for the species themselves whose existence is now increasingly threatened.

**Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation:**

The opportunity to experience giant sequoia groves in wilderness is unique to national parks in the southern Sierra. Without action, there is a risk that individual monarchs, or in the worst-case scenario a portion or all these groves, could be lost and with it one of the parks’ unique and outstanding opportunities for primitive recreation.

**Other Features of Value:** Acting is not necessary to preserve this quality; however, a high severity wildfire could cause damage to, or destroy, the historic Redwood Meadow cabin or other cultural resources.

**E. Public Purposes:** Describe why the action necessary to achieve one or more of the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act): “recreational, scenic, scientific, educational, conservation, and historical use”? If it is not necessary to achieve one or more of the public purposes, write N/A.

**Explain:** This project achieves the conservation purpose of wilderness by restoring fuel loads to their historic range of variability and preventing the forest from becoming increasingly overstocked and prone to high intensity wildfires. Acting would restore naturally lower fuel loading necessary for the continued persistence of giant sequoias within the Redwood Meadow Groves. Promoting an open sequoia mixed conifer forest would improve the scenic value of the Redwood Meadow Groves for future generations.

**F. Other Guidance:** Explain why action is necessary to conform to direction contained in agency policy, unit and wilderness management plans, species recovery plans, or agreements with tribal, state and local governments or other federal agencies. *If not necessary to conform with agency policy or other plans, write NA*

**Explain:**

Acting in the Redwood Meadow Groves conforms with several policies, guidance, or plans.

**Department of the Interior GPR goal 1a01A (Restore Natural Fire Regimes).**

NPS Management Policies (4.5 Fire Management) (2006) require that a “fire management plan will address strategies for preventing the accumulation of hazardous fuels in specific areas and for eliminating hazardous conditions that may have developed over time due to past fire suppression programs or ongoing development activities”. Action is needed to meet the SEKI Fire and Fuels Management Plan (reviewed and updated in 2016) which establishes the following program goal: “Plan and implement appropriate treatments to reduce the threat to values from unwanted wildland fire and to restore or maintain ecological values.”

**Sequoia and Kings Canyon National Parks Resource Stewardship Strategy (2017)**

The Parks’ RSS identified altered fire regimes as one of the primary stressors facing resources within the Parks:

*“Fire plays a critical role in Sierra Nevada ecosystems. Changes in fire frequency and severity have occurred due to exclusion of wildfires, absence of Native American burning, and climate change. These changes have led to cascading impacts throughout many ecosystems. Lack of periodic low- and mixed-intensity fire in some lower and middle elevation montane forests has caused increases in overall forest density and fuels and shifts toward more shade-tolerant tree species. These alterations can increase fire hazard while decreasing resistance of the forest to insects, disease, warming temperatures, and drought. In the southern Sierra Nevada, the amount of fire on the landscape (frequency, size, total area) is still considerably less than the conditions prior to about 1850, but these fire regime components have been increasing over the past few decades along with fire severity and coincident with warming temperatures. Fire frequency and severity are*

*projected to continue to increase in future climate change scenarios (NPS 2017, 23).*

The RSS furthermore outlines the following goals associated with sequoia protection:

- Maximize persistence of large, living giant sequoias.
- Maximize persistence of structurally and compositionally complex giant sequoia groves that are sustainable, resilient (to drought, fire, insects, etc.), and support native biodiversity.
- Manage for ecological functions essential to giant sequoia groves (fire, hydrology).
- Prepare for potential shifts in giant sequoia distribution to enable its persistence in the broader Sierra Nevada landscape.
- Prioritize persistence of giant sequoia in areas of highest social value.

At the time of its writing (2017), the RSS states that only 20% of sequoia groves in the Parks are within desired fire return interval and that small trees are overly dense in most groves.

**The parks’ 2015 Wilderness Stewardship Plan (WSP) outlines the following desired conditions:**

- “The untrammelled quality of wilderness character will be preserved by limiting deliberate manipulation of ecological systems *except as necessary to promote another quality of wilderness character*” (emphasis added).
- “The natural quality of wilderness will be preserved by mitigating the impacts of modern civilization on ecosystem structure, function, and processes. The NPS aspired to minimize or localize adverse impacts caused by visitor use and administrative activities. In the wilderness, natural process would dominate: *ecosystem structure and function; native biodiversity; water quality and quantity; decomposition, nutrient cycling, and soil forming processes; meadow and wetland productivity; fire regimes; and soundscapes, dark skies, and viewsheds*” (emphasis added).

**Sequoia and Kings Canyon National Parks Wilderness Character Assessment (2014)**

Though not a guidance document, the wilderness character assessment supported the parks’ 2015 WSP and examined of the characteristics and conditions of designated and proposed wilderness in Sequoia and Kings Canyon National Parks.

Importantly, the assessment identified giant sequoias as an attribute of the parks’ natural quality and the loss of natural fire regime, including in sequoia groves, as contributing to diminished naturalness of the parks’ wilderness.

- “The regional endemics include two very visible and characteristic tree species--giant sequoias and foxtail pines. Some 65% of the area of sequoia groves in the parks lie within designated wilderness, as does roughly 20% of the area of all sequoia groves in the world [citations removed]. ...These two globally significant tree taxa form distinctive forests in the parks’ wilderness.”

- “Human-caused changes in fire regimes have also decreased the natural quality of the parks wilderness, although these changes were more severe in the decades prior to wilderness designation. A century of fire suppression in the mid-elevations of the parks has resulted in unnaturally high fuel loads, which increases the risk of catastrophic fire. In addition, periodic fire is important to the life-cycle of giant sequoia and other organisms. As a result of fire suppression, nearly 79,000 acres of fire-dependent ecosystems in the parks’ wilderness have missed multiple natural fire-return cycles, and sequoia reproduction has decreased [citations removed].”

**Decision:** Is administrative action is necessary in wilderness?

*To determine if an action is necessary in wilderness, review questions A-F above.*

*NOTE: The questions vary in weight. A-D have first priority, E has second priority, and F has third priority.*

*In addition, consider the following: If you do not accomplish the work, what would be the resulting impacts? Would there be adverse effects on wilderness? Would you fail to meet the mandate of other laws and/or policies?*

*If you are unable to determine if action is necessary based on Step 1 information, consult your Division Chief or supervisor. Researchers should consult the Research Permit Coordinator.*

**Explain:** Action is necessary to preserve natural quality of wilderness character, and outstanding opportunity for primitive recreation. If left untreated the area would remain susceptible to wildfire under potentially extreme conditions. This may result in adverse impacts to the forest due to high fire severity and could result in impairment of the parks’ resources – including potential degradation or loss of the species for whom the parks’ were established and an integral component of the parks’ natural quality of wilderness character.

**Compliance Pathway:** Is the action covered under an existing plan, management directive and/or other compliance document (i.e., MD-49, EA, EIS, CE/programmatic CE).

Yes:  No:

If yes, provide document name and PEPC reference number: Emergency Fuels Reduction within SEKI Sequoia Groves (111910)

***If no (or if you are unsure), contact the Environmental Protection Specialist for instructions.***

**STEP 2:**

Determine the need to develop alternatives.

**Does your project propose a Section 4(c) prohibited activity?**

Section 4(c) prohibited activities are: the use of mechanical transport and/or motorized equipment and vehicles, the landing of aircraft, and the installation of materials, equipment and/or structures. *For further descriptions of 4(c) prohibitions, see the MRA Instructions.*

Yes:  No: 

**If yes, proceed to Step 3.** The questions below and project description were deleted.

If you answered *no* to all the questions, provide a brief project description below and retain this form in your permanent administrative record. Submit an electronic copy to the Wilderness Coordinator.

**Project Description (projects without the need for alternative development only):****Prepared by:**

Name: Theresa Fiorino	Position: Environmental Protection Specialist	Date: 10/05/2022
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**STEP 3:**  
Determine the minimum activity.

Develop a range of reasonable and feasible alternatives. Please refer to the MRA Instructions for additional information on developing alternatives and identifying effects. Describe at least two alternatives including a “no action” alternative. Add additional pages as necessary.

Also include a list of alternatives that were considered but dismissed, with a brief explanation for dismissal, including safety concerns that cannot be mitigated.

Alternative #1 No Action

**Describe the Alternative:** What are the details of this alternative? When, where, and how frequently will the action occur? What methods and techniques will be used? How long will the activity last? What mitigation measures will be taken?

NO ACTION. Conduct no treatment and wait for a natural or human caused ignition to occur. Develop appropriate management objective(s) for the wildfire and respond accordingly. This could include a range of options from full control to managing the fire for resource objectives. Fires burning under this alternative would be subject to the conditions present the day of the fire. Under this alternative, fuels would continue to accumulate prior to an ignition source.

**A. Wilderness Character:** How does this alternative affect the qualities of wilderness character in both the short and long term? Include both positive and negative effects. What mitigation measures will be taken? *For definitions of wilderness character qualities, see the MRA Instructions.*

**Untrammelled:** Under the no action alternative, no trammeling would occur so long as no natural or human caused ignition in the area occurs. However, once ignitions occur, trammeling may or may not occur depending on whether future unplanned ignitions in the unit are suppressed, which is highly likely given the importance of the resources therein.

**Undeveloped:** Under the no action alternative there would be no impact to the undeveloped quality of wilderness character so long as an unplanned ignition in the area does not occur. When ignition occurs, undeveloped quality may be temporarily affected if fires in the unit are suppressed using traditional firefighting tools which typically include chainsaws and helicopter support.

**Natural:** Until an ignition occurs, fuels would continue to accumulate, and the current fire return interval would lengthen to exceedingly unnatural levels. Once ignition occurs and fire spreads to this area, unnaturally severe impacts from high intensity fire are expected, given the fuels build up at even existing conditions. Evidence from recent wildfires suggest that a wildfire ignition has a high probability of high severity effects in and around the Redwood Meadow Groves and would result in subsequent in the loss of individual

sequoias and at least a portion of the sequoia groves. Additional loss of these ancient trees would further degrade the natural quality of wilderness character.

**Opportunities for Solitude or Primitive and Unconfined Recreation:** There would be no impact on this quality until an ignition occurs. However, as with previous qualities, there would likely be impacts to opportunity as an unplanned ignition would likely result in closures, heavy smoke, and/or fire suppression activities as has been the case with wildfires in 2020 and 2021. As well, the opportunity to experience giant sequoias in wilderness would be diminished.

**Other Features of Value (e.g. Cultural Resources, Scientific):** There would be no impact on this quality until an ignition occurs. Depending on the conditions under which a future wildfire occurs, there would be impacts to cultural resources – namely the historic Redwood Meadow cabin – if fire were to reach the cabin.

**B. Other Criteria:** How does this alternative affect the special provisions (grazing, mining, water developments, access to non-federal land, etc.) identified in Sections 4 and 5 of the Wilderness Act?

**Explain:** NA

Alternative #2 Prescribed Treatment Using a Combination of Fire Management and Transport Support Tools

**Describe the Alternative:** What are the details of this alternative? When, where, and how frequently will the action occur? What methods and techniques will be used? How long will the activity last? What mitigation measures will be taken?

The NPS is proposing to complete fuels reduction work within 3,445 acres in the Middle Fork drainage of the Kawaeh River, to include Redwood Meadow, Little Redwood Meadow, and Granite Creek Groves. This fuels reduction work would be completed in the following phases to complete the prescription needed to protect Granite Creek, Redwood Meadow, and Little Redwood Meadow Groves.

### **Manual Treatment and Pile Burn**

Within each of the groves and up to 300 feet from the edge of the groves, the NPS would use chainsaws, pulaskis and other hand tools, to thin surface fuels and understory small trees and shrubs to protect individual sequoia trees and modify fire behavior and reduce the likelihood of a surface fire escalating in intensity to prevent high-severity fire effects. This treatment would occur in 353 acres within and around Redwood Meadow Grove, 62 acres within and around Little Redwood Meadow Grove, and 7 acres within and around Granite Creek Grove.

As early as October 2022, roughly 20-30 personnel would mobilize to the groves and begin falling small diameter trees and limb larger trees such that a maximum of 25 trees less than 40 feet in height would be left per acre and all live trees over 40 feet tall would remain. Trees that would remain standing would be limbed up to at least 6 feet above ground. In addition to tree removal, up to 50% of larger brush patches would be cut using chainsaws to create a mosaic pattern.

Species anticipated for thinning include: White fir (*Abies concolor*), red fir (*Abies magnifica*), incense cedar (*Calocedrus decurrens*), sugar pine (*Pinus lambertiana*), Jeffrey pine (*Pinus jeffreyi*), and ponderosa pine (*Pinus ponderosa*).

Stumps would be flush cut at ground level, and felled trees and snags and other dead and down logs and additional woody material up to 18 inches in diameter would be lopped and scattered or gathered, cut into logs, and piled for burning later. Logs larger than 18 inches in diameter would be left for wildlife habitat, unless they pose a fire hazard to adjacent structures, giant sequoias, historic stumps, and logs of special interest. If so, they would be piled away from these resources.

Any created piles for pile burning will be located at least 15 feet from any remaining residual green tree in the downhill or sidehill direction of the pile, and at least 20 feet from any residual green tree upslope of the pile. Piles may be covered with Clean Burn Kraft Paper to keep moisture out of the center until ignitions take place.

Once manual thinning has been completed and as soon as conditions and staffing allow, the NPS would burn all piles that were created during manual thinning. Pile burning would be completed in accordance with the Park Wide Pile Burn Plan and would need to occur when snow is on the ground. This specific treatment (i.e., manual thinning and pile burning) would begin in fall 2022 and spring 2023 and could extend beyond fall 2023 in other treatment units if conditions do not permit pile burning sooner.

## **Prescribed Burn**

As early as October 2022, the NPS would complete perimeter preparedness around the unit as outlined in Table 1. Treatment includes snag removal and the construction of a short (1/10<sup>th</sup> of a mile) minimum impact handline to protect a historic structure. Snags that pose immediate threats to personnel or holding would be felled with chainsaws. Hand line construction would be implemented using minimum impact techniques; line width would be no more than necessary to hold a low intensity backing fire, typically 12-24 inches in width. Preparedness could occur at any time of year when snow is not on the ground and is expected to take between 10-14 days.

Following perimeter preparedness and as soon as prescription conditions and staffing allow, the NPS would ignite the Redwood unit. Broadcast prescribed burning would occur in the spring or fall and is estimated to take between 5-7 days to implement. Ignition would primarily begin at high points to enable the fire to slowly back downhill and would target burning between 500 and 1000 acres per day to help regulate fire intensity and minimize smoke impacts.

Table 1: Perimeter Treatment for Redwood Meadow Groves

Treatment/ Burn Unit	Perimeter Prep Details		Prescribed Fire Details	
	Duration	Location of Treatment Along Perimeter	Timing/ Duration	Type of Ignition
Redwood Meadow Burn Unit	10-14 days	- Minimum impact handlines: Less than 1/10 <sup>th</sup> of a mile surrounding the historic cabin	Spring or Fall   5-7 days	Some hand firing around the groves may be necessary, especially if implemented prior to pile burning accumulated fuels in the groves. Ignition of broadcast burn would primarily involve aerial firing.

The ignition of the broadcast burn would primarily involve aerial firing with helicopter but some hand firing around the groves with drip torches may be necessary, especially if implemented prior to pile burning accumulated fuels in the groves. While aerial ignitions are being conducted, helicopters would typically be in the air for 30 minutes at a time and would then land at the closest existing helispot to let the ignitions develop. Subsequent passes would be required to complete ignition of the entire unit and intermittent reconnaissance flights would be required.

All trails within the burn units and those sections used for perimeter protection described below would need to be closed during and immediately following prescribed burns. This includes Middle Fork Cut Off, Redwood Meadow Cutoff, Paradise Ridge Trail, Cliff Creek Trail, Redwood Meadow Bear Paw Trail, and Granite Creek.

All handlines and other impacts would be rehabbed to the specifications in the SEKI Fire and Fuels Management Plan following the completion of these prescriptions.

## Transport Methods Decision Support Criteria

The Redwood Meadow area is located a minimum of 8-12 miles (from paradise and middle fork trails respectively) from the trailhead wilderness at 6,000 feet in elevation. The Middle Fork trail is the most feasible to use during the time of year when work would be completed as the Paradise Ridge and High Sierra trails (which is also longer than the middle fork trail) are higher in elevation (up to 9,000 feet) and therefore more subject to inclement weather during late fall/early spring when work will occur.

There is unresolvable uncertainty in multiple critical factors that affect the ability to achieve the project goals, including: the onset of winter weather, snowpack, spring runoff, crew availability, crew productivity, the availability of pack stock and packers, timing of correct prescribed fire and pile burning conditions, and timing of appropriate smoke dispersal conditions. Due to this uncertainty, under this alternative the criteria described below would be used to ensure project goals are met while minimizing 4(c) prohibited uses and preserving wilderness character.

Crews and equipment would be mobilized by a combination of stock, helicopter, and foot. Safety and urgency of action would be considered for all determinations for minimum

transport tool, particularly as this action is being completed to reduce ongoing risk from high intensity fire (risk increases over time as additional fuels build up and as every day presents an opportunity for fire to ignite (primarily between April/May/June and October)). The need to supplement with helicopter support will not negate consideration of either stock or foot travel if such options can feasibly meet transportation requirements without compromising project goals.

*Equipment Mobilization and Resupply:*

To determine the method of mobilization or resupply, an evaluation of barriers to stock travel (trail damage, snow cover, water crossings, etc.) would be made for each project phase or need. Stock would be used when they can safely access the work site, are available for mobilization or resupply efforts, or it is otherwise feasible to achieve mobilization/resupply needs.

Where barriers to stock travel prevent safe access, stock are not available to meet (or cannot fully meet) mobilization/resupply needs, or stock mobilization is otherwise impracticable due to immediate need for action, a helicopter would be used to either wholly mobilize/resupply or supplement mobilization/resupply. Alternatively, if equipment or supplies need to be mobilized which are too sensitive, bulky, or heavy for transport by stock, a helicopter would be used.

*Personnel Mobilization:*

Similar considerations to the above would be applied to determining method of personnel transport. The default transportation mode for personnel would be to hike to the site. However, if personnel cannot safely access the site via foot (i.e., under snow conditions), or when access is needed immediately, or when hiking to the site would hinder operational goals, or where the goals of the action would otherwise be significantly compromised, even when appropriate advanced planning has occurred, helicopter transport would be used. In cases where helicopter mobilization was deemed necessary, helicopter would backhaul equipment/trash/or personnel during delivery flights as feasible to reduce overall transport by either stock or helicopter in and out of wilderness.

*Equipment and Personnel Demobilization:*

Given the same considerations as above, where demobilization – of personnel or equipment – is feasibly achieved using a combination of stock and/or foot travel, those methods would be primarily used; including in cases where mobilization by helicopter was deemed necessary but safety considerations, availability, or urgency are no longer applicable to demobilization. If stock or foot travel methods are not feasible, or not fully feasible, helicopter support would supplement demobilization.

If stock cannot be used to move any equipment and supplies and no personnel hike to the work location, there could be as many as 50 landings at Redwood Meadow with the personnel, equipment, supplies, and food and water necessary to support all phases of treatment within the unit. Given favorable conditions, timing, and resource availability, personnel hiking and transporting dunnage with stock could reduce the number of aircraft landings by approximately 20-30 flights.

Small areas for landing, unloading, and take-off within wilderness would be restricted from public entry for the limited time of actual helicopter operations. All proposed helicopter activities would occur in areas of previous limited helicopter operations.

**A. Wilderness Character:** How does this alternative affect the qualities of wilderness character in both the short and long term? Include both positive and negative effects. What mitigation measures will be taken? *For definitions of wilderness character qualities, see the MRA Instructions.*

### **Untrammelled:**

This project involves the intentional manipulation – trammeling – of natural processes over 3,445 acres of wilderness. The degree of trammeling would vary across the unit commensurate with the intensity of action in each area. For example, some areas where fuels are low may not require thinning. Likewise prescribed ignition would not burn all areas – rather would likely (and ideally) burn in a patchy mosaic within this total acreage.

Trammeling would last approximately 30-42 days and would occur over the course of two to three field seasons. Although speculative, reducing fuels under prescribed conditions may result in fire managers being less likely to suppress lightning ignitions in the long term, preventing impacts to the untrammelled quality when an unplanned ignition occurs.

### **Undeveloped:**

The use of chainsaws (see 4C table on page 18 for quantity and duration) would adversely affect the undeveloped quality of wilderness character in this area while those activities are occurring.

Use of helicopters will further adversely affect the undeveloped quality during anticipated landing and take-off. As well, delivery of plastic sphere via helicopter during aerial ignition would impact the undeveloped quality for a short duration. No temporary or permanent development in the wilderness would be needed to support personnel working on the project. The effects to the undeveloped quality of wilderness would therefore be adverse and short term.

Most evidence of human activity related to this project would be erased by prescribed fire, though some cut stumps and limbs could be visible for several years. The construction of debris piles would occur simultaneously and/or immediately after the cutting of the trees. The debris piles created by the thinning could be present for up to 12-36 months, based on the need for the material to cure and the historical rate of pile burning in the parks. Debris piles and saw cuts would have temporary to long term adverse effects on the undeveloped quality of the wilderness character within the unit as long as they are present on the landscape.

### **Natural:**

Sequoias are an integral attribute of the parks' natural quality of wilderness character. This project would beneficially affect sequoias by reducing fuel loading to more historic levels and otherwise creating conditions necessary for sequoia regeneration. Further, conducting

fuel reduction through a prescribed burning under prescriptive fuel loading, moisture, and weather conditions would reduce ground level fuels and duff, provide for nutrient release, and ultimately result in a more resilient natural forest. Though pile burning may cause short term soil sterilization within each pile's footprint it is necessary to reduce fuel loading to the level necessary to implement low intensity broadcast burning.

To the extent that pack stock is used, it would have a slight adverse impact on the natural quality of wilderness due to limited grazing, ground disturbance, and feces. Impacts would be short term and mitigated by stock use practices and grazing limits outlined in the Sequoia and Kings Canyon National Parks Wilderness Stewardship Plan (2015).

**Opportunities for Solitude or Primitive and Unconfined Recreation:**

Opportunity for solitude in this area would be adversely affected by the noise of chainsaws (see 4c table), helicopters, overflights from UAS, and the presence of workers for the duration of on-site activities.

Opportunity for unconfined recreation would also be compromised for short durations and in the direct vicinity (within 100 feet) of the actual work, and to much of the area while trail closures are in effect during burning operations (roughly 10 days) and extend until the area can be safely reopened (shortly after burn operations cease)

Under post treatment conditions, visitor opportunity for primitive and unconfined recreation would be improved as the grove structure would be more open and visitors would be afforded the unique opportunity to immerse themselves in these wilderness sequoia groves.

**Other Features of Value:** There would be no effect as any discovered cultural resource sites would be avoided during the thinning treatment. This action would serve to reduce the risk of high intensity fire from adversely affecting the historic Redwood Meadow cabin and any other cultural resources within the 3,445 treated acres.

**B. Other Criteria:** How does this alternative affect the special provisions (grazing, mining, water developments, access to non-federal land, etc.) identified in Sections 4 and 5 of the Wilderness Act?

Explain: NA

**Additional Alternatives**

Provide any alternatives that were considered but dismissed and criterion for their dismissal. Include those dismissed due to safety concerns that could not be mitigated.

**Thinning with biomass utilization (e.g. – for firewood, fence posts, or other uses):**

This alternative was considered and dismissed primarily due to the potential conflict with the NPS mission within a wilderness area, the difficulty in removing the material from the site, long distance and less than optimal roads for transporting material, and the lack of

market for small diameter logs in the local area.

**Completing work with non-motorized equipment such as cross-cut saws and pulaskis:** First and foremost, project implementation (primarily falling of small trees) is inherently dangerous and the firefighters available to complete the work do not typically have the skills to safely fall trees with cross-cut saws. Furthermore, this project does not consider use of only hand tools (loppers, pulaskis, and cross-cuts) because urgent action has been deemed necessary and the use of solely hand tools would not allow for quick and efficient reduction of ladder fuels prior to a potential ignition. As described above and within the *Decision Memorandum to Support Emergency Activities for Fuels Reduction Efforts to Protect Sequoia Groves in Sequoia and Kings Canyon National Parks from the Devastating Effects of High-Intensity Fire*, project implementation is dependent on site and weather conditions that could delay implementation at any time. These conditions include: winter weather; timing considerations for the protection of sensitive species (e.g., fisher); the need for coordination with contractors and others for implementation and activities such as on-site monitoring; the loss of workers to firefighting duties; air quality, fuels moisture levels, and other weather conditions at the time of pile and prescribed burning; and the millions of visitors coming to the Parks every year, particularly during the summer. For these reasons, the NPS has determined that it is contrary to the purposes of this project to limit individual tools to hand tools only.

**Prescribed burning only with no thinning/preparation:** Given the high level of surface and ladder fuels present in the Redwood Meadow area, the parks fuels specialists and fire ecologists determined that prescribed burning could not be feasibly and safely accomplished in Redwood Meadow groves without prior thinning and pile burning to reduce the risk of high intensity fire, which is counter to the goals of this project. This alternative was therefore dismissed from further consideration.

**Mobilize with Stock and Foot Traffic Only:** Operational limitations, and fire prescription requirements do not allow mobilization entirely with stock and foot traffic given the urgency of action and the location of the project site.

Redwood meadow is roughly 12 miles from the trailhead. While crews will hike in during the preliminary treatment phase and would not be needed on site during broadcast burning, pile burning must occur when snow is on the ground; making stock use and foot travel infeasible and unsafe for either transport or mobilization/de-mobilization of 20-30 personnel for that phase.

Roughly 10,000 lbs. of gear (chainsaws, fuel, safety equipment, water, food) is needed to supply 20-30 personnel during the initial treatment and pile burning phases of the project some of which is too bulky or heavy to feasibly pack. Such a mobilization effort would require a total of 83 total head of stock (120 lbs per stock animal), plus several packers; additional stock would be required to supply the packers themselves and carry water for stock as there is no water on site. As administrative stock limit per trip is 20 animals, this effort would require 4-5 round trips over the course of roughly three weeks or more when accounting for staff and stock rest time and not including twice weekly re-supplies. Not only are this number of NPS or private stock not available for such an effort but would also

quickly deplete the 120 stock use nights available in Redwood Meadow (as outlined within the parks Wilderness Stewardship Plan) and would risk greater impacts to wilderness character due to intensive use.

Given that delay in mobilization would unacceptably increase the potential for these groves to burn under severe conditions and thus risk potential impairment of resources and permanent degradation of natural quality, this alternative was dismissed from further analysis.

**Cumulative Effects:**

Do you know of any other projects in the vicinity of your project location(s) (past, present, or future) that have the potential to impact wilderness character?

There are no other known projects proposed in the project area though several other sequoia groves will be treated in wilderness as part of a broader emergency action. These groves include: Atwell, East Fork, Horse Creek, and Cahoon Groves, all of which are located in the East Fork drainage of the Kaweah River.

**Decision:**

What is the minimum activity?

**Selected alternative:** Alternative # 2: Prescribed Treatment Using a Combination of Fire Management and Transport Support Tools.

Alternative 1 was dismissed, as it does not meet the need for management action and has a high risk of resulting in adverse effects to natural quality of wilderness character.

Rationale (include safety criterion, if appropriate): Section 4(d)(1) of the Wilderness Act authorizes "...such measure may be taken as may be necessary in the control of fire... as the Secretary deems desirable". In House Reports 98-540 and 98-40, Congress makes clear that these measures include the use of mechanized equipment, fire breaks, and prescribed fire, but that these activities should be implemented in a manner that maintains wilderness character. The Fuels and Fire Management Plan provides similar latitude in methods (including mechanical fuel treatments, pile burning, managing lightning fires for multiple objectives, and prescribed fire) for achieving its goals. Therefore, a decision rests on which methods can be carried out safely to preserve wilderness character with the least prohibited activity.

Alternative methods used in the park in other locations and situations which would require fewer 4(c) actions were considered but dismissed as being unable to accomplish the required work in a sufficiently short timeframe to prevent the potential impairment of park resources and long-term degradation of wilderness character.

Alternative 2 would have negative short-term impacts on several qualities of wilderness character. While mobilizing equipment and personnel through a combination of stock, foot traffic and helicopter would negatively affect the undeveloped and solitude qualities, these

impacts would be limited in duration – lasting only the duration of the project (30-42 days across at least several months if not 2 years). The criteria for making decisions about mobilization methods will ensure that the minimum number of aircraft landings would be used in any given year, reducing short-term impacts on these qualities to the maximum extent feasible given the urgency and necessity of action.

While the degree of temporary impacts to wilderness quality is high due to the urgency and intensity of action, the long-term benefits to overall forest health, landscape resiliency, and preservation of an integral attribute of the parks' natural quality of wilderness character (sequoias), as well as reduced risk of impairment of park resources, represents an acceptable tradeoff to the short-term adverse effects. This alternative would also reduce the potential for additional wilderness character impacts from potential suppression of unplanned ignitions.

**Provide details on any Wilderness Act Section 4(c) uses proposed in this alternative:**

<b>4(c) Prohibition</b>	<b>Frequency and/or Quantity</b>	<b>Duration</b>
mechanical transport for pile burning (Personnel)	Total: Roughly 20 <ul style="list-style-type: none"> <li>(30 people max/ 4 per flight).</li> </ul>	Total: 2 days. Landings would occur on first and last day of pile burning
mechanical transport for mechanical thinning (equipment mobilization)	Total Helicopter:28 <ul style="list-style-type: none"> <li>Initial Mobilization: 10 sling loads</li> <li>Support and Backhaul: during project: 8 sling loads</li> <li>Demobilization: 10 sling loads</li> </ul>	Total: 10 days <ul style="list-style-type: none"> <li>10 sling loads on Day 1 of manual thinning work</li> <li>2 sling loads every three days for support and backhaul</li> <li>10 sling loads on last day of manual thinning work</li> </ul>
motorized equipment for mechanical thinning	8-12 chainsaws 6-8 hrs a day.	21 days
motor vehicles	None	None
motorboats	None	None
landing of aircraft	48 (associated with mechanical transport above).	
structure(s)/installation(s)	None	None
temporary road	None	None

**Additional mitigation, monitoring and reporting requirements (Reviewers provide input):**

Follow-Up Form Required:    Yes:  No:



**STEP 4:**  
Signatures and Reporting

**Prepared by:**

Name	Title	Date

**Review and Comments**

Name/Title	Comments	Date
Wilderness Coordinator	NA	
Environmental Protection Specialist	Drafted/Reviewed - TFiorino	10/07/2022
Other reviewer as appropriate	Reviewed/Edited/Commented - EBoerke	10/07/2022

**Recommendation and Approval**

Role/Title	Signature	Date
Recommended: Division Chief		
Approved: Superintendent		

***Return to Office of Compliance and Planning for decision file once document has been approved by the Superintendent.***