U.S. Department of the Interior
National Park Service

Sequoia and Kings Canyon National Parks

California

Wilderness Stewardship Plan and Final Environmental Impact Statement

Volume 2 • Appendices

April 2015

FRONT COVER
Bubbs Creek Canyon
Photo Courtesy of Rick Cain

APPENDICES

Appendix A: Visitor Capacity A-1

Appendix B: Extent Necessary Determination: An Analysis to Determine the Proper Types and Levels of Commercial Services in the Wilderness of Sequoia and Kings Canyon National Parks B-1

Appendix C: Wilderness Character Monitoring Strategy C-1

Appendix D: Stock Use and Meadow Monitoring and Management Strategy D-1

Appendix E: Wilderness Legislation Related to Sequoia and Kings Canyon National Parks E-1

Appendix F: Wilderness Regulations, Restrictions, and Permit Conditions F-1

Appendix G: Scoping Materials G-1

Appendix H: Wilderness Information and Education Strategy H-1

Appendix I: Minimum Requirements Analysis I-1

Appendix J: Climbing Management Strategy J-1

Appendix K: Trail Management and Classification System for Sequoia and Kings Canyon National Parks K-1

Appendix L: Analysis of Special-status Animal Species L-1

Appendix M: Programmatic Minimum Requirement Analysis M-1

Appendix N: Strategy for Reducing Nonnative Plants in Wilderness N-1

Appendix O: Analysis of Park Sensitive Plant Species O-1

Appendix P: Permitted Research Program and Process P-1

Appendix Q: Public Comment Analysis Report Q-1

Appendix R: Consultation with the U.S. Fish and Wildlife Service R-1

Appendix S: Consultation with the California State Historic Preservation Office S-1

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Appendix A

Visitor Capacity

ON THE PREVIOUS PAGE
Bridge in the Rae Lakes area
NPS Photo

APPENDIX A:

VISITOR CAPACITY

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VISITOR CAPACITY

Visitor capacity concerns the type and amount of recreation and other public use that can be accommodated while sustaining the desired resource and visitor experience conditions, that is, the preservation of wilderness character. This appendix addresses visitor capacity in compliance with the Wilderness Act and NPS Management Policies 2006 (8.2.1, 8.2.2ff). This appendix describes how the Sequoia and Kings Canyon National Parks' Wilderness Stewardship Plan (WSP) will address visitor capacity in the parks' wilderness.

The alternatives presented in chapter 2 differ with regard to the types and amounts of use the wilderness in Sequoia and Kings Canyon National Parks (the parks) could receive and the management actions and infrastructure needed to support that use. The alternatives address management of visitor use and visitor capacity in wilderness by specifying the types and maximum levels of use that would occur under each alternative. Some alternatives may provide greater emphasis of certain wilderness character qualities and other resources, as described below. In addition, some alternatives would provide for public visitation and use at amounts higher than allowed in other alternatives in order to provide the public with a range of options regarding visitation levels and related visitor experiences. Under each alternative, however, wilderness character would be fully protected from impairment.

A discussion of visitor capacity is provided below, along with a description of how visitor capacity was determined for each management alternative described in chapter 2. Additionally, this appendix summarizes the actions that would be taken with each alternative to ensure that wilderness character is protected based on the types and amounts of use proposed.

REQUIREMENTS OF THE WILDERNESS ACT AND IMPLEMENTING GUIDELINES

The Wilderness Act requires that designated, federally managed wilderness areas "shall be administered for **the use and enjoyment of the American people** in such manner as will leave them **unimpaired for future use and enjoyment as wilderness**, and so as to provide for the protection of these areas, [and] **the preservation of their wilderness character**…" (bold added).

The Wilderness Act does not have a specific requirement to determine or establish visitor capacity; however, NPS *Management Policies* 2006 states: "The wilderness management plan will identify desired future conditions, as well as establish indicators [i.e., measures], standards, conditions, and thresholds beyond which management actions will be taken to reduce human impacts on wilderness resources" (6.3.4.2), and "Visitor carrying capacity is the type and level of visitor use that can be accommodated while sustaining the desired resource and visitor experience conditions in the park. . . . Superintendents will identify visitor carrying capacities for managing public use. . . . [and] will also identify ways to monitor for and address unacceptable impacts on park resources and visitor experiences" (8.2.1). Visitor capacity includes managing all components of visitor use (amounts or levels, types, behavior, timing, and distribution). It is also worth noting that any use comes with some level of impact. It is the responsibility of the managing agency to determine what level of impact is acceptable and what actions are needed to keep impacts within acceptable limits.

PROCESS TO ADDRESS VISITOR CAPACITY

The parks' Wilderness Stewardship Plan Interdisciplinary Team addressed visitor capacity using the process described below. Their efforts were approved by the parks' Leadership Team and Pacific West Region leadership. Development of the parks' WSP included several steps to determine the types and

amounts of visitor and other public use that the Sequoia-Kings Canyon and John Krebs wildernesses and proposed wilderness in the parks could sustain without unacceptable impacts to its wilderness character. An explanation of each step in the establishment of visitor capacity in the wilderness-stewardship planning process follows.

Step 1. Define Wilderness Character: These parks have used several key documents that clarify the meaning of wilderness character and provide guidance for its integration into wilderness stewardship and planning. These include: *Keeping It Wild: an Interagency Strategy to Monitor Trends in Wilderness Character Across the National Wilderness Preservation System* (Landres et al. 2008; referred to as *Keeping It Wild*), *Wilderness Stewardship Plan Handbook, Planning to Preserve Wilderness Character* (NPS 2014b), and *Keeping it Wild in the National Park Service: A User Guide to Integrating Wilderness Character Into Park Planning, Management, and Monitoring* (NPS 2014a). Following law and policy, these documents provide a framework to ensure that public use, and the facilities to support that use, do not have unacceptable impacts on wilderness character (qualities are defined in "Chapter 1: Purpose and Need").

Step 2. Identify Issues: In this step, the NPS documented the baseline condition of the parks' wilderness character, and summarized it in the *Wilderness Character Assessment: An examination of the characteristics and conditions of designated and proposed wilderness in Sequoia and Kings Canyon National Parks* (E. Frenzel and G. Fauth, 2014). This assessment was based on an overview of existing research, monitoring information, and a series of targeted workshops and interviews with subject-matter experts. An important component of this assessment is the identification of foreseeable trends for each of the qualities that define wilderness character.

Step 3. Analyze Types and Levels of Use: Under the Wilderness Act, the NPS is to provide for public use and enjoyment of wilderness in a manner that is consistent with the preservation of wilderness character. Allowed uses involve "primitive" types of recreation and others "which are proper for realizing the recreational or other purposes of the areas." The public purposes are defined as: recreational, scenic, scientific, educational, conservation, and historical use (Wilderness Act §4(b)). Recreational use is the most significant subset of public use that occurs in the parks' wilderness.

During scoping for the plan, NPS planners asked the public to describe their experiences and preferences for their use and enjoyment of the wilderness. The parks' staff conducted two series of public meetings in conjunction with WSP public comment periods, in spring 2011 and fall 2012, to gather public input on wilderness issues, concerns, and preferences. The comments were grouped and consolidated in specific public comment summary reports (NPS 2012a and 2013a) and provided important feedback to the NPS regarding the level of public interest in different activities. This information provided feedback and awareness to planners on those wilderness uses that members of the public would like to see preserved as well as uses that the public may choose to see changed. The parks commissioned researchers to conduct a targeted visitor survey (S. Martin and J. Blackwell 2013), conducted other data-gathering and reviewed the findings of social research completed in similar settings for its relevance to wilderness use (G. Fauth and B. Tarpinian 2011; A. Watson et al. 1993; and B. Kantola 1975) in order to understand use patterns. These efforts provided additional insight into the types of activities and experiences visitors are engaged in and prefer and informed the decisions of the parks' management in the planning process.

Step 4. Develop Draft Alternative Concepts: NPS planners developed a draft set of concepts on which to base alternatives consistent with legal requirements, management issues, resource constraints, and public comments identified during the previous steps. These concepts were designed to continue proper types of use, per the Wilderness Act, and to preserve wilderness character by specifying the types and amounts of use that could occur while meeting established management standards and desired conditions that had been determined for wilderness character through the planning process.

A) Management Measures and Standards — In order to control the effects of public use on biophysical resources and experiential aspects of wilderness, the parks' staff adopted visitor-use *indicators* and *measures* to be monitored and identified *standards*:

- *Indicators* are distinct and important elements within each quality of wilderness character, which have measurable attributes that can be the focus of wilderness character monitoring. These function as categories that have one or more measures within them, and are established and defined in Keeping it Wild (Landres, et al. 2008). The indicators that are associated with this visitor capacity framework are:
    - Biophysical resources (as measured by campsite condition and meadow condition under the natural quality)
    - Remoteness from sights and sounds of people inside the wilderness (as measured by encounter frequency under the solitude or primitive and unconfined type of recreation quality)
- *Measures* are quantifiable aspects of wilderness resources or character; the NPS will periodically monitor measures. Measures for this visitor capacity framework are:
    - Weighted Value per Campable Mile (WVCM) for selected monitoring sites (and extrapolated across wilderness); these vary by travel/use zone and alternative. Weighted Value per Campable Mile is a metric that considers three factors of a travel subzone: length of shoreline of water courses and lakes; the number of campsites; and the condition class of the campsites. The final WVCM number is the result of a formulaic calculation of these three factors (per Cole and Parsons 2013; Parsons and Stohlgren 1987). [See page A-25 for a more detailed definition of WVCM.]
    - Grazing capacities (expressed as stock use nights) reflecting maximum utilization rates for all the parks' meadows open to grazing are presented in appendix D. Utilization rates vary according to meadow type and established management goals for each meadow. Grazing capacities (allowable stock use nights) are also adjusted to take into consideration factors that affect a given site's response to grazing, including susceptibility to erosion (measured as the amount of bare ground as well as observed trampling and streambank impacts).
    - Number of encounters with individuals per hour on 90% of peak season (quota season) days – these vary by use/trail class category and by alternative.
- Management *standards* are the minimum acceptable condition of a wilderness resource or an aspect of wilderness character (based on Manning 2007). If the *standard* is exceeded, then specific management actions will be taken to address the situation to ensure that the wilderness resource/character is protected and any deterioration of condition of wilderness resources and experiences is arrested and controlled. One such management action would be adjusting daily trailhead-entry quotas (see table A-3 on page A-15). *Standards* have been established at points that will maintain desired conditions and ensure the preservation of wilderness character. An out-of-standard condition does not imply that wilderness character is impaired, but rather that the desired condition identified in the WSP/FEIS is not being fully achieved. Standards vary by alternative and by subzone within alternatives. These are summarized in table A-4 on page A-26.

The parks also monitor the conditions of a wide variety of social, natural, and cultural resources. These measures inform management decisions about visitor capacity and serve as a source of information about wilderness character conditions, but they do not necessarily have explicit standards that trigger

management action (see definitions in chapter 1, and "Appendix C: Wilderness Character Monitoring Strategy"). Measures of wilderness character condition include:

- overall visitor use days (VUD) recorded from wilderness-permit data – these vary by alternative;
- low-flyers / overflights (affecting the wilderness quality of *solitude*);
- lake, forest, and/or other inventory-and-monitoring program elements (affecting the *natural* quality);
- minimum-requirement analyses (MRA) and reports (affecting the *undeveloped* and *untrammeled* qualities);
- fire-management actions and reports (affecting the *natural* and *untrammeled* qualities);
- aquatic ecosystem re-establishment / mountain yellow-legged frog actions (the *natural* and *untrammeled* qualities); and
- work-crew actions and support (affecting the *undeveloped* and *solitude* qualities).

Table A-1 lists the five wilderness-character qualities that define wilderness character and some of the conditions and activities that will be monitored and assessed over time to ensure their preservation.

B) Management Actions to Preserve Wilderness Character (control use levels) — For each established measure described above, the NPS has identified a variety of management actions that could or would be taken to ensure that wilderness character is preserved.

Using a number of the following management strategies and tools (i.e., actions) is usually the most-effective approach to addressing problems. Options include: collection of additional data to fully inform any decision; providing visitors with information and education; establishing and enforcing regulations of visitor activities, such as party-size limits; manipulating sites and designing infrastructure to accommodate use, such as trails or boardwalks; rehabilitating impacted areas; and implementing restrictions on use levels and access, such as trailhead quotas for wilderness use. There are many other management options. Management strategies and tools employed to protect wilderness character would differ, to some degree, between measures.

Step 5. Establish Visitor Capacities: The next step in the process involved establishing visitor capacities for each of the action alternatives (alternatives 2 through 5).

Overnight use – This category includes staying overnight in the parks' wilderness. It is expressed in terms of annual visitor-use days (VUD). VUDs are calculated from the visitor-use nights (VUN) reported on wilderness permits. As an overnight stay involves part of two days, one VUN is generally calculated as 1.25 VUD (based on the average stay of nearly four nights, which would equate to being in wilderness for five days). Annual overnight-use levels represent the total number of people added to the total number of VUNs in wilderness that year. VUDs are only calculated for overnight visits; not for day-use. Also, past permit data indicates that wilderness campsites and trailhead quotas will seldom be used to full capacity.

Day-use – This category involves people who visit the parks' wilderness only for the day; they spend the night outside the parks wilderness. Much of this use is concentrated near the trailhead (within five miles), although some day-use visitors hike up to 10 or more miles into wilderness to visit lakes or climb peaks. Some popular day-use destinations include Mist Falls, the Watchtower and Heather Lake (via Lakes Trail), Alta Peak, Mounts Langley and Whitney, Sawtooth Peak, and lake basins in the Mineral King area.

Table A-1: Monitoring of Wilderness Character Qualities

Monitoring	Wilderness Quality				
	Natural	**Untrammeled**	**Undeveloped**	**Opportunities for Solitude or Primitive and Unconfined Recreation**	**Other Features (Cultural Resources)**
Measures that include explicit standards for management action	- Campsite conditions (Weighted Value per Campable Mile by management sub-zone) - Grazing capacities (expressed as stock use nights) reflecting maximum utilization rates and site-specific factors for all the parks' meadows (appendix D).	N/A	N/A	- Trail Encounters (encounters per hour on 90% of quota-season days, by trail-class)	N/A
Measures that do not include explicit standards for management action but provide valuable information about visitor use and Wilderness Character condition	- Wilderness ranger end-of-season reports - Snow/precipitation data gathering - Wildlife surveys - Fire-ecology monitoring - NPS Inventory and Monitoring program; lakes, high-elevation forests, wetlands, birds, climate, and rivers - Air quality and pollutant deposition - Park-sponsored and independent research on: water quality, hydrology, forest health, fire, wildlife, climate, plant and animal invasives, caves, etc.	- Minimum Requirement Analyses (MRA) preparation and approval, specifically as they relate to manipulative actions (for both NPS and permitted researchers) to remove non-natives, introduce natives, remove specimens (sampling), and provide restoration actions. - Unauthorized actions (e.g., marijuana grow sites)	- Facility numbers and condition (FMSS - database) - Research installation numbers - Actions to remove unneeded facilities - Helicopter use inventories and assessments - Climbing installations (future) - Motorized tool use assessments	- Visitor Use Days (from permits) - Stock use nights - Full-quota events - Wilderness ranger end-of-season reports - Commercial Use Authorizations / Concession Use - Low-flyer reports - Visitor comment letters (may relate to other qualities as well) - Soundscapes and night-sky research and monitoring - Agency recreation structures - Use restrictions - Social trail observations	- Cultural-resource inventories/ assessments - Wilderness ranger end-of-season reports - Law-enforcement actions for cultural-resource violations

Day-use limits are not being established directly by this plan at this time. Use levels will be monitored at key locations and assessed in the future to determine if a change in management policy or action may be needed to preserve wilderness character. Management action, applied on a site-specific or a wider basis, may consist of targeted educational efforts; day-use quotas or permits; reduction in parking; or other management actions to reduce use to acceptable levels. Such future restrictions could be informed by a number of accepted methodologies for measuring use levels, such as the people-at-one-time (PAOT) measure, which refers to the total number of people at a single point in time within a specified area.

Step 6. Monitor to Ensure Standards Are Being Achieved: The final step in the process to implement visitor capacity includes monitoring and assessing data regarding the condition of wilderness character. While NPS staff designed each alternative to preserve wilderness character, some degree of impact will always result from visitor use (Cole 1990; Cole and Stankey 1997; Marion 1998; Hammit and Cole 1998; Cole et al. 2005, Manning 2007, McCool et al. 2007). It is therefore important to monitor conditions to ensure that impacts associated with public use do not degrade wilderness character.

Those measures which have established standards (campsite conditions and trail encounters, as well as stock use thresholds [see appendix D, table D-6]), would have annual reviews of data collected from monitoring efforts. If data indicates a trend leading to an out-of-standard condition, then corrective actions would be considered and recommended to park management.

For monitoring, review, and analysis of data and conditions related to stock use and meadows, see appendix D.

FACTORS LIMITING VISITOR CAPACITY

This section discusses the factors used to establish overall maximum amounts of use that may be allowed in the parks' wilderness without unacceptable impacts on wilderness character, whether biophysical or experiential. In determining maximum visitor capacity for each alternative, the parks' management took into account the variety of existing constraints that could affect both types and amounts of use.

Some alternatives would allow more people to visit the parks' wilderness, and some would allow fewer. The use levels reflect different possible visions for providing visitors a wilderness experience. These visions are based in large part on public comments received in the scoping phase of this process and in related research and findings (NPS 2012a and 2013a; Martin and Blackwell 2013; Fauth and Tarpinian 2011; Watson et al. 1993; and Kantola 1975). For example, alternative 4 envisions a visitor experience characterized by high levels of self-reliance and self-determination in the wilderness, while keeping access near present levels. In alternative 5, the total number of people allowed in the wilderness at any one time would be noticeably reduced from existing amounts to allow visitors even greater opportunities for solitude and remoteness, but this would also result in decreased visitor access. The level of visitor use that would be allowed under alternative 3 would be substantially more than that currently allowed under the no-action alternative 1 or the other action alternatives, resulting in greater visitor access but reduced opportunities for solitude. These represent different trade-offs in terms of values that have been expressed as important through public outreach and social-science research (Martin and Blackwell 2013).

The maximum visitor capacity of the parks' wilderness differs in each alternative and is limited by the following several factors:

- **Constraints on level of development:** The level of development that can be provided in wilderness is constrained by wilderness designation. Federally designated wilderness is described by the Wilderness Act as: “an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation” (16 *United States Code* [USC] 1131-1136, Section 2(c)). This legal designation has the direct effect of constraining the level of developed infrastructure that may be provided. Agencies have authority, through provisions in Section 4(c), to add "developments" but only if they are determined necessary for the administration of the area. Thus an increase in development over that present in the wilderness at the time of designation is considered a degradation of the *undeveloped* quality.
- **Resource constraints and site suitability:** These constraints include topography, meadow and riparian areas, rare and sensitive plant and animal populations, scenic vista points, and cultural-resource sites. Generally, planning for visitor use and access in wilderness seeks to avoid excessive levels of use in these sensitive resource areas in order to prevent unacceptable impacts. The Wilderness Act speaks to this by stating that wilderness “generally appears to have been affected primarily by the forces of nature, with the imprint of man’s work substantially unnoticeable” and “may also contain other features of scientific, educational, scenic, or historical value” (16 *United States Code* [USC] 1131-1136, Section 2.(c)). Considering these mandates and factors, the WSP proposes various alternatives that allow different use levels with varying controls on locations, behaviors, and types of use while still preserving wilderness character and allowing reasonable access to the visiting public.
- **Wilderness experience:** Wilderness is to be a place where solitude and intimacy with nature play a key role in shaping the human experience. Observing too many other visitors can reduce a person’s ability to access these wilderness experiences and thus might have a limiting effect on the amount of use that could be provided. Therefore, a constraint for visitor capacity is the ability of visitors to achieve “outstanding opportunities for solitude or a primitive and unconfined type of recreation” (16 United States Code [USC] 1131-1136, Section 2(c)). The Wilderness Act does not require that solitude be omnipresent in wilderness, but requires that there are “outstanding opportunities” to achieve the experience of solitude.

The visitor capacities proposed in the WSP are within the constraints discussed above because all known site constraints were factored into the development of each alternative. In every alternative, visitors could have a wilderness experience where they can view a naturally functioning environment (i.e., land with a primeval character), and have easily obtained opportunities to experience solitude or a primitive and unconfined type of recreation.

DETERMINING ALTERNATIVE VISITOR CAPACITIES

To address visitor capacity, all aspects of use and the effects of use on wilderness character must be considered, including the need for additional regulations or developments to provide for resource protection and preservation. For example, alternative 3 allows for an increase in visitor-use levels above those in alternative 1 (i.e., current levels). Alternative 3 therefore requires retaining or adding to existing recreational infrastructure, such as food-storage boxes and privies, and increasing regulations, such as adding night limits in specific locations, in order to preserve the natural quality of wilderness given the higher potential amounts of visitor use. While each alternative emphasizes different factors related to visitor use and enjoyment and wilderness character, all would preserve wilderness character in an unimpaired condition. A summary of each alternative’s proposed visitor capacity is described in the Alternative Visitor Capacities section below. While use levels would be allowed to reach the established capacities for each alternative, there are social, economic, and other factors that may lead to actual use being below capacity.

ALTERNATIVE VISITOR CAPACITIES

This section provides a summary of the proposed visitor capacities for each alternative analyzed in the WSP/FEIS, including a description of the types and levels of use each alternative would allow, as well as the actions necessary to protect wilderness character from the impacts of these uses over time. The implications of the proposed capacities and related management actions are also discussed.

ALTERNATIVE 1: NO-ACTION / STATUS QUO

As described in chapter 2, the no-action alternative provides a baseline from which to compare the environmental and other impacts of the action alternatives. For visitor capacity, this includes the current types and amounts of use available and occurring in the parks' wilderness. These are addressed in "Chapter: Affected Environment" and below.

Summary of the Types and Amounts of Use: Current use of the parks' wilderness is oriented toward myriad recreational experiences. Recreational activities include day hiking, backpacking, camping, swimming, fishing, stock trips, day rides, river running, educational programs, mountaineering and rock climbing, skiing and snowshoeing, and similar activities.

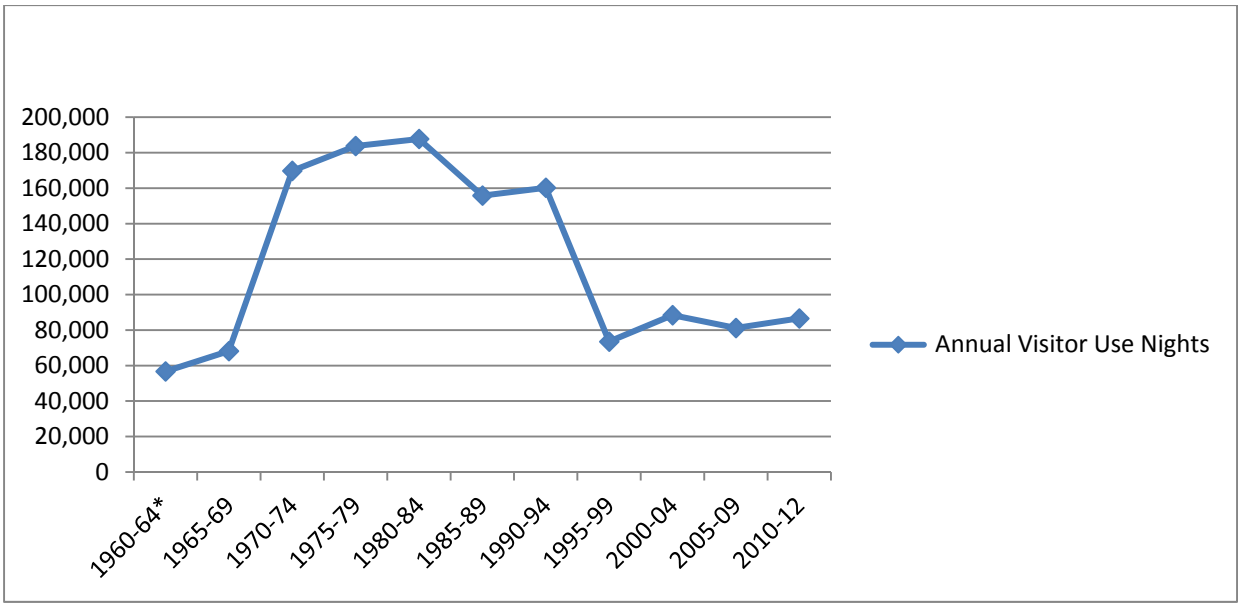
Table A-2: Current Use Levels of the Parks' Wilderness

Activity Type	Number of Overnight Visitors/Year (3-year average)	Number of Visitor Use Days (3-year average)	Number of Day-use Visitors (estimates; not used in setting capacities)
Hiking, backpacking, riding and packing with stock, fishing, river running, skiing, snowshoeing, etc.	23,000	111,000	75,000- 90,000 (approximation)

In table A-2, the average number of overnight wilderness visitors for a recent 3-year period (2010 - 2012) is approximately 23,000, accounting for an average of approximately 111,000 visitor-use days (VUD) per year. These figures are compiled from permits issued by the parks, Inyo National Forest (NF), Sequoia NF, and Sierra NF. This does not include Pacific Crest National Scenic Trail (PCT) users coming from south of Sequoia NF, from north of Inyo and Sierra NFs, or John Muir Trail (JMT) users from Yosemite NP or other points north of Sierra NF. It is estimated that these additional 3,500 users account for an additional 28,000 VUDs (based on projected numbers of hikers and nights of use – estimates of VUDs in these parks per trip per person for PCT and JMT users is eight). For the purposes of the WSP, only the VUDs calculated from wilderness permits are used. The estimates from PCT/JMT long-distance use have not been included, though they have been considered in visitor capacity decision making.

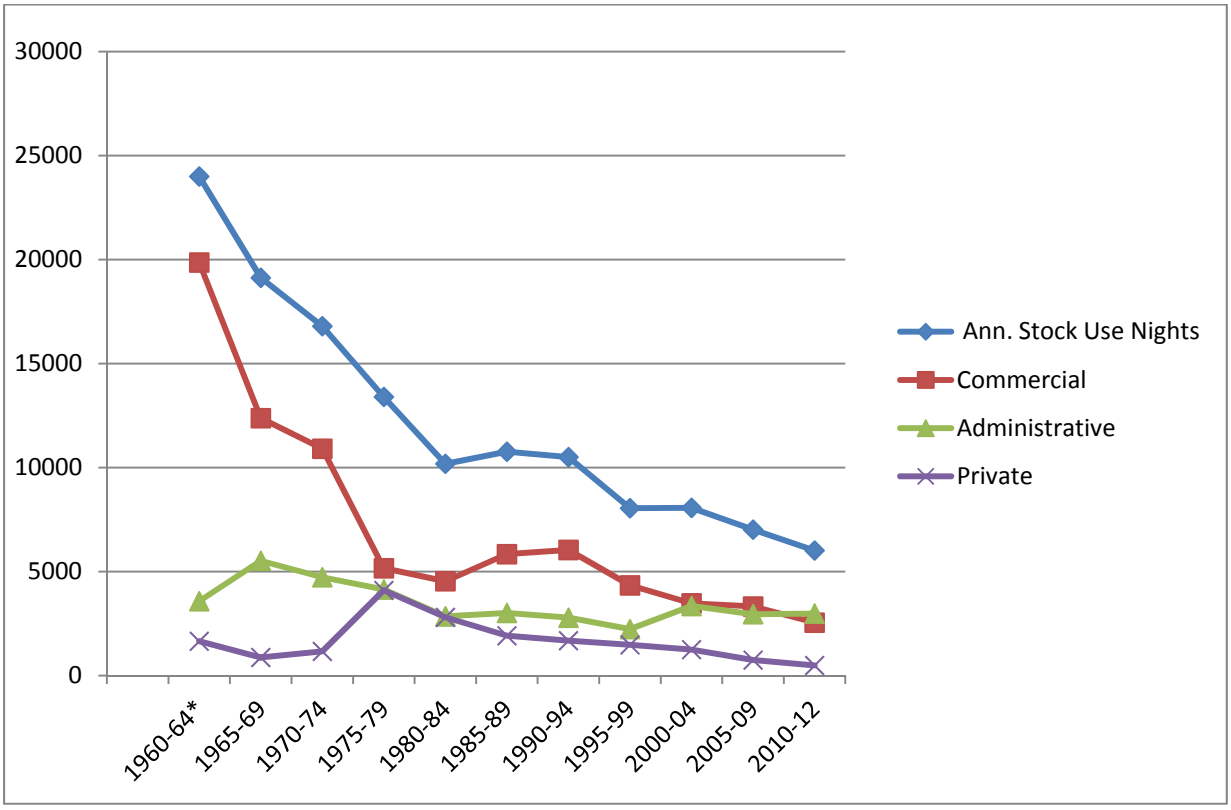
Use levels vary significantly by season. The majority of use, nearly 90%, occurs in the four summer months, June through September. The busiest month of the year, August, alone accounts for one-third of the year's total. The six months of the winter season, November through April, account for less than 4% of annual wilderness visitation.

Overall use levels for the past 15 years have been generally steady. There was a notable drop in use from the historic high levels of the 1970s and 1980s – the period of wilderness designation – to the relatively low-use levels of the mid-to-late 1990s (see figure A-1 for use level trends). Recreational stock use in wilderness has continued to decline to less than half of the relatively high levels of the late 1980s and early 1990s, and less than a quarter of the levels prior to the 1960s, while administrative stock use has remained relatively steady (see figure A-2 for stock use-level trends).



Data from the parks and local USFS permits only; does not include JMT/PCT use from other permitting agencies. One visitor-use night (VUN) equals approximately 1.25 visitor-use days (VUD)

Figure A-1: Annual Visitor Use Nights – Averages by 5-year Periods



*- Data is missing and averages have been calculated for only those years where data is present (in figures A-1 and A-2).

Figure A-2: Annual Stock Use Nights – Averages by 5-year Periods

Existing Controls on Visitor Capacity: Current use levels of visitors are controlled through several methods. Primary among these is the control through a quota system on daily entries for overnight use from individual trailheads. This method is in place at almost all park-managed trailheads and at most trailheads managed by the Inyo, Sierra, and Sequoia National Forests. Additional methods include the existence of limited designated campsites and areas, group-size limits, and night-stay limits in specific areas. Many of these controls were put in place in the 1970s and 1980s (specifically with the 1986 *Backcountry Management Plan*) to control the historically high use levels, and the subsequent impacts of use, of that time period.

If all trailhead entry quotas filled and average length of stay (3-4 nights) was met, on the busiest days of the season there would be approximately 3,500 people overnight camping on a given night in the parks' wilderness. This is undoubtedly high and is likely to happen on only very rare occasions, if ever. At this level, annual visitation would be in excess of 350,000 VUDs, more than triple current observed use levels. The highest observed level of annual use was approximately 290,000 VUDs (occurring in ca. 1974-76). Currently, if all quotas filled and estimates of use at non-quota trailheads was met, approximately 1,100 overnight visitors could enter SEKI wilderness per day during peak season (though it would be lower as many visitors entering on USFS trailheads remain on USFS lands and do not enter SEKI).

Using current statistics, it is reasonable to estimate that on an average night in the parks during peak season (June 20 to September 10) there are approximately 1,000 to 1,500 wilderness campers at a given time, with the weekend periods (Fri-Sun), especially in later-July and August, accounting for the highest use in the range.

ALTERNATIVE 2: PROTECT WILDERNESS CHARACTER BY IMPLEMENTING SITE-SPECIFIC ACTIONS (NPS PREFERRED ALTERNATIVE)

As explained in detail in chapter 2, alternative 2 would in large part retain existing types and amounts of use that would be allowed in the parks' wilderness in an attempt to retain opportunities for visitor use and enjoyment of wilderness, with limited and targeted controls applied only in those areas where current amounts and types of use may be leading to the relative highest level of impacts on wilderness character. The emphasis on retaining existing experiences is supported by data that show current wilderness character is being preserved or even improved. Monitoring and research show improvement in, among other things, campsite conditions, and residual biomass in meadows. Survey research and public input suggest strong general visitor satisfaction with their park wilderness experiences, and reveals little support for major changes to the existing wilderness management systems. There are a few areas, the Mount Whitney area in particular, where visitor-use levels and subsequent impacts may need to be reduced in order for conditions to be within standards and to ensure continued preservation of wilderness character.

The planning objective for visitor use for alternative 2 is:

> Visitor use and enjoyment of wilderness would be promoted while ensuring the preservation of wilderness character. In this alternative, visitor use levels would be reduced in some popular areas to preserve opportunities for solitude or other wilderness-character qualities.

Summary of the Types and Amounts of Use: Uses under alternative 2 include day hiking, backpacking, camping, swimming, fishing, stock overnight trips and day rides, river running, educational programs, mountaineering and rock climbing, skiing and snowshoeing, and other similar activities.

Under this alternative, some commercial visitor services, primarily in the Mount Whitney area, would be reduced to improve wilderness character.

Based on the desired conditions and foundational concept of this alternative to retain wilderness character at near current status, (i.e. types and amounts of use would be similar to the existing situation (see above)), the advisory maximum visitor capacity wilderness-wide for alternative 2 is established at approximately 134,000 visitor use days (VUD), with ten-year averages to be near 108,000-114,000 VUD. While use levels would be allowed to reach the established capacities for this alternative, there are social, economic, and other factors that may lead to actual use being below capacity.

Management of Visitor Capacity Proposed in Alternative 2

Visitor Overnight Use – Levels of overnight use in wilderness would continue to be managed through a system of trailhead quotas for daily entry for overnight use. Daily quotas would remain the same as in alternative 1 for all trailheads (see table 46, page 245 in chapter 2). The NPS would retain oversight of entry quotas from in-park entries and work with the USFS on oversight of entries from non-park trailheads. The NPS would also work within the 1998 Concessions Management Act and Commercial Use Authorization authorities to control use levels of commercial-service activities. Some limited and existing designated campsites and camp areas would continue in order to control use in those specific areas. Overnight wilderness permits, from NPS, USFS, and approved cooperators would continue to be available through a reservation system and on a first-come, first-served basis.

Visitor Day-Use – Day-use levels would not receive any new controls such as permits or quotas. Day use would be required to comply with off-trail party-size limits. Day use would continue to be monitored and may be the subject of *people at one time* (PAOT) or other monitoring methodologies to ensure that biophysical resources and wilderness experiences are not adversely impacted. If monitoring were to indicate degradation of wilderness character, management actions would be taken. These could consist of increased education, controls on parking, or other actions to deal with site-specific problems (table A-3).

Table A-3: Management Actions to Return Out-of-Standard Measures to Within Standard

Campsite Conditions	Trail Encounters	Grazing
Increase education – to the visiting public at large (via multiple media) and to specific area users which may include enforcement actions, and may include signage Rehabilitate impacted areas Site specific actions, such as modifying sites to render them uninviting to camping, or site-specific closures (short or long-term) to camping Area wide closures to camping (short or long-term) Increased patrols to achieve compliance Change party size, night limit and or campfire restrictions Reduce use supported by commercial services Change trailhead quotas Require special-use-zone permits	Re-sample the area in question using developed sampling protocols to check/verify preliminary sampling results (initial to WSP implementation) Increased education – to the visiting public at large (via multiple media) and to specific area users which may include enforcement actions, and may include signage Change party size, night limit and or campfire restrictions Discuss cross-boundary actions with USFS, including quotas Reduce use supported by commercial services Change trailhead quotas Build additional trails to disperse use Require day-use or special-use-zone permits	Various changes to meadows open to grazing See appendix D

Administrative Use – Current levels and types of administrative use would continue similar to those of alternative 1. Administrative users would work with sensitivity toward not impeding public wilderness use or experiences.

Actions to Preserve Wilderness Character Given the Types and Amounts of Use Proposed in Alternative 2: Under alternative 2, wilderness character would be preserved based on the kind and amounts of use proposed because the associated capacities would be within the constraints for the protection of biophysical resources and visitor experiences. Further, the following describes the actions that would ensure use levels would remain within established capacities and not increase to the point where they might degrade wilderness character over time.

Campsite Condition: The measure of campsite condition would be adopted to ensure that the number of campsites and their condition does not exceed standards. The metric of Weighted Value per Campable Mile (WVCM), derived from Parsons and Stohlgren, 1987, would be used. For this measure, three areas of general use categorization have been established in the parks' wilderness: high use; moderate use; and low use, see figure A-3 on page A-31 (Note: these areas, or sub-zones, are based on long-established wilderness Travel Zones, of which each are comprised of several sub-zones. Measures are applied at the sub-zone level). Each has a specified WVCM that serves as a standard: 1000 for high use sub-zones; 500 for moderate use sub-zones; and 250 for low use sub-zones. A monitoring plan will be developed to establish protocols and schedule monitoring frequencies to ensure that sub-zones remain within their applied standard. Currently two sub-zones (83-1 Guitar Lake and 86-1 Kern Hot Spring) are out of standard in the high use category, and one sub-zone (80-3 Shepherd Pass Lake) is out of standard in the moderate category. All other sub-zones are currently within standard.

Trail Encounters: The measure of trail encounters would be adopted to ensure that encounters of other people by hikers/stock users on trails does not exceed standards. The metric of people encountered per hour (EPH), adopted from the generally applied groups per hour, would be used (Note: people per hour was chosen over groups per hour due to the difficulty of determining which people encountered actually constitute a group). For this measure, four areas of general use categorization have been established in the parks' wilderness: very high use (primarily Mount Whitney and day-use areas); high use (generally Class 3 trails, with some exceptions); moderate use (generally Class 2 trails, with some exceptions); and low use (generally Class 1 trail areas, with some exceptions), see figure A-4 on page A-36. Each has a specified EPH that serves as a standard: 45 for very high use; 25 for high use; 15 for moderate use; and 6 for low use**.** A monitoring plan will be developed to establish protocols and schedule monitoring frequencies to ensure that areas remain within their applied standard.

Current areas out of standard, based on the preferred alternative, are:

- Moderate category: Evolution Basin and Valley, McClure 1 and 5 segments

Other areas with measures out of standard (or near standard), but requiring more data collection to establish a 90% confidence level, are:

- Very High category: Mount Whitney, Crabtree 3 segment and Roads End, Cedar Grove 4 segment
- Moderate category: Rae Lakes/John Muir Trail, Rae Lakes 2 segment; Crabtree Ranger Station to Trail Crest, Crabtree 2 segment
- Low category: Sixty Lake Basin Trail, Rae Lakes 3 segment

Total Annual Visitor Use: The measure of total annual visitor use days (VUDs) in the parks' wilderness will be adopted. This will be determined from compiling information from the parks and local USFS wilderness permits. Other available data (e.g., John Muir Trail permits from Yosemite NP) will also be considered in evaluating capacity, but will not be used as critical data at this time (if this data becomes more readily available, it will be included in future assessments). The metric of VUDs, whereby one person spending one night in the parks' wilderness as part of an overnight trip constitutes one VUD, would be used. For this measure, the parks' wilderness is considered a whole. For this alternative, a maximum expected visitor use-level wilderness-wide would be 134,000 annual VUDs, with expected ten-year averages near 108,000-114,000 VUDs. Each year, total annual VUDs would be discussed and analyzed by an interdisciplinary group at an annual meeting on wilderness management. If the observed values exceeded these expected values, action would be taken to better understand the sources and consequences of this change in total use.

Other Measures of the Natural Quality of Wilderness: A wide variety of monitoring and inventorying of natural conditions occurs in the parks on an annual and long-term basis (see above). The results of these efforts would be used to inform the parks' interdisciplinary wilderness-management team. Results of monitoring, and possible management actions to ensure the preservation of wilderness character, would be discussed and developed as a result of annual meetings. Recommendations for changes to address problems would be made to the parks' superintendent as needed. Though these efforts would not have identified standards, they would inform management of trends and issues that require actions, both proactive and reactive.

Measures of the Undeveloped and Untrammeled Qualities of Wilderness Character: The preservation of wilderness character as it relates to the undeveloped and untrammeled qualities is primarily a function of management and administrative actions and practices, with little to no relation to visitor capacity. Though high levels of use may equate to a need for more development to protect the natural quality and potential other effects, those discussions and actions are detailed in chapter 2. In order to ensure the preservation of the undeveloped and untrammeled qualities, the parks would be diligent in conducting thorough and thoughtful minimum requirement analyses before undertaking any actions that could degrade the undeveloped or untrammeled qualities (as well as NEPA compliance as needed). These analyses would need to consider the benefits and detriments of actions to all wilderness character qualities and make decisions based on what is best for wilderness character as a whole. (See Wilderness Character discussion in chapter 3).

Measures of the Other Quality of Wilderness, or Cultural Resources: Monitoring and inventorying of cultural resources occurs in the parks on an annual and long-term basis (see above). The results of these efforts would be used to inform the parks' interdisciplinary wilderness-management team. Results of monitoring, and possible management actions to ensure the preservation of wilderness character, would be discussed and developed as a result of annual meetings. Recommendations for changes to address problems would be made to the parks' superintendent as needed. Though these efforts would not have identified standards, they would inform management of trends and issues that require actions.

ALTERNATIVE 3: PROVIDE MORE OPPORTUNITIES FOR PRIMITIVE RECREATION

As explained in greater detail in chapter 2, alternative 3 would expand the amounts of use within the constraints described above and using the measures to protect wilderness character listed below. This alternative presents the highest use levels that would be accommodated across the range of action alternatives. This alternative would allow increased opportunities for people to access and participate in primitive recreation (a part of the "Solitude or a primitive and unconfined recreation quality of wilderness character"), without undue impacts to the *natural* and *solitude* qualities of wilderness.

The planning objective for visitor use for alternative 3 is:

> Visitor use and enjoyment of wilderness would be promoted while ensuring the preservation of wilderness character. In this alternative, opportunities for visitor use and enjoyment of wilderness would be increased by permitting more visitor use.

Summary of the Types and Amounts of Use: The various types of use proposed under alternative 3 would remain the same as in alternative 2, above. The levels, or amounts, of use would be allowed to increase in order to provide additional opportunities for more visitors to obtain wilderness permits (through increased trailhead quotas) with this alternative.

Based on the desired conditions and foundational concept of this alternative of allowing additional opportunities for primitive recreation, through types and amounts of use, and in consideration of the constraints described earlier in this appendix, the estimated maximum visitor use days for the parks' wilderness for alternative 3 is established at approximately 175,000 visitor use days, with ten-year averages to be near 141,000-147,000 VUD. While use levels would be allowed to reach the established capacities for this alternative, there are social, economic, and other factors that may lead to actual use being below capacity. Also while the potential level of use proposed in this alternative is the highest among the alternatives, it would still be as much as 50% below peak historic use levels of the mid-1970s.

Management of Visitor Capacity Proposed in Alternative 3

Visitor Overnight Use – Levels of overnight use in wilderness would continue to be managed through a system of trailhead quotas for daily entry for overnight use. The NPS would retain oversight of the entry quotas from in-park entry and work with the USFS on oversight of out-of-park entries, (i.e., east-side and others). Some trailhead quotas would be increased for certain trailheads (see table 46, page 245 in chapter 2). The NPS would also work within the Concessions Act and Commercial Use Authorization authorities to control use levels of commercial service activities. Some limited and existing designated campsites and camp areas would continue in order to control use in those specific areas. Overnight wilderness permits, from NPS and USFS, and approved cooperators would continue to be available through a reservation system and on a first-come, first-served basis.

Visitor Day Use – Day use levels would not receive any new controls, such as permits or quotas. Day use would be required to comply with off-trail party size limits. Day use would continue to be monitored and may be the subject of *people at one time (PAOT)*, or other monitoring methodologies to ensure that biophysical resources and wilderness experiences are not adversely impacted. If monitoring were to indicate degradation of wilderness character, management actions would be taken. These could consist of increased education, controls on parking, or other actions to deal with site-specific problems (table A-3).

Administrative Use – Current levels and types of administrative use would generally continue. Trail maintenance activities would increase in order to ensure trail integrity with increased use and the "upgrading" of some trails or trail segments to higher classes. Administrative users would work with sensitivity toward not impeding on public wilderness use or experiences.

Actions to Preserve Wilderness Character given the Types and Amounts of Use Proposed in Alternative 3: Under alternative 3, wilderness character would be preserved based on the types and levels of use proposed because the associated capacities would be within the constraints for the protection of biophysical resources and visitor experiences. Further, the following describes the actions that would ensure use levels would remain within established capacities and not increase to the point where they might degrade wilderness character over time.

Campsite Condition: The *measure* of campsite condition would be adopted to ensure that the number of campsites and their condition does not exceed standards. The metric of Weighted Value per Campable Mile (WVCM), derived from Parsons and Stohlgren, 1987, would be used. For this measure, three areas of general use categorization have been established in the parks' wilderness: high use; moderate use; and low use, see figure A-3 on page A-31 (Note: these areas, or sub-zones, are based on long-established wilderness Travel Zones, of which each are comprised of several sub-zones. Measures are applied at the sub-zone level). Each has a specified WVCM that serves as a *standard*: 1300 for high use sub-zones; 650 for moderate use sub-zones; and 325 for low use sub-zones. A monitoring plan will be developed to establish protocols and schedule monitoring frequencies to ensure that sub-zones remain within their applied standard. Currently one sub-zone (83-1 Guitar Lake) is out of standard in the high use category, and one sub-zone (80-3 Shepherd Pass Lake) is out of standard in the moderate category. All other sub-zones are currently within standard.

Trail Encounters: The *measure* of trail encounters would be adopted to ensure that encounters of other people by hikers/stock users on trails does not exceed standards. The metric of people encountered per hour (EPH), adopted from the generally applied groups per hour, would be used (Note: people per hour was chosen over groups per hour due to the difficulty of determining which people encountered actually constitute a group). For this measure, four areas of general use categorization have been established in the parks' wilderness: very high use (primarily Mount Whitney and day-use areas); high use (generally Class 3 trails, with some exceptions); moderate use (generally Class 2 trails, with some exceptions); and low use (generally Class 1 trail areas, with some exceptions), see figure A-4 on page A-36. Each has a specified EPH that serves as a *standard*: 59 for very high use; 33 for high use; 20 for moderate use; and 8 for low use**.** A monitoring plan will be developed to establish protocols and schedule monitoring frequencies to ensure that areas remain within their applied standard.

No current areas are out of standard based on a 90% confidence level under alternative 3. Areas with measures out of standard, but requiring more data collection to establish a 90% confidence level, are:

- Very High category: Roads End, Cedar Grove 4 segment
- Moderate category: Evolution Basin and Valley, McClure 1 segment
- Low category: Sixty Lake Basin Trail, Rae Lakes 3 segment

Total Annual Visitor Use: The *measure* of total annual visitor-use days (VUDs) in the parks' wilderness will be adopted. This will be determined from compiling information from the parks and local USFS wilderness permits. Other available data (e.g., John Muir Trail permits from Yosemite NP) will also be considered in evaluating capacity, but will not be used as critical data at this time (if this data becomes more readily available, it will be included in future assessments). The metric of VUDs, whereby one person spending one night in the parks' wilderness as part of an overnight trip constitutes one VUD, would be used. For this measure, the parks' wilderness is considered a whole. For this alternative, a maximum expected visitor use-level wilderness-wide would be 175,000 annual VUDs, with expected ten-year averages near 141,000-147,000 VUDs. Each year, total annual VUDs would be discussed and analyzed by an interdisciplinary group at an annual meeting on wilderness management. If the observed values exceeded these expected values, action would be taken to better understand the sources and consequences of this change in total use.

Other Measures of the Natural Quality of Wilderness: A wide variety of monitoring and inventorying of natural conditions occurs in the parks on an annual and long-term basis (see above). The results of these efforts would be used to inform the parks' interdisciplinary wilderness-management team. Results of monitoring, and possible management actions to ensure the preservation of wilderness character, would

be discussed and developed as a result of annual meetings. Recommendations for changes to address problems would be made to the parks' superintendent as needed. Though these efforts would not have identified standards, they would inform management of trends and issues that require actions, both proactive and reactive.

Measures of the Undeveloped and Untrammeled Qualities of Wilderness Character: The preservation of wilderness character as it relates to the *undeveloped* and *untrammeled* qualities is primarily a function of management and administrative actions and practices, with little to no relation to visitor capacity. Though high levels of use may equate to a need for more development to protect the *natural* quality and potential other effects, those discussions and actions are detailed in chapter 2. In order to ensure the preservation of the *undeveloped* and *untrammeled* qualities, the parks would be diligent in conducting thorough and thoughtful minimum-requirement analyses (MRAs) before undertaking any actions that could degrade the *undeveloped* or *untrammeled* qualities (as well as NEPA compliance as needed). These analyses would need to consider the benefits and detriments of actions to all wilderness-character qualities and make decisions based on what is best for wilderness character as a whole (see the "Wilderness Character" discussion in chapter 3).

Measures of the Other Quality of Wilderness, or Cultural Resources: Monitoring and inventorying of cultural resources occurs in the parks' wilderness on an annual and long-term basis (see above). The results of these efforts would be used to inform the parks' interdisciplinary wilderness-management team. Results of monitoring and inventorying, and possible management actions to ensure the preservation of wilderness character, would be discussed and developed as a result of annual meetings. Recommendations for changes to address problems would be made to the parks' superintendent as needed. Though these efforts would not have identified standards, they would inform management of trends and issues that require actions.

ALTERNATIVE 4: EMPHASIZE UNDEVELOPED QUALITY AND NON-COMMERCIAL RECREATION

As explained in greater detail in chapter 2, alternative 4 would remove many developments in wilderness, restrict the level of provided commercial services, and nominally reduce wilderness use levels from those of alternative 1. Some restrictions on the levels of visitor use, services, and reductions in overnight capacities are proposed in order to improve the *undeveloped* and *solitude* qualities of wilderness character, while still allowing near current levels of use and opportunities for a primitive and unconfined recreation.

The planning objective for visitor use for alternative 4 is:

> Visitor use and enjoyment of wilderness would be promoted while ensuring the preservation of wilderness character. In this alternative, increased emphasis on self-reliance and reduced development would be accompanied by a slight decrease in visitor numbers.

Summary of the Types and Amounts of Use: The majority of the current kinds of use in the parks' wilderness would be retained with alternative 4. However, some proposed changes could affect the kinds and amounts of use in specific areas. For example, commercial lodging and meal service at Bearpaw Meadow High Sierra Camp would be eliminated, and multiple wilderness developments (e.g., privies and food-storage boxes) would be removed. Similarly, commercially provided day rides and other commercially provided day trips for any purpose (e.g., photography, fishing, hiking, or climbing) would be eliminated. The overnight capacities would be lowered slightly with alternative 4, by reducing daily entry quotas at specific trailheads.

Based on the desired conditions and foundational concept of this alternative of moderately reducing use and increasing self-reliance by removing facilities and reducing commercial service levels, and consideration of the constraints described earlier in this appendix, the advisory maximum visitor capacity for the parks' wilderness for alternative 4 is established at approximately 127,000 visitor use days, with ten-year averages to be near 102,500-108,500 VUD. While use levels would be allowed to reach the established capacities for this alternative, there are social, economic, and other factors that may lead to actual use being below capacity.

Management of Visitor Capacity Proposed in Alternative 4:

Visitor Overnight Use – Levels of overnight use in wilderness would continue to be managed through a system of trailhead quotas for daily entry for overnight use. The NPS would retain oversight of the entry quotas from in-park entries and work with the USFS on oversight of out-of-park entries, (i.e., east-side and others). Some trailhead quotas would be reduced for certain trailheads (see table 46, page 245 in chapter 2). The NPS would also work within the Concessions Act and Commercial Use Authorization authorities to control use levels of commercial service activities. Existing designated campsites and camp areas would be eliminated, allowing more self-reliant experiences. The operation of the Pear Lake Ski Hut (winter) would be discontinued. Overnight wilderness permits, from NPS, USFS, and approved cooperators would continue to be available through a reservation system and on a first-come, first-served basis.

Visitor Day Use – Day use levels would not receive any new controls, such as permits or quotas. Day use would be required to comply with off-trail party size limits. Day use would continue to be monitored and may be the subject of *people at one time* (PAOT), or other monitoring methodologies to ensure that biophysical resources and wilderness experiences are not adversely impacted. If monitoring were to indicate degradation of wilderness character, management actions would be taken, such as the establishment of day use permits and quotas for higher use areas. Management actions could also consist of increased education, controls on parking, or other actions to deal with site-specific (table A-3).

Administrative Use – Current levels and types of administrative use would generally continue. Trail-maintenance activities would be reduced from those of alternatives 1 and 2, with some trail segments being abandoned and some trail classes lowered to meet the desired condition of increased self-reliance. Administrative users would work with sensitivity toward not impeding on public wilderness use or experiences.

Actions to Preserve Wilderness Character given the Types and Amounts of Use Proposed in Alternative 4: Under alternative 4, wilderness character would be preserved based on the types and amounts of use proposed because the associated capacities would be within the constraints for the protection of biophysical resources and visitor experiences. Further, the following describes the actions that would ensure use levels would remain within established capacities and not increase to the point where they might degrade wilderness character over time.

Campsite Condition: The *measure* of campsite condition would be adopted to ensure that the number of campsites and their condition does not exceed standards. The metric of Weighted Value per Campable Mile (WVCM), derived from Parsons and Stohlgren, 1987, would be used. For this measure, three areas of general use categorization have been established in the parks' wilderness: high use; moderate use; and low use, see figure A-3 on page A-31 (Note: these areas, or sub-zones, are based on long-established wilderness Travel Zones, of which each are comprised of several sub-zones. Measures are applied at the sub-zone level). Each has a specified WVCM that serves as a *standard*: 950 for high use sub-zones; 475 for moderate use sub-zones; and 235 for low use sub-zones. A monitoring plan will be developed to

establish protocols and schedule monitoring frequencies to ensure that sub-zones remain within their applied standard. Currently two sub-zones (83-1 Guitar Lake and 86-1 Kern Hot Spring) are out of standard in the high use category, and two sub-zones (80-3 Shepherd Pass Lake and 90-6 Hockett Meadow) are out of standard in the moderate category. One low use sub-zone, 47-1 Amphitheater Lake, is at standard. All other sub-zones are currently within standard.

Trail Encounters: The *measure* of trail encounters would be adopted to ensure that encounters of other people by hikers/stock users on trails does not exceed standards. The metric of people encountered per hour (EPH), adopted from the generally applied groups per hour, would be used (Note: people per hour was chosen over groups per hour due to the difficulty of determining which people encountered actually constitute a group). For this measure, four areas of general use categorization have been established in the wilderness: very high use (primarily Mount Whitney and day-use areas); high use (generally Class 3 trails, with some exceptions); moderate use (generally Class 2 trails, with some exceptions); and low use (generally Class 1 trail areas, with some exceptions), see figure A-4 on page A-36. Each has a specified EPH that serves as a *standard*: 43 for very high use; 24 for high use; 14 for moderate use; and 5 for low use**.** A monitoring plan will be developed to establish protocols and schedule monitoring frequencies to ensure that areas remain within their applied standard.

Current areas out of standard based on alternative 4 are:

- Moderate category: Evolution Basin and Valley, McClure 1 and 5 segments

Other areas with measures out of standard (or near standard), but requiring more data collection to establish a 90% confidence level, are:

- Very high category: Mount Whitney, Crabtree 3 segment and Roads End, Cedar Grove 1 and 4 segments
- Moderate category: Rae Lakes/John Muir Trail, Rae Lakes 2 segment and Crabtree Ranger Station to Trail Crest, Crabtree 2 segment
- Low category: Sixty Lake Basin Trail, Rae Lakes 3 segment

Total Annual Visitor Use: The *measure* of total annual visitor-use days (VUDs) in wilderness will be adopted. This will be determined from compiling information from parks and local USFS wilderness permits. Other available data (e.g., John Muir Trail permits from Yosemite NP) will also be considered in evaluating capacity, but will not be used as critical data at this time (if this data becomes more readily available, it will be included in future assessments). The metric of VUDs, whereby one person spending one day in the parks' wilderness as part of an overnight trip constitutes one VUD, would be used. For this measure, the parks' wilderness is considered a whole. For this alternative, a maximum expected visitor use-level wilderness-wide would be 127,000 annual VUDs, with expected ten-year averages near 102,500-108,500 VUDs. Each year, total annual VUDs would be discussed and analyzed by an interdisciplinary group at an annual meeting on wilderness management. If the observed values exceeded these expected values, action would be taken to better understand the sources and consequences of this change in total use.

Other Measures of the Natural Quality of Wilderness: A wide variety of monitoring and inventorying of natural conditions occurs in the parks on an annual and long-term basis (see above). The results of these efforts would be used to inform the parks' interdisciplinary wilderness-management team. Results of monitoring, and possible management actions to ensure the preservation of wilderness character, would be discussed and developed as a result of annual meetings. Recommendations for changes to address

problems would be made to the parks' superintendent as needed. Though these efforts would not have identified standards, they would inform management of trends and issues that require actions, both proactive and reactive.

Measures of the Undeveloped and Untrammeled Qualities of Wilderness Character: The preservation of wilderness character as it relates to the *undeveloped* and *untrammeled* qualities is primarily a function of management and administrative actions and practices, with little to no relation to visitor capacity. However, this alternative has as a desired condition a wilderness with a significantly improved *undeveloped* quality. Though higher levels of use may equate to a need for more development to protect the *natural* quality and potential other effects, those discussions and actions are primarily detailed in chapter 2. In order to ensure the preservation of the *undeveloped* and *untrammeled* qualities, the parks would be diligent in conducting thorough and thoughtful minimum requirement analyses before undertaking any actions that could degrade the *undeveloped* or *untrammeled* qualities (as well as NEPA compliance as needed). These analyses would need to consider the benefits and detriments of actions to all wilderness-character qualities and make decisions based on what is best for wilderness character as a whole (see the "Wilderness Character" discussion in chapter 3).

Measures of the Other Quality of Wilderness, or Cultural Resources: Monitoring and inventorying of cultural resources occurs in the parks on an annual and long-term basis (see above). The results of these efforts would be used to inform the parks' interdisciplinary wilderness-management team. Results of monitoring and inventorying, and possible management actions to ensure the preservation of wilderness character, would be discussed and developed as a result of annual meetings. Recommendations for changes to address problems would be made to the parks' superintendent as needed. Though these efforts would not have identified standards, they would inform management of trends and issues that require actions.

ALTERNATIVE 5: EMPHASIZE OPPORTUNITIES FOR SOLITUDE

As explained in greater detail in chapter 2, alternative 5 would reduce the amounts of use within the constraints described above and using the measures to protect wilderness character listed below. This alternative proposes the lowest use levels across the range of alternatives and as such strongly emphasizes the *solitude* quality of wilderness character. This would lead to reductions in opportunities for primitive recreation by limiting use levels and access.

The planning objective for Visitor Use for alternative 4 is:

> Visitor use and enjoyment of wilderness would be promoted while ensuring the preservation of wilderness character. In this alternative, increased opportunities for solitude would be achieved with a decrease in visitor numbers.

Summary of the Types and Amounts of Use: The majority of the current types of use in the parks' wilderness would generally be retained with alternative 5. However, some proposed changes could affect the types and amounts of use in specific areas. Levels of use would be notably reduced and levels of development would be somewhat reduced from that of alternative 1. The lower levels of use would also provide for the reduction of some controls, or restrictions on visitor behavior (e.g., fewer night limits). Commercial services would be reduced proportionally with overall visitor use levels. The overnight capacities would be lowered considerably with alternative 5, by reducing daily-entry quotas at the majority of trailheads.

Based on the desired conditions and foundational concept of this alternative of emphasizing the *solitude* quality by notably reducing use levels, and consideration of the constraints described earlier in this appendix, the advisory maximum visitor capacity for the parks' wilderness for alternative 5 is established at approximately 93,300 visitor use days, with 10-year averages to be near 74,700-84,700 VUD. While use levels would be allowed to reach the established capacities for this alternative, there are social, economic, and other factors that may lead to actual use being below capacity.

Management of Visitor Capacity Proposed in Alternative 5

Visitor Overnight Use – Levels of overnight use in wilderness would continue to be managed through a system of trailhead quotas for daily entry for overnight use. The NPS would retain oversight of the entry quotas from in-park entry and work with the USFS on oversight of out-of-park entries (i.e., east-side and others). Many trailhead quotas would be reduced for identified trailheads (see table 46, page 245 in chapter 2). The NPS would also work within the Concessions Act and Commercial Use Authorization authorities to control use levels of commercial service activities. Existing designated campsites and camp areas would be eliminated, and no new designated sites or areas would be established. Destination quotas at Emerald and Pear Lakes would be discontinued, though new destination quotas may be implemented in the future if impacts increase in specific areas. The operation of the Pear Lake Ski Hut (winter), as an overnight facility, would be discontinued. Overnight wilderness permits, from NPS, USFS, and approved cooperators would continue to be available through a reservation system and on a first-come, first-served basis.

Visitor Day Use – A day-use permit and quota system would be implemented to control day use in specific areas (e.g., Lakes Trail, Mist Falls, and Monarch Lakes). Day use would be required to comply with off-trail party size limits. Day use would continue to be monitored and may be the subject of *people at one time* (PAOT) or other monitoring methodologies to ensure that biophysical resources and wilderness experiences are not adversely impacted. If monitoring were to indicate degradation of wilderness character, management actions would be taken, such as increased education, controls on parking, or other actions to deal with site-specific problems (table A-3).

Administrative Use – Current levels and types of administrative use would be similar to that of alternative 1. Trail maintenance activities would also be similar to slightly greater than those of alternatives 1 and 2, with some trail segments "upgraded" in class to meet the desired condition. Administrative users would work with sensitivity toward not impeding on public wilderness use or experiences.

Actions to Preserve Wilderness Character given the Types and Amounts of Use Proposed in Alternative 5: Under alternative 5, wilderness character would be preserved based on the kind and amounts of use proposed because the associated capacities would be within the constraints for the protection of biophysical resources and visitor experiences. Further, the following describes the actions that would ensure use levels would remain within established capacities and not increase to the point where they might degrade wilderness character over time.

Campsite Condition: The *measure* of campsite condition would be adopted to ensure that the number of campsites and their condition does not exceed standards. The metric of Weighted Value per Campable Mile (WVCM), derived from Parsons and Stohlgren, 1987, would be used. For this measure, three areas of general use categorization have been established in the parks' wilderness: high use; moderate use; and low use, see figure A-3 on page A-31 (Note: these areas, or sub-zones, are based on long-established wilderness Travel Zones, of which each are comprised of several sub-zones. Measures are applied at the sub-zone level). Each has a specified WVCM that serves as a *standard*: 700 for high use sub-zones; 350

for moderate use sub-zones; and 175 for low use sub-zones. A monitoring plan will be developed to establish protocols and schedule monitoring frequencies to ensure that sub-zones remain within their applied standard. Currently six sub-zones (39-4 LeConte Ranger Station, 42-2 Middle Dusy Basin, 42-5 Lower Dusy Lakes, 80-7 Lakes above Tyndall, 83-1 Guitar Lake, and 86-1 Kern Hot Spring) are out of standard in the high use category, and six sub-zones (39-7 JMT-Simpson Jct., 42-3 11393 Lakes, 42-4 South Dusy Lakes, 80-3 Shepherd Pass Lake, 90-1 Atwell-Hockett Trail, and 90-6 Hockett Meadow) are out of standard in the moderate category. One sub-zone, 47-1 Amphitheater Lake, is out of standard in the low use sub-zone. All other sub-zones are currently within standard.

Trail Encounters: The *measure* of trail encounters would be adopted to ensure that encounters of other people by hikers/stock users on trails does not exceed standards. The metric of people encountered per hour (EPH), adopted from the generally applied groups per hour, would be used (Note: people per hour was chosen over groups per hour due to the difficulty of determining which people encountered actually constitute a group). For this measure, four areas of general use categorization have been established in the parks' wilderness: very high use (primarily Mount Whitney and day-use areas); higher use (generally Class 3 trails, with some exceptions); moderate use (generally Class 2 trails, with some exceptions); and low use (generally Class 1 trail areas, with some exceptions), see figure A-4 on page A-36. Each has a specified EPH that serves as a *standard*: 25 for very high use; 18 for high use; 11 for moderate use; and 4 for low use**.** A monitoring plan will be developed to establish protocols and schedule monitoring frequencies to ensure that areas remain within their applied standard. Current areas out of standard based on alternative 5 are:

- Very High category: Mount Whitney, Crabtree 3 segment; and Roads End, Cedar Grove 1 and 4 segments
- Moderate category: Rae Lakes/John Muir Trail, Rae Lakes 1 and 2 segments, Charlotte Lake 1 segment, LeConte 4 segment, and Tyndall 1 segment; Crabtree Ranger Station to Trail Crest, Crabtree 2 segment; and Evolution Basin and Valley, McClure 1 and 5 segments
- Low category: Sixty Lake Basin Trail, Rae Lakes 3 segment

Other areas with measures out of standard (or near standard), but requiring more data collection to establish a 90% confidence level, are:

- High category: Mineral King Valley, Mineral King 6 segment;
- Moderate category: Rae Lakes Loop-Lower Portion, Cedar Grove 3 and 5 segments; Mount Langley approach, Rock Creek 1segment; and West Side of Kearsarge Pass, Charlotte Lake 3 segment

Total Annual Visitor Use: The *measure* of total annual visitor use days (VUDs) in the parks' wilderness will be adopted. This will be determined from compiling information from the parks and local USFS wilderness permits. Other available data (e.g., John Muir Trail permits from Yosemite NP) will also be considered in evaluating capacity, but will not be used as critical data at this time (if this data becomes more readily available, it will be included in future assessments). The metric of VUDs, whereby one person spending one night in wilderness as part of an overnight trip constitutes one VUD, would be used. For this measure, the parks' wilderness is considered a whole. For this alternative, a maximum expected visitor use-level wilderness-wide would be 93,300 annual VUDs, with expected ten-year averages near 74,700-84,700 VUDs. Each year, total annual VUDs would be discussed and analyzed by an interdisciplinary group at an annual meeting on wilderness management. If the observed values exceeded these expected values, action would be taken to better understand the sources and consequences of this change in total use.

Other Measures of the Natural Quality of Wilderness: A wide variety of monitoring and inventorying of natural conditions is occurring in these parks on an annual and long-term basis (see above). The results of these monitoring and inventorying efforts would be used to inform the parks' interdisciplinary wilderness-management team. Results of monitoring, and possible management actions to ensure the preservation of wilderness character, would be discussed and developed as a result of annual meetings. Recommendations for changes to address problems would be made to the parks' superintendent as needed. Though these efforts would not have identified standards, they would inform management of trends and issues that require actions, both proactive and reactive.

Measures of the Undeveloped and Untrammeled Qualities of Wilderness Character: The preservation of wilderness character as it relates to the *undeveloped* and *untrammeled* qualities is primarily a function of management and administrative actions and practices, with little to no relation to visitor capacity. However, this alternative has as a desired condition a wilderness with an improved *undeveloped* quality. Though higher levels of use may equate to a need for more development to protect the *natural* quality and potential other effects, those discussions and actions are primarily detailed in chapter 2. In order to ensure the preservation of the *undeveloped* and *untrammeled* qualities, the parks would be diligent in conducting thorough and thoughtful minimum requirement analyses before undertaking any actions that could degrade the *undeveloped* or *untrammeled* qualities (as well as NEPA compliance as needed). These analyses would need to consider the benefits and detriments of actions to all wilderness-character qualities and make decisions based on what is best for wilderness character as a whole (see the "Wilderness Character" discussion in chapter 3).

Measures of the Other Quality of Wilderness, or Cultural Resources: Monitoring and inventorying of cultural resources occurs in the parks on an annual and long-term basis (see above). The results of these efforts would be used to inform the parks' interdisciplinary wilderness-management team. Results of monitoring and inventorying, and possible management actions to ensure the preservation of wilderness character, would be discussed and developed as a result of annual meetings. Recommendations for changes to address problems would be made to the parks' superintendent as needed. Though these efforts would not have identified standards, they would inform management of trends and issues that require actions.

Table A-4: Summary of Measures and Standards to Ensure Desired Level of Visitor Capacity

Measure	Standards				
	Alt 1	Alt 2	Alt 3 (Alt 2 x 1.3)	Alt 4 (Alt 2 x .95)	Alt 5 (Alt 2 x .7)
Campsite Condition – Weighted Value Per Campable Mile (WVCM) - by sub-zone	n/a	High - 1000 Mod - 500 Low - 250	High - 1300 Mod – 650 Low – 325	High - 950 Mod - 475 Low - 235	High - 700 Mod - 350 Low - 175
Trail Encounters – People Encountered Per Hour (EPH) – by area	n/a	Very High - 45 High -25 Mod-15 Low - 6	Very High - 59 High - 33 Mod - 20 Low - 8	Very High - 43 High - 24 Mod - 14 Low - 5	Very High - 25 High - 18 Mod - 11 Low - 4
Grazing capacities (expressed as stock use nights) reflecting maximum utilization rates and site-specific factors for all park meadows.	n/a	Meadow specific grazing capacity (see appendix D)	Meadow specific grazing capacity (see appendix D)	N/A – grazing not allowed	Meadow specific grazing capacity (see appendix D)

WEIGHTED VALUE PER CAMPABLE MILE

The measure Weighted Value per Campable Mile (WVCM) is used to characterize the condition of areas that contain campsites. It is derived by first assigning a condition class, ranging from 1 to 5, to each campsite in a defined wilderness travel sub-zone. Condition class is assigned based on the following attributes: vegetation density, vegetation composition, total area of campsite, area of barren core of campsite, developments, litter and duff, social trails, and mutilations (Parsons and Stohlgren 1987). The number of sites within each condition class is then tallied, and multiplied by a weighting factor specific to each condition class to create a weighted value for each condition class. These five weighted values are then summed to create a total weighted value for the camping area. This total weighted value is then divided by the length of campable areas along water bodies (i.e., not including areas of talus, steep slopes, or other properties that make it unusable for camping) to create a WVCM measurement.

Condition class is assigned based on the following attributes: vegetation density, vegetation composition, total area of campsite, area of barren core of campsite, developments, litter and duff, social trails, and mutilations (Parsons and Stohlgren 1987). Note that because of the use of weighted value factors, a few high-class sites (most heavily impacted) can greatly outweigh many low-class sites (least impacted).

Here is an example for a given sub-zone:

Sub-zone has:	15 Class 1 sites	–	multiplied by weighted value factor of 1	=	15
	8 Class 2 sites	–	multiplied by weighted value factor of 6	=	48
	4 Class 3 sites	–	multiplied by weighted value factor of 30	=	120
	1 Class 4 site	–	multiplied by weighted value factor of 75	=	75
	0 Class 5 sites	–	multiplied by weighted value factor of 150	=	0
			Total weighted value	=	258

This sub-zone has 6 miles of water courses/shoreline, of which 40% is campable. The number of campable miles is derived by multiplying the 6 miles times 0.4 (or 40%) resulting in 2.4 campable miles in the sub-zone. The WVCM of the sub-zone is then determined by dividing the total weighted value (258) by the campable miles (2.4). This imaginary sub-zone has a WVCM of 107.5.

$$\frac{258 \text{ (total weighted value)}}{2.4 \text{ (campable miles)}} = 107.5 \text{ WVCM}$$

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CAMPSITE CONDITIONS:

Table A-5a: Visitor Capacity Monitoring – High Use Campsite Sub-zones

Zone -Subzone	Name	Rating / Use Level	Monitoring Frequency*	Comments	Patrol Area	WVCM ca. 1980	Alt 1 WVCM (from 2006-07 survey)	Standards for High Use Areas			
								Alt 2 WVCM	Alt 3 WVCM	Alt 4 WVCM	Alt 5 WVCM
28-1	Piute Creek Bridge	ML	M		McClure	1305	277	1000	1300	950	700
33-4	McClure Meadow	ML	M		McClure	825	183	1000	1300	950	700
34-1	Evolution Lake	H	H		McClure	386	138	1000	1300	950	700
39-2	Big Pete Meadow	ML	M		LeConte	1665	433	1000	1300	950	700
42-1	Upper Dusy Basin	H	H	Not done in '06-07, done in 2012	LeConte	39	598	1000	1300	950	700
42-2	Middle Dusy Basin	H	H	Not done in '06-07, done in 2012	LeConte	1033	834	1000	1300	950	700
42-5	Lower Dusy Lakes	H	H	Not done in '06-07, done in 2012	LeConte	1489	720	1000	1300	950	700
46-7	Lake Marjorie	ML	M		LeConte/Bench	280	48	1000	1300	950	700
58-1	Woods Creek Crossing	H	H	Not done in '06-07	Rae Lakes	1460	TBD	1000	1300	950	700
58-2	Castle Domes Meadow	H	H		Rae Lakes	879	105	1000	1300	950	700
62-6	South Rae Lake 2	H	H		Rae Lakes	1402	147	1000	1300	950	700
64-3	Lower Kearsarge Lake	H	H		Charlotte	2348	460	1000	1300	950	700
64-4	Kearsarge Lakes 1 & 2	H	H		Charlotte	1871	314	1000	1300	950	700
64-5	Kearsarge Lake 3	H	H		Charlotte	1778	156	1000	1300	950	700
65-3	JMT - Below Center Basin	H	H		Charlotte	1439	557	1000	1300	950	700
66-4	Junction Meadow	ML	M	Not done in '06-07	Charlotte	3360	TBD	1000	1300	950	700
73-4	Ranger Lake	H	H		Roaring/LPTH	1475	147	1000	1300	950	700
74-1	Silliman Lake	ML	M		LPTH	107	28	1000	1300	950	700
77-1	Panther Gap - Alta	ML	M		LPTH/Pear	773	453	1000	1300	950	700
78-1	Hamilton Lake	H	H	Not done in '06-07	Pear/LPTH	2086	TBD	1000	1300	950	700
80-1	Lakes below Forester Pass (S)	ML	M		Tyndall	325	535	1000	1300	950	700
80-7	Lakes Above Tyndall	ML	M		Tyndall	2235	810	1000	1300	950	700
83-1	Guitar Lake	H	H		Crabtree	2808	1398	1000	1300	950	700
84-1	Guyot Creek	ML	M		Rock Creek	720	100	1000	1300	950	700
84-2	Lower Rock Creek	H	H		Rock Creek	382	124	1000	1300	950	700
85-3	Soldier Lake	H	H		Rock Creek	1262	184	1000	1300	950	700
86-1	Kern Hot Spring	H	H		Little 5/Kern	1495	1170	1000	1300	950	700
86-2	Upper Funston	ML	M		Little 5/Kern	748	340	1000	1300	950	700
87-1	Upper Big Arroyo	ML	M		Little 5	114	61	1000	1300	950	700
92-2	Monarch Lakes	H	H	Not done in '06-07	MKTH/Little 5	3935	TBD	1000	1300	950	700

WVCM = Weighted Value per Campable Mile [from Cole (2013), and specific Dusy Basin Survey (2012) – those not surveyed in 2006-07, or 2012 would have the first read/survey serve as baseline – noted as TBD in Alt. 1]; WVCM is calculated by a formula that includes miles of campable area (which consists of lakeshores and water-course banks) and the numbers and class conditions of existing campsites. The higher the WVCM number, the higher the level of impact in the subzone.

* Monitoring frequency for the subset in the table above: High = once/6 years; Moderate = once/12 years; Low = once/30 years

CGTH = Cedar Grove Trailhead Ranger; LPTH = Lodgepole Trailhead Ranger; MKTH = Mineral King Trailhead Ranger

All (or nearly all, depending on site-by-site circumstances) sub-zones not included above would be monitored once every 30 years. There are 273 sub-zones. Sub-zones are geographically based divisions of the Wilderness Travel Zones, and were referred to in Parsons (1987) as Management Areas.

All sub-zones not listed above have had a standard applied for each alternative and are subject to the same campsite condition standard, based on whether they have been determined to be a High, Moderate, or Low use area. Not all sub-zones are included in the monitoring protocol. The same standard applies to all High Use areas, Moderate Use areas, and Low Use areas, as they are categorized (e.g., all High Use areas in alternative 1 have a standard WVCM of 1000).

Table A-5b: Visitor Capacity Monitoring – Moderate Use Campsite Sub-zones

Zone -Subzone	Name	Rating/ Use Level	Monitoring Frequency*	Comments	Patrol Area	WVCM ca. 1980	Alt 1 WVCM (from 2006-07 survey)	Standards for Moderate Use Areas			
								Alt 2 WVCM	Alt 3 WVCM	Alt 4 WVCM	Alt 5 WVCM
33-2	Darwin Canyon	ML	M		McClure	834	76	500	650	475	350
54-1	Granite Lake	ML	M		CGTH/Monarch	540	47	500	650	475	350
57-1	Woods Lake	ML	M	Not done in '06-07	Rae	551	TBD	500	650	475	350
70-3	Cement Table	ML	M		Roaring	435	47	500	650	475	350
72-1	Sugarloaf Valley	ML	M		Roaring	353	171	500	650	475	350
80-3	Shepherd Pass Lake	ML	M		Tyndall	210	950	500	650	475	350
83-7	Hitchcock Lakes	ML	M		Crabtree	45	53	500	650	475	350
83-10	Crabtree Lakes	ML	M		Crabtree	185	18	500	650	475	350
85-2	Upper Rock Creek	ML	M		Rock Creek	311	51	500	650	475	350
88-3	Middle-Upper Little Five	ML	M		Little 5	707	192	500	650	475	350
90-6	Hockett Meadow	ML	M		MKTH/Hockett	2207	480	500	650	475	350
90-11	South Fork Meadows	ML	M	Not done in '06-07	MKTH/Hockett	249	TBD	500	650	475	350

WVCM = Weighted Value per Campable Mile [from Cole (2013), and specific Dusy Basin Survey (2012) – those not surveyed in 2006-07, or 2012 would have the first read/survey serve as baseline – noted as TBD in Alt. 1]; WVCM is calculated by a formula that includes miles of campable area (which consists of lakeshores and water-course banks) and the numbers and class conditions of existing campsites. The higher the WVCM number, the higher the level of impact in the subzone.

* Monitoring frequency for the subset in the table above: High = once/6 years; Moderate = once/12 years; Low = once/30 years

CGTH = Cedar Grove Trailhead Ranger; LPTH = Lodgepole Trailhead Ranger; MKTH = Mineral King Trailhead Ranger

All (or nearly all, depending on site-by-site circumstances) sub-zones not included above would be monitored once every 30 years. There are 273 sub-zones. Sub-zones are geographically based divisions of the Wilderness Travel Zones, and were referred to in Parsons (1987) as Management Areas.

All sub-zones not listed above have had a standard applied for each alternative and are subject to the same campsite condition standard, based on whether they have been determined to be a High, Moderate, or Low use area. Not all sub-zones are included in the monitoring protocol. The same standard applies to all High Use areas, Moderate Use areas, and Low Use areas, as they are categorized (e.g., all High Use areas in alternative 1 have a standard WVCM of 1000).

Table A-5c: Visitor Capacity Monitoring – Low Use Campsite Sub-zones

Zone -Subzone	Name	Rating/ Use Level	Monitoring Frequency*	Comments	Patrol Area	WVCM ca. 1980	Alt 1 WVCM (from 2006-07 survey)	Standards for Low Use Areas			
								Alt 2 WVCM	Alt 3 WVCM	Alt 4 WVCM	Alt 5 WVCM
45-1	Barrett Lakes	ML	M		LeConte	129	68	250	325	235	175
61-1	Lower Sixty Lake Basin	ML	M		Rae	167	29	250	325	235	175

WVCM = Weighted Value per Campable Mile [from Cole (2013), and specific Dusy Basin Survey (2012) – those not surveyed in 2006-07, or 2012 would have the first read/survey serve as baseline – noted as TBD in Alt. 1]; WVCM is calculated by a formula that includes miles of campable area (which consists of lakeshores and water-course banks) and the numbers and class conditions of existing campsites. The higher the WVCM number, the higher the level of impact in the subzone.

* Monitoring frequency for the subset in the table above: High = once/6 years; Moderate = once/12 years; Low = once/30 years

CGTH = Cedar Grove Trailhead Ranger; LPTH = Lodgepole Trailhead Ranger; MKTH = Mineral King Trailhead Ranger

All (or nearly all, depending on site-by-site circumstances) sub-zones not included above would be monitored once every 30 years. There are 273 sub-zones. Sub-zones are geographically based divisions of the Wilderness Travel Zones, and were referred to in Parsons (1987) as Management Areas.

All sub-zones not listed above have had a standard applied for each alternative and are subject to the same campsite condition standard, based on whether they have been determined to be a High, Moderate, or Low use area. Not all sub-zones are included in the monitoring protocol. The same standard applies to all High Use areas, Moderate Use areas, and Low Use areas, as they are categorized (e.g., all High Use areas in alternative 1 have a standard WVCM of 1000).

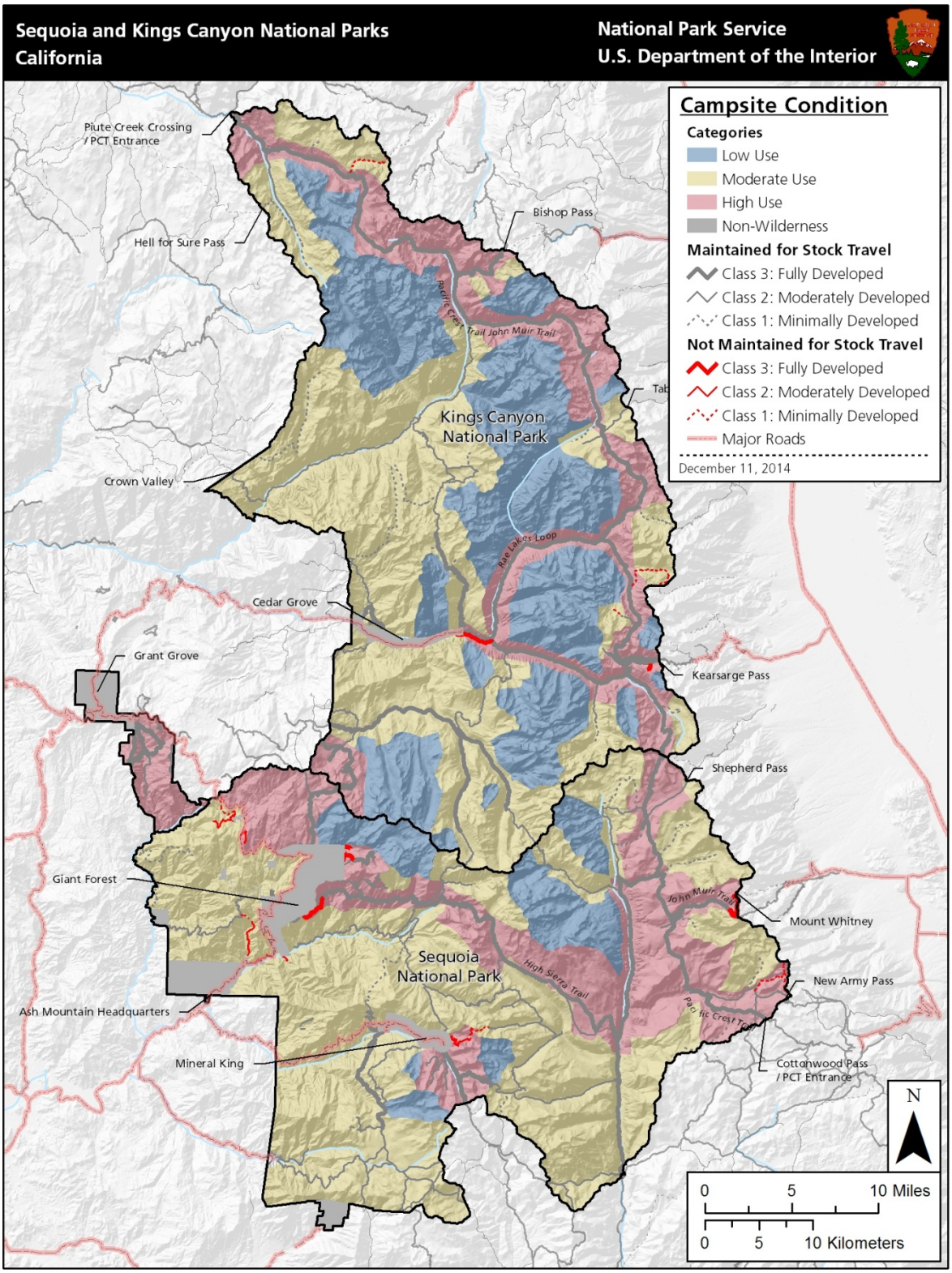

Figure A-3: Campsite Condition Categories by Wilderness Travel Subzone (Alternatives 2 through 5)

TRAIL ENCOUNTERS:

Table A-6 contains trail encounter standards for four encounter categories (very high, high, moderate, and low) and analysis area status for each action alternative that is evaluated in the WSP/FEIS (see figure A-4). Analysis area status is obtained by comparing the analysis area encounter rate component to the 90th quantile estimates from the three years of aggregated data (2012-2014) using a 90% confidence interval.

Confidence intervals (90%) for the 90th quantile estimates were calculated using bootstrapping methods. For a given 90th quantile estimate, the confidence interval can be interpreted as a 90% probability that the real population parameter falls within the upper and lower bounds of the confidence interval.

Therefore, when a trail segment's encounter rate component falls below the lower bound of the confidence interval, it is considered out of standard (red). When it falls above the upper bound of the confidence interval, it is considered in standard (green). When it falls within the upper and lower bounds of the confidence interval, it is considered near standard (yellow), and more data is required to establish its status with a 90% confidence level.

Table A-6: Visitor Capacity Monitoring - Encounter Categories, Standards and Initial Monitoring Data

Analysis Area	Encounter Category	Encounter Rate Standard*				Aggregated Sample Size (2012-2014) per Segment**	90th quantile estimate and 90% confidence interval***
		Alternative 2 (NPS Preferred)	Alternative 3	Alternative 4	Alternative 5		
Mt. Whitney (trail crest to summit)	Very High	45	59	43	32	38 (Crabtree-3)	44.0 (33, 57.3)
Roads End	Very High	45	59	43	32	66 (Cedar Grove-1) 26 (Cedar Grove-4)	43.7 (28.3, 47.2) 62.2 (35.7, 84.1)
High Sierra Trail (Crescent Meadow to Wolverton Cutoff Junction)	Very High	45	59	43	32	4 (Bearpaw-1)	24.7 (0, 28)
Lakes Trail	High	25	33	24	18	49 (Pear Lake-3) 38(Pear Lake-4)	17.4 (14.3, 20.4) 15.7 (10.7, 32.1)
Mineral King Valley	High	25	33	24	18	13 (Mineral King-1) 20 (Mineral King-2) 14 (Mineral King-3)	3.7 (0, 12.4) 9.3 (6.3, 15.3) 6.7 (3.5, 12)

Analysis Area	Encounter Category	Encounter Rate Standard*				Aggregated Sample Size (2012-2014) per Segment**	90th quantile estimate and 90% confidence interval***
		Alternative 2 (NPS Preferred)	Alternative 3	Alternative 4	Alternative 5		
						31 (Mineral King-4) 1 (Mineral King-5) 43 (Mineral King-6) 18 (MineralKing-7) 14 (Mineral King-8)	9.4 (8, 12) 4.6 (N/A) 18.8 (15.8, 21) 9.4 (6.9, 14.4) 4.2 (2.8, 6)
Little Baldy Trail Paradise Creek Trail Redwood Canyon Trails	High	25	33	24	18	N/A	N/A
Evolution Basin and Valley (JMT/PCT) Trail	Moderate	15	20	14	11	26 (McClure-1) 4 (McClure-2) 9 (McClure-3) 9 (McClure-5)	21.1(17.6, 38.8) 6.5 (0, 9.1) 9.3 (5.2, 13.6) 19.7 (9.5, 40.5)
Rae Lakes / John Muir Trail	Moderate	15	20	14	11	35 (Rae Lakes-1) 33 (Rae Lakes-2) 31 (CharlotteLake-1) 35 (Crabtree-4) 21 (LeConte-1) 31 (LeConte-4) 21 (Tyndall-1) 29 (Tyndall-2)	14.2 (11.3, 16.7) 16.4 (13.8, 23.7) 13.9 (9.2, 17.8) 10.6 (8, 15.2) 8.2 (5.5, 10.5) 11.1(8.4, 13.9) 13.2 (9.6, 25.1) 8.9 (6.3, 11)
Mt Langley approach	Moderate	15	20	14	11	12 (Rock Creek-1)	12.8 (4, 40.6)
Crabtree R.S. to Trail Crest	Moderate	15	20	14	11	38 (Crabtree-2)	16.7 (13.9, 26.1)
Rae Lakes Loop — Lower Portion	Moderate	15	20	14	11	31 (Cedar Grove-2) 27 (Cedar Grove-3) 7 (Cedar Grove-5)	9.0 (7.2, 13.5) 11.5 (9.2, 14.3) 13.4 (6, 14.9)
West Side of Kearsarge Pass	Moderate	15	20	14	11	27 (Charlotte Lk-2) 15 (Charlotte Lk-3)	9.5 (7.1, 15.6) 12.7 (6.5, 48)

Analysis Area	Encounter Category	Encounter Rate Standard*				Aggregated Sample Size (2012-2014) per Segment**	90th quantile estimate and 90% confidence interval***
		Alternative 2 (NPS Preferred)	Alternative 3	Alternative 4	Alternative 5		
Dusy Basin	Moderate	15	20	14	11	48 (LeConte-2) 26 (LeConte-3)	8.5 (6.7, 11.6) 9.0 (6, 11)
Twin Lakes Trailhead to Silliman Creek	Moderate	15	20	14	11	28 (Lodgepole-1)	9.0 (6.6, 13.2)
High Sierra Trail (Wolverton Cutoff Junction to JMT Junction)	Moderate	15	20	14	11	15 (Little Five-5) 15 (Bearpaw-3) 8 (Bearpaw-4) 15 (Tyndall-4)	7.7 (3.5, 18) 5.2 (3.7, 10.7) 8.2 (3.7, 17) 8.2 (4.7, 8.8)
Rock Creek	Moderate	15	20	14	11	19(Rock Creek-3) 41 (Rock Creek-4) 47 (RockCcreek-5) 8 (Rock Creek-6)	3.9 (2.9, 13.5) 2.2 (2, 4) 9.2 (4.9, 12.4) 1.8 (.9, 2.6)
Little Five	Moderate	15	20	14	11	20 (Little Five-1) 22 (Little Five-2) 36 (Little Five-3) 8 (Little Five-4)	6.2 (3.3, 7.6) 5.3 (4.6, 12.1) 4.7 (2.8, 7.1) 5.0 (3.2, 6.7)
Sugarloaf area Hockett area Granite Pass to State Lakes Jct Copper Creek Crossing Kern RS to Rattlesnake	Low	6	8	5	4	10 (Roaring River-1) 3 (Roaring River-2) 8 (Hockett 1) 8 (Hockett-2) 2 (Hockett 3&4) 6 (Cedar Grove-7) 12 (Cedar Grove-6) 10 (Kern-1) 4 (Kern-2)	0.8 (0, 1) 2.6 (.9, 3) 1.2 (0, 1.5) 0 (0, 0) 0 (N/A) 1.2 (0, 1.3) 2.6 (1.9, 2.7) 2.0 (1, 2) 2.3 (.7, 2.4)
Sixty Lake Basin Trail	Low	6	8	5	4	20 (Rae Lakes-3)	9.2 (4.4, 12.2)
Crabtree Lakes	Low	6	8	5	4	24 (Crabtree-1)	1.9 (.5, 8.3)
All other trails not identified above	Low	6	8	5	4	N/A	N/A

*- The encounter rate standard should be interpreted as the number of people encountered per hour that should not be exceeded on 90% of quota season days.

**- Sample size is the number of sampling events. Samples collected during 2012-14 were aggregated to achieve the stated sample sizes. Encounters are all normalized to people encountered per hour (EPH).

***- The 90th quantile is provided as the first figure, and the lower and upper bounds of the 90% confidence interval are provided in parentheses.

[Note: trail encounter data from 2012-2014 and detailed above, was collected opportunistically by park staff and volunteers. As a result, a larger proportion of samples occurred on weekend days and mid-day times than would be expected from a random or structured sample. A standardized sampling protocol will be developed on completion of the WSP, and areas that are shown as out-of-standard (in red above), and may be out-of-standard, above, would be prioritized for re-sampling.]

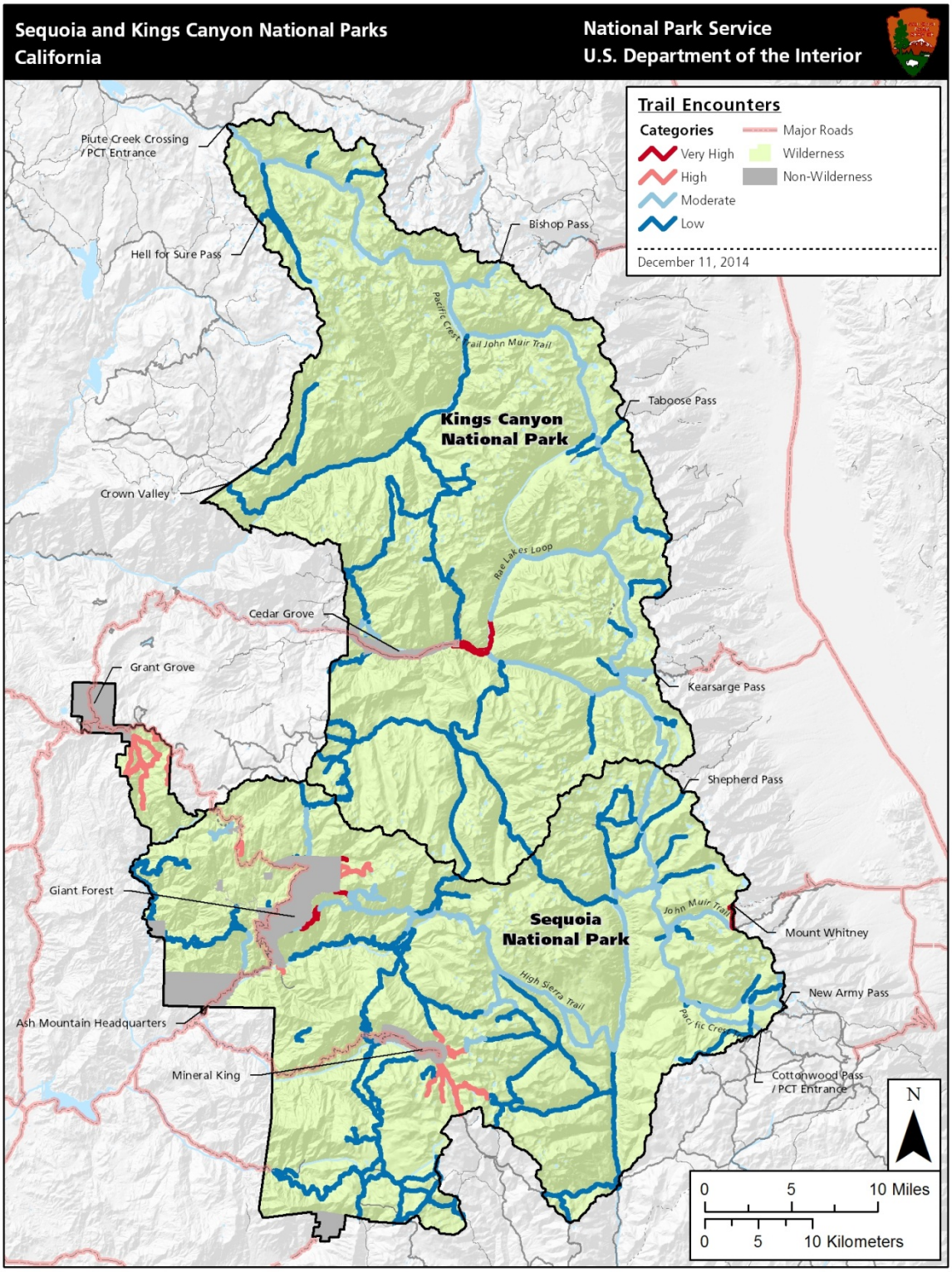

Figure A-4: Map of Encounter Categories

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Appendix B

Extent Necessary Determination: An Analysis to Determine the Proper Types and Levels of Commercial Services

ON THE PREVIOUS PAGE
Wilderness in Sequoia and Kings Canyon National Parks
NPS Photo

APPENDIX B:

EXTENT NECESSARY DETERMINATION: AN ANALYSIS TO DETERMINE THE PROPER TYPES AND LEVELS OF COMMERCIAL SERVICES IN THE WILDERNESS OF SEQUOIA AND KINGS CANYON NATIONAL PARKS

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EXTENT NECESSARY DETERMINATION: AN ANALYSIS TO DETERMINE THE PROPER TYPES AND LEVELS OF COMMERCIAL SERVICES IN THE WILDERNESS OF SEQUOIA AND KINGS CANYON NATIONAL PARKS

A SPECIALIZED WILDERNESS ACT FINDING

INTRODUCTION

The Wilderness Act (16 USC 1131-1136; PL 88-577) secured for our nation an enduring resource of wilderness. Wilderness areas included in the National Wilderness Preservation System are to be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and to ensure that the wilderness character of these areas is preserved.

In order to achieve these goals, the Wilderness Act (the Act) in its Prohibition of Certain Uses section (§ 4(c)) lists some specific prohibited uses, or practices. There are absolute prohibitions on commercial enterprise and permanent roads, and also general prohibitions, with qualified exceptions, on: temporary roads; use of motor vehicles; motorized equipment and motorboats; landing of aircraft; mechanical transport; and structures and installations. Under the Special Provisions section of the Act, in §4(d)(5), it states that "Commercial services may be performed within the wilderness areas designated by this Act to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas." The "purposes" referred to in §4(d)(5) are those enumerated in §4(b), which states that "...wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use." It is worthwhile to note that these purposes are rarely, if ever, discrete; that is, a recreational activity would commonly involve scenic or educational pursuits, or even both.

DEFINITIONS

The Wilderness Act does not define the terms "activities," "commercial services," or "necessary." When Congress does not include definitions of important terms in a statute, agencies may rely on commonly accepted definitions. The word "activities" is commonly defined as, "a pursuit in which a person is active"[1], "a recreational pursuit or pastime," or "actions taken by a group in order to achieve their aims."[2] In the wilderness context, it is understood as referring to the recreational or other active pursuits engaged in by wilderness visitors. The word "commercial" is commonly defined as (1) "[o]f or relating to commerce," i.e., "[t]he buying and selling of goods, esp. on a large scale: business," (2) "[e]ngaged in commerce," (3) "[i]nvolved in work designed or planned for the mass market," or (4) [h]aving profit as a

[1] Merriam-Webster's (online)
[2] Oxford Dictionary (online)

primary aim."[3] The word "service" is commonly defined as "the organized system of apparatus, appliances, employees, etc., for supplying some accommodation required by the public" or "the performance of any duties or work for another." For the purposes of this document, a commercial service is one that relates to or is connected with commerce wherein work is performed for another person or entity, and where the primary purpose is the experience of wilderness through support provided for a fee or charge and where the primary effect is that the wilderness experience is guided and shaped through the use of support services provided for a fee or charge.

The word "necessary" is defined in some dictionaries as meaning "absolutely needed."[4] Other dictionaries define it to mean "important in order to achieve a specific result, or desired by authority or convention."[5] The word necessary appears in many federal statutes. Courts that have been called upon to interpret the word necessary in a statutory context have frequently rejected an absolutist definition and instead adopted a more flexible definition of necessary. In particular, the U.S. Court of Appeals for the Ninth Circuit specifically declined to interpret the word necessary in Section 4(c) of the Wilderness Act as "requiring a finding of absolute necessity" by the wilderness managing agency before a structure could be authorized in wilderness.[6]

Consistent with this judicial interpretation, this Extent Necessary Determination (END) does not use the word necessary in an absolutist sense. Rather, the word necessary in relation to commercial services is defined to mean a service that is important to achieve objectives for visitor use and enjoyment of wilderness in such a manner that the Desired Conditions for wilderness character are achieved, and wilderness character is thereby preserved.

The language of the Act also suggests two distinct but interrelated standards related to the terms "activities" and "commercial services." First, the "activities" that may be supported by commercial services must be "proper for realizing the recreational or other wilderness purposes." Second, "commercial services" can only be authorized "to the extent" that they are necessary for activities deemed proper. The U.S. Court of Appeals for the Ninth Circuit has concluded that this language requires agencies to determine the amount of use that can be allowed. Thus, both the type (i.e., "proper") and amount (i.e., "extent") of commercial support must be addressed in this Extent Necessary Determination.

GUIDANCE FOR EVALUATING COMMERCIAL SERVICES

The NPS *Management Policies* (2006) states that wilderness-oriented commercial services that contribute to public education and visitor enjoyment of wilderness values or that provide opportunities for primitive and unconfined recreation may be authorized if the activities conform to NPS concessions management policies and the Wilderness Act, and if they are consistent with the park's wilderness management objectives. Commercial services must be consistent with the application of the minimum requirement concept and with the objectives of the park's management plans.

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[3] Webster's II New College Dictionary 225 (1995); accord Merriam-Webster's Collegiate Dictionary 230 (2000). See wilderness Society v. U.S. Fish and Wildlife Service, 353 F.3d. 1051, 1061 (9th Cir. 2003).
[4] Merriam-Webster's (online)
[5] Encarta Dictionary (online)
[6] *Wilderness Watch v. U.S. Fish and Wildlife Service*, 629 F.3d 1024 (9th Cir. 2010), interpreting Section 4(c) of the Wilderness Act, which prohibits structures and installations in wilderness "except as necessary to meet minimum requirements for the administration of the area for the purpose of [the Act]."

The NPS's Director's Order #41: *Wilderness Stewardship* requires the NPS to prepare a documented determination setting forth the types and amount of commercial services that are necessary to realize wilderness purposes. This Extent Necessary Determination (END) satisfies that requirement.

The U.S. District Court for Northern California referred to the determination as a "comparative and qualitative analysis where the variables are considered in relation to one another and the interests at stake are weighed (High Sierra Hikers Assn. v. U.S. DOI, 848 F. Supp. 2d 1036 (N. D. Cal. 2012)). In this END, qualitative aspects of visitor use and enjoyment and wilderness character are considered, including the role of particular wilderness-appropriate visitor activities in achieving desired conditions for wilderness character and objectives for visitor use and enjoyment; the particular attributes of these activities that necessitate commercial support; the regulatory framework for those activities that ensures that wilderness character can be preserved while promoting opportunities for visitor use and enjoyment; and the manner in which commercially-supported visitor use is accommodated within the wilderness-protective standards that have been established for overall visitor use. By considering these variables in relation to one another and in relation to the objectives of the particular alternatives for future management of Sequoia and Kings Canyon National Parks' wilderness, a conclusion is reached about the level of commercial support that may be provided under each alternative such that wilderness character is preserved.

RELATIONSHIP TO THE WSP/FEIS

The END, together with the Final Environmental Impact Statement (FEIS) for the Wilderness Stewardship Plan, was prepared using an interdisciplinary approach that included wilderness management experts, commercial services staff, and other resource specialists. Through the process of preparing this END and the FEIS, the NPS considered both the potential short-term and long-term effects of commercial service activities.

The END is an integral part of the WSP/FEIS. The extent to which commercial services in the parks' wilderness were deemed necessary is an outcome of the overall wilderness planning process. This process identified key elements of wilderness character, defined desired conditions and management objectives for these elements, analyzed impacts in determining the overall amount of use appropriate in wilderness, and finally determined the proportion of this use that may be supported by commercial services while ensuring the preservation of wilderness character.

The determination of the extent necessary for commercial services is closely related to the identification of visitor capacity, or the amounts of use appropriate in the wilderness. "Appendix A: Visitor Capacity" provides an explanation of visitor capacity and the amounts of visitor use that are considered in the WSP/FEIS. This appendix provides further explanation of the process and outcomes of determining extent necessary for commercial services in wilderness.

The framework for determining visitor capacity and the extent of commercial services necessary in the SEKI wilderness included the establishment of measures and standards to identify and monitor visitor use and its effects on the condition of wilderness character. These measures and standards are described in chapter 2 of the WSP/FEIS and in "Appendix A: Visitor Capacity."

Each alternative includes a proposed specific visitor capacity and extent of commercial services and each is protective of wilderness character.

In this framework, the assessment of necessary commercial service types and amounts is an extension of the WSP/EIS's visitor use planning, and builds on the visitor capacity decision-making process that is elaborated for each alternative. Indeed, the requirement to identify the activities that are proper for

wilderness purposes is an integral part of visitor use planning, which considers the overall type and amounts of visitor use that can be accommodated while sustaining acceptable resource and social conditions that complement the purpose of a park or area, in this case, a designated wilderness area. Effective visitor use management ensures that wilderness character is preserved by limiting change to important indicators of wilderness character.

As with other aspects of visitor use planning, an assessment of necessity for commercial services within each alternative is the outcome of a decision-making process and part of a larger management program. It requires judgment about the desired environmental and experiential conditions in, and effects on, wilderness. Each of the action alternatives in the WSP/FEIS preserves wilderness character by emphasizing wilderness character qualities in different ways. Resource conditions, management intensity, and visitor capacities, including the extent of support by commercial services, are foundational elements of the alternatives. Changing one has implications for the others. Visitor capacities in the different alternatives show how higher and lower amounts of use fit with management actions to produce different resource conditions and experiences. These represent choices for the kind of place the parks' wilderness will be and the experiences it will offer wilderness visitors in the future. All alternatives preserve wilderness character, as required by the Act, while offering a reasonable range of choices about the future of the wilderness as required by the National Environmental Policy Act (NEPA).

STRUCTURE AND CONTENT OF THE EXTENT NECESSARY DETERMINATION / COMMERCIAL SERVICES EVALUATION

The sections that follow identify the types of "activities which are proper for realizing recreational and other wilderness purposes" and then determine the numeric amount of commercial support, expressed in terms of commercial service days, ensuring that the amount allowed is consistent with the preservation of wilderness character. The appropriate sequence is to first determine which activities are proper for realizing the recreational or other purposes of wilderness, determine if commercial services are beneficial for the activity, and then determine the extent to which commercial services are necessary to support those activities. To be proper, an activity must be both lawful in wilderness and subject to sufficient management control so as to preserve wilderness character. To address the amount of each activity that would be allowed, this assessment examines specific aspects of proper activities and the ability to manage the activities to preserve the wilderness character objectives of each alternative presented in the WSP/FEIS. It should also be noted that the Act does not state that an activity must be *necessary*, but rather that an activity must be proper for realizing wilderness purposes. Nor does it state that commercial services must be necessary for *access* to wilderness, but rather that commercial services may be performed only to the "extent necessary" for activities proper for realizing wilderness purposes, and can be conducted in a manner that does not degrade wilderness character, as determined by the agency.

The extent of commercial support to visitors in wilderness is expressed in terms of service days, which is defined as all or part of a day spent by a client of a commercial service provider on NPS-managed lands. For each plan alternative, a conclusion is reached about the annual overall wilderness-wide service days that may be performed. These commercial service days are divided into two categories, those that use stock and those that do not, with a secondary conclusion separating out the high-use Mount Whitney Management Area, where a reduced portion of overall service days are allocated. There is also a description of other regulatory mechanisms that control commercially supported trips.

Table B-1: Structure and Content of the Extent Necessary Determination / Commercial Services Evaluation

Section	Title	Purpose
I	Activities Which Are Proper for Realizing the Recreational or Other Purposes of Wilderness	Examines various visitor activities and the reasons why each activity is considered proper for the use and enjoyment and recreational or other public purposes of wilderness
II	Aspects of Wilderness Activities that May Necessitate Commercial Support	Looks at several potential characteristics of an activity that may provide insight into why commercial services may be necessary for that activity
III	Type of Commercial Services that are Necessary for Each Proper Activity	Uses the categories provided in Section II to analyze the aspects of specific activities that may necessitate commercial support. A conclusion regarding the necessity for commercial support is made for each activity
IV	Extent (Amount) of Commercial Support that is Necessary for Each Proper Activity	Reviews each activity against the desired conditions and visitor capacities of each alternative in order to allocate an amount of commercial support that is necessary for the proper activities
V	Summary	Alternatives Summaries and Table for Visitor Capacities, Commercial Services Allocations, and Preservation of Wilderness Character
VI	Maps	Maps show spatial distribution of Non-stock, Stock, and Combined commercial support

SECTION I: ACTIVITIES WHICH ARE PROPER FOR REALIZING THE RECREATIONAL OR OTHER PURPOSES OF WILDERNESS

For a commercial service to be considered as a necessary form of support for an activity, that activity must be proper for realizing wilderness purposes. Any activity that occurs in designated wilderness must first be of a type that does not violate the prohibitions of §4(c) on the use of motor vehicles, motorized equipment or motorboats, the landing of aircraft, or other forms of mechanical transport. NPS Management Policies 6.4.3 states that recreational uses in wilderness will be of a nature that:

- Enables the areas to retain their primeval character and influence;
- Protects and preserves natural conditions;
- Leaves the imprint of man's work substantially unnoticeable;
- Provides outstanding opportunities for solitude or primitive and unconfined types of recreation; and
- Preserves wilderness in an unimpaired condition.

Also, for an activity to be proper, it must be subject to sufficient management control so as to preserve wilderness character, which is the fundamental purpose of managing visitor use in a wilderness area. These management controls are outlined and discussed in the activity descriptions below and are in chapter 2 of the WSP.

In addition, the WSP has established goals, desired conditions, and objectives for the future management of wilderness in Sequoia and Kings Canyon National Parks (chapter 1, pages 5, 11-13). One critical objective of the WSP is to *provide opportunities for and encourage public use and enjoyment of*

wilderness in accordance with the Wilderness Act and other laws and policies. The goals, objectives, and desired conditions that are relevant for this END are:

Goals:

- Preserve ecological, geological, scientific, educational, scenic, and historical values of wilderness, including culturally significant resources and paleontological resources within wilderness, as important and prominent values, consistent with the Wilderness Act, California Wilderness Act, and the applicable planning guidance from the GMP (2007).
- Promote safety and outdoor ethics within the context of wilderness where users are expected to be self-reliant.
- Work to reduce conflicts between user groups as well as between users and sensitive resources.
- Determine the types and levels of commercial services that will be allowed in wilderness and manage these services subject to applicable laws and policies.
- Foster an inspired and informed public and park staff who value preservation of the parks' wilderness.

Desired Conditions for Wilderness Character:

- The untrammeled quality of wilderness character would be preserved by limiting deliberate manipulation of ecological systems except as necessary to promote another quality of wilderness character.
- The natural quality of wilderness character would be preserved by mitigating the impacts of modern civilization on ecosystem structure, function, and processes. The NPS aspires to minimize or localize adverse impacts caused by visitor use and administrative activities. In the wilderness, natural processes 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
    - soundscapes, dark skies and viewsheds

  Additionally, the NPS seeks to minimize adverse impacts caused by visitor use and administrative activities to cultural, historical, and pre-historical resources.
- The undeveloped quality of wilderness character would be preserved through the removal of installations that are unnecessary for the protection of other wilderness character qualities.
- Outstanding opportunities for solitude or primitive and unconfined recreation would be provided to support visitor use and enjoyment of the parks' wilderness areas in balance with the protection of other wilderness character qualities.
    - Visitors with diverse backgrounds and capabilities would have opportunities to use and enjoy wilderness.

- Visitors would have opportunities to experience solitude, a state of being alone or feeling remote from society, although these opportunities could vary by location and time.
- Visitors would have opportunities to participate in a variety of primitive recreation activities, characterized by non-motorized, non-mechanical travel and reliance on personal skill; primitive recreation activities would be managed to preserve other wilderness character qualities.
- Visitors would have opportunities to recreate in an unconfined, self-directed manner, subject only to those regulations that are necessary to preserve wilderness character.

Objectives for Specific Planning Elements:

- Visitor use and enjoyment of wilderness would be promoted while ensuring the preservation of wilderness character.
- Visitors would have the opportunity to choose camping locations, except in areas where camping would result in unacceptable impacts.
- Visitors would have opportunities to travel with stock, from day rides to multi-day trips, in a manner that is compatible with the protection of wilderness character.
- Commercial services may be performed to the extent necessary for activities that are proper for realizing the recreational or other wilderness purposes of the areas in a manner that ensures the preservation of wilderness character. Commercial services would support visitor use and enjoyment of wilderness in a variety of appropriate ways.

In addition, these objectives were further elaborated for each action alternative. These elaborations are included in "Table B2: Discussion of Alternative Concepts", current visitor and commercial service use levels and desired conditions.

BACKPACKING AND HIKING TRIPS (OVERNIGHT CAMPING AND DAY HIKES)

Hiking and backpacking are traditional wilderness activities and are currently the most popular ways in which the public experiences the benefits of wilderness.

Day hiking: Hiking from a frontcountry location into and out of wilderness without spending the night is a popular activity that has occurred in the parks since their establishment. Day-use hiking in wilderness is a proper activity because it allows visitors to realize and experience the recreational and other values of wilderness.

Backpacking: Backpacking, which is defined as multi-day hiking while carrying overnight camping gear, fulfills the recreational, scenic, educational, conservation and other wilderness purposes.

Types of commercial services that may directly support day-hiking and backpacking are guide services that help visitors find appropriate locations for these activities and provide local knowledge or education about wilderness resources. Guide services may provide a range of support from all-inclusive (with meals/cooking and gear provided) to minimal guiding (with only a guide). These activities may be exclusively hiking-based or may use stock support to re-supply longer trips.

There are a wide variety of limitations on hiking and backpacking to ensure wilderness preservation. These limitations ensure that these activities remain compatible with wilderness character, i.e., do not lead to unacceptable impacts on resources or social conditions (see alternatives in chapter 2). Backpacking and hiking are permitted in all areas of the wilderness of Sequoia and Kings Canyon National Parks (the

parks), with the exception of a limited number of areas that might be closed to access due to resource impacts, or safety issues (e.g., wildfires). Backpacking and hiking are subject to limitations that include: party size; the requirement to properly store all food; and where campfires are allowed (although these are rare for day hikers). In addition, backpacking and hiking are limited by the general wilderness prohibition on motor vehicles and mechanical transport, by applicable federal regulations (36 CFR Parts 1 and 2) and by the capacity limitations described in chapter 2 and "Appendix A: Visitor Capacity."

This combination of controls effectively limits backpacking and hiking in the wilderness of the parks to a style which is compatible with a wilderness setting and which contrasts with frontcountry environments. Subject to the requirements and limitations discussed above, backpacking and hiking are considered activities that are proper for realizing the recreational and other purposes of wilderness.

STOCK TRIPS (RIDING, PACKING, DAY RIDES AND OVERNIGHT CAMPING WITH STOCK)

The use of stock in wilderness is a long-standing primitive type of recreation consistent with wilderness purposes. Riding and packing with stock is a documented traditional activity that was championed by the founders of the wilderness ideal and has occurred in the parks since their establishment in the late 19th and early 20th Century (Jackson 2004, McKee 2013, Tweed and Dilsaver 1990, Leave No Trace 2002). Through time, many members of the public have been able to experience the benefits of wilderness through stock- supported travel.

Stock in the parks is defined as horses, mules, burros, or llamas. Other animals (e.g., goats, used for packing elsewhere) are not allowed in the parks due to resource impacts. Wilderness trips that use stock for support are varied, but generally consist of two types:

- Traveling trips – these consist of visitors riding or walking and remaining with the stock throughout the duration of the trip. Stock is used for riding and/or for carrying supplies and equipment. Meal service provided by the commercial service operator may be included.
- Day trips – these consist of visitors riding stock from a frontcountry location into wilderness and then returning to the frontcountry without stock or people spending the night in wilderness.

Stock trips are permitted in many areas of the wilderness of the parks, with the exception of areas that are currently closed to stock access or that would be closed to stock access under the WSP due to safety concerns or impacts to natural or social conditions. Stock use is subject to limitations that include: the types of allowed animals; the types of stock feed allowed; party size; off-trail travel restrictions; the requirement to properly store all food; grazing restrictions; locations where campfires are allowed (rare for day users); the type of substrate allowed for camping (bare ground); distance from lakes and streams (25 feet minimum, 100 feet recommended); camp cleanup; and modifying campsites with rock walls, new fire rings, or other structures (all of which are prohibited). In addition, stock use is limited by the general wilderness prohibition on motor vehicles and mechanical transport, by applicable federal regulations (36 CFR Parts 1 and 2) and by the capacity limitations described in chapter 2 and "Appendix A: Visitor Capacity."

This combination of existing limitations and proposed stock use prescriptions effectively restrict stock use in the wilderness of the parks to a style which is compatible with a wilderness setting and which contrasts with stock use in frontcountry environments. Subject to the requirements and limitations discussed above, stock use is considered an activity that is proper for realizing the recreational and other purposes of wilderness.

Types of commercial services that may directly support stock trips are guide and outfitting services based on providing visitors with stock and proper equipment and assisting visitors in finding appropriate locations for these activities and providing localized knowledge or education and information about proper wilderness use and resources. These may consist of day-use trips or overnight camping (also see below under Overnight Camping).

OVERNIGHT CAMPING

Overnight camping is a traditional wilderness activity that is integral to multi-day trips involving hiking, packing, mountaineering, or oversnow travel (i.e., skiing and snowshoeing). The ability, and sometimes the necessity, to spend multiple days traveling and camping without encountering roads or permanent human habitation is a defining feature of wilderness and is an expression of the area's size and undeveloped character. Overnight camping allows visitors to immerse themselves in the wilderness resource.

Overnight camping is now permitted in most areas of the wilderness of Sequoia and Kings Canyon National Parks, with the exception of a limited number of areas that are closed to camping due to the proximity to a trailhead or due to resource impacts. Under all of the action alternatives considered in the WSP/FEIS, overnight camping would continue to be permitted in most areas of the wilderness. Overnight camping is subject to limitations that include: stay length; party size; the requirement to properly store all food; where campfires are allowed; type of substrate allowed for camping (bare ground); distance from lakes and streams (25 feet minimum, 100 feet recommended); and modifying campsites with rock walls, new fire rings, or other structures (all of which are prohibited). In addition, overnight camping is limited by the general wilderness prohibition on motor vehicles and mechanical transport, by applicable federal regulations (36 CFR) and by the capacity limitations described in chapter 2 and "Appendix A: Visitor Capacity."

This combination of limitations effectively restricts overnight camping in the wilderness of the parks to a style which is consistent with a wilderness setting and which contrasts with camping in frontcountry environments. The style of overnight camping may range from minimalist backpacking camps to camps that contain items of comfort (e.g., chairs and cooking tables) that may be associated with stock-supported groups. Subject to the requirements and limitations discussed above, overnight camping is considered an activity that is proper for realizing the recreational or other purposes of wilderness.

Other than the particular uses and practices prohibited under §4(c), the type of equipment which is permitted in wilderness is generally not addressed by regulation. While the NPS does not regulate visitor choices about equipment, it has the authority to regulate visitor behavior to prevent damage to natural and cultural resources, to protect wilderness experiences, and to ensure that wilderness character is preserved. There is disagreement among some users about what equipment may or may not be appropriate in wilderness (e.g., ice chests, phones). The NPS enforces regulations to ensure wilderness resource preservation and protection (e.g., prohibitions on loud audio devices and motorized equipment, see appendix F).

Subject to the requirements and limitations discussed above, certain types of commercial services may then be necessary to directly support overnight camping activities through the transportation of equipment or supplies. These services allow people to have enough supplies to reach inner portions of wilderness and or extend their stays to more thoroughly immerse themselves in the wilderness experience. These services also allow a diverse public who cannot all physically carry the equipment to be able to recreate in and experience the benefits of wilderness.

Examples of these types of commercial services include gear and food hauling services by stock (i.e., spot or dunnage service) or porters (dunnage service).

- Spot trips – these consist of some or all members of a party riding to a place where they separate from the animals with their gear and food and continue their trip without the stock. The stock then returns to the frontcountry. On occasion, stock may return after a period of time to pick up and assist the visitors with exiting wilderness via riding and/or carrying out gear. These trips could involve the stock going in just for the day or involve the stock staying overnight in wilderness.
- Dunnage – this consists of stock or people carrying in gear and food and meeting with wilderness users at a place where gear is delivered and visitors continue their trip without the stock. The stock drops off gear and food and returns to the frontcountry. These trips could involve stock going in just for the day or staying overnight in wilderness. This same service could be provided by porters who carry in gear and/or food for people, either initially at the start of a trip, or to provide mid-trip resupply for wilderness travelers. The human porter(s) could go in just for the day or stay overnight in wilderness.

OVER-SNOW TRAVEL (SKI AND SNOWSHOE TOURING AND WINTER OVERNIGHT CAMPING)

Skiing and snowshoeing are traditional wilderness activities. Though they require specialized skills, they have remained popular as a way to experience the recreational or other purposes of wilderness. There are a variety of limitations on skiing and snowshoeing (with backpacks or sleds) to ensure wilderness preservation. These limitations ensure the activity remains compatible with wilderness character (i.e., does not lead to unacceptable impacts on resources or social aspects). See alternatives in chapter 2.

Skiing and snowshoeing from a frontcountry location into and out of wilderness without spending the night is a popular activity that has occurred in the parks since their establishment. Day-use skiing and snowshoeing in wilderness is a proper activity. Day- skiing and snowshoeing may be supported by commercial service providers solely for skiing and snowshoeing, or to access climbing and mountaineering experiences.

Skiing and snowshoeing is now permitted in all areas of the wilderness of Sequoia and Kings Canyon National Parks, with the exception of a limited number of areas that might be closed to access due to resource impacts or safety issues (e.g., avalanches). Under all of the action alternatives considered in the WSP/FEIS, skiing and snowshoeing would continue to be permitted in most areas of the wilderness. Skiing and snowshoeing are also subject to limitations on: party size; the requirement to properly store all food; and where campfires are allowed (although these are rare for day-users). In addition, skiing or snowshoeing are limited by the general wilderness prohibition on motor vehicles and mechanical transport, by applicable federal regulations (36 CFR Parts 1 and 2) and by the capacity limitations described in chapter 2 and “Appendix A: Visitor Capacity.”

Types of commercial services that may directly support skiing and snowshoeing are guide services based on assisting visitors in finding appropriate locations for these activities and providing specialized equipment and/or technical skill development.

CLIMBING AND MOUNTAINEERING (SUMMER AND WINTER)

The rugged rock and snow-covered areas of the parks provide excellent opportunities for mountaineering (year-round, including ski mountaineering and ice climbing) and technical rock climbing. This activity has been occurring in the Sierra Nevada for more than 150 years. Both mountaineering and technical rock

climbing are proper activities in wilderness provided they are done in a manner compliant with existing regulations. There are some specialized considerations that rock and ice climbers must take into account (i.e., the proper use of fixed anchors) in order to ensure they do not degrade wilderness character. Travel for this activity could involve oversnow travel, hiking, or a mix of hiking and use of stock.

Mountaineering and technical rock climbing is now permitted in all areas of the wilderness of Sequoia and Kings Canyon National Parks, with the exception of a limited number of areas that might be closed to access due to resource impacts. Under all of the action alternatives considered in the WSP/FEIS, climbing and mountaineering would continue to be permitted in most areas of the wilderness. Mountaineering and technical rock climbing are subject to limitations that include: party size; the requirement to properly store all food; specific climbing restrictions (see "Appendix J: Climbing Management Strategy"); where campfires are allowed; type of substrate allowed for camping (bare ground); distance from lakes and streams (25 feet minimum, 100 feet recommended); and modifying campsites with rock walls, new fire rings, or other structures (all of which are prohibited). In addition, overnight camping is limited by the general wilderness prohibition on motor vehicles and mechanical transport, by applicable federal regulations (36 CFR) and by the capacity limitations described in chapter 2 and "Appendix A: Visitor Capacity."

Types of commercial services that may directly support mountaineering and technical rock climbing are guide services based on assisting visitors in finding appropriate locations for these activities and providing specialized equipment and/or technical skill development. This activity could be supported by way of hiking-based, skiing-based, or stock-based support.

FISHING

Though most fish in the parks have been introduced, recreational fishing has been a popular activity for more than a century. This activity can consist of fishing rivers, streams or lakes, whether by the use of flies or other lures or bait. Fishing as an activity is proper in wilderness provided it is done in a manner compliant with existing regulations. Travel for this activity could involve hiking or a mix of hiking and use of stock.

Fishing is now permitted in most areas of the wilderness of Sequoia and Kings Canyon National Parks, with the exception of a limited number of areas that are closed due to resource impacts, and subject to specific fishing regulations. Under all of the action alternatives considered in the WSP/EIS, fishing would continue to be permitted in most areas of the wilderness. People who fish are subject to limitations that include: stay length; party size; the requirement to properly store all food; where campfires are allowed; type of substrate allowed for camping (bare ground); distance from lakes and streams (25 feet minimum, 100 feet recommended); and modifying campsites with rock walls, new fire rings, or other structures (all of which are prohibited). In addition, people who fish are limited by the general wilderness prohibition on motor vehicles and mechanical transport, by applicable federal regulations (36 CFR) and by the capacity limitations described in chapter 2 and "Appendix A: Visitor Capacity."

Types of commercial services that may directly support fishing are guide services based on assisting visitors in finding appropriate locations for angling and providing specialized equipment and/or technical skill development. This activity could be supported by way of hiking-based, or stock-based support.

RIVER-RUNNING

River-running (kayaking and canoeing) is a fundamental and appropriate wilderness activity, provided it is non-motorized/human-powered. This activity is limited in the wilderness of the parks due to short-lived adequate seasonal water flows, the challenging whitewater conditions, and difficulty of accessing remote

rivers. Limitations on river running would include those on hiking, backpacking, and overnight camping. These limitations ensure the activity remains compatible with wilderness character (i.e., does not lead to unacceptable impacts on resources or social aspects). Travel for this activity could involve hiking or a mix of hiking and the use of stock.

River-running is now permitted on almost all rivers in the wilderness of Sequoia and Kings Canyon National Parks, with the exception of a segment of the Middle Fork Kings that is closed due to resource and experiential impacts. Under all of the action alternatives considered in the WSP/FEIS, river-running would continue to be permitted on most rivers, with the existing prohibition on the lowest segment of the Middle Fork Kings being retained. People who river-run are subject to limitations that include: stay length; party size; the requirement to properly store all food; where campfires are allowed; type of substrate allowed for camping (bare ground); distance from lakes and streams (25 feet minimum, 100 feet recommended); and modifying campsites with rock walls, new fire rings, or other structures (all of which are prohibited). In addition, people who river-run are limited by the general wilderness prohibition on motor vehicles and mechanical transport, by applicable federal regulations (36 CFR) and by the capacity limitations described in chapter 2 and "Appendix A: Visitor Capacity."

Types of commercial services that may directly support river running are dunnage/gear transport via stock or porters, and river guide services that would assist visitors in safely conducting the activity in appropriate locations, including providing localized knowledge.

PHOTOGRAPHY

Taking photographs is a popular way for the public to realize the scenic purpose of wilderness and as such is a proper activity. Travel for this activity could involve hiking or a mix of hiking and use of stock.

Photography is now permitted in all areas of the wilderness of Sequoia and Kings Canyon National Parks, with the exception of a limited number of areas that may be closed due to resource impacts. Under all of the action alternatives considered in the WSP/FEIS, photography would continue to be permitted in most areas of the wilderness. People who conduct photography are subject to limitations that include: stay length; party size; the requirement to properly store all food; where campfires are allowed; type of substrate allowed for camping (bare ground); distance from lakes and streams (25 feet minimum, 100 feet recommended); and modifying campsites with rock walls, new fire rings, or other structures (all of which are prohibited). In addition, people who conduct photography are limited by the general wilderness prohibition on motor vehicles and mechanical transport, by applicable federal regulations (36 CFR) and by the capacity limitations described in chapter 2 and "Appendix A: Visitor Capacity."

Types of commercial services that may directly support photography are guide services based on assisting visitors in finding appropriate locations for these activities and providing technical skill development.

NOTE: Filming in wilderness for commercial purposes is prohibited, unless it can be shown that a wilderness purpose is realized. The use of models, sets or props, or other approaches that promote a product or service for commercial still photography is also prohibited (NPS Director's Order 41).

OTHER ACTIVITIES THAT SUPPORT THE PURPOSES OF WILDERNESS AND THAT ARE NOT SUBJECT TO COMMERCIAL SERVICES RESTRICTIONS

Educational Trips: Education is one of the enumerated purposes of the Wilderness Act. Educational trips that have environmental education as their primary purpose occur regularly in wilderness and may also incorporate other activities, such as backpacking and hiking, or stock use. Trips such as these often allow visitors to realize many of the other purposes of the Wilderness Act such as the recreational,

conservation and historic purposes. In general, education will be considered the primary purpose of a trip when academic credit is provided, even if accompanied by staff from environmental education organizations. When academic goals are the primary purpose, having support services provided by other entities does not change the essential character of the trip, which is academic, not commercial.

Scientific Research: Scientific research conducted by educational institutions, governmental entities, and the like is considered a proper use of wilderness because these activities further the scientific, educational, historic, and/or conservation purposes of wilderness. Scientific research is encouraged under NPS policies (NPS *Management Policies* 6.3.6.1). Scientific research conducted by these types of entities is not subject to this Extent Necessary Determination even if commercial services are used to provide ancillary assistance in the transport of research supplies and equipment, either via stock or porters. Researchers of this type operate under the authority of the NPS and their activities are categorized as an administrative use of wilderness.

PUBLIC ACTIVITIES THAT ARE PROHIBITED OR NOT PROPER IN WILDERNESS

Although many activities are proper in wilderness, there are also numerous recreational and other activities which are not. Activities that are proper in wilderness are limited to those that are both legal and appropriate. Improper activities are those that:

- may have impacts that are inconsistent with the preservation of wilderness character,
- are not relevant to the public purposes of wilderness (which are "recreational, scenic, scientific, educational, conservation, and historical use," as defined in §4(b) of the Wilderness Act), and/or,
- are not of a "primitive type."

Some of these activities are prohibited specifically by law. Activities that are not proper and are prohibited in wilderness include (but are not limited to) bicycle riding or other mechanical transportation; launching into the air or landing from the air either people or objects (including but not limited to BASE jumping, hang gliding, or use of drones); use of motorized vehicles or equipment (e.g., motorcycles, generators, drills, saws); competitive events for people or animals; survival exercises or similar activities; the erection of structures; and, for many national parks specifically, hunting. Note that the parks may conduct some of the activities/uses above if they are properly analyzed and approved in a MRA. (Wilderness Act Section 4(c) and NPS *Management Policies 2006*, Chapter 6).

SECTION II: ASPECTS OF WILDERNESS ACTIVITIES THAT MAY NECESSITATE COMMERCIAL SUPPORT

To be conducted safely and in a manner that preserves wilderness character, wilderness activities often require specialized skills, knowledge, or equipment. Climbing and mountaineering, for example, involve technical skills that are necessary for ascent and descent, safety practices associated with exposure (e.g., fall hazards) and environmental factors (e.g., mountain weather), and special equipment that is employed for locomotion and safety. Stock packing involves special equipment, such as the stock and tack and skill in loading packs, riding saddle horses, leading pack mules, providing care for the animals, and mitigating stock-related environmental impacts. Wilderness visitors vary in their ability to conduct these more specialized or technical wilderness activities. Therefore, when parks choose to provide opportunities for these types of visitor activities, some level of commercial support may be necessary.

The extent to which these forms of commercial service support are necessary depends on how the parks balance the competing interests inherent in the Wilderness Act, and in particular, the charge to maintain wilderness character while providing opportunities for wilderness recreation. Factors that are considered

in this analysis include the balance the parks seek in terms of self-reliant experiences as opposed to novice or introductory experiences, and the range of social and environmental conditions that can be provided while preserving wilderness character. In the context of wilderness stewardship planning, these objectives for visitor use have been explored through the development of alternatives. Based on the analysis in this END, the alternatives included in the plan incorporate different proposals for the amount of commercial services that are necessary to achieve desired conditions for wilderness character. This END represents a comparative and qualitative analysis of the relevant wilderness factors and determines the amount of commercial services that are necessary under each alternative.

SPECIALIZED SKILLS OR KNOWLEDGE

For some wilderness visitors the need for, or lack of, specialized skills or knowledge can be a barrier to engaging in that activity. A commercial service may support a visitor activity by providing or teaching the skills or knowledge that are needed to engage in a proper wilderness activity. This may take the form of guiding, in which the outfitter/guide provides the necessary skills or knowledge to the individual or group that is participating in the activity. It may also take an instructional form, in which the outfitter/guide teaches an individual or group the necessary skills or knowledge so that they may independently participate in the activity in the future. In the latter case, the level of instruction may range from basic or introductory wilderness skills and knowledge to advanced technical skills and knowledge. Guides and instructors are also able to provide local knowledge that can make a wilderness trip safer and more rewarding for visitors who are unfamiliar with a particular wilderness area.

SPECIALIZED EQUIPMENT OR SERVICES

Wilderness activities may require specialized equipment or services that cannot be provided by all wilderness visitors who wish to engage in a particular activity. Regarding specialized equipment, the expense, care, or space required for that equipment may be too great for some wilderness visitors to provide without support from a commercial service provider. Visitors may wish to try out an activity before making the financial commitment to purchase equipment. Some visitor trips may require services, such as the transporting of equipment or supplies that cannot be provided without commercial support. For each activity that has been determined to be proper for the recreational or other purposes of wilderness, the specialized equipment or services that may necessitate commercial support are discussed.

SPECIAL SAFETY CONCERNS

Wilderness activities may involve special safety concerns that cannot be managed by all wilderness visitors without commercial support. The NPS does not attempt to eliminate the risks inherent in wilderness travel or in participation in particular wilderness activities. However, for some visitors, a commercial provider may be a necessary means of managing those inherent risks or may be a means to acquire the requisite knowledge to manage those risks independently in the future. For each activity that has been determined to be proper for the recreational or other purposes of wilderness, the special safety concerns that may necessitate commercial support are discussed.

SPECIAL RESOURCE CONCERNS

Wilderness activities may involve the potential for impacts to wilderness resources. A commercial service provider may be a means to ensure that activities are conducted in appropriate locations and in a manner that mitigates or minimizes resource impacts. For each activity that has been determined to be proper for the recreational or other purposes of wilderness, the special resource concerns that may necessitate commercial support are discussed.

OTHER CONTRIBUTIONS THAT SUPPORT WILDERNESS PURPOSES

Commercial services most often support wilderness visitors in their recreational activities, but they may also independently or cooperatively support scenic, scientific, educational, historic, or conservation objectives.

INTRODUCTORY EXPERIENCES

Commercial service providers can provide assistance to visitors who lack the experience or confidence to attempt a wilderness adventure on their own. These types of trips can introduce a diverse public to a variety of ways to experience their public wildlands. These types of support can build confidence in visitors that can lead to future more self-reliant wilderness trips. This can relate to a range of activities, such as hiking and backpacking, stock use, or oversnow travel. Introducing novice visitors to their publicly-owned wilderness can provide rewarding experiences and build support for long-term wilderness preservation.

The NPS considers the provision of such introductory experiences as critical to its mission, and recognizes that commercial services aid in this aspect of mission accomplishment. This is one of the few ways to ensure that diverse people have access to these opportunities to connect with their national parks and wilderness. Chapter 8 of NPS *Management Policies 2006* states:

> National Parks belong to all Americans, and the National Park Service will welcome all Americans to experience their parks. The Service will focus special attention on visitor enjoyment of the parks while recognizing that the NPS mission is to conserve unimpaired each park's natural and cultural resources and values for the enjoyment, education, and inspiration of present and future generations. The Service will also welcome international visitors, in keeping with its commitment to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout the world.

In addition, parks will have "an atmosphere that is open, inviting, and accessible to every segment of American society" (Chapter 8, Sec. 8.2). It has been recognized that some segments of the American population are hesitant to take advantage of their public lands due to de facto barriers: "lack of knowledge, experience, awareness (what to do, where to go, how to get there, equipment needed, etc.)" (Pease 2011). Commercial services can assist people in overcoming some of these barriers, thereby offering an opportunity to more diverse segments of society to experience national parks and wilderness.

SECTION III: TYPE OF COMMERCIAL SERVICES THAT ARE NECESSARY FOR EACH PROPER ACTIVITY

This section uses the categories provided in Section II to analyze the aspects of specific activities from Section I that may necessitate commercial support to achieve wilderness purposes. A conclusion regarding the necessity for commercial services is made for each activity. The amount of commercial services that would be allowed is addressed in Section IV.

Table B-2: Analysis of Types of Activities That May be Supported by Commercial Services

Proper Activity Supported by a Commercial Service	
Backpacking and Hiking Trips (with overnight camping and day hiking)	
Reasons that Commercial Support is Necessary for Activity	
Specialized Skills and Knowledge	Way-finding, orienteering, the use of overnight equipment, campsite selection, food preparation and appropriate food storage in wilderness, wilderness first aid, map reading, sanitation and waste disposal, leadership, and Leave No Trace© practices.
Specialized Equipment or Services	Proper use of backpack, cooking equipment, tent, food storage devices, water purification equipment
Special Safety Concerns	High elevation environment, challenging cross-country areas, orienteering/way-finding, first aid, creek crossings, mountain weather
Special Resource Concerns	N/A
Other Contributions that Support Wilderness Purposes	Introductory experiences and guided trips can lead to a better understanding of wilderness character, purposes, and values, and assists the public in being confident to appropriately experience their public lands.
Introductory Experience	Provides people with the necessary skills to engage in self-reliant recreation.
Conclusion	Backpacking and hiking are activities that are proper for realizing the public purposes of wilderness. The skills, equipment, and safety issues identified above are barriers that impede the ability of some visitors to realize the values inherent in a wilderness experience. These factors necessitate some level of commercial support for backpacking and hiking. The availability of commercial support may also offer opportunities for introductory wilderness experiences. Allowing commercial support for this activity is consistent with the desired conditions of the WSP. In terms of desired conditions, backpacking and hiking allow visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, and to avail themselves of opportunities for solitude or an unconfined recreation experience. The use of commercial support services also helps to achieve the Desired Condition of ensuring that the parks' wilderness resources will be accessible to visitors of diverse backgrounds and capabilities.

Table B-2: Analysis of Types of Activities That May be Supported by Commercial Services (continued)

Proper Activity Supported by a Commercial Service	
Stock trips - Riding, packing, day rides and overnight camping with stock	
Reasons that Commercial Support is Necessary for Activity	
Specialized Skills and Knowledge	Safely packing, riding, and leading of stock in a remote wilderness environment are highly specialized skills. In addition, care for stock is a skill that requires specialized skills and knowledge. Use of the parks' wilderness by private (i.e., not commercially-supported) stock users accounts for less than 20% of total stock use by visitors, and this proportion has decreased over the past three decades. This illustrates that the difficulties and costs of owning and using private stock is a substantial obstacle to experiencing wilderness through the traditional activity of stock use. In addition, local knowledge is important to understand which trails are best-suited to the skill level of the stock user. Way-finding, orienteering, the use of overnight equipment, campsite selection, appropriate food storage in wilderness, wilderness first aid, map reading, sanitation and waste disposal, leadership, competency, communication, and Leave No Trace© practices are also skills and knowledge that are relevant to the use of pack stock in wilderness.
Specialized Equipment or Services	Stock trips require highly specialized and expensive equipment, including the animals, saddles, panniers, saddle trees, bear-proof food storage, hobbles and pickets, nose bags, tree-saver straps, ropes, veterinary first aid, and processed weed-free feed. The cost of stock and stock related equipment is prohibitive for most visitors. Horses and mules cost in excess of $3,000, and the equipment for each animal may exceed $1,500. In addition to the cost of the stock and stock equipment, stock owners must have access to facilities necessary to care for stock. Stock users must have a trailer to bring stock to the trailheads and a vehicle capable of towing a stock trailer. Caring for stock may cost as much as $10,000 per animal each year. Transport of animals is also prohibitively expensive.
Special Safety Concerns	Stock use in wilderness presents special safety concerns that may necessitate commercial support for some visitors that choose to participate in a traditional wilderness stock trip. Stock travel in mountainous terrain on steep, narrow trails is inherently dangerous. Accidents involving stock can result in the injury or death of riders or stock animals. A skilled packer, particularly one with local knowledge about trail and environmental conditions, can mitigate these risks. While some visitors may choose and have the ability to manage these risks independently, many will require the services of a commercial provider.
Special Resource Concerns	Improper use of stock can impact water quality, vegetation, etc. Complex grazing regulations which are critical to protect the parks' resources may be difficult to understand for the casual stock user. These resource concerns can be mitigated or eliminated by skilled commercial providers with local knowledge of trails and camping areas appropriate for stock and specific restrictions and practices to protect resources.
Other Contributions that Support Wilderness Purposes	The use of stock in wilderness is a long-standing primitive type of recreation consistent with wilderness purposes. This is a documented traditional use of wilderness that was championed by the founders of the wilderness ideal. Stock can provide access to wilderness that would otherwise be inaccessible to many members of the public (including those who travel notable distances to reach the parks), and can also provide the support to ensure a positive experience in a wilderness environment.

Table B-2: Analysis of Types of Activities That May be Supported by Commercial Services (continued)

Proper Activity Supported by a Commercial Service	
Stock trips - Riding, packing, day rides and overnight camping with stock	
Reasons that Commercial Support is Necessary for Activity	
Introductory Experience	This activity can provide an introductory experience for wilderness visitors.
Conclusion	Stock riding, packing, and camping are activities that are proper for realizing the public purposes of wilderness. The amount of knowledge and equipment required to successfully undertake a stock trip in wilderness is extremely high. Without access to commercial services, visitors who do not own their own stock are effectively barred from engaging in this type of wilderness activity and realizing the recreational, scenic, and other values that can be experienced during a stock trip. As a result, some level of commercial support is necessary. Commercial support services may also offer opportunities for introductory wilderness experiences. Allowing commercial support for this activity in accordance with the stock use prescriptions in the WSP is consistent with and supports the desired conditions of the WSP. In terms of desired conditions, commercial support for stock riding, packing, and camping allows visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, to avail themselves of opportunities for solitude or an unconfined recreation experience, and to experience a traditional activity that may range from single day to multi-day trips. The availability of commercial stock trips also helps to ensure varied opportunities for wilderness-compatible recreation.

Proper Activity Supported by a Commercial Service	
Overnight Camping - Gear and food support including stock “spot” and stock and porter “dunnage”	
Reasons that Commercial Support is Necessary for Activity	
Specialized Skills and Knowledge	Ability to carry items to support wilderness travel and overnight camping, and to ensure that visitors have opportunities to select campsites in areas that might otherwise not be accessible to them.
Specialized Equipment or Services	N/A
Special Safety Concerns	N/A
Special Resource Concerns	Allows for appropriate wilderness equipment to be utilized (e.g., food storage containers, camp stoves, tents, etc.).
Other Contributions that Support Wilderness Purposes	Allows people to have enough supplies to reach inner portions of wilderness and or extend their stays to more thoroughly immerse themselves in the wilderness experience. Allows a diverse public who cannot all physically carry the equipment to be able to recreate in and experience the benefits of wilderness.
Introductory Experience	This activity supports an introductory experience in wilderness.

Table B-2: Analysis of Types of Activities That May be Supported by Commercial Services (continued)

Proper Activity Supported by a Commercial Service	
Overnight Camping - Gear and food support including stock "spot" and stock and porter "dunnage"	
Reasons that Commercial Support is Necessary for Activity	
Conclusion	Commercial services to support gear and food transport is necessary in the parks wilderness to achieve public purposes. Overnight camping is an activity that is proper for realizing the public purposes of wilderness, and possesses attributes that necessitate commercial support at some level. Overnight camping requires specialized skills and knowledge, involves special natural resource concerns, and may also offer opportunities for introductory wilderness experiences. Commercial support for overnight camping primarily takes the form of transporting gear and supplies that are to be used in the course of a wilderness trip. Allowing commercial support for this activity also assists in achieving the desired conditions of the WSP. In terms of desired conditions, commercial support for overnight camping allows visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, to avail themselves of opportunities for solitude or an unconfined recreation experience, and to assist visitors of diverse abilities and experience levels in selecting their own camping locations.

Proper Activity Supported by a Commercial Service	
Oversnow Travel (ski and snowshoe touring and winter overnight camping)	
Reasons that Commercial Support is Necessary for Activity	
Specialized Skills and Knowledge	Ski, or other oversnow travel skills, route finding, winter survival, avalanche awareness, leadership
Specialized Equipment or Services	Skis, snowshoes, winter camping and survival equipment (e.g., shovels, avalanche beacons)
Special Safety Concerns	Winter survival, winter route-finding, avalanche awareness, weather
Special Resource Concerns	Human waste disposal, winter fires
Other Contributions that Support Wilderness Purposes	These are primitive and traditional recreational activities. Intense solitude is possible as this activity allows visitors to experience wilderness in a different manner.
Introductory Experience	This provides an introductory experience to winter wilderness exploration and use.
Conclusion	Over-snow travel is an activity that is proper for realizing the public purposes of wilderness, and possesses attributes that necessitate commercial support at some level. Over-snow travel requires specialized skills and knowledge, employs special equipment, involves special safety and natural resource concerns, and may also offer opportunities for introductory experiences in a winter wilderness environment. Allowing commercial support for this activity also assists in achieving the desired conditions of the WSP. In terms of desired conditions, over-snow travel allows visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, and to avail themselves of extraordinary opportunities for solitude or an unconfined recreation experience.

Table B-2: Analysis of Types of Activities That May be Supported by Commercial Services (continued)

Proper Activity Supported by a Commercial Service	
Climbing and Mountaineering (summer and winter)	
Reasons that Commercial Support is Necessary for Activity	
Specialized Skills and Knowledge	Route finding, use of equipment for locomotion and protection, orienteering, knowledge of hazards, understanding rock and ice conditions. Certifications /training requirements.
Specialized Equipment or Services	Ropes, climbing equipment/aids, ice axes, crampons, skis, snowshoes
Special Safety Concerns	Minimize risk through education, training, and ensuring safe practices. Knowledge of safe routes and conditions.
Special Resource Concerns	Climber access and social trails, knowledge of what is allowed and what is prohibited, fixed anchors, proper disposal of human waste, knowledge of sensitive plant species, use of “clean” climbing techniques to minimize resource impacts
Other Contributions that Support Wilderness Purposes	Climbing and mountaineering has been occurring since the early exploration of the parks (mid-19th century) and is a primitive form of recreation. Some consider it a traditional value of wilderness.
Introductory Experience	This service supports an introductory experience for a less common but proper wilderness activity.
Conclusion	Climbing and mountaineering is an activity that is proper for realizing the public purposes of wilderness, and possesses attributes that necessitate commercial support at some level. Climbing and mountaineering requires specialized skills and knowledge, employs special equipment, involves special safety and natural resource concerns, and may also offer opportunities for introductory experiences or technical skills development. Allowing commercial support for this activity also assists in achieving the desired conditions of the WSP. In terms of desired conditions, climbing and mountaineering allows visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, and to avail themselves of extraordinary opportunities for solitude or an unconfined recreation experience. Note: A future comprehensive climbing management plan would determine site specific requirements.

Proper Activity Supported by a Commercial Service	
Fishing	
Reasons that Commercial Support is Necessary for Activity	
Specialized Skills and Knowledge	Understanding regulations and proper locations for fishing activities. Knowledge of local fishing conditions and site-specific requirements. Proper use of specialized equipment.
Specialized Equipment or Services	Fishing equipment, camping equipment
Special Safety Concerns	Fast, cold rivers with dangerous conditions in many areas. High elevation conditions, cold lakes, hypothermia.

Table B-2: Analysis of Types of Activities That May be Supported by Commercial Services (continued)

Proper Activity Supported by a Commercial Service	
Fishing	
Reasons that Commercial Support is Necessary for Activity	
Special Resource Concerns	Understanding minimum impact requirements in wilderness. Understanding protocols for decontamination to prevent introduction of non-native aquatic organisms. Fishing is one of few extractive uses permissible in wilderness, so it is important for visitors to understand the fishing requirements and restrictions (catch and release, proper disposal of fish carcasses). Also fishing guides can help visitors ensure the protection of native and/or particularly sensitive fish species, such as those protected under the Endangered Species Act. Guides can promote practices that provide for bank and riparian area protection.
Other Contributions that Support Wilderness Purposes	Fishing is a primitive form of recreation that can lead to increased self-reliance. Also this provides education to users on the appropriate methods and regulations related to fishing in wilderness.
Introductory Experience	Instruction about fishing techniques in wilderness.
Conclusion	Fishing is an activity that is proper for realizing the public purposes of wilderness, and possesses attributes that necessitate commercial support at some level. Fishing is an activity that is proper for realizing the public purposes of wilderness, and possesses attributes that necessitate commercial support at some level. Fishing requires specialized skills and knowledge, employs special equipment, involves special safety and natural resource concerns, and may also offer opportunities for introductory experiences. Allowing commercial support for this activity also assists in achieving the desired conditions of the WSP. In terms of desired conditions, fishing allows visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, and to avail themselves of opportunities for solitude or an unconfined recreation experience.

Proper Activity Supported by a Commercial Service	
River running	
Reasons that Commercial Support is Necessary for Activity	
Specialized Skills and Knowledge	Knowledge of local conditions, ability to survive in severe river conditions, navigation skills in hazardous waters
Specialized Equipment or Services	Kayaks, rafts, emergency gear, personal flotation devices, paddles, dry bags, helmets, food storage
Special Safety Concerns	Extreme river conditions, changing river conditions (fluctuating flows), wilderness travel with heavy equipment
Special Resource Concerns	Protection of Wild and Scenic River values, riparian protection, human waste disposal, litter (kayak pieces), abandoned gear and equipment

Table B-2: Analysis of Types of Activities That May be Supported by Commercial Services (continued)

Proper Activity Supported by a Commercial Service	
River running	
Reasons that Commercial Support is Necessary for Activity	
Other Contributions that Support Wilderness Purposes	River running is a primitive recreational pursuit. Areas not commonly explored would be accessed through this activity. The extremely difficult conditions of the parks' rivers present notable challenges to physical abilities and self-reliance for river runners, consistent with wilderness values.
Introductory Experience	Because of the extreme difficulty to safely run the parks wilderness rivers, novice river runners would not be able to access the parks. This activity does not support an introductory experience in wilderness.
Conclusion	River running is an activity that is proper for realizing the public purposes of wilderness, and possesses attributes that necessitate commercial support at some level. River running requires specialized skills and knowledge, employs special equipment, involves special safety and natural resource concerns, and may also offer opportunities for technical skills development. Allowing commercial support for this activity also assists in achieving the desired conditions of the WSP. In terms of desired conditions, river running allows visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, and to avail themselves of extraordinary opportunities for solitude or an unconfined recreation experience.

Proper Activity Supported by a Commercial Service	
Photography	
Reasons that Commercial Support is Necessary for Activity	
Specialized Skills and Knowledge	Knowledge of photography skills, local knowledge of wilderness conditions and use, knowledge of care of photographic equipment in wilderness setting.
Specialized Equipment or Services	Camera equipment, tripod
Special Safety Concerns	N/A
Special Resource Concerns	N/A
Other Contributions that Support Wilderness Purposes	Supports education and the scenic purposes of wilderness. Long-standing tradition of photography of wilderness that has been extensively used to support wilderness establishment and preservation.
Introductory Experience	This activity supports an introductory experience in wilderness.
Conclusion	Photography is an activity that is proper for realizing the public purposes of wilderness, and possesses attributes that necessitate commercial support at some level. Photography requires specialized skills and knowledge, employs special equipment, supports the educational and scenic purposes of wilderness, and may also offer opportunities for introductory experiences or technical skills development. Allowing commercial support for this activity also assists in achieving the desired conditions of the WSP. In terms of desired conditions, photography allows visitors to use and enjoy wilderness in a manner that is consistent with the preservation of wilderness, to experience a natural, undeveloped, and untrammeled environment, and to avail themselves of extraordinary opportunities for solitude or an unconfined recreation experience.

SECTION IV: EXTENT OF COMMERCIAL SERVICES DETERMINED NECESSARY FOR EACH PROPER ACTIVITY IN WILDERNESS

Section IV: Extent or Quantity of Commercial Services that are Necessary for Each Proper Activity reviews each activity against the desired conditions and visitor capacities of each alternative. A conclusion is reached about the annual overall wilderness-wide service days (level of use) that may be commercially supported, divided into two categories, those that use stock and those that do not, with a secondary conclusion separating out the high-use Mount Whitney Management Area, where a reduced portion of overall service days are allocated. There is also a description of other regulatory mechanisms that control commercially supported trips.

Table B-3: Alternatives Concepts and Objectives

	Alt 1: No-action / Status Quo	Alt 2: Use Levels Near Current Levels (NPS Preferred Alternative)	Alt 3: Allow for Increased Use	Alt 4: Reduce Development and Commercial Services	Alt 5: Reduce Use
Alternatives Concepts	Continue to manage wilderness under the existing Backcountry Management Plan / Stock Use and Meadow Management Plans	*Preserve Wilderness Character with targeted site-specific actions to reduce the recreational impacts in the highest use areas of wilderness with increased restrictions, while allowing less-restricted primitive recreation in less-visited areas.* Moderate levels of commercial services would be allowed, similar to current levels overall, with some increased controls in specific areas. Types of commercial services allowed would be expanded. Commercial services in high-use areas would be reduced in level.	*Maximize opportunities for visitor use and enjoyment and emphasize the quality of wilderness as a place that provides opportunities for primitive recreation.* There would be increased opportunities for commercial services potentially in expanded areas for visitors who want to experience the wilderness but may need additional services, facilities, or direction, or who may lack the specialized equipment to travel independently.	*Increase the undeveloped and self-reliant qualities of wilderness while protecting the natural quality of wilderness through restrictions on visitor behavior in high use areas and by reducing the availability of commercial support.* Notably reduce commercial services overall (types, levels, and areas), from current conditions.	*Increase the opportunities for solitude and unconfined recreation, and protect the natural quality of wilderness by notably reducing visitor use.* Commercial services would be allowed, but less use would be expected overall commensurate with reduced trailhead quotas for all visitors (including those supported by commercial services).

Table B-3: Alternatives Concepts and Objectives (continued)

	Alt 1: No-action / Status Quo	Alt 2: Use Levels Near Current Levels (NPS Preferred Alternative)	Alt 3: Allow for Increased Use	Alt 4: Reduce Development and Commercial Services	Alt 5: Reduce Use
Objectives of the Alternatives that are Relevant to the Commercial Support Allocation	N/A	**Visitor Use Levels -** Visitor use and enjoyment of wilderness would be provided in a manner that ensures the preservation of wilderness character. In this alternative, visitor use levels would be reduced in some popular areas to preserve opportunities for solitude or other wilderness-character qualities.	**Visitor Use Levels -** Visitor use and enjoyment of wilderness would be provided in a manner that ensures the preservation of wilderness character. In this alternative, opportunities for visitor use and enjoyment of wilderness would be increased by permitting more visitor use.	**Visitor Use Levels -** Visitor use and enjoyment of wilderness would be provided in a manner that ensures the preservation of wilderness character. In this alternative, increased emphasis on self-reliance and reduced development would be accompanied by a slight decrease in visitor numbers.	**Visitor Use Levels -** Visitor use and enjoyment of wilderness would be provided in a manner that ensures the preservation of wilderness character. In this alternative, increased opportunities for solitude would be achieved through a decrease in visitor numbers.
	N/A	**Camping and Campsites -** Visitors would have the opportunity to choose camping locations, except in areas where camping would result in unacceptable impacts. In this alternative, camping restrictions would be adjusted in targeted areas.	**Camping and Campsites -** Visitors would have the opportunity to choose camping locations, except in areas where camping would result in unacceptable impacts. In this alternative, increased visitor use would require an increase in camping restrictions.	**Camping and Campsites -** Visitors would have the opportunity to choose camping locations, except in areas where camping would result in unacceptable impacts. In this alternative, an emphasis on visitor self-reliance would allow fewer camping restrictions.	**Camping and Campsites -** Visitors would have the opportunity to choose camping locations, except in areas where camping would result in unacceptable impacts. In this alternative, decreased visitor use would allow fewer camping restrictions.

Table B-3: Alternatives Concepts and Objectives (continued)

	Alt 1: No-action / Status Quo	Alt 2: Use Levels Near Current Levels (NPS Preferred Alternative)	Alt 3: Allow for Increased Use	Alt 4: Reduce Development and Commercial Services	Alt 5: Reduce Use
	N/A	**Stock Use -** Visitors would have opportunities to travel with stock, from day rides to multi-day trips, in a manner that is compatible with the protection of wilderness character. Grazing and stock access would be managed to protect wilderness character and reduce conflict with other wilderness visitors. Under this alternative, the number of meadows available to grazing would be reduced.	**Stock Use -** Visitors would have opportunities to travel with stock, from day rides to multi-day trips, in a manner that is compatible with the protection of wilderness character. Grazing and stock access would be managed to protect wilderness character and reduce conflict with other wilderness visitors. Under this alternative, increased visitor use would result in a need for more stock structures and closure of selected off-trail grazing areas in order to protect resources.	**Stock Use -** Visitors would have opportunities to travel with stock, from day rides to multi-day trips, in a manner that is compatible with the protection of wilderness character. To support the self-reliant aspect of this alternative, off-trail access would be limited to private stock, drift fences and hitch rails would be removed, and no grazing would be permitted (carry all feed).	**Stock Use -** Visitors would have opportunities to travel with stock, from day rides to multi-day trips, in a manner that is compatible with the protection of wilderness character. Grazing and stock access would be managed to protect wilderness character and reduce conflict with other wilderness visitors. In areas where stock would be permitted, fewer restrictions would be needed to protect wilderness character given the lower levels of visitor use in this alternative. Off-trail areas would not be open to stock.

Table B-3: Alternatives Concepts and Objectives (continued)

	Alt 1: No-action / Status Quo	Alt 2: Use Levels Near Current Levels (NPS Preferred Alternative)	Alt 3: Allow for Increased Use	Alt 4: Reduce Development and Commercial Services	Alt 5: Reduce Use
	N/A	**Commercial Services** - Commercial services would be performed to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas. Commercial services would support visitor use and enjoyment of wilderness in a variety of appropriate ways. Visitors with diverse backgrounds and skill levels would be encouraged to experience wilderness and to explore primitive recreation activities such as hiking, backpacking, stock trips, fishing, over-snow travel, or mountaineering, or to build skills in these activities. In order to protect wilderness character, commercial services would be reduced in the very popular Mount Whitney Management Area.	**Commercial Services -** Commercial services would be allowed to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas. Commercial services would support visitor use and enjoyment of wilderness in a variety of appropriate ways. Visitors with diverse backgrounds and skill levels would be encouraged to experience wilderness and to explore primitive recreation activities such as hiking, backpacking, stock trips, fishing, over-snow travel, or mountaineering, or to build skills in these activities. The availability of commercial support would be allowed to expand commensurate with potentially higher levels of visitor use.	**Commercial Services -** Commercial services would be allowed to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas. Commercial services would support visitors in limited ways and circumstances in order to emphasize the self-reliant aspect of wilderness character.	**Commercial Services -** Commercial services would be allowed to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas. Commercial services would support visitor use and enjoyment of wilderness in a variety of appropriate ways. Visitors with diverse backgrounds and skill levels would be encouraged to experience wilderness and to explore primitive recreation activities such as hiking, backpacking, stock trips, fishing, over-snow travel, or mountaineering, or to build skills in these activities. The types of commercial support would be similar to current conditions, but the lower overall levels of visitor use would result in lower overall levels of commercial support.

Table B-4: Visitor Capacities and Relationship to Commercial Services

	Alternative 1: No-action / Status Quo	Alternative 2: Use Levels Near Current Levels (NPS Preferred Alternative)	Alternative 3: Allow for Increased Use	Alternative 4: Reduce Development and Commercial Services	Alternative 5: Reduce Use
Visitor Capacity **VUD = visitor use day(s)** **(Also, see "Appendix A: Visitor Capacity")**	Current Conditions show an average of ~23,000 visitors/Year and ~111,000 Visitor Use Days(VUD)/ Year [This does not include PCT, JMT, and other park wilderness users who obtain wilderness permits from sources other than the parks and local US Forests (Inyo, Sequoia, and Sierra), such as Yosemite NP, and the Pacific Crest Trail Association.]	Alternative 2 would have overall visitor use levels similar to alternative1, but with some specific areas targeted for reductions and other areas allowed to increase if visitation patterns shift. However, overall use-levels would remain near alternative1 averages. Use data shows that visitation levels also fluctuate from year to year by as much as 20% above or below the annual averages, based on permit data and best professional judgment. Alternative 2 would have an estimate of a "maximum" of 134,000 VUDs (based on a 20% fluctuation over the current average annual VUD of 111,000) with annual average of approximately 108-114,000 VUD.	Alternative 3 would allow for an increase of around 30% from current visitor use levels to averages of: - visitors = ~30,000, and - VUD = ~141-147,000 (would allow fluctuations of about 15-20% above and below the "average") An estimate of a maximum of 175,000 VUDs with annual average of 141-147,000 VUD.	Alternative 4 would reduce visitor use levels from alternative1 levels by ~ 5%. Adjusted averages would be: - visitors =~22,000 - VUD =~102,500-108,500 (would allow fluctuations of about 15-20% above and below the "average") An estimate of a maximum of 127,000 VUDs with annual average of 102,500-108,500 VUD.	Alternative 5 would reduce current visitor use levels from alternative1 levels by ~ 30%. Adjusted averages would be: - visitors =~16,500 - VUDs =~74,700-80,700 (would allow fluctuations of about 15-20% above and below the "average") An estimate of a maximum of 93,300 VUDs with annual average of 74,700-80,700 VUD.

Table B-4: Visitor Capacities and Relationship to Commercial Services (continued)

	Alternative 1: No-action / Status Quo	Alternative 2: Use Levels Near Current Levels (NPS Preferred Alternative	Alternative 3: Allow for Increased Use	Alternative 4: Reduce Development and Commercial Services	Alternative 5: Reduce Use
Activities supported by commercial services (either by Concessioner or CUA holder) **[CUA = Commercial Use Authorization (e.g., permit)]**	Backpacking and hiking Stock trips (day rides, overnight, traveling) Stock spot and dunnage Skiing and snowshoeing Mountaineering (summer and winter)	Backpacking and hiking Stock trips (day rides, overnight, traveling) Overnight camping – gear support (porters, stock spot and dunnage) Oversnow travel (skiing, snowshoeing, and winter camping) Climbing and mountaineering (summer and winter) Fishing River running Photography	Backpacking and Hiking Stock trips (day rides, overnight, traveling) Overnight camping – gear support (porters, stock spot and dunnage) Oversnow travel (skiing, snowshoeing, and winter camping) Climbing and mountaineering. (summer and winter) Fishing River running Photography	Backpacking and Hiking Stock trips (overnight, traveling) Overnight camping – gear support (porters, stock spot and dunnage) Oversnow travel (snowshoeing, skiing, and winter camping) Climbing and mountaineering. (summer and winter) **The following would be discontinued:** - stock day rides - day-trips into wilderness, that is, where visitor/client enters and leaves wilderness without spending the night (non-stock) for any purpose (e.g., fishing, hiking, climbing) No additional activities would be supported by commercial services based on the overall goals of this alternative. This alternative promotes self-reliance; therefore a reduction in the types of activities would be appropriate.	Backpacking and Hiking Stock trips (day rides, overnight, traveling) Overnight camping – gear support (porters, stock spot and dunnage) Oversnow travel (skiing, snowshoeing, and winter camping) Climbing and mountaineering. (summer and winter) Fishing River running Photography

Table B-4: Visitor Capacities and Relationship to Commercial Services (continued)

	Alternative 1: No-action / Status Quo	Alternative 2: Use Levels Near Current Levels (NPS Preferred Alternative	Alternative 3: Allow for Increased Use	Alternative 4: Reduce Development and Commercial Services	Alternative 5: Reduce Use
Use levels of activities that commercial services could support	Current Visitor Use Days (VUD) average 111,000 per year. Current Commercial Service Days (CSD) are near 7,500 per year. Comparing this data provides an observed ratio of CSDs to VUDs of approximately 6.8% (though these numbers are comparative only and not directly linked). Of note is that the 4 years sampled for CSDs (with good quality data), were among the lowest for commercial stock use over the past 30 years.	Overall commercial service levels would be limited to near what has occurred in the recent past. The exception is the Mount Whitney Management Area, where commercial service levels would be reduced. These changes would be consistent with the desired conditions for this alternative. To summarize, under alternative 2: • Visitors with diverse backgrounds and skill levels could experience wilderness and engage in activities such as hiking, backpacking, stock trips, fishing, over-snow travel, or mountaineering, or build skills in these activities • Visitors could choose their own camping locations • Visitors could travel with stock, from day rides to multi-day trips • Visitors could use and enjoy wilderness in a variety of appropriate ways. Data available is best for the 4-year period of 2010-2013. During that time there were approximately 6,500 commercial service days on average, with a high near	Commercial service levels would be allowed to increase proportionally with the potential increase in overall use (VUDs). With this alternative allowing up to a 30% increase in overall VUDs, this could result in a proportional increase in CSDs. These changes would be consistent with the desired conditions for this alternative. To summarize, under Alternative 3: • Visitors with diverse backgrounds and skill levels could experience wilderness and engage in activities such as hiking, backpacking, stock trips, fishing, over-snow travel, or mountaineering, or build skills in these activities • Visitors could choose their own camping locations • Visitors could travel with stock, from day rides to multi-day trips • Visitors could use and enjoy wilderness in a variety of appropriate ways. • Visitors would have more opportunities to obtain permits for overnight use	Commercial service levels would be notably reduced, percentage wise compared to VUDs, from current levels. CSD levels would be reduced by about 45% of current levels, and would also be subject to site-specific reductions / prohibitions in order to control impacts in high-use areas. This alternative would notably reduce CSDs, by approximately 45% from alternative1 levels, whether or not demand was present. These changes would be consistent with the desired conditions for this alternative. To summarize, under alternative 4: • Visitors would have access to limited amounts and types of commercial support • Visitors could choose camping locations they could reach self-reliantly • Few visitors could travel with stock • Visitors could use and enjoy wilderness in a variety of appropriate ways if they could provide the necessary skills, knowledge, and	Commercial service levels would be reduced, proportionally, to that of allowed VUDs. CSD levels would be allowed near current percentages of VUD and would also be subject to site-specific reductions / prohibitions in order to control impacts in high-use areas. This alternative would provide for a reduction of overall VUDs. CSDs would also be proportionally reduced, whether or not demand was present. These changes would be consistent with the desired conditions for this alternative. To summarize, under alternative 5: • Visitors with diverse backgrounds and skill levels could experience wilderness and engage in activities such as hiking, backpacking, stock trips, fishing, over-snow travel, or mountaineering, or build skills in these activities • Visitors could choose their own camping locations • Visitors could travel with stock, from day rides to multi-day trips

Table B-4: Visitor Capacities and Relationship to Commercial Services (continued)

	Alternative 1: No-action / Status Quo	Alternative 2: Use Levels Near Current Levels (NPS Preferred Alternative	Alternative 3: Allow for Increased Use	Alternative 4: Reduce Development and Commercial Services	Alternative 5: Reduce Use
		7,500. CSDs in high-use areas would be subject to additional site-specific reductions / prohibitions in order to reduce or control impacts in these areas. This alternative would allow overall CSDs of near current to slightly increased versus current levels, and would limit (via location, percentage, and absolute numbers) any increase in CSDs in highest use areas, whether or not demand was present.	CSDs in high-use areas would be subject to additional site-specific reductions / prohibitions in order to reduce or control impacts in these areas. This alternative would allow a proportional increase in overall CSDs, but would limit (via location, percentage, and absolute numbers) any increase in CSDs in highest use areas, whether or not demand was present.	equipment without commercial support	• Visitors could use and enjoy wilderness in a variety of appropriate ways. • Visitors would have fewer opportunities to obtain permits for overnight use
Visitor capacity standards that ensure Wilderness Character is preserved (applies to all visitors, of which commercially supported visitors make up the stated percent)		Maximum permitted Proportion of Commercial Support: ~7.6%	Maximum permitted Proportion of Commercial Support: ~7.6%	Maximum permitted Proportion of Commercial Support: ~4.2%	Maximum permitted Proportion of Commercial Support: ~7.6%
		Campsite Condition Standard (WVCM): High Use – 1000 Moderate Use – 500 Low Use – 250 Consequences for Wilderness Character: Research conducted in 2009 (Cole) indicates widespread improvement in campsite condition since the time of designation. These standards would maintain current, high-quality conditions throughout the wilderness. Improved conditions would result from management	Campsite Condition Standard (WVCM): High Use – 1300 Moderate Use – 650 Low Use – 325 Consequences for Wilderness Character: These standards would potentially allow for greater campsite impacts than exist under current conditions, but given current trends in visitor use, high-quality conditions throughout the wilderness are expected to remain. Improved conditions would result from management action at	Campsite Condition Standard (WVCM): High Use – 950 Moderate Use – 475 Low Use – 235 Consequences for Wilderness Character: Research conducted in 2009 (Cole) indicates widespread improvement in campsite condition since the time of designation. These standards would maintain current, high-quality conditions throughout the wilderness. Improved conditions would result from management	Campsite Condition Standard (WVCM): High Use – 700 Moderate Use – 350 Low Use – 175 Consequences for Wilderness Character: Research conducted in 2009 (Cole) indicates widespread improvement in campsite condition since the time of designation. These standards would maintain current, high-quality conditions throughout the wilderness. Improved conditions would result from management

Table B-4: Visitor Capacities and Relationship to Commercial Services (continued)

	Alternative 1: No-action / Status Quo	Alternative 2: Use Levels Near Current Levels (NPS Preferred Alternative	Alternative 3: Allow for Increased Use	Alternative 4: Reduce Development and Commercial Services	Alternative 5: Reduce Use
		action at Guitar Lake, Kern Hot Springs, and Shepherd Pass Lake. See WSP/FEIS chapters 2 and 4 and "Appendix A: Visitor Capacity."	Guitar Lake and Shepherd Pass Lake. See WSP/FEIS chapters 2 and 4 and "Appendix A: Visitor Capacity."	action at Guitar Lake, Kern Hot Springs, Hockett Meadow, and Shepherd Pass Lake. See WSP/FEIS chapters 2 and 4 and "Appendix A: Visitor Capacity."	action at LeConte Ranger Station, Middle Dusy Basin, Lower Dusy lakes, Lakes above Tyndall, Guitar Lake, Kern Hot Springs, Simpson Junction, 11,393 Lakes, South Dusy Lakes, Atwell-Hockett Trail, Hockett Meadow, and Shepherd Pass Lake. See WSP/FEIS chapters 2 and 4 and "Appendix A: Visitor Capacity."
		Trail Encounter Frequency Standard (# of encounters per hour on 90% of quota season days): Very High – 45 High – 25 Moderate – 15 Low – 6	**Trail Encounter Frequency Standard (# of encounters per hour on 90% of quota season days):** Very High – 59 High – 33 Moderate – 20 Low – 8	**Trail Encounter Frequency Standard (# of encounters per hour on 90% of quota season days):** Very High – 43 High – 24 Moderate – 14 Low – 5	**Trail Encounter Frequency Standard (# of encounters per hour on 90% of quota season days):** Very High – 25 High – 18 Moderate – 11 Low – 4
		Consequences for Wilderness Character: Recent social science research (Martin and Blackwell 2013) suggest that almost all visitors encounter other visitors during their wilderness trips, but a majority of visitors stated that these encounters neither added nor detracted from the quality of their visit. These standards would ensure that encounter frequencies in most wilderness areas	**Consequences for Wilderness Character:** These standards would potentially allow for encounter frequencies higher than under current conditions, but given current trends in visitor use, high-quality conditions in most parts of wilderness are expected to remain. Improved opportunities for solitude would result from management action at Roads End, Rae Lakes, and Evolution Basin &	**Consequences for Wilderness Character:** These standards would ensure that encounter frequencies in most wilderness areas would remain near current conditions. Improved opportunities for solitude would result from management action at Mount Whitney, Roads End, Rae Lakes/JMT, Evolution Basin & Valley, Rae Lakes/JMT, Mount Langley Approach, Rae Lakes Loop-	**Consequences for Wilderness Character:** These standards would ensure that encounter frequencies in most wilderness areas would remain near current conditions. Improved opportunities for solitude would result from management action at Mount Whitney, Roads End, Lakes Trail, Mineral King, Evolution Basin & Valley, Rae Lakes/JMT, Mount Langley Approach, Rae

Table B-4: Visitor Capacities and Relationship to Commercial Services (continued)

	Alternative 1: No-action / Status Quo	Alternative 2: Use Levels Near Current Levels (NPS Preferred Alternative	Alternative 3: Allow for Increased Use	Alternative 4: Reduce Development and Commercial Services	Alternative 5: Reduce Use
		would remain near current conditions. Improved opportunities for solitude would result from management action at Mount Whitney Roads End, Rae Lakes/JMT, Evolution Basin & Valley, Mount Langley Approach, and Crabtree Ranger Station to Trail Crest.	Valley.	Lower, and Crabtree Ranger Station to Trail Crest.	Lakes Loop-Lower, Dusy Basin, West Side Kearsarge, and Crabtree Ranger Station to Trail Crest.
		Grazing Standards: See appendix D for specific grazing standards. **Consequences for Wilderness Character:** Meadow specific grazing capacities would limit impacts to the natural quality of wilderness throughout the parks. Stock would have access to 46% of meadows in wilderness, as compared to 51% under current conditions, thus improving the natural quality of wilderness.	**Grazing Standards:** See appendix D for specific grazing standards. **Consequences for Wilderness Character:** Meadow specific grazing capacities would limit impacts to the natural quality of wilderness throughout the parks. Stock would have access to 37% of meadows in wilderness, as compared to 51% under current conditions, thus improving the natural quality of wilderness.	**Grazing Standards:** See appendix D for specific grazing standards. **Consequences for Wilderness Character:** Grazing would not be permitted. Natural conditions would improve in meadows currently subject to grazing use.	**Grazing Standards:** See appendix D for specific grazing standards. **Consequences for Wilderness Character:** Meadow specific grazing capacities would limit impacts to the natural quality of wilderness throughout the parks. Stock would have access to 36% of meadows in wilderness, as compared to 51% under current conditions, thus improving the natural quality of wilderness

NOTES:

The above VUD calculations did not include use of the parks by visitors who obtained their wilderness permits from sources other than the parks or local US Forests (Inyo, Sequoia, and Sierra). These visitors could have originated from multiple starting points, including points north and south on the Pacific Crest Trail, John Muir Trail, or others. They could have been issued wilderness permits from various other entities, including Yosemite NP and the Pacific Crest Trail Association. However, in the rare event that a visitor permitted by a park, forest, or other permitting agency used a commercial service provider authorized to operate in the parks' wilderness, that commercial support would be subject to the Commercial Service Day allocation. See additional information on wilderness visitor use in "Appendix A: Visitor Capacity".

Table B-5: Current Visitor Use levels, Current Commercial Service Levels and Proposed Commercial Service Allocations

		Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
		Current Visitor Use Levels **data is for 4 years - 2010-2013**	**Proposed Visitor Capacity**	**Proposed Visitor Capacity**	**Proposed Visitor Capacity**	**Proposed Visitor Capacity**
	Total Visitor Use Days – by overnight users, both private and supported by Commercial Services (this does not take into account use by PCT and JMT users that are not recorded by the parks wilderness permit system, or day-use visitors)	109,815 - high 108,167 - average	111,000 average 134,000 estimated maximum	144,000 average 175,000 estimated maximum	105,500 average 127,000 estimated maximum	77,700 average 93,300 estimated maximum
			PROPOSED ALLOCATIONS BY ACTION ALTERNATIVE IN COMMERCIAL SERVICE DAYS (CSDs)			
	Total Allocation for All Commercial Services Combined – for overnight and day use, Non-Stock and Stock based.	**Commercial Service Days (CSDs):** CSDs for All (w/day): 7,474 - high 6,550 – average	For All, day and overnight, Non-Stock and Stock based. 8,400 CSDs*	For All, day and overnight, Non-Stock and Stock based. 10,920 CSDs*	For All, day and overnight, Non-Stock and Stock based. 4,390 CSDs*	For All, day and overnight, Non-Stock and Stock based. 5,880 CSDs*
Wilderness-Wide: Activities that are supported by commercial services that are *Non-Stock* based. Allocated CSDs can be used anywhere/ anytime, except in the Mount Whitney Management Area during the wilderness permit quota period. (from the Friday of Memorial Day Weekend to September 30)	▪ Backpacking and Hiking Trips ▪ Overnight Camping - gear support by porters– year round ▪ Climbing and Mountaineering (summer and winter)* ▪ Over-snow Travel (ski and snowshoe touring and winter camping – winter only fishing ▪ River Running ▪ Photography	**Commercial Service Days Supported by *Non-stock* providers:** CSDs for all visitors (w/day): 4,675 - high 4,063 – average	For All, day and overnight, Non-Stock based services. 5,040 CSDs	For All, day and overnight, Non-Stock based services. 6,550 CSDs	For All, day and overnight, Non-Stock based services. 2,630 CSDs	For All, day and overnight, Non-Stock based services. 3,530 CSDs

Table B-5: Current Visitor Use levels, Current Commercial Service Levels and Proposed Commercial Service Allocations (continued)

		Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Mt. Whitney Management Area (see map below)**:** **Activities supported by commercial services that are *Non-Stock* based. (excludes Fishing, River- running, and Photography)** **NOTE:** These are the only allocations that may be used for non-stock based services in the Mount Whitney Management Area as defined by the map below during the wilderness permit quota period. These allocations are a part of, not in addition to, the overall Non-Stock CSDs above.		**Commercial Service Days Supported by *Non-Stock* providers:** CSDs for All (w/day): 1,346 - high 1,062 – average	Of the above allocation for Non-Stock Services, the level which can occur in the Mt. Whitney Management Area 930 CSDs	Of the above allocation for Non-Stock Services, the level which can occur in the Mt. Whitney Management Area 1,210 CSDs	Of the above allocation for Non-Stock Services, the level which can occur in the Mt. Whitney Management Area 490 CSDs	Of the above allocation for Non-Stock Services, the level which can occur in the Mt. Whitney Management Area 650 CSDs
Wilderness-Wide: Activities supported by commercial services that are *Stock* based. Allocated CSDs can be used anywhere/anytime, except in the Mt. Whitney Management Area during the wilderness permit quota period.	▪ Stock trips - Riding, packing, day rides and overnight camping with stock ▪ Overnight Camping - gear support, including stock spot and dunnage	**Commercial Service Days Supported by *Stock* providers:** CSDs for All(w/day): 3,110 - high 2,487 – average	For all, day and overnight Stock based 3,360 CSDs	For all, day and overnight Stock based 4,370 CSDs	For all, day and overnight Stock based 1,760 CSDs	For all, day and overnight Stock based 2,350 CSDs

Table B-5: Current Visitor Use levels, Current Commercial Service Levels and Proposed Commercial Service Allocations (continued)

		Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Mt. Whitney Management Area: **Activities supported by commercial services that are *Stock* based.** **NOTE:** These are the only allocations that may be used for Stock-based services in the Mt. Whitney Management Area during the wilderness permit quota period. These allocations are a part of, not in addition to, the overall Stock CSDs above.		**Commercial Service Days Supported by *Stock* providers:** CSDs for All(w/day): 635 – high 521 – average	Of the above Stock allocation, the level which can occur in the Mt. Whitney Management Area 500 CSDs	Of the above Stock allocation, the level which can occur in the Mt. Whitney Management Area 650 CSDs	Of the above Stock allocation, the level which can occur in the Mt. Whitney Management Area 260 CSDs	Of the above Stock allocation, the level which can occur in the Mt. Whitney Management Area 350 CSDs

* The overall allocations of all commercial services wilderness-wide for alternatives 2-5, have been established at 12% over the highest years' use of the 4-year period of 2010-2013. It is known that current data collection methods have not been capable of completely documenting all commercial services that were provided during those 4 years, and therefore underestimate actual commercial use levels. With the implementation of this WSP, additional data collection methods will be established that provide more accurate information and ensure that allocations are not exceeded. Also, the 4-year period of best data, 2010-2013, is known to have been a period of relatively low commercial services due to a very heavy snow year in 2010 (which delays wilderness entry, due to snow on passes, to later in the season), followed by 3 drought years (which allow for early entry, but low water then shortens the primary use season). These factors are confirmed by more accurate data from annual stock use, which shows that 2012 was the 2nd lowest, 2011 was the 3rd lowest, 2013 was the 4th lowest, and 2010 was the 8th lowest commercial stock use years of the last 3 decades (Frenzel, E. and S. Haultain 2014). An informed estimate to compensate for these factors which allows for a more accurate baseline of typical commercial service levels is to estimate typical use by adjusting the high use year by 12%. This factor has been applied to the overall allocations for all commercial services wilderness-wide. The factor of 12% was selected as a reasonable estimate of unreported/unrecorded commercially supported services and also relates to the anomaly of the low stock use in those years used for comparative data (e.g., annual stock use nights from 2006-2009 was 3,150, and from 2010-2013 was 2,497, a 21% reduction).

HOW ALLOCATION NUMBERS FOR CSDS ABOVE WERE CALCULATED

- Total Visitor Use Day capacities – as stated in "Appendix A: Visitor Capacity."
- Total Allocation calculations of CSDs for all Commercial Services combined:
  - Baselines were calculated based on the observed total of all commercially-supported use during the highest year from 2010-2013 data, which equals 7,474, rounded to 7,500, and representing a baseline proportion of commercial support to visitor use days (111,000) of approximately 6.8%. This is then adjusted up by 12% to account for the known low sample data to establish a baseline commercial annual allocation maximum of 8,400 CSDs.
  - Under alternative 2, the parks would adopt a maximum allocation level equal to the baseline of 8,400 CSDs, and maintain a commercial support proportion of overall visitation of approximately 7.6%.
  - Under alternative 3, this baseline of 8,400 would be multiplied by 1.3 to allow for an increase in visitor use by up to 30% while maintaining a commercial support proportion of overall visitation of approximately 7.6%, resulting in 10,920 CSDs.
  - Under alternative 4, the baseline of 8,400 would be multiplied by 0.95 (to adjust for the limited decrease of 5% in visitor use) to 7,980, and then multiplied by .55 to provide for the notable reduction (45%), in commercial support in this alternative to 4,390 CSDs (rounded up from 4,389), and to reduce the proportion of commercially supported visitors to approximately 4.2% of overall visitation.
  - Under alternative 5, the baseline of 8,400 would be multiplied by 0.7 to allow for a decrease in visitor use of 30% while maintaining a commercial support proportion of overall visitation of approximately 7.6%, resulting in 5,880 CSDs.
- Allocation calculations for wilderness-wide Non-Stock CSDs:
  - The figures in each of the alternatives are equal to 60% of Total CSDs for that alternative (rounded):
    - Alternative 2 = 5,040 CSDs (60% of 8,400)
    - Alternative 3 = 6,550 CSDs (60% of 10,920)
    - Alternative 4 = 2,630 (60% of 4,390)
    - Alternative 5 = 3,530 (60% of 5,880)
  - The calculation of 60% of all CSDs allotted to Non-stock commercial services is based on current and past use levels, and has proven to be at a level that provides for visitor use and enjoyment of wilderness, supports activities that realize the recreational and other purposes of wilderness, and allows for the preservation of wilderness character (see WSP/EIS, chapter 4).
- Allocation calculations for wilderness-wide Stock CSDs:
  - The figures in each of the alternatives are equal to 40% of Total CSDs for that alternative (rounded):
    - Alternative 2 = 3,360 CSDs (40% of 8,400)
    - Alternative 3 = 4,370 CSDs (40% of 10,920)

        - Alternative 4 = 1,760 (40% of 4,390)
        - Alternative 5 = 2,350 (40% of 5,880)
    - The calculation of 40% of all CSDs being allotted to Stock commercial services is based on current and past use levels, and has proven to be at a level that provides for visitor use and enjoyment of wilderness, supports activities that realize the recreational and other purposes of wilderness, and allows for the preservation of wilderness character (see WSP/EIS, chapter 4).

- Allocation calculations for Mount Whitney Management Area:
    - CSDs for the Mount Whitney Management Area are based on achieving a 10 % reduction of commercial service supported use of the area. The reduction is based on the combined averages of non-stock (1,062 CSDs/yr) and stock (521 CSDs/yr) use of 1,583 CSDs/yr from the four year period of 2010-2013. The baseline allowable level of CSDs for the Mount Whitney Management Area of 1,425 is determined by multiplying 1,583 by 0.9. The allowable baseline level of 1,425 CSDs/yr is allocated as described below.
        - Non-stock CSDs in the Mount Whitney Management Area will be allowed to consist of 65% of the baseline use level determined above. By multiplying the 1,425 overall CSD baseline by 0.65, a non-stock baseline of 930 CSD is derived (rounded up from 926). This non-stock baseline is then applied to each of the alternatives below:
            - Alternative 2, adopt baseline of 930 CSDs.
            - Alternative 3, multiply baseline of 930 by 1.3 to provide for an increase of 30% (adjust for the increase in visitor capacity) to 1,210 CSDs.
            - Alternative 4, multiply baseline of 930 by 0.95 (to adjust for the limited decrease, 5%, in visitor capacity) to 885, and then multiply by 0.55 (to provide for the specific notable reduction, 45%, to commercial services in this self-reliant emphasizing alternative) to 490 CSDs (rounded up from 487).
            - Alternative 5, multiply baseline of 930 by 0.7 to provide for a decrease of 30% (adjust for the decrease in visitor capacity) to 650 CSDs.
        - Stock CSDs in the Mount Whitney Management Area will be allowed to consist of 35% of the baseline use level determined above. By multiplying the 1,425 overall CSD baseline by 0.35, a stock baseline of 500 CSD is calculated (rounded up from 499). This stock baseline is then applied to each of the alternatives below:
            - Alternative 2, adopt baseline of 500 CSDs.
            - Alternative 3, multiply baseline of 500 by 1.3 to provide for an increase of 30% (to adjust for the increase in visitor capacity) to 650 CSDs.
            - Alternative 4, multiply baseline of 500 by 0.95 (to adjust for the limited decrease, 5%, in visitor capacity) to 475, and then multiply by .55 (to provide for the specific notable reduction, 45%, to commercial services in this self-reliant emphasizing alternative) to 260 CSDs (rounded down from 261).
            - Alternative 5, multiply baseline of 500 by 0.7 to provide for a decrease of 30% (to adjust for the decrease in visitor capacity) to 350 CSDs.

Monitoring and analysis of the established process of managing commercial services in wilderness will be conducted by the parks' staff in response to changes that occur during the life of the Wilderness Stewardship Plan. Depending on the nature of changes that occur, the National Park Service would take additional actions consistent with the management directions in the WSP in regards to the management of commercial services in wilderness. In all cases, appropriate environmental compliance and public involvement would occur, as necessary, when corrective actions are taken. Possible adjustments may include, but are not limited to:

- Group size limits, client-to guide ratios, number of trips, allocation of use and locations of use available to commercial services providers may be revised in response to new information, such as assessments of impacts to environmental and social conditions (especially as related to visitor capacity standards) and changes in the parks' programs.
- The number of commercial service providers may be limited.
- Approved activities, if found incompatible with resource protection, visitor enjoyment, and / or safety, may be suspended or terminated.
- The limits on commercial services imposed by this plan will be reassessed and/ or recalculated when significant changes in use patterns occur. Actions that may affect this process are:
    - Changes in visitor use travel patterns that would affect the results of an Extent Necessary Determination.
    - Extent Necessary methodology will be reevaluated using improved data that will be collected in the future.

Bearpaw Meadow High Sierra Camp and the Pear Lake Ski Hut offer overnight lodging in designated potential wilderness addition areas of these parks. When Congress designated the Sequoia-Kings Canyon Wilderness in 1984, it allowed the continuation of these facilities as non-conforming uses and designated the areas they occupy as potential wilderness additions. These seasonal facilities offer rustic lodging, and at Bearpaw Meadow High Sierra Camp, meal service (to guests and employees). Due to their special status as congressionally authorized non-conforming uses, this Extent Necessary Determination treats these facilities separately from the parks' concessioners and CUA holders who provide commercial services to visitors using designated wilderness.

The Congressionally authorized Bearpaw Meadow High Sierra Camp (lodging and meal service) is run through a long-term Concession Contract with DNC Parks and Resorts at Sequoia. This facility has a seven year (2006 -2012) avg. of 1,497 VUD/yr. This allowed seasonal commercial entity would continue to operate at its established capacity of approximately 1,700 Visitor Use Days per year (June through September) and to continue its current levels and types of resupply activities. Services at and resupply trips to the Bearpaw Meadow High Sierra Camp are not included in the calculations and limitations in table B-5 because these activities are not commercial services provided to visitors in designated wilderness and have been expressly allowed per Congressional direction.

The Congressionally allowed operation of the Pear Lake Ski Hut (lodging service) is conducted through an agreement between the NPS and Sequoia Natural History Association. This entity has a 5 year (2008/2009 – 2012/2013) avg. of 1,220 VUD/yr. This seasonal commercial operation would continue at its established capacity of approximately 1,500 Visitor Use Days per year (December through April). Services provided at Pear Lake Ski Hut are not included in the calculations or limitations in table B-5.

SECTION V: SUMMARY

SUMMARY OF ALTERNATIVE 2

Alternative 2 would seek to provide opportunities for visitors to enjoy a range of proper activities similar to existing conditions, except in areas of higher use and impact where site-specific actions would be taken to improve wilderness character. These site-specific actions would include reducing the availability of commercial support in the Mount Whitney Management Area, as well as many other site-specific restrictions that would apply to all visitors regardless of commercial support (see WSP chapter 2). Of special note are changes in the way that stock parties are regulated, since stock parties often involve commercial support. Collectively, the combination of proposed visitor capacity, regulation of visitor use, and commercial service allocation would result in conditions that preserve wilderness character, with some improvement of wilderness character in high use areas relative to current conditions. This determination is based on a variety of recent research that shows that past and current management has been successful in protecting wilderness character. This research includes studies of current visitor experiences, visitor effects on bighorn sheep, visitor effects on water quality, visitor effects on meadow condition, and visitor effects on campsite conditions. These studies show good to excellent resource conditions in most of the wilderness with very few limited site-specific exceptions. For some resources, such as meadow and campsite condition, the impacts of past use are measurable (primarily from many decades ago), but the current trend is towards improving conditions. Alternative 2 would focus management actions on site-specific resource impacts in order to improve the overall condition of wilderness character. A complete discussion of the environmental consequences of alternative 2 on Wilderness Character is included in the WSP/FEIS "Chapter 4: Environmental Consequences."

The commercial service levels proposed in table B-5 have been determined to be appropriate to achieve the objectives of alternative 2, which include the preservation of wilderness character. Namely, these commercial service levels are necessary to ensure that visitors have sufficient freedom to choose camping locations and camping styles that allow them to use and enjoy wilderness and realize the recreational (or other) purpose of wilderness; ensure that visitors with diverse backgrounds and capabilities are able to access wilderness, develop or expand wilderness skills, and otherwise use and enjoy wilderness; and to ensure that visitors are able to engage in the traditional activity of traveling with stock. Because these opportunities are envisioned to be similar to existing conditions in most areas, commercial allocations are proposed at levels similar to current conditions. The exception is in the Mount Whitney Management Area, where improvements to wilderness character would be achieved in part by reducing the levels of use supported by commercial services.

SUMMARY OF ALTERNATIVE 3

Alternative 3 would seek to provide opportunities for visitors to enjoy a range of proper activities at use levels exceeding current conditions. Actions would be taken to accommodate higher levels of visitor use while protecting the natural quality of wilderness character. These actions would often involve impacts on the undeveloped quality of wilderness and increased regulations, which would impact the unconfined aspect of wilderness character; and higher use levels would directly affect opportunities for solitude. Despite these changes, wilderness character would not be impaired under alternative 3. The conditions that visitors would encounter in terms of development, density of other visitors, naturalness, and freedom from manipulation would be consistent with conditions associated with designated wilderness areas and the requirements of the Act, and would contrast sharply with conditions found in non-wilderness settings. A complete discussion of the environmental consequences of alternative 3 on Wilderness Character is included in the WSP/FEIS "Chapter 4: Environmental Consequences."

The proposed commercial service levels have been determined to be appropriate to achieve the objectives of alternative 3, which include the preservation of wilderness character. Namely, these commercial service levels are necessary to ensure that a larger number of visitors have sufficient freedom to select camping locations and camping styles that allow them to use and enjoy wilderness and realize the recreational (or other) purpose of wilderness; ensure that visitors with diverse backgrounds and capabilities are able to access wilderness, develop or expand wilderness skills, and otherwise use and enjoy wilderness; and to ensure that visitors are able to engage in the traditional activity of traveling with stock. Because these opportunities are envisioned to occur at levels exceeding existing conditions in most areas, commercial allocations are proposed at levels that would exceed current levels of commercial support although the level of support would be proportional to current conditions.

SUMMARY OF ALTERNATIVE 4

Alternative 4 would seek to provide opportunities for visitors to enjoy primarily self-reliant activities; overall use levels would be slightly lower than current conditions, reflecting the decreased availability of commercial support. Actions would be taken to reduce most forms of visitor assistance, including removing developments and decreasing the availability of commercial support, and regulations would be relaxed to improve visitor freedom. Under alternative 4, wilderness character would be preserved in terms of opportunities for solitude and the natural wilderness qualities, and improved in terms of the undeveloped quality and unconfined aspect. This would occur, however, at the expense of the use and enjoyment for certain types of visitors, including those that desire to develop or expand wilderness skills, and those that wish to travel with stock. A complete discussion of the environmental consequences of alternative 4 on Wilderness Character is included in the WSP/FEIS "Chapter 4: Environmental Consequences."

The proposed commercial service levels have been determined to be appropriate to achieve the objectives of alternative 4, which include the preservation of wilderness character. Namely, commercial service support would be available at levels significantly diminished from current conditions, and opportunities for self-selecting camping locations, developing or expanding wilderness skills, and traveling with stock would also be diminished. Commercial allocations are therefore proposed at levels below current conditions.

SUMMARY OF ALTERNATIVE 5

Alternative 5 would seek to provide opportunities for visitors to enjoy a range of proper activities at use levels below current conditions. Actions would be taken to improve opportunities for solitude. Due to lower levels of visitor use, the natural quality of wilderness character would be protected with less reliance on development and regulations; this would improve the undeveloped quality and unconfined aspect of wilderness. However, this would occur at the expense of the use and enjoyment of many visitors, who would face greater competition for permits at many popular trailheads. Wilderness character would be preserved under alternative 5. Visitors able to obtain permits would encounter excellent conditions in terms of all wilderness character qualities. A complete discussion of the environmental consequences of alternative 5 on Wilderness Character is included in the WSP/FEIS "Chapter 4: Environmental Consequences."

The proposed commercial service levels have been determined to be appropriate to achieve the objectives of alternative 5, which include the preservation of wilderness character. Namely, these commercial service levels are necessary to ensure that a smaller number of visitors have freedom to select camping locations and camping styles that allow them to use and enjoy wilderness and realize the recreational (or other) purpose of wilderness; ensure that visitors with diverse backgrounds and capabilities are able to access wilderness, develop or expand wilderness skills, and otherwise use and enjoy wilderness; and to

ensure that visitors are able to engage in the traditional activity of traveling with stock. Because these opportunities are envisioned to occur at levels below existing conditions, commercial allocations are proposed at levels that would also be below current conditions, although the level of support would be proportional to current conditions.

CONCLUSION

The proposed allocation of CSDs in this END would support proper activities at levels (i.e., extent) that will provide for full preservation of wilderness character while ensuring that diverse high-quality wilderness opportunities are available for public enjoyment. The determined CSD levels, for each of alternatives 2, 3 and 5, would allow for commercial services to support no more than 7.6% of anticipated overall visitor capacity averages, and would support only 4.2% of averages for alternative 4. Under all action alternatives and under the agency Preferred Alternative, commercial support would remain relatively uncommon, self-supported visitation would remain the norm, and wilderness character would not be threatened by excessive commercial presence.

Nor would environmental consequences of the proposed level of commercial support threaten wilderness character. The activities that commercial services may support are the same activities that are enjoyed by the non-commercially supported public. Also, the impacts of commercially supported visitors in combination with other visitors have been properly and thoroughly analyzed in the WSP/FEIS "Chapter 4, Environmental Consequences." This analysis shows there will be no meaningful threat to wilderness character as the result of the proposed CSDs in this WSP/FEIS.

The findings of this END are the result of the balancing of multiple relevant factors, including the potential environmental effects of commercially supported visitor use, which are found not to impede the preservation of wilderness character, and the opportunities for public enjoyment that this proposed level of commercial support can provide to wilderness visitors. These findings are consistent with the primary objectives of the Wilderness Act, as stated in Section 2(a): "wilderness areas. . . . shall be administered *for the use and enjoyment of the American people* in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, *the preservation of their wilderness character*. . ." (emphasis added).

Table B-6: Summary of Visitor Capacities, Commercial Service Allocations, and Preservation of Wilderness Character

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Alternative Description	Continue to manage wilderness under the existing Backcountry Management Plan /Stock Use and Meadow Management Plans.	Preserve Wilderness Character with targeted site-specific actions to reduce recreational impacts, particularly in high-use areas.	Maximize visitor use and enjoyment and emphasize the quality of wilderness as a place that provides opportunities for primitive recreation.	Increase the undeveloped and self-reliant qualities of wilderness while protecting the natural quality of wilderness with restrictions on visitor behavior and reduced availability of commercial support.	Increase the opportunities for solitude and unconfined recreation, and protect the natural quality of wilderness by notably reducing visitor use.
Wilderness Character Values					
Natural	No campsite condition standards. Grazing management per Stock Use and Meadow Management Plan.	Campsite Condition Standard (WVCM): High Use – 1000 Moderate Use – 500 Low Use – 250 Meadow-specific grazing capacities (See appendix D)	Campsite Condition Standard (WVCM): High Use – 1300 Moderate Use – 650 Low Use – 325 Meadow-specific grazing capacities (See appendix D)	Campsite Condition Standard (WVCM): High Use – 950 Moderate Use – 475 Low Use – 235 Meadow-specific grazing capacities (See appendix D)	Campsite Condition Standard (WVCM): High Use – 700 Moderate Use – 350 Low Use – 175 Meadow-specific grazing capacities (See appendix D)
Untrammeled	Limited impacts to untrammeled quality would continue from fire management, invasive species management, and various restoration activities.				
Undeveloped	Food-storage boxes retained: 86	Food-storage boxes retained/tested for removal/removed: 48/13/25	Food-storage boxes added: 35	Food-storage boxes removed: 86	Food-storage boxes removed: 86
	Privies and restrooms retained: 23 (21 privies and 2 restrooms)	Privies and restrooms retained/tested for removal/removed: 9/7/7 (and possibly one added)	Privies and restrooms retained: 23	Privies and restrooms removed: 23	Privies and restrooms removed: 23
	Ranger stations and patrol cabins retained: 18	Ranger stations and patrol cabins retained/removed: 17/1	Ranger stations and patrol cabins retained: 18	Ranger stations and patrol cabins retained/removed: 9/9	Ranger stations and patrol cabins retained/removed: 14/4
	Hitch rails and drift fences retained: 106	Hitch rails and drift fences retained/removed: 71/35	Hitch rails and drift fences retained/removed: 87/19	Hitch rails and drift fences removed: 106	Hitch rails and drift fences retained/removed: 60/46

Table B-6: Summary of Visitor Capacities, Commercial Service Allocations, and Preservation of Wilderness Character (continued)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Opportunities for Solitude and Unconfined Recreation	No encounter standards	Trail Encounter Frequency (# of encounters per hour on 90% of quota season days, by encounter class): Very High – 45 High – 25 Moderate – 15 Low – 6	Trail Encounter Frequency (# of encounters per hour on 90% of quota season days, by encounter class): Very High – 59 High – 33 Moderate – 20 Low – 8	Trail Encounter Frequency (# of encounters per hour on 90% of quota season days, by encounter class): Very High – 43 High – 24 Moderate – 14 Low – 5	Trail Encounter Frequency (# of encounters per hour on 90% of quota season days, by encounter class): Very High – 25 High – 18 Moderate – 11 Low – 4
Other (Cultural Resources)	The Bearpaw Meadow High Sierra Camp would continue to be operated by a concessioner of the parks.	The Bearpaw Meadow High Sierra Camp would continue to be operated by a concessioner of the parks as in alternative 1.	The Bearpaw Meadow High Sierra Camp would be retained and would continue to be operated by a concessioner. Some expansion could occur within the existing footprint.	The Bearpaw Meadow High Sierra Camp, including any historic elements, would be removed and the area rehabilitated.	The Bearpaw Meadow High Sierra Camp would be reduced in size and its season of operation would be shortened.
Visitor Capacity					
Annual Visitor Use Days	111,000 (observed three year average 2010-12)	111,000 (estimated average, with annual variation +/- 20%)	144,000 (estimated average, with annual variation +/- 20%)	105,500 (estimated average, with annual variation +/- 20%)	77,700 (estimated average, with annual variation +/- 20%)
Commercial Use Allocation					
Total	NA	~7.6%	~7.6%	~4.2%	~7.6%
Non-stock	NA	~4.6%	~4.6%	~2.5%	~4.6%
Stock	NA	~3%	~3%	~1.7%	~3%

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SECTION VI – MAPS OF MOUNT WHITNEY MANAGEMENT AREA AND OF CURRENT COMMERCIAL SERVICE LEVELS BY TRAVEL ZONE

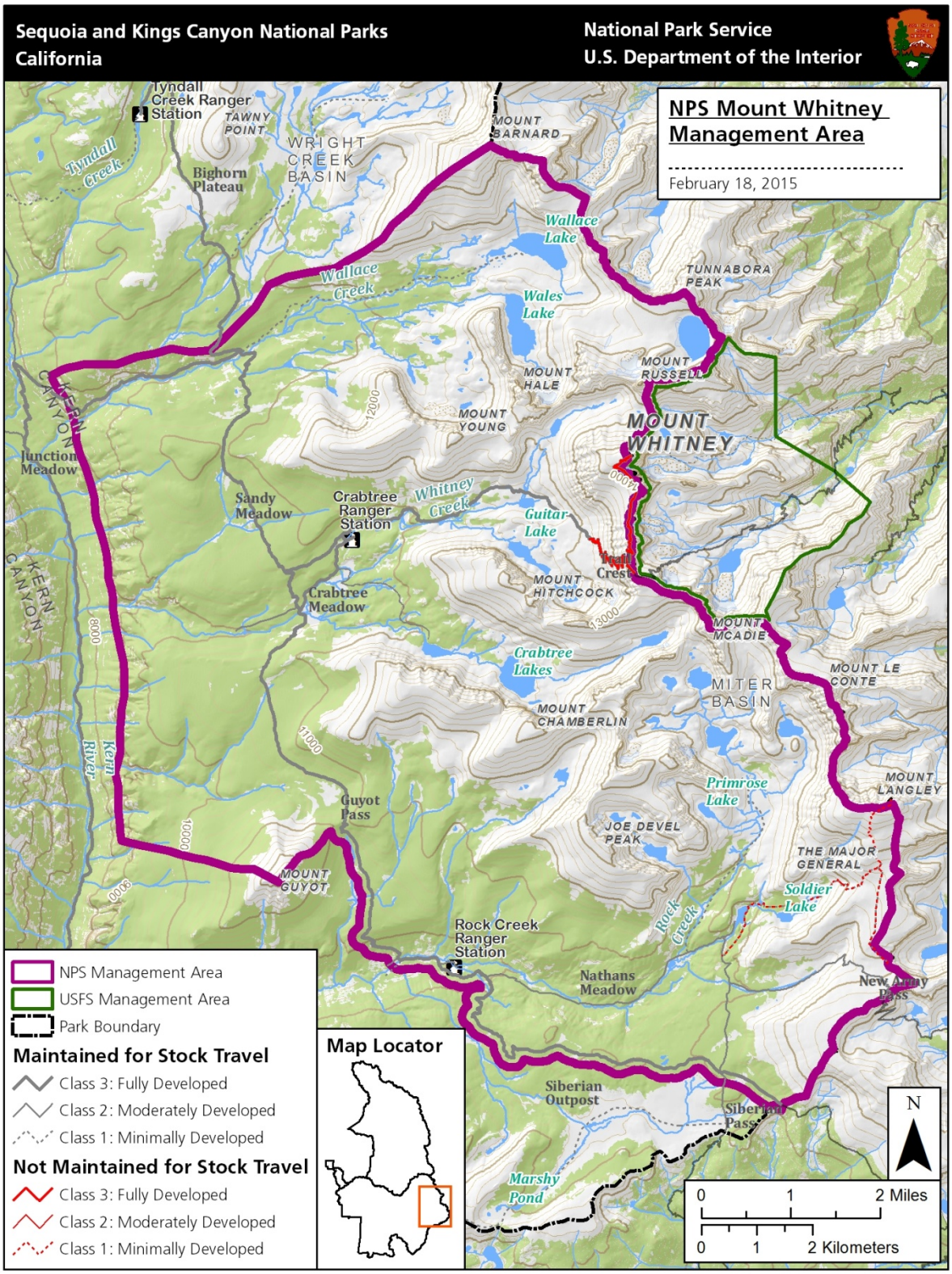

Figure B-1: Mount Whitney Management Area

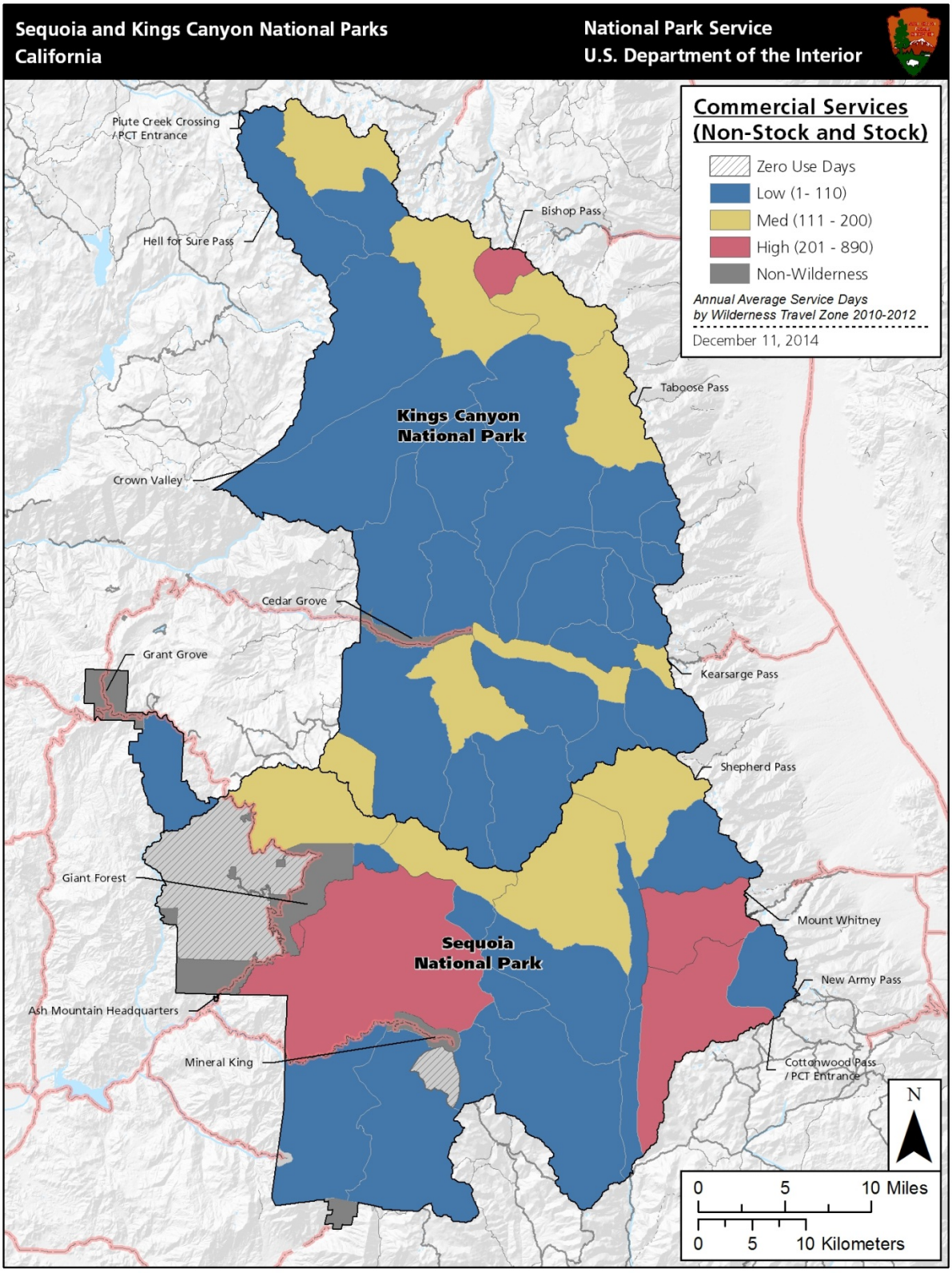

Figure B-2: Combined Non-stock and Stock Commercial Services by Wilderness Travel Zone

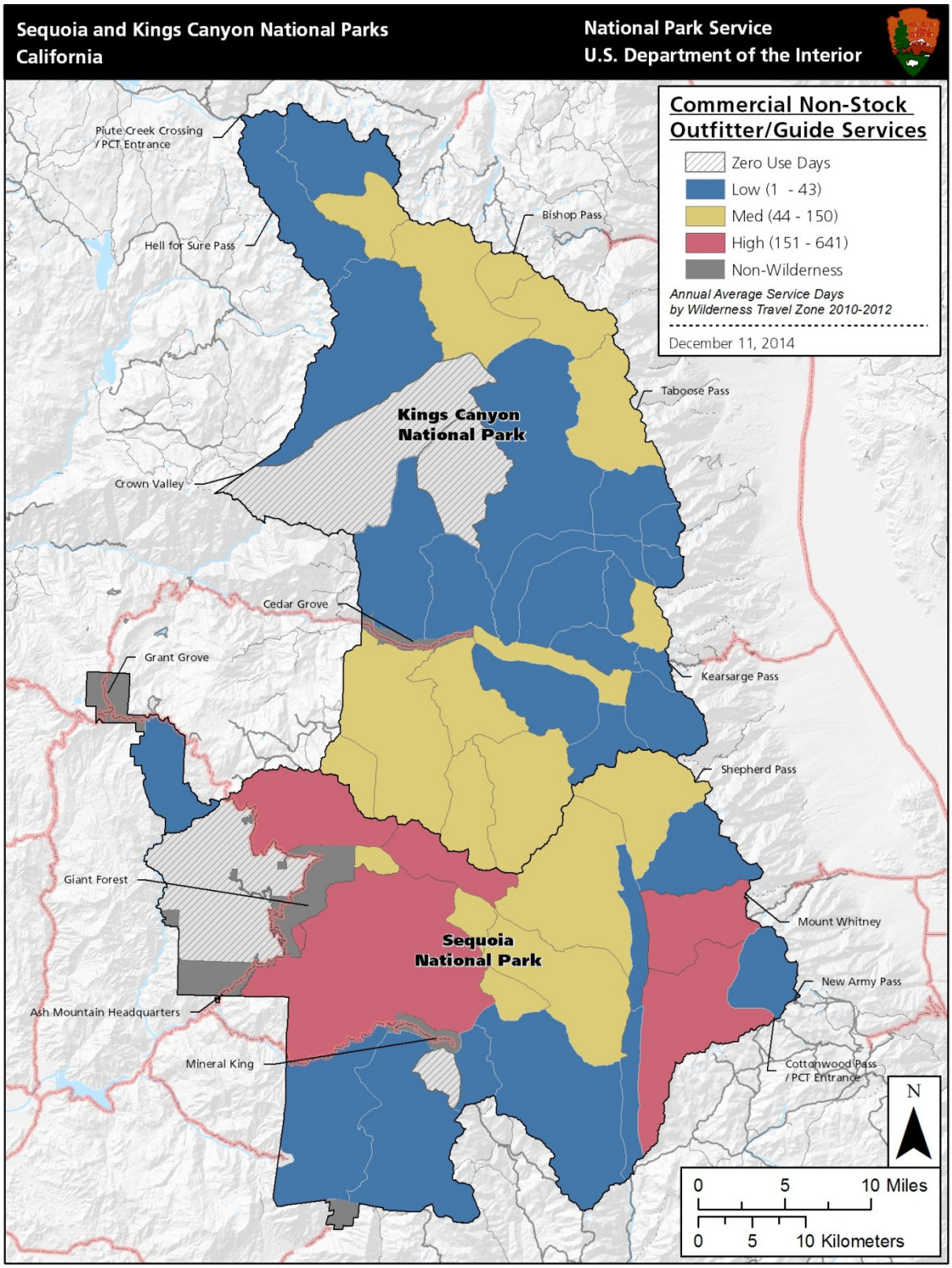

Figure B-3: Non-stock Commercial Services by Wilderness Travel Zone

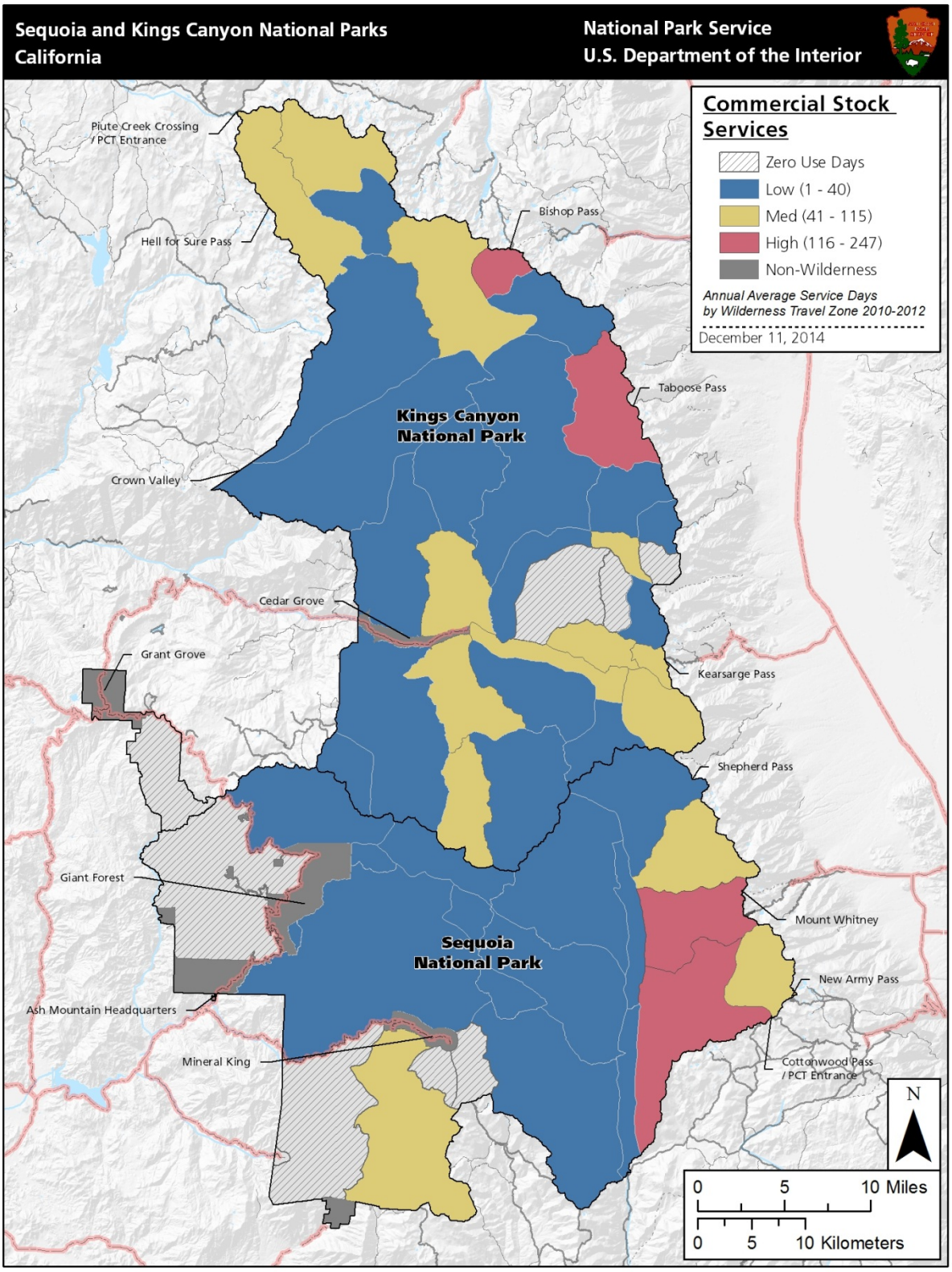

Figure B-4: Stock Commercial Services by Wilderness Travel Zone

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Appendix C

Wilderness Character Monitoring Strategy

ON THE PREVIOUS PAGE
View from Forester Pass
NPS Photo

APPENDIX C:

WILDERNESS CHARACTER MONITORING STRATEGY

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WILDERNESS CHARACTER MONITORING STRATEGY

The wilderness character monitoring strategy for Sequoia and Kings Canyon National Parks (parks) is based on the interagency framework established in *Keeping it Wild: An Interagency Strategy to Monitor Trends in Wilderness Character Across the National Wilderness Preservation System* (Landres et al. 2008), of which the National Park Service (NPS) is a signatory. This monitoring strategy was developed specifically in support of the Sequoia and Kings Canyon National Parks Wilderness Stewardship Plan (WSP) and environmental impact statement (EIS), but is expected to evolve over time as additional information is collected and analyzed and NPS guidance is developed. The Wilderness Character Assessment (Frenzel, E. and G. Fauth 2014) serves as the foundational background for this strategy by articulating what is special about the wilderness of Sequoia and Kings Canyon National Parks and what actions or issues degrade wilderness character.

This strategy was developed by the parks' WSP Interdisciplinary Planning Team (IDT) and other staff of the parks, the NPS, and other cooperating agencies. It was completed in conjunction with the development of a Wilderness Character Map. The Wilderness Character Mapping project was led by Aldo Leopold Wilderness Research Institute staff, Dr. Peter Landres and James Tricker (both of U.S. Forest Service), with significant involvement of the parks' staff and cooperators. The final report of the mapping project was published as a NPS Natural Resource Technical Report in spring 2014 (Tricker et al. 2014).

LAW AND POLICY

The 1964 Wilderness Act established the National Wilderness Preservation System (NWPS) "for the protection of these areas, the preservation of their wilderness character" (Section 2(a)). Congress (United States Congress 1983) and legal scholars (McCloskey 1999; Rohlf and Honnold 1988) confirmed that the primary affirmative legal mandate is to preserve the wilderness character of all areas designated as wilderness. Howard Zahniser (1962), principal author of the Wilderness Act, emphasized this when he wrote, "The purpose of the Wilderness Act is to preserve the wilderness character of the areas to be included in the wilderness system, not to establish any particular use." Likewise, the NPS *Management Policies 2006*, Chapter 6, Wilderness Preservation and Management, states that "The purpose of wilderness in the national parks includes the preservation of wilderness character." Director's Order and Reference Manual 41: Wilderness Stewardship (NPS 2013) states: "each wilderness park will integrate the concept of wilderness character into park planning, management, and monitoring in order to preserve the enduring benefits and values of wilderness for future generations." The Director's Order also references the NPS Wilderness Character User Guide (NPS 2014b) for additional direction.

Monitoring Goal and Objectives: The overall goal of wilderness character monitoring at Sequoia and Kings Canyon National Parks is to preserve or potentially improve wilderness character now and in the future.

The objectives of this monitoring strategy are to:

- Evaluate and select a set of measures that are relevant, cost-effective, and tied to preserving wilderness character;
- Periodically compile existing data and/or collect new data at reasonable frequencies to determine trends in these measures;

- Use these trends to assess the status of wilderness character and report that status to the parks' superintendent, Pacific West Regional Office, and Washington Office; and,
- Where applicable, compare measure outputs and/or trends with the standards established in the WSP (or other plans) and implement prescribed management actions as necessary to achieve desired conditions.

FUNCTIONAL DEFINITIONS

Keeping it Wild (KIW) (Landres et al. 2008) defines the following key terms which are included here for ease of reference. This interagency monitoring framework is based on hierarchically dividing wilderness character into successively finer elements. These elements, starting from wilderness character, are:

Qualities: Primary elements of wilderness character that link directly to the statutory language of the 1964 Wilderness Act. In this framework, all four primary qualities (and the "features of value," or other quality) are necessary to assess trends in wilderness character and each wilderness would be required to report the trend for each quality. These qualities are defined in chapter 1 (starting on page 9).

Monitoring Questions: Major elements under each quality that are significantly different from one another. Established framework monitoring questions shape the monitoring actions in order to answer particular management questions. In this context, monitoring questions are similar to monitoring goals. Each wilderness and agency would be responsible for reporting on the trend for all eight monitoring questions. Note: these are established and set per *Keeping It Wild* (Landres et al. 2008).

Indicators: Distinct and important elements within each monitoring question. In nearly all cases, there is more than one indicator under a monitoring question. Each wilderness would ideally monitor and report on the trend for all 13 indicators. Note: these are established and set per *Keeping It Wild* (Landres et al. 2008).

Measures: A specific aspect of wilderness for which data are collected to assess trend of an indicator. In nearly all cases, there is more than one measure to provide each agency (and potentially each wilderness within an agency) a range of options for assessing trend in the indicator. Some of these measures are more accurate and precise but costly, while others are less accurate and precise but easier and less expensive to monitor.

SELECTION OF MEASURES

Measures were identified and developed in two work efforts. The first was the result of the parks Wilderness Character Mapping project. Starting in November of 2012 and extending into early 2014, several meetings of parks interdisciplinary staff, along with multiple phone calls, were conducted to develop a comprehensive list of ongoing monitoring efforts, to define how those efforts might inform wilderness preservation, and to identify areas where monitoring is not occurring but would prove informative to wilderness stewardship actions.

Potential measures and data sources were also discussed with the staff of the Sierra Nevada Network Inventory and Monitoring Program (SEIN I&M) and the US Geological Survey Sequoia-Kings Canyon Field Station staff (USGS) to identify opportunities to use existing monitoring efforts without having to start new programs.

Over the time span of the Wilderness Character Mapping project, numerous preliminary measures were identified for all four primary qualities (untrammeled, undeveloped, natural, and outstanding

opportunities for solitude or primitive and unconfined recreation). Note that the cultural component has been included in the specialized fifth "other features of value" quality. These numerous measures were then tested to ensure that they could be spatially expressed and that their supporting data were of good quality and preferably had been collected for a number of years, (e.g., three to ten). The measures were also tested for relevance and feasibility of application. The datasets that support these measures will continue to be collected, summarized, and analyzed periodically to assess trends in wilderness character. The measures are listed and summarized in table C-1 (from Tricker et al. 2014). Note also that the *Keeping It Wild* measures do not always directly correlate or have a parallel measure from these parks' mapping project.

A second and more targeted set of measures was developed as a direct result of the WSP process. In May 2012, a three-day workshop was conducted in the parks, led by the NPS Denver Service Center Visitor Use Team (Kerri Cahill, lead). The purpose of the workshop was to look at properly incorporating visitor use management techniques and wilderness character preservation into the WSP. The workshop focused on indicators and measures that were related to visitor use, namely influences of visitors on other visitors, or visitors on resources. The workshop was attended by multiple staff members from the parks, many of whom continued with involvement in the parks' WSP process, including the members of the WSP IDT. A subgroup of the IDT and select staff from the parks continued to work on visitor use and capacity issues through the remainder of 2012 and into 2014. This subgroup specifically examined visitor capacity, both for ways to monitor it as well as approaches to mitigate impacts through management actions. In order to focus the new monitoring actions on those that are realistic to implement through the WSP, the working group proposed two primary aspects of visitor use to monitor: trail encounters and campsite conditions. Standards for these two measures have been established for all action alternatives of the WSP and would be applied in the future. It was also determined to continue to analyze wilderness permit data as this pertains to overall use levels at specific locations to assist in identifying use trends (See "Appendix A: Visitor Capacity").

The WSP IDT also evaluated past efforts to monitor stock use and has determined to continue a series of monitoring actions that have been occurring over the past two to three decades. These are more fully explained in "Appendix D: Stock Use and Meadow Monitoring and Management Strategy". These measures have been included as part of an overall Wilderness Character Monitoring Strategy in table C-2. These would continue to be monitored over time, analyzed regularly, and results reported to the parks' management with recommendations to ensure the preservation of wilderness character.

The IDT also determined that a series of measures should be examined and analyzed on a regular basis in order to detect trends in all qualities of wilderness character. The additional measures selected and summarized in table C-2 have been chosen from among the myriad monitoring efforts being conducted in the parks to better inform the parks' management of trends in wilderness character qualities. It is envisioned that some of these measures may also become part of future geospatial re-mapping of wilderness character. At this time, no standards have been developed for these measures.

Table C-1: Wilderness Character Qualities, Indicators, Measures, and Mapping Measures from Sequoia and Kings Canyon National Parks' Geospatial Mapping Activity

Quality	KIW WC Indicator[1]	KIW WC Measures	WC Mapping Measures for SEKI[2]
Untrammeled	Actions authorized by the federal land manager that manipulate the biophysical environment	Number of actions to manage plants, animals, pathogens, soil, water, or fire	Non-native plant removal/ control
			Restoration of disturbed lands
		Percent of natural fire starts that received a suppression response	Naturally ignited fires that received a suppression response
			Prescribed fires (management ignited)
		Number of lakes and other water bodies stocked with fish	Non-native fish removal
	Actions not authorized by the federal land manager that manipulate the biophysical environment	Number of unauthorized actions by agencies, citizen groups, or individuals that manipulate plants, animals, pathogens, soil, water, or fire	Marijuana grow sites
Natural	Plant and animal species and communities	Abundance, distribution, or number of indigenous species that are listed as threatened and endangered, sensitive, or of concern	Bighorn sheep unoccupied former habitat
		Number of extirpated indigenous species	Absence of frogs in former habitat
		Number of nonindigenous species	Presence of non-native fish in naturally fishless water bodies
		Abundance, distribution, or number of invasive non-indigenous species	Magnitude of invasion by non-native plants
		Number of acres of authorized active grazing allotments and number of animal unit months (AUMs) of actual use inside wilderness	Number of animal unit nights (AUNs) in meadows with stock grazing
		Change in demography or composition of communities	Presence of blister rust
	Physical resources	Visibility based on average deciview and sum of anthropogenic fine nitrate and sulfate	Nitrogen deposition
		Ozone air pollution based on concentration of N100 episodic and W126 chronic ozone exposure affecting sensitive plants	Ozone concentrations
		Acid deposition based on concentration of sulfur and nitrogen in wet deposition	Night sky darkness

Table C-1: Wilderness Character Qualities, Indicators, Measures, and Mapping Measures from Sequoia and Kings Canyon National Parks' Geospatial Mapping Activity (continued)

Quality	KIW WC Indicator[1]	KIW WC Measures	WC Mapping Measures for SEKI[2]
Natural	Physical resources	Extent and magnitude of change in water quality	No corresponding measure identified
		Extent and magnitude of disturbance or loss of soil or soil crusts	No corresponding measure identified
		Departure from natural fire regimes averaged over the wilderness	Departure from historic fire regime
	Biophysical resources	Extent and magnitude of global climate change	No corresponding measure identified
		Area and magnitude for pathways for movement of non-indigenous species into the wilderness	Effects of human infrastructure on natural
		Area and magnitude of loss of connectivity with the surrounding landscape	No corresponding measure identified
		Index of authorized physical development	Wilderness buildings
Undeveloped	Nonrecreational structures, installations, and developments	Index of authorized physical development Index of unauthorized (user-created) physical development	Long-term monitoring/ science equipment
			Administrative support equipment
			Benchmarks
			Authorized non-NPS infrastructure
		Inholdings Area and existing or potential impact of inholdings	Inholdings
	Inholdings	Type and amount of administrative and nonemergency use of motor vehicles, motorized equipment, or mechanical transport	Administrative helicopter use
	Use of motor vehicles, motorized equipment, or mechanical transport	Type and amount of emergency use of motor vehicles, motorized equipment, or mechanical transport	Emergency helicopter use
		Type and amount of motor vehicle, motorized equipment, or mechanical transport use not authorized by the federal land manager	Administrative 4(c) authorized through a minimum requirement analysis (MRA)
		Number and severity of disturbances to cultural resources.*	No corresponding measure identified
	Loss of statutorily protected cultural resources *	Amount of visitor use	Visitor use nights/ quota information/ party size

Table C-1: Wilderness Character Qualities, Indicators, Measures, and Mapping Measures from Sequoia and Kings Canyon National Parks' Geospatial Mapping Activity (continued)

Quality	KIW WC Indicator[1]	KIW WC Measures	WC Mapping Measures for SEKI[2]
Solitude or Primitive and Unconfined Recreation	Remoteness from sights and sounds of people inside the wilderness	Amount of visitor use	Outfitter use nights
		Number of trail contacts	No corresponding measure identified
		Number and condition of campsites	Campsite inventories
		Area of wilderness affected by access or travel routes that are inside the wilderness	Travel time
			Viewshed
		Area of wilderness affected by access or travel routes that are adjacent to the wilderness	No corresponding measure identified
	Remoteness from occupied and modified areas outside the wilderness	Night sky visibility averaged over the wilderness	Viewshed outside of wilderness
		Extent and magnitude of intrusions on the natural soundscape	Soundscapes
		Extent and magnitude of intrusions on the natural soundscape	Overflights/ low flyers
		Type and number of agency-provided recreation facilities	Trail class
	Facilities that decrease self-reliant recreation	Type and number of agency-provided recreation facilities Type and number of user-created recreation facilities	Toilets for visitors
			Designated campsites
			Food storage boxes
			Bearpaw Meadow High Sierra Camp and Pear Lake Ski Hut
			No corresponding measure identified
		Type and extent of management restrictions	Access/ use restrictions
	Management restrictions on visitor behavior	Type and extent of management restrictions	Recreational stock restrictions

SEKI = Sequoia and Kings Canyon National Parks

[1]KIW WC" refers to the publication *Keeping it Wild* (KIW) and wilderness character (WC).

[2] WC Mapping Measures for SEKI refers to those incorporated in the Wilderness Character Mapping project, 2012-2014, led by the Aldo Leopold Wilderness Research Institute, Dr. Peter Landres and James Tricker.

* = In *Keeping it Wild* (2008), Landres et al. placed cultural resources in the undeveloped quality. However, in 2012, the NPS Wilderness Character Integration Team proposed that such values be considered as an "Other Quality" to be determined by the parks and the team proposed indicators and measures for use with cultural and paleontological resources. These indicators and measures would be used where these resources have been determined to be integral to wilderness character. During the geospatial modeling process in 2013, a determination, consistent with the above national direction, was made to not include cultural resources in the Undeveloped quality. It was also excluded from the geospatial modeling activity due to sensitivity and lack of knowledge of resources in a spatial context. Current national trends are to consider cultural resources, along with "other features of value," as a fifth quality of wilderness character.

Table C-2: Monitoring Actions to Preserve Wilderness Character in Sequoia and Kings Canyon National Parks as Part of the Implementation of the Wilderness Stewardship Plan

Quality	Indicator	SEKI Measure	Frequency and data source
Untrammeled	Actions authorized by the federal land manager that manipulate the biophysical environment	Number of actions taken that manipulate the wilderness environment as represented by MRAs completed and approved and research permits approved.	Annual review from completed MRAs and research permits.
	Actions not authorized by the federal land manager that manipulate the biophysical environment	Number of incidents of unauthorized action (e.g., marijuana grow sites).	Annual review of case incident reports and wilderness ranger end of season reports.
Natural	Plant and animal species and communities	Meadow conditions – see appendix D (Stock Use and Meadow Monitoring and Management Strategy)	Annual residual biomass, species composition, and bare ground monitoring data – See appendix D.
	Physical resources	Concentrations of nutrients and other water chemistry parameters in lakes	Annual, SIEN I&M lake monitoring
		Wet deposition – acid and mercury	Annual, National Atmospheric Deposition Program
	Biophysical resources	Campsite condition with metric of Weighted Value per Campable Mile (WVCM) within designated travel subzones	Periodic (every 5 years) campsite inventory and condition assessment for designated sampling areas.*
Undeveloped	Nonrecreational structures, installations, and developments	Number of nonrecreational structures (e.g., food storage boxes, ranger stations, radio repeaters (non-historic))	Periodic (every 5 years) re-inventory and count of structures and installations.
		Number of research/science installations (e.g., tree tags, plot markers, samplers, meteorological devices)	Periodic (every 5 years) inventory and count of science-based installations.
	Inholdings	Acreage of inholdings	Periodic, every 5 years, compilation of acres of inholdings.
	Use of motor vehicles, motorized equipment, or mechanical transport	Number of actions taken that involve the use of motor vehicles, motorized equipment, mechanical transport, or landing of aircraft as represented by MRAs completed and approved, research permits approved, and helicopter use.	Annual review from MRAs, research permits, Annual Aviation Report, and helicopter landing tracking data.

Table C-2: Monitoring Actions to Preserve Wilderness Character in Sequoia and Kings Canyon National Parks as Part of the Implementation of the Wilderness Stewardship Plan (continued)

Quality	Indicator	SEKI Measure	Frequency and data source
Opportunities for Solitude or primitive and unconfined recreation	Remoteness from sights and sounds of people inside the wilderness	Numbers of trail encounters on designated trails or routes measured as number of people encountered per hour	Annual encounter sampling in designated areas. Data to be compiled for analysis every 5 years.*
		Overall visitor use nights per year	Annual compilation from wilderness permit data. Analyzed every 5 years.
		Overall stock use nights per year	Annual compilation from stock reporting cards, administrative reporting, commercial use authorizations reports, wilderness ranger end of season reports, and wilderness permits. Analyzed every 5 years.*
	Remoteness from occupied and modified areas outside the wilderness	Low-flying aircraft reports	Annual compilation from submitted field reporting and response from Edwards Air Force Base (AFB) air traffic control (TRACON). Analyzed every 5 years.
	Facilities that decrease self-reliant recreation	Number of agency-provided recreation facilities (e.g., privies/restrooms, bridges)	Periodic (every 5 years) re-inventory and count of recreational facilities/installations/structures.
	Management restrictions on visitor behavior	Type and extent of management restrictions in wilderness (e.g., campfire and night limits)	Compiled annually from the Superintendent's Compendium.
Other	Deterioration or loss of cultural resources integral to wilderness character	Number of unauthorized actions that result in disturbances to cultural resources (e.g., looting, vandalism)	Annual review of case incident reports and wilderness ranger end of season reports.

*Those measures which have established standards (campsite conditions and trail encounters, as well as stock use thresholds [see appendix D, table D-6]), would have annual reviews of data collected from monitoring efforts. If data indicates a detectable negative trend, then corrective actions would be considered and recommended to the parks' management.

A comprehensive review of monitoring results would occur at least every five years for campsite conditions, trail encounters, visitor use nights, stock use nights, stock use thresholds, and data from all other measures listed in table C-2.

For monitoring, review, and analysis of data and conditions related to stock use and meadows see appendix D.

ADDITIONAL MONITORING ACTIVITIES TO INFORM WILDERNESS CHARACTER PRESERVATION

Sequoia and Kings Canyon National Parks have a robust and diverse array of monitoring activities occurring. The parks' division of Resource Management and Science (RMS) regularly conducts monitoring on a variety of resources. This is supported by other formal monitoring efforts of the NPS Sierra Nevada Network Inventory and Monitoring Program, by the in-park USGS Field Station, by independent researchers, and by the efforts of other operations of the parks, primarily the Division of Visitor, Fire and Resource Protection, and the Division of Maintenance and Construction. Below is a list of regularly occurring formal and informal monitoring efforts that relate to wilderness character preservation.

NPS, Sequoia and Kings Canyon National Parks

Division of Resource Management and Science

- Mountain Yellow-legged Frog (MYLF) Monitoring: Assess effects of management actions in restoring MYLF populations
- Little Kern Golden Trout Monitoring: Document and assess annual and long-term changes in populations
- Long-term Fish Population Monitoring: Evaluate effects of human access and angling regulations on populations
- Bear Incident Monitoring: Track temporal and spatial trends of bear activities and assess effectiveness of management and educational efforts
- Long-term Alpine Vegetation and Temperature Monitoring: Discern trends in species diversity and temperature to assess and predict trends/losses in biodiversity and other threats to alpine ecosystems
- Wilderness Meadow Repeat Photography: Document long-term changes in meadow vegetation and morphology
- Fire and Giant Sequoia Forest Structure, Regeneration, and Fuels Monitoring: Detect and examine changes in forest vegetation following reintroduced fire and subsequent fires
- Fire and Red Fir Forest Dynamics Monitoring: Document conditions and trends in red fir forest dynamics, including fuels, forest tree size and age structure, regeneration, and mortality. Also changes in vegetation and fuels after recently reintroduced fire.
- Fire Effects Monitoring: Measurements in a variety of forest types determine whether vegetation fuel loads, fire severity, and forest structure (such as tree density and size) targets are being met.
- Exotic Plant Management and Monitoring: (1) Document location and abundance of exotic plant infestations, (2) document management actions, (3) document exotic plant taxa and their priorities for management, (4) summarize yearly accomplishments, (5) monitor effectiveness of control actions over time.
- Hydrologic Benchmark Network: Provide long-term measurements of streamflow and water quality in areas that are minimally affected by human activities. These data are used to study long-term trends in surface water flow, water chemistry, aquatic biology, and soil chemistry and serve as a benchmark against which to compare changes in flow and chemistry in developed watersheds.

- Impact of grazing on ten meadows – long-term (occasional): Initially (1965) to examine ten selected meadows in Sequoia and Kings Canyon National Parks to determine as much as possible their current condition, trends in condition, potential causes of such trends, and to make recommendations for future management of the meadows. Subsequent visits to these sites document changes in vascular plant species composition within selected meadows over time.
- Vegetation Change – (occasional): Initially (1969) to quantitatively describe the woodlands and forests, and to qualitatively describe vegetation changes resulting from fire suppression and grazing. Revisits to determine how the vegetation had changed over a 27-year period.
- Vascular Plant Inventory (baseline data, 1985): A plot-based parkwide survey of vascular plants using a randomized systematic sampling design based on 1 km grid intersections. In addition to a suite of vegetation measurements, data were collected on vertebrates either observed from the plots or detected through scat or other sign. A limited amount of small mammal, reptile and amphibian trapping was conducted on a subset of plots. The purpose of this systematic, plot-based inventory was to detect and describe the distribution of vascular plants, vertebrate animals, and soils throughout the parks. It has limited, occasional revisits.
- Western Pond Turtle (adjacent to wilderness): Populations are monitored on the North Fork of Kaweah River and a tributary of the Middle Fork of the Kaweah to determine condition of the population and long-term trends in body condition, age structure, and operating sex ratios.
- Wet Deposition – acid precipitation – (partially in wilderness): To determine spatial patterns and temporal trends in chemical deposition in support of effects research, particularly impacts on aquatic and terrestrial ecosystems. To produce the long-term data necessary to determine temporal trends and inform the understanding of the effects of this stressor on ecosystems.
- Visibility (adjacent and overlooking wilderness): Repeat photography to document visibility events and trends as an important aspect of evaluating existing or potential impairment in Class 1 airsheds and other visibility-sensitive areas.
- Wet deposition – mercury – (adjacent to wilderness): To monitor mercury, which can reach toxic levels in organisms at the top of the food web, like predatory fish and birds. The data are used to develop information on spatial and seasonal trends in mercury deposited to surface waters, forested watersheds, and other sensitive receptors.

Other Divisions of the Parks

- Visitor, Fire, and Resource Protection: Wilderness and trailhead rangers monitor the effects of visitors and administrative actions on wilderness quality and resources. Report findings by direct contact with managers or through end of season reports. To identify trends in use, and to detect and mitigate impacts.
- Snowpack Monitoring: Assess changes in water availability (in partnership with the State of California)
- Maintenance and Construction: Trails maintenance staff conduct field work to monitor effects of use on trails and associated resources. Report findings to the parks' management through supervisory chain. To identify trends in use, and to detect and mitigate impacts.

NPS – Sierra Nevada Network Inventory and Monitoring Program

- Landbird Monitoring: Assess bird population trends and changes in distribution
- Lake Monitoring: Assess trends in ecosystem health by monitoring water chemistry, lake level, and amphibians
- Forest Dynamics Monitoring: In whitebark pine and foxtail pine forests, determine status and trends in (1) Tree species composition and structure; (2) Tree species birth, death, and growth rates; (3) Incidence of white pine blister rust and level of crown kill; (4) Incidence of pine beetle and severity of tree damage; (5) Incidence of dwarf mistletoe and severity of tree damage; and (6) Cone production.
- Wetlands Ecological Integrity Monitoring: Provide basic information on the condition of targeted wetlands (wet meadows and fens), and evaluate long-term trends in vegetation composition and structure, macroinvertebrates, and groundwater level.
- White pine blister rust: More than 150 plots were established from 1995-1999 to measure and map white pine species for long-term monitoring, and evaluation for white pine blister rust (*Cronartium ribicola*) infection to estimate the incidence and severity of effect of blister rust upon the populations of these species within the parks' boundaries. These permanent plots were established as a baseline and can be re-surveyed as funds are available.

U.S. Geological Survey -- Sequoia-Kings Canyon Field Station

- Forest Demography Monitoring: Assess changes in forest structure and population dynamics related to mortality, recruitment, disease, insect and weather for a variety of forest types

NPS Cooperative Efforts

- Christmas Bird Count: Assess trends in bird populations and species composition (conducted by non-government entities)
- Bighorn Sheep Monitoring: Assess sheep populations to aid in recovery (California Department of Fish and Wildlife is lead agency)
- Peregrine Falcon (adjacent to wilderness): Traditional nesting sites are monitored at Chimney Rock by U.S. Forest Service and Moro Rock (in the parks) annually to observe any potential conflicts between peregrine falcons and rock climbers during the breeding season. Occupancy, nesting activity, number of young, and successful fledglings are monitored to determine peregrine activity and nesting success.

IMPLEMENTATION OF MONITORING STRATEGY

In order to ensure that monitoring and other reported data and information are analyzed, reviewed and used to implement changes in wilderness stewardship, the wilderness coordinator will facilitate at least one annual meeting of the wilderness IDT, generally referred to as the annual Wilderness Operations Meeting, to review monitoring results and other wilderness stewardship issues. The wilderness coordinator, in cooperation with the parks' plant ecologist will also facilitate an annual Meadow Management Meeting to review monitoring results specific to meadows and stock management. Any proposed changes in management that arise from these meetings will result in a proposal for change(s) in wilderness operations to the parks' superintendent

Wilderness Coordinator: This position has the primary responsibility to oversee the wilderness character monitoring program, including soliciting data and assistance from other programs in a timely

fashion, compiling the supporting documentation from existing data sources, validating the results of the monitoring effort, and generating reports periodically for submission to the parks' superintendent and other NPS offices, as requested. The wilderness coordinator will regularly review this strategy every 5 years and work with the wilderness IDT to update it as necessary to keep in step with NPS policy requirements.

Wilderness Interdisciplinary Team: The parks' wilderness IDT will serve as the primary review body for the monitoring of results and will also be the forum for discussions regarding appropriate use of and access to databases needed to monitor trends in wilderness character. This group will also be charged with analyzing any negative trend in any quality of wilderness character and making recommendations for management actions to correct the trend, drawing from the actions articulated in the WSP and from current best management practices. The wilderness IDT will also review the on-the ground monitoring program and identify any additional measures needed for effective monitoring.

For the purposes of the Annual Wilderness Operations Meeting, the wilderness coordinator will facilitate, and participants will include: the parks' division chiefs; public affairs specialist; district rangers; sub-district rangers; RMS branch chiefs; ecologist (science coordinator); Geographic Information System (GIS) specialist; plant ecologist; biological science technician (meadows); facility manager for roads and trails; trails supervisors (Kings and Sequoia); fire management officer; aviation officer (Sequoia fire management officer); fuels specialist; telecommunications manager; Wilderness Office staff; and environmental protection specialist. If scheduling precludes the attendance of the above, they may delegate a proxy for participation. Invitees will include: the parks' superintendent, management assistant; and other staff from the parks that work in or have an interest in wilderness management.

For the purposes of the Annual Meadow Management Meeting, the plant ecologist and the wilderness coordinator will facilitate. Participants will include the parks' division chiefs (Maintenance and Construction; Visitor, Fire and Resource Protection; and Resources Management and Science); district rangers; sub-district rangers; RMS branch chiefs (Biological and Ecological Diversity and Vegetation Management); biological science technician (meadows); facility manager for roads and trails; trails supervisors (Kings and Sequoia); and Wilderness Office staff. If scheduling precludes the attendance of the above, they may delegate a proxy for participation. Invitees will include: the parks' superintendent, management assistant, and staff of the parks that work in or have an interest in meadow management.

The Parks' Superintendent: The superintendent, or at their delegation the parks' Leadership Team, will be the recipient of monitoring results and is responsible for taking action as necessary to preserve or improve the qualities of wilderness character.

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Appendix D

Stock Use and Meadow Monitoring and Management Strategy

ON THE PREVIOUS PAGE
Wales Creek
Photo Courtesy of R. Pilewski

APPENDIX D:

STOCK USE AND MEADOW MONITORING AND MANAGEMENT STRATEGY

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STOCK USE AND MEADOW MONITORING AND MANAGEMENT STRATEGY D-7

Introduction D-7

Objectives of the Stock Use and Meadow Monitoring and Management Strategy D-8

Background Information D-9

Description of the Meadow Resource D-9

History of Stock Use and Associated Impacts D-10

Pack and Saddle Stock Management History D-13

Adaptive Management D-14

Monitoring Strategy and Thresholds for Management Action D-16

Stock Use and Grazing Levels D-17

Site Visits and Condition Assessments D-18

Vegetation and Soils D-19

Residual Biomass D-19

Bare Soil D-20

Streambank Alteration D-23

Species Composition D-24

Repeat Photography D-25

The Management System D-26

Network of Meadows Closed to Grazing D-26

Stock Use and Grazing Management Tools and Techniques D-27

Trail Use and Off-trail/Cross-country Stock Travel D-33

Integration of Monitoring Results into Management Actions D-34

Relationship to Other Monitoring Programs D-37

Resource Rehabilitation and Restoration D-38

Research Needs D-38

Determining Vulnerability of Sierra Nevada Meadows to Climate Change D-38

Refining Measurements of Productivity and Bare Ground in Park Meadows D-38

Assessing Potential Effects of Stock Use on Wildlife D-39

Detecting Changes in Species Composition in Grazed Meadows D-39

Temporary Variances and Modifications to the Strategy D-39

Temporary Variances D-39

Modifications to the Strategy D-40

References D-41

GRAZING CAPACITIES FOR RECREATIONAL PACK AND SADDLE STOCK – BACKGROUND AND USE IN SEQUOIA AND KINGS CANYON NATIONAL PARKS . D-51

Limiting Impacts From Stock Grazing D-53

Grazing Capacity Model D-53

Forage Production D-53

Allowable Utilization D-58

Biomass Consumption Rates D-63

Capacity Calculation D-63

Evaluation and Revision of Capacities D-64

Evaluating and Revising Model Parameters D-64

Area and Preferred Proportion D-64

Preferred Vegetation Type and Moisture Regime D-64

Productivity D-64

Evaluating and Revising Estimated Capacities D-66

Impacts Other Than Defoliation D-66

Literature Cited D-80

FIGURES

Figure D-1: Predicted productivity (pounds/acre) by elevation (feet) for three moisture classes (dry, moist, wet), and four condition classes (excellent, good, fair, poor) D-55

TABLES

Table D-1: Provisional Bare Soil Cover Values for Ecological Condition Classes among Sierra Nevada Meadow Types D-21
Table D-2: Provisional Thresholds for Management Action and Rationale Based on Bare Soil Values D-22
Table D-3: Definition of Streambank Alteration Impact Types D-23
Table D-4: Network of Meadows Closed to Grazing for Scientific and Social Value D-27
Table D-5: Anticipated Opening Dates by Travel Zone and Moisture Year D-29
Table D-6: Meadow Monitoring Data, Measures, Thresholds for Action, and Actions D-35
Table D-7: Comparison of Model Productivity Values to Measured Productivity from Three Vegetation Types in Sequoia National Park D-56
Table D-8: Comparison of Model Productivity Values to Measured Productivity from Three Sites in Yosemite National Park D-57
Table D-9: Utilization Recommendations by Moisture and Condition D-59
Table D-10: Utilization Standards for Herbaceous Perennial Vegetation in Wilderness Meadows of the Sierra and Inyo National Forests D-59
Table D-11: Utilization Values for Different Levels of Acceptable Change in Attributes for Three Upper Montane and Subalpine Meadow Vegetation Types D-60
Table D-12: Utilization Rates Proposed as Standards and Used to Estimate Grazing Capacities D-61
Table D-13: Predicted Response of Meadow Attributes for Lower Montane and Woodland Vegetation Types to 25%, 35%, and 45% Utilization D-62
Table D-14: Predicted Mean Response of Meadow Attributes for Three Upper Montane and Subalpine Vegetation Types to 25% and 35% Utilization D-62
Table D-15: Regression Coefficients for Each Combination of Moisture Level and Condition D-67
Table D-16: Forage Areas Designated as Having High Logistical Value D-68
Table D-17: Estimated Grazing Capacities for Forage Areas Open to Grazing under the NPS Preferred Alternative D-69

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STOCK USE AND MEADOW MONITORING AND MANAGEMENT STRATEGY

This appendix describes the strategy for monitoring and managing stock use that would be implemented by the NPS under the preferred alternative as described by this Wilderness Stewardship Plan and Final Environmental Impact Statement (WSP/FEIS). The introductory sections describe the objectives for managing stock use in the wilderness of the parks, provide an overview of the parks' meadow resources, and review the history of stock use, associated impacts, and its management in the parks. This is followed by sections that describe the adaptive management program, including approaches for monitoring and managing stock use in such a way as to minimize and mitigate impacts while providing continued access to wilderness for visitors travelling with stock.

INTRODUCTION

Pack and saddle stock have been used in the southern Sierra Nevada since the mid-nineteenth century, first for exploration and then in conjunction with sheep and cattle grazing and mining. In the late nineteenth century, and progressively into the twentieth century, stock were used for access to the mountains of the region for recreational purposes. The numbers of stock used for recreational trips increased and peaked in the 1930s, dropped in the 1940s, increased again in the 1950s, and have since declined. Pack stock have been used to support the development and administration of the remotest areas of the two parks—e.g., for trail building and maintenance and ranger patrols—since their establishment. The use of stock for administrative and recreational purposes is still recognized as a traditional, historically and culturally significant, and legitimate activity that will continue in the wilderness of Sequoia and Kings Canyon National Parks (NPS GMP 2007).

The Act that created the National Park Service states that its "purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for future generations" NPS Organic Act (16 USC 1). National Park Service policy and the legislation that created these parks require that ecosystems in wilderness be protected and preserved while allowing for their use and enjoyment. NPS *Management Policies 2006*, Section 8.2.2.8 states that:

> "Equine species such as horses, mules, donkeys and burros, and other types of animals (including llamas, alpacas, goats, oxen, dogs and reindeer) may be employed when it is an appropriate use to support backcountry transport of people and materials and will not result in unacceptable impacts. Planning for recreational stock use should be conducted in the context of visitor use planning to address social, biological, and physical carrying capacity considerations, and to make allocation decisions that minimize potential conflicts between and among user groups. The plan should (1) establish routes, trails, and areas of travel; and (2) identify the need for supporting infrastructure such as designated horse camps, hitch rails, corrals, and appropriate trailhead facilities designed for vehicles towing horse trailers. The plan should also identify sensitive natural and cultural resource areas and develop management strategies to protect these resources."

Grazing that is incidental to the recreational use of stock is regulated by the horse and pack stock regulations (36 CFR 2.16). Where grazing is permitted, NPS policy directs the use of best management practices, with particular attention being given to protecting wetland and riparian areas, sensitive species and their habitats. Grazing is managed so that ecosystem dynamics and the composition, condition, and distribution of native plants and animal communities are not significantly altered (NPS *Management Policies 2006*, Section 8.6.8.2).

Many kinds of disturbance occur naturally in meadow ecosystems; this strategy addresses those associated with human activities and stock use. Some disruption of natural ecosystems and processes by stock is expected and considered acceptable as the consequence of a form of primitive wilderness use that is appropriate in Sequoia and Kings Canyon National Parks. The monitoring and assessment protocols proposed in this strategy are designed to provide insight into the integrity of meadow ecosystems, to provide early warnings of stock related changes, and to inform a management program that anticipates potential impacts. The proposed management standards and thresholds are set at levels that will ensure the protection of wilderness character by triggering timely and effective corrective action.

The environmental impacts associated with stock use are discussed in detail under the impacts topics addressed in chapters 3 and 4 of this WSP/FEIS.

OBJECTIVES OF THE STOCK USE AND MEADOW MONITORING AND MANAGEMENT STRATEGY

A goal of wilderness management in Sequoia and Kings Canyon National Parks is to provide for recreational and administrative saddle and pack stock use in a manner that will protect the parks' natural and cultural resources and values, the processes that shape them, and the quality of visitor experience distinctive to them.

Chapter 1 of this WSP/FEIS further articulates the desired conditions which guide protection of the natural quality of wilderness as follows:

- The natural quality of wilderness would be preserved by mitigating the impacts of modern civilization on ecosystem structure, function, and processes.
    - The NPS aspires to minimize or localize adverse impacts caused by visitor use and administrative activities. In the wilderness, natural processes 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
        - soundscapes, dark skies and viewsheds

Some or all of these desired conditions may not be fully attainable due to factors (such as climate change and air pollution) that are unrelated to visitor use or park administrative activities. The ability of the parks to achieve desired conditions that are either tangentially or unrelated to visitor use and administrative activities is being systematically evaluated through a "climate-smart" lens in the parks Resources Stewardship Strategy (RSS).

The following objectives for stock use and meadow monitoring and management provide a more specific interpretation of how the NPS will meet these goals:

- Limit stock induced changes to plant composition, density, cover, productivity and/or vigor

- Prevent adverse effects to soils and associated sod that may lead to accelerated erosion, prevent changes to springs, seeps and water courses that could alter hydrologic processes
- Promote recovery from past overuse where necessary.
- Minimize the effects of stock on trails and camps
- Minimize the effects of stock on hydrology and water quality
- Ensure that a series of meadows (or definable parts of meadows), including representatives of all major types within these parks, be preserved in an ungrazed condition so that they are perpetuated as—or allowed to become—natural functioning ecosystems to the greatest extent possible. Ungrazed meadows will provide an opportunity for visitors to experience naturally functioning meadows, and will facilitate study of the relative effects of climate, plant succession, and grazing.
- Design and implement a monitoring strategy to provide information about the effects of stock on the resources of the parks that enables adaptive management given uncertain future conditions and ensures that objectives are met.

BACKGROUND INFORMATION

DESCRIPTION OF THE MEADOW RESOURCE

Meadows and uplands, including woodland meadows, forest grasslands, and alpine vegetation, are among the most attractive and important natural resources within Sequoia and Kings Canyon National Parks. Meadows are the principal destinations of many wilderness travelers. Meadows and their environs are important to those visitors who ride and/or pack into the backcountry, both for camping nearby and traditionally as places to graze their stock.

Meadows and associated uplands serve as important sources of food, birthing sites, nesting areas, and hunting grounds for many species of wildlife. Meadow areas also provide an opportunity for scientific research and observation. Natural (or near natural) vegetation may serve as a baseline to which the professional resource manager can refer to evaluate the effects of use on areas used by stock. The value of such baseline conditions contributed to earning these parks International Biosphere Reserve status in 1976 (NPS 2012).

Meadows are complex ecosystems, varying widely in character and composition (Benedict and Major 1982, Ratliff 1982). The plant associations and physical conditions of a meadow determine its tolerance to the effects of grazing and trampling. Because meadow vegetation exhibits a high degree of spatial and temporal heterogeneity, only a very broad, relatively insensitive, classification system can be employed at the meadow level. Since it is often of limited value to generalize about the vegetation of meadows as a whole, it is important to understand the characteristics and tolerances of the plant associations that combine to form meadows. Traditionally, meadow classifications have been based primarily on vegetation and soil characteristics (Klikoff 1965, Benedict and Major 1982, Ratliff 1982, Ratliff 1985). Recognizing the importance of the environmental factors underlying and shaping these assemblages, Weixelman et al. (2011) have developed a classification system for Sierra Nevada meadows that incorporates both hydrology and geomorphology. This classification, which represents a more functional approach to the characterization of these complex systems, has been widely adopted by ecologists and public land managers in the Sierra Nevada.

Stock use is not confined to open meadow environments. Forests and woodlands include extensive areas of species palatable to stock including grasses, sedges, rushes, and other herbaceous plants found within aspen or conifer stands along streams, in seeps, or as an extension of the forest meadow transition. Upland

forbs and grasses may provide abundant and nutritious forage, especially when bunch grasses are present (Sumner 1941). Horses and mules spend a considerable amount of time in forested areas where they are protected from wind and mosquitoes and are able to keep their hoofs dry. Alpine vegetation may also provide forage for stock, but in general these areas are lightly used by stock parties (Frenzel and Haultain 2013), in part due to the limited availability of forage and cover for animals and the challenges faced in constraining stock in treeless terrain, and in part due to restrictions on campfires, which are preferred by many recreational stock users.

Ecologists have begun to investigate the importance of peat-accumulating wetlands (fens) in the Sierra Nevada over the past decade. Fens are peat-forming wetlands, supported by nearly constant groundwater inflow (Bedford and Godwin 2003). This state of permanent saturation leads to the development of oxygen-deprived soils characterized by very low rates of decomposition, allowing for the accumulation of organic matter produced by wetland plants. Fens develop and are maintained only under hydrologic conditions that create perennial soil saturation on the time scale of millennia (Wood 1975, Sikes et al. 2013). As is true for most of the Sierra Nevada, most fens in Sequoia and Kings Canyon National Parks occur in meadow complexes consisting of areas of wet meadow (usually saturated for 1-2 months; Benedict 1983) intermixed with peat accumulating areas that stay saturated for most or all of the year.

Concern over the conservation of these relatively rare and distinctive wetlands has grown, as it is thought that activities leading to the disturbance of the hydrologic regime or soil temperature of a fen, causing drying or warming, may threaten its functioning (Sikes et al. 2013). Alternatively, fens may be more resistant to change than wet meadows due to more stable hydrologic regimes associated with springs and other hydrogeomorphic features (Gage et al. 2014). Because peatlands are thought to play an important role in global carbon storage, research interest in fen dynamics has grown significantly in recent years. Despite this attention, the knowledge of fens does not yet allow for accurate predictions of what the impact of climate change will be on these systems (Rydin and Jeglum 2013).

HISTORY OF STOCK USE AND ASSOCIATED IMPACTS

Sheep and cattlemen of the gold rush era found the meadows and plateaus of the High Sierra unaffected by early Spanish immigrants (Strong 1964). Large numbers of domestic sheep and cattle were first herded into the southern Sierra Nevada during the great drought years of 1862-1864 (Burcham 1957).The next forty years can be characterized as a period of heavy, unregulated use. Tens (and perhaps hundreds) of thousands of sheep were driven into the High Sierra annually. Use was locally heavy (Muir 1877; Reports of the Acting Superintendent of Sequoia and General Grant National Parks, 1892, 1894; Dudley 1896, 1898, 1899; King 1902), and it is assumed that virtually all of the areas now included within the parks that were accessible to sheep were grazed. Cattle were also common in the area but were generally confined to the more easily accessible plateaus and drainages.

Sequoia National Park and Kings Canyon National Park were established in stages spanning the years 1890-1940 (Strong, 1968), and thus different areas have different grazing histories. Sequoia National Park was established in 1890 but was not expanded to include the Kern Canyon and Sierra Crest regions until 1926. Kings Canyon National Park was established in 1940. Prior to this time, that area was administered by the U. S. Forest Service. With establishment of Sequoia and Kings Canyon National Parks, grazing by sheep and cattle was virtually eliminated. Exceptions included a considerable amount of trespass grazing from 1890 to 1905, special wartime grazing permits during and immediately following World War I, and lifetime grazing permits extended as a condition of establishing Kings Canyon National Park. Although the Forest Service regulated grazing by permit on its lands after 1905, grazing pressure was heavy with maximum herd sizes on allotments peaking in the 1920s and 1930s (Harper, 1974). Thus, many meadows in Kings Canyon National Park were degraded at the time of its establishment (Sumner 1941). Detailed accounts of the use of the Sierra Nevada by domestic 1ivestock during pre-park and early park periods are

presented by Burcham (1957), Otter (1963), Loughman (1967), Vankat (1970), Harper (1974), Holmes and Dobson (1976), DeBenedetti (1977), Vankat and Major (1978), and DeBenedetti and Parsons (1979), and summarized by Neuman (1990).

Recreational use of pack and saddle stock on land now included within these parks predates their establishment. Large stock-assisted Sierra Club outings began visiting this area in the early 1900s. Loughman (1967) reported that the use of stock for recreational purposes increased steadily after World War I and peaked in the 1930s. Following a decline in the 1940s, use again increased in the early 1950s, only to decline again through the early 1960s (Briggle et al. 1961). Use levels ranged between 8,800 and 11,500 stock nights during the seven years from 1977-84 (National Park Service Annual Stock Use Reports 1977-84). This level of use as measured by the number of stock nights spent in the wilderness was about one-third of the level of the early 1950s and may have been as little as one-sixth of the peak levels of the 1930s. Use levels have continued to decline since the 1980s, with an average of 7,594 annual stock nights reported for the period 1993-2002, followed by an average of 6,775 annual stock nights reported for the years 2003 to 2012 (ranging from a low of 5,434 nights in 2012 to a high of 8,218 nights in 2003) (Hopkinson et al. 2013).

Wilderness meadows in Sequoia and Kings Canyon National Parks have been the object of much study, with early work being mostly qualitative in nature. Beginning with Sumner (1941), these reports were the result of observations that many meadows seemed to be in a deteriorated condition; the cause of this deterioration was believed to be overgrazing by pack stock, cattle, and/or sheep. There has been much controversy over both the definition and the magnitude of the effects of historic grazing. The Sumner series of observations (1940, 47, 48, 68), in conjunction with Sharsmith (1959), suggested that many meadows in the 1930s and 1940s were undamaged even with heavy use. Other areas, at the same time, were assessed as seriously deteriorated. None of the authors, however, proposed that areas they examined were unaltered compared to what would have been their condition without grazing by livestock. For example, Ratcliff (1956) noted during a survey of the Rock Creek areas that the Rock Creek, Crabtree, and Wright Creek areas were in good condition considering the past and then current levels of use. Near Timberline Lake, however, he reported damage due to trampling. He noted that his report should not be extrapolated to represent conditions in Kings Canyon. Sharsmith (1959) also found Crabtree meadows in good shape. Damage reported by Sumner, Sharsmith, and Ratcliff was, in general, proportional to use the area received. Strand (1972) observed that, “many strategically located meadows along popular trails had been severely damaged by pack stock, and their recovery from earlier abuse either prohibited or delayed."

The need to objectively define what constituted "damage" resulted in a shift from qualitative to quantitative assessment (e.g., Bennett 1965 and Strand 1972). Bennett selected ten meadows and determined their condition, trend, and causes of such trends, and made recommendations for their future management. Strand revisited Bennett's transects in search of detectable trends in condition. Strand found some meadows in slightly deteriorating or slightly improving condition; others showed no trend. In general "those meadows which received the greatest amount of grazing were also those determined to be in a state of deterioration or which showed the least amount of recovery from a previously deteriorated state. This was determined by changes in the relative densities of forage species, low value species, and “invasion species” (Strand 1972). Mazzu (1987) reread transects in four of the original meadows sampled by Bennett and Strand, and found that the meadows closed to grazing showed increased species diversity relative to those that had continued to be grazed.

Grazing had been restricted on the meadows assessed by Strand and Bennett after the earlier Sharsmith and Sumner reports. The 1960 Backcountry Management Plan (Briggle et al. 1961) was the first attempt to formally implement the recommendations of Sharsmith and Sumner:

> Ecological studies in these Parks clearly indicate that overgrazing, not drought cycles and floods, has been the primary cause of meadow deterioration despite the beliefs of a few stockmen to the contrary (Briggle et al. 1961).

Both the 1960 and the 1986 plans agreed that the history of scientific study indicated that (1) prior to the use of restrictions, locally significant damage (i.e., deteriorating vegetation and soils) existed in the parks; (2) the result of restrictions had been a general slowdown in deterioration and, in many areas, improvement; (3) there is finite level of use beyond which unacceptable impacts result, and past use patterns give some idea of what this level may be.

Widespread turn of the century grazing by sheep and cattle in the Sierra Nevada destabilized meadow wetlands by weakening sods, which allowed erosion channels to form, resulting in lower water tables and loss of meadow sediments. From the 1930s to 1980, managers in Sequoia and Kings Canyon National Parks attempted to conserve soil and restore moisture in meadows by constructing check dams and fences, logging invading trees, rerouting trails, and altering grazing management. These efforts are documented in the parks' file reports describing the activities of the dedicated Soil and Moisture Crews and were summarized for named meadows by Neuman (1990).

Popular and strategically located meadows and forage areas, many of which were reported to be in deteriorated condition during surveys conducted as late as 1959 (Sumner, 1941; Sharsmith, 1959) have been the continued focus of monitoring and management. Modern recreational and administrative stock use remains more localized than historic use, with use concentrated along the primary trail corridors, on the Hockett Plateau, in the Roaring River area, and in the Kern Canyon. Of the total meadow area in the parks, approximately half is currently open to grazing. During the period following implementation of the 1986 Stock Use and Meadow Management Plan (SUMMP), some level of use has been documented in approximately half of the meadows open to stock, or a quarter of the total meadow area of the parks (Frenzel and Haultain 2013).

Stock grazing has declined in volume since the 1960s, with a trend towards more concentrated use in the past two decades (Hopkinson et al. 2013). In an analysis of use levels between 1985 and 2009, Hopkinson et al. found that grazing levels were relatively light in the majority of meadows, with almost half of the grazed meadows having less than one animal unit night (AUN)/acre per year reported. The number of meadows with at least one season of grazing over 90 AUN/acre decreased from 17 meadows between the years 1985-1997 to only 7 meadows in the period 1998-2009. Stock use on individual meadows was highly variable, with some meadows having significant use in one year and none in the next. Detailed discussions of recent use patterns can be found in the meadow sections of the Natural Resource Condition Assessment (Hopkinson et al. 2013), and in the annual summaries of stock use and grazing (e.g., Frenzel and Haultain 2013; 2014).

The Natural Resource Condition Assessment (NPS 2013a) also assessed the condition of grazed meadows in the two parks through analysis of several decades of monitoring data. In an analysis of monitoring data collected from 25 grazed meadows between 2001 and 2009, Hopkinson et al. (2013) found a trend of increasing residual biomass, or the amount of vegetation left on a meadow at the end of the growing season, while that from comparable ungrazed meadows showed no statistically significant trend. It is likely that this reflects improved meadow condition due to an increased emphasis on residual biomass to inform stock management, with use levels managed to maintain acceptable levels of residual biomass in grazed meadows.

To evaluate stock grazing effects on plant species composition, data have been collected on a set of five paired grazed-ungrazed meadows over the past twenty-five years. Supporting earlier analyses of these data by McClaran and Neuman (1989) and Abbott et al. (2003), Hopkinson et al. (2013) found very little

evidence for grazing-related compositional differences in the five paired meadows. They also reported that percent cover of bare ground was never statistically significantly different for any of the five meadow pairs' grazed and ungrazed meadows, and that temporal trends in bare ground were generally in tandem for paired grazed and ungrazed meadows. Based on these results, the authors found no strong evidence that current management of stock use has resulted in vegetation change in the five meadow pairs sampled. They were careful to note, however, that based on a five year grazing experiment in mountain meadows in Yosemite National Park, Cole et al. (2004) concluded that when grazing impact is light, species composition change is a less sensitive indicator of meadow condition than changes in productivity and ground cover; thus, the lack of strong differences in species composition between grazed and ungrazed meadow pairs may not definitively demonstrate that stock grazing has had no effect on the meadows.

The past decade has seen a marked increase in research interest in the meadow and wetland systems of the Sierra Nevada. In addition to studies of meadow hydrology, productivity, and biodiversity, there have been a number of investigations into the environmental effects of stock use and grazing. Ostoja et al. (2014) reviewed existing literature to provide a summary of potential effects of pack stock on broad response categories relevant to Sierra Nevada meadows, including water quality, soils, plants, and wildlife. Specific relevant results on these topics have been integrated into chapter 3 of the WSP/FEIS.

A number of recent mapping efforts have addressed the value of spatially explicit information on the distribution of meadows in the two parks, both in support of grazing management and to establish a broader ecological knowledge base. Early maps of the meadows used by stock were based on black and white aerial photographs and delineated on 15 minute topographic maps (Neuman 1990). National Wetland Inventory maps based on remotely sensed imagery were created for the parks in 1996 (USFWS 1996); these included many of the wet meadow types, but by definition did not delineate upland types. In 2007 the first comprehensive association-level map of the vegetation of the two parks was completed (NPS 2007b). Based on 1:15840 color infrared photography and traditional photo-interpretation methods, this map incorporated the information captured by the earlier wetland and meadow mapping efforts. In 2013, park ecologists completed the first map distinguishing peat accumulating wetlands and wet meadow complexes within the parks' meadows (Pyrooz et al. 2014 in review), providing a level of detail that had not been discernible from the parks' 2007 vegetation map and insights into the distribution of peat accumulation across the landscape.

In addition to these mapping efforts, the hydrogeomorphic classification system developed by Weixelman et al. (2011) has recently been applied to a majority of the parks' meadows used by stock. Taken together, these studies and mapping efforts have made significant contributions to the understanding of the distribution, use and condition of park meadows.

PACK AND SADDLE STOCK MANAGEMENT HISTORY

Prior to the implementation of the 1986 SUMMP, grazing management in these Parks was not systematic. Heavily grazed meadows were identified sporadically and specific restrictions established to lessen effects. Due to evidence of grazing effects, a framework for a systematic approach to meadow management was proposed in the early 1940s (Sumner 1941; Armstrong 1942). Flexible opening dates for specific forage areas based upon site conditions, limits on herbage removal, and long-term trend monitoring were to be the foundation of the system. All meadows then would receive protection based upon ecological factors and site-specific characteristics. Although the Armstrong-Sumner system was not implemented at the time, in many ways this approach was similar to that described and implemented by the 1986 SUMMP.

Concern about the condition of many wilderness meadows led to NPS support of an inventory of meadow conditions in 1959 (Sharsmith 1959). Sharsmith visited many Kings Canyon meadows previously

surveyed by Sumner (1941) as well as meadows in Sequoia National Park. He qualitatively described trends in specific meadows through comparative photography and narratives. He concluded that many popular and strategically located meadows were in worse condition than at the time of Sumner's survey and were continuing to deteriorate. As a result of these studies, several meadows were added to the 1ists of those meadows closed to all grazing or subject to restricted grazing (NPS 1937, 1949, 1960-1964; Briggle et al. 1961). Use limits were established, including: head limits for specific forage areas (NPS 1949); closure of certain meadows to grazing and opening dates for meadows (NPS 1960-1964; Briggle et al. 1961); and a limit of 20 head per stock party in 1966. At the same time, the NPS expanded management tools to include opening dates for meadows. A program to reroute trails out of meadows was initiated; lodgepole pine and other woody species thought to have encroached into meadows as a result of historic grazing were removed in several places. No cohesive set of criteria defining acceptable or allowable impact accompanied these actions, however.

In 1985, an effort to compile available information on the meadows and forage areas in the two parks was initiated (McClaran and Neuman 1989). Park ecologists expanded this work and in 1990 *Past and Present Conditions of Backcountry Meadows in Sequoia and Kings Canyon National Parks, 2nd Edition* (Neuman 1990) was completed. Building on an early inventory and classification of the parks' meadows developed by DeBenedetti (1984), the resulting narrative recognized 333 forage areas and brought together site-specific information on vegetation associations, use levels, management history and regulatory status, and condition from a wide variety of sources. The report also included maps of the meadows and forage areas derived from black and white aerial photographs (1964, 1:16000). This work provided a detailed history of the meadows in the parks and established the context for implementation of the 1986 SUMMP. The full document is currently being converted to digital database format in order to link the information to spatial data layers, increase accessibility to site-specific management history, and to facilitate continued updates.

The 1986 SUMMP established the first formal system for the management of stock use in the parks. The plan identified which meadows would be open to grazing, and established a network of meadows to be permanently closed to grazing for the purposes of long-term protection and study. It identified areas open to off-trail travel, and specified tools for managing stock use, including night and party size limits and the use of opening dates for controlling the onset of grazing. The plan also established minimum impact restrictions and guidelines for the use of drift fences.

Recognizing that long-term information is necessary to document changes in conditions and to provide information on the effectiveness of the management program, the 1986 SUMMP also established a monitoring program. The objectives of this program were to track use levels, measure changes in plant species composition and bare ground over time, and using a system of photographic records, document coarse changes in meadow condition. In the late 1980s, a temporary range conservationist was hired by the wilderness management program to develop and implement the monitoring protocols. In 1995, a permanent plant ecologist position was created within the Division of Resource Management and Science to oversee the monitoring program. This marked the beginning of the collaborative monitoring and management program currently in place. This program relies heavily on wilderness ranger staff for much of the field data collection and on the ground management, with plant ecology staff overseeing protocol development, data collection, management and summarization. The wilderness coordinator and plant ecologist work together closely to facilitate the integration of monitoring results into adaptive management.

ADAPTIVE MANAGEMENT

Adaptive management is a structured, iterative process by which system monitoring is incorporated into management practices to achieve desired results. Adaptive ecosystem management requires continuing

monitoring and investigations to advance the understanding of stressors impacting native species and wilderness resources so that managers remain informed about which stressors are most serious, which stressors are manageable, and the ways stressors, such as grazing, can be managed. Scientific research allows for expansion of management tools available today and provides information that can be incorporated into future management activities.

Adaptive management is a system of management practices based on clearly identified desired conditions and monitoring to determine whether management actions are achieving objectives and, if not, facilitating management changes that would best ensure that desired conditions are met or re-evaluated (Walters and Holling 1990; Williams et al. 2007). Adaptive management is a technique employed for charting a decision-making course to obtain a desirable condition. An effective monitoring program is required to provide the navigational framework needed for successfully meeting the challenges of adaptive management.

Adaptive management recognizes that knowledge about natural resource systems is sometimes uncertain (43 CFR 46.30; Moir and Block 2001; Ruhl 2005). Adaptive management considers management actions and policy in a context analogous to experimental treatments. Thus, it embraces possible unknown elements by defining a set of quantitative responses that are consistent with management experience for each desired condition (hypothesized outcome). This is often accomplished through the use of various conceptual or quantitative models. The evidence for achieving the conditions/outcomes is considered in a well-designed monitoring framework.

Adaptive management integrates science and management (Lee 1993). From a science perspective, management objectives become the primary response of interest and the source of questions being posed. From a management perspective, the management objectives remain the primary concern, but learning becomes an additional, explicit objective. Thus, management takes on a part of science (i.e., learning), and science takes on a part of management (i.e., the objectives). More detailed information about the use and implementation of adaptive management is given in *Adaptive Management: The U.S. Department of the Interior Technical Guide* (Williams et al. 2007).

Compliance with NEPA is a statutory and regulatory requirement for federal activities affecting the environment, whereas adaptive management is a discretionary, learning-based approach to structured decision-making that may be used in conjunction with the NEPA process. It is a management tool that is consistent with NEPA's goal of informed decision-making (DOI 2010). Adaptive management and NEPA are complementary in that both emphasize collaboration, working with partners or stakeholders, and learning as part of the management process.

Adaptive management is an integral feature of the management of stock use under each of the alternatives evaluated in this WSP/FEIS. The adaptive management approach would include long-term monitoring to evaluate effectiveness of grazing management actions. Stakeholders, such as commercial outfitters, diverse user groups, and other land managers would continue to be fully engaged.

The proposed strategy for managing stock use is designed to prevent unacceptable impacts to meadows through implementation of multiple complementary field protocols and a suite of adaptive management tools. Taken together, the complementary elements of the management program at the parks—monitoring, which includes residual biomass and bare ground, stock use, species composition, repeat photography, and regularly scheduled site visits; an opening date system based on moisture, soil, and vegetation conditions; management tools including the ability to rest meadows when needed, as well as adjust use levels through controls on party size and length of stay; and ongoing research into meadow function and the effects of grazing on meadow ecology—are designed to protect meadows by preventing, minimizing, and/or mitigating impacts.

MONITORING STRATEGY AND THRESHOLDS FOR MANAGEMENT ACTION

Long-term information on the condition of meadows, and on stock use levels and patterns, is necessary to provide information on the effectiveness of the management program, document changes in conditions, and to inform the management of stock and the meadow systems they use. In their review of pack stock monitoring and management in wilderness, McClaran and Cole (1993) recognized the strengths of the program established by the 1986 SUMMP. However, they also called attention to two weaknesses: the application of a single uniform grazing standard to all park meadows, and the absence of defoliation standards. The monitoring protocols and management system described below address those deficiencies, through 1) the development of site-specific grazing capacities that can be modified to take into account different management objectives at the meadow scale, and 2) the continued implementation of residual biomass monitoring in frequently grazed meadows. The strategy for monitoring stock use and meadow condition includes protocols for:

- monitoring stock use, which provides a direct measurement of the timing, frequency, and duration of grazing as well as the holding and feeding of animals
- conducting site visits, for the purpose of surveillance and early detection of stock impacts (including sensitive areas such as springs, seeps, and streambanks)
- monitoring residual biomass, which provides a quantitative estimate of the amount of plant material remaining on a meadow at the end of the growing season and conversely, of the amount of vegetation consumed by grazing animals
- monitoring bare soil, which is an early indicator of the potential for increased erosion in meadow systems
- monitoring streambank alteration by stock, which is an early indicator for the potential for changes to soil erosion and meadow hydrology
- monitoring species composition, which serves to detect changes in the plant species composing meadow vegetation as a result of grazing
- photographic documentation of conditions and trends

Within each forage area, the primary meadows would be routinely evaluated to assess the status of soils, streambanks, and vegetation. Forage areas are defined as the primary meadows and their associated forested or upland grasslands, which are commonly used by stock for grazing. The forage areas open to grazing under each alternative are illustrated on the stock use and grazing alternatives maps provided in chapter 2 of this WSP/FEIS. The condition of the most heavily used portions of the forage area would be used to indicate the status of surrounding and associated areas grazed by stock. This approach rests on the assumption that if conditions in the most heavily used areas remain within established standards, the rest of the forage area will meet standards as well. If the species composition, density, and soil condition in the primary meadows remain comparable to similar but ungrazed meadows, it is assumed that the associated meadows will remain in good health. Because stock may graze areas outside of the primary named meadows, these areas would also be assessed during site visits but would not necessarily be the subject of the formal monitoring protocols.

The proposed strategy for monitoring and managing stock use relies on the measurement of proxy variables and implementation of preventive management strategies to maintain desired wilderness conditions. In the event that standards are not achieved, the management strategy prescribes adaptive management actions that will provide for recovery. The proposed management tools—such as grazing

limits, opening dates, length of stay and party size limits—are site specific, and could be revised as additional information becomes available to address meadow-specific vulnerability to impacts. Thresholds for management action are designed to provide managers with a range of tools that are triggered by either use levels and/or conditions, and the thresholds are set at a point before which unacceptable impacts occur. The following sections describe each of the formal monitoring protocols, establish thresholds for management action, and identify which actions may be triggered under different scenarios.

STOCK USE AND GRAZING LEVELS

In this WSP/FEIS, stock users are divided into three classes: administrative, commercial, and private. Administrative users are those that are employed by the NPS and who use pack stock in order to carry out their official duties. Commercial providers are entities that provide saddle and or pack stock as a paid service. Companies or individuals of this class are required to hold a NPS issued Commercial Use Authorization (CUA) or be a licensed in-park concession; clients of these commercial providers are also required to obtain a wilderness permit. Private use is packing and riding done by an individual with friends or family; only a wilderness permit is required for this class of use. At times commercial packers are employed to provide support for administrative activities. This use would continue to be attributed as commercial for tracking purposes but classified as serving an administrative function, and thus not count towards commercial service allocations. The WSP/FEIS sometimes refers to commercial and private stock use collectively as “recreational stock use,” to distinguish stock use by visitors from stock use by NPS.

Because grazing would continue to be both self-reported and documented by field staff at regular intervals, managers would be able to track the timing, duration, and intensity of use throughout the summer season. As part of the annual work planning process, administrative packers would continue to share their grazing plans with wilderness managers early in the season; commercial outfitters would continue to be required to submit trip itineraries to the parks two weeks in advance of entering the wilderness. All stock parties would continue to be required to report their itineraries after completing their trips. Monthly reports of commercial stock use would be due to the Concessions Management Office according to the requirements established by the relevant Commercial Use Authorization or concessions contract. Commercial service providers would continue to be required to report day use in wilderness, including trail rides, resupply, and spot and dunnage trips whether or not any grazing occurred. Administrative use would continue to be reported monthly, while private users would be requested to submit their reports at the end of the summer season.

The location of each overnight camp, the number of people and stock present, the type of animals, the corresponding dates, and the number of stock fed or grazed would be reported. Stock use reporting forms would be provided to commercial pack stations, NPS and USFS trailheads and administrative packers. Private stock parties would be given reporting cards when obtaining wilderness permits, or when encountered by wilderness rangers in the field. Wilderness rangers would be given a supply of cards each spring for distribution to users, and would also be charged with documenting all observed use within their patrol area. The self-reported use data, along with the wilderness ranger observations, would continue to be compiled and compared against records from the wilderness permit database. This combined information would continue to be evaluated for reporting errors and inconsistencies, summarized, and reported annually. Data would be presented in tabular and graph form, and comparison with past years use presented. Where possible, trends and patterns would be identified and the potential causes discussed. Stock use data would continue to provide information that helps show what levels of stock use resulted in present conditions and would be used to inform the annual discussion of wilderness conditions and any proposed changes to management or restrictions.

Thresholds for Management Action: Use levels serve as a primary proxy for potential impacts to meadow systems, and as such, are used to trigger monitoring activity as well as management responses where necessary. Wilderness rangers would continue to track use in the field and notify the wilderness office when the estimated capacity of a meadow is approached. Self-reported commercial and administrative use would be similarly reviewed by plant ecology staff as reports become available. Meadows in which use reaches the estimated capacity (see attachment 1) would be evaluated for impacts. If conditions warrant, a grazing closure or other appropriate management action would be taken. Such actions would be recommended to the appropriate district ranger by field personnel during the grazing season for immediate implementation, or proposed to the Superintendent following the annual review of monitoring results for implementation during the following summer season. Increased use may be allowed where information from the monitoring program and observed conditions indicate.

As a guideline, areas receiving high levels of use (80% or greater of the estimated capacity) would be evaluated annually, those receiving moderate use (50-79% of the estimated capacity) would be evaluated biannually (or annually if resources are available), and those areas that are lightly used (less than 50% of the estimated capacity) would be evaluated at least every 5 years.

SITE VISITS AND CONDITION ASSESSMENTS

Site visits to grazed meadows would continue to be made with the goal of surveying for stock impacts and describing and documenting these impacts. A typical site visit would include a survey of stock camps, preferred forage areas, maintained and informal trails, stream banks, seeps, and springs, and any other sensitive features in the meadow area. In the course of each site visit, staff would describe stock impacts and other factors influencing meadow vegetation and hydrology. Stock impacts which will be evaluated would include the extent and severity of deep hoof prints, trampled vegetation, closely cropped vegetation, stream bank shearing, erosion, and extent of the area subject to preferential grazing.

Documentation would consist of categorical assessments, narrative, and photographs. The date and extent of each survey would be documented. Observations would be linked to the timing and amount of stock use which has occurred at the time of the survey. The efficacy of existing management (opening dates, capacities, head and night limits, education and outreach) for meeting goals would be evaluated. The need for additional monitoring (residual biomass, bare ground, repeat photography, streambank alteration) would be assessed. Parameters used to estimate grazing capacity would be verified. When non-native species, rare species, or other sensitive resource features are encountered, staff would document and distribute this information to appropriate specialists.

Meadow monitoring staff would continue to train others working in wilderness (wilderness rangers, other technicians, packers) in data collection protocols and collate and summarize field reports.

Because grazing would be both self-reported and documented by field staff at regular intervals, managers would remain able to track the timing, duration, and intensity of use throughout the summer season. Meadow condition would be evaluated during and at the close of the grazing season by both field rangers and professional ecologists. The frequency of site visits would be determined by documented use levels and patterns, which are largely well established and predictable, as well as through regular communication with commercial outfitters and administrative packers. As part of the annual work planning process, administrative packers would continue to share their grazing plans with wilderness managers early in the season; and commercial outfitters would continue to be required to submit trip itineraries to the parks two weeks in advance of entering the wilderness. These requirements would facilitate the focusing of monitoring efforts on popular locations as the need arises.

Thresholds for Management Action: Site visits would provide for early detection of impacts and would identify where management action or additional monitoring may be needed. Although site visits would be triggered by use levels, site visits could trigger management actions or implementation of additional formal monitoring protocols independent of stock use data.

VEGETATION AND SOILS

The primary emphasis of the vegetation and soils components of the monitoring program is to measure changes in productivity, species composition and bare soil over time. Implementation of these protocols also provides for the early detection of impacts to sensitive features (such as streambanks, seeps and springs) and the introduction of nonnative plant species. Four protocols (residual biomass, species composition, bare soil, and repeat photography) developed to address these topics are described below. Each of these protocols would be implemented in a subset of targeted meadows, which will likely fluctuate in response to use levels, availability of staff time, and expertise. Site visits by wilderness patrol and meadow monitoring staff would continue to be made to meadows not included in one of these formal sampling efforts with the goal of monitoring conditions in all meadows used by stock. Site visits would serve to document conditions in meadows used by stock using a standardized rapid assessment protocol (in development) and would include written descriptions of soil and vegetation conditions, presence of nonnative species, impacts of concern, use patterns, and any additional relevant observations.

RESIDUAL BIOMASS

Residual biomass refers to the amount of above ground plant material present in a meadow after grazing. In systems dominated by herbaceous plants, adequate residue serves to protect soil surfaces and plants, to replenish the soil mulch and organic layers, and to trap and hold moisture. Ungrazed vegetation also provides shelter and forage for animals that depend on meadows for all or part of their life cycles. As such, residual biomass is both an important contributor to meadow function and an indicator of grazing impacts that can provide a quantifiable and repeatable measure to guide management. In remote areas where the timing and duration of grazing is unpredictable and the collection of data on plant growth to generate precise estimates of plant productivity is prohibitively costly, monitoring residual biomass on ungrazed sites provides an efficient proxy measure of productivity.

The comparative yield method of estimating residual biomass (Haydock and Shaw 1975) was modified and adopted for use in the wilderness meadows of Sequoia and Kings Canyon National Parks in 1993 (Neuman 1993). In this method, reference quadrats are selected in the field to represent a linear scale of biomass within a designated plot. These quadrats then serve as standards against which the yields of 150-200 systematically selected quadrats are estimated by eye. The ocular estimates are calibrated using the dry matter yields of the original standards and two additional sets of standards that are clipped following the sampling. This procedure is applied to both a core (grazed) and reference (ungrazed) plot within each meadow. The protocol was specifically designed to be used by non-specialists (such as wilderness rangers and packers) and to avoid the installation of permanent markers in wilderness. Each year wilderness rangers at Sequoia and Kings Canyon would continue to undergo training in residual biomass monitoring, with field oversight and assistance provided by the plant ecology program to ensure data consistency and quality.

The locations of the core and reference plots would continue to be documented using photographs and distance and direction to recognizable features. Although the plots would not be permanently marked, this allows for sampling to take place in the same area year after year. As animals tend to graze close to established camps and in favored areas, the location of the plots generally coincides with the area of concentrated use and impact.

The amount of biomass remaining at the end of the growing season would continue to be estimated using this method in meadows that are regularly grazed by stock at levels approaching the estimated capacity, and/or which show signs of heavy use. Core plots would continue to be located subjectively within the area of greatest grazing pressure. If a suitable location is available, an ungrazed reference plot would be located in an area that is both biotically and abiotically comparable to the core plot, with similar soil and hydrologic regime. Optimally the reference plot would also be located within the same meadow; where this is not possible due to the presence of grazing impacts throughout the meadow; a similar site in an adjacent meadow area may be selected. Both core and reference plots may vary in size depending on the size of the meadow being monitored.

This monitoring would continue to use subjectively chosen core plots where grazing impacts are greatest; if the impacts there are considered acceptable, then the rest of the meadow will likely also fall within management standards. This design would prioritize detailed information about the greatest impacted areas of each sampled meadow rather than conditions across the entire meadow or across all meadows in the parks.

Residual biomass monitoring data would continue to be summarized and reported annually. As with the stock use data, these data would continue to be presented in tabular and graph form, and comparison with past years presented. Where possible, trends and patterns would be identified and the potential causes discussed. Residual biomass data could also be used to characterize productivity in ungrazed portions of individual meadows. This information would continue to be coupled with the stock use data and used to inform the annual discussion of wilderness conditions and any proposed changes to management or restrictions. Residual biomass guidelines would be periodically reevaluated to reflect improved knowledge about the relationship between utilization and impacts.

Thresholds for Management Action: Residual biomass monitoring provides meadow production and utilization data that can be used for informing strategies for meadow management. By quantifying the amount of plant material remaining on a meadow at the end of the growing season (and conversely, of the amount of vegetation consumed by grazing animals), the protocol allows managers to assess the validity of assumptions regarding consumption levels used in capacity estimates. When residual biomass monitoring results indicate that utilization has exceeded the established standard (utilization standards, expressed as the proportion of meadow vegetation available for grazing, are provided in attachment 1), management actions would be taken to adjust use levels to bring residual biomass into standard. The specific management actions taken would be based on a consideration of all available monitoring data.

BARE SOIL

The amount and distribution of bare soil is considered an important indicator of meadow integrity as it directly relates to site stability and susceptibility to erosion (Smith and Wischmeier 1962, Morgan 1986, Benkobi et al. 1993; Blackburn and Pierson 1994; Gutierrez and Hernandez 1996; Cerda 1999). Grazing has been linked to increases in bare soil as well as decreased plant cover, decreased primary productivity, and shifts in species composition (Miller and Donart 1981; Trimble and Mendel 1995; Olson-Rutz et al. 1996; Fahnestock and Detling 2000; Cole et al. 2004). Trampling, by either humans or stock, can produce similar results (Cole 1995; Liddle 1975, 1991) with the added impact of soil compaction that compromises root growth and water infiltration (Gilman et al. 1987; Unger and Kaspar 1994; Pietola et al. 2005).

Bare soil is considered a more sensitive indicator of meadow condition than species composition (Cole et al. 2004), as it increases at lower levels of disturbance compared with shifts in species composition in a variety of montane vegetation types of North America (including alpine meadows) (Cole 1993). Plant productivity may be more sensitive to grazing pressure than bare soil (Cole et al. 2004), but is more time

consuming and costly to monitor in wilderness settings and is also subject to high interannual variability in response to climatic factors (Moore et al. 2013), such as the timing and amount of precipitation (Walker et al. 1994), snowpack, or snowmelt (Walker et al. 1995). Because bare soil measured from point data is efficient, objective, easily obtained, and repeatable across time and observers, it has been used to assess meadow condition in Sierra Nevada meadows by the USFS (Weixelman and Zamudio 2001) and has recently been adopted as an indicator of meadow condition in Yosemite National Park (NPS 2014a and 2014b).

Weixelman and Zamudio (2001) classified bare soil cover values into low, moderate and high ecological condition classes based on monitoring data from a comprehensive multi-year study in U.S. Forest Service meadows in the Sierra Nevada (table D-1). These condition classes for bare soil values are based on point-intercept data collected from 363 meadows across a broad disturbance gradient (Weixelman and Zamudio 2001). The values for bare soil cover that define the ecological condition classes presented by Weixelman and Zamudio (2001) vary according to moisture regime and elevation. For example, to be in a high condition class, a moist (mesic) meadow would not have bare soil exceeding 6% of its surface area, and a wet (hydric) montane meadow (6,000-8,000 feet) would not have bare soil exceeding 4%. These values have recently been used as a starting point to inform condition class development in Yosemite National Park (NPS 2014a and 2014b) and are provided below as an example of how they may be applied in Sequoia and Kings Canyon National Parks. Note that the meadows included in the sample described by Weixelman and Zamudio occur at lower elevations than many park meadows, reflecting both latitudinal effects and the preference of the use of montane meadows for livestock grazing in the National Forests.

Table D-1: Provisional Bare Soil Cover Values for Ecological Condition Classes among Sierra Nevada Meadow Types

Meadow Type	High Condition	Moderate Condition	Low Condition
Montane			
Hydric meadow	0-4%	5-9%	>9%
Mesic meadow	0-6%	7-13%	>13%
Xeric meadow	0-8%	9-13%	>13%
Subalpine			
Hydric meadow	0-4%	5-8%	>8%
Mesic meadow	0-6%	7-13%	>13%
Xeric meadow	TBD	TBD	TBD

NOTES: The montane zone is about 6,000 to 9,000 feet in elevation and the subalpine zone is 9,000 to 10,000 feet in elevation in the southern Sierra. Values are from Weixelman et al. 2001 as presented in NPS 2014a.

These values are provisional and will be subject to revision following further study in park meadows.

Estimates of bare soil (and other groundcover categories—e.g., litter and duff) would continue to be collected during residual biomass monitoring (using the step-point method) and species composition monitoring (as cover data associated with each frequency quadrat). These measures have been used in concert with residual biomass data to inform assessments of meadow condition and the need for use level adjustments (Haultain and Frenzel 2013).

It is important to note that estimates of bare soil collected from the residual biomass monitoring plots reflect conditions in a relatively small proportion of the total meadow area, which by design represents the area of highest use; if the impacts there are considered acceptable, the rest of the meadow will likely also fall within management standards. This design would prioritize collection of detailed information

about the greatest impacted areas of each sampled meadow rather than conditions across the entire meadow or across all meadows in the parks.

Thresholds for Management Action: The provisional values for bare soil condition classes would be revised based on values obtained through analysis of existing data and additional data collection in order to ensure applicability to the meadows of Sequoia and Kings Canyon. NPS and USFS ecologists would gather information on bare soils in park meadows using methodology comparable to that used by the USFS and in Yosemite National Park. Data would be collected from both grazed and ungrazed meadows representing a range of use levels, elevations, and vegetation types. Results from these efforts would be used to assess the applicability of the condition classes developed by Weixelman and Zamudio (2001) to park meadows and would inform the further development of thresholds for management action (table D-2).

Table D-2: Provisional Thresholds for Management Action and Rationale Based on Bare Soil Values

Threshold(s) for Management Action	Management Actions	Rationale
Threshold 1: Monitoring indicates "low ecological condition" bare soil cover value at any grazed meadow.	Apply a secondary assessment method for a qualitative evaluation of meadow condition.	Secondary assessments are diagnostic tools that provide standardized, rapid, field-based assessments of the overall condition or functional capacity of meadows. Assessing meadow condition would aid in identifying key stressors that may be affecting meadow condition. Assessment results would assist with interpretation of monitoring results.
Threshold 2: Monitoring indicates "low ecological condition" bare soil cover value at any monitored site for two successive monitoring periods AND secondary assessment indicates stock use is a contributing stressor for both monitoring periods	Increase education about minimum impact and best management practices in meadows for Wilderness visitors, and the parks' staff and partners.	Education in maintaining meadow condition would help prevent further increases in bare soil associated with human or stock use.
	Adjust total grazing levels or timing of use if needed to minimize impacts. Rest the meadow if necessary. Temporarily discontinue grazing until conditions improve based on secondary assessment results.	Grazing capacities constitute use levels that can be sustained in a meadow based on available forage cover, productivity and site condition, which can guide in setting an appropriate level of use. Allowing a period of meadow "rest" facilitates meadow recovery. Effects of trampling and grazing that are expected to decline with reduced use or avoidance of early-season use include soil compaction, bare ground exposure, and plant disturbance.
	Monitor annually for 3-5 years or until meadow reaches moderate or high condition based on bare soil values.	Frequent monitoring would facilitate rapid detection of, and management response to, changes in ecological condition as well as inform the evaluation of the effectiveness of changes in the intensity and/or timing of use on meadow condition.

Table D-2: Provisional Thresholds for Management Action and Rationale Based on Bare Soil Values (continued)

Threshold(s) for Management Action	Management Action	Rationale
Threshold 3: Bare soil is double the value of "low ecological condition" class at a meadow OR previous management actions (such as reduction in use) have been ineffective OR assessments for 3-5 years have not shown improvement in ecological condition.	Discontinue grazing until conditions improve based on bare soil monitoring.	Allowing a period of meadow "rest" facilitates meadow recovery. Effects of trampling and grazing that are expected to decline with reduced use or avoidance of early-season use include soil compaction, bare ground exposure, and plant disturbance.

STREAMBANK ALTERATION

One of the effects of grazing animals on wetland habitats is the alteration of hydrologic regimes through impacts on streambanks and channels (Kauffman and Krueger 1984, Trimble and Mendel 1995). Streambank vegetation plays a critical role in the stability of channels and banks (Gordon et al. 2004). Impacts to streambank vegetation from grazing animals have the potential to interact with climate change to alter hydrologic conditions in wetlands (Viers et al. 2013).

Stream channel and stream bank stability is a function of many complex, interacting factors such as basin size, surficial geology and sediment supply, climate, land use, and history (Gordon et al. 2004). Depending on these factors, stream channels can be relatively static (stable) or dynamic (unstable) in the absence of stock impacts. Alteration is a measure of actual stock impacts to streambank soils and vegetation; it can occur from shearing, trampling, and trailing (table D-3). All else being equal, stability decreases with alteration. Alteration is sensitive to management and actions to reduce alteration can result in more natural channel morphology over time (Bengeyfield 2006).

There are no consensus approaches to setting streambank alteration standards (Cowley 2002). Guidelines for alteration where anadromous fish populations or other sensitive resources are a concern are generally 10%. Alteration standards of 10% on portions of the Inyo National Forest have been part of a management strategy to allow riparian recovery (Frietas et al. 2014).

Table D-3: Definition of Streambank Alteration Impact Types*

Alteration Type	Definition
Shearing	Removal of a portion of the streambank by ungulate hooves leaving a smooth vertical surface and an indentation of a hoofprint at the bottom or along the sides.
Trampling	Indentation of a hoofprint and exposed roots or soil, resulting in a depression at least 13 mm deep or soil displacement at least 13 mm upwards.
Trailing	Linear features compacted and denuded by repeated traffic. Trailing is counted where there are signs of current-year use even if hoofprints do not result in 13-mm displacement of soil because of the impacts of compaction.

* adapted from Heitke et al. 2008 and Burton et al. 2011

Site visits would be used to identify areas where streambank alteration is a concern. Monitoring would be established to quantify the extent of current year alteration and would provide information about trends

related to management actions in a specific forage area. Streambank alteration would be monitored along both banks of affected channels through the forage area. The extent of the survey would be documented by recording the upstream and downstream extents of the monitored reach. Alteration would be measured along a step-transect located along the first line of continuous perennial vegetation (the "greenline," Winward 2000), with decision rules about locating transects adapted from the Multiple Indicator Monitoring protocols (Burton et al. 2011). Alteration would be measured on a 92-centimeter (cm) line perpendicular to and centered on the greenline. Alteration could be recorded as either presence/absence along the 92 cm line or the amount of the 92 cm line that is altered ("GL" or "GLP" method, respectively, Heitke et al. 2008). Current year impacts would be identified based on the absence of weathering effects of freeze and thaw cycles, rain events, and erosion by stream flow or vegetative regrowth. Data would be summarized as percent alteration, calculated as the number of sample points altered divided by the total number of sample points (for presence/absence) or the total length of altered bank divided by the total length evaluated (precise method).

Thresholds for Management Action: In the absence of applicable standards for alteration, monitoring data would be used to identify trends in streambank alteration relative to use patterns and management actions and to provide context to evaluations by subject matter experts. If streambank alteration is associated with accelerated erosion or instability, management action would be taken to limit further alteration and facilitate recovery.

SPECIES COMPOSITION

To evaluate grazing effects on plant species composition, data have been collected from five pairs of grazed and ungrazed meadows over the past twenty-five years. Data were collected on the first meadow pair in 1985 and since then sampling has been conducted on four other meadow pairs, resampling every pair on an approximately 5-year rotation. Meadow pairs selected for monitoring are located at East Lake and on the Monarch Divide in Kings Canyon National Park, and on the Hockett Plateau and in the Upper and Lower Rock Creek drainage in Sequoia National Park. The meadow pairs represent several different meadow types, including fine sedge (*Eleocharis pauciflora*), medium sedge (*Carex scopulorum* var. *bracteosa*)-grass-herb, tall grass (*Deschampsia cespitosa*) and sedge-herb, fine grass (*Calamagrostis breweri*) and sedge-herb, and wide sedge (*Carex utriculata*)-fine grass (*Calamagrostis breweri*)-herb (as described by DeBenedetti 1984).

The sampling protocol implemented in Sequoia and Kings Canyon National Parks was developed by McClaran and Neuman (1989) specifically for use in wilderness and is described in detail in Frenzel and Haultain (2012) and McClaran and Neuman (1989). Briefly, a single large plot (approximately 500 to 3,000 m^2) has been established in the grazed and ungrazed meadows of each meadow pair. Although not permanently marked, plots are relocated using photographs and distance and compass direction from recognizable features. Each plot is divided into 10–15 equal subareas; within these 10–15 subareas, 10–20 25 x 25 cm quadrats are haphazardly located (to avoid bias) during the sampling event, for a total of 100 to 200 quadrats per meadow. The number of quadrats is determined by the vegetation type and is the same for all sampling years for a given meadow. All species rooted within the quadrat are recorded as present, as are moss and hoof prints greater than 2.5 cm deep; percentage of bare ground within the quadrat is also recorded. The same data are collected for a 10 x 10 cm quadrat nested within the 25 x 25 cm quadrat. Abundance is reported as a species' frequency of occurrence in the 100-200 quadrats of each large plot.

Early detection of nonnative plants is also a concern directly related to monitoring changes in species composition. Field staff survey for nonnative plants as part of implementation of each of the stock use and meadow monitoring protocols described here. Both active and passive surveillance protocols for detecting

nonnative species introductions, as well as appropriate management responses, are described in "Appendix N: Strategy for Reducing Nonnative Plants in Wilderness".

Thresholds for Management Action: In comparing native and naturalized species composition of the paired grazed and ungrazed areas beginning with the base year of the monitoring program, modifications to grazing use levels and patterns would be necessary when the grazed area shows: 1) more than 15% change in the dominant species as recorded by the frequency plots, or 2) more than a 15% change in the proportion of bare ground and with observed erosion.

Although these results would apply only to these specific meadow pairs, changes detected as part of this monitoring protocol would also serve as an indicator of the need for additional monitoring in similar meadows.

New occurrences of nonnative plants detected during species composition or other monitoring activities would be documented (including the collection of voucher specimens) and reported to the invasive plant program manager as soon as possible. When identification has been confirmed by a subject matter expert, immediate manual control efforts would be taken as feasible.

REPEAT PHOTOGRAPHY

The 1986 SUMMP introduced a system of using repeat photography to document gross changes in meadow vegetation over time. This system was designed to detect general changes in vegetation (e.g., a shift in dominance from grasses to sedges or sedges and grasses to forbs, enlargement or shrinking of the boundaries of vegetation types, changes in soil conditions and erosional effects and proportion of bare ground). The long-term meadow vegetation repeat photography collection was built on early work by park employees Clay Peters and Terry Gustafson (summarized in a file report prepared by T. Gustafson dated January 15, 1965), and expanded and formalized by Range Conservationist M. Neuman in the late 1980s and early 1990s. Historic scenes of park meadows were obtained, archived, and documented in a tracking database. Binders of printed photographs and associated label information were created for each wilderness patrol area, with the intention that the rangers would re-take the black and white photographs each year and return them at the end of the season for processing.

The long-term meadow repeat photography collection represents a valuable source of information on gross changes in meadow vegetation and morphology. The collection consists of 320 scenes, dating from 1929 through 1992, that have been formally documented in a database. At least 202 of these have one contemporary shot documented in the database; 34 have been re-taken three times and documented, and seven have been photographed four times. Black and white prints of each original scene and subsequent revisit have been made and reside in park files. Subsets of the photographs have been re-taken as time and resources allowed. These images provide a tool with which to document the establishment of lodgepole pine (*Pinus contorta*) saplings into meadows, a dynamic that has been the subject of much research and discussion. Recovery from past heavy grazing by cattle and sheep, and the efficacy of the efforts of the Soil and Moisture Crews (1948-1980) to halt erosion and restore proper hydrologic functioning through the installation of check dams could also be assessed using this resource. The Soil and Moisture Crews also removed 'invasions' of *Pinus contorta* and *Veratrum californicum* from within selected meadows. These restoration efforts were well documented in reports and photographs that remain in park files, and thus there are potentially useful ancillary data on management actions to correlate with any changes in condition captured by the photographic record.

Photographic documentation would continue to be included in each component of the monitoring program, although images would be acquired using contemporary high-resolution color digital photography as opposed to film. Photographs would be taken during site visits made by field staff, during

assessment of opening date conditions, as part of species composition and residual biomass monitoring, and whenever concerns or questions arise regarding meadow, camp, or trail conditions. Digital images would continue to be processed and archived on the park network for access by managers and subject matter experts.

Thresholds for Management Action: There are no specific standards in place for the types of changes that may be detected through repeat photography. Photographic documentation of such changes or of impacts associated with stock use would remain an important source of information when considering management actions. In addition to monitoring photographs taken by wilderness rangers or plant ecology staff, photographs submitted by other staff from the parks, partners, or wilderness visitors can be used to trigger subsequent site visits and inform decisions regarding monitoring or management actions.

THE MANAGEMENT SYSTEM

The goals of managing recreational grazing in a National Park wilderness differ from those in areas devoted to the production of livestock; within the park, the protection of naturally functioning meadow ecosystems is given greater weight than the provisioning of forage for stock. Grazing by recreational stock is inherently less predictable than that of production oriented livestock systems, as different numbers and types of animals, led by different handlers, arrive at varying times throughout the season. A successful management system must have the flexibility to address the variable nature of the timing and intensity of grazing by recreational stock, site-specific responses to grazing, and the inherent variability in productivity of meadow systems in response to changing weather and climate.

Under the preferred alternative, management of stock use in the wilderness of Sequoia and Kings Canyon would continue to use the grazing management tools described in the 1986 SUMMP, which are based in part on traditional range management techniques and adapted for use in the wilderness setting. Stock permitted within Sequoia and Kings Canyon National Parks would continue to include only horses, mules, burros, and llamas. Goats would remain specifically prohibited as they can carry diseases that threaten native bighorn sheep. Management actions would continue to be applied at the scale of the forage area. Forage areas are defined as the primary meadows and their associated forested or upland grasslands, which are commonly used by stock for grazing. Other areas within accessible proximity of the trails and travel zones open to use, although not designated as forage areas and not having an established use level, may also be used for grazing by stock. The 1986 SUMMP recognized that the primary meadow within each of the forage areas was likely the most sensitive to the influence of grazing and would reflect early change. The primary meadow would continue to be the focus of monitoring and used as a barometer to guide decisions on future adjustments in timing and level of grazing use.

The following sections describe the specific components of the management system and how information derived from monitoring would inform management actions.

NETWORK OF MEADOWS CLOSED TO GRAZING

A series of meadows would continue to be closed to grazing to provide opportunities to compare ungrazed meadows with grazed meadows as part of the monitoring program, to provide opportunity for scientific study of meadows that are not affected by stock grazing, and to provide opportunities for park visitors to observe a representative sample of meadows, in proximity to general travel routes, that are not affected by grazing.

For scientific study purposes, a major value of Sequoia and Kings Canyon (an International Biosphere Reserve) is that it contains ecosystems that are as undisturbed by human activities as is reasonably possible. Meadows that are representative of each significant type (by physiography, origin, plant

associations, and unique features) would continue to be protected from grazing by stock. Basin, slope, and streamside stringer meadows; meadows of pre-glacial and post-glacial origins; and meadows representative of the area's common meadow plant associations were identified by the SUMMP and would continue to be included in this category. A selection of meadows closed to grazing would be accessible by trail so that they can easily be observed by the public and accessed efficiently for scientific study.

Table D-4: Network of Meadows Closed to Grazing for Scientific and Social Value

Meadows Designated in 1986 SUMMP	Proposed Additions (Under NPS Preferred Alternative)
Big Pete Meadow (forested portion)	Bighorn Plateau
Crabtree Ranger Station Meadow	Meadow 0.6 mi south of Bighorn Plateau
Dragon Lake Meadow	Chagoopa Plateau #3 Meadow
Ellis Meadow	Darwin Meadow Proper
Goddard Creek Meadows	Grouse Meadow
Guyot Creek Meadows (west of trail)	Guyot Creek Meadows (east of trail)
Lake South America Col Meadow	Lower Crabtree Meadow
Mitchell Meadow	Taboose Pass Meadow (12 acre wet meadow at 10,920 feet)
Rock Creek Ranger Station Meadow	
Rock Creek #2 Meadow	
Wallace Creek Closed Meadow	
Woods Lake Shoreline Meadow	
Wright Creek Closed Meadow	

Meadows that would be closed to grazing under the NPS preferred alternative are listed in chapter 2 of this WSP/FEIS.

STOCK USE AND GRAZING MANAGEMENT TOOLS AND TECHNIQUES

Opening Dates

Opening dates are established for all of the park forage areas. These dates are designed to prevent mechanical disturbance to surface soil and vegetation that results in the breakage of the root-soil complex to the point that vigor of individual plants (or networks of plants) deteriorates as evidenced by deeply incised hoof prints, change in species density, or composition, or both. Such breakage increases soil erosion over what would be natural without grazing. Opening dates also allow for adequate plant development to replenish carbohydrate stores expended in spring and allow plants to reproduce. Meadow vegetation provides an important source of floral and seed forage for native fauna (Frase and Armitage 1989; Hatfield and Lebuhn 2007; Hoffman Black et al. 2011; Holmquist et al. 2011; Smith and Weston 1990). Delaying grazing in meadows thus may allow for many species of wildlife, such as birds, small mammals, invertebrates, and amphibians, to complete critical portions of their life cycles prior to the onset of grazing.

Specific opening date estimates for the parks' major forage areas are based on quantitative data gathered from individual meadows between 1977 and 1984. Moisture conditions and associated physical impacts by stock were tracked in specific plant associations throughout the season in several dozen meadows over the course of the entire study period. A number of other meadows were evaluated less frequently. In meadows where specific data did not exist for all types of hydrological years, or where only one data

point was available, extrapolations were made based on similar vegetation, location, and comparable meadow physiography.

In the initial five-year (1977-81) effort to monitor moisture conditions in individual plant associations in specific forage areas, it was found that moisture was retained at or near the surface for two to four times longer than the norm for that site when the water content of the April 1 or May 1 snowpack exceeded 150 percent of the long-term average. The actual time beyond the norm required for meadow vegetation to dry to a point where trampling damage does not occur depends primarily upon the type of plant associations present in the meadow. Late spring and early summer weather conditions, the topographic position of the meadow, and the size of the watershed it resides in may also cause some variation in this date. Correspondingly, meadows were found to retain moisture for a period of one to three weeks less than the norm during the years where the April 1 or May 1 snowpack was below 50 percent of the long-term average. While these relationships certainly occur along a gradient, the 50 percent and 150 percent level breaking points were found to correlate well with obvious wet (i.e., 1969, 1973, 1978, 1980) and dry (i.e., 1972, 1976, 1977) years.

Based on these results, opening dates for wet, dry, and normal years have been prescribed for the major forage areas based on the water content of the May 1 snowpack. Years in which the May 1 snowpack represents 50% to 150% of the long-term average are characterized as ‘normal’; those ranging from 50% or less of the long-term average are characterized as ‘dry’; and those 150% or more of the long-term average are considered ‘wet’.

Opening dates are keyed to sensitive vegetation and soil within the forage area. Sensitive vegetation and soils are defined as the plant associations and soil surfaces that are most susceptible to trampling damage and would be expected to be trod upon by free-roaming animals when present; or that are especially sensitive to herbage removal. The key plant association may not necessarily comprise a majority of the specific meadow. In nearly all cases, the key association accounts for at least 15 percent of the total meadow area.

Opening dates vary considerably depending on both climatic and topographic factors, as described above. The general range is from mid-July to mid-August for normal years, with some locations earlier or later depending on their characteristics. Opening dates in wet years are later and dry years earlier. Opening dates are established so that, generally, once a given drainage basin is open to use, the entire basin is open. Necessary protection of the resource is provided and the system is simplified for both the stock user and park management. Actual opening dates are seldom the specific dates predicted by the May 1 snowpack because field conditions vary from year to year. For example, on a year classified as normal it may be found that the actual conditions for a specific meadow or basin trend toward dry, so the actual opening date would be set somewhere between the normal and dry season date. Similarly, late lying snows in what would otherwise be characterized as a normal year can lead to delays in opening until soils are sufficiently dry. Opening dates remain flexible according to actual field conditions and staff in the field would continue to be able to make adjustments as needed to respond to observed conditions.

Tentative opening dates would continue to be made available following the April l snow survey. Opening dates for specific forage areas would continue to be established immediately following receipt of the results of the May l snow survey each year. Established opening dates would continue to be compared with on-site conditions in specific forage areas, as reflected from field data, and adjustments to the normal dates in the plan made when necessary. Actual opening dates would be documented each year and summarized as part of the annual report on stock use monitoring. Studies of the effects of early season use and its relationship to climatic conditions would continue as time and resources allow. As more information and experience are gained, the large range of moisture content included in the definition of a

normal year may be narrowed, or adjusted for specific forage areas. Specific opening dates are listed in table D-5.

Table D-5: Anticipated Opening Dates by Travel Zone and Moisture Year

Travel Zone	Forage Area Number	Name of Travel Zone or Forage Area	Dry Year <50% of average snowpack	Normal Year 50%-150% of average snowpack	Wet Year >150% of average snowpack
28	all	Goddard Canyon	1-Jul	15-Jul	1-Aug
33	1	Evolution	15-Jun	1-Jul	15-Aug
33	2-4	McClure, Colby and Darwin	7-Jul	1-Aug	31-Aug
34	all	Evolution Basin	15-Jul	1-Aug	15-Aug
38	all	Blue Canyon	1-Jul	15-Jul	1-Aug
39	all	LeConte	1-Jul	15-Jul	15-Aug
42	all	Dusy Creek	1-Jul	15-Jul	15-Aug
45	all	Upper Palisade Creek	1-Jul	15-Jul	15-Aug
46	1, 3-6	Upper S. Fork Kings River/Above JMT Jct	15-Jul	1-Aug	15-Aug
46	2	Upper S. Fork Kings River/Below JMT Jct	1-Jul	15-Jul	15-Aug
51	all	Simpson and Tehipite	1-Jul	15-Jul	1-Aug
52	all	Kennedy Canyon	1-Jul	15-Jul	1-Aug
53	1-6, 8	Dougherty Creek	15-Jul	1-Aug	15-Aug
53	7	Shorty's Meadow	1-Aug	15-Aug	31-Aug
54	all	Granite Basin	20-Jun	7-Jul	1-Aug
56	all	Twin Lakes	1-Jul	15-Jul	1-Aug
57	all	Woods Lake Basin	15-Jul	1-Aug	15-Aug
58	1	Castle Domes	1-Jul	15-Jul	1-Aug
58	2-3	Woods Creek Crossing	7-Jul	21-Jul	1-Aug
63	all	Charlotte Creek	1-Jul	15-Jul	1-Aug
65	all	Upper Bubbs Creek	1-Jul	15-Jul	1-Aug
66	all	Lower Bubbs Creek	15-Jun	1-Jul	20-Jul
67	all	East Lake	1-Jul	10-Jul	20-Jul
68	all	Sphinx Creek	15-Jun	1-Jul	20-Jul
69	all	Roaring River	10-Jun	25-Jun	20-Jul
70	all	Cloud Canyon	10-Jun	1-Jul	20-Jul
71	all	Deadman Canyon	15-Jun	1-Jul	20-Jul
72	1-13.1	Sugarloaf	15-Jun	1-Jul	15-Jul
72	13.2-22	Ferguson	15-Jun	1-Jul	20-Jul
73	all	Ball Dome Area	15-Jun	1-Jul	20-Jul
74	all	Clover and Silliman Creeks	15-Jun	1-Jul	20-Jul
75	all	Lone Pine Creek	1-Jul	15-Jul	1-Aug
77	1-4, 6-7	Bearpaw Meadow and Cliff Creek	15-Jun	1-Jul	1-Aug
77	5	Redwood Meadow	1-Jun	15-Jun	1-Aug
79	all	Kern-Kaweah	1-Jul	15-Jul	1-Aug

Table D-5: Anticipated Opening Dates by Travel Zone and Moisture Year (continued)

Travel Zone	Forage Area Number	Name of Travel Zone or Forage Area	Dry Year <50% of average snowpack	Normal Year 50%-150% of average snowpack	Wet Year >150% of average snowpack
80	all	Tyndall Creek	20-Jun	1-Jul	25-Jul
81	1-2.2, 2.4	Wright and Wallace Creeks	20-Jun	1-Jul	25-Jul
81	2.3	Wallace Creek Waterfall	1-Jul	15-Jul	10-Aug
82	all	Upper Kern Canyon (Junction Mdw to Hot Springs)	25-Jun	5-Jul	25-Jul
83	1-3, 5-8	Lower Crabtree	20-Jun	1-Jul	1-Aug
83	4	Upper Crabtree	5-Jul	15-Jul	20-Aug
84	all	Lower Rock Creek	20-Jun	1-Jul	1-Aug
85	all	Upper Rock Creek	1-Jul	15-Jul	15-Aug
86	all	Lower Kern Canyon (Hot Springs to Kern Ranger Station)	1-Jun	15-Jun	1-Jul
87	all	Chagoopa Plateau and Big Arroyo	20-Jun	10-Jul	10-Aug
88	1-2	Little Five Lakes	1-Jul	15-Jul	10-Aug
88	3-5	Big Five Lakes	15-Jul	25-Jul	15-Aug
89	1-4, 10	Lost, Soda, Lower Rattlesnake, Laurel, Crytes, Coyote	15-Jun	1-Jul	1-Aug
89	5-9	Upper Rattlesnake (>9,000 feet)	1-Jul	15-Jul	15-Aug
90	all	Hockett	10-Jun	20-Jun	20-Jul
91	all	South Fork Kaweah River	1-Mar	15-Mar	1-Apr
95	all	North Fork Kaweah River	1-Mar	15-Mar	1-Apr

Grazing Levels

The total amount of grazing in each of the meadows and related forage areas open to grazing would be guided by the estimated grazing capacities described in attachment 1. Depending on the meadow characteristics, any impact could be a limiting factor for the amount of grazing that can take place. For example, stream bank shearing could reach unacceptable levels—and trigger management action—before the amount of trampling, social conflicts, species composition changes, or defoliation reaches an unacceptable level.

Due to the inherent delays in use reporting and the variability in the timing and intensity of recreational grazing, actual use of individual areas may be somewhat higher than the estimated capacity in some years and lower in others. For this reason administrative use of specific forage areas which are also used by the public would be kept below the estimated capacity and work would be planned to minimize competition for grazing.

Traditional methods of adjusting grazing levels and patterns would be employed when necessary, including:

- adjusting the number of nights a given party may graze an area
- adjusting the number of stock per party that may graze in a specific area
- allocation of grazing to specific users (administrative, commercial, or private)

- adjusting opening dates
- adjusting the total amount of grazing that occurs within a growing season
- closing an area to grazing (or a portion of it, if feasible) temporarily

Forage areas may be temporarily closed to grazing due to stock impacts and when recovery has been sufficient those areas would be reopened. Such closures would be recommended to the appropriate district ranger by field personnel during the grazing season for immediate implementation, or proposed to the Superintendent following the annual review of monitoring results for implementation during the following season. Procedures for implementing mid-season management actions are described in Management Directive No. 9: Wilderness Stock Use and Group Size Management (NPS 2013b). All use levels would be subject to change as conditions and monitoring data indicate. Changes would be announced by March 1st of each year, with opportunity for comment by interested parties. In order to ensure that the estimated capacities reflect the most current knowledge of meadow response to grazing, capacities would undergo a comprehensive reevaluation every five years, with annual modifications as needed to ensure resource protection. Changes to capacities would be made available for public comment by March 1st of each year along with other public use limits.

Drift Fences, Hitch Rails, and Temporary Means for Holding Stock

Preventing stock from leaving a preferred grazing area and entering areas where grazing is prohibited can be challenging. In areas of higher use that are adjacent to sensitive or at risk resources, drift fences can be a tool to prevent stock from traveling away from the preferred grazing area into closed areas. Besides drift fences, users would have a wide variety of tools at their disposal which could be used to manage their stock. These tools would include electric fences, hobbles, high lines, hand grazing and in limited circumstances, pickets. These tools, often used in combination with natural features, can be effective in containing stock.

In some instances users may be able to use a temporary barrier at a pinch point to contain stock. These temporary barriers can be a very effective and low impact tool to contain stock. Temporary barriers which have been successfully used at pinch points include logs and ropes. When users are considering using a temporary barrier at a pinch point, great consideration must be given to doing so without hampering the travel of other users. Temporary barriers may only be used when stock is actually roaming free in permitted grazing areas and they must be removed when the stock is gathered. Damaging natural resources when constructing temporary barriers is prohibited.

Drift fences and hitch rails would be provided by the NPS in specific locations for visitor safety, resource protection, and visitor or administrative convenience. Fences maintained primarily for convenience would also protect resources and visitor experience, through dispersal of stock use and protection of sensitive areas. Fences and hitch rails that become unnecessary would be removed. An inventory of such installations in wilderness would be maintained by the trails program with input from wilderness field staff, and maintenance conducted under the direction of the trail maintenance program. The establishment of any new fence or hitch rail, temporary or permanent, would require separate planning and compliance, which would be conducted prior to construction. Detailed justification including a minimum requirements analysis and a description of the fence route and dimensions would be required for consideration.

The treatment of specific hitch rails and drift fences varies by alternative in this WSP/FEIS; see table 51b in chapter 2 for a list of those retained under the preferred alternative.

Minimum Impact Stock Use Practices

The following restrictions and recommended practices would minimize the impact of stock to camps and trails and to allow for the restoration of impacted areas:

1) Stock would be tethered to trees for no more than enough time to unpack the animals. Animals pawing the soil away at the base of individual trees cause soil disturbance, root damage, and debarking of trees. Deep depressions and exposed roots are visible evidence of the types of impacts this regulation is designed to prevent.
2) Stock held for periods longer than for unpacking (such as for overnight), would be tethered to a line tied between two trees or rocks. The line must be located on a hardened (flat, sparsely vegetated) site to limit impacts to tree roots and plants.
3) Picketing would be allowed for short periods of time provided that animals are moved frequently to prevent resource impacts.
4) The use of temporary electric fences is allowed for holding lead animals when stock are turned out to graze; as with picketing, such enclosures must be moved frequently to prevent resource impacts.
5) When camping, animals would not be confined within 100 feet of lakes, streams, trails or campsites except while loading or unloading. Manure deposited within or at the perimeter of camps while loading or unloading would be dispersed and scattered to points at least 100 feet from camps, water, or trails. This distance protects water quality, lessens impact on the campsite, and helps reduce insect problems.
6) Stock present in forage areas prior to opening dates or areas closed to grazing would be confined as per (2) and (3), and fed.
7) Shortcutting trails and switchbacks would be prohibited.
8) Loose herding—when riderless animals are not being led by ropes—would be prohibited except as necessary for safety where the exposure is great and there is danger of animals falling off the trail.
9) Stock manure handling best practices—The following best management practices can reduce the impacts of stock manure and urine on the natural environment and protect aesthetic aspects of wilderness character. Scattering (kicking) manure piles increases decomposition rates, reduces odors and fly concentrations, and reduces the potential for manure to enter water bodies.

   Required:

   - Remove manure from within 100 feet of core camping and tie-up areas and scatter manure on dry terrain. The core camp is defined as that area within 100 feet of the fire ring or cooking area.

   Recommended:

   - Carry a shovel and rake, and keep them readily accessible, for use in cleaning up and naturalizing areas.
   - Scatter manure whenever encountered, paying particular attention to manure piles in or near water. Remove manure piles from water whenever possible. Scatter manure that accumulates at riding break areas.

- After stock have grazed or have been held in an area, inspect the area and scatter manure piles.
- Take measures that give stock an opportunity to urinate and defecate away from water (e.g., stop to let them urinate before leading them into water to drink).
- At parking areas and trailheads, pick up and remove all manure from the parks.

In addition to the above restrictions and recommended practices, guidelines for minimum impact travel with stock would continue to be provided to all users online, at permit issuing stations, during seasonal orientation sessions, and through directed mailings to commercial service providers and interested members of the public.

TRAIL USE AND OFF-TRAIL/CROSS-COUNTRY STOCK TRAVEL

The majority of wilderness stock use occurs on the primary trail system in the parks. Current regulations (36 CFR Sec. 2.16 (b and d)) require that the superintendent designate areas and trails that are open to stock travel. The areas and trails proposed open to stock travel under the preferred alternative are described in chapter 2 of this WSP/FEIS (refer to figures 8a and 8b [alternative 1], figures 14a and 14b [alternative 2], 17a and 17b [alternative 3], 19a and 19b [alternative 4], and 22a and 22b [alternative 5] in chapter 2 for stock access and grazing restrictions).

Maintained Trails

Under the preferred alternative, visitors traveling with stock would continue to have access to most maintained trails in the parks (650 of 691 miles). Stock parties would be allowed to travel up to one-half mile from trails in areas where they are allowed to camp. In areas open to day-use only, stock parties would be allowed to travel up to 100 yards from trails. Approximately 530 miles of maintained trails would be open to overnight stock travel. Some trails would be open to stock parties for day use only, some would be open to overnight use for walking parties with burros and llamas (as they cannot travel as far in a day) but limited to day use for parties with horses or mules, and some would be closed to stock travel entirely for reasons including visitor safety, natural and cultural resource protection, and/or popular day use by hikers. Trails with restricted stock access under the preferred alternative are listed in chapter 2 of this WSP/FEIS.

Off-Trail Travel

Stock parties would continue to be allowed to travel up to one-half mile from trails to reach camps. Travel more than one-half mile from maintained trails would continue to be allowed in four areas of the parks: on the Hockett Plateau, on the Monarch Divide, in the Roaring River drainage, and along the western side of the Kern River watershed south from the Chagoopa Plateau.

Trails and areas open to use may be changed from time to time in order to provide for visitor safety or resource protection. Areas or trails that have been closed may be reopened where there is evidence that no resources of the parks or other values would be compromised. Unless in response to emergency conditions, the public would be notified of proposed modifications of areas and trails open to stock through press release and posting on the parks website; comments may be sought before a decision is made.

INTEGRATION OF MONITORING RESULTS INTO MANAGEMENT ACTIONS

Successful adaptive management relies on the formal integration of monitoring results into appropriate management action. The monitoring program described here is designed to detect and characterize impacts, and to provide information to adjust stock use when impacts exceed established standards. Standards are set to ensure that impacts are limited to levels that protect the long-term integrity of meadow habitats and that resource impairment is prevented through timely management action.

Should observations made during site visits indicate a need for immediate management action, field staff would continue to follow the procedures described in Management Directive No. 9: Wilderness Stock Use and Group Size Management (NPS 2013b). This directive describes the procedures for adjusting seasonal opening dates, and defines how case-by-case temporary meadow closures, variances for group sizes (both people and stock), and variances in grazing night limits and limits on the total amount of grazing in a meadow are made. It also establishes who is authorized to adjust opening dates and make closures and how that information is communicated to the public and park staff.

Monitoring data would continue to be summarized annually and provided to the Stock Use and Meadow Management Committee. This committee would continue to meet once each year mid-winter to discuss issues pertaining to stock use and meadow management in the wilderness of the two parks. The interdisciplinary committee would continue to be composed of representatives from most divisions of the park, including wilderness managers, trails staff, and resource specialists. The annual meeting would serve two purposes: to share results from the stock use and meadow monitoring program, and to provide a forum for the discussion of stock use management issues. Results from the previous years' monitoring program would be presented, and where conditions indicate a need for action, alternatives proposed and discussed. If a need for imposing or lifting formal restrictions on stock use should arise, recommendations would be made to the superintendent for final approval. A notice of temporary restrictions for the upcoming season would be distributed to users by March 1, and submitted to the law enforcement specialist for inclusion in the Superintendents Compendium at the same time. Area specific management actions that do not require formal restrictions—such as encouraging use of one meadow over another, or modifying administrative grazing plans—would continue to be discussed at subsequent district-level operations meetings held each spring, and communicated to field staff during early season training and orientation sessions.

Public Notification of Temporary Use Restrictions and Wilderness Conditions

Public notification of temporary restrictions on wilderness travel for the upcoming year would be provided via bulletin and posted online each year in early March. Grazing regulations, restrictions, and trip planning information, including detailed maps and descriptions of forage areas, would be posted online each year at the beginning of the grazing season, sent via mail to all commercial users, and provided to private users on request. Opening date bulletins, which include anticipated opening dates for grazing, would be sent out and posted following the early April and May snow surveys. Information regarding meadow status throughout the season—changes to opening dates at the beginning of the season, and closures as grazing capacities are reached—would be posted online, communicated via phone to commercial operators, and provided to all users who contact the wilderness office or a permitting station by phone or in person as it becomes available from the field. All users must recognize, however, that such information may not always be available and incorporate flexibility in their trip planning accordingly. Wilderness travel by its nature involves a degree of uncertainty and this is reflected and celebrated in the lack of designated campsites or allocated grazing nights in the wilderness areas managed by Sequoia and Kings Canyon National Parks.

Table D-6 provides a summary of monitoring measures and activities and proposed thresholds for triggering management actions. An explicit goal of stock use management is to select actions that are appropriate to the extent and severity of the observed impacts, and to acknowledge the variability of ecosystems and the statistical uncertainty associated with sampling those systems. Therefore, this strategy enumerates several actions for each monitoring program and threshold. More aggressive actions would be taken where impacts are more significant and certainty is high, while less aggressive actions would be taken where impacts are less significant or certainty is low. This would provide managers with the flexibility to meet the overall goals and objectives of the plan.

Table D-6: Meadow Monitoring Data, Measures, Thresholds for Action, and Actions

Monitoring Data, Measure	Threshold	Actions
Stock use, percentage of estimated grazing capacity	Current year's use is greater than 100% of estimated capacity.	Site visit during current year (if possible) or following year Consider establishing residual biomass or bare ground monitoring. Temporary reduction in the following year's capacity if conditions indicate.
	Previous five years' average use is 80-100% of estimated capacity.	Annual site visits to determine the need for management changes. Consider establishing RB or bare ground monitoring.
	Previous five years' average use is 50-80% of estimated capacity.	Site visits at least every 2 years to determine the need for management changes.
	Previous five years' average use is less than 50% of estimated capacity.	Site visits at least every 5 years to determine the need for management changes.
Site visits, qualitative evaluations	Stock impacts to vegetation cover or soil stability in springs, seeps, or stream banks observed.	Consider a temporary grazing closure to prevent further impacts. Document and establish monitoring (follow up site visits, repeat photographs, or streambank alteration as appropriate). Reevaluate opening date. Reevaluate grazing capacity.
	Stock impacts to vegetation cover or soil stability in springs, seeps, or stream banks result in accelerated erosion or instability.	Consider a temporary grazing closure until vegetation and soils have stabilized. Consider active restoration of disturbed soils and vegetation Document and establish monitoring (follow-up site visits, repeat photographs, or streambank alteration as appropriate). Reduce stock impacts (increase education, change stock handling, erect barriers, establish head or night limits). Reevaluate opening date. Reevaluate grazing capacity.

Table D-6: Meadow Monitoring Data, Measures, Thresholds for Action, and Actions (continued)

Monitoring Data, Measure	Threshold	Actions
Site visits, qualitative evaluations (continued)	Deep hoof prints observed in a sensitive area (spring, seep, steep area, rare plant population, amphibian habitat, etc.) or over a majority of the meadow area.	Consider a temporary grazing closure. Reduce stock impacts (increase education, change stock handling, erect barriers, establish head or night limits). Reevaluate opening date. Reevaluate grazing capacity.
	Closely cropped or trampled vegetation observed in a sensitive area (spring, seep, steep area, rare plant population, amphibian habitat, etc.) or over a majority of the meadow area.	Consider a temporary grazing closure. Reduce stock impacts (increase education, change stock handling, erect barriers, establish head or night limits). Reevaluate grazing capacity.
	Introduced species with the potential for spread detected.	Document extent and abundance. Provide to vegetation management program. Control immediately if feasible. Refer to vegetation management program if not feasible. Modify stock use to prevent spread, if appropriate.
Residual biomass, percentage of annual production	Less than 55% in -moist lower montane meadows with high logistical value.	Temporary reduction in the following year's capacity if conditions indicate. Reevaluate grazing capacity.
	Less than 65% in - dry or wet lower montane meadows with high logistical value - moist lower montane meadows with low logistical value - upper montane and subalpine meadows with high logistical value.	Temporary reduction in the following year's capacity if conditions indicate. Reevaluate grazing capacity.
	Less than 75% in -dry or wet lower montane meadows with low logistical value -upper montane and subalpine meadows with low logistical value.	Temporary reduction in the following year's capacity if conditions indicate. Reevaluate grazing capacity.
Bare ground, percentage of soil surface	Bare soil cover value within range for low ecological condition (values to be determined).	Site visit to assess meadow condition and contributing factors.
	Bare soil cover value within range for low ecological condition (values to be determined) for two successive monitoring periods and site visit indicates stock use is a contributing stressor for both monitoring periods.	Reduce impacts (increase education, change stock handling, erect barriers, establish head or night limits). Reevaluate opening date. Reevaluate grazing capacity. Consider temporary grazing closure until bare soil cover value improves. Monitor annually for 3-5 years or until bare soil cover value falls within range for moderate or high ecological condition (values to be determined).
	Bare soil cover value double the value for low ecological condition (values to be determined), or previous management actions have been ineffective, or monitoring for 3-5 years has not shown improvement in bare ground.	Discontinue grazing until bare soil cover value falls within range for moderate or high ecological condition (values to be determined).

Table D-6: Meadow Monitoring Data, Measures, Thresholds for Action, and Actions (continued)

Monitoring Data, Measure	Threshold	Actions
Streambank alteration	Streambank alteration is associated with accelerated erosion or instability.	Consider a temporary grazing closure until vegetation and soils have stabilized. Consider active restoration of disturbed soils and vegetation. Reduce stock impacts (increase education, change stock handling, erect barriers, establish head or night limits). Reevaluate opening date. Reevaluate grazing capacity.
Species composition, percent change	Greater than 15 percent change in the dominant species as recorded by the frequency plots.	Temporary reduction in the following year's capacity if conditions indicate. Reevaluate grazing capacity.
	Greater than 15 percent increase in the proportion of bare ground and with observed erosion.	Temporary reduction in the following year's capacity if conditions indicate. Reevaluate grazing capacity.

RELATIONSHIP TO OTHER MONITORING PROGRAMS

In addition to the specific monitoring protocols described here, there are a number of other programs in place that will provide information relevant to the management of stock use and grazing in wilderness meadows. These include, but are not limited to, the following:

- The Sierra Nevada Network Inventory and Monitoring Program has implemented a long-term Wetland Ecological Integrity monitoring protocol in Kings Canyon, Sequoia, and Yosemite National Parks (Gage et al. 2014). This protocol is designed to characterize the status of and detect changes in wetland water dynamics, plant community composition, and macroinvertebrates in wet meadows and fens. The integration of multiple vital signs in this protocol will improve the ability to understand and interpret change in ungrazed wetland systems, providing important comparison for similar systems that are subject to grazing by pack stock. The inclusion of a bare soil measurement in the permanently marked plots would contribute to a better understanding of the range of variability in this measure in ungrazed wet meadows and fens. There is also tremendous potential for collaboration between this program and the stock use and meadow management program, as both require similar skill sets and deploy field biologists to park meadows.
- The USFS monitors meadow ecosystems subject to livestock grazing in the national forests adjacent to Sequoia and Kings Canyon National Parks, and this information has been used to develop preliminary standards for bare soil for park meadows (Weixelman and Zamudio 2001) as well as provided insights into meadow ecosystem dynamics and response to grazing (Freitas et al. 2014). Sampling by USFS ecologists using this protocol in ungrazed Sequoia and Kings Canyon meadows is scheduled to begin in 2015, which would further contribute to characterization of the range of variability in bare soil and vegetation parameters in park meadows.
- As part of planning efforts focused on the Merced and Tuolumne River corridors in Yosemite National Park, the NPS has identified indicators of meadow condition and developed monitoring protocols which will also help increase the understanding of the natural range of variability in these systems (NPS 2014a, 2014b). Implementation of these protocols would also allow for the continued collaborative development of monitoring and management strategies in the Sierra Nevada parks.

RESOURCE REHABILITATION AND RESTORATION

In areas where past use has caused detrimental effects to vegetation, soils or other resources, the NPS would evaluate the effects and may undertake rehabilitation or restoration. This could include actions such as filling eroded trail beds or hitching areas and revegetating the areas. It could also include re-routing of trail segments to avoid sensitive resources, relocating camps, or the removal of nonnative plant species. Such trail management activities would be guided by the trails management plan described in appendix K of this plan, while the control of non-native plants would be guided by appendix N of this plan, the Resource Stewardship Strategy (in development) and/or a future Invasive Plant Management Plan.

RESEARCH NEEDS

Continued learning through scientific investigation and evaluation of new information is a critical component of the adaptive management process. Although the past decade has seen a marked increase in research interest in the meadow and wetland systems of the Sierra Nevada, additional research in the coming years will lead to a better understanding of wetland ecosystem dynamics. In particular, information is needed on environmental effects across ranges of use levels (e.g., frequency, duration, or intensity gradients) would enhance our understanding of effect thresholds and further inform the management of stock in wilderness (Ostoja et al. 2014). The following sections describe a limited selection of ongoing, planned and potential research topics that would be expected to improve the knowledge of ecosystem dynamics and further inform decisions regarding stock use and grazing management.

DETERMINING VULNERABILITY OF SIERRA NEVADA MEADOWS TO CLIMATE CHANGE

Sierra Nevada land managers have come to recognize that threats posed by climate change may now exceed those posed by anthropogenic activities. Although local land managers can do little to influence global climate trends, it is critically important that they understand how resources may be affected by the simultaneous effects of climate change and land use stressors. Understanding how climate change affects meadow ecosystems, which are centers of biological diversity and productivity, will be a central component of any climate change adaptation strategy for the Sierra Nevada. Although recent studies provide detailed descriptions of hydrologic processes within a few individual meadows, to date there has not been an attempt to characterize the key hydrologic attributes of large groups of meadows over broad landscapes in the Sierra Nevada. This information is needed to classify meadows for their relative vulnerability to climate change versus land use factors. Through this project, research scientists at the USGS Yosemite Field Station are creating a hydrologic vulnerability to climate change assessment for the more than 9,000 meadows located within the national parks of the central and southern Sierra Nevada.

REFINING MEASUREMENTS OF PRODUCTIVITY AND BARE GROUND IN PARK MEADOWS

In order to protect the natural quality of wilderness character while continuing to allow stock use to occur, the proposed monitoring and management strategy described in this WSP/FEIS specifically seeks to limit stock-induced changes in bare ground and plant productivity. The plan proposes preliminary grazing capacities based on modeled estimates of productivity, and preliminary standards for bare ground in grazed meadows that are based on work done primarily on USFS meadows. As the current and proposed monitoring program is primarily dedicated to assessing conditions in grazed meadows, limited direct information is available to judge whether observed bare ground and productivity on a given meadow site in these parks are altered due to visitor activity. Additional research focused on characterizing the range

of bare ground and productivity values in ungrazed reference meadows in the parks' wilderness would allow the parks to revise the preliminary standards proposed by the WSP/FEIS for these two attributes. A study design that employed randomized site selection stratified across the primary environmental gradients of importance (e.g., elevation, moisture, and species composition) would allow for broad applicability of reference data for comparison with sites used by stock.

ASSESSING POTENTIAL EFFECTS OF STOCK USE ON WILDLIFE

Although much work has been done to investigate the effects of cattle on wildlife, the applicability of these studies to pack stock effects is limited, especially in the parks where livestock grazing is prohibited (Ostoja et al. 2014). Studies specific to the effects of pack stock on meadow-dependent vertebrates, such as small mammals are thus a high priority for additional research.

DETECTING CHANGES IN SPECIES COMPOSITION IN GRAZED MEADOWS

The WSP/FEIS proposes to continue monitoring species composition in five pairs of grazed/ungrazed meadows as part of an ongoing long-term monitoring protocol. Although this dataset provides detailed information in these specific meadow pairs, and can serve as a trigger for additional monitoring in other meadows, due to constraints in the study design these results cannot be extrapolated to other meadows in the parks without caution. Through the Wetland Ecological Integrity protocol described above, changes in species composition in ungrazed meadows—in response to factors other than grazing—may be detected and be used to inform management actions where appropriate. Expanding the network of species composition study sites in grazed meadows would increase the likelihood of detecting changes occurring as a result of stock use while improving the understanding of the interaction of external stressors, such as climate change, and stock use. Revisiting the transects established by Bennett in 1965, which were subsequently re-read by Strand (1972) and Mazzu (1987), could be encouraged as a potential masters level research project. Abbott et al. (2003) also suggested that species composition could be characterized as part of the residual biomass monitoring protocol. Although assessing species composition requires specific technical expertise, such an approach may be worth exploring should such staffing be available in the future.

TEMPORARY VARIANCES AND MODIFICATIONS TO THE STRATEGY

TEMPORARY VARIANCES

Climatic conditions, accessibility to portions of the wilderness, needs and interests of wilderness stock parties, and other factors change from year to year, making it possible to consider temporary variances in site-specific guidelines.

Variances could be made in opening dates, numbers of stock per trip, number of nights per area, number of stock per area, etc. Such variances would normally be granted on a case-by-case basis to accommodate special visitor needs where the effects on wilderness character, the parks' resources and other visitors would be within acceptable limits. Short-term or one-time-only variances proposed by visitors would be considered on a case-by case basis by the Superintendent, and if approved would likely be subject to special conditions. Requests for variances should be made in writing at least four weeks in advance to provide adequate time for consideration.

MODIFICATIONS TO THE STRATEGY

As knowledge of meadow systems, technology, and field techniques evolve, the methods used to monitor stock use and resource conditions will be subject to change and improvement. The process by which grazing levels would be evaluated is described in attachment 1. Significant changes to monitoring protocols would be subject to the appropriate level of peer review and provided to the public for comment.

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ATTACHMENT 1:

GRAZING CAPACITIES FOR RECREATIONAL PACK AND SADDLE STOCK – BACKGROUND AND USE IN SEQUOIA AND KINGS CANYON NATIONAL PARKS

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Grazing Capacities for Recreational Pack and Saddle Stock – Background and Use in Sequoia and Kings Canyon National Parks

LIMITING IMPACTS FROM STOCK GRAZING

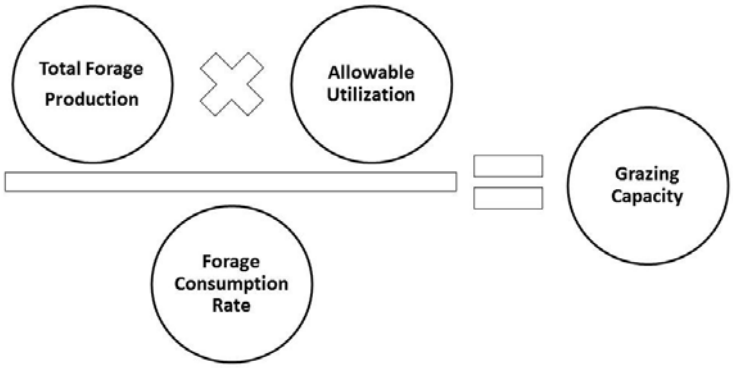
There are several ways that grazing stock can impact natural resources and other wilderness users. Setting a limit on the total amount of grazing allowed within one growing season is one management tool that the NPS can use to keep impacts within standards in the parks.

Depending on the meadow characteristics, any one kind of impact could be a limiting factor for the amount of grazing that can take place. For example, stream bank shearing could reach unacceptable levels before the amount of trampling, social conflicts, species composition changes, or defoliation reaches an unacceptable level. Because defoliation has the closest relationship to grazing (defoliation being a necessary impact for grazing to occur rather than an undesirable side effect which can be mitigated) it is the starting place for developing capacities. The methodology used to estimate capacities for grazing in the parks' meadows is described below.

GRAZING CAPACITY MODEL

Ratliff et al. (1987) present a grazing capacity model based on the ability of Sierra Nevada meadows to produce foliage palatable to stock while leaving enough plant biomass for maintenance or improvement of meadow condition and for meeting other management goals, such as wildlife habitat protection. This model was first applied to the parks' meadows grazed by pack stock in 1992 (Neuman 1994). With modification for wilderness management, this basic model provides a framework for defining and establishing annual grazing capacity.

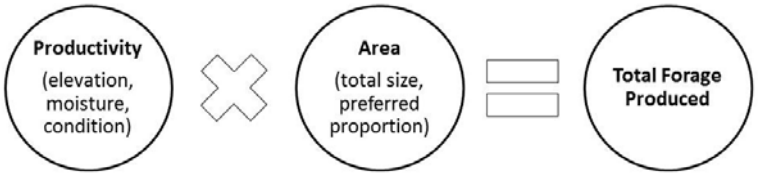
The model includes total forage production, allowable utilization (the proportion of forage production which can be grazed), and a forage consumption rate by pack and saddle stock.



FORAGE PRODUCTION

Net primary productivity (hereafter, "productivity") is the amount of solar energy captured by plants minus the amount of energy used by the plant for respiration; it is expressed per unit area. Measurements of aboveground biomass (the dry weight of plant material per unit area present at one point in time) at the end of the growing season are commonly used to estimate productivity for herbaceous species in temperate environments. Productivity varies across the landscape due to many abiotic and biotic factors (Barbour et al. 1998). In the Sierra Nevada, the factors that are most relevant are elevation, moisture

availability, and condition; in the absence of site-specific data, these are the factors used to predict productivity. The total amount of forage produced will be a product of the area and productivity.



Productivity

Measuring productivity at a specific site over a period of several years (to account for climate variation) is the most precise way of estimating forage production. In the absence of productivity data collected from a particular site, regression relationships developed from existing data can be used to estimate the amount of productivity. The regression models provided in Ratliff et al. (1987) take into account elevation, broad moisture regimes, and condition.

Elevation: All else being equal, meadow productivity decreases as elevation increases (Ratliff 1985; Ratliff et al. 1987). The model assumes a linear decline with elevation.

Moisture: Moisture availability influences both species composition and productivity (Ratliff 1985; Ratliff et al. 1987). The productivity model assumes that meadows can be assigned to one of three moisture classes (Ratliff et al. 1987). Moist meadows with shorthair grass (*Calamagrostis muiriana*), tufted hairgrass (*Deschampsia cespitosa*), or Nebraska sedge (*Carex nebrascensis*) as dominant species are the most productive. Wet meadows with beaked sedge (*Carex utriculata*, C. *vesicaria*) or spikerush (*Eleocharis acicularis*, *E. pauciflora*) as dominant species are intermediate in productivity. Dry sites with shorthair sedge (*Carex filifolia*) as the dominant species are the least productive. In comparing published information, different authors may assign a given species to different moisture categories.

Within any given meadow, a range of moisture conditions and several dominant species will exist. Because horses and mules are selective grazers and do not graze evenly across the meadow, the moisture category (wet, moist, or dry) of the vegetation favored by stock in a given forage area is used to estimate productivity.

Condition: Productivity may vary with species composition and plant vigor, and how intact litter and soils are. Taken together these factors can be considered as “range condition” and included as a factor in the productivity model. Ratliff et al. (1987) assume a decline in the productivity of forage species related to condition based on data presented in Crane (1950).

The decline in productivity is assumed to be the same at all elevations and moisture types (Ratliff et al. 1987). Meadows in excellent condition are assumed to have the maximum productivity. Productivity for other condition levels is given in reference to maximum productivity: good condition produces 65%, fair condition 44%, and poor condition 25%. No reduction was presented for very poor condition meadows.

The missing litter and humus, broken sods, and erosion that characterize fair, poor, and very poor condition meadows are rare in the parks’ meadows, and where they occur, are limited to very small portions of the meadow (although before effective grazing controls were implemented, these impacts were more widespread; see Sumner 1941, Sharsmith 1959, and others). The meadows classified as “excellent” condition by Crane (1950) were largely cultivated and irrigated pastures, while natural meadows generally fit the criteria for “good” condition. Ratliff (1985) applied contemporary condition class concepts (USFS 1969) to 90 non-randomly selected Sierra Nevada meadows and found 27% to be in

excellent condition and 26% in good condition. Therefore, it is assumed that 65% of maximum productivity is a conservative, reasonable value to use in estimating the forage productivity of the parks' meadows.

Productivity model: Given these assumptions, the productivity of dry, moist, and wet meadows can be estimated by the following equations where productivity is in units of pounds per acre, and elevation is in units of feet.

- Dry: Productivity = 2275 - 0.175 * Elevation
- Moist: Productivity = 4725 - 0.325 * Elevation
- Wet: Productivity = 4705 - 0.36 * Elevation

Productivity for other condition classes can be calculated using the coefficients in table D-15. Predicted forage productivity values calculated from data in Ratliff et al. (1987) are illustrated in figure D-1.

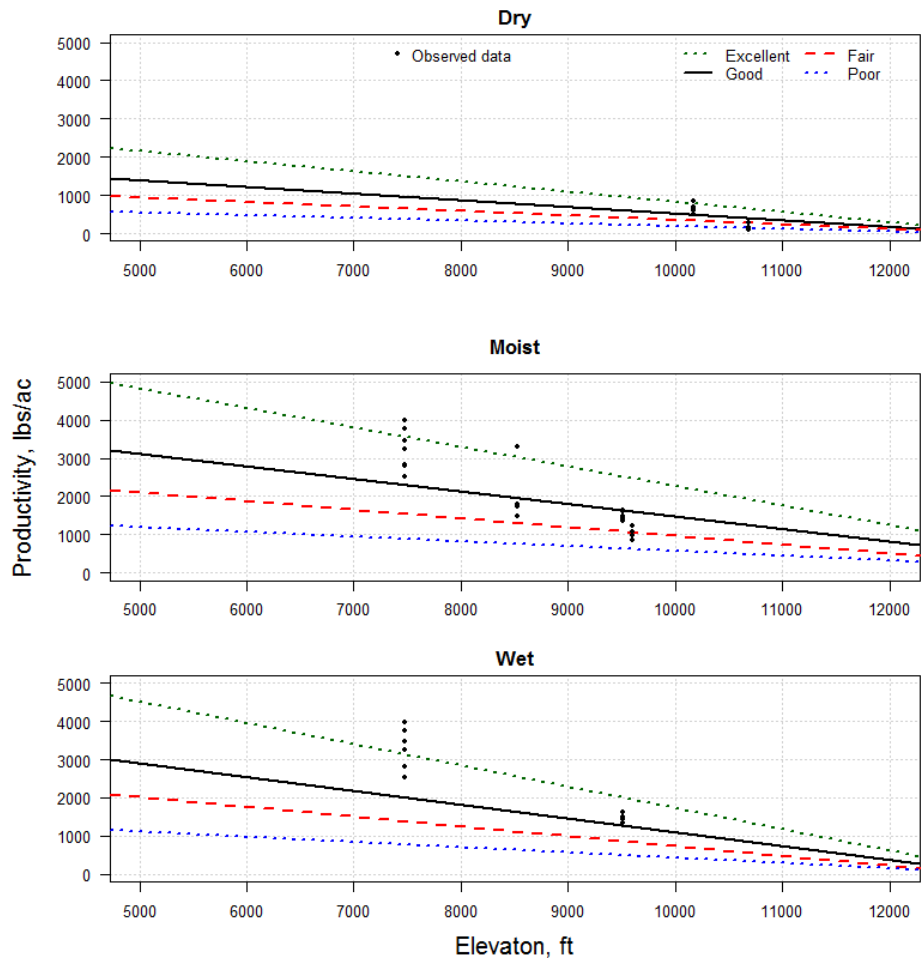


Figure D-1: Predicted productivity (pounds/acre) by elevation (feet) for three moisture classes (dry, moist, wet), and four condition classes (excellent, good, fair, poor)

While Ratliff et al. (1987) does not provide information about model fit, data reported from other locations in the Sierra Nevada can provide some estimate of the uncertainty of productivity estimates.

Productivity values from locations in the Rock Creek drainage of Sequoia National Park were measured over 5 years (Stohlgren et al. 1989). They reported productivity for three vegetation types as the mean across seven sites. Observed mean productivity was significantly lower (41 – 117% of predicted) than that predicted by the model (table D-7). The poorest agreement was for the dry site, while the best fit was for the wet-moist site.

Table D-7: Comparison of Model Productivity Values to Measured Productivity from Three Vegetation Types in Sequoia National Park

Site and Characteristics	Year	pounds/acre	% of Predicted	
Rock Creek and Miter Basin, Dry, 10400 - 11600 feet Dominant species: *Carex filifolia* Predicted productivity: 405 pounds/acre (at the weighted mean elevation of 10685 feet)	1977	297		73%
	1978	171		42%
	1979	120		30%
	1980	145		36%
	1981	101		25%
	Mean	**167**		**41%**
Rock Creek Ranger Station, Moist, 9600 feet Dominant species: *Eleocharis pauciflora - Calamagrostis breweri* Predicted productivity: 1607 pounds/acre	1977	986		61%
	1978	981		61%
	1979	869		54%
	1980	1078		67%
	1981	1217		76%
	Mean	**1026**		**64%**
Lower Rock Creek, Moist-Wet, 9400 – 9600 feet Dominant species: *Deschampsia caespitosa* Predicted productivity: 285 pounds/acre if “wet” (at the mean elevation of 9514 feet) Predicted productivity: 1637 pounds/acre if "moist" (at the mean elevation of 9514 feet)	1977	1635	127%	100%
	1978	1486	116%	91%
	1979	1353	105%	83%
	1980	1433	112%	88%
	1981	1617	126%	99%
	Mean	**1505**	**117%**	**92%**

Source: Stohlgren et al. 1989

Data from three locations in Yosemite National Park over 7 years of study (Moore et al. 2013) indicates that the measured productivity values were much higher than predicted at the high elevation xeric site and the low elevation hydric site, but were slightly lower than predicted at the middle elevation mesic site (table D-8).

Table D-8: Comparison of Model Productivity Values to Measured Productivity from Three Sites in Yosemite National Park

Site and characteristics	Year	pounds/acre	% of Predicted	
Gaylor Lakes, Dry, 10170 feet Dominant species: *Carex filifolia* Predicted productivity: 495 pounds/acre	1994	688		139%
	1995	518		105%
	1996	645		130%
	1997	594		120%
	1998	693		140%
	1999	851		172%
	2000	863		174%
	Mean	**693**		**140%**
Tuolumne Meadows, Moist 8530 feet Dominant species: *Calamagrostis breweri* Predicted productivity: 1952 pounds/acre	1994	3296		169%
	1995	1472		75%
	1996	1730		89%
	1997	1782		91%
	1998	1480		76%
	1999	1769		91%
	2000	1806		92%
	Mean	**1906**		**98%**
Harden Lake, Moist-Wet, 7480 feet Dominant species: *Deschampsia cespitosa* Predicted productivity: 2012 pounds/acre if “wet” Predicted productivity: 2294 pounds/acre if "moist"	1994	3983	198%	174%
	1995	2522	125%	110%
	1996	3468	172%	151%
	1997	3754	187%	164%
	1998	2799	139%	122%
	1999	2824	140%	123%
	2000	3249	161%	142%
	Mean	**3229**	**160%**	**141%**

Source: Moore et al. 2013

These comparisons of model predictions to observed data indicate that productivity values from the model may be inaccurate for any given site or vegetation type. Furthermore, there is considerable interannual variability which may make model predictions a better or worse fit depending on the year.

Area

Calculating capacities for management units of interest requires determining how much grazing area is available. Forage areas are defined as the primary meadows and their associated forested or upland grasslands, which are commonly used by stock for grazing. Therefore, the forage area is the scale at which grazing capacities are calculated.

Total area: The total amount of meadow area in each forage area was calculated from vegetation maps (NPS 2007).

Preferred Proportion: Because horses and mules are selective grazers and overall grazing pressure is light, grazing impacts are generally concentrated in one vegetation type ("patch grazing," McClaran and Cole 1993). For each forage area in the parks, a preferred proportion (1-100%) has been assigned. This is an estimate of the proportion of the entire forage area occupied by vegetation types favored for grazing by horses and mules.

Initial estimates of the preferred meadow vegetation proportion were assigned to the parks' forage areas by Neuman (1994) who described preferred forage as "grasses (both small, fine-leaved species and taller species) and medium sedges, occupying sites that are neither particularly dry nor wet." These estimates are periodically revised as new information is obtained about stock grazing patterns. This information is most reliably obtained by observing actual stock grazing patterns at the end of the grazing season and noting the species which have been grazed by stock and their extent. Where this information is not available, the extent of preferred vegetation can also be estimated by extrapolating observed stock grazing patterns from similar forage areas.

The preferred proportion for all forage areas in the parks was reviewed between 2012 and 2014. Where site knowledge or other information provided more precise estimates of the amount of meadow vegetation favored by stock, the preferred proportion was revised. The review also ensured that the preferred proportion did not include any peat accumulating area within the forage area.

Upland Forage: In some areas, graminoids in non-meadow upland areas may provide some or all of the preferred forage. The extent of upland forage has been described narratively for some areas, but reliable productivity values are not available. If quantitative data for the extent, productivity, and appropriate utilization rate become available, this data can be used to estimate capacity in upland areas using the same basic model as for meadow vegetation. Until quantitative data on the extent, productivity, and appropriate utilization rates for these areas become available, narrative descriptions may be used to identify management areas where total forage is grossly underestimated, and to adjust capacities upwards based on past use patterns and observed impacts (see the "Evaluation and Revision of Capacities" section).

ALLOWABLE UTILIZATION

The amount of biomass that should be left ungrazed for the purposes of maintaining a litter and humus layer on the soil, for wildlife habitat, for maintaining the health of vegetation, and for other purposes will vary with the management goals for individual meadows. In perennial grasslands such as mountain meadows, the amount of biomass to leave at the end of the growing season has generally been defined as a percentage of total biomass production. The proportion of total biomass production which can be grazed while meeting management goals is "allowable utilization." The amount of vegetation remaining ungrazed at the end of the season is referred to as "residual biomass."

Existing utilization guidelines

Guidelines for appropriate utilization rates for Sierra Nevada meadows have evolved over time.

Consistent with range standards at the time, Crane (1950) suggested that utilization guidelines of 60-70% were appropriate for Sierra Nevada meadows used for livestock production.

Ratliff (1976, 1980) measured decomposition rates of filter paper and natural herbage *in situ* to estimate how much biomass decomposed annually; these were proposed this as the minimum that should be retained as residual to maintain a meadow at a given condition, and that more could be retained to increase the condition of meadows in degraded condition (Ratliff et al. 1987, table D-9). Ratliff found that decomposition rates were highest at intermediate moisture levels, and suggested that utilization guidelines

of 20-45% would be appropriate to either maintain or improve condition of Sierra Nevada meadows (Ratliff 1985).

Neuman (1994) proposed reducing the utilization limits in Ratliff (1985, 1987) by 10 percentage points to reflect more conservative grazing levels in a National Park wilderness area.

Table D-9: Utilization Recommendations by Moisture and Condition

Moisture	Condition	Allowable utilization, Ratliff et al. (1987)
Moist	Excellent	45
	Good	40
	Fair	35
	Poor	30
Dry or Wet	Excellent	35
	Good	30
	Fair	25
	Poor	20

Source: Ratliff et al. 1987

The USFS (2001) adopted utilization limits of 30-40% for montane and subalpine meadows and 10-20% for alpine meadows in the Ansel Adams, John Muir and Dinkey Lakes Wildernesses (table D-10). The higher number is for meadows in high-seral ecological condition and the lower is for meadows in mid- to low-seral ecological condition. High-seral status would roughly correspond to Crane's (1950) excellent condition, and mid to low-seral state would roughly correspond to good or lower conditions although the two condition classifications differ.

Table D-10: Utilization Standards for Herbaceous Perennial Vegetation in Wilderness Meadows of the Sierra and Inyo National Forests

Landscape Zone	Seral Ecological State	Allowable use
Montane and Subalpine	High	40
	Mid to Low	30
Alpine	High	20
	Mid to Low	10

Source: USFS 2001

Yosemite National Park used utilization values of 25% to estimate grazing capacities in the upper montane and subalpine meadows of Upper Lyell Canyon (Ballenger 2013).

A study which evaluated the impacts of a range of utilization rates on three upper montane and subalpine meadow vegetation types in Yosemite National Park described the relationship between utilization rates and impacts to meadow attributes (Cole et al. 2004). The authors fit linear models for the relationships between utilization and productivity, basal vegetation cover, and relative graminoid cover, with variation by vegetation type and number of years of grazing. In dry *Carex filifolia* vegetation, statistically significant relationships for productivity and basal vegetation cover were reported. In mesic *Calamagrostis muiriana* vegetation, statistically significant relationships for productivity, basal vegetation cover, and relative graminoid cover were reported; the relationship with bare ground was

statistically significant, but had poor predictive ability. In mesic to hydric *Deschampsia cespitosa* vegetation, only the relationship for productivity was statistically significant.

Cole et al. (2004) suggested that managers could set utilization values by deciding the amount of change in meadow vegetation that would be accepted. This is accomplished by specifying an average level of change for an attribute (e.g., -10%) and then solving for the corresponding utilization value using the regression relationships presented for each attribute and vegetation type (table D-11). The reported coefficient of determination (r^2) value provides a sense of how well utilization predicts the response of interest. Where more than one vegetation type is present in upper montane and subalpine forage areas, one of the combinations of attribute and vegetation type will be the limiting factor, where the level of acceptable change would be reached first.

Table D-11: Utilization Values for Different Levels of Acceptable Change in Attributes for Three Upper Montane and Subalpine Meadow Vegetation Types

Attribute	Vegetation type	r^2	Acceptable change in attribute				
			0%	-5%	-10%	-15%	-20%
Productivity (from peak standing crop)	*Carex filifolia*	0.41	27%	31%	35%	39%	43%
	Calamagrostis muiriana	0.17 – 0.34	5%	15%	24%	34%	43%
	Deschampsia cespitosa	0.37	10%	17%	24%	31%	38%
Basal vegetation cover	*Carex filifolia*	0.38	28%	30%	32%	34%	37%
	Calamagrostis muiriana	0.52 – 0.68	39%	41%	43%	45%	47%
Relative graminoid cover	*Calamagrostis muiriana*	0.01 – 0.39	12%	22%	31%	41%	50%

Values were calculated from regression equations presented in Cole et al. (2004). Values for *Calamagrostis muiriana* are averages across treatment years

Proposed Utilization Rates for Action Alternatives Allowing Grazing

The proposed utilization rates would be used as a starting point for setting grazing capacities at levels that limit stock induced changes to plant composition, density, cover and/or vigor, and productivity. These capacities would be one tool to prevent adverse effects to soils and associated sod that may lead to accelerated erosion, prevent changes to springs, seeps, and water courses that could alter hydrologic processes, and could promote recovery from past overuse where necessary. Allowable utilization rates would vary by vegetation zones and the logistical value of the forage area.

Vegetation zones: Each forage area is classified as either “lower montane/woodland” or “upper montane/subalpine.” The upper montane/subalpine/ forage areas are generally located at higher elevations, but overlap in elevation range with lower montane/woodland forage areas.

Lower montane/woodland zones are below approximately 8,500 feet in elevation. Research results from Ratliff (1976, 1980) were used to guide utilization rate selection for these forage areas.

Upper montane/subalpine zones are above approximately 7,500 feet in elevation. The research results from Cole et al. (2004) were used to guide utilization rate selection in these forage areas.

Logistical value: Some forage areas have high logistical value to groups travelling with stock. The characteristics used to designate forage areas as having high logistical value are:

- resource concerns other than defoliation do not limit grazing capacity
- closest forage area to a high pass
- first forage area beyond round-trip distance from trailhead
- fires allowed at forage area but not in nearby forage areas
- lack of other forage areas open to grazing nearby
- traditional stock camp
- strategic location for administrative use

Proposed Utilization Rates: Using the approach suggested in Cole et al. (2004), utilization rates were arrived at by choosing a level of change in meadow characteristics and determining what utilization value would limit changes to that level. In doing so, the parks' managers considered the value of grazing to opportunities for primitive and unconfined recreation, as well as the cost of grazing to the natural quality of wilderness.

Lower utilization rates are proposed in forage areas with low logistical value; this provides a greater level of conservation without unduly reducing recreational opportunities for stock travelers. Forage areas would not be designated as high logistical value if recent grazing demands could be met by these lower utilization rates. Fifty-five forage areas met these criteria: 14 in the lower montane and woodland zones and 40 in the upper montane and subalpine zones. A list of the named forage areas assigned a high logistical value is provided in table D-16.

Using this process, the proposed utilization standards which would be used to estimate grazing capacities under the preferred alternative range from 25% to 45% (table D-12).

Table D-12: Utilization Rates Proposed as Standards and Used to Estimate Grazing Capacities

Vegetation Zone	Moisture Class	Logistical Value	Utilization Limit
Lower Montane / Woodland	Moist	High	45%
		Low	35%
	Dry or Wet	High	35%
		Low	25%
Subalpine / Upper Montane	All	High	35%
		Low	25%

These utilization rates would, on average, result in changes to the most heavily grazed portions of meadows relative to comparable ungrazed vegetation (tables D-13 and D-14). In lower montane meadows, maximum utilization would be equal to or less than the amount needed to leave residual biomass equal to that which decomposed annually. In upper montane and subalpine meadows, maximum utilization rates would be set to limit decreases in productivity, basal vegetation cover, and relative graminoid cover to 18% or less.

Table D-13: Predicted Response of Meadow Attributes for Lower Montane and Woodland Vegetation Types to 25%, 35%, and 45% Utilization*

Attribute	Utilization Moist <35% Dry or Wet <25%	Utilization Moist 35-45% Dry or Wet 25-35%
Residual biomass	greater than annual decomposition	greater than or equal to annual decomposition
Productivity	similar to comparable ungrazed meadow vegetation	similar to comparable ungrazed meadow vegetation

* Based on Ratliff (1976, 1980, 1985); responses for productivity would be expected to occur after more than one growing season

In lower montane forage areas with higher logistical value, utilization would be limited to no more than 45% in moist meadows and 35% in dry or wet meadows. The amount of foliage left ungrazed at these levels would be approximately equal to the amount of herbage which would be expected to decompose annually; if grazed to capacity regularly, productivity would be expected to remain near current levels.

In lower montane forage areas with lower logistical value, utilization would be limited to no more than 35% in moist meadows and 25% in dry or wet meadows. The amount of foliage left ungrazed at these levels would be more than the amount of herbage which would be expected to decompose annually; if grazed to capacity regularly, productivity would be expected to trend towards or be similar to comparable ungrazed meadow vegetation.

Table D-14: Predicted Mean Response of Meadow Attributes for Three Upper Montane and Subalpine Vegetation Types to 25% and 35% Utilization*

Attribute	Vegetation type	25% utilization, percentage change relative to ungrazed conditions	35% utilization, percentage change relative to ungrazed conditions
Productivity	*Carex filifolia*	+2%	-10%
	Deschampsia cespitosa	-11%	-18%
	Calamagrostis muiriana	-10%	-16%
Basal vegetation cover	*Carex filifolia*	+7%	-16%
	Calamagrostis muiriana	+41%	+14%
Relative graminoid cover	*Calamagrostis muiriana*	-6%	-12%

* Based on Cole et al. (2004); predicted response for *Calamagrostis muiriana* is average across treatment years as reported for two, three and four years of grazing in the original study.

In subalpine and upper montane forage areas having higher logistical value, utilization rates would be limited to 35%. If grazed to capacity regularly, this level of utilization in dry *Carex filifolia* vegetation would, on average, reduce productivity by 10% and reduce basal vegetation cover by 16% relative to ungrazed vegetation. In moist to wet *Deschampsia cespitosa* vegetation, this level of utilization would, on average, reduce productivity by 18% relative to ungrazed vegetation. This level of utilization in moist *Calamagrostis muiriana* vegetation would, on average, reduce productivity by 16%, increase basal vegetation cover by 14%, and decrease relative graminoid cover by 12% relative to ungrazed vegetation. Due to the inherent variability in meadow systems, considerable variation in observed changes would be expected. The magnitude of this variation is reflected in the coefficients of determination reported for the relationship between utilization and meadow response which range from 0.01 – 0.68 (table D-11).

In subalpine and upper montane forage areas having lower logistical value, utilization would be limited to no more than 25%. If grazed to capacity regularly, this level of utilization in dry *Carex filifolia* vegetation would, on average, increase productivity by 2% and increase basal vegetation cover by 7% relative to ungrazed vegetation. In moist to wet *Deschampsia cespitosa* vegetation, this level of utilization would, on average, decrease productivity by 11% relative to ungrazed vegetation. This level of utilization in moist *Calamagrostis muiriana* vegetation would, on average, reduce productivity by 10%, increase basal vegetation cover by 41%, and decrease relative graminoid cover by 6% relative to ungrazed vegetation. Due to the inherent variability in meadow systems, considerable variation in observed changes would be expected. The magnitude of this variation is reflected in the coefficients of determination reported for the relationship between utilization and meadow response which range from 0.01 – 0.68 (table D-11).

BIOMASS CONSUMPTION RATES

Rates of biomass consumption are expressed as an amount of biomass grazed over a given period of time. As most grazing occurs during overnight stays (saddle and pack animals generally work during the day) the time period of interest is one night.

The amount of biomass grazed by a pack or saddle animal is related to the size of the animal. Ninety-four percent of all overnight stock use in the parks' is by horses and mules (Frenzel and Haultain 2013). Horses, mules, burros, and donkeys consume about 3% of their body weight each day (Holechek 1988). Among horses and mules, there is considerable variability in the size of animals that graze in the parks, with larger animals often used as saddle stock and smaller animals used as pack stock. Approximately 45% of all overnight stock use is by NPS-owned animals. The average size of horses and mules in the parks' herd is approximately 900-1000 pounds (NPS 2014). This gives an average nightly forage requirement of 27-30 pounds for horses and mules in the parks' herd. Making the assumption that the parks' herd may be slightly smaller than the other animals in the parks, a conservative nightly forage consumption of 32 pounds is assumed for horses and mules. Burros and llamas are smaller, and consume approximately 10 pounds and 7 pounds per night, respectively (Ratliff et al. 1987).

Capacities provided to stock users and managers are based on a nightly forage consumption of 32 pounds and are expressed in units of "stock nights" which is defined as an overnight stay by any horse, mule, burro, or llama. Capacities reported as stock nights (as opposed to the animal unit nights used in range management) are simple for stock users and managers to understand, track, and report. Information about animal type is included in stock use reports and is available to inform management decisions in the few places where burros and llamas make up a significant portion of the total grazing; therefore, more stock nights can be sustained in areas grazed by burros and llamas.

CAPACITY CALCULATION

Grazing capacities for the parks' forage areas are calculated as:

$$\frac{\text{area} * \text{preferred proportion} * \text{productivity} * \text{allowable utilization}}{\text{nightly forage consumption}} = \text{capacity in stock nights}$$

Model capacities are provided in table D-17 along with the model parameters.

EVALUATION AND REVISION OF CAPACITIES

Given the multiple complex goals and objectives for grazing management, the great variability in natural systems across space and time, and the difficulty in predicting the response of such systems to perturbation, it is expected that the model capacities provide only coarse estimates of the true grazing capacity in any given year. Therefore, evaluating grazing capacities against field observations and revising them upward or downward to better fulfill management goals and objectives will be an essential part of the adaptive management of pack and saddle stock grazing.

The evaluation process will include two complementary aspects: evaluation and revision of model parameters and evaluation of model capacities against observed conditions. All evaluations of model capacities or model parameters will be documented to provide a record of the information used, analysis performed, and the conclusions reached. This information will be reported as part of the annual monitoring report prepared by the plant ecology program each year.

EVALUATING AND REVISING MODEL PARAMETERS

The grazing capacities presented in table D-17 are based on the most up-to-date model parameters available. Qualitative and quantitative data collected in the field can be used to evaluate the model parameters area, preferred proportion, preferred vegetation type, moisture regime, productivity, and utilization.

AREA AND PREFERRED PROPORTION

Site visits can be used to document the extent of the meadow forage and the extent of preferred forage by observing actual stock grazing patterns at the end of the grazing season and noting the extent of area that has been preferentially grazed by stock. These model parameters can be revised as needed.

Where past grazing above modeled capacities has resulted in acceptable meadow condition, upland vegetation (such as the understory of forests and woodlands) is often an important source of additional forage for stock. Therefore, the model may underestimate grazing capacity in these forage areas. The extent of upland forage has been described narratively for some areas. Until quantitative data on the extent, productivity, and appropriate utilization rates for these areas become available, narrative descriptions may be used to identify management areas where total forage is grossly underestimated, and to adjust capacities upwards based on past use patterns and observed impacts. If quantitative data for the extent, productivity, and appropriate utilization rate become available, this data can be used to estimate capacity in upland areas using the same basic model as for meadow vegetation.

PREFERRED VEGETATION TYPE AND MOISTURE REGIME

Site visits can be used to document which species provide the preferred forage by observing actual stock grazing patterns at the end of the grazing season and noting the species which have been preferentially grazed by stock. The moisture category from Ratliff et al. (1987) can be reassigned as indicated by evaluation.

PRODUCTIVITY

The meadow productivity data provided in Ratliff et al. (1987) was based on relatively sparse data and may under- or over-predict forage productivity for any given forage area. Therefore, field measurements of productivity provide an opportunity to input more accurate data into the capacity model.

Residual biomass data measured on ungrazed reference sites provides an estimate of productivity. However, this data is measured in a relatively small area, so caution should be used in using these values to calculate capacity. At minimum, the reference sites may identify forage areas that consistently produce more or less forage biomass than predicted by the model (Abbott et al. 2003), which could result in inaccurate capacities.

Productivity estimates are averages. Annual weather fluctuations are not explicitly included in the model, although they are known to influence productivity. In high snowfall years, productivity can be reduced by cold wet soils and shorter growing seasons (Moore et al. 2013). In very low snowfall years, lack of soil moisture may limit productivity.

Comparison of model values to observed values illustrates the importance of interannual variability on productivity. Residual biomass data collected from ungrazed reference sites in the parks can be used to estimate the magnitude of interannual variation. Twenty-seven meadows had at least three years of reference residual biomass data. The coefficient of variation (ratio of the sample standard deviation to sample mean with small-sample correction [Sokal and Rohlf 1995]), for these meadows averaged 0.36. Data from three sites in Yosemite National Park had coefficients of variation ranging from 0.17 – 0.34 (Moore et al. 2013), while coefficients of variation of three vegetation types in Sequoia National Park ranged from 0.08 – 0.48 (Stohlgren et al. 1989). This variability highlights the need for multiple years of data collection to characterize productivity for use in the capacity model; 3 to 5 years should be considered the minimum needed (USDA 2014).

In years where very high or very low precipitation is an important factor, public information provided to stock users is used to warn them of reduced capacities. Monitoring of conditions throughout the season can indicate when a mid-season grazing closure is appropriate due to reduced productivity

Utilization

Utilization values have been selected which limit grazing induced changes in vegetation, soils, and hydrology. If these values fail to set capacities at a level which meets the goals and objectives of the WSP/FEIS, they could be revised accordingly.

Studies of the relationship between utilization and ecosystem properties conducted in comparable habitats (such as Cole et al. [2004] and Norton et al. [2013]) provide one source to revise utilization values. Residual biomass data provides coarse estimates of utilization. If observed conditions in a forage area with residual biomass monitoring are not meeting goals and objectives, utilization levels from the monitoring data could inform any changes to utilization levels.

The assumption has been made in setting utilization rates that utilization by wildlife, especially by large ungulates such as mule deer and bighorn sheep, is generally low. Horses and mules are characterized as patch grazers, as they tend to graze some areas very closely and leave other areas almost untouched. In most meadows, this use pattern results in areas of meadow vegetation remaining available for wildlife consumption and to meet habitat needs. In meadows monitored for residual biomass, field observations of end-of-season standing crop also account for wildlife utilization. If wildlife utilization is found to be an important consideration in a given meadow, utilization values could be revised to meet the goals and objectives of the plan.

EVALUATING AND REVISING ESTIMATED CAPACITIES

In the adaptive management context, each year becomes a data point for a given forage area. The primary tool for evaluating capacities is to compare observed grazing regimes (total amount of grazing, timing) to observed impacts. The model capacities presented in table D-17 have been evaluated with the information available. Where that information indicates that the model capacity should be revised, an "evaluated capacity" has been assigned using the methods described below. In order to ensure that the estimated capacities reflect the most current knowledge of meadow response to grazing, capacities would undergo a comprehensive reevaluation every five years, with annual modifications as needed to ensure resource protection. Changes to capacities would be made available for public comment by March 1 of each year along with other public use limits.

Comparison of Use Levels to Monitoring Data and Standards

Monitoring data (i.e., site visits, residual biomass, bare ground, streambank alteration) can be associated with grazing timing and intensity levels from stock use data.

If management goals and objectives are being met at an observed use level, then that use level is more likely to be less than or equal to the true capacity. If goals and objectives are not being met, then the observed use level is more likely to be greater than the true capacity. Over time, this should provide a more nuanced understanding of the relationship between total grazing levels and impacts and allow for refinement of grazing capacities.

In making comparisons between use levels and monitoring data, capacity will be evaluated at appropriate spatial (forage area) and temporal (multiple year) scales. In addition to foliage removal by grazing stock, poor agreement between model capacity and observed conditions may be attributable to factors other than defoliation. Climate anomalies should also be considered during evaluation of monitoring data against capacities to ensure that changes to capacities do not reflect atypical responses to grazing.

Impacts Other Than Defoliation

Where grazing at model capacities results in impacts outside of standards, impacts other than defoliation can be the factor limiting grazing capacity. In these areas, previous use levels can be compared to observed impacts to adjust capacity values. Use levels will be evaluated for their impacts in the following areas:

- Trampling
- Impacts to soils and hydrology
- Water quality
- Plant species composition
- Social conflicts

For example, concerns over mechanical impacts such as shearing, trampling in peat accumulating meadows and fens have been partially addressed by ensuring that these areas are not included in the preferred acreage of a meadow. Limiting capacity to the amount of forage available outside of fen areas may reduce the likelihood that stock will seek forage within the fen.

Grazing capacities will be evaluated and refined by continuing to document the grazing level at which impacts other than grazing occur. This will be done in a context which includes other aspects of the

grazing regime such as timing or stock handling practices. Some impacts may be more effectively mitigated through management tools other than grazing capacities, such as grazing opening dates or education of visitors and staff traveling with stock.

Timing and Intensity of Use

Managing grazing by livestock in the traditional sense differs from the management of recreational grazing in wilderness in that in the latter, the timing and intensity of grazing in any given location can be highly variable and is often unpredictable. The arrival and departure of animals at a given site can result in periods of rest for the meadow, during which vegetative growth may occur and thus result in increased capacity. Conversely, periods of intense grazing without recovery periods may lead to depletion of the allowable biomass before the estimated capacity is reached. On site monitoring allows for mid-season adjustments in use levels that reflect these conditions.

Table D-15: Regression Coefficients for Each Combination of Moisture Level and Condition*

Moisture	Condition	B_0	B_E
D	Excellent	3470	-0.265
D	Good	2275	-0.175
D	Fair	1520	-0.115
D	Poor	878	-0.0675
M	Excellent	7355	-0.51
M	Good	4725	-0.325
M	Fair	3225	-0.225
M	Poor	1825	-0.125
W	Excellent	7297	-0.5575
W	Good	4705	-0.36
W	Fair	3297	-0.2575
W	Poor	1780	-0.135

* Productivity for a given moisture and condition is given by $B_0 + B_E$*Elevation.

Table D-16: Forage Areas Designated as Having High Logistical Value

Kings Canyon National Park	Sequoia National Park
28-3 Cony Camp	77-7 Pinto Lake
28-4 Franklin-Montgomery	79-1 Cold Springs Camp Area
33-1 Evolution	79-5 Gallats Lake
39-2 Big Pete	80-3 Tyndall Cr
39-4 Ladder Camp	81-2.1 Wallace Cr/JMT Junction
39-8 Deer	83-4 Upper Crabtree
46-2 South Fork Kings River	83-7 Lower Whitney Creek
51-1 Simpson	83-8 Sandy
53-4.2 Glacier Valley	84-2 Lower Rock Creek Crossing
53-5 Fallen Moon	85-4 Penned-up
53-7 Shorty's	85-10 Nathan's
58-1 Castle Domes	86-1 Kern Bridge Camp
58-2 Woods Creek Crossing	86-2 Upper Funston
58-3 Baxter Creek Drift Fence	86-5 Lower Funston
63-1 Charlotte Creek	86-7 Lewis Camp Large Pasture
65-3 Upper Vidette	87-3 Big Arroyo Patrol Cabin
65-4 Upper Bubbs Creek	89-3 Lower Lost Canyon
66-3 Junction (Bubbs Creek)	89-9 Middle Rattlesnake Canyon
67-1 East Lake	89-10 Cow Camp (Rattlesnake Creek)
69-2.2 Upper West Side Roaring River	90-5.1 Hockett
69-3 JR Past; Allen Camp	90-5.2 Hockett Pasture
69-4 Lackey Pasture	90-9 Lower South Fork
69-5.1 Scaffold Tourist Pasture	90-10 South Fork Meadow
69-5.2 Grasshopper	90-11 South Fork Pasture
70-4 Cement Table	90-13 Slim's
70-5 Big Wet	
70-6 Grand Palace Hotel	
71-1 Austin Camp	
71-2 Grave	
71-3 Ranger	

Table D-17: Estimated Grazing Capacities for Forage Areas Open to Grazing under the NPS Preferred Alternative

Forage Area Number	Forage Area Name	Elevation, feet	Moisture	Vegetation Zone	Logistical Value	Area, acre	Preferred vegetation	Productivity, pounds /acre	Utilization	Model capacity, stock nights	Evaluated capacity, stock nights	Proposed capacity, stock nights	Avg. grazing stock nights/ year 2009-2013
28-1	Piute Cr	8050	D	U	L	0.8	100%	866	25%	5		5	0
28-2	Aspen	8200	M	L	L	0.5	100%	2060	35%	11		11	3.2
28-3	Cony Cmp	8420	M	L	H	1.8	100%	1989	45%	50		50	8.4
28-4	Franklin-Montgomery	8720	W	U	H	7.7	50%	1566	35%	66		66	19
28-5	Pig Chute	9160	M	U	L	0.8	100%	1748	25%	11		11	0
28-6	Hell-For-Sure Jct Area	10000	M	U	L	32.8	50%	1475	25%	189		189	5.8
33-1	Evolution	9230	M	U	H	13.4	80%	1725	35%	202		202	89
33-2	McClure	9630	W	U	L	21.3	50%	1238	25%	103		103	57.2
33-3	Colby	9700	W	U	L	9.6	75%	1213	25%	68		68	21.4
33-4.1	Upr Colby (Upr Colby #1)	9850	W	U	L	3.6	30%	1159	25%	10		10	0
33-4.2	Darwin Pockets (Upr Colby #2)	9850	W	U	L	4.5	30%	1159	25%	12		12	18.2
34-1	Evolution Lk	10860	W	U	L	60.4	25%	795	25%	94		94	0.2
34-2	Sapphire Lk	10970	W	U	L	36.8	35%	756	25%	76		76	0
34-3	Huxley Lk	11300	D	U	L	34.2	35%	298	25%	28		28	0
34-4	Wanda Lk	11400	D	U	L	100.9	15%	280	25%	33		33	0
38-2	Blue Cyn	8410	W	U	L	28.9	30%	1677	25%	114		114	21
38-3	Lwr Blue Cyn	8000	D	L	L	0.9	100%	875	25%	6		6	0
39-2	Big Pete	9230	W	U	H	3.2	75%	1382	35%	36	50	50	52
39-3	Little Pete	8860	W	U	L	10.3	60%	1515	25%	73		73	42.2
39-4	Ladder Cmp	8310	D	L	H	3.5	50%	821	35%	16	50	50	54.4

Table D-17: Estimated Grazing Capacities for Forage Areas Open to Grazing under the NPS Preferred Alternative (continued)

Forage Area Number	Forage Area Name	Elevation, feet	Moisture	Vegetation Zone	Logistical Value	Area, acre	Preferred vegetation	Productivity, pounds /acre	Utilization	Model capacity, stock nights	Evaluated capacity, stock nights	Proposed capacity, stock nights	Avg. grazing stock nights/ year 2009-2013
39-6	Palisade Cr Jct	8020	D	L	L	1.4	50%	872	25%	5		5	1.2
39-7	Stillwater; Lwr Deer	8430	M	L	L	5.8	60%	1985	35%	76		76	11
39-8	Deer	8840	W	U	H	15.4	25%	1523	35%	64	100	100	35.2
42-1	Dusy Cr	9500	M	L	L	1.2	50%	1638	35%	11		11	18.2
45-1	Palisade Lks	10650	M	U	L	26.7	40%	1264	25%	105		105	27.6
46-1	Upr Basin	11200	M	U	L	204	25%	1085	25%	432		432	53.6
46-2	South Fk Kings River	9900	M	U	H	51.3	30%	1508	35%	254		254	73
46-3	Bench Lk/John Muir Trail Jct	10900	W	U	L	50.6	80%	781	25%	247		247	19
46-4	Bench Lk	10550	M	U	L	4.6	60%	1296	25%	28		28	1.8
46-6	Lk Marjorie	11150	M	U	L	14.9	20%	1101	25%	26		26	1.2
51-1	Simpson	5930	M	L	H	22.8	25%	2798	45%	224		224	87.6
51-2	Tehipite Vly	4100	D	L	L	13	10%	1558	25%	16		16	5.8
51-3	Gnat	7850	M	L	L	5.5	25%	2174	35%	33		33	0
51-4	Hay	7320	M	L	L	5	50%	2346	35%	64		64	0
52-1	Volcanic Lks Basin	10000	M	U	L	46.5	10%	1475	25%	54		54	5.8
52-2	Kennedy Cyn	9300	M	U	L	32.4	60%	1703	25%	259		259	0
52-3	Upr Kennedy Cyn	9540	M	U	L	15.3	30%	1625	25%	58		58	0
52-4	Kennedy Pass	10400	M	U	L	19.1	25%	1345	25%	50		50	0
52-5	West Kennedy Lk	9963	M	U	L	4.3	25%	1487	25%	12		12	0
52-6	Frypan	7800	M	L	L	5.8	50%	2190	35%	69		69	0
52-8	Jug	9860	D	U	L	6.8	25%	550	25%	7		7	0
52-9	Big Cmp	9900	M	U	L	14.7	25%	1508	25%	43		43	0

Table D-17: Estimated Grazing Capacities for Forage Areas Open to Grazing under the NPS Preferred Alternative (continued)

Forage Area Number	Forage Area Name	Elevation, feet	Moisture	Vegetation Zone	Logistical Value	Area, acre	Preferred vegetation	Productivity, pounds /acre	Utilization	Model capacity, stock nights	Evaluated capacity, stock nights	Proposed capacity, stock nights	Avg. grazing stock nights/ year 2009-2013
53-1	Horseshoe	10200	M	U	L	25.1	20%	1410	25%	55		55	0
53-2	Horseshoe Lks Turnoff	10500	M	U	L	12.9	40%	1313	25%	53		53	0
53-3	State Lks Area	10400	M	U	L	39.6	30%	1345	25%	125		125	0
53-4.1	Dougherty	9500	M	U	L	7.1	50%	1638	25%	45		45	0
53-4.2	Glacier Vly	9950	M	U	H	25.7	40%	1491	35%	168		168	12.4
53-5	Fallen Moon	9540	W	U	H	18.8	25%	1271	35%	65		65	21.6
53-6	Volcanic Trail Jct	9420	W	U	L	2.3	50%	1314	25%	12		12	0
53-7	Shorty's	10070	W	U	H	7.8	50%	1080	35%	46		46	41.8
53-8	Granite Pass	10300	W	U	L	9.3	45%	997	25%	33		33	0
54-2	Granite Basin	10000	M	U	L	109.5	30%	1475	25%	379		379	22.5
54-3	Grouse Lk	10473	M	U	L	11.4	20%	1321	25%	24		24	0
54-4	Halfmoon	10260	M	U	L	6.1	75%	1391	25%	50		50	14.5
54-5.1	Upr Tent	8200	D	L	L	2.9	25%	840	25%	5		5	0
54-5.2	Lwr Tent	8200	D	L	L	2.3	25%	840	25%	4		4	0
56-1	High south of Pinchot Pass	11200	M	U	L	157.1	20%	1085	25%	266		266	31.2
56-2	Twin Lks Area (Woods Cr)	10600	M	U	L	89.7	20%	1280	25%	179		179	34
56-3	White Fk Cmp/Ghost Forest Cmp	9780	W	U	L	1	50%	1184	25%	5		5	2
57-1	Woods Lake Basin	10800	W	U	L	117.3	15%	817	25%	112		112	13
58-1	Castle Domes	8130	M	L	H	4.4	70%	2083	45%	90		90	36.8
58-2	Woods Cr Xing	8500	M	L	H	3	100%	1963	45%	83	75	75	95.2
58-3	Baxter Cr Drift Fence	9450	W	U	H	2.3	100%	1303	35%	33	40	40	45.6
63-1	Charlotte Cr	10000	W	U	H	30.1	25%	1105	35%	91		91	78.2

Table D-17: Estimated Grazing Capacities for Forage Areas Open to Grazing under the NPS Preferred Alternative (continued)

Forage Area Number	Forage Area Name	Elevation, feet	Moisture	Vegetation Zone	Logistical Value	Area, acre	Preferred vegetation	Productivity, pounds /acre	Utilization	Model capacity, stock nights	Evaluated capacity, stock nights	Proposed capacity, stock nights	Avg. grazing stock nights/ year 2009-2013
65-3	Upr Vidette	10680	W	U	H	5.7	50%	860	35%	27		27	1.2
65-4	Upr Bubbs Cr	10400	M	U	H	39.3	25%	1345	35%	145		145	119
66-1.1	Sphinx Cr Conf	6240	D	L	L	2.5	75%	1183	25%	17		17	0
66-1.2	Angleworm	6840	D	L	L	0.2	75%	1078	25%	1		1	0
66-2	Charlotte Cr Conf	7300	W	L	L	18.5	10%	2077	25%	30		30	0
66-3	Junction (Bubbs Cr)	8130	D	L	H	7	25%	852	35%	16	50	50	49.2
67-1	East Lk	9550	W	U	H	4.8	50%	1267	35%	33	50	50	56
67-2	Ouzel	9580	M	U	L	1.8	70%	1612	25%	16		16	0.2
68-1	Screwball	8550	W	L	L	2.4	50%	1627	25%	15		15	2.8
69-1	The Big Hole	7600	M	L	L	0.6	100%	2255	35%	15		15	0
69-2.1	Lwr West Side Roaring River	7200	D	L	L	2.4	100%	1015	25%	19		19	0
69-2.2	Upr West Side Roaring River	7600	D	L	H	1.5	100%	945	35%	16	75	75	45.4
69-3	JR Past; Allen Cmp	7380	M	L	H	0.9	100%	2327	45%	29	50	50	49.4
69-4	Lackey Past; Scaffold	7370	M	L	H	1.9	75%	2330	45%	47	55	55	48.4
69-5.1	Scaffold Tourist Past	7360	M	L	H	9.5	60%	2333	45%	187		187	311
69-5.2	Grasshopper	7700	M	U	H	3.1	60%	2223	35%	45		45	22
69-6.1	Moraine	8160	W	U	L	6	80%	1767	25%	66		66	0
69-6.2	Moraine Stringers	8800	W	U	L	10.4	80%	1537	25%	100		100	0
69-6.3	Metroyhoy	9500	W	U	L	11.3	80%	1285	25%	91		91	0
70-1.1	Grasshopper Cmp; Brewer Cr Conf	7980	M	L	L	1.4	50%	2132	35%	16		16	0.6
70-1.2	Brewer Stringers	10400	M	U	L	4.2	50%	1345	25%	22		22	5.6
70-2	Barton Stringers	9400	M	U	L	8.8	50%	1670	25%	57		57	0

Table D-17: Estimated Grazing Capacities for Forage Areas Open to Grazing under the NPS Preferred Alternative (continued)

Forage Area Number	Forage Area Name	Elevation, feet	Moisture	Vegetation Zone	Logistical Value	Area, acre	Preferred vegetation	Productivity, pounds /acre	Utilization	Model capacity, stock nights	Evaluated capacity, stock nights	Proposed capacity, stock nights	Avg. grazing stock nights/ year 2009-2013
70-3	False Cement Table	8430	M	U	L	3.6	60%	1985	25%	34		34	0
70-4	Cement Table	8540	W	U	H	5.9	75%	1631	35%	79		79	17.2
70-5	Big Wet	8740	W	U	H	29.4	35%	1559	35%	175		175	26.2
70-6	Grand Palace Hotel	9040	M	U	H	5.7	45%	1787	35%	50		50	14.2
70-7	Colby Lk	10620	D	U	L	4.4	20%	417	25%	3		3	0.6
71-1	Austin Cmp (all)	7950	M	U	H	5	60%	2141	35%	70		70	58.6
71-2	Grave	8400	M	U	H	5.1	50%	1995	35%	56		56	37.8
71-3	Ranger (all)	8780	W	U	H	49.5	35%	1544	35%	293		293	86
71-4	Upr Ranger	9230	M	U	L	11.7	30%	1725	25%	47		47	2.6
71-5	Upr Deadman Cyn	9400	M	U	L	35.4	5%	1670	25%	23		23	0
72-1	Pond	8500	W	L	L	2.5	50%	1645	25%	16		16	0
72-2	Catch'em	8900	W	L	L	2.9	50%	1501	25%	17		17	0
72-3	Willow (Sugarloaf Cr)	9200	W	L	L	9.9	50%	1393	25%	54		54	0
72-4	Mitchell (Sheep Cr)	9600	W	U	L	25.6	50%	1249	25%	125		125	0
72-5	Quartz	8920	M	U	L	5.4	20%	1826	25%	15		15	0
72-6	Williams	8020	M	L	L	31.8	20%	2119	35%	147		147	0
72-7	Comanche	7820	W	L	L	4.3	20%	1890	25%	13		13	0
72-8	Sugarloaf	7300	M	L	L	23.2	50%	2353	35%	298		298	52.2
72-9	Little Sugarloaf	7200	M	L	L	3.6	50%	2385	35%	47		47	0
72-10	Sugarloaf Cr Cmp	6960	D	L	L	0.7	50%	1057	25%	3		3	0
72-11	Tom Sears; Honeymoon	7100	W	L	L	2.3	10%	2149	25%	4		4	0
72-12	Boggy	7240	M	L	L	2.1	50%	2372	35%	27		27	0

Table D-17: Estimated Grazing Capacities for Forage Areas Open to Grazing under the NPS Preferred Alternative (continued)

Forage Area Number	Forage Area Name	Elevation, feet	Moisture	Vegetation Zone	Logistical Value	Area, acre	Preferred vegetation	Productivity, pounds /acre	Utilization	Model capacity, stock nights	Evaluated capacity, stock nights	Proposed capacity, stock nights	Avg. grazing stock nights/ year 2009-2013
72-13.1	Cabbage	7760	D	L	L	2.9	50%	917	25%	10		10	0
72-13.2	Crowley Cyn	8000	D	L	L	1.1	50%	875	25%	4		4	0
72-13.3	Upr Crowley Cyn Pockets	8940	M	U	L	20.5	25%	1820	25%	73		73	0
72-14.1	Lwr Box Cyn	8200	W	U	L	1.6	25%	1753	25%	5		5	0
72-14.2	Suez Canal	9140	W	U	L	5	25%	1415	25%	14		14	0
72-14.3	Upr Box Cyn	9750	W	U	L	16.2	25%	1195	25%	38		38	0
72-16.1	Lwr Paradise	8980	M	U	L	5.6	40%	1807	25%	32		32	0
72-16.2	Upr Paradise	9150	M	U	L	14.3	40%	1751	25%	78		78	0
72-17.1	Lwr Log	8780	M	U	L	2.6	25%	1872	25%	10		10	0
72-17.2	Upr Log	8900	M	U	L	6	25%	1833	25%	21		21	0
72-17.3	Salt Log	8940	M	U	L	0.6	25%	1820	25%	2		2	0
72-17.4	Ditch	8980	W	U	L	1.3	25%	1472	25%	4		4	0
72-17.5	Sheep Pen Meadow	9020	W	U	L	8.5	25%	1458	25%	24		24	0
72-18	Ferguson	8637	M	U	L	9.4	50%	1918	25%	70		70	3.2
72-19	Long (Ferguson Cr)	9590	W	U	L	66.1	40%	1253	25%	259		259	0
72-20.1	Lwr Lewistall	8580	W	U	L	4.5	50%	1616	25%	28		28	0
72-20.2	Upr Lewistall	8820	W	U	L	2.6	50%	1530	25%	16		16	0
72-21	Little Jack	9380	W	U	L	1.3	50%	1328	25%	7		7	0
72-22	Scenic	9780	M	U	L	32.7	35%	1547	25%	138		138	0
73-1	Sheep Cmp (Sugarloaf Cr)	8270	M	U	L	2.4	60%	2037	25%	23		23	0
73-3	Lovelace Cabin	8740	M	U	L	2.8	80%	1885	25%	33		33	0
73-4	Lost Lk	9130	W	U	L	0.8	60%	1418	25%	5		5	5.2

Table D-17: Estimated Grazing Capacities for Forage Areas Open to Grazing under the NPS Preferred Alternative (continued)

Forage Area Number	Forage Area Name	Elevation, feet	Moisture	Vegetation Zone	Logistical Value	Area, acre	Preferred vegetation	Productivity, pounds /acre	Utilization	Model capacity, stock nights	Evaluated capacity, stock nights	Proposed capacity, stock nights	Avg. grazing stock nights/ year 2009-2013
73-5	Ranger & Beville Lks	9142	W	U	L	4	50%	1414	25%	22		22	5
74-1	Twin Lks (Clover Cr)	9430	M	U	L	5.7	50%	1660	25%	37		37	0
74-2	Pattee	9260	M	U	L	9.4	50%	1716	25%	63		63	0
74-3	Clover Cr	8434	M	U	L	33.9	50%	1984	25%	263		263	0
74-4	Cahoon (Silliman Cr)	7760	W	U	L	14.9	50%	1911	25%	111		111	0
75-1	Lone Pine	8800	M	U	L	9.4	25%	1865	25%	34		34	13.2
75-2	Tamarack Lk	9215	M	U	L	4.1	15%	1730	25%	8		8	7.2
77-1	Bearpaw	7460	M	L	L	1.3	75%	2301	35%	25		25	1.4
77-2	Lwr Bearpaw	6860	M	L	L	9.1	60%	2496	35%	149		149	0
77-3	River Vly	6480	D	L	L	0.7	100%	1141	25%	6		6	0
77-5	Redwood	6040	M	L	L	10	40%	2762	35%	121		121	35.8
77-6	Cliff Cr	7400	M	L	L	4.6	40%	2320	35%	47		47	3.4
77-7	Pinto Lk	8700	M	U	H	5.6	50%	1898	35%	58		58	33
79-1	Cold Springs Cmp Area	9180	W	U	H	16	50%	1400	35%	123		123	126
79-3	Rockslide Lk	9050	M	U	L	12.1	25%	1784	25%	42		42	0
79-4	Lwr Kern-Kaweah River	9700	M	U	L	12.2	35%	1573	25%	52		52	35.8
79-5	Gallats Lk	10030	M	U	H	33.2	25%	1465	35%	133		133	30.4
79-6	Upr Kern-Kaweah River	10350	M	U	L	146.9	9%	1361	25%	141		141	52.4
80-2	Tyndall Cr/JMT Frog Ponds	11050	M	U	L	29.3	40%	1134	25%	104		104	7.4
80-3	Tyndall Cr	10600	M	U	H	14.6	50%	1280	35%	102		102	96.2
80-4	Sheep Cmp (Tyndall Cr)	11400	M	U	L	796.4	20%	1020	25%	1269		1269	15.6
80-5.1	Lk South America	11950	M	1	0	22.8	50%	841	25%	75		75	0

Table D-17: Estimated Grazing Capacities for Forage Areas Open to Grazing under the NPS Preferred Alternative (continued)

Forage Area Number	Forage Area Name	Elevation, feet	Moisture	Vegetation Zone	Logistical Value	Area, acre	Preferred vegetation	Productivity, pounds /acre	Utilization	Model capacity, stock nights	Evaluated capacity, stock nights	Proposed capacity, stock nights	Avg. grazing stock nights/ year 2009-2013
80-6	Kern Headwaters	11200	W	1	0	201.8	10%	673	25%	106		106	21.8
81-1	Wright Cr Drainage	10900	M	U	L	507	25%	1183	25%	1171		1171	100.6
81-2.1	Wallace Cr/JMT Jct	10400	M	U	H	3.2	30%	1345	35%	14		14	9.6
81-2.2	Wallace Cr	10500	M	U	L	7.3	50%	1313	25%	37		37	18.6
81-2.3	Wallace Cr Waterfall	10860	W	U	L	9.8	40%	795	25%	24		24	0
81-2.4	Marshy	11100	W	U	L	5.4	40%	709	25%	12		12	0
82-1	Junction (Kern)	8050	W	L	L	1.7	65%	1807	25%	16		16	6.6
82-2	One mi below Junction	8000	D	L	L	0.3	100%	875	25%	2		2	1.8
82-3	Three mi below Junction	7700	D	L	L	1.4	100%	928	25%	10		10	0
83-4	Upr Crabtree	10460	W	U	H	38.9	30%	939	35%	120		120	76.6
83-6	Crabtree Lks	10900	M	U	L	9.2	70%	1183	25%	59		59	0
83-7	Lwr Whitney Cr; Strawberry	9950	M	U	H	5.9	30%	1491	35%	29		29	44.8
83-8	Sandy	10600	M	U	H	47.9	30%	1280	35%	201	300	300	258
84-2	Lwr Rock Cr Xing	9500	M	U	H	47.1	25%	1638	35%	211		211	184.2
84-6	Siberian Outpost	10780	D	U	L	270.6	40%	389	25%	329		329	1.2
85-4	Penned-up	10650	W	U	H	10.8	50%	871	35%	51		51	25.8
85-6	Lwr Soldier Lk	10800	W	U	L	25	20%	817	25%	32		32	3.6
85-7	New Army Pass Jct	10920	M	U	L	50.1	25%	1176	25%	115		115	3.6
85-8	Rock Cr Lk (all)	10430	W	U	L	32.5	40%	950	25%	97		97	29.2
85-10	Nathan's	10020	M	U	H	15.7	50%	1469	35%	126	75	75	43.5
86-1	Kern Bridge Cmp	6800	W	L	H	6.1	75%	2257	35%	113	150	150	297.8
86-2	Upr Funston	6700	M	L	H	10.3	30%	2548	45%	111		111	59.6

Table D-17: Estimated Grazing Capacities for Forage Areas Open to Grazing under the NPS Preferred Alternative (continued)

Forage Area Number	Forage Area Name	Elevation, feet	Moisture	Vegetation Zone	Logistical Value	Area, acre	Preferred vegetation	Productivity, pounds /acre	Utilization	Model capacity, stock nights	Evaluated capacity, stock nights	Proposed capacity, stock nights	Avg. grazing stock nights/ year 2009-2013
86-3	Big Arroyo Conf	6640	D	L	L	1.6	40%	1113	25%	6		6	0
86-4	21-inch Cmp	6580	M	L	L	3.1	30%	2587	35%	26		26	7.4
86-5	Lwr Funston	6480	W	L	H	4.4	50%	2372	35%	57		57	0
86-6	Rattlesnake Cmp; River Past	6390	M	L	L	1.1	50%	2648	35%	16		16	0
86-7	Lewis Cmp Large Past	6400	M	L	H	9	60%	2645	45%	201	220	220	182
86-8	Kern Station Small Past	6440	M	L	L	1.5	50%	2632	35%	22		22	1.4
87-1	Upr Big Arroyo	9960	D	U	L	84.9	85%	532	25%	300		300	73.4
87-2	Little Upr Big Arroyo	9780	M	U	L	6.6	40%	1547	25%	32		32	0
87-3	Big Arroyo Patrol Cabin	9510	W	U	H	5.3	95%	1281	35%	71		71	47
87-4	Lwr Big Arroyo	9200	M	U	L	26.2	80%	1735	25%	284		284	73
87-5	Chagoopa Plateau #1	10460	W	U	L	10.1	40%	939	25%	30		30	0
87-6	Chagoopa Plateau #2	10430	W	U	L	8.7	75%	950	25%	48		48	0
87-8	Chagoopa Plateau #4	9960	W	U	L	14.3	75%	1119	25%	94		94	0
87-9	Chagoopa Plateau Treehouse	10380	M	U	L	14.1	66%	1352	25%	98		98	0
87-10	Sky Parlor	9150	D	U	L	66.2	60%	674	25%	209		209	34.4
88-1	Lwr Little Five Lks	10420	M	U	L	54	10%	1339	25%	56		56	2.6
88-2	Upr Little Five Lks	10520	W	U	L	14.8	50%	918	25%	53		53	3.2
88-3	Big Five Lks Lwr	9900	W	U	L	5.4	50%	1141	25%	24		24	2.4
88-4	Big Five Lks Upr	10220	W	U	L	22.2	35%	1026	25%	62		62	4.4
88-5	Big Five Lks Upr Stringer	10580	W	U	L	2.5	100%	896	25%	18		18	0.6
89-2	Upr Lost Cyn (all)	10100	M	U	L	31	40%	1443	25%	140		140	55.4
89-3	Lower Lost Cyn (all)	9650	M	U	H	20.2	30%	1589	35%	105		105	102.2

Table D-17: Estimated Grazing Capacities for Forage Areas Open to Grazing under the NPS Preferred Alternative (continued)

Forage Area Number	Forage Area Name	Elevation, feet	Moisture	Vegetation Zone	Logistical Value	Area, acre	Preferred vegetation	Productivity, pounds /acre	Utilization	Model capacity, stock nights	Evaluated capacity, stock nights	Proposed capacity, stock nights	Avg. grazing stock nights/ year 2009-2013
89-4	Soda Cr Cyn	9200	M	U	L	23.8	50%	1735	25%	161		161	0
89-5.1	Forester Lk Bench	10760	M	U	L	29.4	75%	1228	25%	212		212	1.6
89-5.3	Forester Lk Pocket	10710	M	U	L	6.3	50%	1244	25%	31		31	0
89-6	Upr Rattlesnake Cyn	10440	M	U	L	6.4	50%	1332	25%	33		33	14.8
89-7	Shotgun Pass	10585	M	U	L	20.5	50%	1285	25%	103		103	0.4
89-8	South Rattlesnake Cyn	10320	W	U	L	20.9	30%	990	25%	48		48	0
89-9	Middle Rattlesnake Cyn	9500	W	U	H	7.2	60%	1285	35%	61		61	47.2
89-10	Cow Cmp (Rattlesnake Cr)	8720	M	U	H	14.4	25%	1891	35%	74		74	49
89-11	Laurel Cr Basin	10400	M	U	L	77	25%	1345	25%	202		202	0
89-12	Crytes Cr	10650	M	U	L	26	35%	1264	25%	90		90	0
89-13	Coyote Cr	9400	M	U	L	36.6	50%	1670	25%	239		239	0.6
90-1	Horse Cr	8580	M	U	L	1.8	75%	1937	25%	20		20	0
90-2	Ansel Lk	10540	M	U	L	19.9	10%	1300	25%	20		20	0
90-3	Evelyn Lk	8700	M	U	L	0.8	50%	1898	25%	6		6	0
90-4	Cow Cmp (Hockett)	8470	M	U	L	5.3	30%	1972	25%	24		24	1.6
90-5.1	Hockett	8500	M	U	H	42.1	35%	1963	35%	316		316	179.6
90-5.2	Hockett Past	8500	M	U	H	8.3	65%	1963	35%	116	100	100	63
90-6	Sand	8540	W	U	L	43.8	50%	1631	25%	279		279	2.4
90-8	Tuohy Cr Jct	8275	D	U	L	3.2	50%	827	25%	10		10	0
90-9	Lwr South Fk	8500	D	U	H	18.2	50%	788	35%	78		78	58
90-10	South Fk Mdw	8515	M	U	H	13.2	50%	1958	35%	141		141	45.4
90-11	South Fk Past	8560	M	U	H	9.3	50%	1943	35%	99		99	34.4

Table D-17: Estimated Grazing Capacities for Forage Areas Open to Grazing under the NPS Preferred Alternative (continued)

Forage Area Number	Forage Area Name	Elevation, feet	Moisture	Vegetation Zone	Logistical Value	Area, acre	Preferred vegetation	Productivity, pounds /acre	Utilization	Model capacity, stock nights	Evaluated capacity, stock nights	Proposed capacity, stock nights	Avg. grazing stock nights/ year 2009-2013
90-12	Blossom Lk	10200	M	U	L	5.9	30%	1410	25%	19		19	0
90-13	Slim's	8860	M	U	H	8	50%	1846	35%	81		81	60.8
90-14	Green; Cabin	9350	M	U	L	44.1	20%	1686	25%	116		116	29.2
90-15	Tuohy	8350	M	U	L	5.8	50%	2011	25%	46		46	0
90-16	Summit	8980	M	U	L	13.5	50%	1807	25%	95		95	0
90-17	Cyclone	9290	W	U	L	31.4	40%	1361	25%	134		134	1
90-18	Summit Lk	9340	W	U	L	3.9	35%	1343	25%	14		14	0
90-19	Quinn	8340	M	U	L	23.8	50%	2015	25%	187		187	8
91-1	Ladybug Cmp	4280	D	L	L	0.4	100%	1526	25%	5		5	0
91-2	Whiskey Log Cmp	5300	D	L	L	0.4	100%	1348	25%	4		4	0
91-3	Cahoon (Hockett)	7340	M	L	L	18.5	50%	2340	35%	237		237	0
96-1	North Fk Kaweah River	1900	D	L	L	9.7	90%	1943	25%	132		132	0

Notes: Forage area number is "travel zone – number."
Moisture is D = dry, M = moist, W = wet.
Vegetation zone is U = upper montane and subalpine, L = lower montane and woodland.
Logistical value is H = higher, L = lower.
Preferred vegetation is the percentage of the meadow area which is preferentially grazed by stock.
Productivity is 65% of the maximum productivity from Ratliff et al. (1987).
Utilization is the maximum percentage of annual plant production that may be grazed.
Model capacity is total production divided by consumption rate.
Evaluated capacity is capacity developed through an evaluation of past use and impacts.
Proposed capacity is the evaluated capacity (if listed) or model capacity.

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Appendix E

Wilderness Legislation Related to Sequoia and Kings Canyon National Parks

ON THE PREVIOUS PAGE
Bubbs Canyon
NPS Photo

APPENDIX: E

WILDERNESS LEGISLATION RELATED TO SEQUOIA AND KINGS CANYON NATIONAL PARKS

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WILDERNESS ACT OF 1964

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WILDERNESS ACT

Public Law 88-577 (16 U.S. C. 1131-1136)
88th Congress, Second Session
September 3, 1964

AN ACT
To establish a National Wilderness Preservation System for the permanent good of the whole people, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

Short Title

Section 1. This Act may be cited as the "Wilderness Act."

WILDERNESS SYSTEM ESTABLISHED STATEMENT OF POLICY

Section 2.(a) In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness. For this purpose there is hereby established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as "wilderness areas", and these shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness; and no Federal lands shall be designated as "wilderness areas" except as provided for in this Act or by a subsequent Act.

(b) The inclusion of an area in the National Wilderness Preservation System notwithstanding, the area shall continue to be managed by the Department and agency having jurisdiction thereover immediately before its inclusion in the National Wilderness Preservation System unless otherwise provided by Act of Congress. No appropriation shall be available for the payment of expenses or salaries for the administration of the National Wilderness Preservation System as a separate unit nor shall any appropriations be available for additional personnel stated as being required solely for the purpose of managing or administering areas solely because they are included within the National Wilderness Preservation System.

DEFINITION OF WILDERNESS

(c) A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

NATIONAL WILDERNESS PRESERVATION SYSTEM - EXTENT OF SYSTEM

Section 3.(a) All areas within the national forests classified at least 30 days before September 3, 1964 by the Secretary of Agriculture or the Chief of the Forest Service as "wilderness", "wild", or "canoe" are hereby designated as wilderness areas. The Secretary of Agriculture shall -

(1) Within one year after September 3, 1964, file a map and legal description of each wilderness area with the Interior and Insular Affairs Committees of the United States Senate and the House of Representatives, and such descriptions shall have the same force and effect as if included in this Act: Provided, however, That correction of clerical and typographical errors in such legal descriptions and maps may be made.

(2) Maintain, available to the public, records pertaining to said wilderness areas, including maps and legal descriptions, copies of regulations governing them, copies of public notices of, and reports submitted to Congress regarding pending additions, eliminations, or modifications. Maps, legal descriptions, and regulations pertaining to wilderness areas within their respective jurisdictions also shall be available to the public in the offices of regional foresters, national forest supervisors, and forest rangers.

Classification. (b) The Secretary of Agriculture shall, within ten years after September 3, 1964, review, as to its suitability or nonsuitability for preservation as wilderness, each area in the national forests classified on September 3, 1964 by the Secretary of Agriculture or the Chief of the Forest Service as "primitive" and report his findings to the President.
Presidential recommendation to Congress. The President shall advise the United States Senate and House of Representatives of his recommendations with respect to the designation as "wilderness" or other reclassification of each area on which review has been completed, together with maps and a definition of boundaries. Such advice shall be given with respect to not less than one-third of all the areas now classified as "primitive" within three years after September 3, 1964, not less than two-thirds within seven years after September 3, 1964, and the remaining areas within ten years after September 3, 1964.
Congressional approval. Each recommendation of the President for designation as "wilderness" shall become effective only if so provided by an Act of Congress. Areas classified as "primitive" on September 3, 1964 shall continue to be administered under the rules and regulations affecting such areas on September 3, 1964 until Congress has determined otherwise. Any such area may be increased in size by the President at the time he submits his recommendations to the Congress by not more than five thousand acres with no more than one thousand two hundred and eighty acres of such increase in any one compact unit; if it is proposed to increase the size of any such area by more than five thousand acres or by more than one thousand two hundred and eighty acres in any one compact unit the increase in size shall not become effective until acted upon by Congress. Nothing herein contained shall limit the President in proposing, as part of his recommendations to Congress, the alteration of existing boundaries of primitive areas or recommending the addition of any contiguous area of national forest lands predominantly of wilderness value. Notwithstanding any other provisions of this Act, the Secretary of Agriculture may complete his review and delete such area as may be necessary, but not to exceed seven thousand acres, from the southern tip of the Gore Range-Eagles Nest Primitive Area, Colorado, if the Secretary determines that such action is in the public interest.

Report to President. (c) Within ten years after September 3, 1964 the Secretary of the Interior shall review every roadless area of five thousand contiguous acres or more in the national parks, monuments and other units of the national park system and every such area of, and every roadless island within the national wildlife refuges and game ranges, under his jurisdiction on September 3, 1964 and shall report to the President his recommendation as to the suitability or nonsuitability of each such area or island for preservation as wilderness.
Presidential recommendation to Congress. The President shall advise the President of the Senate and the Speaker of the House of Representatives of his recommendation with respect to the designation as wilderness of each such area or island on which review has been completed, together with a map thereof and a definition of its boundaries. Such advice shall be given with respect to not less than one-third of the areas and islands to be reviewed under this subsection within three years after September 3, 1964, not less than two-thirds within seven years of September 3, 1964 and the remainder within ten years of September 3, 1964.
Congressional approval. A recommendation of the President for designation as wilderness shall become effective only if so provided by an Act of Congress. Nothing contained herein shall, by implication or otherwise, be construed to lessen the present statutory authority of the

Secretary of the Interior with respect to the maintenance of roadless areas within units of the national park system.

Suitability. (d)(1) The Secretary of Agriculture and the Secretary of the Interior shall, prior to submitting any recommendations to the President with respect to the suitability of any area for preservation as wilderness –
Publication in Federal Register. (A) give such public notice of the proposed action as they deem appropriate, including publication in the Federal Register and in a newspaper having general circulation in the area or areas in the vicinity of the affected land;
Hearings. (B) hold a public hearing or hearings at a location or locations convenient to the area affected. The hearings shall be announced through such means as the respective Secretaries involved deem appropriate, including notices in the Federal Register and in newspapers of general circulation in the area: Provided, That if the lands involved are located in more than one State, at least one hearing shall be held in each State in which a portion of the land lies;
(C) at least thirty days before the date of a hearing advise the Governor of each State and the governing board of each county, or in Alaska the borough, in which the lands are located, and Federal departments and agencies concerned, and invite such officials and Federal agencies to submit their views on the proposed action at the hearing or by no later than thirty days following the date of the hearing.
Any views submitted to the appropriate Secretary under the provisions of (1) of this subsection with respect to any area shall be included with any recommendations to the President and to Congress with respect to such area.
Proposed modification. (e) Any modification or adjustment of boundaries of any wilderness area shall be recommended by the appropriate Secretary after public notice of such proposal and public hearing or hearings as provided in subsection (d) of this section. The proposed modification or adjustment shall then be recommended with map and description thereof to the President. The President shall advise the United States Senate and the House of Representatives of his recommendations with respect to such modification or adjustment and such recommendations shall become effective only in the same manner as provided for in subsections (b) and (c) of this section.

USE OF WILDERNESS AREAS

Section 4.(a) The purposes of this Act are hereby declared to be within and supplemental to the purposes for which national forests and units of the national park and national wildlife refuge systems are established and administered and -
(1) Nothing in this Act shall be deemed to be in interference with the purpose for which national forests are established as set forth in the Act of June 4, 1897 (30 Stat. 11), and the Multiple-Use Sustained-Yield Act of June 12, 1960 (74 Stat. 215) (16 U.S.C. 528-531).
(2) Nothing in this Act shall modify the restrictions and provisions of the Shipstead-Nolan Act (Public Law 539, Seventy-first Congress, July 10, 1930; 46 Stat. 1020), the Thye–Blatnik Act (Public Law 733, Eightieth Congress, June 22, 1948; 62 Stat. 568), and the Humphrey-Thye-Blatnik-Andresen Act (Public Law 607, Eighty-Fourth Congress, June 22, 1956; 70 Stat. 326), as applying to the Superior National Forest or the regulations of the Secretary of Agriculture.
(3) Nothing in this Act shall modify the statutory authority under which units of the national park system are created. Further, the designation of any area of any park, monument, or other unit of the national park system as a wilderness area pursuant to this Act shall in no manner lower the standards evolved for the use and preservation of such park, monument, or other unit of the national park system in accordance with sections 1, 2, 3, and 4 of this title, the statutory authority under which the area was created, or any other Act of Congress which might pertain to or affect such area, including, but not limited to, the Act of June 8, 1906 (34 Stat. 225; 16 U.S.C. 432 et seq.); section 3(2) of the Federal Power Act (16 U.S.C. 796(2)); and the Act of August 21, 1935 (49 Stat. 666; 16 U.S.C. 461 et seq.).
(b) Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this

Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.

PROHIBITION OF CERTAIN USES

(c) Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area.

SPECIAL PROVISIONS

(d) The following special provisions are hereby made:

(1) Within wilderness areas designated by this Act the use of aircraft or motorboats, where these uses have already become established, may be permitted to continue subject to such restrictions as the Secretary of Agriculture deems desirable. In addition, such measures may be taken as may be necessary in the control of fire, insects, and diseases, subject to such conditions as the Secretary deems desirable.

(2) Nothing in this Act shall prevent within national forest wilderness areas any activity, including prospecting, for the purpose of gathering information about mineral or other resources, if such activity is carried on in a manner compatible with the preservation of the wilderness environment. Furthermore, in accordance with such program as the Secretary of the Interior shall develop and conduct in consultation with the Secretary of Agriculture, such areas shall be surveyed on a planned, recurring basis consistent with the concept of wilderness preservation by the United States Geological Survey and the United States Bureau of Mines to determine the mineral values, if any, that may be present; and the results of such surveys shall be made available to the public and submitted to the President and Congress.

Mineral leases, claims, etc. (3) Not withstanding any other provisions of this Act, until midnight December 31, 1983, the United States mining laws and all laws pertaining to mineral leasing shall, to the extent as applicable prior to September 3, 1964, extend to those national forest lands designated by this Act as "wilderness areas"; subject, however, to such reasonable regulations governing ingress and egress as may be prescribed by the Secretary of Agriculture consistent with the use of the land for mineral location and development and exploration, drilling, and production, and use of land for transmission lines, waterlines, telephone lines, or facilities necessary in exploring, drilling, producing, mining, and processing operations, including where essential the use of mechanized ground or air equipment and restoration as near as practicable of the surface of the land disturbed in performing prospecting, location, and , in oil and gas leasing, discovery work, exploration, drilling, and production, as soon as they have served their purpose. Mining locations lying within the boundaries of said wilderness areas shall be held and used solely for mining or processing operations and uses reasonably incident thereto; and hereafter, subject to valid existing rights, all patents issued under the mining laws of the United States affecting national forest lands designated by this Act as wilderness areas shall convey title to the mineral deposits within the claim, together with the right to cut and use so much of the mature timber therefrom as may be needed in the extraction, removal, and beneficiation of the mineral deposits, if needed timber is not otherwise reasonably available, and if the timber is cut under sound principles of forest management as defined by the national forest rules and regulations, but each such patent shall reserve to the United States all title in or to the surface of the lands and products thereof, and no use of the surface of the claim or the resources therefrom not reasonably required for carrying on mining or prospecting shall be allowed except as otherwise expressly provided in this Act: Provided, That, unless hereafter specifically authorized, no patent within wilderness areas designated by this Act shall issue after December 31, 1983, except for the valid claims existing on or before December 31, 1983. Mining claims located after September 3, 1964, within the boundaries of wilderness areas designated by this Act shall create no rights in excess of those rights which may be patented under the provisions of this subsection. Mineral leases, permits, and licenses covering lands within national forest wilderness areas designated by this Act shall contain such reasonable stipulations as may

be prescribed by the Secretary of Agriculture for the protection of the wilderness character of the land consistent with the use of the land for the purposes for which they are leased, permitted, or licensed. Subject to valid rights then existing, effective January 1, 1984, the minerals in lands designated by this Act as wilderness areas are withdrawn from all forms of appropriation under the mining laws and from disposition under all laws pertaining to mineral leasing and all amendments thereto.

Water resources and grazing. (4) Within wilderness areas in the national forests designated by this Act, **(1)** the President may, within a specific area and in accordance with such regulations as he may deem desirable, authorize prospecting for water resources, the establishment and maintenance of reservoirs, water-conservation works, power projects, transmission lines, and other facilities needed in the public interest, including the road construction and maintenance essential to development and use thereof, upon his determination that such use or uses in the specific area will better serve the interests of the United States and the people thereof than will its denial; and **(2)** the grazing of livestock, where established prior to September 3, 1964, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture.

(5) Other provisions of this Act to the contrary notwithstanding, the management of the Boundary Waters Canoe Area, formerly designated as the Superior, Little Indian Sioux, and Caribou Roadless Areas, in the Superior National Forest, Minnesota, shall be in accordance with regulations established by the Secretary of Agriculture in accordance with the general purpose of maintaining, without unnecessary restrictions on other uses, including that of timber, the primitive character of the area, particularly in the vicinity of lakes, streams, and portages: Provided, That nothing in this Act shall preclude the continuance within the area of any already established use of motorboats.

(6) Commercial services may be performed within the wilderness areas designated by this Act to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas.

(7) Nothing in this Act shall constitute an express or implied claim or denial on the part of the Federal Government as to exemption from State water laws.

(8) Nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of the several States with respect to wildlife and fish in the national forests.

STATE AND PRIVATE LANDS WITHIN WILDERNESS AREAS

Section 5.(a) In any case where State -owned or privately owned land is completely surrounded by national forest lands within areas designated by this Act as wilderness, such State or private owner shall be given such rights as may be necessary to assure adequate access to such State -owned or privately owned land by such State or private owner and their successors in interest, or the State -owned land or privately owned land shall be exchanged for federally owned land in the same State of approximately equal value under authorities available to the Secretary of Agriculture:

Transfers, restriction. Provided, however, That the United States shall not transfer to a State or private owner any mineral interests unless the State or private owner relinquishes or causes to be relinquished to the United States the mineral interest in the surrounded land.

(b) In any case where valid mining claims or other valid occupancies are wholly within a designated national forest wilderness area, the Secretary of Agriculture shall, by reasonable regulations consistent with the preservation of the area as wilderness, permit ingress and egress to such surrounded areas by means which have been or are being customarily enjoyed with respect to other such areas similarly situated.

Acquisition. (c) Subject to the appropriation of funds by Congress, the Secretary of Agriculture is authorized to acquire privately owned land within the perimeter of any area designated by this Act as wilderness if **(1)** the owner concurs in such acquisition or **(2)** the acquisition is specifically authorized by Congress.

GIFTS, BEQUESTS, AND CONTRIBUTIONS

Section 6.(a) The Secretary of Agriculture may accept gifts or bequests of land within wilderness areas designated by this Act for preservation as wilderness. The Secretary of Agriculture may also accept gifts or bequests of land adjacent to wilderness areas designated by this Act for preservation as wilderness if he has given sixty days advance notice thereof to the President of the Senate and the Speaker of the House of Representatives. Land

accepted by the Secretary of Agriculture under this section shall be come part of the wilderness area involved. Regulations with regard to any such land may be in accordance with such agreements, consistent with the policy of this Act, as are made at the time of such gift, or such conditions, consistent with such policy, as may be included in, and accepted with, such bequest.
(b) Authorization to accept private contributions and gifts The Secretary of Agriculture or the Secretary of the Interior is authorized to accept private contributions and gifts to be used to further the purposes of this Act.

ANNUAL REPORTS

Section 7. At the opening of each session of Congress, the Secretaries of Agriculture and Interior shall jointly report to the President for transmission to Congress on the status of the wilderness system, including a list and descriptions of the areas in the system, regulations in effect, and other pertinent information, together with any recommendations they may care to make.

APPROVED SEPTEMBER 3, 1964.

Legislative History:

House Reports: No 1538 accompanying H.R. 9070 (Committee on Interior & Insular Affairs) and No. 1829 (Committee of Conference).

Senate report: No. 109 (Committee on Interior & Insular Affairs). Congressional Record: Vol. 109 (1963):

- April 4, 8, considered in Senate.
- April 9, considered and passed Senate.
- Vol. 110 (1964): July 28, considered in House.
- July 30, considered and passed House, amended, in lieu of H.R. 9070
- August 20, House and Senate agreed to conference report.

CALIFORNIA WILDERNESS ACT OF 1984

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2. California Wilderness Act of 1984

PUBLIC LAW 98-425—SEPT. 28, 1984 98 STAT. 1619

Public Law 98-425
98th Congress

An Act

Entitled the "California Wilderness Act of 1984".

Sept. 28, 1984
[H.R. 1437]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this title may be cited as the "California Wilderness Act of 1984".

California Wilderness Act of 1984.

TITLE I

DESIGNATION OF WILDERNESS

National Wilderness Preservation System.
National Forest System.
National parks, monuments, etc.
16 USC 1131 note.

SEC. 101. (a) In furtherance of the purposes of the Wilderness Act, the following lands, as generally depicted on maps, appropriately referenced, dated July 1980 (except as otherwise dated) are hereby designated as wilderness, and therefore, as components of the National Wilderness Preservation System—

(1) certain lands in the Lassen National Forest, California, which comprise approximately one thousand eight hundred acres, as generally depicted on a map entitled "Caribou Wilderness Additions—Proposed", and which are hereby incorporated in, and which shall be deemed to be a part of the Caribou Wilderness as designated by Public Law 88-577;

16 USC 1131 note.

(2) certain lands in the Stanislaus and Toiyabe National Forests, California, which comprise approximately one hundred sixty thousand acres, as generally depicted on a map entitled "Carson-Iceberg Wilderness—Proposed", dated July 1984, and which shall be known as the Carson-Iceberg Wilderness: *Provided, however,* That the designation of the Carson-Iceberg Wilderness shall not preclude continued motorized access to those previously existing facilities which are directly related to permitted livestock grazing activities in the Wolf Creek Drainage on the Toiyabe National Forest in the same manner and degree in which such access was occurring as of the date of enactment of this title;

16 USC 1132 note.

(3) certain lands in the Shasta-Trinity National Forest, California, which comprise approximately seven thousand three hundred acres, as generally depicted on a map entitled "Castle Crags Wilderness—Proposed", and which shall be known as the Castle Crags Wilderness;

16 USC 1132 note.

(4) certain lands in the Shasta-Trinity National Forest, California, which comprise approximately eight thousand two hundred acres, as generally depicted on a map entitled "Chanchelulla Wilderness—Proposed", and which shall be known as the Chanchelulla Wilderness;

(5) certain lands in the Angeles National Forest, California, which comprise approximately four thousand four hundred acres, as generally depicted on a map entitled "Cucamonga Wilderness Additions—Proposed", dated July 1984, and which are hereby incorporated in, and which shall be deemed to be a

part of the Cucamonga Wilderness as designated by Public Law 88-577;

16 USC 1131 note.

(6) certain lands in the Los Padres National Forest, which comprise approximately sixty-four thousand seven hundred acres, as generally depicted on a map entitled "Dick Smith Wilderness—Proposed", dated July 1984, and which shall be known as Dick Smith Wilderness: *Provided*, That the Act of March 21, 1968 (82 Stat. 51), which established the San Rafael Wilderness is hereby amended to transfer four hundred and thirty acres of the San Rafael Wilderness to the Dick Smith Wilderness and establish a line one hundred feet north of the centerline of the Buckhorn Fire Road as the southeasterly boundary of the San Rafael Wilderness, as depicted on a map entitled "Dick Smith Wilderness—Proposed", and wherever said Buckhorn Fire Road passes between the San Rafael and Dick Smith Wildernesses and elsewhere at the discretion of the Forest Service, it shall be closed to all motorized vehicles except those used by the Forest Service for administrative purposes;

16 USC 1132 note.

16 USC 1132 note.

(7) certain lands in the Sierra National Forest, California, which comprise approximately thirty thousand acres, as generally depicted on a map entitled "Dinkey Lakes Wilderness—Proposed", and which shall be known as the "Dinkey Lakes Wilderness": *Provided*, That within the Dinkey Lakes Wilderness the Secretary of Agriculture shall permit nonmotorized dispersed recreation to continue at a level not less than the level of use which occurred during calendar year 1979;

(8) certain lands in the Sequoia National Forest, California, which comprise approximately thirty-two thousand acres, as generally depicted on a man entitled "Domeland Wilderness Additions—Proposed", dated March 1983, and which are hereby incorporated in, and which shall be deemed to be a part of the Domeland Wilderness as designated by Public Law 88-577;

16 USC 1131 note.

(9) certain lands in the Stanislaus National Forest, California, which comprise approximately six thousand one hundred acres, as generally depicted on a map entitled "Emigrant Wilderness Additions—Proposed", and which are hereby incorporated in, and which shall be deemed to be a part of the Emigrant Wilderness as designated by Public Law 93-632;

16 USC 1132 note.

(10) certain lands in the Tahoe National Forest, California, which comprise approximately twenty-five thousand acres, as generally depicted on a map entitled "Granite Chief Wilderness—Proposed", dated July 1984, and which shall be known as the Granite Chief Wilderness;

16 USC 1132 note.

(11) certain lands in the Cleveland National Forest, California, which comprise approximately eight thousand acres, as generally depicted on a map entitled "Hauser Wilderness—Proposed", and which shall be known as the Hauser Wilderness;

16 USC 1132 note.

(12) certain lands in and adjacent to the Lassen National Forest, California, which comprise approximately forty-one thousand eight hundred forty acres as shown on a map entitled "Ishi Wilderness—Proposed", and which shall be known as the Ishi Wilderness;

(13) certain lands in the Sierra National Forest, California, which comprise approximately eighty-one thousand acres, as generally depicted on a map entitled "John Muir Wilderness Additions, Sierra National Forest—Proposed", dated February 1983, and which are hereby incorporated in, and which shall be

deemed to be a part of the John Muir Wilderness as designated by Public Law 88-577: *Provided*, That the Secretary of Agriculture is authorized to modify the boundaries of the John Muir Wilderness Additions and the Dinkey Lakes Wilderness as designated by this Act in the event he determines that portions of the existing primitive road between the two wilderness areas should be relocated for environmental protection or other reasons. Any relocated wilderness boundary shall be placed no more than three hundred feet from the centerline of any new primitive roadway and shall become effective upon publication of a notice of such relocation in the Federal Register;

16 USC 1131 note.

Federal Register, publication.

(14) certain lands in the Klamath National Forest, California, which comprise approximately twenty-eight thousand acres, as generally depicted on a map entitled "Marble Mountain Wilderness Additions—Proposed", dated July 1984, and which are hereby incorporated in, and shall be deemed to be a part of the Marble Mountain Wilderness as designated by Public Law 88-577;

(15) certain lands in the Sierra and Inyo National Forests, California, which comprise approximately nine thousand acres, as generally depicted on a map entitled "Minarets Wilderness Additions—Proposed", and which are hereby incorporated in, and which shall be deemed to be a part of the Minarets Wilderness as designated by Public Law 88-577: *Provided*, That the existing Minarets Wilderness and additions thereto designated by this title henceforth shall be known as the Ansel Adams Wilderness;

16 USC 1132 note.

(16) certain lands in the Eldorado, Stanislaus, and Toiyabe National Forests, California, which comprise approximately fifty-five thousand acres, as generally depleted on a map entitled "Mokelumne Wilderness Additions—Proposed", dated July 1984, and which are hereby incorporated in, and which shall be deemed to be a part of the Mokelumne Wilderness as designated by Public Law 88-577;

(17) certain lands in the Sierra and Sequoia National Forests, California, which comprise approximately forty-five thousand acres, as generally depicted on a map entitled "Monarch Wilderness—Proposed", dated July 1984, and which shall be known as the Monarch Wilderness;

16 USC 1132 note.

(18) certain lands in the Shasta-Trinity National Forest, California, which comprise approximately thirty-seven thousand acres, as generally depicted on a map entitled "Mt. Shasta Wilderness—Proposed", dated July 1984, and which shall be known as Mt. Shasta Wilderness;

16 USC 1132 note.

(19) certain lands in the Six Rivers National Forest, California, which comprise approximately eight thousand one hundred acres, as generally depicted on a map entitled "North Fork Wilderness—Proposed", and which shall be known as the North Fork Wilderness;

16 USC 1132 note.

(20) certain lands in the Cleveland National Forest, California, which comprise approximately thirteen thousand one hundred acres, as generally depicted on a map entitled "Pine Creek Wilderness—Proposed", and which shall be known as the Pine Creek Wilderness;

16 USC 1132 note.

(21) certain lands in the Rogue River National Forest, California, and Oregon, which comprise approximately sixteen thousand five hundred acres, as generally depicted on a map entitled

"Red Buttes Wilderness Additions—Proposed", dated July 1984, and which are hereby incorporated in, and which shall be deemed to be a part of the Red Buttes Wilderness as designated by Public Law 98-328;

Ante, p. 272.
16 USC 1132 note.

(22) certain lands in the Klamath National Forest, California, which comprise approximately twelve thousand acres, as generally depicted on a map entitled "Russian Wilderness—Proposed", and which shall be known as the Russian Wilderness;

(23) certain lands in the San Bernardino National Forest, California, which comprise approximately twenty-one thousand five hundred acres, as generally depicted on a map entitled "San Gorgonio Wilderness Additions—Proposed", and which are hereby incorporated in, and which shall be deemed to be a part of the San Gorgonio Wilderness as designated by Public Law 88-577;

16 USC 1131 note.

(24) certain lands in the San Bernardino National Forest, California, which comprise approximately ten thousand nine hundred acres, as generally depicted on a map entitled "San Jacinto Wilderness Additions—Proposed", and which are hereby incorporated in, and which shall be deemed to be a part of the San Jacinto Wilderness as designated by Public Law 88—577: *Provided, however*, That the Secretary of Agriculture may pursuant to an application filed within 10 years of the date of enactment of this title, grant a right-of-way for, and authorize construction of, a transmission line or lines within the area depicted as "potential powerline corridor" on the map entitled "San Jacinto Wilderness Additions—Proposed": *Provided further,* That if a power transmission line is constructed within such corridor, the corridor shall cease to be a part of the San Jacinto Wilderness and the Secretary of Agriculture shall publish notice thereof in the Federal Register;

Federal Register, publication.

(25) certain lands in the Sierra and Inyo National Forests and the Devils Postpile National Monument, California, which comprise approximately one hundred and ten thousand acres, as generally depicted on a map entitled "San Joaquin Wilderness—Proposed", and which shall comprise a portion of the Ansel Adams Wilderness established pursuant to subparagraph (a)(15) of this section: *Provided, however,* That nothing in this title shall be construed to prejudice, alter, or affect in any way, any rights or claims of right to the diversion and use of waters from the North Fork of the San Joaquin River, or in any way to interfere with the construction, maintenance, repair, or operation of a hydroelectric project similar in scope to the Jackass-Chiquito hydroelectric power project (or the Granite Creek-Jackass alternative project) as initially proposed by the Upper San Joaquin River Water and Power Authority: *Provided further,* That the designation of the San Joaquin Wilderness shall not preclude continued motorized access to those previously existing facilities which are directly related to permitted livestock grazing activities nor operation and maintenance of the existing cabin located in the vicinity of the Heitz Meadow Guard Station within the Ansel Adams Wilderness, in the same manner and degree in which such access and operation and maintenance of such cabin were occurring as of the date of enactment of this title;

16 USC 1132 note.

(26) certain lands in the Cleveland National Forest, California, which comprise approximately thirty-nine thousand five

hundred and forty acres, as generally depicted on a map entitled "San Mateo Canyon Wilderness—Proposed", and which shall be known as the San Mateo Canyon Wilderness;

(27) certain lands in the Los Padres National Forest, California, which comprise approximately two thousand acres, as generally depicted on a map entitled "San Rafael Wilderness Additions—Proposed", and which are hereby incorporated in, and which shall be deemed to be a part of the San Rafael Wilderness as designated by Public Law 90-271;

16 USC 1132 note.

(28) certain lands in the San Bernardino National Forest, California, which comprise approximately twenty thousand one hundred and sixty acres, as generally depicted on a map entitled "Santa Rosa Wilderness—Proposed", and which shall be known as the Santa Rosa Wilderness;

16 USC 1132 note.

(29) certain lands in the Angeles and San Bernardino National Forests, California, which comprise approximately forty-three thousand six hundred acres, as generally depicted on a map entitled "Sheep Mountain Wilderness—Proposed", dated July 1984, and which shall be known as Sheep Mountain Wilderness;

16 USC 1132 note.

(30) certain lands in the Six Rivers, Klamath, and Siskiyou National Forests, California, which comprise approximately one hundred fifty-three thousand acres, as generally depicted on a map entitled "Siskiyou Wilderness—Proposed", dated July 1984, and which shall be known as the Siskiyou Wilderness;

16 USC 1132 note.

(31) certain lands in the Mendocino National Forest, California, which comprise approximately thirty-seven thousand acres, as generally depicted on a map entitled "Snow Mountain Wilderness—Proposed", and which shall be known as Snow Mountain Wilderness;

16 USC 1132 note

(32) certain lands in the Sequoia and Inyo National Forests, California, which comprise approximately sixty-three thousand acres, as generally depicted on a map entitled "South Sierra Wilderness—Proposed", dated July 1984, and which shall be known as the South Sierra Wilderness;

16 USC 1132 note.

(33) certain lands in the Modoc National Forest, California, which comprise approximately one thousand nine hundred and forty acres, as generally depicted on a map entitled "South Warner Wilderness Additions—Proposed", and which are hereby incorporated in, and which shall be deemed to be a part of the South Warner Wilderness as designated by Public Law 88-577;

16 USC 1131 note.

(34) certain lands in and adjacent to the Klamath, Shasta-Trinity and Six Rivers National Forests, California, which comprise approximately five hundred thousand acres, as generally depicted on a map entitled "Trinity Alps Wilderness—Proposed", dated July 1984, and which shall be known as the Trinity Alps Wilderness;

16 USC 1132 note.

(35) certain lands in the Los Padres National Forest, California, which comprise approximately two thousand seven hundred and fifty acres, as generally depicted on a map entitled "Ventana Wilderness Additions—Proposed", and which are hereby incorporated in, and shall be deemed to be a part of the Ventana Wilderness as designated by Public Laws 91-58 and 95-237;

16 USC 1132 note.

(36) certain lands in and adjacent to the Six Rivers and Mendocino National Forests, California, which comprise

approximately forty-two thousand acres, as generally depicted on a map entitled "Yolla-Bolly Middle Eel Additions—Proposed", dated July 1984, and which are hereby incorporated in, and which shall be deemed to be a part of the Yolla-Bolly Middle Eel Wilderness as designated by Public Law 88-577;

16 USC 1131 note.

16 USC 1132 note.

(37) certain lands in the Plumas National Forest, California, which comprise approximately twenty-one thousand acres, as generally depicted on a map entitled "Bucks Lake Wilderness— Proposed", dated March 1983, and which shall be known as the Bucks Lake Wilderness;

16 USC 1132 note.

(38) certain lands in and adjacent to the Los Padres National Forest, California, which comprise approximately twenty thousand acres, as generally depicted on a map entitled "Machesna Mountain Wilderness—Proposed", dated March 1983, and which shall be known as the Machesna Mountain Wilderness; and

16 USC 1132 note.

(39) certain lands in the Sequoia National Forest, which comprise approximately ten thousand five hundred acres, as generally depicted on a map entitled "Jennie Lakes Wilderness—Proposed", dated March 1983, and which shall be known as the Jennie Lakes Wilderness.

(b) The previous classifications of the High Sierra Primitive Area, Emigrant Basin Primitive Area, and the Salmon-Trinity Alps Primitive Area are hereby abolished.

DESIGNATION OF PLANNING AREAS

16 USC 1131 note.

Report. President of U.S.

SEC. 102. (a) In furtherance of the purposes of the Wilderness Act, the following lands shall be reviewed by the Secretary of Agriculture as to their suitability for preservation as wilderness. The Secretary shall submit his report and findings to the President, and the President shall submit his recommendations to the United States House of Representatives and the United States Senate no later than three years from the date of enactment of this title:

(1) certain lands in the Stanislaus and Toiyabe National Forests, California, which comprise approximately thirty thousand acres, as generally depicted on a map entitled "Carson-Iceberg Planning Area", dated July 1984, and which shall be known as the Carson-Iceberg Planning Area;

(2) certain lands in the Toiyabe National Forest, California, which comprise approximately forty-nine thousand two hundred acres as generally depicted on a map entitled "Hoover Wilderness Additions Planning Area", dated July 1984, and which shall be known as the Hoover Wilderness Additions Planning Area; and

(3) certain lands in the San Bernardino National Forest, California, which comprise approximately seventeen thousand acres, as generally depicted on a map entitled "Pyramid Peak Planning Area", dated July 1984, and which shall be known as the Pyramid Peak Planning Area.

(b) Subject to valid existing rights, the planning areas designated by this section shall for a period of four years from the date of enactment of this title, be administered by the Secretary of Agriculture so as to maintain their presently existing wilderness character and potential for inclusion in the National Wilderness Preservation System.

ADMINISTRATION OF WILDERNESS AREAS

SEC. 103. (a) Subject to valid existing rights, each wilderness area designated by this title shall be administered by the Secretary concerned in accordance with the provisions of the Wilderness Act: *Provided,* That any reference in such provisions to the effective date of the Wilderness Act shall be deemed to be a reference to the effective date of this title.

16 USC 1131 note.

(b) Within the National Forest wilderness areas designated by this title—

16 USC 1133.

(1) as provided in subsection 4(d)(4)(2) of the Wilderness Act, the grazing of livestock, where established prior to the date of enactment of this title, shall be permitted to continue subject to such reasonable regulations, policies and practices as the Secretary deems necessary, as long as such regulations, policies and practices fully conform with and implement the intent of Congress regarding grazing in such areas as such intent is expressed in the Wilderness Act and this title;

(2) as provided in subsection 4(d)(1) of the Wilderness Act, the Secretary concerned may take such measures as are necessary in the control of fire, insects, and diseases, subject to such conditions as he deems desirable; and

(3) as provided in section 4(b) of the Wilderness Act, the Secretary concerned shall administer such areas so as to preserve their wilderness character and to devote them to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.

(c) Within sixty days of the date of enactment of this title, the Secretary of Agriculture shall enter into negotiations to acquire by exchange all or part of any privately owned lands within the national forest wilderness areas designated by this title. Such exchange shall to the maximum extent practicable be completed within three years after the date of enactment of this title. The Secretary is authorized to acquire such lands by means other than exchange, beginning three years after the date of enactment of this title. Acquisition shall be only with the concurrence of the owner. Values shall be determined without reference to any restrictions on access or use which arise out of designation as a wilderness area.

FILING OF MAPS AND DESCRIPTIONS

SEC. 104. As soon as practicable after enactment of this title, a map and a legal description on each wilderness area shall be filed with the Committee on Energy and Natural Resources of the United States Senate and the Committee on Interior and Insular Affairs of the House of Representatives, and each such map and description shall have the same force and effect as if included in this title: *Provided,* That correction of clerical and typographical errors in each such legal description and map may be made. Each such map and legal description shall be on file and available for public inspection in the Office of the Chief of the Forest Service, Department of Agriculture.

Public availability.

ADDITIONS TO NATIONAL PARK SYSTEM

SEC. 105. (a) The following lands are hereby added to the National Park System:

16 USC 80 note.

(1) certain lands in the Sequoia National Forest, California which comprise approximately one thousand five hundred acres, as generally depicted on a map entitled "Jennie Lakes Additions, Kings Canyon National Park—Proposed", dated March 1983, and which are hereby incorporated in, and which shall be deemed to be a part of Kings Canyon National Park; and

16 USC 46 note.

(2) certain lands which comprise approximately one hundred eighty-five acres, as generally depicted on a map entitled "McCauley Ranch Addition, Yosemite National Park", dated December 1982 and numbered 80,021, and which are hereby incorporated in, and which shall be deemed to be a part of Yosemite National Park.

(b) Upon enactment of this title, the Secretary of Agriculture shall transfer the lands described in subsection (a) of this section, without consideration, to the administrative jurisdiction of the Secretary of the interior for administration as part of the National Park System. The boundaries of the national forests and national parks shall be adjusted accordingly. The areas added to the National Park System by this section shall be administered in accordance with the provisions of law generally applicable to units of the National Park System.

Report.

(c) The Secretary of the interior shall study the lands added to the National Park System by subsection (a) of this section for possible designation as national park wilderness, and shall report to the Congress his recommendations as to the suitability or nonsuitability of the designation of such lands as wilderness by not later than three years after the effective date of this title.

16 USC 46 note.

(d) The Secretary of Agriculture is authorized and directed to transfer to the jurisdiction of the Secretary of the Interior for administration as a part of Yosemite National Park, two hundred and fifty-three acres of the Stanislaus National Forest at Crocker Ridge, identified as all that land lying easterly of a line beginning at the existing park boundary and running three hundred feet west of and parallel to the center line of the park road designated as State Highway 120, also known as the New Big Oak Flat Road, within section 34, township 1 south, range 19 east, and within sections 4, 9, and 10, township 2 south, range 19 east, Mount Diablo base and meridian. The boundary of Yosemite National Park and the Stanislaus National Forest shall be adjusted accordingly.

(e) The Secretary of the Interior is authorized and directed to transfer to the jurisdiction of the Secretary of Agriculture one hundred and sixty acres within the boundary of the Sierra National Forest identified as the northwest quarter of section 16, township 5 south, range 22 east, Mount Diablo base meridian, subject to the right of the Secretary of the Interior to the use of the water thereon for park purposes, including the right of access to facilities necessary for the transportation of water to the park.

NATIONAL PARK WILDERNESS

SEC. 106. The following lands are hereby designated as wilderness in accordance with section 3(c) of the Wilderness Act (78 Stat. 890; 16 U.S.C. 1132(c)) and shall be administered by the Secretary of the Interior in accordance with the applicable provisions of the Wilderness Act.

(1) Yosemite National Park Wilderness, comprising approximately six hundred and seventy-seven thousand six hundred acres, and potential wilderness additions comprising approximately three thousand five hundred and fifty acres, as generally depicted on a map entitled "Wilderness Plan, Yosemite National Park, California", numbered 104-20, 003-E dated July 1980, and shall be known as the Yosemite Wilderness;

16 USC 1132 note.

(2) Sequoia and Kings Canyon National Parks Wilderness, comprising approximately seven hundred and thirty-six thousand nine hundred and eighty acres; and potential wilderness additions comprising approximately one hundred acres, as generally depicted on a map entitled "Wilderness Plan—Sequoia-Kings Canyon National Parks—California", numbered 102-20, 003-E and dated July 1980, and shall be known as the Sequoia Kings Canyon Wilderness.

16 USC 1132 note.

MAP AND DESCRIPTION

Public availability.

SEC. 107. A map and description of the boundaries of the areas designated in section 106 of this title shall be on file and available for public inspection in the Office of the Director of the National Park Service, Department of the Interior, and in the Office of the Superintendent of each area designated in section 106. As soon as practicable after this title takes effect, maps of the wilderness areas and descriptions of their boundaries shall be filed with the Committee on Interior and Insular Affairs of the United States House of Representatives and the Committee on Energy and Natural Resources of the United States Senate, and such maps and descriptions shall have the same force and effect as if included in this title: *Provided*, That correction of clerical and typographical errors in such maps and descriptions may be made.

CESSATION OF CERTAIN USES

Federal Register, publication.

SEC. 108. Any lands (in section 106 of this title) which represent potential wilderness additions upon publication in the Federal Register of a notice by the Secretary of the Interior that all uses thereon prohibited by the Wilderness Act have ceased, shall thereby be designated wilderness. Lands designated as potential wilderness additions shall be managed by the Secretary insofar as practicable as wilderness until such time as said lands are designated as wilderness.

ADMINISTRATION

16 USC 1131 note.

SEC. 109. The areas designated by section 106 of this tithe as wilderness shall be administered by the Secretary of the interior in accordance with the applicable provisions of the Wilderness Act governing areas designated by that title as wilderness, except that any reference in such provisions to the effective date of the Wilderness Act shall be deemed to be a reference to the effective date of this title, and where appropriate, any reference to the Secretary of Agriculture shall be deemed to be a reference to the Secretary of the Interior.

SEC. 110. Notwithstanding any existing or future administrative designation or recommendation, mineral prospecting, exploration, development, or mining of cobalt and associated minerals under taken under the United States mining laws within the North Fork

Smith roadless area (RARE II, 5-707, Six Rivers National Forest, California) shall be subject to only such Federal laws and regulations as are generally applicable to national forest lands designated as nonwilderness.

WILDERNESS REVIEW CONCERNS

Conservation.

SEC. 111. (a) The Congress finds that—

(1) the Department of Agriculture has completed the second roadless area review and evaluation program (RARE II); and

(2) the Congress had made its own review and examination of national forest roadless areas in California and the environmental impacts associated with alternative allocations of such areas.

(b) On the basis of such review, the Congress hereby determines and directs that—

(1) without passing on the question of the legal and factual sufficiency of the RARE II final environmental statement (dated January 1979) with respect to national forest lands in States other than California, such statement shall not be subject to judicial review with respect to National Forest System lands in the State of California;

(2) upon enactment of this title, the injunction issued by the United States District Court for the Eastern District of California in the State of California versus Bergland (483 F. Supp. 465 (1980)) shall no longer be in force;

(3) with respect to the National Forest System lands in the State of California which were reviewed by the Department of Agriculture in the second roadless area review and evaluation (RARE II), and those lands referred to in subsection (d), except those lands remaining in further planning as referred to in subsection (e), or designated as planning areas upon enactment of this title, that review and evaluation shall be deemed for the purposes of the initial land management plans required for such lands by the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976, to be an adequate consideration of the suitability of such lands for inclusion in the National Wilderness Preservation System and the Department of Agriculture shall not be required to review the wilderness option prior to the revisions of the plans but shall review the wilderness option when the plans are revised, which revisions will ordinarily occur on a ten-year cycle, or at least every fifteen years, unless prior to such time the Secretary of Agriculture finds that conditions in a unit have significantly changed;

16 USC 1600 note.

(4) areas in the State of California reviewed in such final environmental statement or referenced in subsection (d) and not designated as wilderness or planning areas by this title or remaining in further planning as referenced m subsection (e) upon enactment of this title shall be managed for multiple use in accordance with land management plans pursuant to section 6 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976: *Provided*, That such areas need not be managed for the purpose of protecting their suitability for wilderness designation prior to or during revision of the land management plans;

16 USC 1604.

(5) in the event that revised land management plans in the State of California are implemented pursuant to section 6 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976, and other applicable law, areas not recommended for wilderness designation need not be managed for the purpose of protecting their suitability for wilderness designation prior to or during revision of such plans, and areas recommended for wilderness designation shall be managed for the purpose of protecting their suitability for wilderness designation as may be required by the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976, and other applicable law; and

16 USC 1604.

(6) unless expressly authorized by Congress, the Department of Agriculture shall not conduct any further statewide roadless area review and evaluation of National Forest System lands in the State of California for the purpose of determining their suitability for inclusion in the National Wilderness Preservation System.

16 USC 1600 note.

(c) As used in this section, and as provided in section 6 of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976, the term "revision" shall not include an "amendment" to a plan.

(d) The provisions of this section shall also apply to—

(1) those National Forest System roadless lands in the State of California: in the Plumas and Tahoe National Forests which were evaluated in the Mohawk Unit Plan; in the Six Rivers National Forest which were evaluated in the Blue Creek Unit Plan not designated as Wilderness by this title and the Fox Unit Plan; in the Klamath National Forest which were evaluated in the King Unit Plan; in the Angeles National Forest which were evaluated in the San Gabriel Unit Plan; in the Modoc and Shasta-Trinity and Klamath National Forests in the Medicine Lake Unit Plan; in the Cleveland National Forest which were evaluated in the Palomar Mountain Unit Plan and Trabuco Unit Plan; in the Los Padres National Forest which were evaluated in the Big Sur Unit Plan; in the Tahoe National Forest which were evaluated in the Truckee-Little Truckee Unit Plan; and those portions of the Carson-Iceberg roadless area not designated as wilderness or planning areas or remaining in further planning as referenced in subsection (e);

(2) National Forest System roadless lands in the State of California which are less than five thousand acres in size; and

(3) National Forest System roadless areas or portions thereof in the State of California as identified in Executive Document Numbered 1504 Ninety-sixth Congress (House Document Numbered 96-119) and identified by name and number at the end of this subparagraph, which are not designated as wilderness by this title:

National Forest	Area name	Area I D.
Eldorado	Pyramid	05023
Eldorado	Rubicon	05026
Eldorado	Dardanelles	05982
Eldorado	Tragedy-Elephants Back	05984
Eldorado	Raymond Peak	05985
Klamath	Orleans Mountain	B5079
Klamath	Condrey Mountain	05704

National Forest	Area name	Area I.D.
Lake Tahoe Basin M U.	Dardanelles	05982
Lassen	Lost Creek	05089
Lassen	Polk Springs	05097
Lassen	Chips Creek	05099
Los Padres	Machesna Mountain	05110
Los Padres	Miranda Pine	05114
Los Padres	Tepusquet Peak	05116
Los Padres	Spoor Canyon	05118
Los Padres	Fox Mountain	05120
Los Padres	Cuyama	05135
Mendocino	Wilderness Contiguous	05137
Mendocino	Elk Creek	05140
Mendocino	Big Butte-Shinbone	05145
Mendocino	Black Butte	05269
Plumas	Chips Creek	05099
Plumas	Middle Fork	05167
Plumas	Bald Rock	05169
Plumas	West Yuba	05172
Rogue River	Condrey Mountain	06704
Sequoia	Agnew	05199
Sequoia	Woodpecker	05206
Sequoia	Domeland addition	05207
Shasta-Trinity	Chanchelulla	05220
Shasta-Trinity	East Fork	05226
Shasta-Trinity	Murphy Glade	05298
Shasta-Trinity	Fisher Gulch	A5299
Sierra	Mount Raymond	05242
Sierra	Dinkey Lakes	05244
Sierra	Rancheria	C5198
Six Rivers	Orleans Mountain	B5079
Six Rivers	North Fork Smith	05707
Stanislaus	Tuolumne River	05258
Stanislaus	Raymond Peak	05985
Tahoe	West Yuba	05172
Tahoe	North Fork American	05262
Tahoe	East Yuba	05264
Toiyabe	Dardanelles	04982
Toiyabe	Tragedy-Elephants Back	04984
Toiyabe	Raymond Peak	04985
Tahoe	Granite Chief	05261
Angeles	Pleasant View	F5008
Shasta-Trinity	Castle Crags	B5219
Shasta-Trinity	Mt. Shasta	C5213
Lake Tahoe Basin M.U.	Pyramid	O5023

(e) Certain National Forest System roadless lands in the State of California as identified in Executive Document Numbered 1504 Ninety-sixth Congress (House Document Numbered 96-119) and identified by name and number at the end of this subsection, shall remain as further planning areas for purposes of this title:

National Forest	Area name	Area I.D.
Angeles	Sespe-Frazier	05002
Angeles	Arroyo Seco	05012
Cleveland	Sill Hill	05304
Cleveland	Caliente	05017
Eldorado	Caples Creek	05027
Inyo	White Mountains	A5058
Inyo	White Mountains	B5058
Inyo	Coyote-Southeast	05033
Inyo	Table Mountain	05035
Inyo	Mazourka	A5064
Inyo	Wheeler Ridge	05040
Inyo	Horse Meadow	05049
Inyo	Tioga Lake	05050
Inyo	Hall Natural Area	05051
Inyo	Log Cabin Saddlebag	05052
Inyo	Benton Range	05056

National Forest	Area name	Area I.D.
Inyo	Blanco Mountain	05059
Inyo	Birch Creek	05060
Inyo	Black Canyon	05061
Inyo	Andrews Mountain	05063
Inyo	Paiute	B5064
Inyo	Laurel-McGee	05045
Inyo	Buttermilk	05038
Lake Tahoe Basin M U.	Freel	05271
Lassen	Wild Cattle Mountain	05093
Lassen	Butt Mountain	05100
Lassen	Trail Lake	B5095
Lassen	Heart Lake	05096
Lassen	Ishi	B5098
Los Padres	Antimony	05136
Los Padres	Bear Canyon	05104
Los Padres	Bear Mountain	05103
Los Padres	Big Rocks	05112
Los Padres	Black Butte	05102
Los Padres	Black Mountain	05108
Los Padres	Diablo	05127
Los Padres	Dry Lakes	05131
Los Padres	Horseshoe Springs	05115
Los Padres	La Brea	05117
Los Padres	La Panza	05109
Los Padres	Little Pine	05278
Los Padres	Los Machos Hills	05111
Los Padres	Machesna Mountain	05110
Los Padres	Matilija	05129
Los Padres	Quatal	05268
Los Padres	Sawmill-Badlands	05134
Los Padres	Sespe Frazier	05002
Los Padres	Stanley Mountain	05113
San Bernardino	Sugarloaf	05186
San Bernardino	Raywood Flat	B5187
San Bernardino	Cucamonga B	B5174
San Bernardino	Cucamonga C	C5174
Sequoia	Dennison Peak	05202
Sequoia	Kings River	B5198
Sequoia	Oat Mountain	05197
Sequoia	Moses	05203
Sequoia	Scodies	05212
Sequoia	Cypress	A5213
Shasta-Trinity	Mt. Eddy	05229
Sierra	Kings River	B5198
Stanislaus	Carson-Iceberg (Pacific Valley portion)	B5986
Toiyabe	Sweetwater	04657
Toiyabe	Hoover Extension	E4662
Lassen	Mill Creek	05284
Los Padres	Garcia Mountain	05107

SEVERABILITY

SEC. 112. If any provision of this title or the application thereof is held invalid, the remainder of the title and the application thereof shall not be affected thereby.

SEC. 113. For fiscal years commencing after September 30, 1985, there are authorized to be appropriated such sums as may be necessary to implement the provisions of this title.

Appropriation authorization.

TITLE II

DESIGNATION WILD AND SCENIC RIVER

Ante, p. 1491.
16 USC 1274.

SEC. 201 Section 3(a) of the Wild and Scenic Rivers Act (16 U.S.C. 1271-1287) as amended is further amended by inserting the following new paragraph:

"(52) TUOLUMNE, CALIFORNIA.—The main river from its sources on Mount Dana and Mount Lyell in Yosemite National Park to Don Pedro Reservoir consisting of approximately 83 miles as generally depicted on the proposed boundary map entitled 'Alternative A' contained in the Draft Tuolumne Wild and Scenic River Study and Environmental Impact Statement published by the United States Department of the Interior and Department of Agriculture in May 1979;) to be administered by the Secretary of the Interior and the Secretary of Agriculture. After consultation with State and local governments and the interested public and within two years from the date of enactment of this paragraph, the Secretary shall take such action as is required under subsection (b) of this section. Nothing in this Act shall preclude the licensing, development, operation, or maintenance of water resources facilities on those portions of the North Fork, Middle Fork or South Fork of the Tuolumne or Clavey Rivers that are outside the boundary of the wild and scenic river area as designated in this section. Nothing in this section is intended or shall be construed to affect any rights, obligations, privileges, or benefits granted under any prior authority of law including chapter 4 of the Act of December 19, 1913, commonly referred to as the Raker Act (38 Stat. 242) and including any agreement or administrative ruling entered into or made effective before the enactment of this paragraph. For fiscal years commencing after September 30, 1985, there are authorized to be appropriated such sums as may be necessary to implement the provisions of this subsection.".

Appropriation authorization.

TITLE III

ESTABLISHMENT OF NATIONAL FOREST SCENIC AREA

16 USC 543.

SEC. 301. The area in the Mono Basin within and adjacent to the Inyo National Forest in the State of California, as generally depicted on a map entitled "Mono Basin National Forest Scenic Area" dated June 1983, and numbered 1983-3, is hereby designated as the Mono Basin National Forest Scenic Area (hereafter in this title referred to as the "Scenic Area"). Such map shall be on file and available for public inspection in the office of the Forest Supervisor, Inyo National Forest and in the of fire of the Chief of the Forest Service, Department of Agriculture. The Secretary of Agriculture (hereinafter in this title referred to as the "Secretary") may make minor revisions in the boundary of the Scenic Area after publication of notice to that effect in the Federal Register and submission of notice thereof to the Committee on Interior and Insular Affairs of the United States House of Representatives and the Committee on Energy and Natural Resources of the United States Senate. Such notice shall be published and submitted at least sixty days before the revision is made.

Public availability.

Federal Register, publication.

EXTENSION OF NATURAL FOREST BOUNDARY

Sec. 302. (a) The exterior boundary of the Inyo National Forest is hereby extended to include the area within the boundary of the Scenic Area. Any lands and interests therein acquired pursuant to section 303 shall become part of the National Forest System. 16 USC 543a.

(b) For the purposes of section 7(a)(1) of the Land and Water Conservation Fund Act of 1965 (78 Stat. 897; 16 U.S.C. 4601-4 through 4601-11), the boundary of the Inyo National Forest, as modified by this section, shall be treated as if it were the boundary of that forest on January 1, 1964. 16 USC 460*l*-9. 16 USC 460*l*-4—460*l*-11.

ACQUISITION

SEC. 303. (a) The Secretary is authorized to acquire all lands and interests therein within the boundary of the Scenic Area by donation, exchange in accordance with this title or other provisions of law, or purchase with donated or appropriated funds, except that— 16 USC 543b.

(1) any lands or interests therein within the boundary of the Scenic Area which are owned by the State of California or any political subdivision thereof (including the city of Los Angeles) may be acquired only by donation or exchange; and

(2) lands or interests therein within the boundary of the Scenic Area which are not owned by the State of California or any political subdivision thereof (including the city of Los Angeles) may be acquired only with the consent of the owner thereof unless the Secretary determines, after written notice to the owner and after opportunity for comment, that the property is being developed, or proposed to be developed, in a manner which is detrimental to the integrity of the Scenic Area or which is otherwise incompatible with the purposes of this title.

(b)(1) Not later than six months after the date of enactment of this title, the Secretary shall publish specific guidelines under which determinations shall be made under paragraph (2) of subsection (a). No use which existed prior to June 1, 1984, within the area included in the Scenic Area shall be treated under such guidelines as a detrimental or incompatible use within the meaning of such paragraph (2). Guidelines, publication.

(2) For purposes of subsection (a)(2), any development or proposed development of private property within the boundary of the Scenic Area that is significantly different from, or a significant expansion of, development existing as of June 1, 1984, shall be considered by the Secretary as detrimental to the integrity of the Scenic Area. No reconstruction or expansion of a private or commercial building, including—

(A) reconstruction of an existing building,

(B) construction of attached structural additions, not to exceed 100 per centum of the square footage of the original building, and

(C) construction of reasonable support development such as roads, parking, water and sewage systems shall be treated as detrimental to the integrity of the Scenic Area or as an incompatible development within the meaning of paragraph (2) of subsection (a).

(c) Notwithstanding any other provision of law, the Secretary shall only be required to prepare an environmental assessment of Conservation.

any exchange of mineral or geothermal interest authorized by this title.

ADMINISTRATION

16 USC 543c.

SEC. 304. (a)(1) Except as otherwise provided in this title, the Secretary, acting through the Chief of the Forest Service, shall administer the Scenic Area as a separate unit within the boundary of the Inyo National Forest in accordance with the laws, rules, and regulations applicable to the National Forest System. All Bureau of Land Management administered lands that fall within the boundaries of the Scenic Area are hereby added to the Inyo National Forest and shall be administered in accordance with the laws, rules, and regulations applicable to the National Forest System.

(2) In addition, the following parcels administered by the Bureau of Land Management are hereby added to the Inyo National Forest and shall be administered in accordance with the laws, rules, and regulations applicable to the National Forest System:

township 1 south; range 26 east; Mount Diablo Meridian:
east half of southwest quarter and south half of southeast quarter of section 10; and
township 1 north; range 26 east; Mount Diablo Meridian:
southwest quarter of northeast quarter and west half of southeast quarter of section 9;
southwest quarter of southwest quarter of section 15;
southwest quarter of northwest quarter and northwest quarter of southwest quarter of section 25;
north half of southeast quarter of section 26, west half of northwest quarter and northwest quarter of southwest quarter of section 27;
township 1 north; range 27 east; Mount Diablo Meridian:
east half of southeast quarter of section 34;
southwest quarter of northwest quarter of section 35; and
west half of section 30 as intersected by Scenic Area Boundary.

(b)(1) In a manner consistent with the protection of the water rights of the State of California or any political subdivision thereof (including the city of Los Angeles) or of any person to the extent that such water rights have been granted or modified under the laws of the State of California, the Secretary shall manage the Scenic Area to protect its geologic, ecologic, and cultural resources. The Secretary shall provide for recreational use of the Scenic Area and shall provide recreational and interpretive facilities (including trails and campgrounds) for the use of the public which are compatible with the provisions of this title, and may assist adjacent affected local governmental agencies in the development of related interpretive programs. The Secretary shall permit the full use of the Scenic Area for scientific study and research in accordance with such rules and regulations as he may prescribe.

(2) Except as specifically provided in this subsection, no commercial timber harvesting shall be permitted in the Scenic Area, but the Secretary shall permit the utilization of wood material such as firewood, posts, poles, and Christmas trees by individuals for their domestic purposes under such regulations as he may prescribe to protect the natural and cultural resources of the Scenic Area. The Secretary may take action including the use of commercial timber harvest to the minimum extent necessary to control fires, insects and diseases that might—

(A) endanger irreplaceable features within the Scenic Area, or

(B) cause substantial damage to significant resources adjacent to the Scenic Area.

(c) The Secretary shall permit those persons holding currently valid grazing permits within the boundary of the Scenic Area to continue to exercise such permits consistent with other applicable law.

(d) The Secretary may enter into cooperative agreements with the State of California and any political subdivision thereof (including the city of Los Angeles) for purposes of protecting Scenic Area resources and administering areas owned by the State or by any such political subdivision which are within the Scenic Area.

Management Plan.

(e) Within three years after the date of enactment of this title, the Secretary shall submit to the committees referred to in section 301, a detailed and comprehensive management plan for the Scenic Area which is consistent with the protection of water rights as provided in subsection (b)(1). The plan shall include but not be limited to—

(1) an inventory of natural (including geologic) and cultural resources;

(2) general development plans for public use facilities, including cost estimates; and

(3) measures for the preservation of the natural and cultural resources of the Scenic Area in accordance with subsections (a) and (b) of this section.

Such plan shall provide for hunting and fishing (including commercial brine shrimp operations authorized under State law) within the Scenic Area in accordance with applicable Federal and State law, except to the extent otherwise necessary for reasons of public health and safety, the protection of resources, scientific research activities, or public use and enjoyment.

(f) The Secretary is authorized to construct a visitor center in the Scenic Area for the purpose of providing information through appropriate displays, printed material, and other interpretive programs, about the natural and cultural resources of the Scenic Area.

(g)(1) Subject to valid existing rights, federally owned lands and interests therein within the Scenic Area are withdrawn from entry or appropriation under the mining laws of the United States, from the operation of the mineral leasing laws of the United States, from operation of the Geothermal Steam Act of 1970, and from disposition under the public land laws.

30 USC 1001 note.

(2) Subject to valid existing rights, all mining claims located within the Scenic Area shall be subject to such reasonable regulations as the Secretary may prescribe to assure that nothing will, to the maximum extent practicable, be consistent with protection of the scenic, scientific, cultural, and other resources of the area, and any patent which may be issued after the date of enactment of this title shall convey title only to the minerals together with the right to use the surface of lands for mining purposes subject to such reasonable regulations.

(h) Nothing in this title shall be construed to reserve any water for purposes of the Scenic Area or to affirm, deny, or otherwise affect the present (or prospective) water rights of any person or of the State of California or of any political subdivision thereof (including the city of Los Angeles), nor shall any provision of this title be construed to cause, authorize, or allow any interference with or infringement of such water rights so long as, and to the extent that,

those rights remain valid and enforceable under the laws of the State of California.

Repeal.

(i)(1) The Act entitled "An Act authorizing and directing the Secretary of the Interior to sell to the city of Los Angeles, California, certain public lands in California; and granting rights-of-way over public lands and reserved lands to the city of Los Angeles in Mono County in the State of California", approved June 23, 1936 (49 Stat. 1892), is hereby repealed.

(2) The Secretary and the Secretary of the Interior shall grant and convey rights-of-way easements, at no cost, to the city of Los Angeles for those rights-of-way on public lands and national forest lands in Mono County, California, as described and set forth in maps and accompanying descriptions which were—

(A) filed by the city of Los Angeles with the Secretary of the Interior on October 24, 1944, and

(B) accepted as proof of construction on behalf of the United States by the Commissioner of the General Land Office on January 4, 1945.

Such easement conveyances shall provide for the right of the city to continue its present operations and to maintain, reconstruct, and replace all existing water and power facilities located within the bounds of the area described in the maps and descriptions referred to in the preceding sentence. The United States shall reserve in the conveyance easements all rights to use and permit the use by others of the lands so conveyed to the extent that such use does not unreasonably interfere with the rights granted herein to the city of Los Angeles.

(3) The grant in paragraph (2) of this subsection shall become effective upon relinquishment in writing by the city of Los Angeles of its applications dated October 20, 1944, and January 17, 1945, to purchase twenty-three thousand eight hundred and fifty acres of Federal land.

(4) The easements granted under paragraph (2) of this subsection shall provide that whenever the city of Los Angeles ceases to use the land or any part thereof subject to such easements for the purposes for which it is currently being used, as of the date of enactment of this title, all interests in such land or part thereof shall revert to the United States.

(j) Existing community recreational uses, as of the date of enactment of this title, shall be permitted at the levels and locations customarily exercised.

STUDIES

16 USC 543d.

SEC. 305. The Secretary shall take such steps as may be necessary to, within one hundred and eighty days of the date of enactment of this title, enter into a contract with the National Academy of Sciences for the purpose of conducting a scientific study of the ecology of the Scenic Area. The study shall provide for consultation with knowledgeable local, State, Federal, and private persons and organizations and shall provide findings and recommendations to the Congress. Such study shall be conducted in accordance with the best scientific methodology (as set forth by the National Academy of Sciences) and shall be transmitted by the National Academy of Sciences to the Committee on Energy and Natural Resources of the United States Senate, to the Committee on Interior and Insular Affairs of the United States House of Representatives, and to the Chief of the Forest Service not later than January 1, 1987. Progress

reports regarding the study shall be transmitted to the above committees on January 1, 1985, and January 1 of each year thereafter.

ADVISORY BOARD

Establishment.
16 USC 543e.

SEC. 306 (a) There is hereby established the Scenic Area Advisory Board (hereinafter referred to as the "Board"). The Secretary shall consult with and seek the advice and recommendations of the Board with respect to—

(1) the administration of the Scenic Area with respect to policies, programs, and activities in accordance with this title;

(2) the preparation and implementation of the comprehensive management plan; and

(3) the location of the visitor center authorized by section 304(f).

(b) The Board shall be composed of nine members, who shall be selected as follows:

(1) five members appointed by the Mono County Board of Supervisors;

(2) two members appointed by the Governor of California (one of whom shall be an employee of the California Division of Parks and Recreation);

(3) one member appointed by the mayor of the city of Los Angeles; and

(4) one member appointed by the Secretary (who shall be an employee of the Forest Service).

(c) Each member of the Board shall be appointed to serve for a term of three years except that the initial appointments shall be for terms as follows:

(1) of those members appointed by the Mono County Board of Supervisors one shall be appointed to serve for a term of one year, two shall be for a term of two years, and two shall be for a term of three years;

(2) of those members appointed by the Governor of California one shall be appointed to serve for a term of one year and one shall be appointed to serve for a term of three years;

(3) the member appointed by the mayor of the city of Los Angeles shall be appointed to serve for a term of two years; and

(4) the member appointed by the Secretary shall be appointed to serve for a term of three years.

(d) The members of the Board shall be appointed within ninety days of the date of enactment of this title. The members of the Board shall, at their first meeting, elect a Chairman.

(e) The Secretary, or a designee, shall from time to time, but at least annually, meet and consult with the Board on matters relating to the administration of the scenic area.

(f) Members of the Board shall serve without compensation as such, but the Secretary is authorized to pay, upon vouchers signed by the Chairman, the expenses reasonably incurred by the Board and its members in carrying out their duties under this title.

(g) Any vacancy in the Board shall be filled in the same manner in which the original appointment was made.

(h) A majority of those members appointed shall constitute a quorum for the conduct of all business of the Board.

Termination.

(i) The Board shall terminate ten years from the date of its first meeting.

TRADITIONAL NATIVE AMERICAN USES

16 USC 543f.

SEC. 307. In recognition of the past use of the Scenic Area by Indian people for traditional cultural and religious purposes, the Secretary shall insure nonexclusive access to Scenic Area lands by Indian people for such traditional cultural and religious purposes, including the harvest of the brine fly larvae. Such direction shall be consistent with the purpose and intent of the American Indian Religious Freedom Act of August 11, 1978 (92 Stat. 469). As a part of the plan prepared pursuant to section 304(c) of this title, the Secretary shall, in consultation with appropriate Indian tribes, define the past cultural and religious uses of the Scenic Area by Indians.

42 USC 1996 and note.

AUTHORIZATION OF APPROPRIATIONS

16 USC 543g.

SEC. 308. In addition to other amounts available for such purposes effective October 1, 1985, there are hereby authorized to be appropriated such sums as may be necessary to carry out the purposes of this title.

COMPLIANCE WITH BUDGET ACT

16 USC 543h.
2 USC 651.

SEC. 309. Any new spending authority described in subsection (c)(2) (A) or (B) of section 401 of the Congressional Budget Act of 1974 which is provided under this title shall be effective for any fiscal year only to such extent or in such amounts as are provided in appropriation Acts.

Approved September 28, 1984.

LEGISLATIVE HISTORY—H.R. 1437:

HOUSE REPORT No. 98-40 (Comm. on Interior and Insular Affairs).
SENATE REPORT No. 98-582 (Comm. on Energy and Natural Resources).
CONGRESSIONAL RECORD, Vol. 129 (1983):
Apr. 12, considered and passed House.
Aug. 9, considered and passed Senate, amended.
Sept. 12, House agreed to Senate amendment.

SEQUOIA AND KINGS CANYON NATIONAL PARKS WILDERNESS IN THE OMNIBUS PUBLIC LAND MANAGEMENT ACT OF 2009

Enacted into law on March 30, 2009 (PL-111-11)

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18 **Subtitle M—Sequoia and Kings**
19 **Canyon National Parks Wilder-**
20 **ness, California**

21 **SEC. 1901. DEFINITIONS.**

22 In this subtitle:

23 (1) SECRETARY.—The term "Secretary" means
24 the Secretary of the Interior.

•S 22 ES

199

(2) STATE.—The term "State" means the State of California.

SEC. 1902. DESIGNATION OF WILDERNESS AREAS.

In accordance with the Wilderness Act (16 U.S.C. 1131 et seq.), the following areas in the State are designated as wilderness areas and as components of the National Wilderness Preservation System:

(1) JOHN KREBS WILDERNESS.—

(A) DESIGNATION.—Certain land in Sequoia and Kings Canyon National Parks, comprising approximately 39,740 acres of land, and 130 acres of potential wilderness additions as generally depicted on the map numbered 102/60014b, titled "John Krebs Wilderness", and dated September 16, 2008.

(B) EFFECT.—Nothing in this paragraph affects—

(i) the cabins in, and adjacent to, Mineral King Valley; or

(ii) the private inholdings known as "Silver City" and "Kaweah Han".

(C) POTENTIAL WILDERNESS ADDITIONS.—The designation of the potential wilderness additions under subparagraph (A) shall not prohibit the operation, maintenance, and re-

•S 22 ES

pair of the small check dams and water impoundments on Lower Franklin Lake, Crystal Lake, Upper Monarch Lake, and Eagle Lake. The Secretary is authorized to allow the use of helicopters for the operation, maintenance, and repair of the small check dams and water impoundments on Lower Franklin Lake, Crystal Lake, Upper Monarch Lake, and Eagle Lake. The potential wilderness additions shall be designated as wilderness and incorporated into the John Krebs Wilderness established by this section upon termination of the non-conforming uses.

(2) SEQUOIA-KINGS CANYON WILDERNESS ADDITION.—Certain land in Sequoia and Kings Canyon National Parks, California, comprising approximately 45,186 acres as generally depicted on the map titled "Sequoia-Kings Canyon Wilderness Addition", numbered 102/60015a, and dated March 10, 2008, is incorporated in, and shall be considered to be a part of, the Sequoia-Kings Canyon Wilderness.

(3) RECOMMENDED WILDERNESS.—Land in Sequoia and Kings Canyon National Parks that was managed as of the date of enactment of this Act as recommended or proposed wilderness but not des-

1 ignated by this section as wilderness shall continue
2 to be managed as recommended or proposed wilder-
3 ness, as appropriate.

4 **SEC. 1903. ADMINISTRATION OF WILDERNESS AREAS.**

5 (a) IN GENERAL.—Subject to valid existing rights,
6 each area designated as wilderness by this subtitle shall
7 be administered by the Secretary in accordance with the
8 Wilderness Act (16 U.S.C. 1131 et seq.), except that any
9 reference in the Wilderness Act to the effective date of
10 the Wilderness Act shall be considered to be a reference
11 to the date of enactment of this Act.

12 (b) MAP AND LEGAL DESCRIPTION.—

13 (1) SUBMISSION OF MAP AND LEGAL DESCRIP-
14 TION.—As soon as practicable, but not later than 3
15 years, after the date of enactment of this Act, the
16 Secretary shall file a map and legal description of
17 each area designated as wilderness by this subtitle
18 with—

19 (A) the Committee on Energy and Natural
20 Resources of the Senate; and

21 (B) the Committee on Natural Resources
22 of the House of Representatives.

23 (2) FORCE AND EFFECT.—The map and legal
24 description filed under paragraph (1) shall have the
25 same force and effect as if included in this subtitle,

1 except that the Secretary may correct any clerical or
2 typographical error in the map or legal description.
3 (3) PUBLIC AVAILABILITY.—The map and legal
4 description filed under paragraph (1) shall be on file
5 and available for public inspection in the Office of
6 the Secretary.
7 (c) HYDROLOGIC, METEOROLOGIC, AND CLIMATO-
8 LOGICAL DEVICES, FACILITIES, AND ASSOCIATED EQUIP-
9 MENT.—The Secretary shall continue to manage mainte-
10 nance and access to hydrologic, meteorologic, and climato-
11 logical devices, facilities and associated equipment con-
12 sistent with House Report 98–40.
13 (d) AUTHORIZED ACTIVITIES OUTSIDE WILDER-
14 NESS.—Nothing in this subtitle precludes authorized ac-
15 tivities conducted outside of an area designated as wilder-
16 ness by this subtitle by cabin owners (or designees) in the
17 Mineral King Valley area or property owners or lessees
18 (or designees) in the Silver City inholding, as identified
19 on the map described in section 1902(1)(A).
20 (e) HORSEBACK RIDING.—Nothing in this subtitle
21 precludes horseback riding in, or the entry of recreational
22 or commercial saddle or pack stock into, an area des-
23 ignated as wilderness by this subtitle—
24 (1) in accordance with section 4(d)(5) of the
25 Wilderness Act (16 U.S.C. 1133(d)(5)); and

•S 22 ES

203

1 (2) subject to any terms and conditions deter-
2 mined to be necessary by the Secretary.

3 **SEC. 1904. AUTHORIZATION OF APPROPRIATIONS.**

4 There are authorized to be appropriated such sums
5 as are necessary to carry out this subtitle.

BACKCOUNTRY ACCESS ACT OF 2012

Enacted into law on June 5, 2012 (PL 112-128)

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FLO12359 S.L.C.

AMENDMENT NO._____ Calendar No._____

Purpose: In the nature of a substitute.

IN THE SENATE OF THE UNITED STATES—112th Cong., 2d Sess.

H. R. 4849

To direct the Secretary of the Interior to issue commercial use authorizations to commercial stock operators for operations in designated wilderness within the Sequoia and Kings Canyon National Parks, and for other purposes.

Referred to the Committee on _____ and ordered to be printed

Ordered to lie on the table and to be printed

AMENDMENT intended to be proposed by _____

Viz:

1 Strike all after the enacting clause and insert the fol-
2 lowing:

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the "Sequoia and King Can-
5 yon National Parks Backcountry Access Act".

6 **SEC. 2. COMMERCIAL SERVICES AUTHORIZATIONS IN WIL-**
7 **DERNESS WITHIN THE SEQUOIA AND KINGS**
8 **CANYON NATIONAL PARKS.**

9 (a) CONTINUATION OF AUTHORITY.—Until the date
10 on which the Secretary of the Interior (referred to in this
11 Act as the "Secretary") completes any analysis and deter-

mination required under the Wilderness Act (16 U.S.C. 1131 et seq.), the Secretary shall continue to issue authorizations to provide commercial services for commercial stock operations (including commercial use authorizations and concession contracts) within any area designated as wilderness in the Sequoia and Kings Canyon National Parks (referred to in this section as the "Parks)" at use levels determined by the Secretary to be appropriate and subject to any terms and conditions that the Secretary determines to be appropriate.

(b) WILDERNESS STEWARDSHIP PLAN.—Not later than 3 years after the date of enactment of this Act, the Secretary shall complete a wilderness stewardship plan with respect to the Parks.

(c) TERMINATION OF AUTHORITY.—The authority of the Secretary to issue authorizations under subsection (a) shall terminate on the earlier of—

(1) the date on which the Secretary begins to issue authorizations to provide commercial services for commercial stock operations within any areas designated as wilderness in the Parks, as provided in a record of decision issued in accordance with a wilderness stewardship plan completed under subsection (b); or

FLO12359 S.L.C.

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1 (2) the date that is 4 years after the date of en-
2 actment of this Act.

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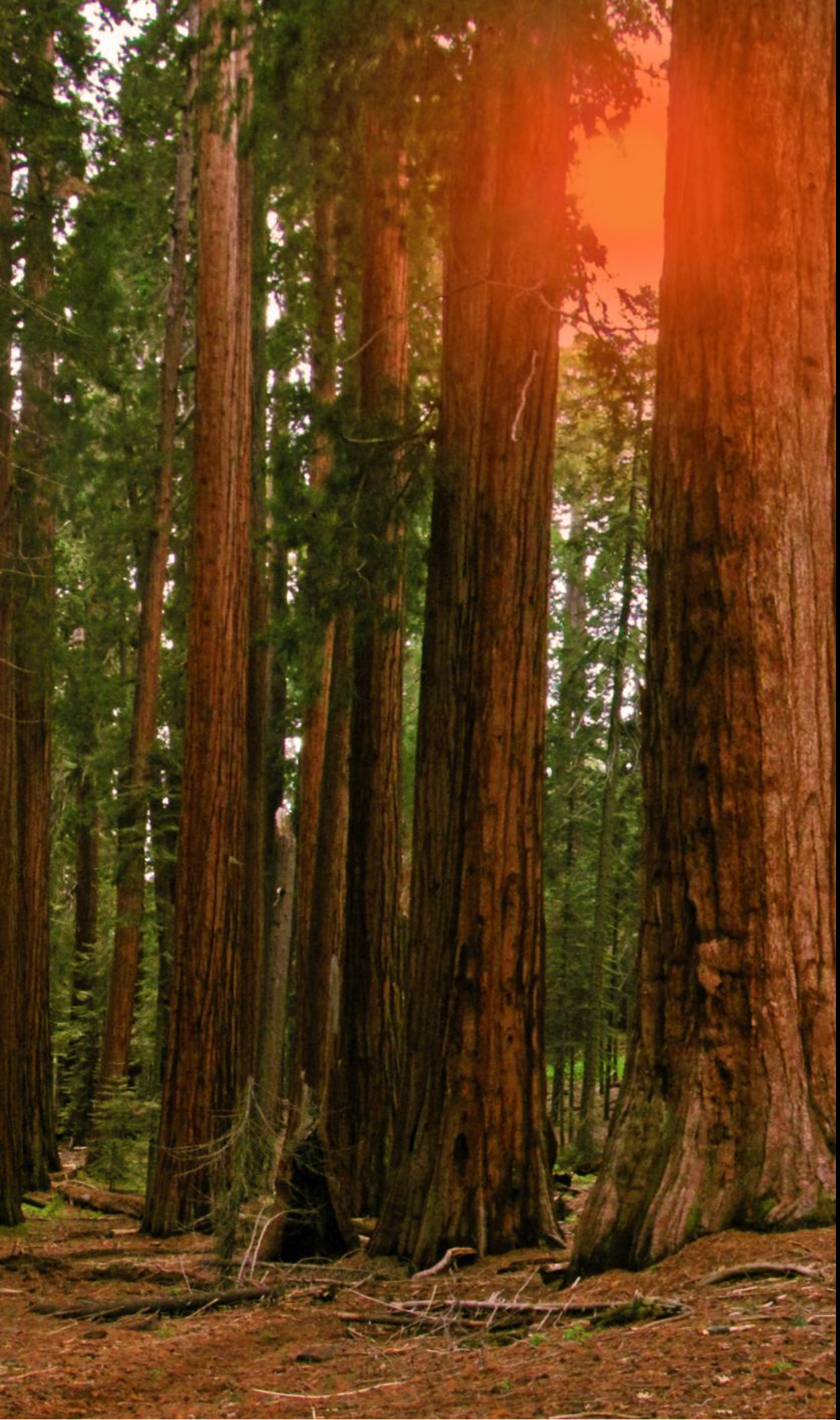

Appendix F

Wilderness Regulations, Restrictions, and Permit Conditions

ON THE PREVIOUS PAGE
Redwood Mountain Grove
Photo Courtesy of Rick Cain

APPENDIX F:

WILDERNESS REGULATIONS, RESTRICTIONS, AND PERMIT CONDITIONS

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WILDERNESS REGULATIONS, RESTRICTIONS, AND PERMIT CONDITIONS

The majority of the wilderness in Sequoia and Kings Canyon National Parks is under exclusive federal jurisdiction. There are a few relatively small areas of concurrent jurisdiction, primarily in the Mineral King Valley and around Chimney Rock. In areas of exclusive jurisdiction (also known as Special Maritime and Territorial Jurisdiction) the federal government has primary responsibility for the enforcement of laws and regulations. State and local authorities retain some jurisdiction (for instance, over civil processes), and may assist the federal government under some circumstances. The regulations and laws that apply come from the United States Code (USC) and the Code of Federal Regulations (CFR); these laws are enforced exclusively by the federal government by commissioned National Park Service (NPS) Law Enforcement Rangers. In areas of concurrent jurisdiction, both the federal government and state of California have authority and both state and federal law apply.

The Wilderness Act governs agency management of wilderness. While it prohibits particular actions and uses, it does not set forth specific regulations or laws governing public activities. Laws governing the public in wilderness include those found in United States Code (USC), principally Title 16, Conservation; and Title 18, Crimes and Criminal Procedure. A number of other laws potentially apply to federal lands under wilderness designation, such as Title 21, Food and Drugs. Where a federal law does not exist, non-conflicting state laws may be adopted as federal law under 18 USC Section 13.

Wilderness regulations are ultimately designed to protect people, natural and cultural resources and wilderness character. The majority of the regulations enforced in the wilderness of Sequoia and Kings Canyon National Parks are contained in Title 36 of the Code of Federal Regulations (36 CFR). The regulations in 36 CFR apply to all National Park System units nationwide, unless otherwise specified, and protect all units of the system in a consistent manner. Adoption of regulations, and changes to existing regulations, goes through established federal rule-making procedures, including an opportunity for public comment prior to the final rule adoption. Prohibitions on certain activities (such as bicycle use on trails and possession of pets) contained in CFR and applicable to all parks cannot be waived by individual park units; changes must go through the federal rule-making process.

Park units may promulgate local, park-specific regulations in order to meet specific regulatory needs not addressed by the general regulations in 36 CFR. These special park regulations are found in Part 7 of 36 CFR. As with other regulations, park-specific regulations must go through the federal rule-making process. Parks may also establish restrictions under the authority of 36 CFR Section 1.5, which are published annually (commonly referred to as the “Superintendent’s Compendium”) in accordance with the requirements in 36 CFR Section 1.7. This authority to establish temporary restrictions is beneficial for situations where regulatory requirements may change, such as meadow restrictions which frequently change from year to year based on usage and environmental conditions.

Public compliance with wilderness regulations and restrictions is achieved through pre-trip education and information efforts, educational contacts in the wilderness, verbal and written warnings for violations of rules and regulation, and citations for violations. Arrest is possible for significant crimes and violations in wilderness, but is historically rare. Pre-trip education is one of the most important factors in achieving compliance with wilderness regulations and takes many forms, such as web-based information, publications and guidebooks, and in-person education during the permitting process.

Compliance with regulations is checked and monitored by park rangers assigned to patrol duties. Park rangers patrolling wilderness may be either non-commissioned rangers or commissioned law enforcement

rangers with arrest authority. Non-commissioned rangers will address minor violations by further educating the users regarding the regulation and purpose of the regulation. Non-commissioned rangers will also provide informal warnings to users violating regulations. Rangers with law enforcement authority will also address minor violations with education and warnings; more significant violations or repeat violations may result in a violation notice.

The level of enforcement for any particular violation of regulations is generally based on the egregiousness of the particular violation. Relatively few violations result in a violation notice, and most are addressed through educational efforts and warnings. The foundation of regulation compliance and enforcement will be education for wilderness users during the in-person permit issuing process. The regulations, and purpose of the regulations, will be thoroughly explained when park staff help users with pre-trip planning and when the permit is issued.

Enforcement of laws and regulations in parks is a means to ensure public safety, protect users' experience, and prevent conflicts. Enforcement is also an important means to protect wilderness resources and preserve wilderness character.

TITLE 36 CODE OF FEDERAL REGULATIONS

Title 36 of the Code of Federal Regulations (36 CFR) Parts 1 – 199 are the primary regulations enforced in the wilderness, and throughout parks. These regulations apply to National Park Service units generally and are not specific to wilderness. Some sections of 36 CFR allow for adoption of local state codes. Violations of 36 CFR regulations are misdemeanors. Penalties (fines) are not retained by the park, and are deposited to the U.S. Treasury.

36 CFR Part 1, General Provisions. Part 1, establishes scope, definitions, penalties and authorities of the regulations contained in 36 CFR. Section 1.5 gives the superintendent authority to establish special restrictions and conditions of use within a park unit. This authority is used to establish the wilderness permit requirement along with permit conditions.

Permit conditions, and a variety of other special public use conditions, are established in the Superintendent's Compendium and reviewed and approved annually. The conditions of the wilderness permit are listed on the annual Minimum Impact Restriction sheet issued with each wilderness permit (see excerpts from wilderness trip planner in next section). These conditions are intended to guide wilderness visitors in the proper use of wilderness in a manner that is consistent with maintaining wilderness character. The conditions have the force of regulation, and are used to govern activities prohibited by the Wilderness Act, and for which no stand-alone regulation exists, such as the use of a generator.

36 CFR Part 2, Resource Protection and Public Use and Recreation. Part 2 is the mainstay in providing regulatory protection for park resources and governing human activities within National Parks. The enforcement of these regulations provides direct protection to the park's wildlife, plants, cultural resources, geologic resources, and ecosystems, which protects the natural quality of wilderness character. Other regulations within Part 2 govern human behavior and regulate noise, aircraft landings, pets, property, memorializing and residing. These regulations protect the unconfined recreation and undeveloped qualities of wilderness.

36 CFR Part 3, Boating and Water Use Activities. Part 3 regulates boating, swimming and other water activities. There is limited applicability to these regulations in the Sequoia and Kings Canyon Wilderness but these regulations would apply to white water boating, boating on lakes and restricting swimming activities if there were closures.

36 CFR Part 4, Vehicles and Traffic Safety. Part 4 is designed to regulate motor vehicle traffic in National Parks and has very limited applicability in the Sequoia and Kings Canyon wilderness areas. Off-road motor vehicle use in wilderness would be prohibited under 36 CFR section 4.10. While portions of roads are within wilderness (the Oriole Lake and Milk Ranch roads), the roads are closed to public use. Authorized private land owners in the Oriole Lake area, and limited administrative use (subject to a Minimum Requirements Analysis), are the only permitted uses.

36 CFR Part 5, Commercial and Private Operations. Part 5 regulations govern business operations in the National Parks. The enforcement of these regulations in the Sequoia and Kings Canyon wilderness are primarily related to individuals conducting unauthorized business in the wilderness in violation of 36 CFR 5.3.

36 CFR Part 7 Special Regulations, Areas of the National Park System. Part 7 establishes particular regulations for individual park units. 36 CFR 7.8 applies to Sequoia and Kings Canyon National Parks, it has limited applicability to wilderness, although 36 CFR 7.8(a) confines pets to frontcountry areas and 36 CFR 7.8(b) may be used to regulate fishing.

CIVIL PENALTIES FOR RESOURCE DAMAGE

It addition to criminal penalties for violations of park laws and regulations, any violation resulting in significant damage to park resources may be subject to civil penalties. The Park System Resource Protection Act (codified in 16 USC 19jj) allows for civil penalties related to resource damage. Revenue from penalties may be used for restoration and rehabilitation of damaged lands. In addition to 19jj, courts may also independently impose restitution fees during criminal proceedings. These funds are typically payable directly to parks for restoration or rehabilitation of damaged lands.

WILDERNESS PERMIT CONDITIONS AND LEAVE NO TRACE©

Wilderness permits are required for all overnight travel. By acquiring the permit, the visitor has agreed to comply with the restrictions contained within the permit. Failure to abide by the specific conditions set forth in the permit constitutes a violation of 36 CFR 1.6(g)(2). These conditions are generally communicated to the public through annual printed material (and available on the parks' website) often titled Minimum Impact Restrictions and Stock Use and Grazing Restrictions and other topic specific handouts. Wilderness permit conditions and requirements have integrated Leave No Trace© concepts. Leave No Trace© is a national education program that promotes the responsible enjoyment and active stewardship of the outdoors (www.lnt.org). The NPS is one of many partners encouraging everyone to practice the seven principles of Leave No Trace©.

Examples of Leave No Trace© for the Sierra Nevada and wilderness permit conditions include:

Plan Ahead and Prepare. Know the restrictions, regulations, and special concerns for the area you will visit. Prepare for extreme weather, hazards, and emergencies. Visit in small groups when possible. Select terrain, mileage, and elevation changes that match the skills and abilities of your group. Carry appropriate food, clothing, equipment, and water. Ensure you have the essentials. Repackage food to minimize waste.

Travel and Camp on Durable Surfaces. Never camp on vegetation, especially meadows. Camp on locations on bare ground, such as established sites, rock, gravel, or snow. Avoid camping beneath dead trees or overhanging dead branches. Protect riparian areas by camping at least 100 ft. from water where terrain permits. Campsites must always be at least 25 ft. from water (36 CFR 2.10(a)(3)). Good campsites are found, not made. "Improvements" such as rock walls, trenches, or bough beds are prohibited (36 CFR

2.10(a)(5)). Building new fire rings is prohibited. Short-cutting trails is prohibited. Stay on trails to reduce erosion and preserve vegetation. Do not build rock cairns or other trail markers.

Dispose of Waste Properly. Pack out all trash, leftover food, and litter. Inspect your campsite and rest areas for trash or spilled foods. Deposit solid human waste in cat holes dug 6 to 8 inches deep at least 100 ft. from water, campsites, and trails. Cover and disguise the cat hole when finished. Pack out toilet paper and hygiene products. Bring plastic baggies solely for this purpose. Never wash yourself, dishes, or clothes directly in a water source. Carry water for these purposes at least 100 ft. away from streams and lakes. Scatter strained dishwater.

Leave What You Find. Preserve the past. Do not take or disturb cultural or historic artifacts. Leave rocks, plants and other natural objects as you find them (36 CFR 2.1). Avoid introducing or transporting non-native species - brush off your boots and clean your trekking poles before and after your trip.

Minimize Campfire Impacts. Campfires can cause lasting impacts. You create the least impact if you use only a stove for cooking and forego the campfire. Where fires are permitted, use established fire rings. Do not build new ones or enlarge existing ones. Keep fires small. Only use dead wood from the ground that can be broken by hand. Always attend the fire. Completely extinguish campfires by drowning with water (not dirt) and stirring until all heat is gone. Do not place aluminum foil (foil does not burn), cans or plastic (when burned it emits toxic fumes) in fires. Thoroughly sift through the ashes with a stick and remove unburned trash and pack it out.

Respect Wildlife. Observe wildlife from a distance. Do not follow, disturb, or approach them. Never feed animals (36 CFR 2.2). Feeding wildlife damages their health, alters natural behaviors, and exposes them to predators. Protect wildlife and your food by storing food and trash securely.

Be Considerate of Other Visitors. Respect other visitors and protect the quality of their experience. Be courteous. Yield to other users on the trail. Take breaks and camp away from trails and other visitors. Let nature's sounds prevail. Avoid loud voices and noises (36 CFR 2.12 and 36 CFR 2.34).

Leave No Trace© (LNT) guidelines ensure the general preservation of wilderness character and resources. There are specific situations, however, that necessitate more stringent restrictions than the LNT guidelines. These parks will on occasion implement restrictions that are more rigorous than the general LNT guidelines, specifically as conditions of wilderness permits.

TEMPORARY VARIANCES

Variances to selected restrictions could be made for party size, access, campfire limits, meadow opening dates, number of stock per trip, number of nights per area, number of stock per area, etc., depending on special, compelling circumstances. Such variances may be granted in rare case-by-case instances to accommodate special visitor needs where the effects on wilderness character, park resources, and other visitors would be within acceptable limits. Short-term or one-time-only variances proposed by visitors would be individually considered by the superintendent, and, if approved would likely be subject to special conditions. Requests for variances should be made in writing at least four weeks in advance to provide adequate time for consideration.

PUBLIC INFORMATION

A variety of means are used to convey regulatory information to the general public. The park’s website, as well as the national NPS website, provides information about regulations, restrictions, temporary closures, public use limits, and special announcements. Park-produced handouts and press releases are

also used to communicate regulatory information to the public. Wilderness-specific information is made available to visitors through a variety of means. The Wilderness Trip Planner, produced by the park and updated periodically, provides a wealth of information to help users plan their trip. This includes general safety information, recommendations on minimizing the environmental impact of their actions (including the Leave No Trace© program), and regulatory information.

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Appendix G

Scoping Materials

ON THE PREVIOUS PAGE
Rae Lakes
NPS Photo

APPENDIX G:

SCOPING MATERIALS

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PUBLIC, AGENCY, AND TRIBAL SCOPING INITIATION

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United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9651
(559) 565-3341

IN REPLY REFER TO:
L7617

March 22, 2011

Gabe Horta
Big Sandy Rancheria of Mono Indians
P.O. Box 337
Auberry, California 93602

Dear Mr. Horta:

We are initiating the Wilderness Stewardship Plan and Environmental Impact Statement (WSP/EIS) for Sequoia and Kings Canyon National Parks, and would like your input on this important effort. We would like to invite you to a presentation on this planning effort at the Sierra National Forest Headquarters, 1600 Tollhouse Road, in Clovis, California on April 26, 2011, from 9 am until 11 am. This meeting will provide an opportunity for your input on issues and concerns related to current and future wilderness management in Sequoia and Kings Canyon National Parks. We are also inviting area agencies and other area tribes to participate in this meeting.

For your information, we will be conducting a public scoping meeting in Fresno on April 25 at 7 pm at Fresno Pacific University, 1717 South Chestnut Avenue, in the Marpeck Center room 102, and in Visalia on April 29, at 6 pm in the Tulare County Office of Education on 2637 West Burrell. You are welcome to attend one or both of those meetings.

We are available for government-to- government consultation with your Tribe if you wish to discuss your questions and concerns about the Wilderness Stewardship Plan separately from the aforementioned meetings. If you would like a separate meeting, please contact Wilderness Coordinator Gregg Fauth at (559) 565-3137 or by Email at gregg_fauth@nps.gov.

We are in the initial stage of this planning process, also called the "scoping" phase, and foresee providing you with additional opportunities for input as we develop the plan and alternatives and prepare a draft environmental impact statement. However, as we begin our planning process, it is important to understand Tribal concerns early so these can be reflected in the plan.

If you would like to submit written comments during this scoping phase related to wilderness management in Sequoia and Kings Canyon National Parks, we would appreciate receipt of your comments by June 30, 2011. We look forward to working with you on this and other future planning efforts.

Sincerely,

Karen F. Taylor-Goodrich
Superintendent

Identical letter sent to 25 area tribes, tribal organizations, or tribal representatives.

National Park Service
U.S. Department of the Interior

Sequoia and Kings Canyon
National Parks

47050 Generals Hwy.
Three Rivers, CA 93271

559 565-3341 phone
559 565-3730 fax

Sequoia and Kings Canyon National Parks News Release

For Immediate Release: March 29, 2011
Contact: Dana M. Dierkes or Malinee Crapsey
Phone Number: (559) 679-2866 or 559-565-3131

National Park Service Seeks Public Input in Development of Wilderness Stewardship Plan for Sequoia and Kings Canyon National Parks

Sequoia and Kings Canyon National Parks, CA – Starting on April 11, the National Park Service will be seeking your input in development of a Wilderness Stewardship Plan and Environmental Impact Statement (WSP/EIS) for Sequoia and Kings Canyon National Parks in Tulare and Kings counties in California. The National Park Service is interested in your concerns about existing and future wilderness use and management at Sequoia and Kings Canyon National Parks. Potential issues which may be addressed in the plan include: day and overnight use; wilderness permitting; use of campfires; wildlife and proper food storage; party sizes; camping and campsites; human waste management; stock use; meadow management; research activities; wildlife management in wilderness; cultural resources in wilderness; maintenance of trails, bridges, or other necessary infrastructure; the extent to which commercial services are necessary to fulfill the recreational and other purposes of wilderness areas, etc. The majority of Sequoia and Kings Canyon National Parks, over 96% of the land or approximately 835,000 acres, is managed as wilderness, including the Sequoia-Kings Canyon and John Krebs wilderness areas.

- more -

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To learn more about the process and how to comment, visit *http://parkplanning.nps.gov/sekiwild* and/or consider attending an upcoming workshop during the last week of April to listen to a presentation by the National Park Service and to meet with staff in an informal open house setting and discuss issues of interest or submit your comments. The schedule for the meetings is:

Monday, April 25, 2011
7:00-9:00 p.m.
Fresno Pacific University
Marpeck Center, Room 102
1717 South Chestnut Avenue
Fresno, CA 93727

Tuesday, April 26, 2011
7:00-9:00 p.m.
East Bay Regional Parks
Richard C. Trudeau Training Center,
Conf. Room 2
11500 Skyline Blvd
Oakland, CA 94619

Wednesday, April 27, 2011
7:00-9:00 p.m.
Inyo National Forest Headquarters
Conference Room
351 Pacu Lane
Bishop, CA 93514

Thursday, April 28, 2011
7:00-9:00 p.m.
L.A. River Center
California Building Atrium
570 West Avenue Twenty-Six
Los Angeles, CA 90065

Friday, April 29, 2011
6:00 – 8:00 p.m.
Tulare County Office of Education
"The Pit"
2637 West Burrel Ave.
Visalia, CA 93291

- more -

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All written comments must be transmitted, postmarked, or hand-delivered within 90 days of the date the "Notice of Intent," the official announcement of this public comment period, is published in the *Federal Register.* To respond electronically, you may submit your comments online to the National Park Service Planning, Environment and Public Comment (PEPC) website at *http://parkplanning.nps.gov/sekiwild.* To submit written comments by letter you may send them by U.S. Postal Service or other mail delivery service or hand-deliver your comments to Superintendent Karen F. Taylor-Goodrich, Sequoia and Kings Canyon National Parks, Attn: Wilderness Stewardship Plan, 47050 Generals Highway, Three Rivers, CA 93271. Faxed comments will be accepted at (559) 565-4202. Written comments will also be accepted during public scoping meetings. Comments in any format (written or electronic) submitted by an individual or organization on behalf of another individual or organization will not be accepted. Anonymous comments will not be accepted.

It is the practice of the National Park Service to make all comments available for public review, after the close of the EIS process. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

For more information about Sequoia and Kings Canyon National Parks, visit www.nps.gov/seki.

–NPS–

Note to News Media: Over 20 million people live within a 250-mile drive of Sequoia and Kings Canyon National Parks.

EXPERIENCE YOUR AMERICA
The National Park Service cares for special places saved by the American people so that all may experience our heritage.

United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9651
(559) 565-3341

IN REPLY REFER TO:
L7617 (SEKI)

March 30, 2011

Dear Interested Party:

You are invited to participate in an important planning process for Sequoia and Kings Canyon National Parks. We are resuming our Wilderness Stewardship Plan and Environmental Impact Statement (WSP/EIS) this spring and beginning our public scoping process. Wilderness is an important resource, with more than 808,000 acres of designated wilderness within these two parks, including the Sequoia-Kings Canyon Wilderness and John Krebs Wilderness. Including our proposed and potential wilderness additions, we manage more than 96% of our total acreage as wilderness.

We are very interested in your concerns and issues related to wilderness management and preservation at Sequoia and Kings Canyon National Parks. We will be initiating our first public comment period, also called "scoping" for the plan on April 11, 2011. A "Notice of Intent" (NOI) to prepare the WSP/EIS is expected to be published in the Federal Register in April. The public scoping period will end 90 days after the NOI is published.

We have several meetings scheduled to provide more information on the project (see page 2). If you are unable to attend the meetings, information on the proposed project is available online at the National Park Service Planning, Environment and Public Comment (PEPC) website at http://parkplanning.nps.gov/sekiwild.

Public comments may be submitted several ways. You may input your comments on the PEPC website (above), or you may direct comments regarding this project to the park by mail, hand delivery, or fax to:

Superintendent
Sequoia and Kings Canyon National Parks
Attn: Wilderness Stewardship Plan
47050 Generals Highway
Three Rivers, CA 93271
Fax: 559-565-4202

If you need assistance using our PEPC website, please contact Environmental Protection Specialist Nancy Hendricks at (559) 565-3102 and she will assist you.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. We will always make submissions from organizations or businesses, and from individuals identifying themselves as representatives of or officials of organizations or businesses, available for public inspection in their entirety. Anonymous comments will not be accepted.

Thank you for your interest in the wilderness of Sequoia and Kings Canyon National Parks and we hope to see you at one of our public meetings.

for Karen F. Taylor-Goodrich
Superintendent

Wilderness Stewardship Plan Scoping Meetings/Open Houses

Monday, April 25, 2011
7:00 – 9:00 p.m.
Fresno Pacific University
Marpeck Center, Room 102
1717 South Chestnut Avenue
Fresno, California, 93727

Tuesday, April 26, 2011
7:00 – 9:00 p.m.
East Bay Regional Parks
Richard C. Trudeau
Training Center, Conf. Room 2
11500 Skyline Boulevard
Oakland, California, 94619

Wednesday, April 27, 2011
7:00 – 9:00 p.m.
Inyo National Forest HQ
Conference Room
351 Pacu Lane
Bishop, California, 93514

Thursday, April 28, 2011
7:00 – 9:00 p.m.
L.A. River Center
California Building Atrium
570 West Avenue Twenty-Six
Los Angeles, California, 90065

Friday, April 29, 2011
6:00 – 8:00 p.m.
Tulare County Office of Education
"The Pit"
2637 West Burrel Avenue
Visalia, California, 93291

National Park Service
U.S. Department of the Interior

Sequoia and Kings Canyon
National Parks

47050 Generals Hwy.
Three Rivers, CA 93271

559 565-3341 phone
559 565-3730 fax

Sequoia and Kings Canyon National Parks News Release

For Immediate Release: April 20, 2011
Contact: Dana M. Dierkes
Phone Number: (559) 679-2866

Public Meetings Scheduled in Various Cities and Towns from April 25-29 to Obtain Feedback in Development of Wilderness Stewardship Plan and Environmental Impact Statement

Sequoia and Kings Canyon National Parks, CA –Join the National Park Service at various upcoming meetings throughout central and southern California to provide your input in development of a Wilderness Stewardship Plan and Environmental Impact Statement (WSP/EIS) to guide existing and future wilderness use and management at Sequoia and Kings Canyon National Parks. Listen to a presentation by National Park Service staff. Then, meet with staff afterwards in an informal open house setting to discuss issues of interest or submit your comments. The meeting schedule is:

Monday, April 25, 2011
7:00-9:00 p.m.
Fresno Pacific University
Marpeck Center, Room 102
1717 South Chestnut Avenue
Fresno, CA 93727

Tuesday, April 26, 2011
7:00-9:00 p.m.
East Bay Regional Parks
Richard C. Trudeau Trng. Ctr., Conf. Room 2
11500 Skyline Blvd
Oakland, CA 94619

Wednesday, April 27, 2011
7:00-9:00 p.m.
Inyo National Forest Headquarters
Conference Room
351 Pacu Lane
Bishop, CA 93514

Thursday, April 28, 2011
7:00-9:00 p.m.
L.A. River Center
California Building Atrium
570 West Avenue Twenty-Six
Los Angeles, CA 90065

- more -

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Friday, April 29, 2011
6:00 – 8:00 p.m.
Tulare County Office of Education
"The Pit"
2637 West Burrel Ave.
Visalia, CA 93291

All written comments must be transmitted, postmarked, or hand-delivered within 90 days of the date the "Notice of Intent" is published in the *Federal Register*. (The Notice of Intent, the official announcement of this public comment period, is expected to be published shortly.) To respond electronically, submit your comments via the National Park Service Planning, Environment and Public Comment (PEPC) website at *http://parkplanning.nps.gov/sekiwild*.
To submit written comments by letter, you may send them by U.S. Postal Service or other mail delivery service or hand-deliver your comments to Superintendent Karen F. Taylor-Goodrich, Sequoia and Kings Canyon National Parks, Attn: Wilderness Stewardship Plan, 47050 Generals Highway, Three Rivers, CA 93271. Faxed comments will be accepted at (559) 565-4202. Written comments will be accepted during public scoping meetings. Comments in any format (written or electronic) submitted by an individual or organization on behalf of another individual or organization will not be accepted. Anonymous comments will not be accepted.

It is the practice of the National Park Service to make all comments available for public review after the close of the EIS process. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

For more information about Sequoia and Kings Canyon National Parks, visit www.nps.gov/seki.

–NPS–

Fascinating Facts:

(1) Over 96% of the land at Sequoia and Kings Canyon National Parks is managed as wilderness.
(2) Over 20 million people live within a 250-mile drive of Sequoia and Kings Canyon National Parks.

2

United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9651
(559) 565-3341

IN REPLY REFER TO:
L7617

May 16, 2011

Ed Armenta
Forest Supervisor
Inyo National Forest
351 Pacu Lane, Suite 200
Bishop, California 93514

Dear Ed:

Thank you for your support at our April 27 and 28 public and agency scoping meetings at your headquarters in Bishop. It was great to meet you and your staff and discuss wilderness stewardship, particularly cross boundary issues that are important to both our agencies. We'd like to thank your staff, particularly Nancy Upham, for helping us coordinate our meetings and for sending our meeting notification to her contact list.

Based on our discussions at those meetings, we believe that it would benefit both our agencies to work together through this 3 to 4-year planning process. Therefore, we are requesting that Inyo National Forest participate as a cooperating agency in our Wilderness Stewardship Plan/ Environmental Impact Statement. We hope that as a cooperating agency, you would designate a primary point of contact for Inyo National Forest who would be the liaison with our wilderness planning staff. We expect that there would be periodic meetings with your staff to provide updates on the planning effort and opportunities for input. Work may include providing us with information about potential issues and ideas for how we can effectively work together on cross boundary management issues; assisting in developing and reviewing alternatives; and providing information and data that would allow us to better assess environmental consequences and cumulative effects. As a cooperating agency, you would be able to review preliminary draft text and provide feedback.

Please let us know if you would be interested in cooperating agency status. If you need further information, our primary contacts for the project are Wilderness Coordinator Gregg Fauth at (559) 565-3137 and Environmental Protection Specialist Nancy Hendricks at (559) 565-3102.

We look forward to working with you on this and other future planning efforts.

Sincerely,

Karen F. Taylor-Goodrich
Superintendent

United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9651
(559) 565-3341

IN REPLY REFER TO:
L7617

May 16, 2011

Deb Whitman
Acting Forest Supervisor
Sequoia National Forest
1839 South Newcomb St
Porterville, California 93257

Dear Deb:

We have initiated public, agency, and tribal scoping for the Sequoia and Kings Canyon National Parks Wilderness Stewardship Plan and Environmental Impact Statement. We'd like to thank Marianna Emmendorfer and Miguel Macias for participating in our agency scoping meeting at the Sierra National Forest office on April 26.

Based on our discussions at our April 26 meeting, we believe that it would benefit both our agencies to work together through this 3 to 4-year planning process. Therefore, we are requesting that Sequoia National Forest participate as a cooperating agency in our Wilderness Stewardship Plan/ Environmental Impact Statement. We hope that as a cooperating agency, you would designate a primary point of contact for Sequoia National Forest who would be the liaison with our wilderness planning staff. We expect that there would be periodic meetings with your staff to provide updates on the planning effort and opportunities for input. Work may include providing us with information about potential issues and ideas for how we can effectively work together on cross boundary management issues; assisting in developing and reviewing alternatives; and providing information and data that would allow us to better assess environmental consequences and cumulative effects. As a cooperating agency, you would be able to review preliminary draft text and provide feedback.

Please let us know if you would be interested in cooperating agency status. If you need further information, or if you would like to schedule a meeting to discuss this further, our primary contacts for the project are Wilderness Coordinator Gregg Fauth at (559) 565-3137 and Environmental Protection Specialist Nancy Hendricks at (559) 565-3102.

We look forward to working with you on this and other future planning efforts.

Sincerely,

Karen F. Taylor-Goodrich
Superintendent

United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9651
(559) 565-3341

IN REPLY REFER TO:
L7617

May 16, 2011

Scott Armentrout
Forest Supervisor
Sierra National Forest
1600 Tollhouse Road
Clovis, California 93611

Dear Scott:

As you know, we have initiated public, agency, and tribal scoping for the Sequoia and Kings Canyon National Parks Wilderness Stewardship Plan and Environmental Impact Statement. Thank you for allowing us to host our agency scoping meeting at your Clovis office on April 26. We appreciate your staff's assistance in coordinating this meeting for us, particularly Susan Burkindine for her efforts. We also would like to especially thank Dirk Charley for including us in the Tribal Forum meeting to help us engage tribes in our Wilderness planning process.

Based on our discussions at our April 26 meeting, we believe that it would benefit both our agencies to work together through this 3 to 4-year planning process. Therefore, we are requesting that Sierra National Forest participate as a cooperating agency in our Wilderness Stewardship Plan/ Environmental Impact Statement. We hope that as a cooperating agency, you would designate a primary point of contact for Sierra National Forest who would be the liaison with our wilderness planning staff. We expect that there would be periodic meetings with your staff to provide updates on the planning effort and opportunities for input. Work may include providing us with information about potential issues and ideas for how we can effectively work together on cross boundary management issues; assisting in developing and reviewing alternatives; and providing information and data that would allow us to better assess environmental consequences and cumulative effects. As a cooperating agency, you would be able to review preliminary draft text and provide feedback.

Please let us know if you would be interested in cooperating agency status. If you need further information, our primary contacts for the project are Wilderness Coordinator Gregg Fauth at (559) 565-3137 and Environmental Protection Specialist Nancy Hendricks at (559) 565-3102.

We look forward to working with you on this and other future planning efforts.

Sincerely,

Karen F. Taylor-Goodrich
Superintendent

Sequoia and Kings Canyon National Parks

National Park Service
U.S. Department of the Interior

Wilderness Stewardship Plan Update - October 27, 2011

Comments for Wilderness Stewardship Plan Now Available for Public Review

Nearly 900 comment letters were received during the public scoping period for the Sequoia and Kings Canyon National Parks' (SEKI) Wilderness Stewardship Plan and Environmental Impact Statement (WSP). The scoping period occurred from April 11 to August 31, 2011 and included five public meetings held in northern, central, and southern California.

"This tremendous response demonstrates the public's care and passion about protecting our nation's special wild places, specifically the 830,000 acres of lands managed as wilderness in Sequoia and Kings Canyon National Parks" stated Superintendent Karen Taylor-Goodrich.

All the comment letters are available for the public to read on the National Park Service's Planning, Environment and Public Comment (PEPC) website. They can be accessed at: http://parkplanning.nps.gov/sekiwild (Click on "Document List"). Personal identifying information of unaffiliated individuals has been excluded from comment letters; names of persons representing interest groups, agencies, and businesses are included.

All the comment letters have been included in one large "pdf" file that is searchable by word or phrase. All comment letters were entered as received and they have not been edited or changed in any way. We cannot verify that the comments are accurate as to fact. If you need help finding your individual comment letter in the document, or if you would like a CD version of the document, please contact the Sequoia and Kings Canyon National Parks Environmental Compliance Office at 559-565-3102.

Comments were received on an extremely wide variety of wilderness topics and issues, and expressed a wide variety of opinions. While the majority of commenters were California residents (83%), we also received comments from 41 other states and 3 other countries.

Numerous commenters were concerned about issues that have been under discussion for years while others brought forward new wilderness management considerations and ideas, such as requesting increased restrictions on types of equipment that can be brought into wilderness. Some examples of issues presented during public scoping include:

- Opinions on how wilderness should be experienced, recommending "appropriate" and "inappropriate" activities, equipment, and material items, including:
  - Campfires
  - Group sizes
  - Food storage lockers and portable bear-resistant food storage canisters
  - Camp equipment (e.g. chairs and ice chests)
  - Electronic devices (e.g. GPS units and cell phones)
  - Trails and bridges
  - Administrative use of helicopters

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- Support for or concern about stock use in wilderness.
- Support for or suggested changes in current management practices (e.g. regulations, permitting, and quotas).
- Support for or suggested changes in the conduct of commercial services (e.g. hiking, climbing, and stock trips provided by private guides and outfitters). This relates to the "extent necessary" clause of the Wilderness Act.
- Views on what wilderness means to the commenter.
- Suggestions to afford more protection to the natural environment.

Currently we are studying the comments to determine the scope and the significant issues to be analyzed in depth in the Wilderness Stewardship Plan and Environmental Impact Statement. Note that the process of commenting and providing input should not be viewed as a voting process, that is, if a particular outcome is popular among a majority of those who comment, this does not necessarily mean that it will be the final outcome. The National Park Service will make management decisions based on the mandates of relevant legislation and scientific integrity.

The tentative schedule for the Wilderness Stewardship Plan is as follows:

- Fall 2011 - Spring 2012 – Analyze Public Scoping Comments
- Spring-Summer 2012 – Alternatives Development
- Fall 2012 – Release Draft Alternatives for Public Review
- Winter 2012-Fall 2013 – Prepare Draft WSP/Environmental Impact Statement (EIS)
- Fall 2013-Winter 2014 – Public Review of Draft WSP/EIS
- Summer 2014 – Release of the Final WSP/EIS
- Fall 2014 – Record of Decision by Pacific West Regional Director

All commenters who supplied either Email or physical mailing address are included on the parks' mailing list for this project. Anyone who wishes to be included on the mailing list for this project should supply their name and either an Email or physical mailing address to: SEKI_Planning@nps.gov. Please include the following on the subject line: *WSP Mailing List*.

Additional information:

Congressionally Designated Wilderness is to be:

- lands ". . . designated for preservation and protection in their natural condition. . ."
- lands ". . . administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character. . ."
- land ". . .where the earth and its community of life are untrammeled by man." And to be land that retains its ". . . primeval character and influence . . . which is protected and managed so as to preserve its natural conditions . . ."
- land that appears ". . . affected primarily by the forces of nature, with the imprint of man substantially unnoticeable. . ." and ". . . has outstanding opportunities for solitude or a primitive and unconfined type of recreation. . ."
- land that "may also contain ecological, geological, or other features of scientific, educational , scenic, or historical value." And is ". . . devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use."

From: The Wilderness Act, Public Law 88-577, passed September 3, 1964.

Sequoia-Kings Canyon Wilderness:

- Designated by 1984 California Wilderness Act	=	723,036 acres
- Designated by 2009 Omnibus Public Land Management Act	=	45,186* acres
John Krebs Wilderness (from 2009 OPLMA)	=	39,740* acres
Total designated wilderness acres *(93.3% of park lands)	=	807,962 acres
Proposed Wilderness – managed as wilderness per NPS policies	=	~30,000 acres
Total designated or managed as wilderness (96.8% of park lands)	=	~837,962 acres

(Note: * denotes preliminary number of acres which may be slightly altered upon establishment of final wilderness boundaries)

For further reference on National Park and Wilderness Legislation and Policies, see:

- Act establishing Sequoia National Park, September 25, 1890 (and following acts)
- Act establishing Kings Canyon National Park, March 4, 1940 (and following acts)
- The National Park Service "Organic" Act, August 25, 1916
- The Wilderness Act, Public Law 88-577, September 3, 1964.
- The California Wilderness Act, Public Law 98-425, Sept. 28, 1984
- The Omnibus Public Land Management Act of 2009, Public Law 111-11, March 30, 2009
- National Park Service, Management Policies, 2006 – Chapter 6, Wilderness Preservation and Management

Note: These and other pertinent documents are posted for your review on the PEPC site at:
http://parkplanning.nps.gov/sekiwild Click on "Document List."

Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, CA 93271

Wilderness Plan Update

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ALTERNATIVES DEVELOPMENT

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National Park Service
U.S. Department of the Interior

Sequoia and Kings Canyon
National Parks

47050 Generals Hwy.
Three Rivers, CA 93271

559 565-3341 phone
559 565-3730 fax

Sequoia and Kings Canyon National Parks News Release

For Immediate Release: July 16, 2012
Contact: Dana Dierkes
Phone Number: (559) 565-3131 or (559) 679-2866 (cell)

National Park Service Will Seek Public Input in Development of Wilderness Stewardship Plan Alternatives for Sequoia and Kings Canyon National Parks Starting in October 2012

Sequoia and Kings Canyon National Parks, CA – Starting in early October, the National Park Service will be seeking public input on the preliminary draft alternatives for the Wilderness Stewardship Plan for Sequoia and Kings Canyon National Parks in Tulare and Kings counties, California. The National Park Service is interested in your ideas and feedback about alternatives to address future wilderness management at Sequoia and Kings Canyon National Parks. Topics which may be addressed in the plan include: day and overnight use; permitting and quotas; party sizes; campfires; food storage; camping and campsites; human waste management; pack stock and grazing management; scientific research; natural and cultural resource management; maintenance of signs, trails, bridges, and other recreational infrastructure; administrative infrastructure; education and outreach; the extent to which commercial services are necessary to fulfill the recreational and other purposes of wilderness areas; and front-country support facilities. Many of these topics were brought forward during the public scoping phase of the planning process, which occurred from April 11 to August 31, 2011.

To learn more about the process and how to comment, visit the National Park Service Planning, Environment, and Public Comment website (PEPC) at *http://parkplanning.nps.gov/sekiwild* and/or consider attending an upcoming workshop during the last two weeks of October to listen to a presentation by the National Park Service and meet with staff to discuss your ideas about alternatives or submit your comments. The schedule for the meetings is:

– continued on page 2 –

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[redacted]

– continued from page 1 –

Thursday, October 25, 2012
7:00 - 9:00 p.m.
Eastern Sierra Tri-county Fairgrounds
Patio Building
Sierra Street and Fair Street
Bishop, CA 93514

Friday, October 26, 2012
7:00 - 9:00 p.m.
Los Angeles River Center
California Building Atrium
570 West Avenue 26
Los Angeles, CA 90065

Monday, October 29, 2012
7:00 - 9:00 p.m.
East Bay Regional Parks
Redwood Regional Park
Richard C. Trudeau Training Center
Main Conference Room
11500 Skyline Blvd
Oakland, CA 94619

Tuesday, October 30, 2012
6:00 - 8:00 p.m.
Visalia Marriott Hotel
Main Ballroom
300 South Court Street
Visalia, CA 93291

– continued on page 3 –

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– continued from page 2 –

In order to ensure that your comments are considered, you may use either of two methods to comment during the alternative review process. If you wish to comment electronically, you may submit your comments online to the PEPC website by visiting http://parkplanning.nps.gov/sekiwild, clicking on "Open for Comment," and then clicking on the link to the document. The National Park Service encourages commenting electronically through PEPC, but if you wish to submit your written comments in hard copy (e.g., in a letter), you may send them by U.S. Postal Service or other mail delivery service, or hand-deliver your comments to Superintendent Karen F. Taylor-Goodrich, Sequoia and Kings Canyon National Parks, Attn: Wilderness Stewardship Plan, 47050 Generals Highway, Three Rivers, CA 93271. Faxed comments will be accepted at (559) 565-4202. Written comments will also be accepted during public workshops. Comments in any format (written or electronic) submitted by an individual or organization on behalf of another individual or organization will not be accepted. Anonymous comments will not be accepted.

It is the practice of the National Park Service to make all comments available for public review. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

For more information about Sequoia and Kings Canyon National Parks, visit www.nps.gov/seki.

–NPS–

SEQUOIA AND KINGS CANYON NATIONAL PARKS

Sequoia and Kings Canyon National Parks, which lie side-by-side in the southern Sierra Nevada in central California, serve as a prime example of nature's size, beauty, and diversity. With the world's largest trees (by volume), grand mountains, rugged foothills, deep canyons, vast caverns, and the highest point in the lower 48 states, it is a place that attracts 1.6 million visitors a year from across the U.S. and the world. Visitor activities vary by season and elevation. The majority of Sequoia and Kings Canyon National Parks, nearly 97% of the land or approximately 835,000 acres, is managed as wilderness, including the Sequoia-Kings Canyon and John Krebs wildernesses. For more information, visit www.nps.gov/seki or call 559-565-3341.

EXPERIENCE YOUR AMERICA

The National Park Service cares for special places saved by the American people so that all may experience our heritage.

Sequoia and Kings Canyon National Parks
California

Newsletter 2
October 2012

National Park Service
U.S. Department of the Interior

Wilderness Stewardship Plan and Environmental Impact Statement

Preliminary Draft Alternatives Newsletter

Planning for the Future of Sequoia and Kings Canyon National Parks' Wilderness

Dear Friends,

The National Park Service (NPS) is in the early stages of preparing a Wilderness Stewardship Plan (WSP) for Sequoia and Kings Canyon National Parks. Last spring and summer, we received more than 900 comments during the initial public scoping period for the WSP. We reviewed all of the comments and have identified topics which will be addressed in the WSP. For each of the key topics, we have developed preliminary draft alternatives.

Now, we are asking for your input. Please help us identify any topics that we have missed so that we can further refine the alternatives. Take a moment to read this newsletter, which provides a summary of the alternatives, and make sure to visit our planning website at http://parkplanning.nps.gov/sekiwild for a detailed description of each of the preliminary draft alternatives. We will be accepting your comments on the preliminary draft alternatives through November 19, 2012. Also, in late October, we will be conducting public meetings to provide additional information, and to listen to your concerns and questions. A complete meeting schedule is found on this page.

We value your feedback during this process and look forward to reading your comments on these preliminary draft alternatives.

Sincerely,

Superintendent *Karen F. Taylor-Goodrich*

Public Meetings

Thursday, October 25, 2012
7:00 - 9:00 pm
Eastern Sierra Tri-county Fairgrounds
Patio Building
Sierra Street and Fair Street
Bishop, CA 93514

Friday, October 26, 2012
7:00 - 9:00 pm
Los Angeles River Center
California Building Atrium
570 West Avenue 26
Los Angeles, CA 90065

Monday, October 29, 2012
7:00 - 9:00 pm
East Bay Regional Parks
Redwood Regional Park
Richard C. Trudeau Trainng Center
Main Conference Room
11500 Skyline Blvd
Oakland, CA 94619

Tuesday, October 30, 2012
6:00 - 8:00 pm
Visalia Marriott Hotel
Main Ballroom
300 South Court Street
Visalia, CA 93291

Next Steps in the Planning Process

Dates	Planning Activity
Fall 2012	Public Review of Preliminary Draft Alternatives
Winter 2012 - Fall 2013	Refine Draft Alternatives and Prepare Draft WSP/EIS
Fall 2013 - Winter 2014	Public Review of Draft WSP/EIS
Spring 2014	Analysis of Public Comment on Draft WSP/EIS
Summer 2014	Prepare Final WSP/EIS
Fall 2014	Release Final WSP/EIS
Spring 2015	Record of Decision

Purpose and Need for the Wilderness Stewardship Plan

The California Wilderness Act of 1984 designated wilderness in Sequoia and Kings Canyon National Parks. The Omnibus Public Land Management Act of 2009 designated the John Krebs wilderness and expanded wilderness acreage. Today, 808,079 acres of the two parks is designated as wilderness, with another 29,500 acres managed as wilderness in accordance with NPS policies. Since 1986, the wilderness management in the parks has been guided by the Backcountry Management Plan and Stock Use and Meadow Management Plan. The purpose of the new Wilderness Stewardship Plan (WSP) is to establish a framework for management of wilderness within Sequoia and Kings Canyon National Parks in order to preserve wilderness character and provide opportunities for access and use in accordance with the Wilderness Act and other laws and policies.

What is Wilderness Character?

Section 2(a) of the Wilderness Act of 1964 states that wilderness areas "shall be administered for *the use and enjoyment* of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, *and so as to provide for the protection of these areas, the preservation of their wilderness character…*" (emphasis added).

Federal wilderness managers have agreed on the meaning of wilderness character as defined in Keeping It Wild (Landres, et.al.), a 2008 document produced by an interagency panel. The qualities of wilderness character have been categorized as:

- Untrammeled - wilderness is essentially unhindered and free from the *actions* of modern human control or manipulation.
- Natural - wilderness ecological systems are substantially free from the *effects* of modern civilization.
- Undeveloped - wilderness retains its primeval character and influence, and is *essentially* without permanent improvement or modern human occupation.
- Solitude or primitive and unconfined recreation - wilderness provides outstanding opportunities for solitude *or* primitive and unconfined recreation.
- Unique - An individual wilderness may have unique qualities, such as archeological resources or historic structures whose contributions to wilderness values cannot be captured by the other four qualities.

Preserving wilderness character is our mission, by law and policy.

Actions Common to All Alternatives

Commenters brought forward a number of important issues. However, many are topics related to existing laws, regulations, and policies, or are actions that will be common across all alternatives. The following are examples of these topics:

- Education will be a component of all the alternatives. A separate wilderness education and interpretation plan would be developed.
- Cultural resources, including archeological sites, historic structures, and ethnographic resources, will continue to be managed in accordance with law, including the National Historic Preservation Act.
- Cooperative management with the adjoining U.S. Forest Service wilderness areas, and Yosemite National Park, will continue to occur.
- Existing regulations will remain in place (e.g. no hunting, no pets, no pack goats, no bicycles, no paragliding, no hang gliding, no base jumping, no marijuana cultivation, etc.).
- The protection of threatened, endangered, or sensitive species, and critical habitat, will be considered under each alternative.
- The NPS is developing a resource stewardship strategy for Sequoia and Kings Canyon National Parks that will recommend science- and scholarship-based approaches to achieve and maintain the desired conditions of the parks' natural and cultural resources.
- Sequoia and Kings Canyon National Parks are recognized for being at the forefront of advancing scientific research and the integration of knowledge gained from scientific inquiry into the management of wilderness resources. The WSP will support the continuation of scientific research in wilderness, using methods that preserve the qualities of wilderness character.
- The WSP will be linked to other ongoing or future planning efforts, such as the Cave Management Plan, Aquatic Ecosystem Restoration Plan, Climbing Management Plan, and the Resource Stewardship Strategy.

Zoning

The Wilderness Act and NPS policies provide the foundation for the management of wilderness. Zoning is a management tool that can be used to make distinctions in desired conditions and management actions in wilderness, while meeting the mandates of law and policy. The following four zones would be considered for the WSP (Figure 1).

Commercial Services

Through the WSP, a specialized finding of the extent of commercial services necessary (Extent Necessary Determination) to meet one or more of the purposes of wilderness will be completed. If commercial services are shown to be necessary, alternatives could include allowing existing commercial uses, reducing commercial uses, authorizing new types of commercial services, and restricting commercial services in certain zones or areas.

Preliminary Draft Alternatives

The preliminary draft alternatives are based on wilderness planning guidelines and public input during the scoping process. These preliminary draft alternatives were developed with a goal of maintaining or improving wilderness character while providing for a diversity of appropriate uses.

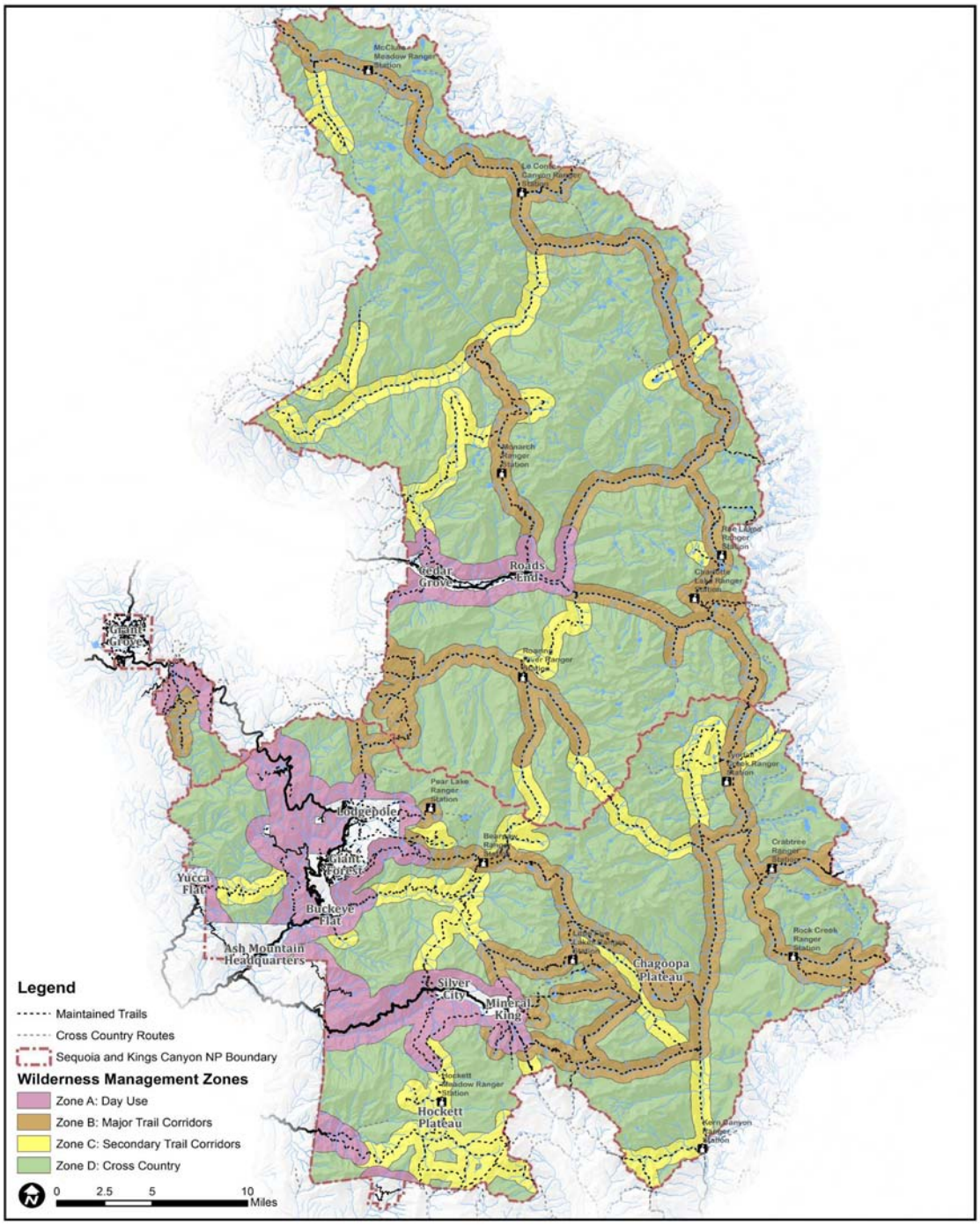
We encourage you to review the full description of the preliminary draft alternatives located on the web at: **http://parkplanning.nps.gov/sekiwild**. If you are unable to access these materials electronically, a CD or printed version of the information is available by calling (559) 565-3102.

Alternatives will be fully developed following analysis of public input received during the comment period, which ends on November 19, 2012. The alternatives and their descriptions are likely to change as public input is incorporated.

The refined draft alternatives will be presented for public comment as part of the draft WSP/EIS which is scheduled for release in early 2014. A preferred alternative for the WSP will be presented at that time.

Zone	Description
Zone A	Areas and trail corridors proximate to non-wilderness areas (within 1 mile of roads, and trail corridors within approximately 6 miles of the trailheads). Examples include the Mist Falls, Little Baldy, Watchtower/Heather Lake, and the Ladybug trail corridors.
Zone B	Includes high use major trail corridors and administrative and visitor developments, such as ranger stations, bridges, and food storage lockers. Trails are highly developed and regularly maintained. Examples include the John Muir, High Sierra, and Pacific Crest trail corridors.
Zone C	Includes lower use trail corridors that are generally less developed. There are fewer administrative and visitor developments. Examples include Taboose Pass to Bench Lake, Kennedy Canyon, and Upper Ranger Meadow to Elizabeth Pass trail corridors.
Zone D	Cross country areas that generally do not include administrative or visitor facilities. Examples include Miter Basin, Lamarck Col/Darwin Canyon, Baxter Pass, and New Army Pass to Mount Langley summit.

Wilderness Management Zones



Key Topics Addressed in the Preliminary Draft Alternatives

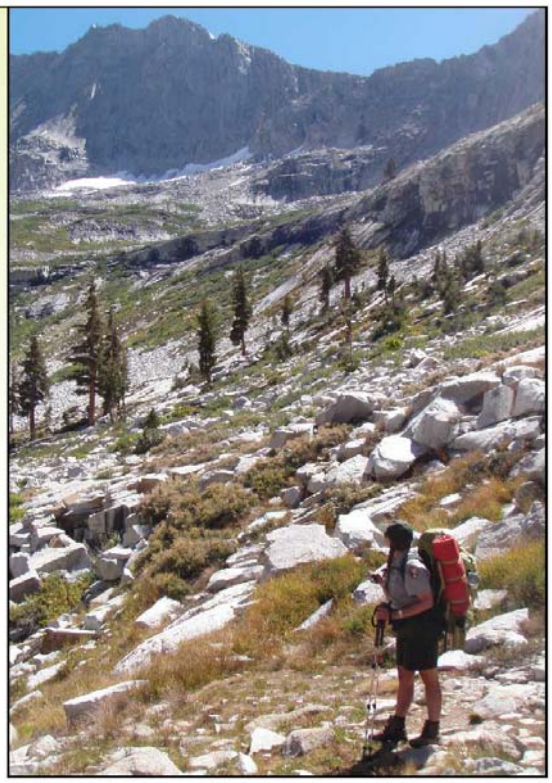
Permitting/Quotas
The NPS would develop specific entrance/ trailhead quotas. Destination quotas-- where the total number of visitors allowed at a particular location is limited-- would be considered for selected areas.

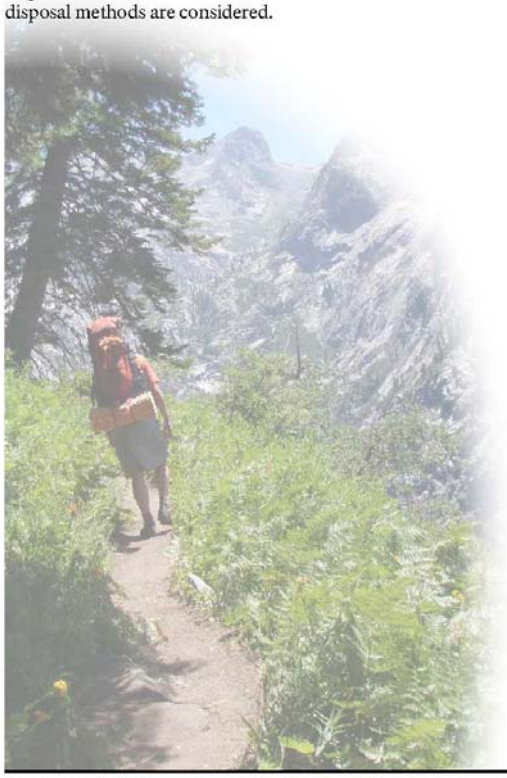
Trails/Bridges and Related Trail Structures, including Signs
A Trail Management Plan will be a component of the WSP. A trails classification system is being developed to guide the level of trail development, maintenance, and signing.

Campfires
The NPS currently restricts campfires for protection of down wood resources and for other ecological purposes. Elevational fire limits would be considered for resource protection.

Food Storage
Food storage requirements provide resource protection by preventing wildlife from obtaining human food. A range of alternatives is included to address food storage in wilderness.

Human Waste Management
Management goals related to human waste include protecting natural and cultural resources, reducing litter and health hazards created by improperly disposed of toilet paper, and increasing visitor knowledge of appropriate sanitation and toilet paper disposal in wilderness. Alternatives related to facilities and disposal methods are considered.





Party Size - People
The size of groups traveling and/or camping together would be managed to preserve opportunities for solitude and to reduce adverse impacts on the natural character of wilderness. A variety of options are explored.

Party Size - Stock Groups
The size of stock groups would be managed to preserve opportunities for solitude and to manage the impacts on wilderness character created by the number of stock and people traveling and camping together. The number of people, the number of stock, and the combined group size could be limited to manage impacts.

Campsites - Backpacker
Our goal is to provide opportunities for solitude or primitive and unconfined recreation, and to preserve the natural quality of wilderness character, while limiting development. Alternatives include removing, maintaining, and designating campsites.

Campsites - Stock Camps
The NPS will consider alternatives to address the issue of hiker and stock user conflict and to minimize impacts from stock camps to opportunities for solitude and the natural quality of wilderness. Options considered include establishing stock camps and requiring their use, recommending the use of previously used and established camps, and the removal and restoration of some stock camps.

Night Limits for All Campers (Stock and Backpackers)

Short-term night limits in high use areas would be considered in order to protect opportunities for solitude. Short-term night limits could be applied in areas close to trail heads, busy trail junctions, or at popular destinations. Long-term night limits would be established to ensure that individuals / groups do not establish semi-permanent camps thereby limiting opportunities for others.

Stock (horses, mules, burros, and llamas)

Alternatives consider constraints on stock travel for resource protection and to minimize conflicts between users.

Recreational and Administrative Grazing

Options for recreational and administrative grazing are considered, including expanding the existing meadow management program, setting elevational limits on grazing, and prohibiting grazing overall.

Administrative Support Facilities - Ranger Stations, Staging Areas, and Administrative Pastures

Ranger stations may include a tent platform or building and associated administrative facilities. Ranger stations may be used by other administrative functions, such as for resource stewardship, maintenance, and other purposes. Alternatives include keeping existing ranger stations, adding stations, or removing stations.

Administrative Support Facilities - Crew Camps

Crew camps are used by park maintenance, resource managers, and rangers to administer the wilderness. Camps may include core camping areas, fire pits, and food storage lockers. Options for managing crew camps are considered in the alternatives.

Other Facilities

Redwood Canyon Cabin and Cache: The Redwood Canyon cabin and cache is a structure in wilderness. It is currently used by a non-governmental organization to facilitate research in a nearby cave. Future options for this cabin are explored through the WSP.

Pear Lake Ski Hut (Ranger Station): The California Wilderness Act of 1984 and its accompanying House of Representatives Committee Report 98-40 (1983) provides for the continued winter operation of the Pear Lake Ski Hut, unless this non-conforming use is deemed to have unacceptable wilderness impacts. The area is categorized as a Potential Designated Wilderness Addition (PDWA) based on the non-conforming use of a commercial enterprise (winter ski hut operation). Options for the continuation or cessation of the ski hut operation are explored in the WSP.

Bearpaw High Sierra Camp: The Bearpaw High Sierra Camp is operated as a commercial enterprise in a PDWA per the California Wilderness Act (1984) and its accompanying House of Representatives Committee Report 98-40 (1983). The WSP will look at options for the continuation or cessation of the non-conforming commercial enterprise of the Bearpaw High Sierra Camp.

Hockett Plateau High Sierra Camp: The 2007 GMP called for the consideration of a new commercial high sierra camp on the Hockett Plateau. However, this option has been ruled out as a result of clauses in the 2009 Omnibus Act requiring the area to be managed as wilderness (Public Law 111-11, March 30, 2009, 123 STAT. 991).

Frontcountry Facilities to Support Wilderness Use

The development or modification of any frontcountry facilities that may support the use, enjoyment, and stewardship of wilderness would be evaluated in the WSP. Commercial services in the frontcountry that support wilderness use would be addressed after the Extent Necessary Determination is completed.

Page 6 • WSP Newsletter 2 • October 2012 For complete information visit http://parkplanning.nps.gov/sekiwild

Preliminary Draft Alternatives Overview

The following summary table is representative of what is included in the full matrix of alternatives found at: http://parkplanning.nps.gov/sekiwild

Topic	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
	No Action - Current management practices continue.	Accommodate increased visitor use while protecting wilderness character by allowing increased facilities for visitor and administrative support.	Protect wilderness resources by balancing visitor access, development, and restrictions.	Protect wilderness resources and reduce need for development by decreasing visitor access and increasing restrictions.	Substantially reduce development and protect wilderness resources by reducing visitor use and increasing restrictions.	Provide for the most unconstrained wilderness experience and protect wilderness by significantly reducing the number of visitors allowed.
Permits	Permits required for overnight use only	Permits required for overnight use only	Permits required for overnight use only	Permits required for day and overnight use	Permits required for day and overnight use	Permits required for day and overnight use
Quotas: Entry	No Change to existing trailhead quotas	Quotas would increase for some trailheads	Quotas would remain mostly unchanged except in high use areas	Quotas decreased at some higher use trailheads	Quotas decreased at most trailheads	Quotas decreased at all trailheads
Quotas: Destination	Some destination quotas exist in popular areas	More destination quotas could be added	More destination quotas could be added	More destination quotas could be added	More destination quotas could be added	No destination quotas
Campfires	Campfires prohibited above 10,000' in KICA and 10,400' in SEQU (and lower in specific locations)	Campfires prohibited above 10,400'(and lower in specific locations)	Campfires prohibited above 10,000' in KICAA and above 8,500' in SEQU	Campfires prohibited above 8,500' wilderness-wide	Campfires prohibited wilderness-wide	Campfires allowed in all areas except Zone A
Food Storage: Requirements	Containers required in some areas	Containers required in some areas	Containers required in some areas	Containers required for all overnight users	Containers required for most overnight users	Self-determined, appropriate food storage required
Food Storage: Lockers	Food storage lockers are present in many locations	Some food storage lockers would be added	Existing food storage lockers would be maintained or some removed	All food storage lockers would be removed	All food storage lockers would be removed	All food storage lockers would be removed
Party Size	Day use limit is 25, overnight limit is 15, stock limit of 20	Party sizes increased	Party sizes mostly unchanged	Party sizes decreased from current limit	Party sizes decreased from current limit	Party sizes decreased from current limit
Stock Use: Access	Stock allowed on most trails	Stock allowed on most trails	Some areas closed to stock	Some areas closed to stock	No stock access in Zone D	Most areas open to stock
Stock Use: Grazing	Grazing is allowed in selected meadows while other meadows are closed to grazing	Some additional meadows may be opened to grazing by small stock parties	Elevation limit established for grazing, but some grazing allowed below elevation limit	Elevation limit established for grazing, but some grazing allowed below elevation limit	No grazing allowed	Few grazing restrictions

National Park Service
U.S. Department of the Interior

Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9700
http://parkplanning.nps.gov/sekiwild

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Sequoia and Kings Canyon National Parks

California

Newsletter 2
October 2012

National Park Service
U.S. Department of the Interior

How to Comment

There are several ways to provide comments:

- Access additional information and provide comments online at: http://parkplanning.nps.gov/sekiwild;
- Attend the public meetings; or
- Mail or fax comments to:

Karen F. Taylor-Goodrich, Superintendent
ATTN: Wilderness Stewardship Plan Preliminary Draft Alternativess
Sequoia and Kings Canyon National Parks
47050 Generals Highway, Three Rivers, CA 93271-9700
Fax: (559) 565-4202

The comment period for the preliminary draft alternatives ends on November 19, 2012. Before including your address, phone number, e-mail address, or other personal information in your comment, you should be aware that your entire comment – including your personal identifying information – may be publicly available at any time. Comments made by individuals or organizations on behalf of other individuals or organizations will not be accepted.

Questions to Consider

Is this a sufficient range of alternatives?

Have we missed any key topics?

What do you like about the alternatives?

Are there specific elements that should be changed? If yes, how would you change them?

For complete information visit http://parkplanning.nps.gov/sekiwild

United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, California 93271-9651
(559) 565-3341

IN REPLY REFER TO:
1.A.1 Permanent

October 3, 2012

David Alvarez, Chairperson
Traditional Choinumni Tribe
2415 East Houston Avenue
Fresno, CA 93720

Dear Chairperson Alvarez:

As you may be aware, we are in the process of preparing a Wilderness Stewardship Plan for Sequoia and Kings Canyon National Parks. Last spring and summer, we conducted public scoping and offered to meet with area tribes to discuss your concerns and issues. We received more than 900 pieces of correspondence during this initial scoping period. We were able to meet with several tribal representatives during this period. Many people brought forward substantive issues and topics which provided us with information we needed to develop preliminary draft alternatives. We now are seeking your input on these alternatives.

The preliminary draft alternatives newsletter is attached. The newsletter provides you with a summary of the alternatives; for more comprehensive information, please visit our planning website at: http://parkplanning.nps.gov/sekiwild.

We are available for government-to-government consultation with your tribal group or organization if you wish to discuss the Wilderness Stewardship Plan. We would be happy to make a presentation at an upcoming tribal meeting at a location of your choosing, and to talk about your issues and concerns.

To schedule a meeting, please contact Wilderness Coordinator Gregg Fauth at (559) 565-3137 (email at gregg_fauth@nps.gov) or Cultural Resources Program Manager, David Humphrey (559) 565-3139 (email at dave_humphrey@nps.gov). We look forward to working with you on this and other future planning efforts.

Sincerely,

Karen F. Taylor-Goodrich
Superintendent

Identical letter sent to the following area tribes, tribal organizations, or tribal representatives.

Chairperson David Alvarez
Traditional Choinumni Tribe
2415 East Houston Avenue
Fresno, CA 93720

Tribal Chairwoman Donna Begay
Tubatulabals of Kern Valley
P.O. Box 226
Lake Isabella, CA 93240

Vice Chair Richard Button
Lone Pine Paiute-Shoshone
P.O. Box 747
Lone Pine, CA 93545

Chairperson Delia Dominguez
Kitanemuk & Yowlumne Tejon Indians
981 N. Virginia
Covina, CA 91722

Chairperson Ron Goode
North Fork Mono Tribe
13396 Tollhouse Rd.
Clovis, CA 93619

Chair Melvin R. Joseph
Lone Pine Paiute-Shoshone Reservation
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Lone Pine, CA 93545

Board Chairperson Mandy Marine
Dunlap Band of Mono Indians
P.O. Box 18
Dunlap, CA 93621

Chair Israel Naylor
Fort Independence Paiute Indians
P.O. Box 67
Independence, CA 93526

Chair James Ramos
San Manuel Band of Mission Indians
26569 Community Center Dr.
Highland, CA 952346

Chairperson Rosemary Smith
The Choinumni Tribe of Yokuts
1505 Barstow
Clovis, CA 96311

Chairman Raymond Andrews
KutzadikaA Indian Community Cultural Preserve
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Bishop, CA 93515

Chair Elaine Bethel-Fink
North Fork Rancheria of Mono Indians
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North Fork, CA 93643

Chairman John Davis
Kings River Choinumni Farm Tribe
1064 Oxford Avenue
Clovis, CA 93612-2211

Chair Ryan Garfield
Tule River Indian Tribe
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Tribal Historic Preservation Officer Bill Helmer
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Chairperson Charlotte Lange
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Big Pine, CA 93513

Chairperson Robert Marquez
Cold Springs Rancheria of Mono Indians
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Tribal Historic Preservation Officer Matthew J. Nelson
Bishop Paiute Tribe
50 Tu Su Lane
Bishop, CA 93514

Co-Chairperson Robert Robinson
Kern Valley Indian Community Tribal Council
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Weldon, CA 93283

Vice-Chair William Vega
Bishop Indian Tribal Council
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Bishop, CA 93514

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Santa Rosa Rancheria
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Lemoore, CA 93245

Chairperson Lawrence Bill
Sierra Nevada Native American Coalition
P.O. Box 125
Dunlap, CA 93621

Chairman Dale Delgado Jr.
Bishop Paiute Tribe
50 Tu Su Lane
Bishop, CA 93514

Tribal Council Chairman John L. Glazier
Bridgeport Paiute Indian Colony
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Bridgeport, CA 93517

Chairperson Elizabeth Hutchins-Kipp
Big Sandy Rancheria of Mono Indians
P.O. Box 337
Auberry, CA 93602

Chair David Laughing Horse Robinson
Kawaiisu Tribe
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Chairperson Virgil D. Moose
Big Pine Paiute Tribe of Owens Valley
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Big Pine, CA 93513

Chairperson Neil Peyron
Tule River Indian Tribe
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Porterville, CA 93258

Chairperson Jake Saulque
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567 Yellow Jacket Rd
Benton, CA 93512

Chair Leanne Walker-Grant
Table Mountain Rancheria
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Friant, CA 93626

Chair June Walker-Price
Kern Valley Indian Community Tribal Council
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Lake Isabella, CA 93240

Chairperson Mary Wuester
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Lone Pine, CA 93545

Chair Susan Weese
Wukchumni Tribal Council
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Visalia, CA 93292

Chairperson Ken Woodrow
Eshom Valley Band of Indians / Wuksache Tribe
1179 Rock Haven Court
Salinas, CA 93906

Appendix H

Wilderness Information and Education Strategy

ON THE PREVIOUS PAGE
Hamilton Lake
NPS Photo

APPENDIX H:

WILDERNESS INFORMATION AND EDUCATION STRATEGY

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WILDERNESS INFORMATION AND EDUCATION STRATEGY

Nearly 97% of Sequoia and Kings Canyon National Parks is designated or managed as wilderness. To experience these parks is to encounter, directly or indirectly, one of the world's premiere wilderness areas. To work for these parks is to serve the missions of both the parks and the wilderness.

Information and education have long been recognized as some of the most effective tools available to meet these missions and support visitor experiences. In this document, the term *education* includes not only curriculum-based work with schools, but also other forms of information sharing done by these parks, such as interpretation, orientation, and outreach.

The parks' staff uses all these techniques to communicate about the many aspects of wilderness: its preservation, the experiences it offers, and its benefits to society. Recognizing that the word wilderness means many things to many people, the parks strive to teach by example and to learn from others. When possible, the parks work to adjust the level, complexity, and type of information shared in order to reach audiences with different characteristics: age, familiarity with relevant concepts and topics, wilderness experience, goals, and interests. The parks offer different levels of participation and connection with wilderness.

This strategy was developed in 2014 in support of the parks Wilderness Stewardship Plan. It is designed to support ongoing efforts to improve, update, and develop new ways to connect with the public about wilderness, and to expand the demographics of the audiences with whom the parks connect regarding wilderness. It is a flexible document, open to revision through trial and error, evaluation, and changing techniques, conditions, or priorities.

STATUS OF CURRENT EFFORTS

A variety of the parks' work groups and programs participate in educating the public and other employees of the parks about wilderness. The Wilderness Office and rangers take the lead with overnight wilderness users, while the interpretive division focuses on wilderness day users, other visitors of the parks, students, and outreach to people outside the parks. They connect with thousands of people every day. These and other efforts of the parks are echoed and magnified by maintenance crews, resource management staff, concession office staff, law enforcement, the parks' partners, volunteers, and many others who are committed to constant improvement of wilderness stewardship by one and all.

An old saying may be applied to wilderness: "We conserve what we love. We love what we understand. We understand what we are taught."

As a result, many products already in use in these parks offer information on wilderness guidelines, options, values, and experiences. The sharing takes place one-on-one, through visitor and student programs, and via a variety of materials: handouts, exhibits, trailhead panels, webpages, slide shows, and films (see *Existing Products and Techniques*, below).

To date, this effort has made a difference on the ground: Conditions in the wilderness have improved over the past 30 years, based largely on visitor response to concerted efforts by wilderness rangers and others to encourage minimum-impact techniques (see "Campsite Condition" in the "Wilderness Character" section of "Chapter 3: Affected Environment," in the WSP/FEIS).

PURPOSE AND NEED FOR A STRATEGY TO ENHANCE CURRENT EFFORTS

The term "wilderness" encompasses an array of landscapes, laws, philosophies, ideals, and experiences. It offers recreation, inspiration, a sense of belonging, solitude, challenge, self-reliance, connections to nature, scenic beauty, and risk. Every visitor meets wilderness on its own terms, and for their own purposes. Helping people, including those who have not yet experienced wilderness, to understand and appreciate the factors that may contribute to *their* relationship with wilderness calls for an equally broad array of tools and techniques for sharing information.

Wilderness in these parks and other areas add value to the shared society, economy, and future, even for those who never set foot in it. Because of this, wilderness needs current and future stewards, people who care about and care for it. It needs people of all ages, varying backgrounds, diverse cultures, and different knowledge and experience who will champion wilderness in a variety of ways. This calls for ongoing efforts to broaden ways in which to connect with people about wilderness and to expand the number and kinds of people who connect to it. It calls for exploring wilderness as a value, not just as a regulated environment.

Another way to reach more and different people is by increasing the number and type of employees who have and can confidently share information about it. Many policy documents direct this effort (see the "References" section, below), including:

> **Director's Order #41.** Wilderness Stewardship (2013) – Staff education is an integral part of wilderness stewardship. Therefore, wilderness awareness training will be incorporated into all appropriate training programs for park staff, including seasonal staff, cooperating association employees, concessions employees, and volunteers.

Visitor understanding of and compliance with their roles in wilderness stewardship is also critical to successful management. Wilderness management, however, is a complicated balance of laws, uses, protection strategies, and changing conditions. This strategy can help the parks' staff to tease out the information needed to enhance understanding by their employee and public audiences. By following a series of steps, those park divisions with operational plans that touch on some aspect of wilderness can identify audiences, messages, and methods for imparting information that is critical to their work and related aspects of wilderness.

This strategy is designed to assist development of new information that includes any changes due to adoption of the Wilderness Stewardship Plan as well as refining existing informational materials in order to enhance wilderness stewardship among employees, partners, visitors, and the general public – both traditional supporters and those unfamiliar with wilderness. The strategy aims to support the following goals and desired outcomes:

GOALS

The goal of this strategy is to enhance understanding, enjoyment, and stewardship of wilderness – and its benefits – in a broad range of audiences. More specifically:

- Diverse people feel welcomed and encouraged to connect with wilderness.
- People have incremental, progressive opportunities to discover the value and meaning of wilderness for themselves, in ways that are appropriate to their interests and abilities, and that offer varied levels at which to participate at a rate with which they are comfortable.
- Visitors and staff understand and support wilderness as an important facet of the parks' landscape, experience, and management.
- Wilderness condition and visitor experience improve due to increased understanding and stewardship by visitors, commercial-service users, and staff.

A visitor reads a wayside titled "Wilderness" at Panoramic Point in the Grant Grove area of Kings Canyon National Park.

DESIRED GENERAL OUTCOMES

- All employees have easy access to correct information about wilderness and their role in its management.
- Employees embrace the opportunity to learn and share information about wilderness. They know where to find information for themselves, and where to direct others for additional information.
- All employees welcome a wide variety of people to experience wilderness directly or indirectly.
- Each work group provides their contacts with information in varied formats and levels of detail.
- Employees of the parks integrate wilderness stewardship into their jobs and communicate that with coworkers and visitors.
- Visitors and staff recognize and endorse the characteristics of wilderness that call for human restraint, self-reliance, and personal responsibility, and make informed choices regarding their use of, support for, and work in wilderness.
- Visitors and staff have an increased understanding of issues affecting wilderness, in particular, aspects of climate change.

SPECIFIC DESIRED OUTCOMES

- Staff provide information on the spectrum of appropriate uses in wilderness.
- Visitors recognize the spectrum of legal uses in wilderness. The result: they experience neither conflict nor decreased satisfaction when they encounter uses different from theirs but will report illegal uses to a ranger.

- Trail crews, rangers, fire crews and monitors, contractors and researchers, resources staff, volunteers, and others working in wilderness continue to share information with visitors they encounter and explain the wilderness-protection measures that influence their tasks.
- Fire, law enforcement, compliance, and resource/research staff use and communicate the minimum-requirement concept as a positive means for preserving and managing wilderness.
- Concessions Office staff provide current and potential concessioners, contractors, permittees, and commercial use authorization holders with information that clarifies the positive aspects of the parks' requirements and invites them and their clients to partner with the parks in wilderness stewardship.
- Interpretive and educational programs and outreach efforts continue to reach diverse audiences across a range of ages regarding the values and characteristics of wilderness. The parks increase cooperation with organizations to exchange information about shared wilderness trails and visitors (e.g., neighboring wilderness-management agencies, the Pacific Crest Trail Association [PCTA], the John Muir Trail Association [JMTA], and Yosemite National Park).
- Work groups and the public learn and adapt to changes in wilderness management that result from adoption of the Wilderness Stewardship Plan.

THE STRATEGY

In 2013, the parks used a survey to determine the level of knowledge that employees have on wilderness topics. The results of that survey are helping the parks to assess needs for training, experience, or access to information about wilderness. By reviewing the survey results and using the following strategy, work groups can improve how they integrate wilderness information into their jobs and share it with the public.

When initiating or creating any operational plan or SOP, every division should consider whether it has a wilderness component that calls for sharing information about that aspect of the plan:

1) Does this plan or operating procedure connect in any way to wilderness on the ground, administratively, or in concept? If so:
2) **Identify audiences** (public, partner, and park) that need or would benefit from wilderness information related to this planning effort.
3) **Identify work groups,** cooperators, and partners that serve those audiences.
4) **Identify information and messages** that each group needs for each of their audiences.
5) **Develop materials and methods** to meet these informational needs.
6) **Make materials available**, readily and widely, in a variety of formats.
7) **Train employees to use new communication technologies** as appropriate and as technologies become available.
8) **Develop and submit proposals for projects** that advance the effort to develop another generation of wilderness stewards, in the parks and in the public.

Note: Items 2, 3, and 4 may be interchangeable, depending on the planning process underway.

Trailhead orientation, safety and minimum-impact guidelines, plus a touch of inspiration, welcome a visitor at Road's End in Kings Canyon National Park.

USING THE STRATEGY

This strategy supports each work group in reviewing and improving the ways in which they:

- provide wilderness information and management;
- integrate wilderness information into their planning efforts as appropriate;
- develop and provide correct, thorough, and audience-appropriate materials;
- train their employees to use this information; and
- make information widely available to current and potential audiences/contacts.

It calls on each division to be alert to changing conditions – different audiences, resource conditions, wilderness uses, planning efforts, changes in funding or staffing – and to adapt the wilderness information that needs to be dispersed and how best to accomplish that.

It also involves helping people to imagine different aspects of wilderness – to sense its challenge and space, to appreciate its values to the world downstream, to comprehend what it offers to science and education, to embrace the need for self-reliance. To accomplish this, employees are urged to add interest and images to the facts they can offer.

A challenge to incorporating some technologies to enhance information availability involves the minimal amount of connectivity in the parks. The parks expect to be able to incorporate some of these options over time thanks to both local and the parks' efforts to increase internet and telephone access and bandwidth, and to changing technology.

FOR ASSISTANCE

The Division of Interpretation, Education, and Partnerships, as well as the Wilderness Office, are committed to contacting work groups that have connections to wilderness in order to help them implement this strategy and propose needed materials. Also available to help groups to direct their improvement are the results of the survey on employee knowledge of wilderness, conducted in 2013.

The following serve as reference for divisions or work groups to use or build on as they implement the strategy in their operational planning:

1) Identify Audiences —The term audience refers to any group with whom the parks exchange information. They may be visitors, clients, partners, subjects of SARs, cooperators, donors, and other individuals or groups.

> A note about diversity from the *NPS Wilderness Education and Partnership Plan*:
> Ensuring outreach education for diverse and multicultural audiences is a priority…. The relative lack of minority involvement in wilderness has been identified as a complex problem arising from economic, cultural, and social factors. …Sequoia, Kings Canyon, and [other parks in California] already offer significant wilderness outreach programs and partnerships specifically targeted to culturally diverse students.

It is important to note that many of the audiences in and living near the parks are immigrants and the children of immigrants. These parks will seek to continue these efforts and increase outreach to even more audiences, including those who never have or are unlikely to experience wilderness. Questions for work groups to consider should include: Do the parks have some materials that address the needs of or provide benefit to all these groups? Do materials need to be available in other languages?

Audiences with whom work groups may interact: These are not only audiences for wilderness information but may be important partners in sharing wilderness-stewardship goals with other audiences:

- Staff of the parks: permanent and temporary
  - Wilderness rangers and crews
  - Interpreters
  - Staff with public contact
  - Staff without regular public contact
- Cooperators/partners:
  - With public contact
  - Others
- Volunteers
- Researchers in wilderness
- Neighboring agencies
- Commercial-use licensees
- Frontcountry concessioners
- Wilderness concessions operations
- Visitors encountered in wilderness:
  - started from the parks' trailheads
  - Started outside the parks' boundaries
- Non-government organizations and partners (including friends groups that work with the public, mass media, and elected officials) (e.g., PCTA and JMTA)
- Special permit requesters:
  - Commercial film permits, events, human-ash dispersal, etc.
- Parks' visitors not going to wilderness
- Other publics, including:
  - Students, teachers
  - Wilderness advocates; Non-supporters
- Neighboring property owners
- Other local residents
  - Cabin permittees, inholders
- Local businesses
- Media outlets
- Wilderness visitors – planning a trip in advance and those ready to leave on a trip:
  - Day-hikers; Long-trippers: PCT, JMT
  - Backpackers; Stock users
  - Solo travelers
  - Informal groups; Formal groups
  - Seeking commercial assistance: guides, stock, shuttles
- Those needing permit variances

2) Identify Work Groups Involved —The work of every division relates in some way to wilderness. Work groups know that results improve and work is more satisfying when the audiences they serve have the wilderness information they need. (See "Specific Desired Outcomes" section, above.)

3) Identify Information and Messages — Consider:
What wilderness information do you need to perform your job successfully? What information do you wish your audience had?

What information or insight would improve your audience's satisfaction, safety, understanding, or stewardship? Can the information be offered at varied levels: does everyone need it all?

Types of information and messages:

- Permit information
- Other regulations and policies
- Commercial activity in wilderness
  - filming in wilderness
- The job you do in wilderness (staff)
- Safety – personal responsibility:
  - travel techniques
  - weather conditions
  - sanitation/health
  - fire danger
- The basic concept of wilderness
  - wilderness characteristics and qualities
  - best management practices for protecting each of the qualities
- Use of or reliance on the rapidly evolving suite of electronic equipment available
- Trail and travel options and conditions, including the new trail-classification system
- Ecological/environmental conditions
- Food:
  - storage: regulations, techniques, planning for long-distance travel
  - packaging
- Resources: natural and cultural
  - exotics
  - dark night skies: value/protection
- Sharing wilderness with other users
  - wilderness etiquette
  - climbing/peak registers
- Minimum impact / Leave No Trace©
- Fire use

Researchers in wilderness are an example of a group that could be encouraged to share information with visitors they encounter:

What are they studying and why? How do they operate in order to minimize their impacts on wilderness character? Will what they learn influence wilderness management?

These soil cores taken by this researcher are part of the first-ever inventory of soils in the parks.

Consider the benefits of sharing information pertaining to wilderness values other than recreation. Examples of important aspects of wilderness that are of significance to society include:

- Ideas behind the National Wilderness Preservation System;
- Economic/ecological benefits for communities (e.g., ecosystem services, property values);
- Opportunities to enjoy wilderness vicariously;
- Non-recreational purposes of wilderness: scenic, scientific, geological, educational;
- Observed and potential effects of climate change in wilderness;
- Wilderness as a natural laboratory;
- Wilderness influences on U.S. history, character, and culture;
- Cultural values associated with wilderness values and resources such as good air quality, dark skies, scientific discovery and history, challenge, personal freedom, and more.

Messages are most successful when they are accompanied by description, images, and the reasons for regulations. Consider what might help your audience to "get" your message.

At the wilderness-permit desk in Grant Grove, a child proudly displays Junior Ranger badges earned at many parks – a wilderness steward in the making.

In addition, there are many messages that shared by the parks' employees that have less obvious connections to wilderness: water and air quality, wildlife habitat, dark skies and natural soundscapes, archeology and cultural resources, the parks' histories, and many more. One of the goals is to look for ways to point out these connections to the parks' audiences.

Timing of messages: For each audience, there may multiple opportunities for contacting them, and good reasons for using more than one opportunity. In determining how and when to reach each audience, consider which of the following should be addressed:

- Before arrival
- In the frontcountry
- In the wilderness
- Post-wilderness visit while still in park
- Post-visit after leaving the park
- At any time
- Special events (e.g., 50th anniversary of the Wilderness Act, anniversary of the designation of the parks' wilderness areas, the centennial of NPS)

4) Develop Materials and Methods — Consider how best to dispense information at different times and locations. Consider possible barriers to communication: age, language, depth of understanding about wilderness, lack of exposure to the concept of wilderness, and so on. Work with the Division of Interpretation and/or the Wilderness Office to fine tune what is needed.

How would your messages be best communicated? Consider:

- Staff trainings
- With permits: wilderness, research
- Written
- Spoken
- Handouts, postings, or signs
- Trailhead panels
- Interpretive/orientational exhibits:
- Indoors / Outdoors
- Travelers Information Station (TIS) broadcast (radio 1610 in SEKI)
- News releases, other media events
- Outreach activities
- In a classroom or on a field trip
- Through another entity:
  - Concessioners,
  - Commercial use licensees
  - Partners/SNHA
  - Neighboring agencies
  - Organizations of wilderness users
- With contracts
- Wilderness concessions operations
- General visitors of the parks
- Online / internet:
  - Is a new webpage needed?
  - Are new links between pages needed?
  - Webcast, podcast

Existing training and materials: Find out what is already available for SEKI. Consider using or adapting existing materials, references, and trainings. Many options are available at low or no cost (see the "Existing Training and Materials" section below).

5) Make Materials Available —

- Identify the outlets for your materials. Make your information widely available. Most information developed can be made available in some format online; check with the Division of Interpretation.
  - What other forms of technology might carry your messages successfully?
  - Develop standard operating procedures that include:
    - Updating materials on a regular basis
    - Distributing them to the outlets identified
    - Maintaining supplies.
    - Including them in annual trainings.

EXISTING TRAINING AND MATERIALS

Many options are available at low or no cost from reliable sources. The Wilderness Office, interpreters, wilderness rangers, and the Sequoia Natural History Association (SNHA – an important partner in these parks) use a number of these consistently for staff training:

- **Wilderness: Gateway to National Park Service Wilderness** (http://wilderness.nps.gov/):
  - Wild soundscapes in the national parks
  - Wilderness education and partnership plan
  - K – 12 Wilderness and Land Ethic Curriculum
  - Wilderness education plans toolbox
  - Wilderness Views: interactive multimedia program with accompanying curriculum
- **Arthur Carhart National Wilderness Training Center (http://carhart.wilderness.net/),** managed by four federal land-management agencies that manage wilderness. These are used regularly by the parks' Wilderness Office:
  - Wilderness Stewardship:
    - Classroom Courses
    - Online Courses
    - Webinars
    - Core Competencies
  - Wilderness Information Resources: online tools for the natural resource workforce, scientists, educators, students, and the public
    - Wilderness.net
    - Print Resources and Products
    - National Wilderness Preservation System Displays
  - Wilderness Education Resources: online educational materials designed to increase public awareness, knowledge, and understanding of wilderness heritage
    - Outdoor Explorers Mentoring Program
    - Distance Education Courses
    - K-12 Curriculum
    - WildLink Project
    - DVD Technical Assistance
- **Eppley Institute for Parks and Public Lands (http://eppley.org) –** at Indiana University, in partnership with NPS. Online and classroom courses: some are free, others are low cost. Carhart Training Center and Wilderness.net also offers some of these courses. Courses include:
  - Understanding American Wilderness
  - Natural and Cultural Resource Management in Wilderness (multiple courses, also on DOILearn)

Some wilderness enthusiasts start young, but many discover it a bit later in life – sometimes with help from a park employee.

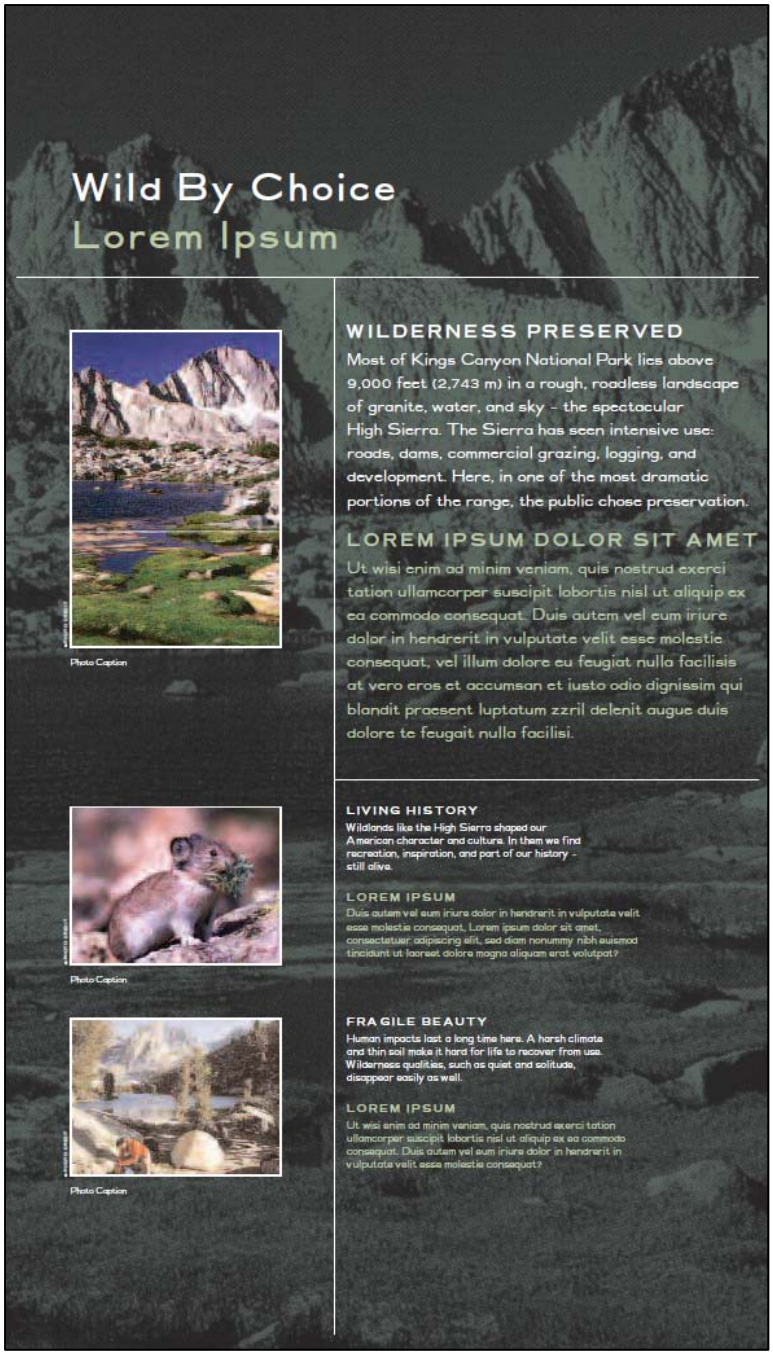
- **Wilderness.net:** Connecting federal employees, scientists, educators, and the public with their wilderness heritage (http:www.wilderness.net) – public wilderness-information website based on a collaborative partnership between federal land-management agencies that manage wilderness and the University of Montana:
  - Interagency Classroom Training Courses, including
    - Interagency Wilderness Interpretation & Education Training: Action Planning for the 50th Anniversary and Beyond
    - Regional Wilderness Stewardship Course
  - Online Courses (many are free), including:
    - Wilderness Act
    - Writing a Minimum Requirements Analysis
    - Natural Resource Management in Wilderness (also on DOILearn)
  - K – 12 Educational Resources and websites for educators, including:
    - Wilderness Investigations
    - Outdoor Explorers Mentoring Program
    - WildLink
    - Wilderness and Land Ethic Curriculum
    - Wilderness Views and Teacher Resources
- **DOI Learn (http:www.doi.gov/doilearn) –** U.S. Department of the Interior website links to catalog that includes trainings on wilderness planning, management, resources, interpretation, safety, and first aid. A number of the courses are also offered by the Carhart Center, Eppley, and Wilderness.net.

EXISTING PRODUCTS, TECHNIQUES, AND EXAMPLES

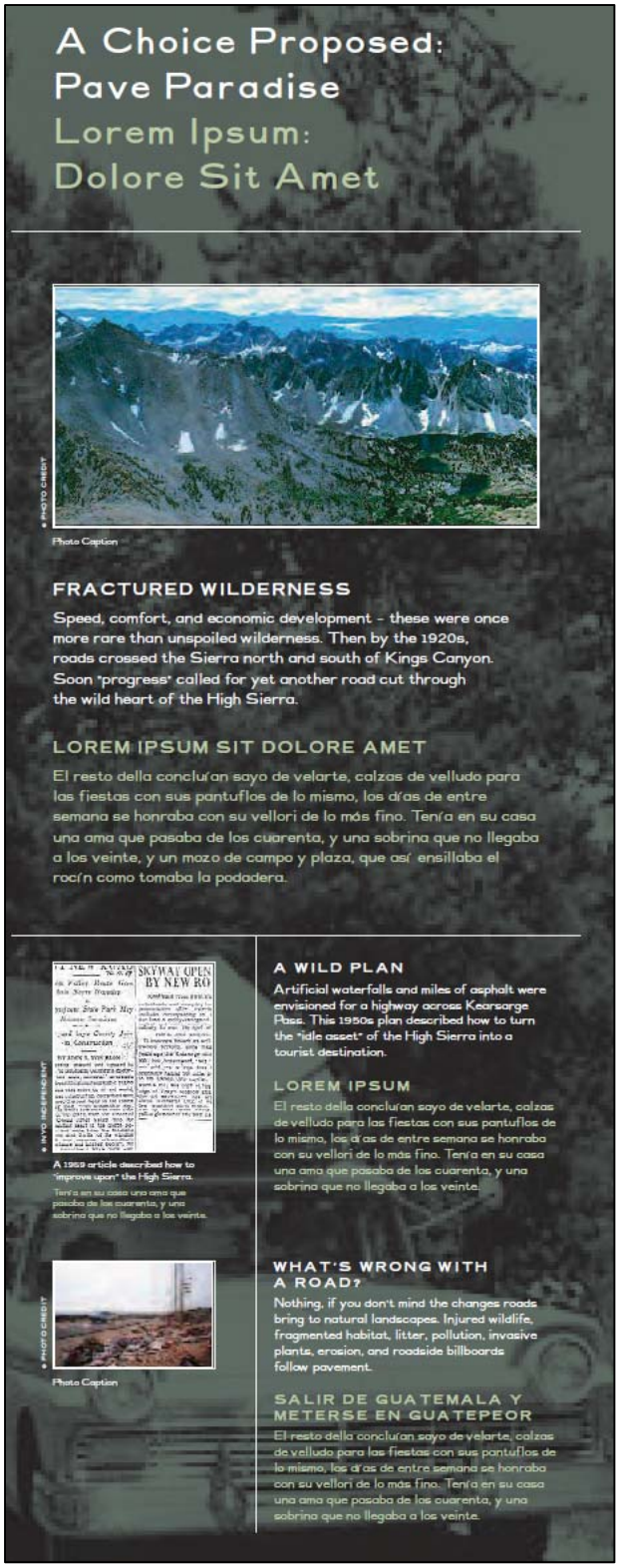
The parks already share many messages on wilderness, wild places, and related values throughout the parks. The following provides a starting point for additional efforts:

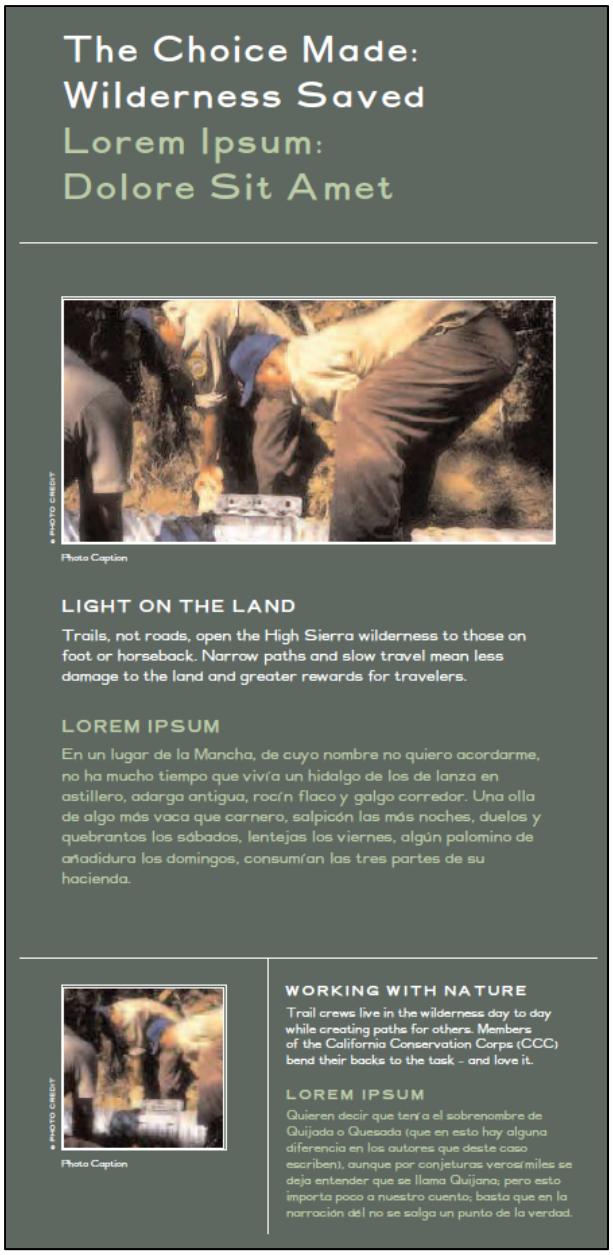
EXHIBITS – INDOORS, WITHIN THE PARKS

- **Kings Canyon Visitor Center**: These bilingual exhibits highlight wilderness as an identifying aspect of Kings Canyon National Park, and explore choices that society made in order to preserve it. (Note: The second language shown is place-holder text. Spanish was added before installation.)



Visitor Center, *continued*: One panel explores what might have been on one side, and current management on the other.

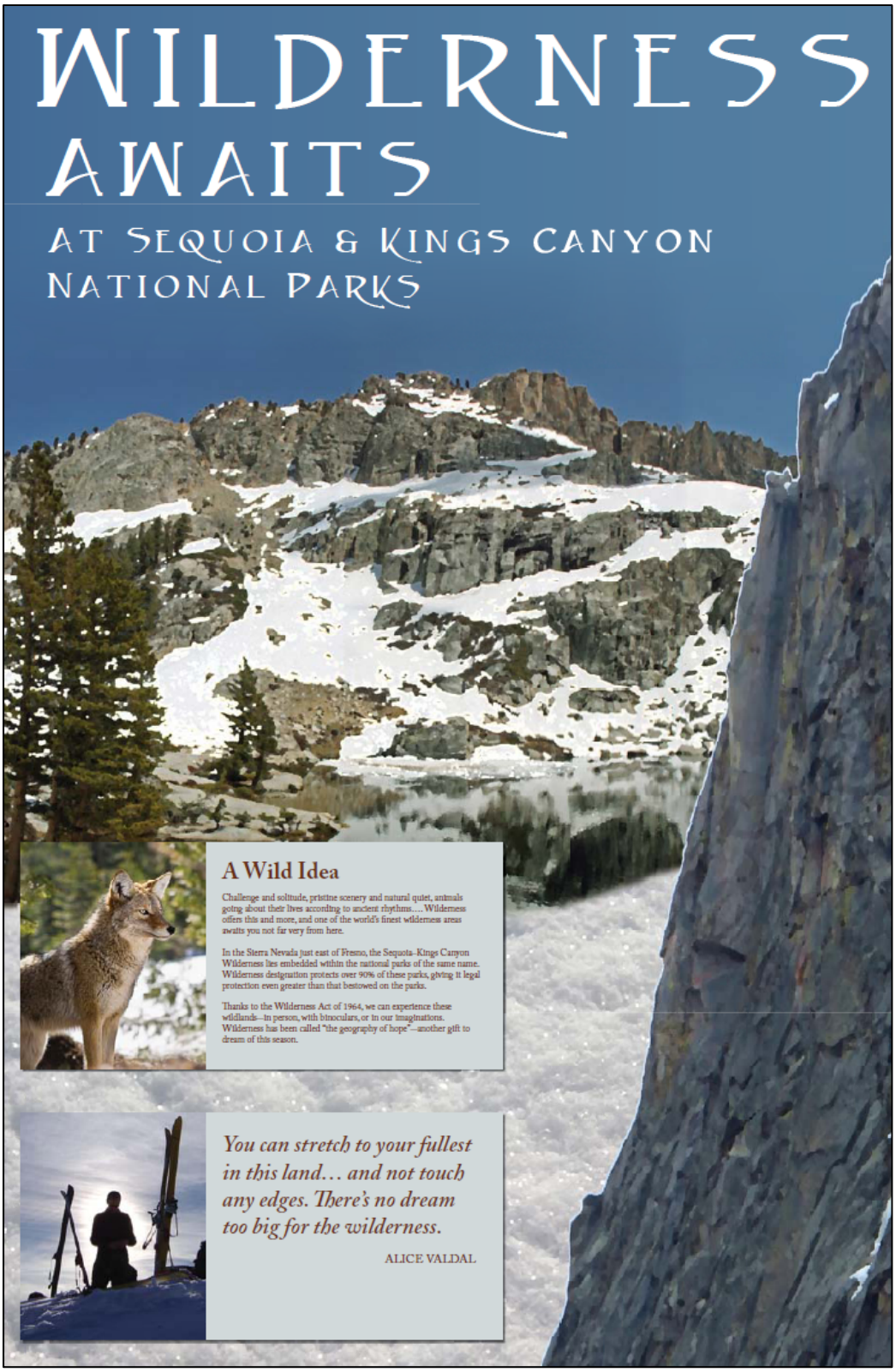




Visitor Center, *continued*: Another exhibit in the visitor center offers two journals: one from early explorers in the Kings Canyon high country, and one illustrating the day-to-day life of a modern wilderness ranger.

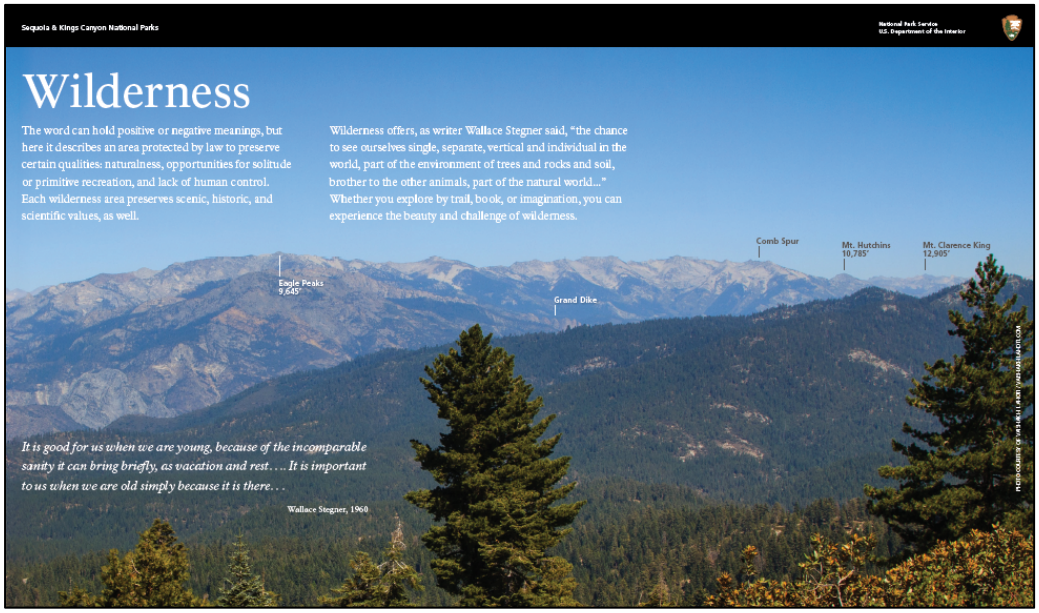
EXHIBITS – INDOORS, OUTSIDE THE PARKS

- **Fresno Airport:** These parks regularly display 6-foot-tall exhibit panels such as this at the airport:

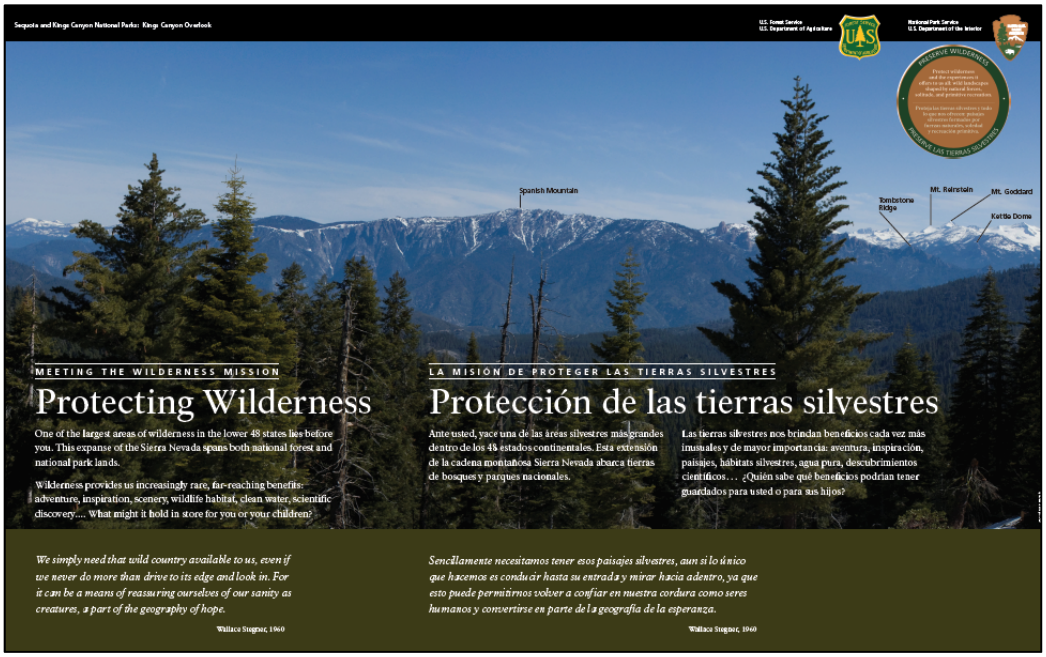


EXHIBITS – OUTDOORS, IN THE PARKS: WAYSIDES AT OVERLOOKS

- Panoramic Point (in the Grant Grove area): Describing the qualities of wilderness and inviting people to experience it in a variety of ways, directly and indirectly.



- Kings Canyon Overlook on the Generals Highway (bilingual) – part of a series along the highway the describes the basic mission of the national parks: Wilderness as part of the mission of national parks and national forests, and as a place that is important to people even if they do not go there.



EXHIBITS – OUTDOORS, IN THE PARKS CONTINUED: WAYSIDES ALONG TRAILS AND ROADS

- Moro Rock Staircase on the edge of the Giant Forest: A series of exhibits points out past and future changes of the wilderness views they see from the top of this popular viewpoint.

- Posted inside the parks' shuttle buses: Under development for summer 2014 and beyond, these images will be read by visitors inside the shuttles as they ride to, from, and within Sequoia National Park.

- At the end of Crescent Meadow Road where the High Sierra Trail starts (Sequoia National Park): Part of a series on people who shaped these parks.

Sequoia and Kings Canyon National Parks

National Park Service
U.S. Department of the Interior

SHAPING A PARK

Trailbuilders

You are standing at the start of an amazing footpath that has an inspired story. From here—thanks to hardy trailbuilders in the park's early years—you can hike to the Sierra Nevada's highest peaks.

In the 1920s Congress extended Sequoia National Park eastward from the sequoia groves to the crest of the Sierra Nevada.

Superintendent John White knew that people needed access to the new park area. Rather than build roads, he envisioned a "High Sierra Trail" from the Giant Forest to Mount Whitney.

For his trailbuilding project, White set forth two criteria: minimal damage to the land and as few ups and downs as possible. Despite the steep, rocky terrain, trail crews met his challenge. Using White's route, hikers today can travel from sequoia grove to Sierra crest with remarkable ease for such a rugged landscape.

. . . the Kern Canyon and High Sierra area should be developed only as a trail park . . . . the honk of the motor horn should never echo in [them].

Park Superintendent John White

Susan Thew in the high country

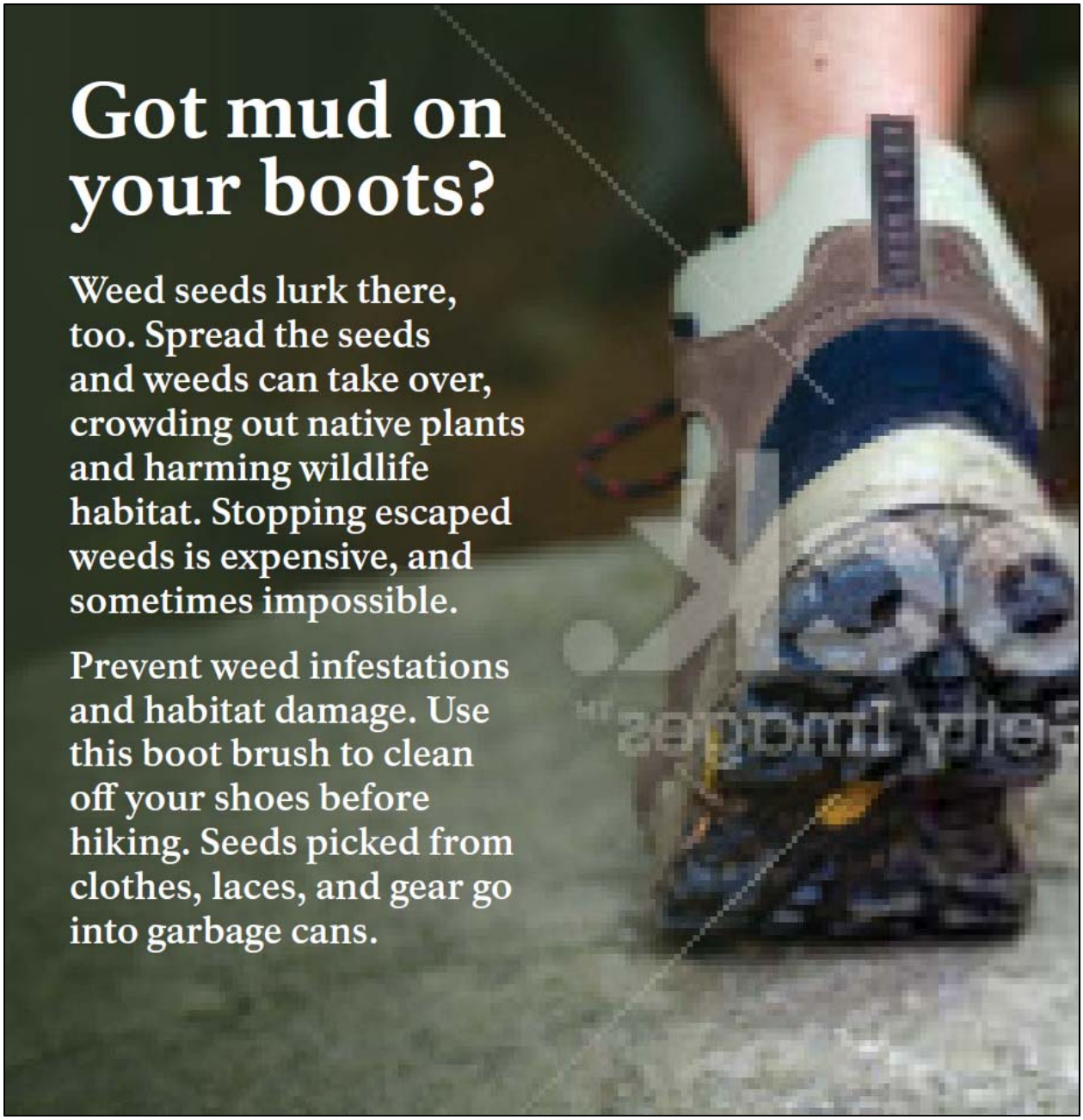
Getting Involved

When a debate began over whether the High Sierra should be added to Sequoia National Park, a local woman took action. Susan Thew hired a photographer and set off into the mountains. Upon returning, she mailed her photos to every member of Congress, showing them the wild beauty that was at stake.

ORIENTATION EXHIBITS – OUTDOORS, IN THE PARKS: AT TRAILHEADS

These reach not only overnight wilderness users, but day hikers and those exploring the aread for the first time. Recent efforts have placed 18 such panels at almost all wilderness trailheads on the west side of the parks. Each has a quote about the essence of wilderness, and information about minimum impact use, safety, regulations, destinations, and designated wilderness as a form of landscape protection.

Some wayside panels address specific ways to help protect wilderness character and qualities – in this case, preventing introduction of nonnative seeds. (When final, these panels will be installed in 2014).



PUBLICATIONS & PRINTED INFORMATION – IN THE PARKS, ONLINE; FREE, FOR SALE

The parks' newspaper always carries basic information about wilderness permits. Sometimes it covers the topic in more depth. Handouts and other free materials provide additional details.

SEQUOIA & KINGS CANYON NATIONAL PARKS

& SEQUOIA NATIONAL FOREST/GIANT SEQUOIA NATIONAL MONUMENT

SUMMER 2009 GUIDE

Crystal Cave Tours / Free Activities • page 3
Road & Safety Tips / Finding Gasoline • page 5
Highlights & Shuttle in Sequoia Park • page 6
Highlights in Kings Canyon & USFS • page 7
page 8 • Facilities & Ranger Programs in Sequoia
page 9 • Facilities & Programs in Kings Canyon & USFS
page 10 • Camping & Lodging / Bears & Your Food
page 12 • Park Road Map

Finally forever wild

What would be the best use for gorgeous slopes and lake basins ringing a beautiful sub-alpine valley in the southern Sierra Nevada?

Debates over how to use public land are common to this country's history. In this case, the area in question is Mineral King, and the history of its potential uses is a long one.

Let's start back in 1873, when one James Crabtree dreamed a dream of riches. In that vision, an Indian chief led him to a place where he should establish a mine. The resulting White Chief Mine soon inspired a rush of silver seekers and the name "Mineral King."

Looking across Mineral King Valley from one of the Mosquito Lakes, now protected in the John Krebs Wilderness. Photo @Rick Cain

Yet the land yielded nothing in the way of mineral wealth. The name stuck anyway, but it was rich scenery and cool mountain air that continued to draw people after the mines went bust.

Fast forward to 1926. An expansion of Sequoia National Park excluded Mineral King due to the old jumble of mining claims. Instead, it became the "Sequoia Game Refuge," overseen by the U.S. Forest Service. People increasingly sought it out for recreation, idyllic scenery, and mild summer temperatures, and for the lovely lake basins to be explored.

Twenty years later, commercial downhill skiing became an option. Should the rocky basins and valley of Mineral King Valley be transformed with lifts and lodges? Could wealth be wrested from the area this way, rather than by mining?

This on-and-off debate continued until a serious proposal made it to the national stage in 1965, a plan that included 14 ski lifts, two hotels, and a parking garage. People questioned the proposal. Should large roads be blasted through the national park to serve this non-park area? Could ski facilities survive the frequent avalanches that keep this area unusually free of forest?

A national discussion in the courts and public airwaves went on for a decade. It came to an abrupt end when one congressman stood up for preserving Mineral King. Fresno's John Krebs sponsored a bill to add Mineral King to Sequoia National Park. Despite many local objections, the nation agreed with him, and the bill passed.

Still, talk over this area's future did not end. This spring, the name "Mineral King" was again before Congress. Again the discussion involved what its best and highest use might be.

Once again the American people made a decision through their representatives, this time choosing the highest form of preservation for America's public lands — wilderness designation. Named for the man who rose to defend Mineral King 40 years ago, the John Krebs Wilderness now protects its beauty, habitat, and wild experiences for generations to come.

PUBLICATIONS – FOR SALE IN THE PARKS

The parks ensure that bookstores in visitor centers carry books on wilderness for both adults and children. They include biographies of wilderness advocates, trail guides, minimum-impact guides, and history, and continually seek new and different books, maps, and activities on this topic.

AUDIO VISUAL PRODUCTS – IN THE PARKS, FOR SALE, ONLINE

The film *Gem of the Sierra*, shown daily in the Kings Canyon Visitor Center, was created to orient, inform, and inspire people about three outstanding features of Kings Canyon National Parks: its expansive wilderness, deep canyon, and giant sequoias.

ONLINE – WEBSITE AND SOCIAL MEDIA

- Photos and Multimedia: links to a variety of images of the parks' wilderness
- E-hike on Paradise Creek Trail into wilderness.
  Another e-hike, on the High Sierra Trail, is planned for completion by fall of 2014.
- 360-degree panorama of wilderness views from Moro Rock.
- Two webcams, at Park Ridge and lower Giant Forest, provide a glimpse into the parks' wilderness.
- A tremendous amount of information about wilderness logistics, guidelines, regulations, and safety is available on line and as printouts in the parks (check for live links):

Overnight backpacking	Trail Descriptions
Day Hiking	Trailhead Availability
Food Storage in the Wilderness	Trail Conditions
Permit Issuing Hours & Reservations	Wilderness Trip Planner
Permit Reservation Application	Stock Use

SOCIAL MEDIA

A typical post on the parks' Facebook page.

On the parks' Facebook page, the parks' staff and online "visitors" regularly post information related to wilderness. Sometimes a conversation starts between visitors and/or the parks.

For two years, these parks have held a photo contest on their Facebook page. In 2014, "wilderness" became a category in the competition. People entered almost 300 photos overall. Two rounds of voting led to large spikes in *likes*, *reach*, and *visits* (Facebook terms). The first round of voting reached almost 90,000 people. On January 1, 2014, the site had 29,834 likes. On the day of photo judging, there were 32,423 likes – an increase of about 2500 in less than two months. The first round of voting for the overall favorite brought 250 new fans in one day. People new to the idea of wilderness saw the beauty of its manifestation in these parks. People familiar with wilderness shared their experiences and viewpoints through their images, and were willing to share them for future use by the parks.

The winning photo in the wilderness category for the 2014 Facebook Photo contest: Mount Whitney Storm by Daniel Jeffcoach.

PERSONAL SERVICES – WALKS, TALKS, AND PROGRAMS

Programs by the parks' and SNHA staff that invite visitors to touch or focus on wilderness include snowshoe walks, day and night hikes, slide programs, astronomy talks, and special events such as celebrations of wilderness and dark skies. These personal contacts and experiences help people to develop a sense of connection to the untamed parts of the world.

PERSONAL SERVICES – EMPLOYEES IN THE FIELD

Employees work with people in the wilderness, at trailheads, on dayhikes, and at desks, sharing rules, encouragement, observations, regulations, and wilderness values. That these efforts make a difference is shown by inventories of the condition of campsites in the wilderness show clearly: Outreach to visitors by the parks' staff over the past 30 years has resulted in significant improvement of naturalness and other wilderness qualities (2013 Wilderness Character Assessment. In: *Sequoia and Kings Canyon National Parks Wilderness: Taking Stock of Visitor Perceptions and Trends, Manager Recollections, Long-term Observations and Resource Conditions*. Aldo Leopold Wilderness Research Institute).

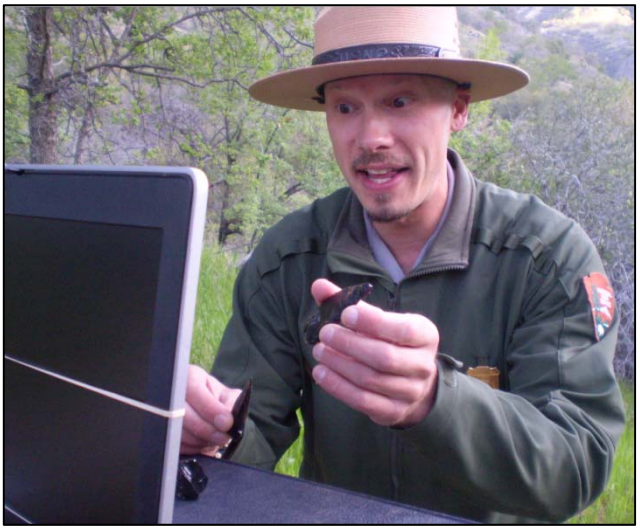
PERSONAL SERVICES – EDUCATION IN THE PARKS

School groups of varying ages learn from the parks' education staff, resource management staff, and volunteers. Many students served by the parks' programs are immigrants and the children of immigrants.

PERSONAL SERVICES – EDUCATION IN THE CLASSROOM

Rangers trained in educational techniques regularly visit classrooms in the San Joaquin Valley, part of the popular "Rangers in the Classroom" program.

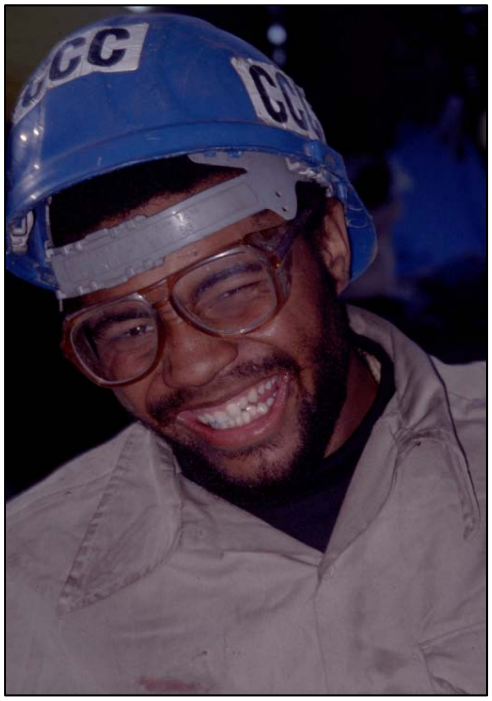
New digital camera equipment now allows rangers to "visit" classrooms farther away as well as those that cannot afford to make a field trip.



PERSONAL SERVICES – WALKS, TALKS, AND PROGRAMS BY PARTNERS

The Sequoia Field Institute (part of Sequoia Natural History Association – SNHA) offers a variety of programs and skill-building trips into the wilderness.

PERSONAL SERVICES – TRAININGS AND PROJECTS WITH PARTNERS AND VOLUNTEERS



The California Conservation Corps partners with these parks to offer invaluable experiences that build outdoor and other skills as well as self-confidence in young people who spend long stretches of time in the wilderness.

PERSONAL SERVICES – TRAININGS AND PROJECTS WITH STAFF AND VOLUNTEERS

Embracing stewardship of wilderness and demonstrating it to those who pass by (clockwise from top left):

A ranger uses the minimum tool needed for the job; volunteers revegetate a wilderness meadow; and the parks' staff train volunteers, partners, and other staff about wilderness and related topics.

PERSONAL SERVICES – OUTREACH OUTSIDE THE PARKS

Often accomplished through the public information office, this generally refers to reaching beyond the parks' boundaries to share the parks' ideals and issues.

Ongoing efforts encourage local communities to celebrate the wilderness resource of these parks. Outreach is often tied to special events such as National Parks Family Day in Fresno and "First Saturday" in Three Rivers. For the Fresno Airport's annual Christmas gala in 2013, extensive decorations had a wilderness theme (and were kept on display for months).

At citizenship swearing-in ceremonies, people are introduced to the national park concept and more. They learn that they have become citizens of the wide wilderness of these parks. Two of these ceremonies have been held in these parks to date.

REFERENCES: FOUNDATIONAL DOCUMENTS THAT DIRECT WILDERNESS INFORMATION AND EDUCATION EFFORTS

DIRECTOR'S ORDER #41: WILDERNESS STEWARDSHIP (2013)

6.14 Interpretation and Education

The Comprehensive Interpretive Plan for parks with proposed, recommended, or designated wilderness should include and address the primary the parks' interpretive themes that reflect the wilderness. Wilderness significance statements and interpretive themes can be found in the NPS Wilderness Education and Partnership Plan, developed by the Wilderness Leadership Council. Wilderness character, resources, and stewardship should be included in the park's interpretation, education, and outreach programming and should be included as an integral component of the park's long-range interpretive plan and annual implementation plan.

Staff education is an integral part of wilderness stewardship. Therefore, wilderness awareness training will be incorporated into all appropriate training programs for the parks' staff, including seasonal staff, cooperating association employees, concessions employees, and volunteers.

Leave No Trace© (LNT) principles and practices will be applied to all forms of recreation management within wilderness. LNT principles should be incorporated into interpretive activities and products such as hikes, talks, brochures, maps, and websites. All commercial guides leading trips into wilderness should attend LNT workshops and be required to incorporate LNT into their trips. The parks' staff who work in wilderness should attend LNT workshops and training.

NPS MANAGEMENT POLICIES 2006

6.4.2 Wilderness Interpretation and Education

In the context of interpretive and educational planning, national park system units with wilderness resources will:

> (1) operate public education programs designed to promote and perpetuate public awareness of and appreciation for wilderness character, resources, and ethics while providing for acceptable use limits;

(2) focus on fostering an understanding of the concept of wilderness that includes respect for the resource, willingness to exercise self-restraint in demanding access to it, and an ability to adhere to appropriate, minimum-impact techniques; and

(3) encourage the public to use and accept wilderness on its own terms—that is, the acceptance of an undeveloped, primitive environment and the assumption of the potential risks and responsibilities involved in using and enjoying wilderness areas.

NPS interpretive plans and programs for wilderness parks will address the primary interpretive themes for wilderness. Education is among the most effective tools for dealing with wilderness use and management problems and should generally be applied before more restrictive management tools.

NPS WILDERNESS EDUCATION AND PARTNERSHIP PLAN (2002)

Interpretation provides opportunities for people to forge intellectual and emotional connections to the meanings inherent in wilderness. The NPS Wilderness Education and Partnership Plan lays out a strategy for identifying audiences, developing services, and delivering those services in a thoughtful and coherent manner.

The primary purposes of the Wilderness Education and Partnership Plan are to:

1. Establish the individual elements of the NPS Wilderness Education Program.
2. Establish a priority for funding and implementation of the elements of the plan.
3. Provide for the continuity of the program through the development of an approved and comprehensive work plan.

The goal of these actions is to broaden awareness and understanding of the idea of wilderness and to inspire appreciation of wilderness values in an increasingly diverse population. Wilderness education and interpretation must reach beyond National Park Service audiences to increase knowledge of the National Wilderness Preservation System and the NPS role in managing wilderness. Desired results include increased public support for wilderness that results in protection of wilderness resources and preservation of wilderness for future generations.

INTERAGENCY UNIFIED NATIONAL STRATEGIC PLAN FOR WILDERNESS EDUCATION (1995)

Educating the public has long been considered an important function of stewardship. In the past, this has largely meant training wilderness visitors in low-impact camping techniques and user ethics. Wilderness education needs to expand beyond instructing visitors to build a shared understanding of the role and value of wilderness to society. The wilderness message needs to reach a much broader spectrum of the American public.

Historically, wilderness training has concentrated on wilderness specialists. The parks must now expand wilderness training to the interdisciplinary staff and line officers to assure all personnel are adequately equipped for their stewardship role.

SEQUOIA AND KINGS CANYON GENERAL MANAGEMENT PLAN (GMP), 2007

The Parks' Purposes

The purposes of the parks are the reasons why Congress established these areas as part of the national park system. The purpose statements are basic to all other assumptions about the parks and the ways in which the parks should be used and managed. As defined by the parks' managers, the following are the purposes of Sequoia and Kings Canyon National Parks, which incorporate the mission statement:

- Protect forever the greater Sierran ecosystem — including the sequoia groves and high Sierra regions of the park — and its natural evolution.
- Provide appropriate opportunities to present and future generations to experience and understand park resources and values.
- Protect and preserve significant cultural resources.
- Champion the values of national parks and wilderness.

The Parks' Significance

Sequoia and Kings Canyon National Parks are special and unique places because they have [among other things]: the core of the largest area of contiguous designated wilderness in California, the second largest in the lower 48 states…

The Parks' Primary Interpretive Themes

One of SEKI's primary interpretive themes is: Sequoia and Kings Canyon National Parks protect a large wilderness area, where natural forces prevail, and which provides significant scientific and social values to the world.

LEAVE NO TRACE©

Federal and State Land Management Agency Partners

The Leave No Trace Center for Outdoor Ethics has a memorandum of understanding with the following federal and state land management agencies: National Park Service, Bureau of Land Management, USDA Forest Service, US Fish and Wildlife Service, US Army Corps of Engineers and the National Association of State Park Directors. (See NPS *Management Policies 2006*, above.)

Appendix I

Minimum Requirements Analysis

ON THE PREVIOUS PAGE
Valhalla in Sequoia National Park
NPS Photo

APPENDIX I:

MINIMUM REQUIREMENTS ANALYSIS

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SEQUOIA AND KINGS CANYON NATIONAL PARKS

MINIMUM REQUIREMENTS ANALYSIS

INSTRUCTIONS AND BACKGROUND MATERIALS

WORKSHEET INSTRUCTIONS

- The Minimum Requirements Analysis (MRA) worksheet is designed to assist the parks' employees and outside researchers with completing a Minimum Requirement Analysis for wilderness projects. These instructions refer directly to the MRA worksheet. For more information about MRAs, see the toolboxes on www.wilderness.net/toolboxes.
- **Use of this document assumes familiarity with the Wilderness Act, other relevant legislation, and agency policy.** For training in the Wilderness Act or on conducting a Minimum Requirements Analysis, go to: www.wilderness.net/index.cfm?fuse=NWPS&sec=elearning.
- The Wilderness Act prohibits specific activities—the use of motor vehicles, motorized equipment, and mechanical transport, the landing of aircraft, and the installation of structures and equipment—when other reasonable alternatives are available. The MRA worksheet provides a formalized method for developing alternative ways to address an issue by evaluating and comparing the effects of various actions on wilderness character.
- Any proposed administrative activity that has the potential to affect the wilderness or potential wilderness additions will be analyzed through the minimum requirement process. It is important to use professional judgment when deciding whether or not you need to complete the MRA Worksheet. Projects that have negligible impacts (e.g., observing wildlife, monitoring vegetation with a small crew, revisiting previously installed scientific equipment) do not need to go through the MRA process. If you are unsure about how to proceed, contact your Division Chief, the Research Coordinator, your supervisor, the Assistant Wilderness Coordinator (AWC), or the Environmental Protection Specialist (EPS).
- The process will be used to determine if the action will be implemented and, if so, the tools or techniques that will be used. The analyses will clearly identify how minimum requirement decisions were developed and include reference to the applicable compliance documents (Categorical Exclusion, Environmental Assessment, and Environmental Impact Statement). Approval will be documented with the superintendent's signature, and a permanent record of the analyses will be retained in the parks' files.

The MRA Worksheet is based on the requirements of both the Wilderness Act and NPS Management Policies (2006):

Section 4(c) of the Wilderness Act states: *" . . .except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be. . .* ***no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area****."*

Section 6.3.5 of NPS Management Policies 2006 states that the Minimum Requirement concept will be a two-step process to [1] determine if the management action is necessary *"for administration of the area as wilderness and does not cause a significant impact to wilderness resources and character; and* [2] *the techniques and types of equipment needed to ensure that impacts on wilderness resources and character are minimized."* Also: *"When determining minimum requirements,* ***the potential disruption of wilderness character and resources will be*** *considered before, and* ***given significantly more weight than, economic efficiency and convenience."***

STEP 1: DETERMINE IF ANY ADMINISTRATIVE ACTION IS NECESSARY

Description of Situation

The description should explain, in general terms, the situation that may require action. However, it should neither assume that action will be taken, nor identify a specific method or tool to be used. The description helps determine whether any action is necessary in wilderness. ***The appropriate administrative response may be no action at all.***

The description should not justify the use of motorized equipment/mechanical transport or the placement of a structure, facility, or temporary road. If action is needed, the specific actions, methods, and tools will be identified and evaluated in Step 3.

The table below provides examples of correct/incorrect descriptions. The descriptions are abbreviated for training purposes. Actual descriptions should provide all relevant background information.

Correct examples of description	Incorrect examples of description
An administrative cabin is deteriorating and there is a proposal to reconstruct the structure. The cabin is located six miles inside the wilderness and is currently used by trail crews and wilderness rangers.	There is a need to use motorized tools to restore an administrative cabin
A windstorm has blown down trees which are blocking maintained trails. Approximately 47 miles of trail are currently blocked limiting access to 32% of the wilderness.	Chainsaws would be the quickest tool for clearing the downed trees.
There is a lack of information available to biologists about a wildlife species that has the potential for listing under the ESA.	A helicopter should be used to survey the population because all other methods would take too long.
A trail bridge has washed out. The bridge serves a main trail used by visitors and outfitter-guides to access approximately 20% of the wilderness. Alternatives to access this portion of the wilderness would add 18 miles to the travel route.	There is a need to replace the washed out trail bridge. A helicopter is needed to fly in a replacement bridge and would be the most cost effective and safest tool for the job.
Invasive plant species are present in the wilderness along the Clear Creek, Blue Lake, and Windy Pass Trails. The trails are the most popular access routes to the lake basin area of the wilderness and are used by both recreation livestock users and hikers.	A motorized herbicide sprayer is the most efficient tool to treat invasive plants.

Answer questions A through F with "Yes" or "No," and explain your answer. If one of the questions is not applicable to the proposal, answer "No" and explain why it is not applicable.

To 'check' or 'uncheck' a box, move your cursor into the box and double click to open the check box form field options menu. Alternatively, you may access the field menu by holding your cursor over the box, right click, and select properties.

Remember that in Step 1, the analysis is about whether or not there is a need to take action and not about specific proposed activities or techniques. The specific alternatives for implementing a decision and the positive and negative impacts of each action will be described and evaluated in Step 3.

A. Options Outside of Wilderness

Can actions taken outside of wilderness adequately address the situation and meet project goals?

Identify options outside of wilderness and discuss whether or not they can adequately address the situation described above.

Examples of administrative actions outside wilderness include:

- installing nest boxes or conducting wildlife surveys outside of wilderness boundaries
- surveying visitors at the trailhead, rather than on the trail
- using quota reductions to address recreational impacts
- locating monitoring or other administrative structures outside of wilderness

B. Valid Existing Rights or Special Provisions of Wilderness Legislation

Is action necessary to satisfy valid existing rights or special provisions in <u>wilderness legislation</u> (the Wilderness Act of 1964 or subsequent wilderness laws)?

Valid existing rights are granted only by provisions in law. These may include rights associated with mining, water, rights-of-way, or access to non-federal lands inside wilderness. Special provision language could be contained within the Wilderness Act of 1964 or the designating legislation for Sequoia-Kings Canyon Wilderness and/or John Krebs Wilderness.

Identify any valid existing rights or special provisions in wilderness legislation and cite the law and section. If there are none, state that none exist.

Examine the special provision and describe whether the law says that a specific action "shall" be taken or that an action "may" be taken. Remember that legislative history (i.e., Congressional committee reports) is useful background information that should be considered, but it does not have the same requirement for implementation as direction contained in law.

Some valid existing rights or provisions of special legislation may be satisfied by an option outside wilderness. Such possibilities would likely reduce impacts to the wilderness resource and character and should be explored.

Valid Existing Rights or Special Provisions that apply to Sequoia and Kings Canyon National Parks are:

<u>Omnibus Public Land Management Act of 2009</u>

- Section 1902. Designation of Wilderness Areas:

(1) John Krebs Wilderness

(C) Potential Wilderness Additions – The designation of the potential wilderness additions

(A) shall not prohibit the operation, maintenance, and repair of the small check dams and water impoundments on Lower Franklin Lake, Crystal Lake, Upper Monarch Lake, and Eagle Lake. The Secretary is authorized to allow the use of helicopters for the operation, maintenance and repair of the small check dams and water impoundments on these same lakes.

- Section 1903 (c) – Hydrologic, Meteorologic, and Climatological Devices, Facilities, and Associated Equipment: The Secretary shall continue to manage maintenance and access to hydrologic, meteorologic, and climatological devices, facilities and associated equipment consistent with House Report 98–40.
- Section 1903(e) Horseback Riding – Nothing in this subtitle precludes horseback riding in, or the entry of recreational or commercial saddle or pack stock into, an area designated as wilderness by this subtitle (1) in accordance with section 4(d)(5) of the Wilderness Act and (2) subject to any terms and conditions determined necessary by the Secretary.

Other special provisions and valid existing rights included in the 1984 California Wilderness Act and Omnibus Public Land Management Act of 2009 and accompanying Committee Reports include:

- the continued use of Bearpaw High Sierra Camp (a Potential Wilderness Addition).
- management of southern Hockett Plateau as Proposed Wilderness.
- existing Rights of private landowners at Oriole Lake to access their private lands

C. Requirements of Other Legislation

Is action necessary to meet the requirements of other federal laws?

Laws that do not directly address wilderness may influence the need for actions in wilderness. In some instances, the administrator is asked to satisfy the requirements of multiple laws. Identify and cite applicable provisions of other laws and describe any conflicts between the provisions of other laws and the Wilderness Act or enabling legislation for your area. If no other laws are applicable, state that there are no requirements.

Apparent conflicts between the Wilderness Act and other legislation may require innovative approaches and not all apparent conflicts are genuine. No law over-rides another law (unless specifically stated in the superseding law). The requirements of all applicable laws must be met.

For a list of laws that may apply to projects within SEKI, refer to attachment 1 (pages I-17 – I-22).

D. Wilderness Character

Is action necessary to preserve one or more of the qualities of wilderness character?

Explain how taking action in wilderness is necessary to preserve each quality of wilderness character.

As you become increasingly familiar with analyzing effects on the qualities of wilderness character, you will realize that taking action often positively impacts one or more qualities of wilderness character while

simultaneously negatively impacting others. Keep in mind that at this point in the analysis you are determining if any action is necessary, not looking at impacts from taking action (that analysis comes in Step 3, if you decide at the end of Step 1 that some action must be taken).

For more information about the qualities of wilderness character, refer to attachment 2 (pages I-23 – I-26).

E. The Public Purposes of Wilderness

Is 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?"

Identify which of the public purposes are applicable to the situation and describe whether it is necessary to take action to be consistent with that public purpose.

The public purposes are defined as follows:

Recreational: Wilderness is designated, in part, to provide for recreation opportunities that allow visitors to experience wilderness ***as wilderness***. This public purpose is related to the direction for administration of wilderness areas Section 2 (a) "…and these shall be administered for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness…" The recreational public purpose is also supported by the definition of wilderness found in Section 2 (c) "…has outstanding opportunities for solitude or a primitive and unconfined type of recreation…"

A management action is consistent with the recreational public purpose, and may be necessary, if the action will contribute to providing opportunities for visitors to experience wilderness. A management action is not necessary if it impacts these opportunities. <u>The need to accommodate visitor use, or provide "easy" access, does not over-ride the mandate to preserve the qualities of wilderness character.</u>

Scenic: The scenic public purpose of wilderness is the visual experience provided by the natural features of wilderness (vegetation, geology, water, etc.) obtained by visitors inside wilderness or as seen by others outside wilderness. This public purpose is closely related to the Natural, Undeveloped, and Opportunities for Solitude or Primitive and Unconfined Recreation qualities of wilderness character. It is also related to the Wilderness Act Section 2 (c) definition of wilderness and direction for management, "…which is protected and managed so as to preserve its natural conditions." In addition, Section 2 (c) lists "scenic" as a value that may be found in wilderness.

It may be necessary to take management action to be consistent with the scenic public purpose when there is a need to protect or restore natural conditions and, therefore, the scenic value of wilderness. An action is not needed and is inconsistent if it impairs the natural scenery of wilderness (e.g., modern human structures or installations).

Natural events (such as fires, floods, mudslides, and insect or disease infestations) are not a negative impact to the scenic public purpose. The scenic public purpose does not include the view from the wilderness to other lands nor would it justify cutting trees inside wilderness to provide a view point along a trail.

Scientific: The Wilderness Act, in Section 2 (a) includes "…gathering and dissemination of information regarding their use and enjoyment" as part of the necessary administration of the area. In addition, Section 2 (c) lists "scientific" as one of several values that may be found in wilderness.

A management action is consistent with the scientific public purpose, and may be necessary, when an opportunity for research or other scientific activity is needed for the benefit of wilderness. This public purpose does not require that all proposals for research or scientific activities in wilderness be implemented. Instead, this purpose recognizes the value of research and scientific activities that are necessary for wilderness management or that have a significant value for society and, in certain unique circumstances, can only be accomplished in wilderness, even if it involves a use prohibited by Section 4(c) of the Wilderness Act. An action which does not directly support the scientific public purpose nonetheless may be allowed if it does not involve a prohibited use or otherwise degrade wilderness character.

For example, is a proposal to monitor air quality in wilderness consistent with the scientific public purpose? The scientific public purpose includes gathering information about the effects of outside forces (i.e., air pollution) on wilderness. If a suitable location outside wilderness cannot be found, and if the information to be gathered is needed to preserve wilderness character, monitoring in wilderness may be evaluated to determine if it is the minimum necessary action to meet management objectives for the management of the wilderness. In addition, air quality monitoring may also be consistent with the conservation public purpose if the information gathered can be used to ensure preservation of the Natural quality of wilderness character.

Educational: The educational public purpose of wilderness is the benefit to the American people that is provided through learning about wilderness and understanding the role of wilderness ecosystems and visitor opportunities in the broader social and biophysical landscapes. The Wilderness Act, in Section 2 (c) includes "educational" as a value that may be found in wilderness.

A management action is consistent with the educational public purpose, and may be necessary, if opportunities for education about the wilderness resource (either in general, or for a unique, specific element) are recognized and necessary to meet management objectives that preserve wilderness character. Activities such as interpretation inside wilderness (e.g., signs) or marketing that encourages use of specific locations for recreation opportunities is inconsistent with the educational public purpose and could impact the preservation of wilderness character if opportunities for solitude or a primitive and unconfined type of recreation are compromised.

Conservation: The conservation public purpose is closely related to both the Natural and Untrammeled qualities of wilderness character. The Wilderness Act in Section 2 (c) defines wilderness as a place "…where the earth and its community of life are untrammeled by man…" and that is "…protected and managed so as to preserve its natural conditions…" Also in Section 2 (c), the Wilderness Act, includes "ecological" as one of the values that may be found in wilderness. These definitions and terms are consistent with the common definition of conservation which is to save or protect.

A management action is consistent with the conservation public purpose, and may be necessary, when actions benefit the natural conditions and the natural function of ecological processes in wilderness through protection or restoration. But not all biophysical management or restoration actions are consistent with the conservation public purpose.

For example, a proposal to alter existing habitat in wilderness to help prevent listing of a wildlife species may or may not be consistent with the conservation public purpose. It may be consistent if the action

would help restore natural conditions that have been impacted by modern human activity to within the Historic Range of Variability (HRV).

If the action to alter existing habitat would create conditions outside the HRV, it would be inconsistent with the conservation public purpose (and possibly degrade the Natural quality of wilderness character). However, compliance with the Endangered Species Act or adoption of new scientifically-based goals for conserving ecosystem integrity in the face of rapid global changes may still require this or other actions to be considered and possibly implemented. In these cases the proposed action may need to be revised to minimize the use of motorized equipment, installations, structures, etc.

Historical: The historical public purpose of wilderness is represented by the historic and pre-historic sites, artifacts, structures, or other cultural landscapes that may be within the areas and by the human activities that once occurred there. Section 2 (c) lists "historical" as one of several values that may be found in wilderness.

A visitor to wilderness, or anyone learning about wilderness, becomes aware of or benefits from the associations between past human activities or influences and the wilderness. There may be a need for management action that is consistent with the historical public purpose if there is a need for protection of cultural resources. But the historical public purpose does not mean that every structure must be preserved or restored or that every past use of wilderness must continue.

F. Other Guidance

Is action 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?

Describe any applicable guidance for the situation or project. If the issue has been addressed in agency policy, unit and wilderness management plans, species recovery plans, or agreements with tribal, state, and local governments or other federal agencies, cite the guidance here.

Carefully consider the context and requirements of the policy, plan or agreement. Plans developed using a NEPA analysis are decisions that provide stronger guidance than plans developed with less public or interdisciplinary involvement.

For a list of plans, policies, and agreements that may apply to projects within SEKI, refer to attachment 3 (pages I-27 – I-34).

Decision

Is administrative action necessary in wilderness?

Evaluate your responses to the questions above in order to determine whether or not administrative action is necessary in wilderness.

In making the determination, prioritize compliance with the Wilderness Act and the provisions of other laws (questions A-D). Second priority is given to question E, since the Public Purposes are subject to the clause: "Except as otherwise provided in this Act." Third priority is given to question F, since policies, plans, and agreements do not override the legal requirements used as the basis of the other questions.

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, consult your Division Chief or supervisor. Researchers should consult the Research Permit Coordinator.

STEP 2: DETERMINE THE NEED TO DEVELOP ALTERNATIVES

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

If your project includes a Section 4(c) prohibited activity, skip Step 2 and proceed directly to Step 3.

> Section 4(c) prohibited activities include: the use of mechanical transport (wheelbarrows, bicycles, etc.) and/or motorized equipment and vehicles (chainsaws, water pumps, rock drills, etc.); the landing of aircraft; and the installation of materials, equipment, and/or structures.

If your project does not include a Section 4(c) prohibited activity, answer the questions provided.

If you answer *yes* to any of the questions, you may be required to complete Step 3. Contact the AWC or the EPS for guidance.

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

STEP 3: DETERMINE THE MINIMUM ACTIVITY

Description of Alternatives

Develop a minimum of two action alternatives plus a no-action alternative. The no-action alternative is used for comparison purposes and/or a baseline when evaluating effects. (In rare cases, it may be appropriate to develop only one action alternative.)

Develop reasonable and feasible alternatives. When you develop alternatives, consider existing laws, policies, and guidance. Also consider your specific project objectives. Only analyze alternatives that do not appear to be "too remote or speculative" to accomplish the project's purpose.

For each alternative, describe: the methods and techniques that will be used; when the activity will take place; where the activity will take place; the necessary mitigation measures; and the general effects to the biophysical and social components of the wilderness resource and the qualities of wilderness character.

Identify and describe a full range of feasible alternatives, including (as applicable):

- No-action
- No Section 4(c) prohibited uses
- Minimal Section 4(c) prohibited uses (e.g., a combination of motorized and non-motorized methods or tools)

The level of detail required in the description of alternatives and effects varies by the complexity of the activity. For some projects, it may be necessary to reference agency policy, standards, or guidelines for construction of facilities and structures, safety, etc. A "no-action" alternative should be included to help

confirm that action in wilderness is necessary and to facilitate a comprehensive comparison of effects (this is also useful for subsequent NEPA analysis).

Include mitigation measures that would be implemented for the various activities, methods, and tools that could be used. This is particularly important when describing the effects to the biophysical or social components of the wilderness resource from workers traveling or camping in the wilderness.

Include an explanation of how the impacts can be mitigated: through employee training; location of work areas, campsites and travel routes; project timing; temporary closures; and other actions. Also include any seasonal timing requirements or identified need for urgency based on protection of wilderness character or worker safety.

Describe the alternatives to highlight their differences. For instance, if *all* alternatives contain an identical action component and mitigation, evaluate it separately as an action common to all alternatives.

A. Wilderness Character

In Step 1, you used the qualities of wilderness character as criteria for determining whether or not action is necessary in wilderness. Here, describe the positive or negative effects ***of each alternative*** on wilderness character. Identify both short-term and long-term effects where necessary.

For more information on the five qualities of wilderness character, refer to attachment 2 (pages I-23 – I-26).

Untrammeled

Identify how this quality is positively impacted where a trammeling is reduced or eliminated or negatively impacted where trammeling occurs or increases. Discuss the degree to which the components or processes of ecological systems are ***intentionally*** controlled, manipulated, or hindered by the proposed actions.

This quality is degraded by modern human activities or actions that control or manipulate the components or processes of ecological systems inside the wilderness. Examples include the suppression of natural fire or managing vegetation and wildlife. ***Even when the manipulation is for a "good" purpose, such as eliminating a non-native species, it is considered a trammel and has a negative impact to this quality.*** A proposal which does not manipulate the biophysical environment has no impact on this quality. ***The only way a positive effect to this quality could be registered is if the proposal would stop a <u>current</u> manipulation of the biophysical environment.***

For projects that do not intend to manipulate "the earth and its community of life" (e.g., the installation of monitoring equipment, clearing trees from a trail, etc.), simply state that there is no effect on the Untrammeled quality of wilderness character.

Undeveloped

This quality is degraded by the presence of structures, installations, habitations, and by the use of motor vehicles, motorized equipment, or mechanical transport that increases people’s ability to occupy or modify the environment. Examples include: radio repeaters, monitoring installations, administrative cabins, helicopter landings, and the use of chain saws, pumps, motor vehicles, motor boats, etc.

An alternative that does not involve these prohibited activities would have no impact on this quality. An alternative that removes a structure or installation, or otherwise stops a prohibited use, would have a

positive effect on this quality. Note that when a proposal is broken down into phases or components, more than one effect to this quality may be registered. For instance, an alternative to remove a sampling device by flying it out with a helicopter would both improve (by removing the structure) and degrade (by using an aircraft) this quality.

Natural

Describe the potential positive or negative impacts to this quality in terms of protection or restoration of natural conditions (i.e., air, water, soil, wildlife, fish, plants). Include, where applicable, a discussion of the effects related to protecting natural conditions within the regional landscape (i.e., insects, disease, non-native species, and wildlife migration corridors).

There are positive impacts to this quality if the alternative would improve natural conditions, negative impacts if the alternative would degrade natural conditions, and no impact if the alternative would have no effect on natural conditions.

Examples of degradation include: the results of suppressing a natural fire or allowing non-native invasive species to become established or expand. Examples of the preservation of this quality include: the effects from allowing natural fire, successful treatment of non-native species, and the restoration of native species.

Note that in some instances, an alternative might have both positive and negative impacts. For instance, providing artificial water to aid in the recovery of a sensitive species would be a positive impact (if the species increased) to this quality and also a negative impact because of the effects to other species due to an unnatural water source. (Of course, this alternative would have impacts to other qualities as well.)

Opportunities for Solitude or Primitive and Unconfined Recreation

Identify how opportunities for solitude or a primitive and unconfined type of recreation will be protected or degraded. Include negative impacts to visitors from the use of motorized equipment, mechanical transport, landing of aircraft, structures, or installation, as well as the positive impacts from actions that preserve these opportunities.

If necessary, describe the positive or negative impacts separately for each sub-part of this quality: Solitude, Primitive Recreation, and Unconfined Recreation.

Examples of degradation include: management actions that cause (by action or inaction) crowding or too many visitor encounters (impacting solitude); facilities or other signs of modern civilization (impacting primitive recreation); and additional restrictions on visitor behavior (impacting unconfined recreation). An alternative which increases solitude, removes infrastructure that diminishes primitive recreation, or removes a management restriction would have a positive impact on this quality.

Because this quality has three sub-parts, the effects are not always straight forward. One alternative could produce multiple counterweighing impacts to this quality. For example, designating campsites negatively impacts unconfined recreation while positively impacts solitude.

Other Features of Value

Identify any values or characteristics of this wilderness (i.e., "ecological, geological, or other features of scientific, educational, scenic, or historical value") that are not accounted for in the above qualities, and

describe the effects on these unique features. Heritage and cultural resources including historic sites and paleontological localities are also included here.

B. Safety

Describe any safety concerns for visitors or workers directly associated with implementing the alternative. Identify which hazards can be mitigated and which hazards cannot be mitigated. Describe how mitigation might be achieved through providing information to the public, temporary area closures, training, or the use of protective equipment.

Identify the degree of risk for each alternative after considering both the rate of occurrence and severity of reported injuries. Base the determination of the safety risks of implementing an alternative on adequate supporting evidence (i.e., agency accident data, project specific Job Hazard Analysis, agency specific guidelines, or other documentation).

C. Other Criteria

Describe the alternative's effect on any other applicable criteria, such as maintaining traditional skills, other special provisions, economic and timing constraints, etc.

Note: While administrative activities should always be accomplished with economic efficiency, neither the cost nor the time required for implementation can be primary factors in allowing uses that would otherwise be prohibited. Identify and describe the costs and time required for each alternative, but avoid pre-selecting an alternative based on these criteria.

Additional Alternatives

Action alternatives which are not feasible to implement should be identified, when appropriate. Provide brief reasons as to why these alternatives were "considered but dismissed."

Valid reasons for dismissing an alternative include: 1) actions that are impossible to accomplish by any means, 2) actions that are possible to accomplish but implementation would cause *significantly* greater negative impacts to wilderness character, or 3) actions that would cause a significant safety risk to workers or the public which cannot be mitigated. Alternatives should not be eliminated from full consideration simply because implementation would take more time or money or because the skills or equipment needed are not readily available. Other valid reasons for ruling out an alternative may relate to timing restrictions associated with the NPS budget cycle, or that the alternative does not conform to laws, regulations, or NPS policy.

Comparison of Alternatives

Compare the alternatives in the table provided using your best judgment on their level of effect, (both positive and negative, short- and long-term). The overall impact of an alternative can be roughly approximated by tallying the scores.

You are mandated by the Wilderness Act to "preserve wilderness character," and this is the most important criteria for wilderness. Therefore, the impacts on the qualities of wilderness character are tabulated first.

Decision

What is the minimum activity?

Usually, the alternative that results in the least overall adverse effect to wilderness character and that represents the minimum requirement necessary to administer the area as wilderness will be the selected alternative. However, there may be other considerations. If you do not select the alternative with the least overall adverse effect, provide the rationale.

The selected alternative must conform to all applicable laws. Explain why the use of motorized equipment, aircraft landing, mechanical transportation, structures, or installations is the minimum requirement for the administration of the area as wilderness by briefly describing the benefits or adverse effects to the qualities of wilderness character and other legal requirements.

The selected alternative must also meet agency policy. Cite the specific criteria, direction, standard, or guideline that applies and explain how the alternative complies.

The rationale should demonstrate that the decision is clearly a result of objective evaluation of the alternatives and not the result of an inappropriate bias or justification of an alternative or method for non-wilderness reasons.

If your selection is based at least in part on the safety criterion, be sure to explain the rationale and include or reference supporting analysis or documentation. This analysis should explain why the use of motorized equipment or other prohibited uses is necessary because to do otherwise would cause increased risks to workers or visitors that cannot be satisfactorily mitigated through training, use of personal protective equipment (PPE), or other actions.

Avoid selecting an alternative based primarily on costs and the amount of time needed for implementation. While administrative activities should always be accomplished with economic efficiency, both law and agency policy directs us away from considering either the cost or the time required for implementation as the over-riding factor for administrative use of otherwise prohibited activities.

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?

If yes, describe the effects. If you are unsure, contact your Division Chief or supervisor.

STEP 4: SIGNATURES AND REPORTING

Review and Approval

Electronic copies of the MRA worksheet should be submitted concurrently to the Assistant Wilderness Coordinator and Environmental Protection Specialist for review to ensure legal adherence to the purposes of the Wilderness Act and for compliance review.

If the project is not included within the scope of a current compliance document (existing categorical exclusion, environmental assessment, or environmental impact statement), a project proposal form must

be completed, and presentation to the Leadership Team will be required. **Follow the process as directed in MD-59.**

Other reviewers may be added as appropriate (e.g., Science Coordinator or other subject matter experts). Comments provided by the reviewers may need to be addressed in an updated worksheet.

After all comments or concerns are addressed, the updated worksheet will be submitted to the Division Chief for review. The Division Chief will determine if they will recommend the proposed alternative to the Superintendent.

The Division Chief will forward a printed MRA worksheet to the Superintendent for review and signature. If the Division Chief changes the MRA, they will return the updated version electronically to the AWC and EPS. **If the MRA is part of a larger environmental compliance or permitting package, the entire package must go to the Superintendent for signature at the same time.**

The signed MRA will be sent to the EPS for record keeping. Signed/scanned copies will be filed as PDFs under: S:\SUPT\Environmental Compliance Office\Wilderness\MRMTs and MRAs*Year*\Signed MRAs. The EPS will email a PDF of the signed MRA Worksheet to the project proponent so that he/she can review mitigation, monitoring, and reporting requirements.

Note – The Minimum Requirements Analysis Worksheet is not a substitute for a NEPA analysis and decision where one is required.

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ATTACHMENT 1:
REQUIREMENTS OF OTHER LEGISLATION

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Laws that may apply to projects within the parks include (but are not limited to):

The Organic Act of the National Park Service

"Sec.1. …. The service thus established shall promote and regulate the use of the federal areas known as national parks, monuments, and reservations hereinafter specified by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life 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."

The Organic Act directs us "to conserve the scenery and the natural and historic objects and the wild life 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."

The 1978 Amendment (a.k.a. Redwoods Act) strengthened the protective functions of NPS and influenced recent decisions regarding resource impairment. "…the protection, management, and administration of these areas shall be conducted in the light of the high public value and integrity of the NPS and shall not be exercised in derogation of the values and purposes for which these various areas have been established…"

The National Park Service Omnibus Management Act of 1998

The National Park Service Omnibus Management Act of 1998 directs the Secretary of the Interior "to assure that management of units of the National Park System is enhanced by the availability and utilization of a broad program of the highest quality science and information."

This act establishes the framework for fully integrating natural resource monitoring into the management process of the NPS. Section 5934 of the Act requires the Secretary of the Interior to develop a program of "inventory and monitoring of NPS resources to establish baseline information and to provide information on the long-term trends in the condition of the National Park System resources." The message of the Parks Omnibus Management Act of 1998 was reinforced by Congress in the FY 2000 Appropriations bill.

Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended -- Public Law 93-205

This act and its amendments were enacted to provide a program for the conservation of wildlife and plant species that are threatened or endangered with extinction. The Act recognizes that several species of plants are in danger of extinction, and these species are of aesthetic, ecological, educational, historical, recreational and scientific value. The act sets up specific procedures to determine which plant and animal species are added or removed from protective status. It also sets up cooperative programs with states and establishes civil penalties for violation of the act. Subsequent amendments to this act were made in 1978 and 1982. The Act requires federal agencies to ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat.

National Historic Preservation Act, Antiquities Act, and the Archaeological Resources Protection Act

These laws provide the statutory basis for protecting and managing heritage resources on federal lands. Policies derived from this legal direction seek to balance the need for protecting heritage resources with

the apparently conflicting mandate in the Wilderness Act to eliminate structures which do not have a legitimate administrative need. The intent and direction of all applicable laws must be met in wilderness.

National Trail System Act

Sec.3.(2):" (2) National scenic trails, established as provided in section 5 of this Act, which will be extended trails so located as to provide for maximum outdoor recreation potential and for the conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which such trails may pass. Sec. 7 (j) (j) Potential trail uses allowed on designated components of the national trails system may include, but are not limited to, the following: bicycling, cross-country skiing, day hiking, equestrian activities, jogging or similar fitness activities, trail biking, overnight and long-distance backpacking, snowmobiling, and surface water and underwater activities. Sec. 11. (a)(1) In addition to the cooperative agreement and other authorities contained in this Act, the Secretary of the Interior, the Secretary of Agriculture, and the head of any federal agency administering federal lands, are authorized to encourage volunteers and volunteer organizations to plan, develop, maintain, and manage, where appropriate, trails throughout the Nation. (2) Wherever appropriate in furtherance of the purposes of this Act, the Secretaries are authorized and encouraged to utilize the Volunteers in the Parks Act of 1969, the Volunteers in the Forests Act of 1972, and section 6 of the Land and Water Conservation Fund Act of 1965 (relating to the development of Statewide Comprehensive Outdoor Recreation Plans).

Americans with Disabilities Act (1990)

The purpose of this act is to provide a clear and comprehensive national mandate for the elimination of discrimination against people with disabilities in areas of employment, transportation, communication, from the discriminatory aspects of architecture, over protective rules and policies, failure to make modifications to existing facilities and practices, and relegation to lesser services, programs, activities, benefits, jobs, or other opportunities. This Act amends the Rehabilitation Act of 1973 which requires federal agencies to make facilities and programs accessible. ADA extends the mandate to all state and local governments and any facility or program receiving government funding. The Rehabilitation Act, ADA and the Wilderness Act appear to conflict dramatically if read literally without applying some common sense. The latter proposes to protect natural and undeveloped landscape values for future generations. ADA seeks to eliminate all discrimination to programs and facilities by tailoring facilities and programs to be universally accessible. The key point is that equal access will be provided and facilities will be 'universally accessible' by not discriminating against people with disabilities. Wheelchairs (as defined by the law) are allowed in wilderness. However, wilderness trail standards (management objectives) are applied and not the trail standards established for accessible non-wilderness trails. This approach allows equal access to all but does not alter the character of the wilderness.

Federal Noxious Weed Act of 1974 (PL 93-629)

The Federal Noxious Weed Act of 1974 (FNWA) is a federal legislation enacted in 1975. The purpose of the FNWA was to manage and control the spread of noxious weeds. Pursuant to the Act, the U.S. Secretary of Agriculture was given the authority to declare plants "noxious weeds", and limit the interstate spread of such plants without a permit.

The FNWA was amended by the 1990 Farm Bill on November 28, 1990. The amendment requires the Bureau of Land Management, the National Park Service, the U.S. Fish and Wildlife Service, the U.S. Forest Service, and all other federal land managing agency to do the following: (a) Designate an office or person trained in managing undesirable plant species, to develop and coordinate a program to control such plants on the agency's land, (b) Ensure that the agency’s budget process adequately fund the plant

management program, (c) Develop and implement cooperative agreements with the States regarding undesirable plants on agency land, (d) Establish integrated management systems to control or contain undesirable plants targeted under the cooperative agreements.

The provisions relating to the FNWA were found under 7 USCS §§ 2801 through 2814. The FNWA was superseded in 2000 by the Plant Protection Act, except for the amendment of 1990. 7 USCS §§ 2801 through 2813 now stands repealed

Carson-Foley Act of 1968 (43 USC 1241)

This law provides for the control of noxious plants on land under the control and jurisdiction of the federal government by permitting the appropriate state agency to enter such lands to destroy noxious plants.

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ATTACHMENT 2
QUALITIES OF WILDERNESS CHARACTER

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1. Untrammeled: "...an area where the earth and its community of life are untrammeled by man..." "...generally appears to have been affected primarily by the forces of nature." **Wilderness is essentially unhindered and free from modern human control or manipulation.** Measures of this quality could include: • spraying weeds • suppressing fire • collaring wildlife • eradicating fish • manipulating water flow • unauthorized trespass cattle • unauthorized marijuana cultivation	**2. Natural** "...is protected and managed so as to preserve its natural conditions." **Wilderness ecological systems are substantially free from the effects of modern civilization.** Measures of this quality could include: • species of concern • non-native species • visibility, ozone • acid deposition • water quality, loss of soil • loss of connectivity • pathways for nonnative species • fire regimes
3. Undeveloped "...an area of undeveloped federal land...without permanent improvement or human habitation" "...where man himself is a visitor who does not remain." **Wilderness retains its primeval character and influence and is essentially without permanent improvement or modern human occupation.** Measures of this quality could include: • authorized non-recreational physical development: scientific equipment, radio repeaters, fish barrier • unauthorized non-recreational physical development: illegal stock pond, irrigation systems for marijuana cultivation • inholdings • administrative mechanization: wheelbarrows, chainsaws, water pumps, rock drills, helicopters • emergency mechanization	**4. Solitude or primitive and unconfined recreation** "…has outstanding opportunities for solitude or a primitive and unconfined type of recreation" **Wilderness provides outstanding opportunities for solitude or primitive and unconfined recreation.** Measures of this quality include: • visitor use • trail contacts • area affected by travel routes • night sky visibility • soundscape • authorized recreation facilities: trails, toilets, bridges, shelters (these decrease self-reliant recreation) • unauthorized recreation facilities: user-created campsites, climbing hardware, illegal motorcycle trail • visitor management restrictions
5. Other Features of Value "…may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." **An individual wilderness may have unique qualities that cannot be characterized in the other four qualities.** Measures of this quality include: cultural sites, archeological resources, historic trails, cultural landscapes	

The four qualities of wilderness character mentioned in Section 2(c) of the Wilderness Act are:

Untrammeled – In wilderness, the "earth and its community of life" are essentially unhindered and free from modern human control or manipulation, "in contrast with those areas where man and his own works dominate the landscape." This quality is important because it helps ensure that wilderness is managed with the utmost humility and restraint, respecting the autonomy of nature that allows a place to be wild and free.

Undeveloped – Wilderness retains its "primeval character and influence," and is essentially "without permanent improvements" or modern human occupation. Preserving this quality keeps areas free from “expanding settlement and growing mechanization” and “with the imprint of man’s work substantially unnoticeable” as required by the Wilderness Act.

Natural – A wilderness area is to be "protected and managed so as to preserve its natural conditions." Wilderness ecological systems are substantially free from the effects of modern civilization. Preserving this quality ensures that indigenous species, patterns and ecological processes are protected and allows us to understand and learn from natural features.

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation – The Wilderness Act defines wilderness as having “outstanding opportunities for solitude or a primitive and unconfined type of recreation.” This quality is about the *opportunity* for people to experience wilderness; it is not directly about visitor experiences *per se*. The opportunities provided by wilderness include the chance to experience primitive recreation, natural sights and sounds, solitude, freedom, risk, the physical and mental challenges of self-discovery and self-reliance, and to use traditional skills free from the constraints of modern culture.

Other Features of Value -- In addition to the four required qualities of wilderness listed above, the Wilderness Act says these areas “may also contain ecological, geological, or other features of scientific, educational, scenic, or historical use” that reflect the character of this wilderness. Some of these unique features, such as the presence of threatened and endangered species, are also part of the Natural quality of a wilderness and could be evaluated for effects to that quality unless the specific species or habitat is unique to the wilderness area. Other components, however, such as the presence of important geologic features, cultural resources, historical sites, paleontological localities, or any features not in one of the other four qualities do not fit easily into one of the four statutory qualities. While many different types of features could be included, the intent is to include those that are significant or integral to the wilderness and that are decision factors that represent the unique characteristics and special features of this wilderness. Features mentioned in wilderness enabling legislation would likely qualify. The Unique Features that are present must be just as rigorously protected as the other qualities of wilderness character, however, and so you should account for these separately in this section of the MRA.

The description of wilderness character qualities above is not comprehensive. For a detailed discussion of wilderness character refer to:

U.S. Forest Service Rocky Mountain Research Station, General Technical Report, RMRS-GTR-151: *Monitoring Selected Conditions Related to Wilderness Character: A National Framework.*

U.S. Forest Service Rocky Mountain Research Station, General Technical Report, RMRS-GTR-212: *Keeping It Wild: An Interagency Strategy to Monitor Trends in Wilderness Character Across the National Wilderness Preservation System.*

ATTACHMENT 3:
OTHER GUIDANCE

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Plans, policies, and agreements that may apply to projects within SEKI include (but are not limited to):

Executive Order 11990, Protection of Wetlands (42 Fed. Reg. 26961)

Direct the NPS and other federal agencies to protect and manage wetlands as follows:

Section 1. (a) Each agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; and (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Executive Order 13112, "Established Policy to Limit the Introduction and Spread of Invasive Species" (1998)

This federal directive provides overarching guidance for the management of invasive species, and requires federal agencies to act upon: leadership and coordination, prevention, early detection and rapid response, control, education, research, and restoration.

NPS Management Policies 2006

4.4.2 Management of Native Plants and Animals – The Service may intervene to manage individuals or populations of native species only when such intervention will not cause unacceptable impacts to the populations of the species or to other components and processes of the ecosystems that support them. Also management is necessary:

- because a population occurs in an unnaturally high or low concentration as a result of human influences (such as loss of seasonal habitat, the extirpation of predators, the creation of highly productive habitat through agriculture or urban landscapes) and it is not possible to mitigate the effects of the human influences; and
- to protect rare, threatened, or endangered species.

4.4.2.3 Management of Threatened or Endangered Plants and Animals – The Service will survey for, protect, and strive to recover all species native to national park systems units that are listed under the Endangered Species Act. The Service will fully meet its obligations under the NPS Organic Act and the Endangered Species Act to both proactively conserve listed species and prevent detrimental effects on these species.

4.4.4 Management of Exotic Species – Exotic species will not be allowed to displace native species if displacement can be prevented.

4.4.4.2 Removal of Exotic Species Already Present – All exotic plant and animal species that are not maintained to meet an identified purpose of the parks will be managed—up to and including eradication—if (1) control is prudent and feasible, and (2) the exotic species interferes with natural processes and the perpetuation of natural features, native species or natural habitats, or disrupts the genetic integrity of native species.

4.5 Fire Management – All wildland fires will be effectively managed through application of the appropriate strategic and tactical management options as guided by the park's fire management plan.

4.6.5 Wetlands – The Service will implement a "no net loss of wetlands" policy. In addition, the Service will strive to achieve a longer-term goal of net gain of wetlands across the national park system through restoration of previously degraded or destroyed wetlands.

When natural wetland characteristics or functions have been degraded or lost due to previous or ongoing human actions, the Service will, to the extent practicable, restore them to predisturbance conditions.

When practicable, the Service will not simply protect but will seek to enhance natural wetland values by using them for educational, recreational, scientific, and similar purposes that do not disrupt natural wetland functions.

4.7.2 Weather and Climate – Parks containing significant natural resources will gather and maintain baseline climatological data for reference.

5.0 Cultural Resources Management – The cultural resource Management Policies of the National Park Service are derived from a suite of historic preservation, environmental, and other laws, proclamations, executive orders, and regulations. A comprehensive list can be found in the Cultural Resource Management Handbook issued pursuant to Director's Order #28. Taken collectively, this guidance provides the Service with the authority and responsibility for managing cultural resources in every unit of the national park system so that those resources may be preserved unimpaired for future generations. Cultural resource management will be carried out in a manner that is consistent with these legislative and regulatory provisions and with implementing policies and procedures such as the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 Federal Register (FR) 44716-740), and Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act (63 FR 20497-508).

5.3.1 Protection and Preservation of Cultural Resources – The National Park Service will employ the most effective concepts, techniques, and equipment to protect cultural resources against theft, fire, vandalism, overuse, deterioration, environmental impacts, and other threats without compromising the integrity of the resources.

5.3.5.4 Historic and Prehistoric Structures – The treatment of historic and prehistoric structures will be based on sound preservation practice to enable the long-term preservation of a structure's historic features, materials, and qualities. There are three types of treatment for extant structures: preservation, rehabilitation, and restoration.

6.3.5 Minimum Requirement – All management decisions affecting wilderness must be consistent with the minimum requirement concept. This concept is a documented process used to determine if administrative activities effecting wilderness resources or the visitor experience are necessary and how to minimize impacts. The minimum requirement concept will be applied as a two-step process that determines:

- Whether or not the proposed management action is appropriate or necessary for administration of the area as wilderness; and does not pose a significant impact to wilderness resources and character; and
- The techniques and type of equipment needed to ensure that impact to wilderness resources and character is minimized.

In accordance with this policy, superintendents will apply the minimum requirement concept in the context of wilderness management planning as well as to all other administrative practices, proposed special uses, scientific activities and equipment use in wilderness. When determining minimum

requirement, the potential disruption of wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience. If a compromise of wilderness resources or character is unavoidable, only those actions that preserve wilderness character and/or have localized, short-term adverse impacts will be acceptable.

While the parks' managers have flexibility in identifying the method used to determine minimum requirement (See IV.C.2) within the approved wilderness management plan, the method used must clearly weigh the benefits and impacts of the proposal, document the decision process, and be supported by an appropriate environmental compliance document. Parks with no approved wilderness management plan must develop a separate process to determine minimum requirement until the plan is finally approved. Parks will complete a minimum requirement analysis on those administrative practices and equipment use that have the potential to impact wilderness resources or values. The minimum requirement concept cannot be used to rationalize permanent roads or inappropriate or unlawful uses in wilderness.

Administrative use of motorized equipment or mechanical transport will be authorized only:

- If determined by the superintendent to be the minimum requirement needed by management to achieve the purposes of the area as wilderness, including the preservation of wilderness character and values, or
- In emergency situations (search and rescue) involving the health or safety of persons actually within the area. Such management activities will be conducted in accordance with all applicable regulations, policies, and guidelines, including minimum requirement protocols as practicable.

Such management activities will also be conducted in accordance with all applicable regulations, policies, and guidelines and, where practicable, will be scheduled to avoid creating adverse resource impacts or conflicts with visitor use.

6.3.6.1 Scientific Activities in Wilderness, General Policy – The National Park Service has a responsibility to support appropriate scientific activities in wilderness and to use science to improve wilderness management. The Service recognizes that wilderness can and should serve as an important resource for long-term research into and study and observation of ecological processes and the impact of humans on these ecosystems. The National Park Service further recognizes that appropriate scientific activities may be critical to the long-term preservation of wilderness.

Scientific activities are to be encouraged in wilderness. Even those scientific activities (including inventory, monitoring, and research) that involve a potential impact to wilderness resources or values (including access, ground disturbance, use of equipment, and animal welfare) should be allowed when the benefits of what can be learned outweigh the impacts on wilderness resources or values. However, all such activities must also be evaluated using the minimum requirement concept and include documented compliance that assesses impacts against benefits to wilderness.

6.3.7 Natural Resources Management (in wilderness) – Management should seek to sustain the natural distribution, numbers, population composition, and interaction of indigenous species. Management intervention should only be undertaken to the extent necessary to correct past mistakes, the impacts of human use, and influences originating outside of wilderness boundaries. Management actions, including the restoration of extirpated native species, the alteration of natural fire regimes, the control of invasive alien species, the management of endangered species, and the protection of air and water quality, should be attempted only when the knowledge and tools exist to accomplish clearly articulated goals.

6.3.8 Cultural Resources (in wilderness) – The Wilderness Act specifies that the designation of any area of the park system as wilderness "shall in no manner lower the standards evolved for the use and

preservation of" such unit of the park system under the various laws applicable to that unit (16 USC 1133(a)(3)). Thus, the laws pertaining to historic preservation also remain applicable within wilderness but must generally be administered to preserve the area's wilderness character. The responsible decision-maker will include appropriate consideration of the application of these provisions of the Wilderness Act in analyses and decision-making concerning cultural resources.

Cultural resources that have been included within wilderness will be protected and maintained according to the pertinent laws and policies governing cultural resources using management methods that are consistent with the preservation of wilderness character and values. These laws include the Antiquities Act and the Historic Sites, Buildings and Antiquities Act, as well as subsequent historic preservation legislation, including the National Historic Preservation Act, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act. The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation projects provide direction for protection and maintenance. Cemeteries or commemorative features, such as plaques or memorials, that have been included in wilderness may be retained (including approved access to these sites), but no new cemeteries or additions to existing cemeteries may be made unless specifically authorized by federal statute, existing reservations, or retained rights.

6.3.10 Management Facilities – Part of the definition of wilderness as provided by the Wilderness Act is "undeveloped federal land retaining its primeval character and influence, without permanent improvements." Accordingly, authorizations of NPS administrative facilities in wilderness will be limited to the types and minimum number essential to meet the minimum requirements for the administration of the wilderness area. A decision to construct, maintain, or remove an administrative facility will be based primarily on whether or not the facility is required to preserve wilderness character or values, not on considerations of administrative convenience, economic effect, or convenience to the public or staff of the parks.

6.3.10.2 Trails in Wilderness – Trails will be permitted within wilderness when they are determined to be necessary for resource protection and/or for providing for visitor use for the purposes of wilderness.

Trails will be maintained at levels and conditions identified within the approved wilderness management plan or other planning document. Trail maintenance structures (such as water bars, gabions) may be provided, under minimum requirement protocols, where they are essential for resource preservation or where significant safety hazards exist during normal use periods.

9.2.2.9 Trail Bridges – Trail bridges may be used for crossing swift waters areas prone to flash flooding, and other places that present potential safety hazards. Less obtrusive alternatives to bridges (such as, fords) and trail relocation will be considered before a decision is made to build a bridge. A bridge may be the preferred alternative when necessary to prevent stream bank erosion or protect wetlands or fisheries. If a bridge is determined to be appropriate, it will be kept to the minimum size needed to serve trail users, and it will be designed to harmonize with the surrounding natural scene and be as unobtrusive as possible.

Director's Order 77-1: *Wetland Protection* (Section 2.7)

Where natural wetland characteristics or functions have been degraded or lost due to previous or ongoing human activities, the NPS will, to the extent appropriate and practicable, restore them to pre-disturbance conditions.

Sequoia and Kings Canyon National Parks Backcountry Management Plan (1986)

Section 2.2 Facilities – Facilities in the backcountry include trails, bridges, campsites, signs, ranger stations, resource monitoring and research devices, and toilets. Facilities are limited to those necessary for administrative activities and visitor use, to produce as little conflict as possible with visitors' wilderness experience.

Section 3.2 Philosophy – Provides guidance on the overall management philosophy of SEKI's backcountry.

Section 5.13.2 Management Policies – The ranger patrol cabins [stations] will be maintained for administrative use, including use by trail, research, or resources management crews, snow surveyors, etc.

Section 5.14 Administration – Provides guidance on how the parks' managers are to treat generally prohibited actions of Section 4(c) of the Wilderness Act. Specifically treated are radio communications (5.14.2.1), helicopters (5.14.2.2), mechanized trail maintenance equipment (5.14.2.3), cabins (5.14.2.4), administrative camps (5.14.2.5), administrative stock use (5.14.2.6), NPS backcountry crews (5.14.2.7), and NPS personnel (5.14.2.8). Section 5.14.3 also provides reference to the Administrative Use Guideline Addendum (January 1985) which provides further clarification on administrative and management actions occurring in SEKI's Wilderness and backcountry.

Section 5.16 Scientific Study and Impact Monitoring – Provides guidance on how the parks' managers are to conduct "scientific study and monitoring" in wilderness and backcountry areas.

Sequoia and Kings Canyon National Parks General Management Plan/Record of Decision (2007)

The GMP provides direction for desired conditions and appropriate facilities in wilderness, and reiterates and reinforces the parks' purpose and significance.

Some key wilderness related information from GMP or ROD:

"Within the wilderness, efforts will be made to preserve a sense of remoteness and freedom from human-caused impacts. However, simple amenities such as ranger stations may be present to support administrative activities, reduce or control resource impacts, or provide for research and monitoring. Facilities used to support the administration and protection of wilderness may be provided."

"Use of stock continues, both as a means of access to wilderness by visitors, and for the administration of wilderness and protection of wilderness values." "The parks' designated wilderness and other areas managed as wilderness are zoned to reflect the varying intensities of use of different areas.

"Preserve or rehabilitate historic ranger cabins, Smithsonian Institution shelter (Mount Whitney shelter), Pear Lake ski hut, and other structures. Preserve and / or stabilize the Shorty Lovelace Historic District cabins or allow them to molder. Evaluate some trails to determine their eligibility for the National Register of Historic Places, plus provide historic trails information."

Assess backcountry ranger stations and replace or rehabilitate as necessary.

Language from the ROD: In heavily traveled zones, there exist engineered trails and bridges, food lockers, designated campsites, and toilets to protect the parks' resources, while in less-used areas, amenities are minimal or non-existent.

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SEQUOIA AND KINGS CANYON NATIONAL PARKS

MINIMUM REQUIREMENT ANALYSIS WORKSHEET

". . . except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act..."

– The Wilderness Act, 1964

INSTRUCTIONS

A Minimum Requirement Analysis (MRA) is required for ***all*** administrative actions in wilderness that either propose a Wilderness Act Section 4(c) prohibited use or have an effect on wilderness character (per Director's Order 41). **See the Minimum Requirement Instructions for directions and background materials to assist you with this analysis**. Additional instructions may be found at: http://www.wilderness.net/mrdg/

Routing Information

1) Complete the Minimum Requirement Analysis Worksheet (MRA). Name the file as follows: SubmissionDate_ShortTitle_LastName_Version1.docx.
2) Email the MRA (WORD version) to the Assistant Wilderness Coordinator (AWC) and the Environmental Protection Specialist (EPS) for review. **You must submit your MRA at least two weeks before your proposed action is to occur.**
3) **If revisions are necessary**, the EPS will:
    a. Return the MRA to the project proponent for revisions. Once revisions are made, project proponent will rename file as Version2. Then, repeat Step 2.

    If no revisions are needed, the EPS will:

    a. Rename the file as Final and save it under: S:\SUPT\Environmental Compliance Office\Wilderness\MRMTs and MRAs*Year*\Final
    b. Forward the electronic copy to the Division Chief for review and signature and "cc:" the project lead.
4) Division Chief will review and forward a printed copy to the Superintendent for signature. If the Division Chief changes the MRA, they will return the updated version electronically to the AWC and EPS. **If the MRA is part of a larger environmental compliance or permitting package, the entire package must go to the Superintendent for signature at the same time.**
5) The signed MRA will be sent to the EPS for record keeping. Signed/scanned copies will be filed as PDFs under: S:\SUPT\Environmental Compliance Office\Wilderness\MRMTs and MRAs*Year*\Signed MRAs
6) The EPS will email a PDF of the signed MRA Worksheet to the project proponent so that he/she can review mitigation, monitoring, and reporting requirements.

GENERAL INFORMATION:

Project Title:_____

Project Duration:_____

(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:_____

Project Proponent:_____

Contact Information: _____

Tracking Number (Office Use Only):_____

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.

A. Options Outside of Wilderness

Can actions taken outside of wilderness adequately address the situation and meet project goals?

Yes: ☐ **No:** ☐

Explain:

B. Valid Existing Rights or Special Provisions of Wilderness Legislation

Is 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.

Yes: ☐ **No:** ☐

Explain:

C. Requirements of Other Legislation

Is action necessary to meet the requirements of other federal laws? Cite law and section.

Yes: ☐ **No:** ☐

Explain:

D. Wilderness Character

Is action necessary to preserve one or more qualities of wilderness character?

Untrammeled:

Yes: ☐ **No:** ☐

Explain:

Undeveloped:

Yes: ☐ **No:** ☐

Explain:

Natural:

Yes: ☐ **No:** ☐

Explain:

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation:

Yes: ☐ **No:** ☐

Explain:

Other Features of Value (e.g., Cultural Resources):

Yes: ☐ **No:** ☐

Explain:

E. Public Purposes

Is 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***"?

Yes: ☐ **No:** ☐

Explain:

F. Other Guidance

Is action 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?

Yes: ☐ **No:** ☐

Explain:

Decision:

Is administrative action <u>necessary</u> 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.

Yes: ☐ **No:** ☐

Explain:

Compliance Pathway:

Yes: ☐ **No:** ☐

If yes, provide document name and PEPC reference number:

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 include: the use of mechanical transport and/or motorized equipment and vehicles, the landing of aircraft, and the installation of materials, equipment and/or structures. ***NOTE:*** Installations include items used to support activities such as communications, water development, stock use, or wildlife management. It includes debris such as old dump sites, plane crash sites, or locations of unexploded ordinance. It includes memorials or other monuments other than those placed during land surveys. It also includes unattended measurement or other device(s) left in place for the purpose of recording environmental data or marking a study plot.

Yes: ☐ **No:** ☐

If *yes*, proceed to Step 3.

If *no*, continue with the questions below.

Wilderness Character Questions	**Yes or No**
Does the proposed activity include human actions that intentionally control or manipulate the components or processes of ecological systems inside the wilderness (e.g., does it involve a trammel)? *(This question does not include collecting abiotic samples or handling, removing or killing organisms for scientific identification or measurement.)*	☐ ☐
Would the proposed activity include any of the following: 1) removing or killing rare or sensitive species/subspecies, 2) handling of threatened or endangered species/subspecies, 3) having more than negligible effects on the health or survival of a population of a species/subspecies, or 4) introducing plants and/or animals into the wilderness?	☐ ☐
Would the proposed activity occur in a sensitive area (e.g., critical habitat) or at a sensitive time for a particular species?	☐ ☐
Does the proposed activity necessitate the establishment of crew camps that exceed normal recreational use (e.g. the installation of food storage lockers, privy structures, or shower facilities)?	☐ ☐
Would the proposed activity change the trail class of any given trail?	☐ ☐
Does the proposed activity rely on crews that exceed the maximum group size for a particular area?	☐ ☐
Would the proposed activity restrict (even temporarily) visitor access to or movement in a particular area?	☐ ☐
Would the proposed activity result in a discernible and noticeable effect (beyond that expected if the crew were members of a typical/legal recreational group) on opportunities for solitude?	☐ ☐
If the proposed activity is approved, is there a risk of long-lasting, cascading, or otherwise significant unintended effects?	☐ ☐

Additional Questions	Yes or No
Would the proposed activity likely be controversial with any publics?	☐ ☐
Would the proposed activity pose other legal or policy issues?	☐ ☐
Would the proposed activity occur in an area that already has past, ongoing, or future planned 4(c) prohibited activities?	☐ ☐
Would the proposed activity result in more than a minor beneficial or adverse effect on the parks' natural or cultural resources, which could require the preparation of an EA or EIS?	☐ ☐

If you answered yes to any of the questions above, you may be required to complete Step 3. Contact the AWC or the EPS for guidance.

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

Project Description:

Prepared by:

Name	Position	Date

STEP 3:

Determine the minimum activity.

Develop a range of reasonable and feasible alternatives. You should have at least two alternatives *plus* a "no-action" alternative. Add additional pages as necessary. Be sure to describe in detail those aspects of your project that involve 4(c) general prohibitions. These are usually contained in the Untrammeled and/or Undeveloped qualities.

You should also include a list of alternatives that were considered but dismissed, with a brief explanation for dismissal. Alternatives should not be eliminated simply because of the cost or time involved. The potential disruption of wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience.

Please refer to the MRA Instructions for additional information on developing alternatives and identifying effects.

Description of 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?

NOTE: *The positive and negative effects of this alternative should not be included in the description.*

A. Wilderness Character

Does this alternative affect the qualities of wilderness character? What mitigation measures will be taken? *For definitions of wilderness character qualities, see the MRA Instructions.*

Untrammeled:

Yes: ☐ **No:** ☐

Explain:

Undeveloped:

Yes: ☐ **No:** ☐

Explain:

Natural:

Yes: ☐ **No:** ☐

Explain:

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation:

Yes: ☐ **No:** ☐

Explain:

Other Features of Value (e.g., Cultural Resources):

Yes: ☐ **No:** ☐

Explain:

B. Safety

How does this alternative affect visitor and/or employee safety? Does it present a new or changed situation that threatens visitor safety? If there are adverse effects, what mitigation measures will be taken? Which hazards cannot be mitigated?

Visitor Safety:

Employee Safety:

C. Other Criteria

Does this alternative help maintain proficiency in the use of primitive and traditional skills? Does it affect the special provisions (grazing, mining, water developments, access to non-federal land, etc.) identified in Sections 4 and 5 of the Wilderness Act? Are there any timing requirements or cost constraints that need to be considered?

Yes: ☐ **No:** ☐

Explain:

Alternative #2

Description of 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?

NOTE: *The positive and negative effects of this alternative should not be included in the description.*

A. Wilderness Character

Does this alternative affect the qualities of wilderness character? *For definitions of wilderness character qualities, see the MRA Instructions.*

Untrammeled:

Yes: ☐ **No:** ☐

Explain:

Undeveloped:

Yes: ☐ **No:** ☐

Explain:

Natural:

Yes: ☐ **No:** ☐

Explain:

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation:

Yes: ☐ **No:** ☐

Explain:

Other Features of Value (e.g., Cultural Resources):

Yes: ☐ **No:** ☐

Explain:

B. Safety

How does this alternative affect visitor and/or employee safety? Does it present a new or changed situation that threatens visitor safety? If there are adverse effects, what mitigation measures will be taken? Which hazards cannot be mitigated?

Visitor Safety:

Employee Safety:

C. Other Criteria

Does this alternative help maintain proficiency in the use of primitive and traditional skills? Does it affect the special provisions (grazing, mining, water developments, access to non-federal land, etc.) identified in Sections 4 and 5 of the Wilderness Act? Are there any timing requirements or cost constraints that need to be considered?

Yes: ☐ **No:** ☐

Explain:

Alternative #3

Description of 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?

NOTE: *The positive and negative effects of this alternative should not be included in the description.*

A. Wilderness Character

Does this alternative affect the qualities of wilderness character? *For definitions of wilderness character qualities, see the MRA Instructions.*

Untrammeled:

Yes: ☐ **No:** ☐

Explain:

Undeveloped:

Yes: ☐ **No:** ☐

Explain:

Natural:

Yes: ☐ **No:** ☐

Explain:

Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation:

Yes: ☐ **No:** ☐

Explain:

Other Features of Value (e.g., Cultural Resources):

Yes: ☐ **No:** ☐

Explain:

B. Safety

How does this alternative affect visitor and/or employee safety? Does it present a new or changed situation that threatens visitor safety? If there are adverse effects, what mitigation measures will be taken? Which hazards cannot be mitigated?

Visitor Safety:

Employee Safety:

C. Other Criteria

Does this alternative help maintain proficiency in the use of primitive and traditional skills? Does it affect the special provisions (grazing, mining, water developments, access to non-federal land, etc.) identified in Sections 4 and 5 of the Wilderness Act? Are there any timing requirements or cost constraints that need to be considered?

Yes: ☐ **No:** ☐

Explain:

Additional Alternatives

Yes: ☐ **No:** ☐

If yes, list alternatives and explain reason for dismissal:

Comparison of Alternatives

Rate each alternative on a scale of +3 to -3.

-3	-2	-1	0	+1	+2	+3
High Negative	Moderate Negative	Low Negative	No Impact Undeterminable	Low Positive	Moderate Positive	High Positive

Wilderness Character	Alternative 1 No-action	Alternative 1 No-action	Alternative 2	Alternative 2	Alternative 3	Alternative 3
Untrammeled						
Undeveloped						
Natural						
Solitude or Primitive and Unconfined Recreation						
Unique/Other Features						
Total						

Safety	Alternative 1 No-action	Alternative 1 No-action	Alternative 2	Alternative 2	Alternative 3	Alternative 3
Visitor						
Employee						
Total						

Other Criteria Summary	Alternative 1 No-action	Alternative 1 No-action	Alternative 2	Alternative 2	Alternative 3	Alternative 3
Total						

Decision:
What is the minimum activity?

Select an alternative. Usually, the alternative that has the least overall adverse effect on wilderness character is preferred. However, there may be other considerations.

Note: When selecting the preferred alternative the potential disruption to wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience. If a compromise of wilderness character or resources is unavoidable, only those actions that preserve wilderness character and/or have localized, short-term acceptable adverse impacts will be allowed.

Selected alternative: _____

Rationale (include safety criterion, if appropriate):

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?

Yes: ☐ **No:** ☐

If yes, please describe.

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

4(c) Prohibition	Frequency and/or Quantity	Duration
mechanical transport		
motorized equipment		
motor vehicles		
motorboats		
landing of aircraft		
structure(s)/installation(s)		
temporary road		

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

Follow-Up Form Required: **Yes:** ☐ **No:** ☐

STEP 4: Signatures and Reporting

Prepared by:

Name	Position	Date

Review and Comments

Name/Position	Comments	Date
Assistant Wilderness Coordinator		
Environmental Protection Specialist		
Other reviewer as appropriate		

Approvals	Print Name	Signature	Date
Recommended:	Division Chief		
Approved:	Superintendent		

Return to Office of Compliance and Planning for administrative record once document has been approved by the Superintendent.

Minimum Requirement Analysis
Follow-Up Form

Project Title:
Tracking Number:

General:

1) Did you complete your proposed action?

Yes: ☐ **No:** ☐ Partial: ☐

If "partial," please explain:

2) Did your work include a 4(c) prohibited action (e.g., the use of helicopters or motorized tools, the installation of equipment, etc.)?

Yes: ☐ **No:** ☐

Installations:

Did your work include the installation of equipment (e.g., tarping, gill nets, RAWS stations, wildlife cameras, etc.)?

Yes: ☐ **No:** ☐

If "yes," please list the type, location, and duration of each installation.

Installation Type	Location	Duration

Helicopters:

Did your work include the use of a helicopter?

Yes: ☐ **No:** ☐

Motorized Tools:

Did your work include the use of motorized tools or mechanical transport (e.g., chainsaws, rock drills, hand drills, water pumps, wheelbarrows, etc.)?

Yes: ☐ **No:** ☐

If "yes," please list the tool type, the location where it was used, and the approximate hours of run time.

Tool Type	Location	Hours of Run Time

Please email the completed form to the assistant wilderness coordinator.

Appendix J

Climbing Management Strategy

ON THE PREVIOUS PAGE
Hamilton Gorge in Sequoia National Park
Photo Courtesy of Rick Cain

APPENDIX J:

CLIMBING MANAGEMENT STRATEGY

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CLIMBING MANAGEMENT STRATEGY

BACKGROUND

The National Park Service (NPS) recognizes climbing as a legitimate and appropriate activity for realizing unconfined and self-reliant recreational opportunities in wilderness. Aspects of climbing may affect wilderness character, including the qualities of natural, undeveloped, and opportunities for solitude (see wilderness character discussion in chapter 3). This climbing management strategy (strategy) is intended to provide guidance of climbing activities in wilderness while preserving wilderness character. Climbing has been a popular activity in the area comprising Sequoia and Kings Canyon National Parks (hereafter the parks), and the Sierra Nevada since the mid-1800s. The wide variety of peaks and rock formations in the parks provide excellent opportunities for a wide spectrum of climbing including rock, big wall, snow and ice, bouldering, canyoneering, caving, and mountaineering. It is a popular area for local, regional, national and international climbers.

For the purposes of this strategy, climbing is defined as ascending or descending very steep terrain, usually by using hands and feet to maintain balance, and typically utilizing ropes and anchors to prevent falls. This includes rock climbing, ice climbing, canyoneering, caving, rappelling, and other similar activities. The requirements for fixed anchors described below apply equally in all areas of the parks' wilderness, including above and below ground locations. The parks are in the process of developing an updated Cave Management Plan (CMP) and it is anticipated that the CMP will adopt the general guidelines of this strategy but expand on cave specific activities.

Climbing in its various forms continues to be a popular activity with the visiting public. Because climbing has resource impacts, managers strive to find a balance between allowing climbing to continue as freely as possible and controlling impacts on environmental resources and other visitors of the parks. A voluntary commitment to Leave No Trace© climbing techniques on the part of the climbing community is an important factor in ensuring the preservation of resources and wilderness character.

Definitions of Key Terms

Clean climbing *— a rock climbing term that describes techniques and equipment that climbers use in order to avoid damaging the rock by widening cracks or drilling holes. Clean climbing techniques may date back to the 1920s and possibly earlier. The term itself likely emerged around 1970 with the widespread and rapid adoption of nuts (also called chocks), hexes, and cams in the United States and Canada. These were adopted for use in preference to pitons, and at times bolts, which damage rock and are more difficult and time-consuming to install.*

Fixed Anchors *— consist of webbing, bolts, pitons, chains, and other devices and equipment permanently or semi-permanently attached to rocks (or other natural features) that are left in place after a rock climbing activity. These may be divided into two categories: 1) permanent anchors (e.g., bolts and pitons), and 2) removable or abandoned anchors (e.g., slings, nuts) with or without accompanying hardware such as carabiners.*

The parks and other areas in the Sierra Nevada have long been known for a strong traditional climbing ethic. The local climbing community in general does not accept practices that create undue impacts, such as adding bolts to existing routes or establishing new bolt-intensive routes. Chipping or gluing new holds is considered unethical and is prohibited. Clean-climbing techniques are generally the norm. It is incumbent on the local and national climbing community, along with the parks, to inform and educate climbers new to the area of this fact for the ultimate protection of resources and to maintain access to climbing areas.

Many impacts related to climbing, such as soil compaction and erosion, wildlife disturbance, or noise, are also associated with other forms of visitor use. However, other impacts are associated solely with climbing, such as the use of chalk or fixed anchors. These are discussed in more detail below.

The intent of this appendix is to focus on a limited set of issues, impacts, and mitigations that are directly related to climbing in wilderness. This appendix is not intended as a comprehensive climbing management plan, but will serve as interim guidance on climbing activities in the absence of such a plan. A future climbing management plan would more thoroughly document and analyze use levels and patterns, identify significant concerns, and implement detailed management actions to comprehensively address climbing related issues.

POLICY AND LAW

Climbing management in National Park wilderness is directly guided by relevant laws, NPS Management Policies, Director's Orders, and Reference Manuals. The U.S. Code of Federal Regulations, and the parks' Superintendent's Compendium also provide indirect and direct management control of climbing and related activities. Director's Order #41: Wilderness Stewardship, and its Reference Manual #41 (DO #41 and RM #41), provides specific guidance on the management of climbing in wilderness. In section 7.2 Climbing, it states: "If climbing activities occur in wilderness, climbing management strategies will be included as part of the park's Wilderness Stewardship Plan, or other activity- level plan. . . Wilderness climbing education and impact monitoring will be important components in climbing management programs . . . climbing practices with the least negative impact on wilderness resources and character will always be the preferred choice." Reference Manual #41 adds that, "Climbing has a history that predates the Wilderness Act, but wilderness is a unique resource that has overriding implications for all recreation uses, including climbing. Wilderness has a special status that compels all visitors to a higher standard of ethics and conduct."

Climbers accessing wilderness are subject to the rules and regulations of wilderness use as described in the WSP/FEIS and established in the Superintendent's Compendium. This includes possessing a valid wilderness permit for overnight use.

Specific federal regulations that relate to climbing and resource preservation include:

- Title 36 CFR 2.1 Preservation of natural, cultural and archeological resources - Prohibits practices of possessing, destroying, injuring, defacing, removing, digging, trundling (rolling rocks) or disturbing (chipping, gluing or gardening) from their natural state any park features.
- Title 36 CFR 2.2 (a)(2) Wildlife Protection - Prohibits feeding, touching, teasing, frightening, or intentional disturbing of wildlife nesting, breeding, or other activities.
- Title 36 CFR 2.12 Audio Disturbances - Prohibits the practice of utilizing motorized equipment or machinery that creates unreasonable noise, particularly in undeveloped areas (e.g., motorized rock drills, amplified sound devices).
- Title 36 CFR 1.5 (f) Closures and Public Use Limits - Temporary closures of specific climbing routes and areas will be enforced to ensure prudent management of raptor nesting areas where they coincide with popular climbing routes.

OBJECTIVES

- Provide opportunities for the pursuit of the traditional activity of climbing in the park's wilderness.
- Ensure that climbing activities do not unacceptably impact wilderness character or resources.
- Emphasize clean-climbing as the proper method to realize the benefits of climbing in wilderness.
- Promote strategies that "will address ways to control, and in some cases reduce, the number of fixed anchors to protect the parks' wilderness resources or to preserve the 'untrammeled,' 'undeveloped,' and 'outstanding opportunities for solitude' qualities of the park's wilderness character." (RM#41)
- Work cooperatively with climbers and the climbing community to advance the practices of responsible climbing in wilderness.
- Provide education to the public on responsible climbing practices in wilderness.

IMPACTS OF CLIMBING AND MITIGATIONS

LITTERING / HUMAN WASTE

Non-degradable litter is common to all aspects of visitation. Litter as it relates to climbing, is deposited by climbers, climbing spectators and at bivouac (bivy) sites. Athletic tape is sometimes found at the base of crack climbs. Ledges and the base of cliffs have been found to have fecal matter scattered around. Some bivy sites pose a problem, since waste cannot be buried. Decomposition of waste is a problem at high elevations due to cold temperatures. Exposed waste poses health problems to other climbers or wildlife and degrades the aesthetics of the user experience.

Climbers, and other wilderness users, are required to clean up after themselves and pack out trash and garbage and follow waste management regulations. Climbers will be expected to pack out human waste when in an area where cat holes or other appropriate means of human waste disposal (e.g., privies) are not available or appropriate. Waste should never be dropped while on a climb (it should be tubed or bagged for later proper disposal).

EROSION

Off the Rock: Climbers and mountaineers often bushwhack and scramble to gain access to the base of their route. Very steep informal trails can result. These informal trails may be braided with other informal trails to the same climb. Because they travel straight up the grade, water is diverted along the path, causing soil loss, gullying and loss of vegetation. At the base of climbs in high use areas, the ground is typically compacted and denuded of vegetation. Informal trails often contour along the base of the rock formation to the start of other climbs.

When informal approach trails to the base of heavily used climbing routes are identified, climbers and the parks' management will increase education efforts to discourage / disperse use in order to establish a sustainable pattern of use. In rare occasions, signs may be placed to direct climbers away from problem or sensitive areas in order to protect resources (after conduct of a minimum requirement analysis). Informal trails associated with climbing routes will be managed according to the guidelines in the Trail Management and Classification System (see appendix K). Dispersed travel to the base of climbs may be encouraged in specific cases.

On the Rock: Through continuous use, the rock surface becomes smoother and freer of lichens, moss and dirt. Ledges and cracks also lose dirt and vegetation from climbing traffic. Toe and finger holds become worn off. Some climbers alter routes by gluing on artificial holds or chipping or prying the rock to create or improve holds. The gluing and chipping of holds, and the intentional "gardening" or cleaning the rock of soil and vegetation, and rolling of rocks deemed as hindrances (trundling), are not legal, or ethical, in wilderness.

SOCIAL IMPACTS

While climbing is widely accepted in the parks, the activity has not previously been addressed through an approved plan, policy, or regulation. Under the Code of Federal Regulations, various aspects of climbing recreation are managed in order to protect the parks' resources. Climbers, and other wilderness users, have a variety of individual experiences and personal perspectives. The climbing community and the parks' staff will continue to work together to mitigate user conflicts and enact appropriate administrative actions.

NOISE

Climbers frequently yell to communicate during a climb. Such noise can disrupt wildlife or impact hikers adjacent to climbing areas. Other noises (e.g., rock hammers) are also considered intrusive in the wilderness setting. Climbers will be encouraged to be sensitive to the value of natural quiet. Rock hammers, when allowed, must be used judiciously during sensitive times for wildlife (e.g., breeding, nesting) and in areas where other visitors may be disturbed.

WILDLIFE

Many of the popular climbing areas in the parks are also prime habitat for sensitive species of wildlife. Birds of prey frequently nest on rocks along and adjacent to established climbing routes. Concerns exist for both birds and climber safety.

The raptor area closures program has been a very successful means to reduce impacts. This program will continue. Temporary closures will be used to protect nesting raptors during critical phases of the courtship, nesting, and fledging periods. Precautionary and usually seasonal closures will occur in areas historically used by raptors (e.g., Moro Rock and Chimney Rock). Raptor activity will be monitored and those areas or routes with current raptor use will be closed. Other areas where susceptible wildlife activity is discovered will also be closed. Closures will be in effect long enough to ensure protection and non-disturbance of the birds. Temporary closures may be enacted for other wildlife protection as necessary (e.g., bighorn sheep).

VISUAL IMPACTS / CHALK

Visual impacts associated with climbing vary with user's attitudes towards climbing and their proximity to the activity. Bright colored slings, shiny metal bolts, white chalk and the sight of climbers and ropes on an otherwise undisturbed formation can detract from the scenic purpose of wilderness and the opportunities for solitude quality of wilderness character. The use of chalk may also cause a change in pH when it comes in contact with lichens, inhibiting growth or killing the plant.

Climbers will be encouraged to use protection, slings, and other equipment that blend in with the natural surroundings. The prudent use of chalk will be allowed, with balls preferred over loose chalk. Climbers will be encouraged to be sensitive to visual and environmental impacts that could occur and make attempts to clean rock of visual intrusions as practicable.

HARDWARE / EQUIPMENT

A wide range of equipment and hardware has been developed to be used as protection and aids for climbers. Hammer-driven pitons which widened and scarred cracks have been generally replaced by removable devices, as part of clean-climbing practices. However, the exploration of steeper, more difficult face climbs has led to an increase in the placement of fixed, artificial protection (e.g., bolts) by some climbers.

The use of permanent fixed anchors (e.g., bolts) is rarely appropriate in wilderness. Removable or abandoned (semi-permanent) fixed anchors (e.g., slings with or without accompanying hardware such as carabiners) must be placed judiciously and closely managed in order to prevent the degradation of wilderness resources and character. Where anchor points are necessary for climber safety, the use of removable equipment is the overwhelming preference. Permanent fixed anchors should not be placed merely for convenience or to make an otherwise un-climbable route climbable.

PUBLIC USE OF FIXED ANCHORS

Fixed anchors consist of webbing, bolts, pitons, chains, and other devices and equipment permanently or semi-permanently attached to rocks (or other natural features) that are left in place after the activity. These are, for the purposes of this strategy, divided into two categories: 1) permanent anchors (e.g., bolts), and 2) removable or abandoned (semi-permanent) anchors (e.g., slings with or without accompanying hardware such as carabiners).

NPS Director's Order #41 (DO #41) establishes that "Authorization will be required for the placement of new fixed anchors or fixed equipment. Authorization may be required for the replacement or removal of existing fixed anchors or fixed equipment. The authorization process to be followed will be established at the park level and will be based on a consideration of resource issues (including the wilderness resource) and recreation opportunities. Authorization may be issued programmatically within the Wilderness Stewardship Plan or other activity-level plan, or specifically on a case-by-case basis, such as through a permit system." And "If unacceptable impacts are occurring in wilderness as a result of climbing, the park superintendent may deem it necessary to restrict or prohibit the placement of fixed anchors."

For the purposes of this strategy, those fixed anchors, both permanent and removable/abandoned, which are currently in place may remain.

- Permanent fixed-anchors (e.g., bolts or pitons), may be placed, or replaced by individual climbers only with prior approval (see permit system below) or in the rare case of emergency. Existing bolts may be removed by individual climbers, without prior permission, if they are deemed unusable or unsafe. The climber should then communicate details of the removal to the parks (through the Chief Ranger's Office).
- Removable (or abandoned and semi-permanent) fixed-anchors (e.g., slings, nuts, or other clean climbing hardware) may be replaced or removed by individual climbers as necessary without prior approval. New semi-permanent rappel or retreat fixed-anchors may also be placed by individual climbers without prior approval, with the strong advisory to leave only the minimum necessary slings or hardware to safely descend or retreat from wilderness climbing routes, in order to keep wilderness climbing routes as free of abandoned slings and hardware as possible. The setting up of fixed-anchors for top-roping is strongly discouraged. When replacing existing slings or hardware, it is incumbent on the individual climber to carry old equipment out of wilderness and to dispose of it properly. Climbers are also strongly encouraged to remove any unsafe/unusable equipment from wilderness for proper disposal.

New, bolt-intensive climbing routes (i.e., "sport climbs") are not appropriate in wilderness and are expressly prohibited.

ADMINISTRATIVE USE OF FIXED ANCHORS

Per DO #41 "Proposals for the placement of fixed anchors or fixed equipment for the administrative purpose of facilitating future rescue operations must be evaluated through a MRA. [Minimum Requirement Analysis]" The parks may place and maintain permanent or removable fixed anchors for administrative and emergency purposes, but only after a MRA is completed, with the exception of emergencies. The NPS will not, as policy or practice, monitor any fixed anchors to evaluate their condition or accept any responsibility for the soundness of fixed anchors. The NPS, when it encounters them during park operations, may remove those fixed anchors deemed unsafe, unnecessary, or intrusive to wilderness.

SAFETY

Personal safety in climbing, as in all wilderness activities, remains the responsibility of the climber / wilderness user. RM #41 states, "Climbing is a "high risk" sport, and climbers are solely responsible for their own safety. Many climbing routes traverse hazardous terrain, and the National Park Service is not obligated to assess or mitigate these hazards, nor is it responsible for assessing or maintaining the safety of fixed anchors or fixed equipment. While the National Park Service has the authority to provide search and rescue services to the parks' visitors in need of assistance, there is no legal requirement to do so. All rescue activities in wilderness will be managed to provide necessary treatment and services to the sick, injured and stranded, keeping in mind the safety and well-being of rescue personnel, the victim and the public, plus "light on the land" and "minimum requirements/tool" rescue actions."

PATROL, EDUCATION AND ENFORCEMENT PROGRAM

Without a visible patrol and education/enforcement program, educational efforts, policies and regulations will have minimal effect. An important aspect of the patrol function is the incorporation of education, research, monitoring, and impact mitigation. Patrols are predicated on the commitment to protect the resource, educate visitors, guard against illegal activities, provide necessary assistance, and perform search and rescue functions in cases of emergencies. Patrols will focus primarily on 1) the education of visitors as to resource impact issues, minimum impact techniques and preventative search and rescue and 2) the enforcement of applicable laws and regulations when necessary and appropriate.

The parks will conduct a strong educational effort promoting minimum impact techniques and sound climbing ethics as outlined in Leave No Trace© Outdoor Skills and Ethics: Rock Climbing booklet in general, and specifically these parks' wilderness regulations and restrictions. The parks will maintain a "Rock Climbing" page on the parks' official website (www.nps.gov/seki), which will contain this strategy, and other climbing guidelines, rules and restrictions pertaining to climbing, as well as pertinent links to related websites. This page will also communicate any information on removal of fixed-anchors, performed by the climbing community or the parks.

Climbers are required to comply with specific regulations and should always:

- Pack out all litter and manage human waste properly (leave it cleaner than you found it)
- Use existing trails to approach climbs
- Know and respect environmentally sensitive areas (e.g., raptor closures)

- Know and abide by all regulations
- Avoid the use of all fixed anchors, as much as possible
- Request and obtain permission for placement or replacement of permanent fixed anchors
- Communicate to the parks any actions involving bolt removal, and on other issues involving the climbing environment
- Be considerate of wildlife and other users
- Share the climbing resource with others and practice and encourage clean-climbing techniques

As enforcement measures become necessary, patrol staff will enforce applicable regulations (e.g., no power drills for bolt placement, no pets in the wilderness, illegal guiding activities, violation of raptor closures, illegal camping and bivouacs, or resource degradation for the purpose of enhancing a climbing route).

RESEARCH AND MONITORING

The parks have sporadically conducted informal surveys of a small proportion of known and potential climbing areas. Given this limited information, a comprehensive inventory would be of value in assisting the proper management of climbing. It is a goal of the parks to develop and maintain an inventory and monitoring program to gather detailed information on how climbing activities affect wilderness character and resources. This inventory would be conducted prior to or in conjunction with the future development of a comprehensive climbing management plan.

SUMMIT REGISTERS

More than 170 summit (or peak) registers exist in the parks. They generally consist of a sealable weather-resistant container (metal, plastic, or glass) holding a small notebook in which people record dates and details of their climbs. The parks recognize that a limited number of summit registers is compatible with wilderness character, provided registers are in appropriate locations, of appropriate size and construction, and are well maintained. It is a desired condition of this WSP/FEIS to reduce developments and installations in wilderness; therefore, the parks will work toward reducing the number of registers and will not permit placement of new registers. In the near future, the parks will pursue the development of a general agreement (e.g., Memorandum of Understanding) between the NPS and the Sierra Peaks Section of the Sierra Club, which would determine locations, maintenance standards, and other conditions under which registers could remain.

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ATTACHMENT 1:
APPLICATION FOR SPECIAL USE PERMIT

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OBTAINING A PERMIT

To request permission to place a new permanent fixed anchor, or replace an existing permanent fixed anchor complete the Special Use Permit (Form 10-930) application below and submit to:

Superintendent, Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, CA 93271

INSTRUCTIONS

Within the permit, provide detailed information on:

- What you propose to do; place a new permanent fixed anchor, or replace an existing permanent fixed anchor.
- Where you propose to accomplish the above – provide as much detail as possible – area, route, etc.
- The description and justification of the proposed action (i.e., provide in detail, why you need to do what you are proposing. Attach any diagrams, maps, and additional pages if necessary):
- The dates of the proposed action
- Will you be accomplishing the action by yourself or with assistance of others? Please describe.

Regulations and restrictions for all wilderness users, as well as specific required conditions for permittees, include:

- Permittee will be required to comply with all wilderness regulations, including obtaining a wilderness permit (if staying overnight) and abiding by all camping restrictions and guidelines, and ensuring that other group members conduct themselves accordingly.
- The use and possession of motorized equipment (e.g., drills) is prohibited.
- The permittee is responsible for their personal safe conduct and that of other group members.

You may provide additional information and justification by attaching additional pages. You will be notified of the disposition of the application and the necessary steps to secure your final permit. Applications should be submitted at least 4 weeks before the date of the proposed action.

National Park Service
Sequoia and Kings Canyon National Parks
47050 Generals Highway, Three Rivers, CA 93271
559-565-3111

Application for Special Use Permit

Please supply the information requested below. **Attach additional sheets, if necessary, to provide required information**. A nonrefundable processing fee of $20.00 must accompany this application unless the requested use is an exercise of a First Amendment right. You must allow sufficient time for the parks to process your request; check with the parks for guidelines. You will be notified of the status of the application and the necessary steps to secure your final permit. Your permit may require the payment of cost recovery charges and proof of liability insurance naming the United States of America as also insured.

Enter either a social security number OR a tax ID number: we do not require both.

Applicant Name:	Company/Organization Name:
Social Security #:	Tax ID #
Street/Address:	Street/Address:
City/State/Zip Code:	City/State/Zip Code:
Telephone #:	Contact name:
Cell phone #:	Telephone #:
Fax #:	Fax#:
Email:	Email:

Description of Proposed Activity (attach diagram, attach additional pages if necessary):

Requested Location(s): _____

Date(s):

Set up begins: (date and time)	Activity begins: (date and time)	Activity ends: (date and time)	Removal completed (date and time)

Maximum Number of Participants: _____ (Please provide best estimate)

Maximum Number of vehicles: (attach parking plan)

_____Cars _____Vans/lt.trucks _____Utl.vans/trucks _____Buses/oversized vehicles

Support equipment (list all equipment; attach additional pages if necessary):

List support personnel including addresses and telephones; attach additional pages if necessary:

Individual in charge of activity on-site (include cell phone number) and authorized to make decisions related to the permitted activity: _____

Is this an exercise of First Amendment Rights?	☐ Y	☐ N
Have you visited the requested area?	☐ Y	☐ N
Have you obtained a permit from the National Park Service in the past? (If yes, provide a list of permit dates and locations on a separate page.)	☐ Y	☐ N
Do you plan to advertise or issue a press release before the event?	☐ Y	☐ N
Will you distribute printed material?	☐ Y	☐ N
Is there any reason to believe there will be attempts to disrupt, protest or prevent your event? (If yes, please explain on a separate page.)	☐ Y	☐ N
Do you intend to solicit donations or offer items for sale? (These activities may require an additional permit.)	☐ Y	☐ N

You are encouraged to attach additional pages with information useful in evaluating your permit request including: staging, sound systems, parking plan, security plans, sanitary facilities, crowd control, emergency medical plan, use of any building, site clean-up, etc.

The applicant by his or her signature certifies that all the information given is complete and correct, and that no false or misleading information or statements have been given.

Signature _____ Date _____

Printed Name_____ Title_____

Note: This is an application only, and does not serve as permission to conduct any special activity in the park. The information provided will be used to determine whether a permit will be issued. Send the

completed application along with the application fee in the form of a credit card payment, cashier's check, money order or personal check made payable to **National Park Service** to:

Superintendent,
Sequoia and Kings Canyon National Parks
47050 Generals Highway
Three Rivers, CA 93271

If your request is approved, a permit containing applicable terms and conditions will be sent you. The permit must be signed by the responsible person and returned to the parks for final approval by the Superintendent before the permitted activity may begin.

Notice to Customers Making Payment by Personal Check: When you provide a check as payment, you authorize us either to use information from your check to make a one-time electronic fund transfer from your account or to process the payment as a check transaction. When we use information from your check to make an electronic fund transfer, funds may be withdrawn from your account as soon as the same day we receive your payment, and you will not receive your check back from your financial institution.

NOTICES

Privacy Act Statement: The Privacy Act of 1974 (5 U.S.C. 552a) provides that you be furnished with the following information in connection with information required by this application. This information is being collected to allow the parks' manager to make a value judgment on whether or not to allow the requested use. Applicants are required to provide their social security or taxpayer identification number for activities subject to collection of fees and charges by the National Park Service (31 U.S.C. 7701). Information from the application may be transferred to appropriate Federal, State, and local agencies, when relevant to civil, criminal or regulatory investigations or prosecutions.

Paperwork Reduction Act Statement: We are collecting this information subject to the Paperwork Reduction Act (44 U.S.C. 3501) to provide the parks' managers the information needed to decide whether or not to allow the requested use. All applicable parts of the form must be completed in order for your request to be considered. You are not required to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

Estimated Burden Statement: Public reporting burden for this form is estimated to average 30 minutes per response including the time it takes to read, gather and maintain data, review instructions and complete the form. Direct comments regarding this burden estimate or any other aspect of this form to the Information Collection Clearance Officer, National Park Service, 1849 C Street NW. (1237), Washington, D.C. 20240

Title 18 U.S.C. Section 1001 makes it a crime for any person to knowingly and willfully make to any department or agency of the United States any false, fictitious, or fraudulent statements or representations as to any mater within its jurisdiction.

Appendix K

Trail Management and Classification System

ON THE PREVIOUS PAGE
Wilderness in Sequoia and Kings Canyon National Parks
NPS Photo

APPENDIX K:

TRAIL MANAGEMENT AND CLASSIFICATION SYSTEM FOR SEQUOIA AND KINGS CANYON NATIONAL PARKS

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TRAIL MANAGEMENT AND CLASSIFICATION SYSTEM FOR SEQUOIA AND KINGS CANYON NATIONAL PARK

PURPOSE AND NEED FOR THE TRAIL MANAGEMENT AND CLASSIFICATION SYSTEM

INTRODUCTION AND HISTORY

The trail system of Sequoia and Kings Canyon National Parks (the parks) has a history as long as human use of the area. American Indians lived and traveled in what are now park lands. Besides traveling the foothills and mid-ranges for subsistence, American Indians established routes over many Sierra Crest passes to trade back and forth between the Owens and San Joaquin Valleys. In the 19th century, European-American explorers, shepherds, miners, loggers, and cattle ranchers entered the mountains and began to establish trails and routes for stock travel (often following American Indian routes over passes). In the late 19th century and into the mid-20th century, private recreationists, explorers, and others began to explore the area and establish stock trails. After over 20 years of discussion and exploration, construction began on John Muir Trail in 1915. With the establishment of Sequoia National Park, more formal trail construction and maintenance efforts came into play, notably early trail construction by the military and the construction of the High Sierra Trail in the 1920s. Many Sequoia National Park trails benefited from Civilian Conservation Corps work in the 1930s. After the creation of Kings Canyon National Park in 1940, trail work in the north end of the parks began to include regular clearing and rerouting into switchbacks, and all of the parks' trails became dedicated to recreational rather than extractive uses. In the 1960s resource management concerns were evident as many of the parks' trails were rerouted out of meadows by volunteer and agency crews, and trail work since then has focused on the dual goals of protecting wilderness and the parks' resources while providing for recreational and administrative access. The Pacific Crest Trail was one of the two original National Scenic Trails established in 1968.

Each generation of trail builders and users had goals, techniques, and resources that they brought to bear on establishing their trails. As goals have changed, trails have been established, rerouted, reconstructed, and maintained or abandoned. The current trail system reflects this varied history, which continues into the present with changing visitor desires and management goals.

The purpose of this Trail Management and Classification System is to explain the guiding principles of trail management at Sequoia and Kings Canyon National Parks, to describe desired conditions for the trail system, to describe programmatic methods used in trail management, and to identify actions that will need to be taken in order to achieve the desired conditions of the Wilderness Stewardship Plan (WSP).

RELATED LAWS, POLICIES, AND PLANS

The WSP provides detailed information on the legislative and policy context that requires planning in wilderness. Several citations particularly relevant to trail management planning are repeated here:

ORGANIC ACT

The NPS *Organic Act* of 1916 directs the U.S. Department of the Interior and the National Park Service (NPS) to manage units of the national park system "to conserve the scenery and the natural and historic objects and the wild life 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" (16 USC 1).

SEQUOIA AND KINGS CANYON ENABLING LEGISLATION

Sequoia Enabling Act of 1890: Preamble: "…dedicated .and set apart as a public park, or pleasure ground for the benefit and enjoyment of the people…" and to "…provide for the preservation from injury of all timber, mineral deposits, natural curiosities or wonders within said park, and their retention in their natural condition" (Sec. 2).

Kings Canyon Enabling Act of 1940: Sec. 3. "That the National Park Service shall… administer for public recreational purposes the lands withdrawn." and "to insure (sic) the permanent preservation of the wilderness character of the Kings Canyon National Park."

WILDERNESS ACT

The *Wilderness Act* of 1964 states: "Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use."

NATIONAL TRAIL SYSTEM ACT AND PACIFIC CREST TRAIL MANAGEMENT PLAN

National Trails System Act of 1968: Sec. 7(c): "National scenic or national historic trails may contain campsites, shelters, and related-public-use facilities. Other uses along the trail, which will not substantially interfere with the nature and purposes of the trail, may be permitted by the Secretary charged with the administration of the trail. Reasonable efforts shall be made to provide sufficient access opportunities to such trails and, to the extent practicable, efforts shall be made to avoid activities incompatible with the purposes for which such trails were established."

Comprehensive Management Plan for the Pacific Crest Trail (1982), Appendix C: Criteria for Location, Design, Signing, and User Facilities, p12, General Design Criteria: "The design of the Pacific Crest Trail should be in keeping with the nature and purpose of the trail. As a National Scenic Trail, it should exhibit high quality, permanence, and minimize disturbance to the environment. It should be designed, on a segment-by-segment basis, to accommodate, in a safe and enjoyable manner, the volume and types of traffic planned."

NPS *MANAGEMENT POLICIES 2006*

NPS *Management Policies 2006* provides interpretation and policy guidance relative to laws, proclamations, executive orders, regulations, and special directives. Examples of the management policies that provide direction to this trails plan are listed below.

8.2. Visitor Use – Enjoyment of park resources and values is part of the fundamental purpose of all parks. To provide for enjoyment of parks, the NPS will encourage visitor activities that:

- are appropriate to the purpose for which the park was established
- are inspirational, educational, or healthful, and otherwise appropriate to the park environment

- will foster an understanding of, and appreciation for, park resources and values, or will promote enjoyment through a direction of, interaction with, or relation to park resources
- can be sustained without causing unacceptable impacts on park resources or values.

8.2.5.1. Visitor Safety – While recognizing that there are limitations on its capability to totally eliminate all hazards, the NPS and its concessioners, contractors, and cooperators will seek to provide a safe and healthful environment for visitors and employees.

9.2. Transportation Systems – The location, type, and design of transportation systems and their components (e.g., roads, bridges, trails, and parking areas) all strongly influence the quality of the visitor experience. These systems also affect, to a great degree, how and where park resources will be impacted. Before a decision is made to design, construct, expand, or upgrade access to or within a park, nonconstruction alternatives — such as distributing visitors to alternative locations — must be fully explored. If nonconstruction alternatives will not achieve satisfactory results, then a development solution may be pursued if the project:

- is appropriate and necessary to meet park management needs or to provide for visitor use and enjoyment
- is designed with extreme care and sensitivity to the landscape through which it passes
- will not cause unacceptable adverse impacts on natural and cultural resources, and will minimize or mitigate those that cannot be avoided
- will not cause use in the areas it serves to exceed the areas' visitor carrying capacity
- will incorporate universal design principles to provide for accessibility for all people, including those with disabilities
- will take maximum advantage of interpretive opportunities and scenic values
- is based on a comprehensive and multidisciplinary approach that is fully consistent with the parks' General Management Plan (GMP).

9.2.2 Trails and Walks – Trails and walks provide the only means of access into many areas within parks. These facilities will be planned and developed as integral parts of each park's transportation system and incorporate principles of universal design. Trails and walks will serve as management tools to help control the distribution and intensity of use. All trails and walks will be carefully situated, designed, and managed to:

- reduce conflicts with automobiles and incompatible uses;
- allow for a satisfying park experience;
- allow accessibility by the greatest number of people; and
- protect park resources.

9.2.2.2. Hiking Trails – Trail design will vary to accommodate a wide range of users and will be appropriate to user patterns and site conditions.

9.2.2.3. Equestrian Trails – Equestrian trails and related support facilities may be provided when they are consistent with park objectives and when site conditions are suitable.

6.1. Wilderness Preservation and Management – The NPS will manage wilderness areas for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and

enjoyment as wilderness. Management will include the protection of these areas, the preservation of their wilderness character, and the gathering and dissemination of information regarding their use and enjoyment as wilderness.

6.3.10.2 Trails in Wilderness – Trails will be permitted within wilderness when they are determined to be necessary for resource protection and/or for providing for visitor use for the purposes of wilderness. … Trail maintenance structures (such as water bars, gabions) may be provided, under minimum requirement protocols, where they are essential for resource preservation or where significant safety hazards exist during normal use periods. Historic and/or prehistoric trails will be administered in keeping with approved cultural resource and wilderness management plan requirements.

6.4.1 General Policy – Park visitors need to accept wilderness on its own unique terms. … The National Park Service will not modify the wilderness area to eliminate risks that are normally associated with wilderness, but it will strive to provide users with general information concerning possible risks, (and) any recommended precautions …

GENERAL MANAGEMENT PLAN AND DESIRED CONDITIONS:

Desired Conditions for Class 3 Trails (identified in GMP as "Major Trails"):

Desired Natural Resource Conditions – Natural resources are mostly undisturbed. Impacts are restricted to trails and campsites, facilities, and attractions near the trails. Impacts are reversible, but it may take many years for natural resource regeneration. The goal is to restore disturbed areas, including visitor-created or widened trails.

Desired Visitor Experience –While day hikers may use trails closer to trailheads, most users are overnight visitors. On the more popular trails there is a moderate to high probability of encountering others, particularly at campsites and attractions. Visitors have opportunities for a wide range of experiences, with some opportunities for solitude and isolation from the sights, sounds, or evidence of other users. Travel is generally along remote but regularly maintained trails that require a moderate degree of outdoor skills and self-reliance. Party sizes may be larger than those allowed on secondary trails or in cross-country areas. Visitors may have to use designated, established campsites in some popular areas.

Desired Conditions for Class 1 and 2 Trails (identified in GMP as "Secondary Trails")

Desired Natural Resource Conditions – Natural resources are mostly undisturbed. Impacts are generally confined to the immediate area of trails. Damaged areas and unplanned impacts (such as trails created by visitors) are restored or left to regenerate naturally.

Desired Visitor Experience – Visitors are generally overnight users. Use is lower than on major trails, and there is less probability of visitors encountering others while hiking and camping. Party sizes may be smaller than along major trail corridors. Visitors need self-reliance and outdoor skills. Food canisters may be required.

Desired Conditions for Off-trail Areas (identified in the GMP as "Cross-country Areas")

Desired Natural Resource Conditions – Natural resources are largely undisturbed, with wild and naturally functioning ecosystems. Evidence of past use may be actively removed to reduce resource damage (e.g., restoring previously disturbed areas, or eliminating visitor-created trails and campsites) or left to regenerate naturally.

Desired Visitor Experience **–**Visitors are generally overnight users, and most need to commit a minimum of two nights to use these areas. Visitation is very low, with a low probability of encounters with other users while hiking and camping. Party sizes are generally small. Visitors may experience challenges and must be self-reliant. Food canisters may be required. Visitors need a high degree of backcountry skills, including map reading and orienteering.

GUIDING PRINCIPLES OF TRAIL MANAGEMENT AT SEQUOIA AND KINGS CANYON NATIONAL PARKS

Based on the desired conditions established by the parks' GMP, the overall desired condition is for the trail system to provide access and support to a wide range of wilderness recreational opportunities, including opportunities for stock and hiker use, a range of levels of user experience levels, and the opportunity for different visitors to seek their desired level of challenge and solitude at different times and places in wilderness. These opportunities should be provided in a way that minimizes impacts on wilderness character, particularly to the wilderness' natural and undeveloped qualities, and maximizes the effectiveness of resources spent on trail management activities.

The goals of trail management at the parks therefore are to protect wilderness character, provide for visitor access and a diversity of primitive recreational experiences, and to conduct trail management activities efficiently and effectively. The following provides a summary of each goal:

PROTECT WILDERNESS CHARACTER

Trails and trail management activities have effects on all the qualities of wilderness character. Below, the interactions of trails and trail management activities are discussed for each of the qualities, along with some principles of how to manage effects.

Natural Quality

The presence of a trail can affect the natural quality of wilderness character by altering the composition, ecosystem structure, and ecological functionality of the soil, aquatic systems, and native plant and animal communities through which the trail runs. Effects of the trails as a landscape feature include vegetation loss and creation of bare ground, soil compaction and erosion, diversion or concentration of water flows, increased water turbidity and sedimentation, travel barriers to very small wildlife (e.g., insects in meadows), and travel corridors for larger animals (e.g., bears). Wilderness users may introduce non-native plants, animals, or pathogens, displace or startle wildlife (e.g., bighorn sheep), step on wildlife (e.g., amphibians), and deposit urine and feces (stock and hiker), and these effects are concentrated along trails. The overall effects of these changes can alter local plant and animal habitats along trails, sometimes in a way that facilitates the establishment of non-native plants. River and creek banks, wetlands, meadows, and steep terrain are particularly vulnerable to visitor-induced impacts, and increasing visitor use can increase the width and severity of trail impacts. On the positive side, trails can concentrate visitor use on a hardened pathway, preventing more dispersed and randomized impacts to vegetation and other natural resources, and reducing impacts overall.

Materials for trail maintenance and construction may be scavenged locally from the trail area, disturbing the vegetation and soil. Trail crew camps have localized impacts on vegetation and wildlife, particularly any camps that are made on recently undisturbed land or where the crew has campfires. Trail crew members' effects on wildlife are similar to those of visitors, and trail crews also deposit urine and feces in wilderness. Helicopters supporting trail crews create noise that can influence wildlife, and livestock

supporting trail crews can impact the natural quality by trampling, grazing, and depositing urine and manure in wilderness.

Informal and abandoned trails are often on alignments that are particularly prone to erosion (steep, low slope-angle trails), and often lack tread-hardening structures to prevent erosion. Because of these things, informal and abandoned trails have many of the same effects on vegetation and wildlife as maintained trails do, but ongoing natural resources damage can be worse. The various effects of active trail management activities on informal and abandoned trails are essentially absent compared to maintained trails.

Principles to Manage Impacts – Trail management will focus on creating and maintaining trails on sustainable alignments where trail widening and tread erosion are minimized and natural water flow patterns are preserved. Disturbed lands along trail corridors that are not necessary for the trail system will be targeted for restoration. Trail management crews will be exemplary in using "Leave No Trace" principles to camp and travel in wilderness. Trail management crews will work to minimize helicopter and livestock impacts. Where informal or abandoned trails are creating unacceptable impacts on the natural quality, they may be restored to natural-functioning conditions or adopted into the maintained trail system (with appropriate compliance per Attachment 2, the Trails Maintenance Programmatic Exemption).

Untrammeled Quality

Interactions – As trails are intended to provide access to wilderness, they do not constitute a trammeling action, and do not affect the untrammeled quality. Several trail management activities, however, contribute to trammeling of wilderness. The most obvious of these is landscape restoration on informal or abandoned trail segments, which seeks to alter the natural processes of erosion and succession. Installation of water bars and erosion control structures on trails could be construed as trammeling actions seeking to alter the natural processes of hydrology and erosion. Occasionally in the past, logjams have been removed to keep watercourses flowing under bridges.

Principles to Manage Effects – Landscape restoration on informal or abandoned trail segments will typically be done as the result of a Minimum Requirements Analysis showing a long-term benefit to wilderness character from a short-term trammeling action. Installing water bars and erosion control structures will normally be considered a net benefit to wilderness character because of the protection given to the natural quality.

Undeveloped Quality

Interactions –According to Keeping It Wild: An Interagency Strategy to Monitor Trends in Wilderness Character across the National Wilderness Preservation System, the trail as a whole should be treated as affecting primarily the "Opportunities for Solitude and Primitive or Unconfined Recreation," and not as a "Development." However, the amount and kind of structures on a trail can have a large effect on trail users' perception of development. Causeways, steps, bridges, large rock or log structures, and signs are all typically recognizable as built structures, and trails where structures are less frequent feel less developed and wilder.

Trail management crews also sometimes use motorized tools or mechanized transport to perform work, diminishing the Undeveloped Quality. Some trail management activities involve placement of temporary installations such as signs, camps, tool caches and the like.

Informal or abandoned trails can impact visitors' sense of solitude, and the presence of abandoned trails and associated structures can impact the Undeveloped Quality.

Principles to Manage Effects – The trail classes adapted from the U.S. Forest Service (USFS) trail management framework provide a summary measure of overall development of a trail, including trail width, signage, bridges, and amount of other trail structures. The Undeveloped Quality will be preserved at these parks by maintaining trails to the appropriate trail class for the levels of use and recreational experience desired. Trail crews will perform the far greater part of trail management activities using primitive tools, with motorized equipment, mechanized transport, and temporary installations only being done as the result of a Minimum Requirements Analysis showing a net benefit to wilderness character.

Opportunities for Solitude or Primitive and Unconfined Recreation Quality (O-SPUR)

Interactions – The formal trail system in the parks predates wilderness designation. This trail system has a dual effect on O-SPUR: it facilitates opportunities for primitive recreation for many user groups by providing access to wilderness; however, trails tend to channel and concentrate use, which typically diminishes opportunities for solitude available along the trail.

A consequence of the fact that most wilderness users choose to travel on trail is that opportunities for solitude off-trail are enhanced over what they would be in a trail-less wilderness.

The fact that stock are generally permitted on trails and generally prohibited off trails means that trail-corridor based recreation is significantly more unconfined (has fewer rules) than off-trail recreation.

As discussed in greater detail under "Trail Classification," the development class of a trail has a strong effect on O-SPUR. Class 3 trails require the least self-reliance, and provide opportunities for primitive recreation to people needing or seeking less challenging travel in wilderness. Class 2 trails are typically more challenging to travel and provide access to less-visited areas of the park, providing opportunities for primitive recreation to people who are seeking more challenge and/or solitude. Class 1 trails provide another step in increasing challenge and solitude. Trail-less areas of the parks are typically the most challenging and provide the greatest opportunities for solitude and the most self-reliant type of recreation (although some popularized off-trail areas provide less opportunity for solitude than most of the Class 1 and Class 2 trails do). Abandoned trails have effects on solitude similar to Class 1 trails, although since they do not generally appear on maps and tend to see less travel, there may be greater opportunities for solitude. Informal trails are similar to abandoned trails, although areas with a dense network of informal trails suffer a diminished sense of solitude.

Recent trends in wilderness use show overnight recreation concentrating on "destination trails" such as the Pacific Crest, John Muir (with feeder trails), High Sierra, Rae Lakes Loop, and North Lake/South Lake Loop, leaving much of the rest of the trail system less-visited than in past decades. Similarly, day use is concentrated on a few "destination" trails like Mist Falls, Lakes, and Monarch Lake trails.

Principles to Manage Effects – Since the above-described range of trail-based primitive recreational opportunities were available when the parks' wildernesses were designated, trail management efforts will seek to preserve this diversity through conscious management of different trails for varied opportunities. Each trail is assigned a development class, and trail management will be appropriate to the trail class – Class 1 and 2 trails will not be reconstructed to achieve Class 3 conditions (although some trail management actions to protect the natural quality of wilderness character may have a side effect of making a Class 1 or Class 2 trail less challenging in spots). Any decision made to change the development class of a trail in order to protect other aspects of wilderness character will typically require separate National Environmental Policy Act (NEPA) compliance.

In addition to trail class, trails will typically be maintained for the allowed use requiring the most construction. For example, trails where stock is allowed will have maintenance guided by the Design Parameters for Stock Trails and trails with only hiker use allowed will have maintained guided by the Design Parameters for Hiker Trails.

Other Features of Value

Interactions – The parks' wilderness possesses a rich history of human use, including American Indian tribes, explorers, military, prospectors, sheepherders, scientists, educators, and recreationists. Trails have two potential effects on the historic legacy: they are reminders of the past, and relics themselves, and they have the potential to affect cultural resources located within and adjacent to the trail corridors.

Although all of the trails in the parks' wilderness have some historic context, very few of them have been formally evaluated under the National Historic Preservation Act (NHPA). Many currently abandoned trails were originally constructed and maintained by explorers, prospectors, sheepherders, loggers, and the military. Most existing maintained trails have been modified by maintenance and other management actions in pursuit of continued recreational access and to protect the natural quality of wilderness character. For both abandoned and maintained trails, it is unknown whether the historic features of any given trail are intact enough to warrant protection under the NHPA.

In places, trails cross historic and prehistoric sites, and trail-associated soil erosion can threaten those cultural resources. Cultural sites with trail access can also be more vulnerable to intentional or unintentional damage from visitors and trail maintenance activities.

Depending on their location and level of construction, trails may have a negative effect on the scenic features of wilderness.

The trail system does not have a known effect on other Features of Value other than providing access to visitors who wish to experience wilderness resources.

Principles to Manage Effects – As resources become available, a formal evaluation of the historic value of each trail segment in the parks should be conducted. In the interim, a first-round survey of trail segments by staff knowledgeable of the parks has been done to identify trails with particularly compelling historic context or whose historic character is largely intact, and trails have been prioritized for evaluation and preservation of possibly historic features. For all trails, trail management actions will minimize adverse effects on trail features that could contribute to the historic value of a trail segment, such as: unique or large rock walls and distinctive alignments. Particular effort will be made to preserve features of trails with compelling context or intact character.

Where trails cause impacts to cultural sites, trail management actions to preserve sites will be given equal priority to actions preserving the natural quality of wilderness character.

Any actions taken to erase abandoned trails will require appropriate NEPA and NHPA analysis.

PROVIDE FOR VISITOR ACCESS

The parks' trail system primarily serves the public purpose of recreation under the Wilderness Act by providing recreational access to wilderness areas of the parks. (The purposes of conservation, science, and education are also served, as the trail system also provides access for administration, research, and learning.) As discussed previously, and in the trail classification section later, the maintained trail system provides for a diverse range of opportunities for solitude and self-reliance. The maintained trail system

also provides access to a diversity of destinations (canyons, peaks, rivers, lakes, meadows, scenic features and vistas), environments (foothill shrub lands and woodlands, lower and upper mixed-conifer forests, subalpine areas, and alpine tundra), and for a diversity of activities (stock use, boating, foot travel and climbing). Much of the parks' wilderness would be impossible for stock users to access without trails, due to the difficulty of the terrain.

ACHIEVE OPERATIONAL EFFICIENCY AND EFFECTIVENESS

The parks' wilderness provides many logistical challenges for trail management and maintenance, from winter snowfall and timing of spring snowmelt to multi-day travel times to access project sites. Because of these challenges, trail crew operations must make efficient use of resources to keep the trails open for access and to protect wilderness character. Efficiency also supports opportunities for solitude by reducing administrative crew time in wilderness.

Some ways to achieve efficiency and effectiveness include building to the trail class and design use (and not beyond), working on trails seasonally (typically May-September), starting at low elevations and working higher elevation trails later, using work itineraries that minimize travel time, carefully considering use of 4(c) generally prohibited methods (such as helicopter and mechanized tools), coordinating logistics with other wilderness operations, and prioritizing work based on the trail class and designed use, with resources allocated to more heavily traveled trails, and to trails where negative impacts on wilderness character are ongoing and rapid.

SPECIFICS OF TRAIL MANAGEMENT

TRAIL CLASSIFICATION AND TERMINOLOGY

The Sequoia and Kings Canyon National Parks trail system will be managed to provide a range of diverse recreational experiences to wilderness visitors. The USFS Trails Management Handbook (Forest Service Handbook 2309.18 "USFS Trails Handbook") describes how this can be achieved through trail planning and development. Three of the organizing concepts of the USFS Trails Handbook are "Trail Type", "Trail Design Use", and "Trail Development Class" (trail class), which together lead to a set of design parameters for trail construction and maintenance. Trail management at the parks will use an adapted version of trail class to guide trail management decisions, and will be informed by the "Design Parameters for Hiker and Stock Use" trails.

Trail type describes if a trail is on soil (motorized or non-motorized terra trails), water, or snow. SEKI wilderness trails will be non-motorized terra or snow trails.

Trail design use incorporates construction and maintenance requirements of a trail based on the allowed uses of the trail. This ensures that the trail is suitable for the kinds of traffic that are allowed. SEKI wilderness trails will be designed, constructed, and maintained to be suitable for foot travel or various stock use types.

Trail class is a general description of the level of development on a given trail, graded on a continuum from Class 1 (minimally developed) through Class 5 (fully developed). Trail classes 4 and 5 would often be located near developed areas in the frontcountry, or in urban settings. These trails have wide, smooth tread surface - often composed of gravel or pavement. There could be many signs, railings, and interpretive displays, and they often include trailside amenities like benches or picnic tables. These two classes will not be used in these parks' wilderness. Trail classes 1, 2 and 3 describe appropriate development levels for the parks' wilderness trails and are described below.

***Class 1 (Minimally Developed)* – These** trails are as much routes as trails. The trail can be indistinct and difficult to find in places, and may require route-finding skills to follow. The trail surfaces may be very rough and rocky, and logs, brush and limbs may only infrequently be cleared. Structures such as walls and water bars are essentially absent, and there are no bridges. Signing is typically only at junctions, and route markers are typically no more than old blazes in locations where the trail is not otherwise evident. Examples of existing trails in the parks in this class include Kennedy Canyon, Blue Canyon, and Milestone Basin. Although the USFS Trails Handbook indicates that Class 1 trails are not typically hardened adequately to accept unrestricted stock use, some Class 1 trails at Sequoia and Kings Canyon National Parks that traverse suitable landscapes will continue to be open to low levels of stock use.

***Class 2 (Moderately Developed)* –** These trails are constructed and maintained so that the tread is continuously visible and can typically be followed without needing route-finding skills. Trail surfaces may be rough and include substantial obstacles. Logs and fallen rocks are cleared periodically. Structures like walls, water bars, and causeways are of limited size, scale, and quantity, and water crossings do not typically have bridges. Junctions are typically signed; regulatory and resource protection signing may be present, but is uncommon. Examples of existing trails in the parks that are in this class include the Middle Fork of the Kings, State Lakes Loop and the south side of Colby Pass.

***Class 3 (Developed)* –** These trails are constructed and maintained so that the tread is continuously obvious. The trail surface is natural, with no substantial obstacles. Logs, fallen rocks, and encroaching vegetation are cleared regularly. Structures like walls, water bars, and causeways are common to protect the parks' resources from damage and to provide for appropriate access. Bridges are present where needed to protect resources or provide appropriate access. Junctions are signed; regulatory and resource protection signing may be common. Examples of existing trails in the parks that meet the standards for this class include the Pacific Crest Trail, Paradise Valley Trail, and the High Sierra Trail.

The maintained system of formal trails in SEKI wilderness will include Class 1, 2, o3 3 hiker or stock use trails, and Class 2 snowshoe trails.

Besides the formal trail system, there are other trail-like features in wilderness. Some of these features are remains of trails that were once constructed and maintained; others were never formally maintained and are the result of wilderness users traveling across the landscape in high densities. Also, specific off-trail travel routes have been popular at different times in the parks' wilderness. For clarity of communication, the following terminology is used throughout the WSP/FEIS:

- ***Formal Trail* –** Designated and regularly maintained trail. These can be Class 1, Class 2, Class 3, Class 4, or Class 5 (Class 4 and 5 are not in wilderness).
- ***Abandoned Trail* –** A trail that was once a formal, maintained trail, but maintenance has been discontinued.
- ***Informal Trail* –** A landscape impact created by users that looks like a segment of trail.
- ***Route* –** A travel corridor of social value with no designated trail. Traffic may create informal trails in parts of a route.
- ***Restored Trail* –** A trail that was at one point a formal or informal trail that has had restoration work done attempting to restore the landscape to its natural condition.

TRAIL MAINTENANCE FUNDING AND PRIORITIES

Attachment 2 is a list of projects that are needed to transition current conditions of the trail system to the desired conditions described in the preferred alternative of the Wilderness Stewardship Plan. The desired

conditions will be realized only as funding becomes available to perform the compliance, construction, and maintenance work necessary. Similarly, annual maintenance of formal trails will be prioritized within the constraints of funding and may therefore deviate from the ideal conditions described below.

There are two primary types of funding: base appropriated NPS funds and specialized project funds. Base-funded trail operations typically include the salaries of permanent staff, vehicle costs, supplies and materials, and a small seasonal trail-clearing crew. The initial trail clearing and basic drainage maintenance is the priority for these funds.

Project fund sources include cyclic maintenance, repair / rehabilitation, Federal Lands Recreation Enhancement Act (FLREA), and donations used to perform more extensive maintenance and reconstruction, such as:

- ***Cyclic Maintenance*** – Clearing vegetation from the trail corridor, replacing trail structures and repairing tread as needed on a cyclic basis (every 3-5 years on a given trail segment).
- ***Major Trail Reconstruction*** – Reconstructing trail segments when resource or trail conditions have deteriorated due to inadequate annual or cyclic maintenance. This work could include major tread repair, replacement and construction of trail structures, and minor reroutes.
- ***Trail Rerouting*** – Moving a trail segment to a more sustainable alignment, and performing landscape restoration work on the abandoned trail segment.
- ***Abandoned Trail Restoration*** – performing landscape restoration work on an abandoned trail segment, or on areas with multiple parallel trail treads.

As funding allows, the different trail classes will receive the following levels of regular maintenance:

- Class 1 trails will receive maintenance semiannually to every few years. Most trails in this class are remote and receive little use by hikers and little to no use by stock. Work is primarily to protect the natural quality of wilderness along with ensuring the trail remains appropriately apparent on the landscape. The goal of project work is to control negative impacts on the natural quality of wilderness character and to establish sustainable alignments.
- Class 2 trails have a higher priority and will typically be cleared and drainages maintained annually. These trails are more frequently used by both hikers and stock and more frequent maintenance is important early in the use season to ensure access and to better protect the natural quality of wilderness character. The goal of the project work is to control negative impacts on the natural quality of wilderness character and to establish sustainable alignments.
- Class 3 trails will be the highest priority to clear and repair in a timely manner, since impacts to the natural quality can occur rapidly on these heavily used trails if action is not taken. These trails may be cleared several times in a year to keep them open and to protect the adjacent landscape from trampling. This trail class will receive the priory for project funding. Work typically includes controlling negative impacts on the natural quality of wilderness character, establishing sustainable alignments, and maintaining the desired visitor access.
- Class 4 and 5 trails do not occur within wilderness.
- Abandoned or informal trails may be adopted into the formal trail system (per this Wilderness Stewardship Plan or with additional compliance) and appropriate construction work undertaken to achieve the desired trail class. If not adopted into the formal trail system, these trails will be analyzed under the NHPA and considered for landscape restoration.

- Changing the development class of a trail, or abandoning a formal trail is an action that would require additional compliance and public input.

TRAIL CONDITION MONITORING AND RESPONSE OPTIONS

Formal Trails – A comprehensive condition assessment will be performed at least every five years on each Class 1, 2 and 3 trail segment. This condition assessment will look at the condition of the trail tread and trail structures to identify deficiencies relative to the desired conditions for that trail class. Deficiencies could include: tread erosion, multiple parallel tread development, failed trail structures (e.g., bridges, water bars, retainer bars, walls, and cribbing), washouts or rockfalls, encroaching vegetation, and informal trail development. The deficiencies will be documented in the Facilities Management Software System (FMSS), cost estimates prepared, and funding requests prioritized according to current procedures. Trail maintenance funding requests may be for primarily facility-based deficiencies, or for repairing trail-related natural resource impacts.

Solutions to formal trail deficiencies will be designed to match the relevant trail development class, while minimizing constructed features to the extent possible. For Class 1 and Class 2 trails, the solution to tread erosion and other natural resource impact problems will favor rerouting to a sustainable alignment over construction of structures that would alter the development level of a trail. Class 3 trails, with their higher existing level of development and landscape impact, may require solutions that involve additional trail structures on the existing alignment. Constructing a new Class 3 trail segment involves more landscape impact than needed for a new Class 1 or Class 2 trail segment, and restoring the greater landscape impacts likely present on a problematic Class 3 trail would require extensive work. Despite these general rules, balancing short- and long-term impacts will result in reroutes or trail development solutions being recommended for Class 1, 2, and 3 trails in different situations.

Informal Trails – Systematic monitoring of informal trail impacts over the entire parks' landscape is not possible at current or expected staffing levels. An interdivisional team will meet annually to revise and update a list of routes and destinations of concern for monitoring. A first-year list and map of routes and destinations of concern is in Attachment 5. Observations by wilderness staff will be used to detect undesirable changes over time where corrective actions are needed.

Suggested levels of monitoring and examples of possible management responses to informal trail development are as follows:

Level of Informal Trail Impacts

Level 1 Impacts:	Trail distinguishable; slight loss of vegetation cover and /or minimal disturbance of organic litter.
Level 2 Impacts:	Trail obvious; vegetation cover lost and/or organic litter pulverized in primary use areas. Rocks/gravel disturbed on barren ground.
Level 3 Impacts:	Vegetation and organic litter lost across the majority of the tread. Rocks/gravel displaced from tread on barren ground.
Level 4 Impacts:	Soil erosion in the tread beginning in some places.
Level 5 Impacts:	Soil erosion is common along the tread. Trail braiding exists where parallel informal trails are easily visible from each other.

Monitoring Informal Trails Along Routes – Traffic along a route can create visible trail impacts on sensitive ground such as slopes, wetlands, and areas with fragile vegetation. Monitoring will consist of traveling identified routes once per season (near the end of the season when possible), and recording locations of Level 2 or greater impact with braiding and any Level 4 or Level 5 impacts. Minimal recording would include a brief narrative of the condition, GPS readings, and digital photos of the problem spots.

Monitoring Informal Trails at a Destination – Examples of informal trails at a destination include informal trails used by anglers, campsite trails (to water and between sites), shore-side trample zones, rock climbing access trails, and trails in and around alpine basins. Monitoring will focus on specific, known high-use areas identified by the interdivisional team. Monitoring will involve a survey of current conditions repeated every five years as funding allows. The survey will record a GPS line feature and Impact Level for each segment in the informal trail network. Representative photos may be taken and referenced to each informal trail segment.

Monitoring Results Analysis and Management Options – Results of monitoring will be presented and reviewed annually by the interdivisional team. If recommended at that meeting, a subgroup will be assigned to develop options for management intervention to prevent or mitigate unacceptable informal-trail impacts. Some options include:

- Visitor education
- Blocking a trail and doing local site restoration
- Destination permitting requirements and quotas.
- Area closure (e.g., no camping in area, such as at Bullfrog Lake and Timberline Lake)
- Lower trailhead permit quotas.
- Travel type restrictions (for example, prohibiting off-trail stock travel, or off-trail travel of any type).
- Appropriate NEPA compliance to adopt the informal trail into the formal trail system and funding requests to perform any construction needed to ensure environmental sustainability of the new trail.

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ATTACHMENT 1:
TRAIL SYSTEM DESCRIPTION/INVENTORY

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Table K-1: Trail Classification and Design Use for All Alternatives

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
EAST FORK KAWEAH WATERSHED								
Aspen Flat	0.40	Crystal Creek	Aspen Flat	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Atwell-Hockett	9.74	Atwell Campground	Hockett Meadow	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Cahoon Rock	2.58	Hockett Meadow Junction	Cahoon Rock	1,2 Stock	1,2 Stock	2,3 Stock	1,2 Stock	1,2 Stock
Eagle Lake	1.41	Eagle-Mosquito Junction	Eagle Lake	2 Stock	2 Stock	3 Stock	2 Hiking	2 Stock
Eagle-Mosquito Lakes	0.93	White Chief Jct	Eagle-Mosquito Junction	2 Stock	2 Stock	3 Stock	2 Hiking	2 Stock
Evelyn Lake	1.05	Cahoon Rock Jct	Evelyn Lake	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Farewell Gap	2.65	Franklin Pass Junction	Farewell Gap	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Farewell/Franklin Lakes	2.65	Aspen Flat Junction	Franklin Pass Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Franklin Pass - Franklin Lakes	4.78	Franklin Pass Junction	Franklin Pass	3 Hiking	3 Stock	3 Stock	3 Stock	3 Stock
Hockett-Sand Meadow	0.85	Hockett Mdw	Sand Meadow Junction	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Mineral King Valley	0.41	Disney Prkg-road end trailhead	Aspen Flat Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Monarch Lakes	3.33	Timber Gap Jct	Lower Monarch Lake	3 Stock	2 Hiking	3 Hiking	2 Hiking	3 Hiking
Mosquito Lakes	1.58	Eagle-Mosquito Junction	Mosquito Lakes	2 Stock	2 Stock	3 Stock	2 Hiking	2 Stock
Paradise Ridge	3.31	Atwell Mill CG Trailhead	Top of Paradise Ridge	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Sawtooth Pass West	1.51	Monarch Lakes	Sawtooth Pass	Informal	1 Hiking	1 Hiking	1 Hiking	1 Hiking
Tar Gap	6.95	Trailhead Cold Springs CG	Atwell Hockett trail	2 Stock	2 Stock	3 Stock	2 Hiking	3 Stock

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Timber Gap	1.02	Sawtooth Prkg Trailhead	Timber Gap	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
White Chief	2.41	Disney Prkg-road end trailhead	White Chief	2 Stock	2 Stock	3 Stock	2 Hiking	2 Stock
KERN WATERSHED								
Big Five-Little Five Lakes	4.38	Lost Canyon	Little Five Lakes	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Bighorn Plateau	4.14	Tyndall Creek	Wallace Creek	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Blackrock Pass - Little Five Lakes	1.58	Little Five Lakes	Blackrock Pass	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Chagoopa Plateau	11.00	Big Arroyo Patrol Cabin	Upper Funston Mdw	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Cottonwood Pass	5.00	Rock Creek Junction	Park Boundary	2 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Coyote Lake	2.22	Coyote Pass/Coyote Lakes Junction	Park Boundary	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Coyote Pass	5.31	Kern Station	Coyote Pass	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Crabtree - Rock Creek	3.30	Lower Crabtree Mdw	Rock Creek	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Crabtree Lakes	1.78	Lower Crabtree Mdw	Crabtree Lakes	2 Stock	1 Stock	2 Stock	Abandon	2 Stock
Crabtree Sand Flats	0.80	Crabtree Sand Flats	Crabtree Ranger Station Jct	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Forester Pass South	5.02	Forester Pass	Tyndall Creek	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Forgotten Creek	3.46	Siberian Pass Creek	Funston Lake	Unmaint	Abandon	Abandon	Abandon	Abandon
Franklin Pass - Upper Rattlesnake	2.44	Forester Lake Junction	Franklin Pass	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Funston Lake	5.10	Siberian Pass	Funston Lake	Unmaint	1 Stock	1 Stock	1 Stock	1 Stock
John Dean Cutoff	2.54	Upper Kern	Tyndall Ranger Station	Unmaint	1 Stock	1 Stock	Abandon	1 Stock

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Kern Canyon	9.37	Upper Funston	Junction Meadow (Kern)	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Kern Kaweah	7.82	Junction Meadow (Kern)	Colby Pass	2 Stock	2 Stock	2 Stock	1 Hiking	2 Stock
Lake South America	5.34	Tyndall Cutoff	Upper Kern Canyon	1 Stock	1 Stock	2 Stock	Abandon	2 Stock
Little Five - Big Arroyo	2.64	Little Five Lakes	Big Arroyo Patrol Cabin	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Lost Canyon	5.12	Soda Creek	Columbine Lake	2 Stock	2 Stock	3 Stock	1-2 Mixed	2-3 Stock
Lower Big Arroyo	6.14	Big Arroyo Patrol Cabin and HST Jct	Soda Creek/Willow Meadow Junction	1 Stock	Abandon	Abandon	Abandon	Abandon
Lower Crabtree	0.67	Crabtree Sand Flats	Lower Crabtree Meadow	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Lower Kern	8.52	South Boundary of Kern Station	HST at Upper Funston Meadow	3 Stock	3 Stock	3 Stock	2 Stock	3 Stock
Lower Kern Bridge	0.26	Lower Kern RS	Kern Bridge	3 Stock	3 Stock	3 Stock	2 Stock	3 Stock
Lower Rattlesnake	7.77	Jct of Kern Trail	Forester Lake Junction	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Lower to Upper Crabtree Meadows	1.09	Crabtree Ranger Station	Lower Crabtree Mdw	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Lower Whitney Creek Use	0.75	Lower Crabtree Mdw	Lower Whitney Creek	2 Stock	2 Stock	2 Stock	2 Stock	2 Stock
Milestone Basin	0.50	Upper Kern Jct	Milestone Basin	2 Stock	Abandon	1 Stock	Abandon	Abandon
Miter Basin	2.30	Upper Rock Creek	11,300' Elevation	Unmaint	1 Stock	1 Stock	1 Stock	1 Stock
Moraine Lake	3.68	Sky Parlor Meadow	Upper Chagoopa Plateau	2 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Mount Langley	1.45	Army Pass Junction	Summit Mount Langley	Informal	1 Hiking	1 Hiking	1 Hiking	1 Hiking
Mount Whitney	7.05	Crabtree Station	Mt Whitney Summit	3 Mixed	3 Mixed	3 Mixed	3 Mixed	3 Mixed

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
New Army Pass	2.64	Upper Rock Creek	New Army Pass	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Rattlesnake - Soda Creek	2.92	Forester Lake Junction	Soda Creek	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Rock Creek	3.54	Rock Creek	Cottonwood Pass Jct	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Rock Creek Lake	3.12	Cottonwood Pass Jct	Soldier Lake	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Sandy Meadow	3.34	Wallace Ck	Crabtree Sand Flats	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Sawtooth Pass East	1.04	Columbine Lake	Sawtooth Pass	Informal	1 Hiking	1 Hiking	1 Hiking	1 Hiking
Shepherd Pass	3.38	JMT-PCT Tyndell Ck	Shepherd Pass	2 Stock	2 Stock	3 Stock	1 Hiking	2 Stock
Shotgun Pass	1.81	Shotgun/Upper Rattlesnake Jct	Shotgun Pass	1 Stock	1 Stock	2 Stock	Abandon	1 Stock
Siberian Pass	0.70	Siberian Junction	Siberian Pass	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Siberian Pass Creek	2.01	Pacific Crest Trail	Funston Lake Route	Unmaint	Abandon	Abandon	Abandon	Abandon
Soda Creek	4.29	Lower Big Arroyo	Upper Soda Creek	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Soldier Lake	0.26	Upper Rock Creek	Soldier Lake	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Trail Crest	0.15	Trail Crest Trail	Park Boundary	3 Hiking	3 Hiking	3 Hiking	3 Hiking	3 Hiking
Tyndall Ranger Station	0.59	Pacific Crest Trail	Tyndall Ranger Station	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Upper Big Arroyo	3.38	Kaweah Gap	Big Arroyo Patrol Cabin	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Upper Big Five Lakes	1.66	Lower Big Five Lake	Upper Big Five Lake	2 Stock	2 Stock	2 Stock	Abandon	1 Stock
Upper Crabtree Meadow	0.19	JMT-PCT Junction	Crabtree Ranger Station	2 Stock	2 Stock	2 Stock	2 Stock	2 Stock

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Upper Kern Canyon	4.44	HST Wallace Ck	Tyndall Cut-off	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Upper Kern -Tyndall Cutoff	2.93	Upper Kern	JMT-PCT Tyndall Ck	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Upper Milestone Basin	2.13	Milestone Basin Trail	Milestone Lakes	Unmaint	Abandon	1 Stock	Abandon	Abandon
Upper Rock Creek	1.73	Soldier Lake	Junction with PCT	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Upper Soldier Lake	2.00	Soldier Lake	Junction with Mt Langley Trail	Abandon	1 Hiking	1 Hiking	Abandon	Abandon
Wallace Creek	4.11	Junction Meadow (Kern)	JMT-PCT Wallace Ck Jct	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Wallace Lakes	2.53	PCT Junction	Wallace Lakes	Unmaint	1 Stock	1 Stock	1 Stock	1 Stock
Willow Meadow Cut-off	4.69	Soda Creek	Rattlesnake Creek	1 Stock	1 Stock	2 Stock	Abandon	2 Stock
Wright Lakes	1.90	PCT Junction	Wright Lakes	Unmaint	1 Stock	1 Stock	Abandon	1 Stock
MARBLE FORK KAWEAH WATERSHED								
Admiration Point	0.70	Colony Mill Road	Admiration Point overlook	2 Stock	2 Hiking	3 Stock	1 Stock	3 Stock
Hump	0.73	Lakes Trail Jct	Heather Lake	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
JO Pass	1.79	Jct off Twin Lk Trail	JO Pass	2 Stock	2 Stock	3 Stock	2 Hiking	2 Stock
Lakes	2.94	Wolverton Prkg Trailhead	Pear Lake	3 Mixed	3 Mixed	3 Mixed	3 Mixed	3 Mixed
Little Baldy	0.20	Baldy Saddle Gen Hwy	Little Baldy Dome	2 Stock	2 Hiking	3 Stock	2 Hiking	3 Hiking
Marble Falls	2.73	Potwisha Campground	Marble Falls, Marble Fork	2 Hiking	2 Hiking	3 Hiking	2 Hiking	2 Hiking
Old Colony Mill Road	2.48	North Fork Road	Crystal Cave Road	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Pear Lake Ranger Station	0.34	Pear Lake Trail	Pear Lake Ranger Station	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Pear Lake Ski	2.50	Wolverton Prkg Trailhead	Pear Lake	2 Snowshoe	2 Snowshoe	2 Snowshoe	2 Snowshoe	2 Snowshoe
Silliman Pass South	2.61	JO Pass/Twin Lakes Jct	Silliman Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Sunset Rock	0.35	Museum area	Sunset Rock	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Tokopah Falls	0.36	Lodgepole CG trailhead	Tokapah Falls	3 Stock	3 Hiking	3 Hiking	3 Hiking	3 Hiking
Twin Lakes	3.51	Trailhead Lodgepole CG	JO/Twin Lakes Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
MIDDLE FORK KAWEAH WATERSHED								
Alta - Panther Gap	1.94	Giant Forest	Alta Meadow/Peak Jct	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Alta Meadow	1.70	Panther Gap Junction	Alta Meadow	2 Stock	2 Stock	2 Stock	2 Stock	2 Stock
Alta Peak	1.81	Alta Meadow Junction	Alta Peak Summit	2 Stock	2 Stock	2 Stock	2 Stock	2 Stock
Alta-High Sierra Cut-off	1.99	Cut-off between Alta & HST	Cut-off between Alta and HST	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Bearpaw Cut-off	1.55	Middle Fork Kaweah	Little Bearpaw Meadow	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Bearpaw Meadow	0.34	HST	Redwood/Bearpaw Trail	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Blackrock Pass - Pinto Lake	7.76	Timber Gap Jct	Blackrock Pass	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Bobcat Point	0.20	High Sierra Trail	Sugar Pine Trail	3 Hiking	3 Hiking	3 Hiking	3 Hiking	3 Hiking
Cliff Creek	3.25	Redwood Mdw	Blackrock Pass Junction	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Crescent Mdw-Bearpaw	10.40	Crescent Meadow Trailhead	Bearpaw	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Elizabeth Pass South	3.72	Over the Hill Junction	Elizabeth Pass	2 Stock	2 Stock	3 Stock	2 Hiking	2 Stock
Granite Creek	3.30	Redwood Mdw-Bearpaw Trail	Granite Creek lake	Unmaint	Abandon	Abandon	Abandon	Abandon
Hamilton Lakes	3.81	Bearpaw	Hamilton Lakes	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Kaweah Gap	4.06	Hamilton Lakes	Kaweah Gap	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Kaweah Middle Fork Cut-off	0.91	Redwood Mdw-Bearpaw Trail	Middle Fork Kaweah Bridge	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Lone Pine Creek	1.92	Elizabeth Pass Junction	Tamarack Lake	2 Stock	2 Stock	2 Stock	2 Hiking	2 Stock
Middle Fork Kaweah	11.32	Moro Creek	Middle Fork Bridge	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Over the Hill	1.47	High Sierra Trail	Elizabeth Pass South Trail	2 Stock	2 Stock	3 Stock	2 Hiking	2 Stock
Paradise Creek	2.02	Buckeye Flat CG	2 miles up from Middle Fork	2 Stock	2 Hiking	2 Stock	2 Hiking	2 Hiking
Paradise Ridge-Redwood Mdw	5.94	Redwood Mdw	Paradise Gap	2 Stock	2 Stock	2 Stock	2 Stock	2 Stock
Potwisha-Hospital Rock	1.52	Potwisha Dump station	Hospital Rock Picnic Area	3 Stock	2 Hiking	3 Hiking	2 Hiking	2 Hiking
Redwood Mdw Cut-off	0.89	Middle Fork Kaweah	Redwood Mdw	2 Stock	2 Stock	2 Stock	2 Stock	2 Stock
Redwood Mdw-Bearpaw	4.64	Bearpaw	Redwood Mdw	2 Stock	2 Stock	3 Stock	2 Stock	2-3 Stock
Timber Gap Cliff Creek	2.91	Cliff Creek	Timber Gap	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Twenty-Seven Switchback Cut-off	0.91	High Sierra Trail	Over the Hill Trail	2 Stock	2 Stock	2 Stock	2 Hiking	2 Stock
Wolverton Cutoff	1.04	Alta Trail	High Sierra Trail	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
MIDDLE FORK KINGS WATERSHED								

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Blue Canyon	6.19	Kettle Ridge Entrance	Blue Canyon Meadow	1 Stock	1 Stock	2 Stock	Abandon	1 Stock
Cartridge Pass	10.43	Middle Fork Kings River	Muro Blanco Trail	Unmaint	Abandon	Abandon	Abandon	Abandon
Cataract Creek	1.54	PCT Near Deer Meadow	Amphitheater Lakes	Unmaint	Abandon	Abandon	Abandon	Abandon
Dusy Basin	3.49	Lip of Dusy Basin	Bishop Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Dusy Switchbacks	2.77	Dusy Switchbacks/PCT Junction	Lip of Dusy Basin	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Granite Pass North	5.21	Northern State Lakes Loop Junction	Granite Pass	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Horseshoe Lakes	0.95	Spur Trail	Horseshoe Lakes	1 Stock	1 Stock	2 Stock	Abandon	2 Stock
Kennedy Canyon	8.12	Outlet of Volcanic Lakes Crossing	Kennedy Pass	1 Stock	1 Stock	2 Stock	1 Hiking	2 Stock
Lower LeConte Canyon	3.48	Palisade Creek Crossing	Dusy Switchbacks/PCT Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Lower Middle Fork Kings	10.82	Crown Creek Crossing	Simpson Junction	2 Stock	2 Stock	2 Stock	1 Stock	1 Stock
Palisade Creek	6.11	Palisade Creek Crossing	Outlet of Palisade Lakes	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Palisade Lakes	3.69	Outlet of Palisade Lakes	Mather Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
State Lakes Loop	4.23	North State Lakes Junction	South State Lakes Junction	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Tehipite Switchbacks	4.59	Gnat Meadow Entrance	Crown Creek Crossing	2 Stock	2 Stock	2 Stock	1 Stock	1 Stock
The Bitch	5.93	Simpson Meadow Junction	Northern State Lakes Loop Junction	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Upper Blue Canyon	1.00	Blue Canyon Meadow	Blue Canyon Lakes	Unmaint	1 Stock	1 Stock	Abandon	1 Stock
Upper LeConte Canyon	7.34	Dusy Switchbacks/PCT Junction	Muir Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Upper Middle Fork Kings	8.09	Simpson Junction	Palisade Creek Junction	2 Stock	2 Stock	2 Stock	2 Stock	2 Stock

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Volcanic Lakes	1.90	Granite Pass North Trail	Outlet of Volcanic Lakes Crossing	2 Stock	1 Stock	2 Stock	1 Stock	2 Stock
NORTH FORK KAWEAH WATERSHED								
Big Baldy	2.06	Big Baldy Trailhead	Top of Big Baldy	3 Stock	3 Stock	3 Stock	3 Hiking	3 Stock
Big Baldy Ski	2.06	Big Baldy Trailhead	Top of Big Baldy	2 Snowshoe	2 Snowshoe	2 Snowshoe	2 Snowshoe	2 Snowshoe
Buena Vista	0.86	Buena Vista Trailhead	Top of Buena Vista Peak	3 Stock	3 Stock	3 Stock	3 Hiking	3 Stock
Dorst/Lost Grove	2.06	Muir Grove Trail/Lost Grove Trail Junction	Lost Grove	1 Hiking	1 Hiking	1 Hiking	1 Hiking	1 Hiking
Hidden Springs	13.87	North Fork Kaweah Trailhead	Hidden Spring	1-2 Stock	1 Stock	2 Stock	1 Stock	1 Stock
Little Baldy	1.35	Baldy Saddle Gen Hwy	Little Baldy Dome	2 Stock	2 Hiking	3 Stock	2 Hiking	2 Hiking
Muir Grove	2.53	Dorst CG Trailhead	Muir Grove	3 Stock	2 Hiking	3 Stock	2 Hiking	3 Hiking
Old Colony Mill Road	7.28	North Fork Road	Crystal Cave Road	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
Redwood Canyon	2.14	Redwood Saddle Trailhead	Hart Tree Junction on Redwood Creek	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Redwood Canyon Big Springs	3.62	Redwood Canyon/Hart Tree Junction	Big Springs	2 Stock	2 Stock	2 Stock	1 Hiking	2 Stock
Redwood Canyon Hart Tree	4.76	Upper Hart Junction	Lower Hart Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Redwood Canyon Sugar Bowl	4.42	Redwood Saddle Trailhead	Sugarbowl Junction along ridge	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
SAN JOAQUIN WATERSHED								
Evolution Basin	6.44	Lamarck Col/PCT Junction	Muir Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Evolution Valley	7.43	Goddard Canyon Junction	Lamarck Col Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Goddard Canyon	5.08	Goddard Canyon Junction	Hell for Sure/Martha Lake Junction	2 Stock	2 Stock	3 Stock	1 Mixed	2 Stock

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Hell for Sure Pass	3.70	Hell for Sure/Martha Lake Junction	Hell for Sure Pass	1 Stock	1 Stock	2 Stock	1 Hiking	2 Stock
Lake 11,106	1.56	McClure Meadow	Lake 11106	Unmaint	1 Stock	1 Stock	1 Stock	1 Stock
Lamarck Col	3.29	Lamarck Col/PCT Junction	Lamarck Col	Informal	1 Hiking	1 Hiking	1 Hiking	1 Hiking
Lower Goddard Canyon	3.54	Piute Creek Entrance	Goddard Canyon Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Martha Lake	2.8	Hell for Sure/Martha Lake Junction	Martha Lake	Unmaint	1 Stock	1 Stock	1 Stock	1 Stock
McGee Canyon	2.71	PCT above McClure Meadow	Lower McGee Lakes	Unmaint	Abandon	Abandon	Abandon	Abandon
SODA SPRINGS CREEK WATERSHED								
Farewell Gap	0.42	Quinn Mdw	North Boundary	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
South Fork Meadows	1.08	Sand Mdw-Hockett Lakes Jct	Windy Gap Jct	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Windy Gap	1.99	Blossom Lk Jct	Quinn Mdw (Ranger Station)	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Windy Ridge	0.86	Tuohy Gap	Blossom Lake Jct	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
SOUTH FORK KAWEAH WATERSHED								
Blossom Lake	2.71	Hunter Creek Junction	Blossom Lk	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Cyclone Meadow	1.73	Windy Ridge/Cyclone Meadow Jct	Windy Ridge	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Hockett Lakes	0.72	South Fork Crossing	Hockett Lakes Junction	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Hockett Lakes Cutoff	1.00	Hockett Lakes Junction	South Fork Meadows	2 Stock	Abandon	3 Stock	Abandon	2 Stock
Hockett-Sand Meadow	0.29	Hockett Mdw	Sand Meadow Junction	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Hockett-South Fork Crossing Cutoff	0.98	Sand Meadow Junction	Hockett Lakes Junction	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Hockett-South Fork Meadow	0.89	Sand Meadow Junction	South Fork Meadows	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Ladybug	1.73	South Fork Campground Trailhead	Whiskey Log Junction	2 Stock	2 Stock	3 Stock	2 Hiking	3 Stock
South Fork Kaweah	9.73	South Fork Campground Trailhead	South Fork Kaweah Crossing	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
South Fork Meadows	0.19	South Fork Meadows	South Fork Kaweah Trail	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Tuohy	1.94	South Fork Crossing	South Boundary	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Tuohy Cutoff	1.92	South Fork Mdw	Tuohy Gap Jct	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Wet Meadow	0.68	Quinn Mdw	Boundary at Wet Mdw	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Whiskey Log	1.26	Ladybug Trail	Cedar Creek	2 Stock	2 Stock	2 Stock	2 Hiking	2 Stock
Windy Gap	2.17	Hunter Creek Junction	Quinn Meadow (RS)	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Windy Ridge	4.64	Tuohy Gap	Blossom Lake-Windy Ridge Junction	2 Stock	Abandon	3 Stock	Abandon	3 Stock
SOUTH FORK KINGS WATERSHED								
Avalanche Pass - Sphinx	5.00	Sphinx Junction	Avalanche Pass	2 Stock	2 Stock	2 Stock	1 Stock	2 Stock
Avalanche Pass Roaring River	5.80	Avalanche Pass/Cloud Canyon Junction	Avalanche Pass	2 Stock	2 Stock	2 Stock	1 Stock	2 Stock
Baxter Pass	4.57	Baxter Pass/PCT	Baxter Pass	1 Stock	1 Hiking	1 Hiking	1 Hiking	1 Hiking
Bell Canyon - Comanche Cutoff	1.53	Seville Lake Junction	Comanche Junction	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Bell Canyon Entrance	1.46	Bell Canyon Entrance	Seville Lake Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Bench Lake	2.00	Bench Lake/PCT Junction	Bench Lake	2 Stock	2 Stock	2 Stock	1 Stock	2 Stock

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Beville Lake	0.07	Silliman Pass/Beville Lake Trail Junction	Beville Lake	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Bubbs Creek	6.20	Sphinx Junction	Junction Meadow (East Lake Jct)	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Bubbs Creek Switchbacks	1.42	Bailey Bridge Junction (north side)	Sphinx Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Bullfrog Lake	2.29	Bullfrog/PCT Junction	Kearsarge Lakes/Bullfrog Junction	3 Hiking	3 Stock	3 Hiking	3 Hiking	3 Stock
Cedar Grove Overlook	0.46	Cedar Grove Overlook/Hotel Creek Junction	Cedar Grove Overlook	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Cedar Grove Sand Flats	1.73	Roads End	Bailey Bridge Jct	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Charlotte Lake	1.64	Charlotte Lake/PCT Junction	Charlotte Creek Stock Camps	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Cloud Canyon	6.17	Roaring River Ranger Station	Creek Crossing @ Grand Palace	3 Stock	3 Stock	3 Stock	2 Stock	3 Stock
Colby Pass North	4.05	Creek Crossing @ Grand Palace	Colby Pass	2 Stock	2 Stock	2 Stock	2 Hiking	2 Stock
Deadman Canyon	5.81	Roaring River Ranger Station	Creek between Lower and Upper Ranger	3 Stock	3 Stock	3 Stock	2 Stock	3 Stock
Don Cecil	3.50	Cedar Grove Bike Path	Summit Mdw	3 Stock	2 Stock	3 Stock	2 Stock	3 Stock
East Lake	2.75	Junction Meadow	East Lake Drift Fence	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Elizabeth Pass North	3.62	Creek between Upper and Lower Ranger	Elizabeth Pass	2 Stock	2 Stock	2 Stock	2 Hiking	2 Stock
Frypan Entrance	0.40	Park Boundary @ Wildman Meadow	Kennedy Pass Trail	2 Stock	2 Stock	2 Stock	2 Stock	2 Stock
Glen Pass South	1.90	Kearsarge Pass/PCT Junction	Glen Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Granite Basin	3.18	Lip of Granite Basin (benchmark)	Granite Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Granite Lake	0.52	Granite Basin Trail	Granite Lake	1 Stock	1 Stock	1 Stock	1 Stock	1 Stock
Grouse Lake	0.63	Copper Creek Trail	Grouse Lake	Unmaint	1 Stock	1 Stock	1 Stock	1 Stock
Grizzly Lake	0.36	Park Boundary	Kennedy Pass Trail	2 Stock	2 Stock	2 Stock	2 Stock	2 Stock
Hotel-Creek	2.56	Hotel Creek Trailhead	Hotel/Lewis Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Junction Meadow Switchbacks - Bubbs	2.27	Junction Meadow on Bubbs	Vidette Meadow Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Kanawyers Gap	3.30	Kanawyers Gap	Comanche Junction	2 Stock	2 Stock	3 Stock	Abandon	2 Stock
Kearsarge Lakes	0.57	Bullfrog Lake/Kearsarge Lakes Junction	Kearsarge Lakes	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Kearsarge Pass	2.87	Kearsarge Pass/PCT Junction	Kearsarge Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Kennedy Pass South	3.75	Frypan Meadow	Kennedy Pass	2 Stock	2 Stock	2 Stock	1 Hiking	2 Stock
Lake Reflection	1.09	East Lake Drift Fence	Lake Reflection	Abandon	1 Stock	1 Stock	Abandon	Abandon
Lost Lake	0.70	Lost Lake Junction	Lost Lake	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Lower Copper Creek Switchbacks	3.69	Roads End Cedar Grove	Lower Tent Mdw crossing	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Lower Lewis Creek	0.91	Lewis Creek Trailhead	Hotel/Lewis Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Lower Sixty Lake Basin	1.65	First Lake in Sixty Lake Basin	Lower Sixty Lake Basin	1 Hiking	1 Hiking	1 Hiking	Abandon	1 Hiking
Mist Falls	3.16	Bailey Bridge Jct	Lower Paradise Camping	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Paradise Valley	3.30	Lower Paradise Valley Camping	South Fork Bridge @ Upper Paradise	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Pinchot Pass North	3.83	South Fork Kings Crossing	Pinchot Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Pinchot Pass South	7.38	Woods Creek Crossing	Pinchot Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Rae Lakes	4.93	Dollar Lake Outlet	Glen Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Ranger Lake	0.14	Silliman Pass/Ranger Lake Junction	Ranger Lake	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Sawmill Pass	3.22	Sawmill Pass/PCT Junction	Sawmill Pass	1 Stock	1 Stock	2 Stock	1 Hiking	2 Stock
Seville Lake	1.14	Seville Junction	Seville Lake	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Seville Lake Boy Scout	1.27	Bell Canyon Entrance	Seville Lake	Informal	-	1 Hiking	-	-
Silliman Pass North	4.90	Seville Junction	Sillman Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
South Side Cedar Grove Sand Flats	1.88	Bailey Bridge Jct	Red Bridge @ Roads End	3 Stock	3 Stock	3 Hiking	3 Hiking	3 Hiking
Sphinx Lakes	2.08	Screwball Meadow	Sphinx Lakes	Unmaint	Abandon	1 Hiking	Abandon	Abandon
Sugarloaf Entrance	2.22	Sugarloaf Entrance	Comanche Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Sugarloaf Valley	7.45	Comanche Junction	Roaring River Ranger Station Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Taboose Pass	2.36	Taboose Pass/PCT Junction	Taboose Pass	2 Stock	2 Stock	2 Stock	2 Stock	2 Stock
Upper Basin	5.74	South Fork Kings Crossing	Mather Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Upper Bubbs Creek - Forester Pass North	4.95	Center Basin/PCT Junction	Forester Pass	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Upper Copper Creek Switchbacks	3.26	Lower Tent Meadow crossing	Lip of Granite Basin (benchmark)	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Upper Lewis Creek	4.06	Hotel/Lewis Junction	Frypan Meadow	2 Stock	2 Stock	2 Stock	2 Stock	2 Stock
Upper Sixty Lake Basin	1.42	Sixty Lake/PCT Junction	Outlet of first lake in Sixty Lake Basin	2 Stock	2 Stock	2 Stock	1 Stock	2 Stock

Table K-1: Trail Classification and Design Use for all Alternatives (continued)

Trail Name	Miles	Beginning	End	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Vidette Meadow	3.05	Vidette Meadow Junction	Center Basin/PCT Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Vidette Switchbacks	1.74	Vidette Meadow Junction	Kearsarge Pass/PCT Junction	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Woods Creek	5.10	South Fork Kings Bridge	Woods Creek Crossing	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
Woods Creek Crossing - Dollar Lake	3.96	Woods Creek Crossing	Dollar Lake Outlet	3 Stock	3 Stock	3 Stock	3 Stock	3 Stock
TULE WATERSHED								
Summit Lake	0.39	Windy Ridge	Summit Lake	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Tuohy	1.05	South Fork Crossing	South Boundary	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock
Windy Ridge	1.45	Tuohy Gap	Blossom Lk Jct	2 Stock	2 Stock	3 Stock	2 Stock	2 Stock

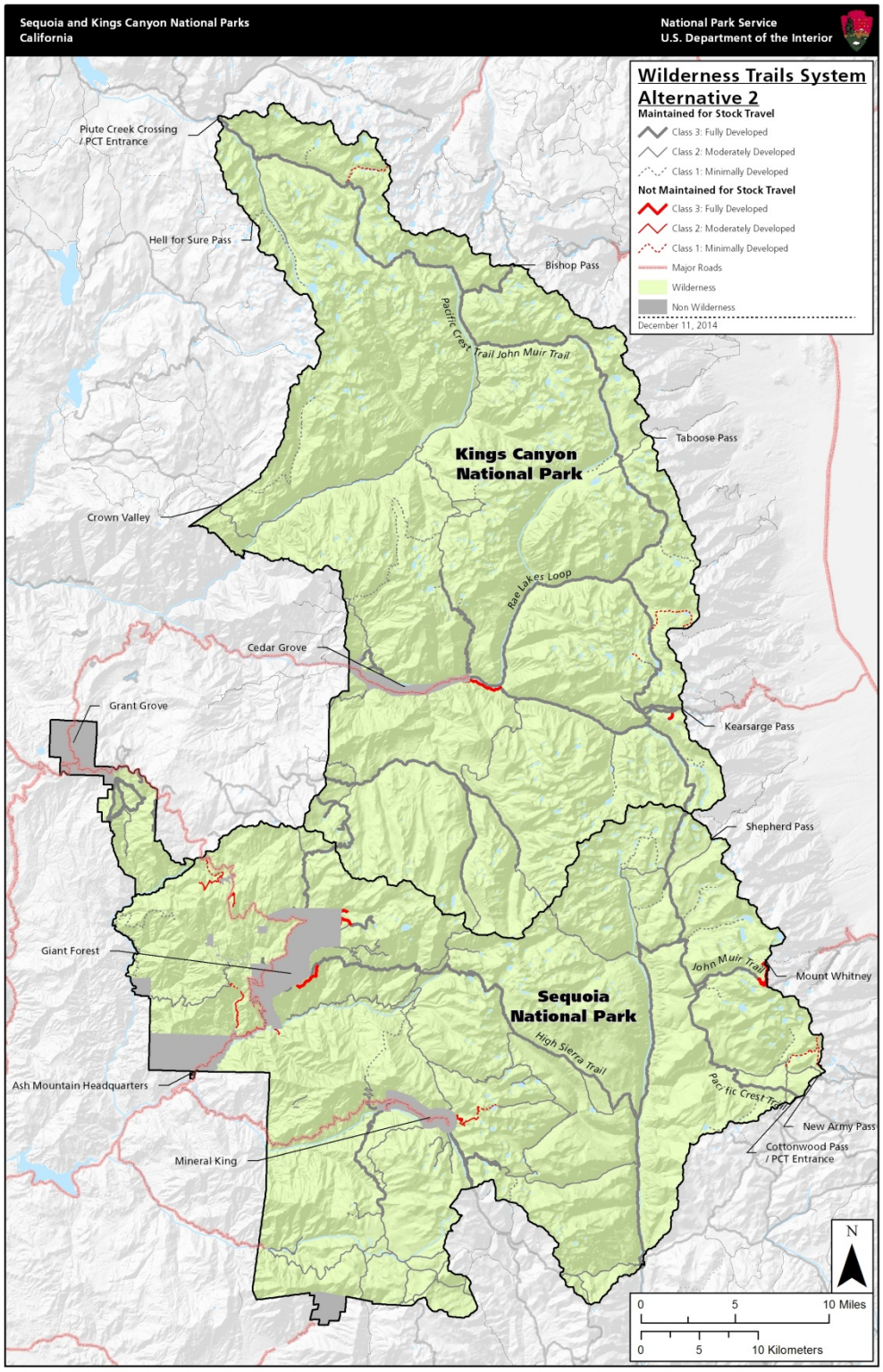

Figure K-1: Wilderness Trails System - Trail Segments and Planned Class and Design Use under the Preferred Alternative

ATTACHMENT 2:
"MAJOR PROJECT" LIST TO BRING TRAIL SYSTEM TO DESIRED CLASS AND DESIGN USE FROM CURRENT CONDITIONS

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MAJOR PROJECT LIST TO BRING TRAIL SYSTEM TO DESIRED CLASS AND DESIGN USE FOR CURRENT CONDITIONS

The Trail Management and Classification System outlines desired conditions for the trail system of Sequoia and Kings Canyon National Parks that are different from current conditions in many places. In some locations, trails have been abandoned and restoration work may be needed on the abandoned trail segments. In other locations, new trails are called for, or current trail development is more than or less than called for in the plan. Much of the work needed to realize the desired conditions can be done within the constraints of the Programmatic Categorical Exemption (attachment 3). The more extensive work needed in other places may require additional site-specific compliance under NEPA or NHPA. This attachment contains a listing and map of those projects where more extensive work is needed.

Table K-2: Large Project List to Bring Trail System to Desired Class and Design Use for the Preferred Alternative

Project Map Number	Project Name	Description	Wilderness Qualities	Access	Sustainability
1	Lamarck Col Trail Establishment	Numerous informal trails have developed from hiker and mountaineer use in the Lamarck Col and Darwin Bench area. This project would establish a Class 1 hiker only trail to channel use onto one route, and would do landscape restoration on the rest of the informal trails.	Nat UnD Sol	Yes	Yes
2	Hell For Sure Pass Trail Reroute	Near the top of Hell for Sure Pass, the trail ascends straight up a wet hillside meadow. This project would reroute the trail out of the meadow onto dry, stable slopes and do landscape restoration on the abandoned section of trail.	Nat		Yes
3	Martha Lake Trail Alignment	The Martha Lake Trail traverses several wet meadows below Martha Lake. These meadows are known habitat for the Yosemite toad. Under the WSP this trail will be a Class 1 trail open to stock travel. This project would relocate the trail from ground that is not suitable for a Class 1 stock use trail, including impacts to wet meadows and possible impacts to Yosemite toad populations. Landscape restoration would be done on the abandoned trail sections.	Nat UnD Sol	Yes	Yes
4	Dusy Basin Trail Reroute	Near the west end of Dusy Basin, the trail drops steeply down mixed meadow and bedrock benches where the trail is heavily braided and eroded. After reaching the level of the lakes, the trail crosses level meadow areas where traffic has established multiple routes. This project would establish a Class 3 stock use trail on a sustainable alignment, and would do landscape restoration on the abandoned sections of trail.	Nat UnD Sol		Yes

Project Map Number	Project Name	Description	Wilderness Qualities	Access	Sustainability
5	Cartridge Pass Trail Restoration	Cartridge Pass was the original route for the John Muir Trail. Since construction of the Golden Staircase and Mather Pass Trail as the current JMT, Cartridge Pass has seen little maintenance, and under the WSP this trail will no longer be a stock travel route or a maintained trail. Portions of the trail near Triple Falls, through the meadows of Lake Basin, over the pass, and down to the Muro Blanco Trail are still evident as abandoned trail segments, and in places cause active erosion. This project would assess the Cartridge Pass Trail under NHPA, then perform landscape restoration or historic preservation as appropriate.	Nat UnD Sol		
6	Kennedy Canyon Trail Alignment	The Kennedy Pass Trail traverses several wet meadows in Kennedy Canyon. In addition, the trail is indistinct in many spots and even light levels of use are creating informal trails to dead ends. Under the WSP this trail will be a Class 1 trail open to stock travel. This project would relocate the trail from ground that is not suitable for a Class 1 stock use trail, including impacts to wet meadows and replacing dead end informal trails with trails that allow through stock traffic. Landscape restoration would be done on the abandoned trail sections.	Nat UnD Sol	Yes	Yes
7	Pinchot Pass North Trail Reroute	Between Marjorie Lake and Pinchot Pass, the John Muir/Pacific Crest Trail climbs steeply up several vegetated benches. Past efforts to stabilize the trail with structures have failed, as the trail is too steep for sustained use. This project would construct a series of reroutes to put the trail on a sustainable alignment by lowering the grade. Landscape restoration would be performed on the abandoned sections of trail.	Nat	Yes	Yes
8	Pinchot Pass South Deferred Restoration	During the summers of 1982-1985, over a mile of the John Muir/Pacific Crest Trail was rerouted from wet meadows and steep alignments onto more stable ground and lower trail grades. The abandoned trail through the wet meadows never had landscape restoration work done, and is still an apparent and eroding scar. This project would perform landscape restoration work on the trail section abandoned in 1982-1985.	Nat UnD Sol		
9	Sawmill Pass Trail Alignment	The Sawmill Pass Trail traverses several wet sidehill meadows between Woods Lake and Sawmill Pass. In addition, near the pass the trail has a fall-line alignment where erosion has created features several feet deep and a dozen feet wide. This project would relocate the trail from ground that is not suitable for a Class 1 stock use trail, and would address the ongoing erosion near Sawmill Pass.	Nat UnD Sol	Yes	Yes

Project Map Number	Project Name	Description	Wilderness Qualities	Access	Sustainability
10	Gardiner Pass Trail Restoration	The Gardiner Pass Trail will no longer be a stock travel route or a maintained trail under the WSP. Portions of the trail near in Charlotte Creek, over Gardiner Pass, and into Gardiner Basin are still evident on the landscape, and in places cause active erosion. This project would assess the Gardiner Pass Trail under NHPA, then perform landscape restoration or historic preservation as appropriate.	Nat UnD Sol		
11	Dragon Lake Trail Restoration	The Dragon Lake Trail will no longer be a stock travel route or a maintained trail under the WSP. Portions of the trail evident on the landscape and in places cause active erosion. This project would assess the Dragon Lake Trail under NHPA, then perform landscape restoration or historic preservation as appropriate.	Nat UnD Sol		
12	Junction Pass Restoration	The Junction Pass Trail will no longer be a stock travel route or a maintained trail under the WSP. Portions of the trail evident on the landscape and in places cause active erosion. This project would assess the Junction Pass Trail under NHPA, then perform landscape restoration or historic preservation as appropriate.	Nat UnD Sol		
13	Milestone Basin Restoration	The Milestone Basin Trail will no longer be a stock travel route or a maintained trail under the WSP. Portions of the trail evident on the landscape and in places cause active erosion. This project would assess the Milestone Basin Trail under NHPA, then perform landscape restoration or historic preservation as appropriate.	Nat UnD Sol		
14	JMT-PCT Tyndall Reroute	This Class 2 trail is on a hillside meadow and the trail is deeply rutted by a stream crossing. This project would reroute the trail to higher, more stable ground and perform landscape restoration on the abandoned trail segments.	Nat		Yes
15	Elizabeth Pass South Reroute	Existing trail alignment is not sustainable for a Class 2 trail due to steep terrain, meadows, and wetlands. Tread erosion is severe in places and ongoing. Establish a sustainable alignment and restore abandoned trail sections.	Nat Sol	Yes	Yes
16	Coppermine Pass Trail Restoration	Coppermine Pass Trail connects upper Cloud Canyon and upper Deadman Canyon over Coppermine Pass. The trail was originally constructed to access copper deposits in those areas. Under the WSP, this trail will not be maintained. Portions of the trail are still evident on the landscape and in places cause active erosion. This project would assess the Coppermine Pass Trail under NHPA, then perform landscape restoration or historic preservation as appropriate.	Nat UnD Sol		

Project Map Number	Project Name	Description	Wilderness Qualities	Access	Sustainability
17	Upper Wallace Creek Alignment	The Upper Wallace Creek Trail is being established in the WSP as a Class 1 trail open to stock use. There is a meadow between the High Sierra Trail and Waterfall Meadow where the existing "designated unmaintained route" cannot sustainably carry stock traffic. This project would relocate the trail from ground that is not suitable for a Class 1 stock use trail. Landscape restoration would be done on the abandoned trail sections.	Nat UnD Sol	Yes	Yes
18	Kern Bridge "Maze" restoration	During the 1990s, this trail was rerouted onto stable ground. The abandoned trail near the river never had landscape restoration work done. This project would perform landscape restoration work on the trail section abandoned in 1982-1985.	Nat UnD Sol		
19	Lower Kern Reroute	The Kern river has moved to the west and seasonally floods many sections of the trail. This project would reroute the trail to higher ground in two locations totaling about 2000 LF and perform landscape restoration on the abandoned trail segments	Nat	Yes	Yes

Nat = Natural
UnD = Undeveloped
UnT = Untrammeled
Sol = Solitude
Oth = Other

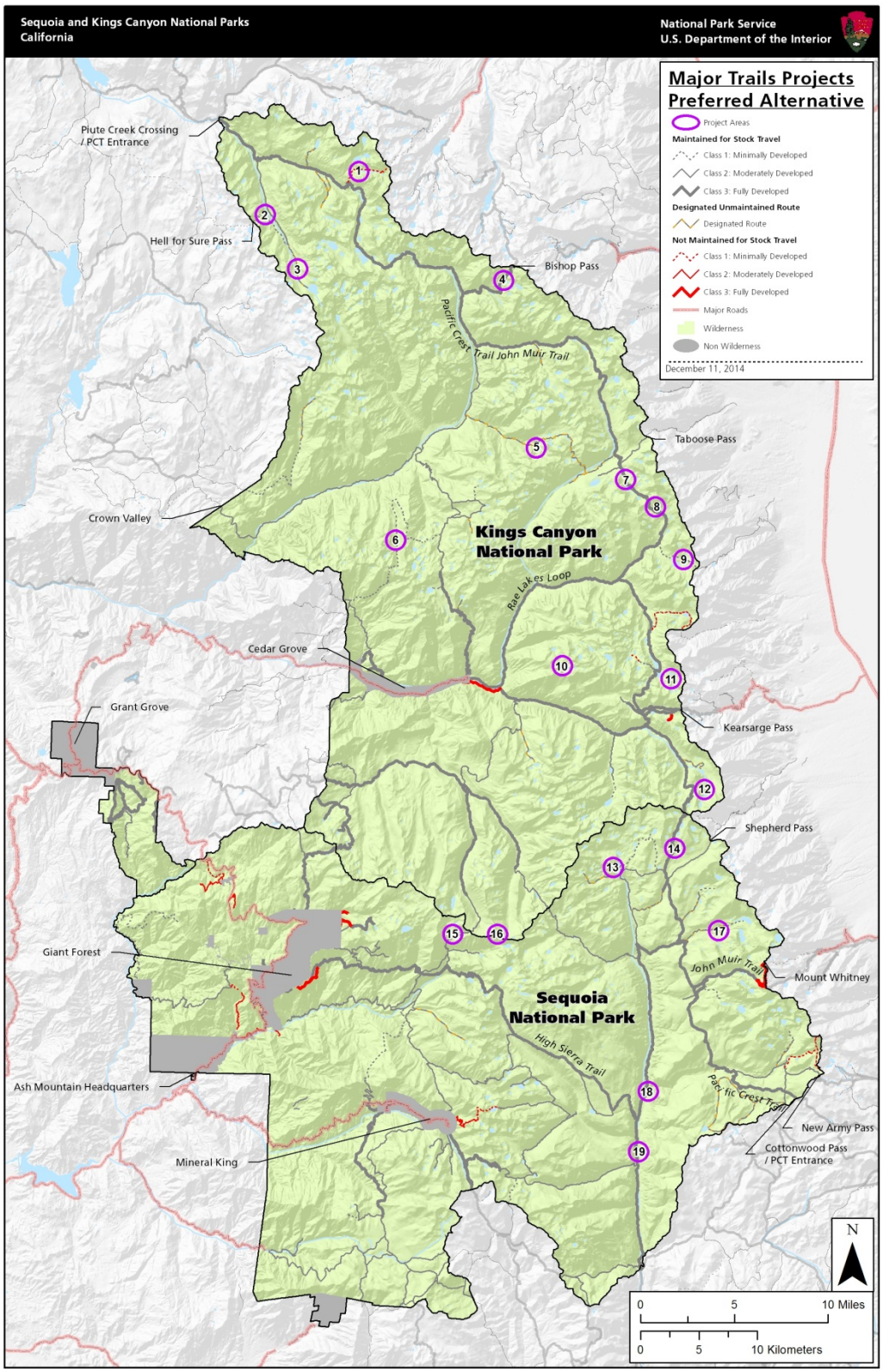

Figure K-2: Major Trail Projects for the Preferred Alternative

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ATTACHMENT 3:
PROGRAMMATIC CATEGORICAL EXCLUSION

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PROGRAMMATIC CATEGORICAL EXCLUSION

The Programmatic Categorical Exclusion (PCE) for Routine Maintenance and Repairs to Trails for the Preferred Alternative. This PCE will be updated annually to identify significant new work projects covered, reflect any changes in best management practices, and to ensure it remains compliant with law, regulation, and policy.

Since the trail maintenance programs at Sequoia and Kings Canyon National Parks are also expected to perform maintenance on non-wilderness trails, drift fences, and wilderness camps, those topics are also included in the PCE.

Other Sequoia and Kings Canyon National Parks documents referenced in this PCE include:

- Management Directive 009 - Wilderness Stock Use and Group Size Management (MD-9)
- Management Directive 049 - Minimum Requirement Analysis – Determination (MD-49)

TRAILS AND TRAIL BRIDGE MANAGEMENT PROJECT DESCRIPTION

PROGRAMMATIC CATEGORICAL EXCLUSION FOR ROUTINE MAINTENANCE AND REPAIRS TO TRAILS, SEQUOIA AND KINGS CANYON NATIONAL PARKS

The purpose of the trail maintenance program at Sequoia and Kings Canyon National Parks is to provide for visitor access and a diversity of recreational experiences, to ensure visitor safety and enjoyment, and to promote resource protection by encouraging trail use. The purpose of wilderness trails is to protect wilderness character and provide outstanding opportunities for primitive and unconfined wilderness recreation and visitor enjoyment.

This categorical exclusion document (CE) will serve as a formal record for routine trail operation and maintenance activities for the years 2010-2014. The Council on Environmental Quality (CEQ) directs agencies to use CEs for actions "which do not individually or cumulatively have a significant effect on the human environment and which are therefore exempt from requirements to prepare an environmental impact statement" (40 CFR §1500-1508). This project is categorically exempt under NPS Director's Order #12, Action 3.4 C. 3: *Routine maintenance and repairs to non-historic structures, facilities, utilities, grounds, and trails.*

The National Park Service (NPS) maintains a trail system of approximately 800 miles of foot and horse routes in the wilderness and frontcountry areas of the parks.

Activities covered under this programmatic document include: maintaining, repairing, and rebuilding damaged/deteriorated walls, trail tread, drainage structures, signs, and other structural elements; rebuilding and repairing trail bridges including decking, railings, approaches, abutments, and stringers; removing fallen trees and rocks and debris from the trail corridor; repairing sections where erosion and other landscape processes have compromised trail integrity; creating barriers to discourage trail shortcutting, trail widening, and use of informal trails; restoring landscape damage from abandoned trail segments; and maintaining/repairing asphalt paths and multi-use trails. This project also covers the maintenance and repairs to stairs, railings, and other trail features; repair and replacement of benches; repair, maintenance, and replacement of drift fences; and repair and replacement of signs, kiosks, and wayside exhibits located along the parks' trails.

It is also the intention of this CE to cover trail crew camps.

This CE can cover minor trail reroutes as long as they are evaluated in accordance with the guidance provided by D0-12, Section 3.4 C. 11. Examples include, but are not limited to: reconstructing trails around or through landslides and similar events that render the existing trail impassable, rerouting trails where erosion and ongoing trail or resource damage cannot be controlled through hardening in the existing alignment, taking preventative measures to ensure further erosion impact is alleviated or controlled, and relocating a small section of a trail for resource or visitor protection. Additional analysis would be necessary when there is potential for more than minor resource damage to occur or for major trail reroutes. Consultation with the Environmental Review Team (ERT) and subject matter experts (SMEs) is warranted to determine the level of impact from more than minor trail reroutes.

This CE is not intended to cover major off-trail drainage redirection, new trail construction, bridge abutment relocation, and new bridge construction.

COMPLIANCE PROCEDURES

This programmatic CE will be reviewed by the project leaders (Roads and Trail Supervisor and Trail Supervisors) and the Environmental Protection Specialist yearly to ensure consistency and to determine if conditions have changed. Work performed under this CE must apply the techniques, protocols, and methodologies described below. Work must also occur without significant changes in technology, location, capacity, or appearance.

If new techniques or significant changes in the scope of work are proposed, the project lead will consult with the Environmental Protection Specialist to request an amendment to the CE to cover the proposed changes. The proposed changes would be reviewed by the parks ERT and subject matter experts as warranted, to assure the changes are within the scope of this programmatic CE. The standard for determining a significant change is based on the potential for increasing environmental impacts, as determined by the Environmental Screening Form (ESF).

An annual work plan for work to be performed under this programmatic CE will be submitted each year to the Environmental Compliance Office and posted on the internal Planning, Environment, and Public Comment (PEPC) website. Any non-routine projects proposed under this programmatic document will be reviewed by the Environmental Protection Specialist to determine if these non-routine projects fall within the scope of the programmatic CE. If non-routine project work is added to the programmatic CE, this information will be updated in PEPC and provided to the parks' ERT and subject matter experts for review.

Other documentation, such as Section 106 compliance and a wilderness minimum tool/minimum requirement analysis may be necessary for project work authorized under this programmatic CE.

FRONTCOUNTRY TRAILS ROUTINE MAINTENANCE AND REPAIRS/REHABILITATION

There is a total of approximately 147 miles of frontcountry trails, of which approximately 77 miles of trail are in Sequoia National Park (SEQU) and 70 miles of trail are in Kings Canyon National Park (KICA) (trails located outside of wilderness areas in these parks). There are approximately 36 SEQU bridges/boardwalks on frontcountry trails and 25 in KICA. These trails are usually in or adjacent to developed areas, and some may connect to wilderness. These trails may be constructed of earth, rock, gravel, and logs, and sometimes portions are asphalt or concrete. Constructed features such as bridges, boardwalks, stairs, benches, walls, signs, interpretive displays, and overlooks are made of an assortment of manufactured materials such as steel, aluminum, mortared stone, and milled lumber.

Frontcountry trail maintenance activities are usually conducted by trail crews based in the developed area of the parks. Frontcountry trails generally receive similar maintenance and repairs as wilderness trails, although they typically include more constructed features that need maintenance. The major exception to this is maintenance of asphalt paved trails and winter snow and ice removal.

Asphalt Paths and Multi-Use Trail Maintenance and Repair/Rehabilitation

The routine maintenance and repair of asphalt paved tread with premix asphalt on trails and walks to provide a safe and durable travel surface. Standard asphalt maintenance procedures are as follows:

- Fog sealing: a sealing coat is applied to the trail to prevent water intrusion.
- Crack Sealing: Cracks are sealed with flexible rubberized asphalt that bonds to the crack walls and moves with the pavement to prevent water intrusion.
- Asphalt Patching: Damaged materials are removed, new aggregate road base is installed and compacted, tack oil is applied, and new asphalt material is installed and compacted.
- Asphalt Overlays: Deteriorated sections of asphalt surface are repaired and overlaid with 1 to 3 inch lifts of new compacted asphalt material.
- Shoulder Maintenance and Repair: As road shoulders deteriorate, they are repaired by replacing compacted aggregate road base or other fill material up to the grade of the asphalt surface to provide edge protection and minimize grade change.
- Asphalt Replacement-in-kind: In locations where existing asphalt is extensively deteriorated, the old asphalt may be removed and recycled into the base course or removed from the parks prior to installation of new asphalt.

Equipment – Mid-sized trucks and loaders, 4WD utility vehicle, pavers and compactors, motorized and non-motorized hand tools, welders, generators.

Impacts of Not Performing Activity – Trail surface deteriorates and becomes hazardous to users, and promotes the establishment of off-trail parallel alignments, drainage, erosion, and sedimentation impacts, and vegetative and other possible resource impacts.

Winter Snow and Ice Control

Removal of snow and ice from the Grant Tree Trail and the lower portion of the Sherman Tree Trail and sanding of the trails for footing on bad icy spots. Snow removal takes place after each snowfall event, and road sand is applied as needed by hand on icy spots. In the spring any accumulated sand is swept from the trail.

Equipment – Mid-sized loader and with plow or rotary attachment, motorized and non-motorized hand tools, skid steer with rotary snow blower, walk behind (manually propelled) snow blower, small 4-wheel drive utility vehicle, walk-behind, or vehicle-mounted broom.

Impacts of Not Performing Activity – Loss of trail service to visitors in the winter. Risk of visitor injury from slips and falls.

WILDERNESS TRAILS ROUTINE MAINTENANCE AND REPAIRS/REHABILITATION

There are approximately 665 (395 SEQU, 270 KICA) miles of trail located within the designated or potential/proposed wilderness of the parks, which covers approximately 97% of the park. There are

approximately 15 trail bridges in wilderness within Kings Canyon and 22 trail bridges in Sequoia. The goal of this program is to conduct maintenance as needed on all of the parks' trails each year. However, generally, at least 85% of the parks' trails receive some level of maintenance when conditions allow. Work can occur year round; work can be performed in the lower elevations during the fall, winter, and spring, and work can occur in the higher elevations during the summer as conditions allow. Summer is generally the peak season for trail work.

Wilderness trails are maintained and improved by trail work crews that are often based in wilderness, with subsequent logistical support facilities and actions. Trails in the parks' wilderness areas are constructed primarily of available native materials including earth, rock, gravel, and logs. Causeways of timber, rock and earth may be constructed in wet areas. Trails are generally 2-3 feet wide, but may be wider in areas of heavy use or rough terrain, where additional space is required for appropriate uses (e.g., stock with pack boxes, or extreme exposures). The trail prism is generally defined as the corridor through which the trail passes, no greater than 8 feet either side of the centerline of the trail, and 12 feet high.

To support recreational use of these trail systems and to manage human impacts associated with use, in addition to the trails, the parks also maintain the following trail-associated items:

- Trail crew camp facilities (food storage lockers, stock accoutrements) at existing wilderness camp sites
- Signing (directional)
- Footlogs and bridges
- Some locations have designated trailside camps with limited improvements (site markers, food storage lockers, campfire rings, hitching rails, and other stock amenities)

Trail maintenance includes clearing trails (brushing, limbing, downed tree removal, live tree removal, rock and debris removal, and scaling), maintaining drainages, walls, and other trail structures (cleaning drainage structures and replacement/repair/installation of rock and log trail structures), general trail maintenance (tread maintenance and repair, trail delineation, safety railing repairs, sign repair/replacement, drift fence and designated campsite maintenance, trail condition assessments), maintaining bridges (bridge maintenance and repairs), safety rail repairs, minor reroutes (minor reroutes and abandoned trail restoration), operational support (camping, livestock packing, helicopter use, staging areas, other operational support), and various tasks incidental to trail work (blasting, rock quarrying, winching and rigging, trail closures).

Specific activities that will always require additional consultation or approval include: generally prohibited acts in wilderness (minimum requirements analysis, or MRA is required), variances from the Superintendent's Compendium restrictions (including variances to groups size limits and campfire prohibitions), variances from the Stock Use and Meadow Management Plan, or work in known areas of sensitive resources. Also, it should be noted that although tool/equipment lists are provided under each activity below to give an idea of what is typically used for a given job, actual tools used may include any wilderness-appropriate tool that is appropriate for a listed activity.

CLEARING TRAILS

Trail clearing includes many of the trail maintenance activities described as follows:

Brushing

Brushing is the clearing and disposal of limbs and brush to provide adequate lateral and vertical clearance on the trail corridor. This is in addition to spring opening. Limbs and brush are disposed of off-trail, out of drainages, and out-of-sight. The width of the vegetation removal varies considerably, depending on elevation, aspect, vegetation type, and other factors. On brushy south-facing slopes where annual growth can be in excess of three feet per year, the trail is cleared wider. In higher alpine areas where growth is slow, a narrower corridor is brushed. On Class 2 or Class 3 stock use trails, the standard applied is approximately 8’ wide from centerline and 10’ high. On Class 2 or Class 3 hiker trails, the standard applied is approximately 6’ wide and 8’ high. Class 1 trail brushing varies. The cuts are made to the ground or to nearest fork in a branch. All cuts are made cleanly, avoiding any shredding or tearing. Tree branches are cut flush with the trunk. Trees with the potential to encroach upon the trail corridor are removed. Young trees are also removed to preserve the integrity of the trail corridor. Stumps are flush-cut. Slash is stashed out of sight whenever possible for aesthetic reasons. It may also be used to block trail shortcuts.

Limbing

A limbing saw is used to cut low-hanging branches that intrude into the trail corridor. The standard is generally to cut anything that hangs down to within about 10 feet of the ground. Cuts are made cleanly and flush with the trunk. Slash is stashed out of sight of the trail whenever possible for aesthetic reasons. It may also be used to block trail shortcuts.

Downed Tree Removal

The clearing of downed/windfall trees that cross/block a trail to provide adequate lateral and vertical clearance on the trail corridor. This is performed as part of spring opening, and throughout the year as needed on trails that are open year round. Depending on the circumstance this involves simply moving the log or cutting an opening through it to provide adequate lateral clearance, or removing a larger portion of an overhanging tree. Downed trees are cut to a width which allows enough space for the user group of any given trail segment to pass easily and safely. Cut rounds are rolled off the trail. Worker safety is of primary concern in deciding the approach to take.

Live Tree Removal

Trees that interfere with the trail corridor are considered for removal. This includes leaners, and live trees that will interfere with the integrity of the trail corridor in the near future. Leaners may be of any size, but live trees removed will typically be under 12” diameter at breast height (dbh).

Rock and Debris Removal

In order to keep the trail corridor clear, the trails program uses a number of techniques to remove rocks and debris that have fallen in the trail:

- Move rocks or debris off the trail using muscle or hand tools.
- Move rocks to the side of the trail using hand winches (e.g., grip hoists) to drag the rocks out of the corridor.
- Blast rock or debris off the trail with surface charges.
- Drill rocks with gas or air powered rock drills and split the rocks with steel wedges (plugs and feathers) so that they are more manageable to move by hand or with grip hoists.

- Drill rocks and use explosives or other explosive-like products to break rocks into smaller pieces so that they are more manageable to move by hand or with grip hoists.

Scaling

Scaling involves the light use of a rake or shovel on the uphill side of the trail to bring down loose rocks and branches that are likely to wash, roll or fall down onto the trail within the following year. These materials are removed so they will not end up impeding the function of drainage structures or become obstacles to trail users. These materials are disposed of by being moved off the trail; or by being used in trail repair, shortcut blocking, back-filling, or some combination of these.

Equipment – Motorized and non-motorized hand tools, winching and rigging equipment, livestock and tow ropes, explosives.

Impacts of Not Performing Activity – Trails remain blocked by limbs, brush, windfall trees and rocks. Hikers and stock users establish alternate non-maintained routes around blocked trail segments causing multiple trails, erosion and drainage impacts, vegetative and other possible resource impacts. Drainage systems may fail resulting in impacts to the trail and off-trail resources.

MAINTAINING DRAINAGES, WALLS, AND OTHER TRAIL STRUCTURES

This includes annual clearing of drainage structures, as well as repair, replacement, and installation of various log and rock trail structures (drainage structures, retainer bars, trail tread riprap, retaining walls, and cribbing). Typically new structures are installed in the trail to slow trail tread erosion and provide for adequate footing for allowed trail users (foot or stock traffic, as appropriate).

Maintaining Drainages

This activity involves maintaining, restoring, or establishing trail drainage structures to proper depth and shape for optimum performance. Maintaining drainage structures and digging new ones are performed on the trail tread and the immediately adjacent uphill and downhill slopes. In some cases, off-trail drainages have been established to help keep the flow of water within the drainage structures. Maintenance of these structures is limited to digging out accumulated dirt, rock, and organic material, within the confines of the previously impacted area.

Replacement/repair/installation of Rock and Log Trail Structures

Repairs are made to damaged, non-functioning trail structures. Drainage, retaining, or tread structures are constructed within the trail prism to preserve the tread, prevent resource damage, maintain drainage, and provide for visitor safety. Trail structures are repaired/constructed using local, native materials, and traditional methods.

For stone structures, dry stone masonry techniques are typically used. Wet masonry is used in rare instances, essentially only for bridge abutments and frontcountry trails. Historic building techniques are replicated whenever possible.

Onsite stone used for these structures is (in order of preference): rocks that are loose and within the trail corridor; rocks close to the trail lying atop the ground; and rocks close to the trail that are partially buried. Any movement of rocks includes subsequent and immediate restoration of the area from which the rock is removed. Where no rock of the appropriate size and shape is available, rocks may be quarried (see Rock Quarrying) or in the case of frontcountry work, purchased or brought in from one of various rock caches

within the park. Standard procedures of the parks will be followed to ensure that all equipment and materials brought into the parks are free of non-native, invasive plants and animals, and noxious weeds. All staff working on site shall be informed of and follow best management practices for preventing the introduction and spread of non-native, invasive species.

Structures are repaired in-kind, although log structures are often replaced with rock for longevity. Logs are sometimes used where no rock is available. The material comes from fallen, standing dead, or live trees (where felling will not have an adverse effect on the forest). All stumps are flush cut with the ground and disguised.

Where new raised causeways are required to prevent increasing trail-associated resource damage or to provide adequate trail footing, they will be constructed so as to minimize the effects on natural hydrologic processes. Where a raised causeway that might have an impact on natural hydrologic processes is seen as the only possible trailwork solution by the crew leader on site, then the Trails Supervisor and appropriate subject matter experts from the Division of Resources Management and Science will be consulted before proceeding.

Equipment – Motorized and non-motorized hand tools, grubbing tools, winching and rigging equipment, livestock, explosives.

Impacts of Not Performing Activity – Trails degrade beyond usability. Hikers and stock users establish alternate non-maintained routes around impassible trail segments causing multiple trails, erosion and drainage impacts, vegetative and other possible resource impacts. Uncorrected small trail structure failures become large problems. Drainage systems may fail resulting in impacts to the trail and off trail resources. Failing drainage structures lead to increased erosion and resource impact.

GENERAL TRAIL MAINTENANCE

Tread Maintenance and Repair

This activity involves repairing the trail surface by replacing material lost to natural processes. On sidehills, the trail bench is restored by “re-hinging” the trail: cutting slough out of the inside hinge and spreading it on the trail and pulling the outside berm back into the trail. At other locations where rock and soil fill need to be brought in to replace material lost to erosion, rock will be used as described above for constructing stone trail structures. Soil will be used (in order of preference): from any trailside berm or deposition at trail drainage outwashes, from the trail tread, from barren or freshly disturbed areas near the trail (e.g., avalanche debris, bases of uprooted trees), and from lightly vegetated areas. Any areas of soil “borrow” will be immediately restored. Soil will not be replaced on an eroded trail unless accompanied by trail construction to ensure it will not be lost again.

Trail Delineation

In areas where there are problems with trail visibility or where the trail width is a concern, trails may be delineated with border rocks, and/or border/barricade logs. Informal trails, shortcuts, and trail braids may be disguised using branches, duff, or rocks. Temporary signing may be installed in locations where shortcutting is a major resource damage concern. The temporary signing will be removed when the vegetation in the area has recovered.

Safety Railing Repairs and Replacement

This work involves the repair of existing safety railings and fencing of various types at a variety of frontcountry and wilderness locations. This work sometimes includes the drilling of new holes in rock to support replacement sections of railing.

Sign Repair/Replacement

Work involves replacing existing wilderness trail signs that have been lost or damaged and straightening or resetting existing signs. Only wilderness-type trail signs are covered by this CE.

Drift Fence and Designated Campsite Maintenance

Drift fences are installed in various locations in the parks to manage recreational livestock grazing and protect opportunities for solitude or primitive and unconfined recreation. Fences are typically constructed from native wood posts and imported fence wire and fasteners, although some locations have metal T-posts and other locations have "spookums" constructed from logs and rock. Maintenance to these fences consists of annual setting up and dropping the wire, replacing posts in-kind as they become unserviceable, and splicing wire. Drift fence locations will not be changed without following the procedures outlined in the WSP and MD-9.

Designated campsites may have site markers, native stone fire pits, metal bear-proof food storage boxes, and stock hitchrails. Site markers are maintained similarly to other trail signs. Stone fire pits may be cleaned of ashes and the ashes scattered in hidden locations (typically in brush) after trash is removed. Otherwise stone firepits are maintained as are stone trail structures. Bear-proof food storage boxes have hinges oiled and latches replaced as needed, and dents pounded out. Any other repairs to food storage boxes typically require replacement, which requires ERT review. Stock hitchrails are freestanding native wooden rails fastened to native wood posts. They are replaced in-kind as rails or posts rot out.

Condition Assessments

Trails are generally assessed on a 5-year rotation for deferred maintenance. An aggregate inventory is also maintained of the existing trail structures. Global Positioning System (GPS) locations and photos are used where warranted as a means of documenting trail conditions for assessing work and recording completed work.

Equipment – Non-motorized and motorized hand tools, livestock, explosives, winching and rigging gear may all be utilized for general trail maintenance activities.

Impacts of Not Performing Activity – Trail alignment and surface deteriorates and becomes hazardous to users, and promotes the establishment of multiple trails, drainage, erosion, and sedimentation impacts, and vegetative and other possible resource impacts. Visitor safety may be at-risk from not conducting these activities. Desired primitive recreational opportunities are lost. Campers create new sites when existing ones are poorly maintained. Stock impacts increase due to inability to hold stock as required by MD-9.

Bridge Maintenance, Repairs, and Replacement

Maintenance and replacement in-kind of all or parts of a bridge or footlog to ensure a safe and stable trail surface.

Equipment – pack stock, motorized and non-motorized hand tools; cement mixer, generator; helicopter transport of materials and equipment may be required

Note: Major bridge replacement will likely require a separate analysis and compliance.

Impacts of Not Performing Activity – If bridges, footlogs, or boardwalk segments are not repaired or replaced, extreme safety hazards for trail users may occur which could result in a loss of diversity in primitive recreational opportunities. Damage to riparian environments may occur as trail users search for alternative routes across rivers and drainages. Around wet segments of trail, alternate informal trails may be established resulting in: erosion and drainage impacts, vegetative and other possible resource impacts, and impacts to visitors' enjoyment of the scenic quality of wilderness.

MINOR REROUTES

Constructing Reroutes

Reroutes are constructed so as to minimize resource damage and landscape and scenery impacts. Routes are selected that require the minimum of construction and trail-related structures, and construction is performed to match the character of the trail around it. All phases of construction are performed according to the relevant guidelines in this document.

Restoring Abandoned Trails

Restoration of abandoned trail segments will be completed immediately on completion of a new trail reroute, and may also be performed on long-abandoned trails that exist as landscape scars. Restoration efforts focus on restoring natural processes, ecological function, and scenery. Soil and rock fill needed to restore contour will be gathered as outlined in tread repair above. Local native vegetation will be used for plantings. "Borrow" sites for fill and vegetation will be restored to natural appearance and ecological function.

Equipment – Motorized and non-motorized hand tools, winching and rigging equipment, livestock, explosives.

Impacts of Not Performing Activity – Trails on unsustainable alignments continue to damage the parks' resources and provide poor recreational opportunities. Hikers and stock users establish alternate informal trails around difficult trail segments causing erosion and drainage impacts, vegetative and other possible resource impacts, and impacts to visitors' enjoyment of the scenic quality of wilderness. Abandoned trails continue to scar landscape and erosion continues unchecked.

OPERATIONAL SUPPORT:

Trail Camps

Trail crews will camp and use the wilderness in accordance with "Leave No Trace" techniques and regulations of the parks for public camping in wilderness areas. Exceptions to this are that crews (and crew members on lieu days in wilderness) are exempt from permitting requirements and camp duration limits, and trail crew camps may require "hardening" before use and restoration afterwards. Large crew/long duration adaptations of "Leave No Trace" include digging latrines and sumps, establishing paths around camp and to water, digging holes to set up poles for rain flies. Prefabricated camp appurtenances are encouraged (e.g., tables, chairs, free standing tents). In some locations, core camp areas and in-camp trails will be hardened with skrim or other fabric.

Where possible, crews use established stock camps, trail crew camps, and backpacker camps. When a project requires that a virgin site be used for crew camping, appropriate Resource Management & Science

and Visitor, Fire, & Resource Protection SMEs will be consulted regarding camp selection. Paramount in selecting a new site will be ability to restore the site once the work project is completed and the camp is no longer needed. A typical camp for 4-6 workers for 2-6 weeks would include a 16'x20' rain fly over a communal cooking area with tables or benches, a fire pit, food storage boxes, a rain fly for tool storage, an open-air pit toilet, a greywater sump, and individual sleeping areas with tents.

Livestock Packing

Trail crews are often resupplied by NPS or commercial pack stock. All grazing and stock use is done within the constraints of the WSP and MD-9, and using "Leave No Trace" stock techniques.

Helicopter Use

Helicopter support is used to resupply crews when a trail camp location is so remote that stock support is infeasible or would cause a greater impact to wilderness than helicopter support would, or when materials needed for work projects cannot be packed by stock. Helicopter support must be approved by the Superintendent on a project basis in accordance with MD-49, and requires the submission of a separate MRA.

Staging Areas

Staging areas may be needed to stockpile materials (primarily stone and aggregate base material), especially in frontcountry locations. Staging areas must be localized to job sites to prevent spread of non-native plants from one area of the parks to another. Pollution prevention measures and erosion control measures must be in effect, and natural features protected from scarring or damage while staging areas are in use. The only soil disturbance that may occur is on the surface. Upon project completion all areas must be restored back to their original condition.

Other Operational Support Functions

The trails program has various activities that would be classified as operational support including.

- Cleaning, maintaining tools – including repair to motorized and non-motorized tools such as chainsaws, rock drills, pumps, shovels, axes, and hammers.
- Transportation of equipment, food, supplies, stock and personnel in motor vehicles on roads.
- Fabrication work in support of trail work such as cutting of metal backcountry trail signs and fabricating camp gear or bridge parts.

TASKS INCIDENTAL TO TRAIL WORK

Blasting

All blasting activities will adhere to *NPS Director's Order 65. Explosives Use and Blasting Safety* (DO-65). In order to provide for public safety, trails will be closed by trail crews for the duration of blasting operations, with adequate site security and communication as determined by the Blaster in Charge. The crew will alert the parks' Dispatch Office at the beginning and the end of all blasting operations per DO-65 protocol.

Rock Quarrying

Where building material is unavailable, crews may have to quarry for building stone. In the backcountry, nearby rock sources are used. In the frontcountry, approved rockfall locations and previously stockpiled rock may also be used. Rocks are chosen that are the right size so that all of the rock can be used on the project and no cut rock faces are left behind.

Equipment – Gas- or air-powered rock drills for drilling freestanding rocks, steel wedges (plugs and feathers) or explosives to split rocks. Blasting equipment, motorized and non-motorized hand tools, stock, pack boxes, stoneboats.

Winching and Rigging

Rigging is used to move materials to where they are needed. Various powered and non-powered winches are used (e.g., comealong, Griphoist, chain hoist, chainsaw winch). Rocks and trees are used to provide anchors for rigging. Holes may be drilled in rock to support an anchor for rigging. As discreet a location as possible is chosen for this. Winching and rigging operations may require short-duration trail closures while objects are suspended above the trail.

Trail Closures

Trails have various levels of closure during repairs. If visitors can safely pass through the work zone while the work is going on, then the workers notify each other when visitors are coming and stop any activities that would have potential to hurt the visitors (hammer swinging or rock moving) until the visitors pass. Some situations are too dangerous to allow visitors to pass while work is going on (e.g., highline operation or moving stones on a switchback); in this case, a trail worker will hold the visitors until work can be stopped and conditions allow safe passage. Popular trails may need to be completely closed during working hours to allow for visitor safety. If a trail is to be closed, the trailhead is signed and, where possible, an alternate route is established. The Wilderness Management Office, Public Information Office, Visitor Centers, and Gateway Partners are also notified. All seasonal and natural hazard (e.g., rockfall) closure decisions are made by the Division of Visitor, Fire, and Resource Protection in consultation with other divisions of the parks as warranted.

STANDARD MITIGATIONS AND BEST MANAGEMENT PRACTICES FOR TRAILWORK

Protect Wilderness Character

- Appropriate actions should be taken to protect wilderness character. Any mechanized equipment use, installation, or other 4(c) prohibitions, shall be analyzed for compliance with the Wilderness Act.
- Prepare a minimum requirement analysis as soon as practicable, and submit to the Wilderness and Environmental Compliance offices allowing at least 3 weeks for review.
- Helicopter support must be approved by the Superintendent on a project basis in accordance with MD-49, and requires the submission of a separate supplemental MRA.
- Camp and travel in wilderness using Leave No Trace techniques.

Protect Health and Safety

- Tree hazards should be considered in selection/ maintenance of wilderness administrative camps.

Protect Cultural Resources

- The locations of trail camps, trail reroutes, and similar areas of potential impact may have to be surveyed on a case-by-case basis. Contact the parks' Cultural Resource Specialist for case-by-case guidance.
- Avoid work in areas where known cultural resources exist.

Protect Native Wildlife

- Trail realignments in bighorn sheep critical habitat require separate compliance and consultations with US Fish and Wildlife Service. See attached map in PEPC.
- Bear-proof food storage boxes have hinges oiled and latches replaced as needed, and dents pounded out. Any other repairs to food storage boxes typically require replacement, which requires Environmental Review Team review and Minimum Requirements Analysis under the WILDERNESS STEWARDSHIP PLAN and MD-9.
- Comply with food-storage and garbage disposal requirements at all times.

Protect Wild and Scenic Rivers

- Comply with the parks' General Management Plan-specified "river protection measures."

Protect Water Quality and Aquatic Ecosystems

- Avoid in-stream work.
- Where new raised causeways are required to prevent increasing trail-associated resource damage or to provide adequate trail footing, they will be constructed so as to minimize the effects on natural hydrologic processes. Where a raised causeway might have impacts on natural hydrologic processes and is seen as the only possible trailwork solution by the crewleader on site, the Trails Supervisor and the Branch Chief, Biodiversity and Ecological Resilience, Division of Resources Management and Science, will be consulted before proceeding.

Prevent Introduction and Spread of Non-Native Plants- Stock

- Prior to entering the parks for the season, the exterior of all stock vehicles and trailers will be pressure-washed or steam-cleaned to remove mud and plant material. Inspect and clean truck and trailer interiors; contain and dispose of sweepings.
- Before returning from winter pastures outside the parks, the hooves and hair of stock animals will be thoroughly cleaned to remove all mud and vegetative matter.
- Arrange with Invasive Plant Management staff to periodically inspect winter pastures for invasive plants before moving animals into the parks' pastures.
- Before leaving a pack station and entering wilderness, or prior to leaving a low-elevation pack station for a high-elevation pack station, animals will be inspected and cleaned of mud and vegetative matter, particularly for pack stations that do not have regular weed control activities, such as Ash Mountain. Inspect and clean tack and equipment.
- Consult with Invasive Plant Management staff to control weeds at frontcountry pack stations.

- In the frontcountry, stock will be fed California certified weed-free feed. Any stock feed used in wilderness will be processed to eliminate viable seeds (e.g., steam-rolled grains, pellets, Chaffhaye).
- As practical, for example when there is only one or two head of stock, feed stock on top of tarps rather than on bare ground. Pack out or burn residue or feed.
- Tie or hold stock in ways that minimize soil disturbance and avoid loss of desirable native vegetation.

Prevent Introduction and Spread of Non-Native Plants- Import Materials

- Use on-site fill materials whenever possible, without adverse impacts to local site. If import fill is necessary, consult with Invasive Plant Management staff prior to beginning procurement to ensure purchase of clean material. Do not move stockpiled earth materials from lower to higher elevations without consulting with Invasive Plant Management staff.

Prevent Introduction and Spread of Non-Native Plants- Equipment

- Before moving vehicles or equipment (such as Off Road Vehicles, backhoes, bobcats, etc.) to a new job site, particularly from lower to higher elevations, inspect and clean equipment thoroughly to remove all mud, dirt, and plant parts. Consult with Invasive Plant Management staff for cleaning techniques and procedures. If possible, clean vehicles before leaving each job site.
- Ensure that rental equipment is free of mud, dirt, and plant parts before the contracting officer's representative accepts it.

Prevent Introduction and Spread of Non-Native Plants- Tools

- Thoroughly inspect and clean dirt, mud, and plant parts from tools (shovels, pulaskis, winches, saws, weed eaters, etc) prior to mobilizing to a new job site, particularly when moving within the foothills or from a lower to higher elevation. A sufficient cleaning typically involves scrub brushes and picks to get out all seeds. Pay particular attention to chainsaws and other types of fast action equipment that have compartments that transport seed. Once mobilized, inspect and clean tools ON SITE, before leaving a job site.

Prevent Introduction and Spread of Non-Native Plants- Crews

- Inspect and clean shoes, clothing, and camping equipment of dirt, mud, and plant parts before mobilizing to a new job site, particularly when moving from lower to higher elevations. Clean shoes and lower extremities prior to leaving job site, particularly if there are known weed infestations in area (such as cheatgrass on Kings Middle Fork Trail and High Sierra Trail).
- Arrange for weed awareness training annually between trail crews and Invasive Plant Management staff. Coordinate with the parks' Invasive Plants Specialist.

Protect Native Vegetation and Soils

- Staging areas must be localized to job sites to prevent spread of non-natives from one area of the parks to another. Pollution prevention measures and erosion control measures must be in effect, and natural features protected from scarring or damage while staging areas are in use. The only

soil disturbance that may occur is on the surface. Upon project completion, all areas must be restored back to their original condition.

- All grazing and stock use is done within the constraints of MD-9 and using "Leave No Trace" stock techniques.
- Drift fence locations will not be changed without following the procedures outlined in the WILDERNESS STEWARDSHIP PLAN and MD-9.

Protect Native Vegetation and Soils- Crew Camps

- Where possible, crews use established stock camps, trail crew camps, and backpacker camps. When a project requires that a virgin site be used for crew camping, appropriate Resource Management & Science and Visitor, Fire, & Resource Protection subject matter experts will be consulted regarding camp selection. Paramount in selecting a new site will be ability to restore the site once the work project is completed and the camp is no longer needed.

Protect Native Vegetation and Soils- Restoration

- Consult with Restoration Ecologist on restoration techniques.

Protect Native Vegetation and Visual Resources

- Minor trail reroutes will be constructed to minimize resource damage and landscape and scenery impacts. Routes are selected that require the minimum of construction and trail-related structures, and construction is performed to match the character of the trail around it.
- Restoration of abandoned trail segments will be completed immediately on completion of a new trail reroute, and may also be performed on long-abandoned trails that exist as landscape scars. Local native vegetation will be used for plantings.
- All cuts are made cleanly, avoiding any shredding or tearing. Tree branches are cut flush with the trunk and stumps are flush-cut.
- Informal trails, shortcuts, and trail braids may be disguised using branches, duff, or rocks. Temporary signing may be installed in locations where shortcutting is a major resource damage concern. The temporary signing will be removed when the vegetation in the area has recovered.
- Limbs and brush (slash) are disposed of off-trail, out of drainages, and out-of-sight. Cut vegetation is hidden from trail users and dispersed into native vegetation.

ATTACHMENT 4:
LIST OF TRAILS WITH PARTICULARLY COMPELLING HISTORIC CONTEXT OR WHOSE HISTORIC CHARACTER IS LARGELY INTACT

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LIST OF TRAILS WITH PARTICULARLY COMPELLING HISTORIC CONTEXT OR WHOSE HISTORIC CHARACTER IS LARGELY INTACT AND PRIORITY FOR EVALUATION PER NPS-28 CULTURAL RESOURCE MANAGEMENT GUIDELINE AND SECTION 110 OF THE NATIONAL HISTORIC PRESERVATION ACT (NHPA)

Trails are divided into 5 tiers for the purposes of prioritizing needs for evaluation of historic properties/features per NPS-28 Cultural Resource Management Guideline and Section 110 of the NHPA and for preservation of trail features:

- Tier 1: Previously assessed per NPS-28 Cultural Resource Management Guideline; either by preparation of a determination of eligibility (DOE) or by inclusion on the NPS List of Classified Structures (LCS). Trail exhibits significant historical integrity/context; intact features. These would have the highest priority for preservation.
- Tier 2: First priority for assessment per NPS-28 and next level of priority for preservation of identified historical features. Trail exhibits some integrity with significant historical context, intact features may need preservation.
- Tier 3: Second priority for assessment per NPS-28; intact features identified to preserve. Trail may exhibit possibly significant historical context; however, known intact features are not threatened by planned management action.
- Tier 4: Abandoned/moldering trails - assessment per NPS-28 when project work is proposed.
- Tier 5: All other formal trails: Lowest priority for assessment, little known or identified cultural significance; no identifiable historic features to preserve.

Tiers 1, 2, 3, and 5 apply to formal trails; Tier 4 applies to abandoned trails.

Earlier in this Trail Management and Classification System, a distinction was made between routes (travelways of social importance) and formal trails (built and maintained structures). The majority of the routes within the boundaries of Sequoia and Kings Canyon National Park have been used for over 50 years and many routes have been in use for thousands of years. This plan is concerned specifically with trails as constructed facilities and consisting of built features (alignment, bridges, culverts, etc.). In most cases, the contemporary trail does not possess integrity of location, design, setting, materials, workmanship, feeling, and association with the route's earlier history. For example, the Bubbs Creek Trail in Kings Canyon National Park is in a canyon that was used for travel in prehistoric times. The first EuroAmericans to go up Bubbs Creek were J. H. Johnson and Party in 1858. Later, William Brewer and the California Geological Survey crossed the Sierra using Bubbs Creek in 1865. John Muir crossed the Sierra by this route in 1873, and Bubbs Creek was part of the Visalia-Independence Trail in the 1870s. However, as a built structure, the current Bubbs Creek Trail was constructed subsequent to these uses and there are no identifiable historic features to preserve. Because of this, Bubbs Creek has been placed in Tier 5: Lowest priority for assessment.

Table K-3 shows Sequoia and Kings Canyon trails organized by historic priority tier. Although there are many abandoned trails in Sequoia and Kings Canyon, only a small sample with identified potential historic significance was included in the list below. Even though other abandoned trails are not on the list, all abandoned trails will be given consideration as Tier 4 priority for assessment and for preservation of features.

Figure K-3 shows where these trails are in wilderness. Abandoned trails were not shown on the map for two reasons: the geospatial information in hand is incomplete, and most management actions covered by this plan will be taking place on formal trails.

Historical stories that were considered in generating the priority list include:

- Prehistoric uses
- Exploration of the American West and California
- Regional economic development and extractive uses such as mining, grazing, logging, and trapping
- Early history of the parks, administration, and development, including the military administration of Sequoia National Park
- Development of recreational trails
- Sierra Club and pioneering recreationists of the 1890s–1930s

Finally, this list is necessarily a work in progress, as the parks have not yet secured resources to perform a comprehensive inventory of the potential historic value of formal and abandoned trails on park lands.

Table K-3: Wilderness Historic Trails Preservation Priorities

Tier	Trail Name	Wilderness	Significance	Suspected Contributing Features (existing/intact)	Known Compromised Features
1	Colony Mill Road	yes	Recreation/Logging	DOE - CA SHPO - 9/25/1978 The Colony Mill Road is on the LCS (ID 9506).	Documented in DOE
1	Crystal Cave Trail	no	Recreation/CCC	DOE for Crystal Cave Historic District, including the Crystal Cave Road, Parking Lot, Access Trail, Appurtenant Structures, Spiderweb Gate, and Cave Trail System submitted to CA SHPO 5/4/12 The POS is 1938 to 1941 The CC Barrier Gate (LCS ID 58113), CC Comfort Station & Generator Room (LCS ID 58116) and CC Trail (LCS ID 58117) are all on the LCS.	Documented in DOE
1	Moro Rock Trail	no	Recreation/CCC	The Moro Rock Stairway (includes rock walls and stairs) is on the LCS (ID 5026).	Documented in DOE
2	John Muir Trail	yes	Recreation Pre-JMT Histories	Muir/Mather/Forester Passes - Rock walls, alignment Whitney Summit - Rock walls, route Golden Staircase - route Boulder in Lower Goddard Canyon	Rerouted in many places; Lots of later construction/structures
2	High Sierra Trail	yes	Recreation	Alignment Cliff routes, rock walls, Kaweah Gap, Kern switchbacks	Rerouted in many places; Lots of later construction/structures
2	Lakes Trail	yes	Recreation/CCC	Cliff route, rock walls Pear Lake Cabin	Much later construction/structures
2	Hockett-Atwell Trail	yes	Regional commercial development Cattle/grazing Early recreation Early park administrative transportation	Alignment from Atwell to Hockett Meadow East Fork Bridge Approaches Deer Creek walls, Blasting on The Bluffs Various structures along 30% of trail length Hockett Ranger Station	Lots of later construction/structures
2	Upper Soldier Lake Trail (Army Pass)	yes	Early park administration by military	Route Trail tread Rock Walls	Much of trail missing
3	Alta Trail	yes	Early park recreation	Alignment	No structures
3	Marble Falls Trail	yes	Early power development Early park recreation	Mostly original alignment Last half mile has walls	Reroutes in drainages below falls

Table K-3: Wilderness Historic Trails Preservation Priorities (continued)

Tier	Trail Name	Wilderness	Significance	Suspected Contributing Features (existing/intact)	Known Compromised Features
3	White Chief Trail	yes	Mining	Route for access of historic mines, dams	Some later construction/structures
3	Timber Gap Trail	yes	Mining Early park development	Mostly original alignment Switchbacks and walls	Some later construction/structures
3	Timber Gap Cliff Creek Trail	yes	Mining Early park development	Mostly original alignment	Some later construction/structures
3	Franklin Lakes	yes	Mining	Access to mines and dam	Some later construction/structures
3	Tehipite Switchbacks (Winchell-Dusy)	yes	Mining/cattle (Winchell/Dusy)	Original route, unmodified construction	
3	Blue Canyon (beginning of Tunemah)	yes	Sheepherding/cattle	Original route, unmodified construction	Trail moves around within general original route.
3	Non-wilderness Giant Forest Trails	no	Early park recreation	Some parts of alignment	Lots of later construction
4	Little Tehipite Trail (abandoned)	yes	Mining	Route, mines	Trail overgrown and missing in many places
4	Cartridge Pass Trail (abandoned)	yes	Original JMT	Route	Trail overgrown and missing in many places
4	Tunemah Trail (abandoned)	yes	Sheepherding	Route	No trail exists
4	River Valley Trail (HST Construction)	yes	Contributing to HST	Route, walls	Trail overgrown with brush
4	Visalia-Lone Pine Trail (Abandoned)	yes	1860s travel route	Parts of Hockett Trails follow route	Trails mostly not on historic alignment
4	Visalia-Independence Trail (parts of Bubbs/ Kearsarge)	yes	1870s travel route	Parts of Bubbs Creek, Kearsarge Pass	Trails mostly not on historic alignment
4	Junction Pass Trail (Abandoned)	yes	Original JMT	Route	Trail deteriorated and missing in many places

Table K-3: Wilderness Historic Trails Preservation Priorities (continued)

Tier	Trail Name	Wilderness	Significance	Suspected Contributing Features (existing/intact)	Known Compromised Features
4	Cataract Creek	yes	Mining	Route, Trail structures	Trail overgrown and missing in many places
4	Black Oak Trail (abandoned)	yes	Middle park recreation, 1920s	Route	Trail overgrown and missing in many places
4	Coppermine Pass Trail (abandoned)	yes	Mining Early recreation (Stewart E White)	Route Abandoned mines	Missing in many places
5	All other formal trails	Current constructed trail has no known connection to historic uses of the routes they may follow.			

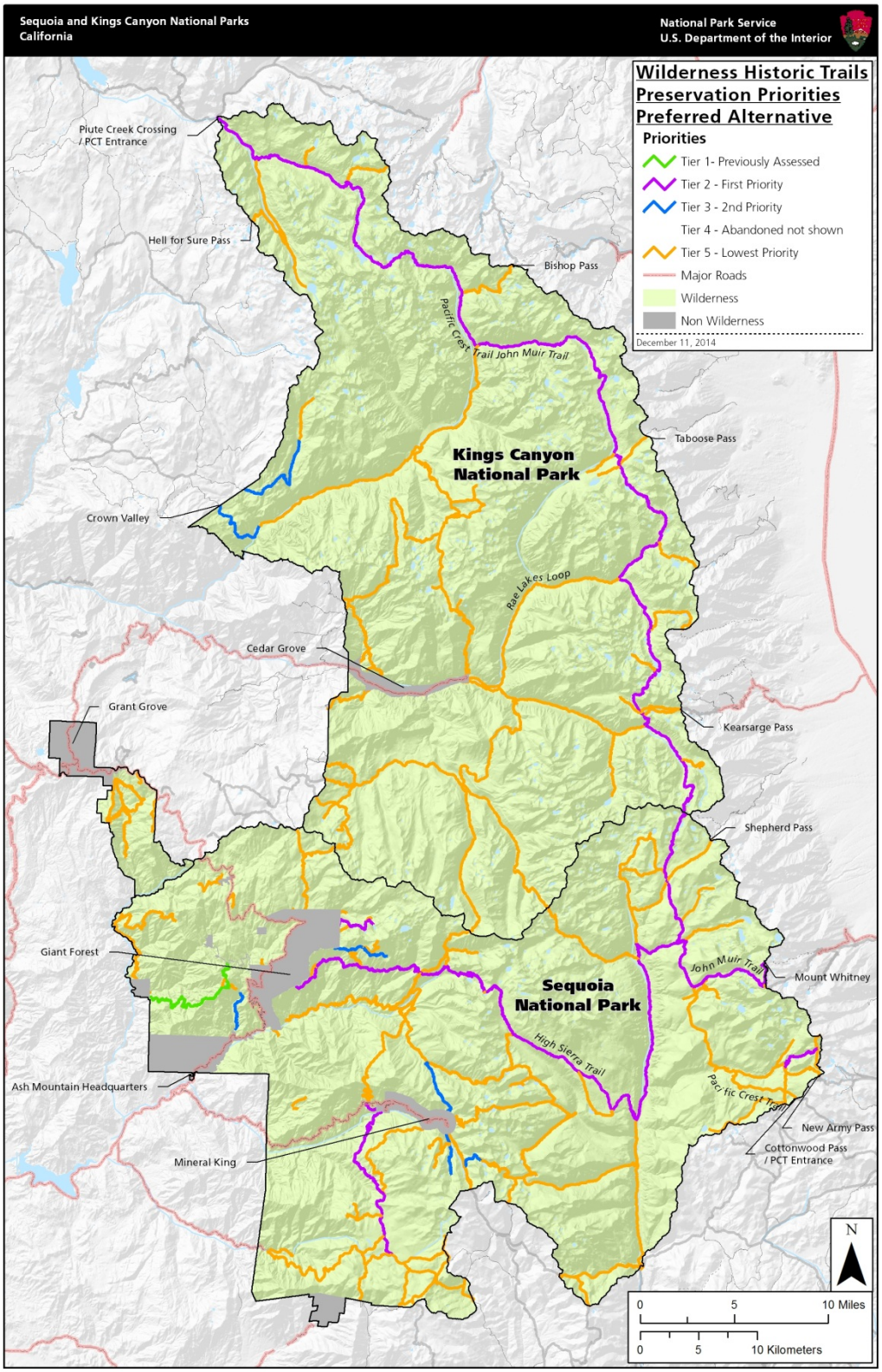

Figure K-3: Preservation Priorities of Historic Wilderness Trails for the Preferred Alternative

ATTACHMENT 5:
ROUTES AND DESTINATIONS OF CONCERN FOR MONITORING INFORMAL TRAIL IMPACTS

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2015 ROUTES AND DESTINATIONS OF CONCERN FOR MONITORING INFORMAL TRAIL IMPACTS

This attachment contains a list and map of routes and destinations of concern where the parks' staff will attempt to make observations to detect undesirable changes to prompt management action.

ROUTES

- High Route (Milestone Basin to Tablelands section)
- Lamarck Col/Darwin Bench
- Miter Basin-Crabtree
- Roper's Route
- Silliman Creek
- South Side Mt Langley
- Tableland Divide
- Glacier Pass to Spring Lake

DESTINATIONS OF CONCERN

- Crabtree Pass
- Crabtree Lakes
- Barrett Lakes
- Dusy Basin
- Guitar Lake
- Rae Lakes
- Moose Lake
- Miter Basin

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Appendix L

Analysis of Special-status Animal Species

ON THE PREVIOUS PAGE
Looking at Timberline Lake
NPS Photo

APPENDIX L:

ANALYSIS OF SPECIAL-STATUS ANIMAL SPECIES

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ANALYSIS OF SPECIAL-STATUS ANIMAL SPECIES

The table below provides an analysis of the federal and state listed and sensitive vertebrate species listed above. Those species that likely would not be measurably affected by the proposed actions were dismissed from further analysis. Those species that have the potential to be measurably affected by the proposed actions were evaluated in the "Special-status Species" or "Wildlife" sections in chapter 4.

Federal Agencies
FE = Endangered
FT = Threatened
FC = Candidate
FSS = Forest Service Sensitive
BLMS = Bureau of Land Management Sensitive

California State Agencies
CE = Endangered
CT = Threatened
CC = Candidate
CSC = Special Concern
CP = Protected
CWL = Watch List
DFS = Department of Forestry Sensitive

Table L-1: An Analysis of the Potential for Proposed Actions to Measurably Affect the Federal and State Listed and Sensitive Vertebrates That are Known to Occur in Sequoia and Kings Canyon National Parks

Common Name	Latin Name	T&E Listed		Other Status		Analysis	Result
		Federal	State	Federal	State		
Fish							
California roach	*Lavinia symmetricus*				CSC	The California roach is a small minnow that is uncommon, and found in rocky pools of small intermittent tributaries and larger streams at low elevations. California roach have been found to congregate in warm pools, which could indicate that they are able to survive at low oxygen levels during the summer (Moyle and Nichols 1973, 484). Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term, infrequent, and of a negligible impact, this species has been dismissed from further analysis.	Dismissed
Hardhead	*Mylopharodon conocephalus*	-	-	FSS	CSC	There are no records of this species occurring within SEKI; therefore it will not be further evaluated.	Dismissed

Table L-1: An Analysis of the Potential for Proposed Actions to Measurably Affect the Federal and State Listed and Sensitive Vertebrates That are Known to Occur in Sequoia and Kings Canyon National Parks (continued)

Common Name	Latin Name	T&E Listed		Other Status		Analysis	Result
		Federal	State	Federal	State		
California golden trout	*Oncorhynchus mykiss aguabonita*	-	-	FSS	CSC	The California golden trout is native outside the parks in the Golden Trout Wilderness, but has been introduced to many high elevation locations within the parks (NPS 2013b, appendix F, 375; NPS 2013h). Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term and of a negligible impact, this species has been dismissed from further analysis.	Dismissed
Kern rainbow trout Also called the "Kern golden trout"	*Oncorhynchus mykiss gilberti*	-	-	-	CSC	The Kern rainbow trout is endemic to the Kern River basin, and occupies the mainstem of the Kern River and its tributaries. This species is restricted to mid-elevations due to steep cascades and waterfalls. It was stocked in areas above its range, and it is considered nonnative in those areas (NPS 2013a, 202). Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term and of a negligible impact, this species has been dismissed from further analysis.	Dismissed
Little Kern golden trout	*Oncorhynchus mykiss whitei*	FT	-	-	-	The Little Kern golden trout is endemic to the Little Kern River basin, which occurs primarily in the Golden Trout Wilderness of Sequoia National Forest, and in a small area of the drainage in Sequoia National Park. Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term and of a negligible impact, this species has been dismissed from further analysis.	Dismissed
Amphibians							
Yosemite toad	*Anaxyrus (Bufo) canorus*	FT	-	FSS	CSC	This taxon, a federally listed endangered species, may be affected by the alternatives; therefore it will be evaluated in chapter 4.	Evaluated
Mount Lyell salamander	*Hydromantes platycephalus*	-	-	-	CSC	The Mount Lyell salamander is found in the parks but it is uncommon (NPS 2013b, appendix F, 375; NPS 2013h). The Mount Lyell salamander can be found foraging in high elevation aquatic ecosystems, though it is most often found in seeps and the spray zones of waterfalls, or under low-growing plants (NPS 2013b, 32, 382). This taxon would not be affected by the alternatives; therefore it will not be further evaluated.	Dismissed
Mountain yellow-legged frog (Sierra Nevada DPS)	*Rana muscosa*	FE	CE	FSS	CSC	This taxon, a federally and state listed endangered species, may be affected by the alternatives; therefore it will be evaluated in chapter 4.	Evaluated

Table L-1: An Analysis of the Potential for Proposed Actions to Measurably Affect the Federal and State Listed and Sensitive Vertebrates That are Known to Occur in Sequoia and Kings Canyon National Parks (continued)

Common Name	Latin Name	T&E Listed		Other Status		Analysis	Result
		Federal	State	Federal	State		
Sierra Nevada yellow-legged frog	*Rana sierrae*	FE	CT	FSS	CSC	This taxon, a federally listed endangered species and state listed threatened species, may be affected by the alternatives; therefore it will be evaluated in chapter 4.	Evaluated
Reptiles							
Western pond turtle	*Emys marmorata*	-	-	FSS BLMS	CSC	The western pond turtle is commonly found in two low elevation streams within the parks (NPS 2013h). Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term and of a negligible impact, this species has been dismissed from further analysis.	Dismissed
California legless lizard	*Anniella pulchra*	-	-	FSS	CSC	There are no records of this species occurring within SEKI; therefore it will not be further evaluated.	Dismissed
Coast horned lizard	*Phrynosoma coronatum*	-	-	FSS BLMS	CSC	There are no records of this species occurring within SEKI; therefore it will not be further evaluated.	Dismissed
Birds							
Cooper's hawk	*Accipiter cooperii*	-	-		CWL	Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term, infrequent, and of a negligible impact, this species has been dismissed from further analysis.	Dismissed
Northern goshawk	*Accipiter gentilis*	-	-	FSS BLMS	CSC DFS	Same as above.	Dismissed
Sharp-shinned hawk	*Accipiter striatus*			-	CWL	Same as above.	Dismissed
Golden eagle	*Aquila chrysaetos*	-	CP	-	DWL DFS	Same as above.	Dismissed
Short-eared owl	*Asio flammeus*	-	-	-	CSC	Same as above.	Dismissed
Long-eared owl	*Asio otus*	-	-	-	CSC	Same as above.	Dismissed
Ferruginous hawk	*Buteo regalis*	-	-	-	CWL	Same as above.	Dismissed
Swainson's hawk	*Buteo swainsoni*	-	CT	FSS	-	Same as above.	Dismissed
Vaux's swift	*Chaetura vauxi*	-	-	-	CSC	Same as above.	Dismissed
Northern harrier	*Circus cyaneus*	-	-	-	CSC	Same as above.	Dismissed

Table L-1: An Analysis of the Potential for Proposed Actions to Measurably Affect the Federal and State Listed and Sensitive Vertebrates That are Known to Occur in Sequoia and Kings Canyon National Parks (continued)

Common Name	Latin Name	T&E Listed		Other Status		Analysis	Result
		Federal	State	Federal	State		
Black swift	*Cypseloides niger*	-	-	-	CSC	Same as above.	Dismissed
Yellow warbler	*Dendroica petechia*	-	-	-	CSC	This species is a known host for brown-headed cowbirds and there is a potential for measurable negative impacts as a result of nest parasitism. Therefore this species will be evaluated (collectively with other bird species that are hosts for brown-headed cowbirds).	Evaluated
White-tailed kite	*Elanus leucurus*	-	CP	-	-	Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term, infrequent, and of a negligible impact, this species has been dismissed from further analysis.	Dismissed
Willow flycatcher	*Empidonax traillii*	-	SE	FSS	-	This species is a known host for brown-headed cowbirds and there is a potential for measurable negative impacts as a result of nest parasitism. Therefore this species will be evaluated (collectively with other bird species that are hosts for brown-headed cowbirds).	Evaluated
Horned lark	*Eremophila alpestris*	-	-	-	CWL	This species is a known host for brown-headed cowbirds and there is a potential for measurable negative impacts as a result of nest parasitism. Therefore this species will be evaluated (collectively with other bird species that are hosts for brown-headed cowbirds).	Evaluated
Merlin	*Falco columbarius*	-	-	-	CWL	Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term, infrequent, and of a negligible impact, this species has been dismissed from further analysis.	Dismissed
Prairie falcon	*Falco mexicanus*	-	-	-	CWL	Same as above.	Dismissed
Peregrine falcon	*Falco peregrinus*	Delisted	CP	-	DFS	Same as above.	Dismissed
California condor	*Gymnogyps californianus*	FE	CE	-	DFS	Same as above.	Dismissed
Bald eagle	*Haliaeetus leucocephalus*	Delisted	SE CP	FSS	DFS	Same as above.	Dismissed
Harlequin duck	*Histrionicus histrionicus*	-	-	-	CSC	Same as above.	Dismissed
Northern shrike	*Lanius excubitor*	-	-	-	CSC	This taxon is not found in project area.	Dismissed

Table L-1: An Analysis of the Potential for Proposed Actions to Measurably Affect the Federal and State Listed and Sensitive Vertebrates That are Known to Occur in Sequoia and Kings Canyon National Parks (continued)

Common Name	Latin Name	T&E Listed		Other Status		Analysis	Result
		Federal	State	Federal	State		
California gull	*Larus californicus*	-	-	-	CWL	Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term, infrequent, and of a negligible impact, this species has been dismissed from further analysis.	Dismissed
Osprey	*Pandion haliaetus*	-	-	-	CWL DFS	Same as above.	Dismissed
Purple martin	*Progne subis*	-	-	-	CSC	This species is a known host for brown-headed cowbirds and there is a potential for measurable negative impacts as a result of nest parasitism. Therefore this species will be evaluated (collectively with other bird species that are hosts for brown-headed cowbirds).	Evaluated
Great gray owl	*Strix nebulosa*	-	SE	FSS	DFS	Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term, infrequent, and of a negligible impact, this species has been dismissed from further analysis.	Dismissed
Spotted owl	*Strix occidentalis*	-	-	FSS BLMS	CSC	Same as above.	Dismissed
Mammals							
Pallid bat	*Antrozous pallidus*	-	-	FSS BLMS	CSC	Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term, infrequent, and of a negligible impact, this species has been dismissed from further analysis.	Dismissed
Sierra Nevada mountain beaver	*Aplodontia rufa californica*	-	-	-	CSC	Same as above.	Dismissed
Townsend's big-eared bat	*Corynorhinus townsendii*	-	-	FSS BLMS	CSC	Same as above.	Dismissed
Spotted bat	*Euderma maculatum*	-	-	BLMS	CSC	Same as above.	Dismissed
Western Mastiff bat	*Eumops perotis*	-	-	BLMS	CSC	Same as above.	Dismissed
Wolverine	*Gulo gulo*	FC	ST CP	FSS	-	This species is likely extirpated from the parks.	Dismissed

Table L-1: An Analysis of the Potential for Proposed Actions to Measurably Affect the Federal and State Listed and Sensitive Vertebrates That are Known to Occur in Sequoia and Kings Canyon National Parks (continued)

Common Name	Latin Name	T&E Listed		Other Status		Analysis	Result
		Federal	State	Federal	State		
Western red bat	*Lasiurus blossevillii*	-	-	FSS	CSC	Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term, infrequent, and of a negligible impact, this species has been dismissed from further analysis	Dismissed
White-tailed jack rabbit	*Lepus townsendii*	-	-	-	CSC	Same as above.	Dismissed
Marten	*Martes americana sierrae*	-	-	FSS	-	Same as above.	Dismissed
Fisher	*Martes pennanti*	FC	-	FSS BLMS	CSC	Same as above.	Dismissed
Small-footed myotis	*Myotis leibii*	-	-	BLMS	-	Same as above.	Dismissed
Long-eared myotis	*Myotis evotis*	-	-	BLMS	-	Same as above.	Dismissed
Fringed myotis	*Myotis thysanodes*	-	-	BLMS	-	Same as above.	Dismissed
Yuma myotis	*Myotis yumanensis*	-	-	BLMS	-	Same as above.	Dismissed
Sierra Nevada bighorn sheep	*Ovis canadensis sierrae*	FE	SE CP	-	-	Some bighorn sheep populations in the US have experienced significant negative effects as a result of human disturbance. Such impacts could potentially occur in SEKI as well; therefore, this species is being evaluated under Special-Status Species in chapter 4.	Evaluated
American badger	*Taxidea taxus*	-	-	-	CSC	Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term, infrequent, and of a negligible impact, this species has been dismissed from further analysis.	Dismissed
Sierra Nevada red fox	*Vulpes vulpes necator*	-	ST	FSS	-	Visitor use and administrative activities can cause disturbances to this species. However, because disturbances would be short-term, infrequent, and of a negligible impact, this species has been dismissed from further analysis.	Dismissed

Appendix M

Programmatic Minimum Requirements Analysis

ON THE PREVIOUS PAGE
Wilderness in Sequoia and Kings Canyon National Parks
NPS Photo

APPENDIX M:

PROGRAMMATIC MINIMUM REQUIREMENT ANALYSIS

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SEQUOIA AND KINGS CANYON NATIONAL PARKS WILDERNESS STEWARDSHIP PLAN MINIMUM REQUIREMENTS ANALYSIS FRAMEWORK

Part 1 - What Actions are Necessary in Wilderness?

The MRA Worksheet is based on the requirements of both the Wilderness Act and NPS Management Policies (2006):

Section 4(c) of the Wilderness Act states: " . . .except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be . . no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area."

Section 6.3.5 of NPS Management Policies 2006 states that the Minimum Requirement concept will be a two-step process to [1] determine if the management action is necessary "for administration of the area as wilderness and does not cause a significant impact to wilderness resources and character; and [2] the techniques and types of equipment needed to ensure that impacts on wilderness resources and character are minimized." Also: "When determining minimum requirements, the potential disruption of wilderness character and resources will be considered before, and given significantly more weight than, economic efficiency and convenience."

This MRA process was used to help screen alternatives in anticipation of the need to authorize actions in the future while ensuring the preservation of wilderness resource and character. The MRA serves as a single analysis to determine the necessity for similar, current, and/or future actions where the social and biophysical values and potential effects will be nearly identical, and to assess the necessity for action involving the Section 4(c) uses as similar needs come along in the future.

Range of Reasonable and Feasible Alternatives per NEPA

The Sequoia and Kings Canyon National Parks (SEKI) Wilderness Stewardship Plan (WSP) will develop and analyze a range of reasonable and feasible alternatives to wilderness management. According to CEQ, the phrase "range of alternatives...includes all reasonable alternatives, which must be rigorously explored and objectively evaluated, as well as those other alternatives, which are eliminated from detailed study with a brief discussion of the reasons for eliminating them."

Alternative 2		Alternative 3		Alternative 4		Alternative 5	
This alternative recognizes that SEKI wilderness can be broadly understood as three different types of locations: day use areas close to frontcountry, highest-use overnight areas like the HST, RLL, and PCT, and low-use overnight areas like the Middle Fork of the Kings and the Hockett Plateau. It further recognizes that current and projected visitor use levels pose few threats to wilderness character in the low-use areas under current management, but that there are some threats in highest use areas (or areas with very sensitive resources) that can be mitigated through targeted improvements to current management.		This alternative seeks to increase opportunities for primitive recreation by allowing additional use, which is mostly expected to occur at high-demand areas. Allowing increased use could result in decreased opportunities for solitude wilderness-wide. In order to preserve the natural quality of wilderness, SEKI's high use areas would require additional development and restrictions on visitor behavior.		This alternative seeks to emphasize the undeveloped and non-commercial qualities of SEKI wilderness. Removal of development and reduction of commercial services would increase the self-reliant nature of wilderness recreation. In order to preserve the natural quality of wilderness with less resource-protecting development, the amount of use would need to be reduced.		This alternative seeks to enhance the quality of solitude available in SEKI wilderness. Total numbers of visitors allowed and party sizes would be reduced, which would mean that reduced levels of development and reduced restrictions on visitor behavior would serve to protect natural resources.	
Trail Structures	Allowable installations dependent upon trail classification and subject to MRA.	**Trail Structures**	Allowable installations dependent upon trail classification and subject to MRA.	**Trail Structures**	Allowable installations dependent upon trail classification and subject to MRA.	**Trail Structures**	Allowable installations dependent upon trail classification and subject to MRA.
Signs and Bulletin Boards	Allowable installations dependent upon trail classification and subject to MRA.	**Signs and Bulletin Boards**	Allowable installations dependent upon trail classification and subject to MRA.	**Signs and Bulletin Boards**	Allowable installations dependent upon trail classification and subject to MRA.	**Signs and Bulletin Boards**	Allowable installations dependent upon trail classification and subject to MRA.

Food Storage	Some proposed number (or range) of wilderness installations subject to MRA		**Food Storage**	Some proposed number (or range) of wilderness installations subject to MRA		**Food Storage**	no proposal for prohibited uses		**Food Storage**	no proposal for prohibited uses
Human Waste Mgmt.	Some proposed number (or range) of wilderness installations subject to MRA		**Human Waste Mgmt.**	Some proposed number (or range) of wilderness installations subject to MRA		**Human Waste Mgmt.**	no proposal for prohibited uses		**Human Waste Mgmt.**	no proposal for prohibited uses
Designated Campsites	Some proposed number (or range) of wilderness installations subject to MRA		**Designated Campsites**	Some proposed number (or range) of wilderness installations subject to MRA		**Designated Campsites**	no proposal for prohibited uses		**Designated Campsites**	no proposal for prohibited uses
Recreational and Administrative Stock Management	Some proposed number (or range) of wilderness installations subject to MRA		**Recreational and Administrative Stock Management**	Some proposed number (or range) of wilderness installations subject to MRA		**Recreational and Administrative Stock Management**	no proposal for prohibited uses		**Recreational and Administrative Stock Management**	no proposal for prohibited uses

Administrative and Recreational Structures (Non-Historic)	Some proposed number (or range) of wilderness installations subject to MRA		**Administrative and Recreational Structures (Non-Historic)**	Some proposed number (or range) of wilderness installations subject to MRA		**Administrative and Recreational Structures (Non-Historic)**	Some proposed number (or range) of wilderness installations subject to MRA		**Administrative and Recreational Structures (Non-Historic)**	Some proposed number (or range) of wilderness installations subject to MRA
Administrative and Recreational Structures (Historic)	Some proposed number (or range) of wilderness installations subject to MRA		**Administrative and Recreational Structures (Historic)**	Some proposed number (or range) of wilderness installations subject to MRA		**Administrative and Recreational Structures (Historic)**	Some proposed number (or range) of wilderness installations subject to MRA		**Administrative and Recreational Structures (Historic)**	Some proposed number (or range) of wilderness installations subject to MRA

Minimum Requirements Analysis per Wilderness Act
The Wilderness Act requires that the parks demonstrate the necessity for an otherwise prohibited use of wilderness, such as permanent and temporary installations in wilderness. This stems from Section 4 (c): "Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and, **except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act** (including measures required in emergencies involving the health and safety of persons within the area), **there shall be** no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and **no structure or installation within any such area**."
The Wilderness Act prohibits specific activities—the use of motor vehicles, motorized equipment, and mechanical transport, the landing of aircraft, and the installation of structures and equipment—when other reasonable alternatives are available. The MRA worksheet provides a formalized method for developing alternative ways to address an issue by evaluating and comparing the effects of various actions on wilderness character. Per NPS Management Policies, any proposed administrative activity that has the potential to affect the wilderness or potential wilderness additions will be analyzed through the minimum requirement process.
Part 1 of this Minimum Requirement Analysis determines if any administrative action in wilderness is necessary. If an action is determined necessary, Part 2 of the analysis determines which alternatives best meet the goals and objectives developed through the Wilderness Stewardship Plan process. Part 3 is the evaluation of effects of each alternative, including fully exploring the alternatives and analyzing the effects on wilderness character, which is contained within the WSP/FEIS. Step 1 answers the following questions:
A. Options Outside of Wilderness - Can actions taken outside of wilderness adequately address the situation and meet project goals?
B. Valid Existing Rights or Special Provisions of Wilderness Legislation - Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws)?
C. Requirements of Other Legislation - Is action necessary to meet the requirements of other federal laws?
D. Wilderness Character - Is action necessary to preserve one or more qualities of wilderness character?
E. Public Purposes - Is 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"?
F. Other Guidance - Is action 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?
G. Is the action necessary in wilderness?
H. Options and Criteria for Action
After determining if the 4(c) administrative action is necessary in wilderness, the actions will be evaluated through the WSP/FEIS process to determine how each prohibited action would affect wilderness character and meet the objectives of the proposed preferred alternative. The NEPA alternative that is identified as the preferred alternative must be congruent with the finding. The analysis contained within the MRA is interdependent with the NEPA analysis and with the logic behind the identification of the preferred alternative.

Minimum Requirements Analysis for Trails and Trail Structures per Wilderness Act
A. Options Outside of Wilderness - Can actions taken outside of wilderness adequately address the situation and meet project goals?
Visitors to wilderness have diverse appropriate recreational desires, including mountaineering and cross-country travel, travel on primitive and challenging trails, travel on trails that are easy to find, and travel by foot, horseback, or boat. Their desires for solitude range from no sight or sound of other people for days on end to the companionable solitude found on the Pacific Crest Trail. Wilderness travel can create landscape impacts, including denudation of vegetation with accompanying soil compaction and erosion. Since the recreational uses occur in wilderness, any measures taken to accommodate use or mitigate impacts must also happen wilderness.
B. Valid Existing Rights or Special Provisions of Wilderness Legislation - Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws)?
None.
C. Requirements of Other Legislation - Is action necessary to meet the requirements of other federal laws?
The Organic Act of the National Park Service: "Sec.1. …. The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life 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." Kings Canyon Enabling Act of 1940 – Sec. 3: "That the National Park Service shall… administer for public recreational purposes the lands withdrawn." and "to insure (sic) the permanent preservation of the wilderness character of the Kings Canyon National Park." Sequoia Enabling Act of 1890 – Preamble: "…dedicated .and set apart as a public park, or pleasure ground for the benefit and enjoyment of the people…" and to "…provide for the preservation from injury of all timber, mineral deposits, natural curiosities or wonders within said park, and their retention in their natural condition" (Sec. 2). National Trail System Act: Sec.3.(2):" (2) National scenic trails, established as provided in section 5 of this Act, which will be extended trails so located as to provide for maximum outdoor recreation potential and for the conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which such trails may pass. Sec. 7 (j) (j) Potential trail uses allowed on designated components of the national trails system may include, but are not limited to, the following: bicycling, cross-country skiing, day hiking, equestrian activities, jogging or similar fitness activities, trail biking, overnight and long-distance backpacking, snowmobiling, and surface water and underwater activities.
D. Wilderness Character - Is action necessary to preserve one or more qualities of wilderness character?
Yes. The formal trail system in SEKI predates wilderness designation. The trail system and structures both protect the natural quality by focusing use, but may also create adverse effects on the natural quality (barrier or attractant to wildlife, protect or modify hydrologic systems, etc.). The SEKI trail system has a dual effect on opportunities for solitude or primitive and unconfined recreation: on the one hand it facilitates opportunities

for primitive recreation for many user groups by providing access to wilderness; on the other hand trails tend to channel and concentrate use, which typically diminishes the unconfined and solitary nature of recreation available along the trail.
E. Public Purposes - Is 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"?
Yes. The trail system supports the recreational purpose of wilderness, and indirectly supports the scientific, education, and conservation uses by facilitating access to wilderness for those purposes.
F. Other Guidance - Is action 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?
SEKI General Management Plan Record of Decision: "Use of stock continues, both as a means of access to wilderness by visitors, and for the administration of wilderness and protection of wilderness values." "The parks' designated wilderness and other areas managed as wilderness are zoned to reflect the varying intensities of use of different areas. In heavily traveled zones, there exist engineered trails and bridges, food lockers, designated campsites, and toilets to protect park resources, while in less-used areas, amenities are minimal or non-existent." NPS Management Policies 2006 and NPS DO-41: 6.3.10.2 Trails in Wilderness. "Trails will be permitted within wilderness when they are determined to be necessary for resource protection and/or for providing for visitor use for the purposes of wilderness. … Trails will be maintained at levels and conditions identified within the approved wilderness management plan or planning document." Trails will be maintained at levels and conditions identified within the approved wilderness management plan or other planning document. Trail maintenance structures (such as water bars, gabions) may be provided, under minimum requirement protocols, where they are essential for resource preservation or where significant safety hazards exist during normal use periods. 9.2.2.9 Trail Bridges Trail bridges may be used for crossing swift waters areas prone to flash flooding, and other places that present potential safety hazards. Less obtrusive alternatives to bridges (such as, fords) and trail relocation will be considered before a decision is made to build a bridge. A bridge may be the preferred alternative when necessary to prevent stream bank erosion or protect wetlands or fisheries. If a bridge is determined to be appropriate, it will be kept to the minimum size needed to serve trail users, and it will be designed to harmonize with the surrounding natural scene and be as unobtrusive as possible. Comprehensive Management Plan for the Pacific Crest Trail (1982) – (appendix C): Criteria for Location, Design, Signing, and User Facilities, p12, General Design Criteria) "The design of the Pacific Crest Trail should be in keeping with the nature and purpose of the trail. As a National Scenic Trail, it should exhibit high quality, permanence, and minimize disturbance to the environment. It should be designed, on a segment-by-segment basis, to accommodate, in a safe and enjoyable manner, the volume and types of traffic planned." p 24"Maintenance of the Pacific Crest National Scenic Trail should be of sufficient frequency to ensure that all features of the trail, including drainage, tread clearing, signing, and related structures will be at the standards to which they were designed and constructed." RM 41: 6.4.10. Accessibility for Persons with Disabilities. The National Park Service has legal obligations to make available equal opportunities for people with disabilities in all programs and activities. This requirement includes the opportunity to participate in wilderness experiences. Management decisions responding to requests for special consideration to provide wilderness use by persons with disabilities must be in accord

with the Architectural Barriers Act of 1968, The Rehabilitation Act of 1973 (as amended in 1978), and Section 507(c) of the Americans with Disabilities Act of 1990. Such decisions should balance the intent of access and wilderness laws and find a way of providing the highest level of protection to the wilderness resource.

Section 17.550 of the Secretary of the Interior's regulations regarding "Enforcement of Nondiscrimination on the Basis of Disability in Department of Interior Programs" (43 CFR Part 17) states that agencies are not required to take any actions nor provide access that would result in a fundamental alteration in the nature of a program or activity. However, the agency has the burden of proving that compliance would result in a fundamental alteration. This concept is also found in Section 507 of the Americans with Disabilities Act.

G. Is the action necessary in wilderness?

Yes. Trails are necessary in SEKI to preserve the natural and primitive and unconfined recreation qualities of wilderness character, and in support of the recreational, scientific, and conservation public purposes of wilderness. Trails are also necessary to comply with the Organic Act of the NPS, the enabling legislation of Sequoia and Kings Canyon national parks, and the National Scenic Trails Act. Construction and maintenance of a trail system to provide diverse recreational opportunities in wilderness is also consistent with the guidance of the SEKI General Management Plan, the 2006 NPS Management Policies, RM 41, and the Comprehensive Management Plan for the Pacific Crest Trail.

H. Options for Action and Criteria for Installations

The only means of providing trail-based recreational experiences is by providing trails. The minimum requirements question is then how many trails and what level of development and maintenance they will receive. Since the goal is to provide a diverse set of recreational opportunities, it is necessary for different trails to have different levels of development. The level of development each trail has must be the minimum necessary to provide the desired balance of solitude and opportunities for primitive and unconfined recreation while protecting the natural quality of wilderness.

Forest Service Handbook 2309.18 - TRAILS MANAGEMENT HANDBOOK describes a range of trail development classes that are appropriate to the recreational opportunities desired for SEKI wilderness. The different alternatives of the WSP describe the number and development level of trails necessary to preserve wilderness character under the different articulated balances of opportunities for solitude and opportunities for primitive and unconfined recreation.

Trails and trail-related structures are the minimum required to preserve wilderness character if they are necessary and appropriate to the trail development class and designed use described in the selected alternative of the WSP.

Constructing new trails or changing the development class of a trail from that described in the selected alternative will require separate MRA, planning, and compliance.

Minimum Requirements Analysis for Signs (including bulletin boards) per Wilderness Act
A. Options Outside of Wilderness - Can actions taken outside of wilderness adequately address the situation and meet project goals?
In order to plan and execute wilderness trips with minimal impact to wilderness character, visitors need information about trails and landscape, about regulations and restrictions, and about current conditions and short-term closures. The purpose of signs is to provide information to visitors about wilderness navigation, current conditions, and wilderness regulations. Education efforts outside wilderness are very effective means of communicating this information. However, site-specific information is sometimes necessary on site to inform visitors who did not get the information, to remind some of those who did, and to answer questions that can only be addressed on-site (e.g. the exact location of a trail junction and which trail goes where).
B. Valid Existing Rights or Special Provisions of Wilderness Legislation - Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws)?
None.
C. Requirements of Other Legislation - Is action necessary to meet the requirements of other federal laws?
Yes. The Organic Act of the National Park Service: "Sec.1. …. The service thus established shall promote and regulate the use of the Federal areas known as national parks,...to conserve the scenery and the natural and historic objects and the wild life 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."
D. Wilderness Character - Is action necessary to preserve one or more qualities of wilderness character?
Yes. Without specific information delivered on site, visitors will inadvertently violate regulations to protect the natural and other features of value qualities of wilderness (e.g., trespass onto sensitive resources or into restoration areas, have fires at inappropriate locations, trample large areas in search of trail junctions). In addition, signs can protect opportunities for solitude by defining camp area in high-use areas. Although the presence of signs detracts from the opportunities for solitude for those who do not need them for navigation, they improve opportunities for primitive recreation for less experienced visitors. Signs also provide direction and information to wilderness users that allow them to have opportunities for recreation.
E. Public Purposes - Is 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"?
Yes. Specific information delivered on site in wilderness supports the recreational, educational, and conservation purposes of wilderness by providing wilderness users information that would serve to improve their recreational opportunities, expand their education, and allow them to conform to regulations that serve to protect wilderness resources.
F. Other Guidance - Is action 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?
RM 41: 6.3.10.4 Signs. Signs detract from the wilderness character of an area and make the imprint of man and management more noticeable.

Only those signs necessary for visitor safety or to protect wilderness resources, such as those identifying routes and distances, will be permitted. Where signs are used, they should be compatible with their surroundings and the minimum size possible.
G. Is the action necessary in wilderness?
Yes. Specific information delivered on site is necessary in wilderness to preserve the natural and other features of value qualities of wilderness character, to preserve the desired variety in Opportunities for Solitude or Primitive Recreation quality, and to promote the recreational, educational, and conservation purposes of wilderness. Action is necessary to comply with the Organic Act of the NPS, and signing is allowed by RM 41.
H. Options for Action and Criteria for Installations
The two ways available to provide specific information delivered on site in wilderness are staff contacts and sign installations. Staff contacts are limited by practical reasons as well as by their impacts to opportunities for solitude. Sign installations are an effective means of communicating information, but adversely impact the undeveloped quality of wilderness character. Informational and regulatory will sometimes be the minimum action required to preserve the natural quality in areas of high visitor use where it is most threatened. Informational and navigational sign installations will also be the minimum action required to provide opportunities for primitive recreation in areas most desired by relatively inexperienced visitors. Because trails are managed to higher levels of trail development in high use areas and to provide opportunities for primitive recreation for inexperienced users, the minimum requirement for sign installations will be the kind and amount of signing that is consistent with the trail development class. If specific areas need additional regulatory signs (e.g., closures for restoration, other information) then these signs will go through a separate analysis and review prior to placement.
[redacted]

Minimum Requirements Analysis for Food Storage Regulations and Methods per Wilderness Act
A. Options Outside of Wilderness - Can actions taken outside of wilderness adequately address the situation and meet project goals?
Visitors to the wilderness typically bring food with them. As this food is of high energy density, it is appealing to wildlife, and wildlife behavior (notably bear behavior) has been observed to change as a result of the rewards of obtaining human food. Visitors have had their recreational activities disrupted because of altered wildlife behavior and loss of their food. Visitor education efforts outside wilderness have had large effects in improving this problem, but action in wilderness is also necessary since the wildlife-human interactions of concern take place in wilderness.
B. Valid Existing Rights or Special Provisions of Wilderness Legislation - Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws)?
None.
C. Requirements of Other Legislation - Is action necessary to meet the requirements of other federal laws?
Action is necessary to meet the requirements of 16 USC § 1 (the National Park Service Organic Act). Ensuring that adequate food storage options remain available in the SEKI wilderness is necessary to "conserve ... the wild life therein" because food conditioned bears (1) exhibit unnatural behavior, ecology, and distribution and (2) often must be killed because of human safety concerns. It is also necessary to "provide for the enjoyment of the same" because food conditioned bears often become aggressive and destructive, resulting in a negative experience for visitors. Action is necessary to meet the requirements of Section 2(c) of the Wilderness Act. Ensuring that adequate food storage options remain available in the SEKI wilderness is necessary to "preserve its natural conditions."
D. Wilderness Character - Is action necessary to preserve one or more qualities of wilderness character?
Without appropriate food storage technology and techniques, bears will have access to human food sources, and their natural behavior, ecology, and distribution will be altered, impacting the natural quality of wilderness character. Food-conditioned bears would likely be the targets of management actions such as tagging, relocation, or removal, impacting the untrammeled quality. In addition, food-conditioned bears become aggressive and destructive in their search for human food. This behavior negatively impacts solitude and unconfined recreation because (1) bears may eat visitors' food, impacting their ability to complete their trip; (2) persistent bears can require all-day and all-night response from visitors (and as food-conditioned bears associate all humans with food, this will also affect visitors who store their food properly). Food storage regulations negatively impact opportunities for unconfined recreation, and installations (such as food storage boxes) negatively impact the undeveloped quality of wilderness character. Food storage boxes can improve opportunities for primitive recreation by providing some inexperienced visitors the extra security they need to engage in overnight wilderness trips, and in providing extra food storage for the first days of a longer trip. Food storage boxes can negatively affect opportunities for solitude if visitors are attracted to them for camping, but can improve opportunities for solitude at campsites that are not near the boxes.

E. Public Purposes - Is 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"?
Ensuring that adequate food storage options remain available is necessary to protect the recreational purpose of wilderness because without adequate food storage, food-conditioned bears will become aggressive and destructive in their search for human food. This behavior negatively impacts solitude and unconfined recreation because visitors could be dealing with persistent bears at all hours of the day and night-even visitors who store their food properly-since once food-conditioned, bears will associate all humans with food, not just those who store it improperly.
Reliance on alternative methods of food storage is inadequate because: (1) In YOSE, McCurdy and Martin (2007) found that where portable bear resistant containers were required, food was stored by visitors in portable bear resistant containers in only 59% of the nights. This means that even when visitors had portable bear resistant containers with them, they did not necessarily use them. (2) Visitors often carry more food than can fit into portable bear resistant containers. (3) Trash that would normally be placed in lockers-despite this practice being illegal-will be left on the ground. (4) YOSE, which relies almost exclusively on portable food storage containers, consistently has much higher levels of human-bear conflict in wilderness than SEKI does. Adequate food storage: Ensuring that adequate food storage options remain available is necessary to protect the conservation purpose of wilderness because without adequate food storage, (1) food-conditioned bears will be influenced by modem civilization (i.e., human foods)their natural behavior, ecology, and distribution will be altered, and (2) they will need to be manipulated by humans (e.g., radio-collared, ear tagged, or killed) to protect visitor safety.
F. Other Guidance - Is action 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?
Ensuring that adequate food storage options remain available is necessary according to the following policy documents: 1) NPS Management Policies 2006 states in section 4.4.1 that parks will maintain native plants and animals by: • "preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur" and, • "minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them." 2) The goal of the SEKI Bear Management Plan is to: • "restore and perpetuate the natural distribution, ecology, and behavior of black bears free of human influences."
Language from the ROD: In heavily traveled zones, there exist engineered trails and bridges, food lockers, designated campsites, and toilets to protect park resources, while in less-used areas, amenities are minimal or non-existent.

G. Is the action necessary in wilderness?
Yes. Maintaining availability of food storage technology and food storage regulations is necessary to protect the natural and opportunities for primitive recreation qualities of wilderness character, and to promote the recreational, conservation, and scientific purposes of wilderness. Action is also necessary to comply with the National Park Service Organic Act, and is consistent with the guidance of the 2006 NPS Management Policies, the SEKI Bear Management Plan, and SEKI's general management plan.
H. Options for Action and Criteria for Installations
Visitor education, food storage restrictions, installation of food storage boxes, and bear removal actions are the options available to achieve the desired condition of minimum development necessary to preserve wild bear populations and opportunities for primitive recreation. In many ways, food storage restrictions are part of education, in terms of emphasizing the importance of proper storage. Education can have a very large beneficial effect on ensuring proper food storage; restrictions reinforce education but have a negative effect on the unconfined quality of wilderness character; food storage boxes are very effective locally at preventing bears from accessing human food but have negative effects on the undeveloped quality and constitute a 4(c) generally prohibited installation in wilderness. Removal of problem bears is a trammeling action and will be a last-resort option when all others have failed. Education outside of wilderness will always be used to prevent wildlife (including bears) from becoming food-conditioned. Regulations requiring the use of portable bear resistant containers will be part of the minimum action required where an area has a strong history of undesired bear-human interactions. However, a Yosemite study (McCurdy and Martin, 2007) found that regulations requiring use of portable bear resistant containers are inadequate to ensure their proper use. This can be because visitors often carry more food than can fit into portable bear resistant containers (a problem that is worst at ""first night in"" locations), or because they are not experienced enough ensure consistent proper use of portable containers. Installation of food storage boxes is therefore the minimum action required to preserve the natural quality of wilderness and opportunities for primitive recreation in areas with a strong history of undesired bear-human interactions that have not been mitigated by education and food storage restrictions, at ""first night in"" locations (when containers may not hold all scented and food items), and areas of high use/convergence of relatively inexperienced visitors (where numerous trails converge). A rare location where a box installation would be the minimum requirement necessary would be a logistically critical camping area with inadequate trees for counterbalancing food effectively.

Minimum Requirements Analysis for Human-waste Management (including privies, toilets, and pack-out requirements) per Wilderness Act
A. Options Outside of Wilderness - Can actions taken outside of wilderness adequately address the situation and meet project goals?
Visitors need to urinate and defecate while they are in wilderness, therefore human waste must be managed in wilderness.
B. Valid Existing Rights or Special Provisions of Wilderness Legislation - Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws)?
No.
C. Requirements of Other Legislation - Is action necessary to meet the requirements of other federal laws?
Yes. The Organic Act of the National Park Service: "Sec.1. …. The service thus established shall promote and regulate the use of the Federal areas known as national parks,...to conserve the scenery and the natural and historic objects and the wild life 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."
D. Wilderness Character - Is action necessary to preserve one or more qualities of wilderness character?
Yes. Improper disposition of human waste in wilderness can negatively impact the natural quality of wilderness by polluting water resources. Opportunities for solitude or primitive and unconfined recreation can be negatively impacted by the presence of human waste and toilet paper, and by increased necessity of treating drinking water.
E. Public Purposes - Is 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"?
Yes. Proper disposal of human waste in necessary to achieve the conservation purpose, and effective management of toilet paper and waste piles is necessary to achieve the scenic and recreational purposes.
F. Other Guidance - Is action 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?
"RM-41: 6.4.3 Recreation Use Management in Wilderness. Recreational uses of National Park Service wilderness are generally those traditionally associated with wilderness and identified by Congress in the legislative record for the development of the Wilderness Act and in keeping with the language provided by Sections 2(a) and 2(c) of the Act itself. These recreational uses of wilderness will be of a type and nature that ensure its use and enjoyment will leave it unimpaired for future use and enjoyment as wilderness, provide for the protection of the area as wilderness, and provide for the preservation of the wilderness character. Recreational uses in National Park Service wilderness areas will be of a nature that enables the areas to retain their primeval character and influence; protect and preserve natural conditions; leave the imprint of man's work substantially unnoticeable; provide outstanding opportunities for solitude or primitive and unconfined types of recreation; and preserve wilderness in an unimpaired condition.

RM-41:6.3.10.3 Although the development of facilities to serve visitors will generally be avoided, campsites may be designated when essential for resource protection and preservation or to meet other specific wilderness management objectives. In keeping with the terms of the park's wilderness management plan, campsite facilities may include a site marker, fire rings, tent sites, food-storage devices, and toilets if these are determined by the superintendent to be the minimum facilities necessary for the health and safety of wilderness users, or for the preservation of wilderness resources and values. Toilets will be placed only in locations where their presence and use will resolve health and sanitation problems or prevent serious resource impacts, especially where reducing or dispersing visitor use is impractical or has failed to alleviate the problems. Picnic tables will not be allowed in wilderness

Recreational uses in National Park Service wilderness areas will be of a nature that enables the areas to retain their primeval character and influence; protect and preserve natural conditions; leave the imprint of man's work substantially unnoticeable; provide outstanding opportunities for solitude or primitive and unconfined types of recreation; and preserve wilderness in an unimpaired condition.

Language from the ROD: In heavily traveled zones, there exist engineered trails and bridges, food lockers, designated campsites, and toilets to protect park resources, while in less-used areas, amenities are minimal or non-existent.

G. Is the action necessary in wilderness?

Yes. A system for human waste management in wilderness is necessary to preserve the opportunities for primitive recreation and natural qualities of wilderness character, and to support the public purposes of conservation, scenic value, and recreation. Action is necessary to comply with the Organic Act of the NPS and is consistent with the guidance of RM-41 and with the Record of Decision for the SEKI General Management Plan.

H. Options for Action and Criteria for Installations

Options for action to preserve wilderness character include visitor education about Leave No Trace practices, restrictions on methods of waste disposal (e.g., minimum distances from surface waters), requirements to pack out waste, and provision of privies or restrooms.

Visitor education will always be a method used, with restrictions on methods of waste disposal used to reinforce the educational messages. These two actions have minimal adverse effects on wilderness character, but can be inadequate to preserve opportunities for solitude and the natural quality where use is so concentrated that LNT techniques are inadequate for the volume of waste generated, where soil types do not allow for sufficient burial of waste, or where camp areas are close to water sources or other sensitive resources. At these locations pack-out requirements may be imposed, with the preservation of the natural quality and opportunities for solitude more than offsetting the impacts to the unconfined quality of recreation.

In some places with high visitor concentrations and/or soils unsuitable to burying waste, travel and use patterns make packing out waste impractical. In these locations the installation of a privy or toilet may be the minimum action required to preserve the natural and opportunities for solitude qualities of wilderness character. These locations may be evaluated in the WSP or through testing of pack-out requirements during implementation of the WSP as to whether installation of a toilet or privy is the minimum action required to preserve wilderness character.

Minimum Requirements Analysis for Managing Camping and Campsite Impacts (designated campsites) per Wilderness Act
A. Options Outside of Wilderness - Can actions taken outside of wilderness adequately address the situation and meet project goals?
Some routes and areas in SEKI wilderness are more popular with visitors than others. In these areas, concentrated camping can lead to proliferation of campsites. Since the camping occurs in wilderness, actions to influence camping patterns must take effect in wilderness.
B. Valid Existing Rights or Special Provisions of Wilderness Legislation - Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws)?
No.
C. Requirements of Other Legislation - Is action necessary to meet the requirements of other federal laws?
Yes. The Organic Act of the National Park Service: "Sec.1. …. The service thus established shall promote and regulate the use of the Federal areas known as national parks,...to conserve the scenery and the natural and historic objects and the wild life 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."
D. Wilderness Character - Is action necessary to preserve one or more qualities of wilderness character?
Yes. Concentrated camping at popular areas leads to proliferation of campsites, with impacts to opportunities for solitude and the natural qualities of wilderness character.
E. Public Purposes - Is 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"?
Yes. Preventing concentrated camping impacts is necessary to achieve the conservation and scenic purposes of wilderness. Provision of appropriate camping opportunities is necessary to achieve the recreational purpose of wilderness.
F. Other Guidance - Is action 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?
RM 41: 6.3.10.3 Campsites and Shelters. The construction of new shelters for public use will generally not be allowed, in keeping with the values and character of wilderness. An existing shelter may be maintained or reconstructed only if the facility is necessary to achieve specific wilderness management objectives as identified in the park's wilderness and cultural resources management plans. The construction, use, and occupancy of cabins and other structures in wilderness areas in Alaska are governed by applicable provisions of ANILCA and by National Park Service regulations in 36 CFR 13, and may be permitted only under conditions prescribed in the park's wilderness management plan. Although the development of facilities to serve visitors will generally be avoided, campsites may be designated when essential for resource protection and preservation or to meet other specific wilderness management objectives. In keeping with the terms of the park's wilderness management plan, campsite facilities may include a site marker, fire rings, tent sites, food-storage devices, and toilets if these are determined by

the superintendent to be the minimum facilities necessary for the health and safety of wilderness users, or for the preservation of wilderness resources and values. Toilets will be placed only in locations where their presence and use will resolve health and sanitation problems or prevent serious resource impacts, especially where reducing or dispersing visitor use is impractical or has failed to alleviate the problems. Picnic tables will not be allowed in wilderness.

Language from the ROD: In heavily traveled zones, there exist engineered trails and bridges, food lockers, designated campsites, and toilets to protect park resources, while in less-used areas, amenities are minimal or non-existent.

G. Is the action necessary in wilderness?

Yes. Action is necessary to preserve the opportunities for solitude and natural qualities of wilderness character, and to achieve the conservation, scenic, and recreational purposes of wilderness. Action is necessary to comply with the Organic Act of the NPS, and is consistent with the guidance of RM-41 and the GMP ROD.

H. Options for Action and Criteria for Installations

Options for action include visitor education on LNT practices, reducing trailhead quotas, imposing destination quotas, and requiring the use of designated campsites. Education will always be used. Reducing trailhead quotas reduces opportunities for primitive recreation while having a questionable effect on camping at the popular areas (since visitors can access popular sites from different trailheads). Imposing destination quotas can reduce number of people at a time in a popular area with less impact on opportunities for primitive recreation than reducing trailhead quotas. However, destination quotas have additional impacts the unconfined nature of primitive recreation and can fail to control proliferation of campsites as any given party may camp on virgin ground in pursuit of greater solitude.

Of the available options to prevent proliferation of campsite impacts in a popular areas, designated campsites has the least impact on opportunities for primitive recreation and similar impact on the unconfined nature of recreation as destination quotas. Designated campsites can preserve opportunities for solitude in popular areas by separating groups from one another. However, designated campsites impact the undeveloped quality of wilderness character, and managing designated campsites may affect the untrammeled quality if site hazards (e.g., hazard trees) require mitigation.

Installing designated campsites is the minimum action necessary to preserve the opportunities for solitude or primitive and unconfined recreation and natural qualities of wilderness character where use is concentrated, limited campsites exist in a given area, there is a risk of rapidly increasing campsite impacts from levels of use, and opportunities for solitude may be compromised, but where site hazards require only minimal mitigation."

Minimum Requirements Analysis for Managing Administrative and Recreational Stock Facilities (drift fences, gates, and hitch rails) per Wilderness Act
A. Options Outside of Wilderness - Can actions taken outside of wilderness adequately address the situation and meet project goals?
No. Recreational and administrative stock use is an allowed activity in SEKI wilderness, and grazing of stock may by allowed. Any structures or methods to manage the effects of wilderness stock use will have occur or be located in wilderness.
B. Valid Existing Rights or Special Provisions of Wilderness Legislation - Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws)?
No.
C. Requirements of Other Legislation - Is action necessary to meet the requirements of other federal laws?
Yes. The Organic Act of the National Park Service: "Sec.1. …. The service thus established shall promote and regulate the use of the Federal areas known as national parks,...to conserve the scenery and the natural and historic objects and the wild life 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." Installations may be needed to protect natural resources and provide for enjoyment of the park.
D. Wilderness Character - Is action necessary to preserve one or more qualities of wilderness character?
Yes. If stock is allowed to graze, some provision must be made to prevent grazing in inappropriate areas to preserve the natural quality and opportunities for solitude. In order to provide a range of opportunities for recreational stock use, some structures may be needed.
E. Public Purposes - Is 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"?
Yes. Facilitating stock use is necessary to promote the recreational purpose, and controlling stock use is necessary to promote the conservation purpose.
F. Other Guidance - Is action 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?
RM 41: 6.3.10.1 Administrative Facilities. Administrative facilities (e.g., ranger stations and/or patrol cabins, fire lookouts, radio and/or cellular telephone antennas, radio repeater sites, associated storage or support structures, drift fences, and facilities supporting trail stock operations) may be allowed in wilderness only if they are determined to be the minimum requirement necessary to carry out wilderness management objectives and are specifically addressed within the park's wilderness management plan or other supporting environmental compliance documents.
RM 41: 6.4.6. Noncommercial grazing of trail stock used as part of an approved livestock management program within wilderness may be authorized in accordance with National Park Service regulations and conditions outlined in the wilderness management plan or stock use management plan. All approved livestock use must ensure preservation of wilderness resources and character. Superintendents will be responsible

for monitoring livestock use in wilderness to the same degree as human use, and may use the same management tools and techniques, including the application of the minimum requirement concept to manage livestock use that are available for managing other wilderness uses.
RM 41: 6.4.4. The only structures or facilities used by commercial services that will be allowed in wilderness will be temporary shelters, such as tents, or other specifically approved facilities that may be required (within the wilderness management plan) for resource protection and the preservation of wilderness values. Temporary facilities will generally be removed from the wilderness after each trip unless such removal will cause additional degradation of the wilderness resources.
G. Is the action necessary in wilderness?
Yes. Action is necessary to preserve the natural and opportunities for solitude or primitive and unconfined recreation qualities of wilderness character, and to promote the recreational and conservation purposes of wilderness. Action is also necessary to support the NPS Organic Act, and is consistent with the guidance of RM 41.
H. Options for Action and Criteria for Installations
The options for managing impacts associated with stock use include education, use restrictions, and installation of drift fences and hitch rails. Drift fences can preserve the natural quality of wilderness by preventing grazing stock from drifting into areas with sensitive resources. Drift fences can preserve opportunities for solitude by preventing stock from leaving the forage area where they were released and disturbing visitors on trails or in campsites in their travel line. Drift fences can assist in providing opportunities for primitive recreation for relatively inexperienced stock users who cannot effectively use other means of holding stock, and for experienced stock users on challenging trips, and drift fences may be necessary to support administrative action near logistically critical administrative camps. Hitch rails can preserve the natural quality in areas where high-lining would impact sensitive resources, and can assist in providing opportunities for primitive recreation for relatively inexperienced stock users who cannot effectively use other means of holding stock. Both drift fences and hitch rails negatively impact the undeveloped quality, and drift fences impact opportunities for solitude for all visitors who must open and close them to travel.
Installation of a drift fence is the minimum required action where there is significant risk of stock released in an allowed forage area leaving that forage area and impacting sensitive resources or disturbing travelers or campers on their likely travel routes. Installation of drift fences is also the minimum action required to preserve opportunities for primitive recreation in areas chosen to support inexperienced stock users' access to wilderness, and in select locations is the minimum required action to support administration of wilderness. Other options brought forward during the public review of this WSP included using collars or GPS devices to track stock. While these options can be used to track stock, they are not effective in preventing stock travel into places that they are not allowed to go, and would not help protect park resources and visitor experiences. Therefore this option was considered but dismissed.
[redacted]

Minimum Requirements Analysis for Historic Buildings per Wilderness Act
A. Options Outside of Wilderness - Can actions taken outside of wilderness adequately address the situation and meet project goals?
Several historic buildings are located within wilderness, so it is necessary to determine if they are appropriate in wilderness and whether to remove them, maintain them, or allow them to molder. Some of the historic buildings are currently used for wilderness administration (e.g., ranger stations and patrol cabins).
B. Valid Existing Rights or Special Provisions of Wilderness Legislation - Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws)?
No.
C. Requirements of Other Legislation - Is action necessary to meet the requirements of other federal laws?
Yes. The Organic Act of the National Park Service: "Sec.1. …. The service thus established shall promote and regulate the use of the Federal areas known as national parks,...to conserve the scenery and the natural and historic objects and the wild life 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. Historic properties eligible for the National Register of Historic Places that have been included within wilderness will be protected and maintained according to the pertinent laws and policies governing cultural resources, using management methods that are consistent with preservation of wilderness character and values. These laws include the Antiquities Act of 1906 and the Historic Sites Act of 1935, as well as the subsequent historic preservation legislation, including the National Historic Preservation Act, the Archeological Resources Protection Act, the Native American Grave Protection and Repatriation Act, and the American Indian Religious Freedom Act.
D. Wilderness Character - Is action necessary to preserve one or more qualities of wilderness character?
Yes. Historic buildings may contribute to the other features of value quality of wilderness character, and may detract from the undeveloped quality. Maintaining buildings may require the removal of hazard trees, a trammeling action. The Pear Lake Ski Hut supports opportunities for primitive recreation in winter.
E. Public Purposes - Is 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"?
Yes. Historic buildings may support the public purposes of scenic, scientific, educational, and historical use.
F. Other Guidance - Is action 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?
Yes. Management Policies 2006, 6.3.10 Management Facilities Part of the definition of wilderness as provided by the Wilderness Act is "undeveloped federal land retaining its primeval character and influence,

without permanent improvements." Accordingly, authorizations of NPS administrative facilities in wilderness will be limited to the types and minimum number essential to meet the minimum requirements for the administration of the wilderness area. A decision to construct, maintain, or remove an administrative facility will be based primarily on whether or not the facility is required to preserve wilderness character or values, not on considerations of administrative convenience, economic effect, or convenience to the public or park staff.
Management Policies 6.3.8 Cultural Resources - The Wilderness Act specifies that the designation of any area of the park system as wilderness "shall in no manner lower the standards evolved for the use and preservation of" such unit of the park system under the various laws applicable to that unit (16 USC Section 1133(a)(3)). Thus, the laws pertaining to historic preservation also remain applicable within wilderness but must generally be administered to preserve the area's wilderness character. The responsible decision maker will include appropriate consideration of the application of these provisions of the Wilderness Act in analyses and decision-making concerning cultural resources. Cultural resources that have been included within wilderness will be protected and maintained according to the pertinent laws and policies governing cultural resources using management methods that are consistent with the preservation of wilderness character and values. These laws include the Antiquities Act and the Historic Sites, Buildings and Antiquities Act, as well as subsequent historic preservation legislation, including the National Historic Preservation Act, the Archaeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act. The Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation projects provide direction for protection and maintenance. Cemeteries or commemorative features, such as plaques or memorials, that have been included in wilderness may be retained (including approved access to these sites), but no new cemeteries or additions to existing cemeteries may be made unless specifically authorized by federal statute, existing reservations, or retained rights.
RM 41: 6.3.10.1 Administrative Facilities. Administrative facilities (e.g., ranger stations and/or patrol cabins, fire lookouts, radio and/or cellular telephone antennas, radio repeater sites, associated storage or support structures, drift fences, and facilities supporting trail stock operations) may be allowed in wilderness only if they are determined to be the minimum requirement necessary to carry out wilderness management objectives and are specifically addressed within the park's wilderness management plan or other supporting environmental compliance documents. New roads will not be built in wilderness. Temporary vehicular access may be permitted only to meet the minimum requirements of emergency situations, and will be restored, per an approved restoration plan, as rapidly as possible. Where abandoned roads have been included within wilderness, they may be used as trails, restored to natural conditions, or managed as a cultural resource.
From the GMP: "Within the wilderness, efforts will be made to preserve a sense of remoteness and freedom from human-caused impacts. However, simple amenities such as ranger stations may be present to support administrative activities, reduce or control resource impacts, or provide for research and monitoring. Facilities used to support the administration and protection of wilderness may be provided."
From the GMP: "Preserve or rehabilitate historic ranger cabins, Smithsonian Institution shelter (Mount Whitney shelter), Pear Lake ski hut, and other structures. Preserve and / or stabilize the Shorty Lovelace Historic District cabins or allow them to molder. Evaluate some trails to determine their eligibility for the National Register of Historic Places, plus provide historic trails information."
G. Is the action necessary in wilderness?
Yes. Action is necessary to preserve the other features of value and undeveloped qualities of wilderness character, and in support of the scenic, scientific, educational, and historic public purposes of wilderness. Action is also necessary to comply with the Organic Act of the NPS, the

Antiquities Act of 1906,the Historic Sites Act of 1935, and the National Historic Preservation Act. Action must be consisent with the guidance of the SEKI General Management Plan, the 2006 NPS Management Policies, and RM 41.
H. Options for Action and Criteria for Installations
Any given historic building may be maintained, removed, or allowed to molder. Any building that is necessary for the administration of wilderness under the selected alternative must be maintained. All historic buildings detract from the undeveloped quality of wilderness character, but some may also contribute to the other features of value quality. Removal of an historic building is an adverse action under NHPA. Historic buildings necessary to support administration of wilderness under a given alternative pass the minimum requirement test for installations, and will be maintained. Historic buildings that are not necessary for the administration of wilderness are evaluated under each alternative based on the building's contribution to the other features of value quality and on the weight the alternative gives to the undeveloped quality relative to the other qualities of wilderness character. If their contributions to the other features of value outweigh their impacts to the undeveloped quality, they pass the minimum requirement test. If they do not pass this second test, then the WSP prescribes analysis under NHPA to determine if their contributions under NHPA outweigh their impacts to the undeveloped quality of wilderness character. This final determination will then prescribe maintenance, removal, or moldering for the building in question.
[redacted]

Minimum Requirements Analysis for Non-Historic Recreational and Administrative Structures per Wilderness Act
A. Options Outside of Wilderness - Can actions taken outside of wilderness adequately address the situation and meet project goals?
Several buildings are currently located within wilderness, so it is necessary to determine if they are appropriate in wilderness and whether to remove them or maintain them. Some of the buildings are currently used for wilderness administration as ranger stations; other buildings are not currently used for administration of wilderness, but have been used in the past.
B. Valid Existing Rights or Special Provisions of Wilderness Legislation - Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws)?
No.
C. Requirements of Other Legislation - Is action necessary to meet the requirements of other federal laws?
Yes. The Organic Act of the National Park Service: "Sec.1. …. The service thus established shall promote and regulate the use of the Federal areas known as national parks,...to conserve the scenery and the natural and historic objects and the wild life 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." Removing unneeded buildings is necessary to conserve scenery, and facilitating wilderness patrol is necessary to protect the natural and cultural resources in wilderness.
D. Wilderness Character - Is action necessary to preserve one or more qualities of wilderness character?
Yes. Buildings in wilderness impact the undeveloped quality of wilderness character, so any removal of buildings would improve that quality. Administrative presence and patrol in wilderness is necessary to preserve all qualities of wilderness character by facilitating natural and cultural resource protection, wilderness character and natural resources monitoring and restoration activities, enforcement of regulations and restrictions to protect wilderness character, prevent unauthorized trammeling actions.
E. Public Purposes - Is 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"?
Yes. Removal of unnecessary buildings supports the scenic and conservation purposes, and facilitating administrative patrol supports the recreational, scientific, educational, and conservation purposes.
F. Other Guidance - Is action 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?
Management Policies 2006, 6.3.10 Management Facilities Part of the definition of wilderness as provided by the Wilderness Act is "undeveloped federal land retaining its primeval character and influence, without permanent improvements." Accordingly, authorizations of NPS administrative facilities in wilderness will be limited to the types and minimum number essential to meet the minimum requirements for the administration of the wilderness area. A decision to construct, maintain, or

remove an administrative facility will be based primarily on whether or not the facility is required to preserve wilderness character or values, not on considerations of administrative convenience, economic effect, or convenience to the public or park staff.
RM 41: 6.3.10.1 Administrative Facilities. Administrative facilities (e.g., ranger stations and/or patrol cabins, fire lookouts, radio and/or cellular telephone antennas, radio repeater sites, associated storage or support structures, drift fences, and facilities supporting trail stock operations) may be allowed in wilderness only if they are determined to be the minimum requirement necessary to carry out wilderness management objectives and are specifically addressed within the park's wilderness management plan or other supporting environmental compliance documents. New roads will not be built in wilderness. Temporary vehicular access may be permitted only to meet the minimum requirements of emergency situations, and will be restored, per an approved restoration plan, as rapidly as possible. Where abandoned roads have been included within wilderness, they may be used as trails, restored to natural conditions, or managed as a cultural resource.
From the GMP: "Within the wilderness, efforts will be made to preserve a sense of remoteness and freedom from human-caused impacts. However, simple amenities such as ranger stations may be present to support administrative activities, reduce or control resource impacts, or provide for research and monitoring. Facilities used to support the administration and protection of wilderness may be provided."
G. Is the action necessary in wilderness?
Yes. Action is necessary to preserve all five qualities of wilderness character, and in support of the recreational, educational, scenic, and scientific purposes of wilderness. Action is required by the Organic Act of the NPS and is consistent with the guidance of the SEKI GMP, the 2006 NPS Management Policies, and RM 41..
H. Options for Action and Criteria for Installations
The methods available for administrative patrol of wilderness are aerial patrol, day patrol by staff stationed in the frontcountry, multi-day trips by staff stationed in the frontcountry, and patrol by staff (hereafter "rangers") stationed in wilderness. Rangers stationed in wilderness may be based out of temporary camps or permanent buildings. Aerial patrol is limited in what it can accomplish, and negatively impacts the undeveloped and opportunities for solitude qualities of wilderness character. Day patrol is very effective in areas close to the frontcountry but is impractical for locations further than 8 or 10 miles from trailheads. Stationing rangers in temporary camps for long periods reduces their effectiveness in patrolling the wilderness due to the large amount of time and effort required to operate temporary camps, and leaves equipment and supplies vulnerable to depredation by wildlife or visitors while the ranger is patrolling. Temporary camps also impact the undeveloped quality of wilderness character, though less than permanent buildings. Due to the added threats to wideness character in relatively high visitor use areas, administrative patrol must be more frequent in those locations. Maintaining buildings for facilitating administrative patrol of wilderness is the minimum required action to preserve wilderness character in heavily used areas of the wilderness more than a half day's travel from a trailhead. In less-visited areas more than a half-day's travel from trailheads, the minimum required action to preserve wilderness character will be installation of temporary camps. In areas closer than a half-day's travel from trailheads, day patrol is the minimum required action. At locations where buildings are not the minimum required action, and where removal will not unduly impact wilderness, non-historic buildings should be removed to improve the undeveloped quality.

SEQUOIA AND KINGS CANYON NATIONAL PARKS WILDERNESS STEWARDSHIP PLAN MINIMUM REQUIREMENTS ANALYSIS FRAMEWORK

Part 2 - How Does Each Alternative Meet the Goals, Objectives, and Desired Conditions of the WSP

Alternatives Comparison Criteria

PLANNING FRAMEWORK

The WSP provides direction for the management of visitors and administrative activities within the parks' wilderness. The framework of this WSP is founded on defining the goals and objectives for wilderness management, defining wilderness character for the parks, describing desired conditions for wilderness, developing visitor use capacity, and determining the types and levels of commercial services that support wilderness purposes.

Goals and Objectives

Goals and objectives are key elements of a wilderness stewardship plan, as they establish and provide the direction for the parks' wilderness management program and reflect the purpose and need for planning. Wilderness goals and objectives flow from law, policies, park and wilderness enabling legislation, GMP objectives, public input, and more. The following identify what the WSP needs to address to achieve long-term successful management and protection of wilderness:

- Preserve ecological, geological, scientific, educational, scenic, and historical values of wilderness, including culturally significant resources and paleontological resources within wilderness, as important and prominent values, consistent with the Wilderness Act, California Wilderness Act, and applicable planning guidance from the GMP.
- Manage archeological, historical, and ethnographic sites in a manner that is compatible with wilderness and historic-preservation laws.
- Preserve dark night skies.
- Preserve natural soundscapes.
- Work to reduce conflicts between user groups as well as between users and sensitive resources.
- Determine the types and levels of commercial services that will be allowed in wilderness and manage these services subject to applicable laws and policies.
- Foster an inspired and informed public and park staff who value preservation of the parks' wilderness.
- Promote the Leave No Trace© minimum-impact practices.
- Promote safety within the context of wilderness where users are expected to be self-reliant.

Desired Conditions

Desired conditions are the natural and cultural resource conditions that the NPS aspires to achieve and maintain over time, and the conditions necessary for visitors to understand, enjoy, and appreciate those resources (from the planner's sourcebook). In the context of a wilderness stewardship plan, desired conditions qualitatively describe an ideal condition of wilderness character. The Wilderness Act requires that as a minimum, wilderness character be preserved from the time of designation, although Management Polices also allows for improvements to wilderness character. In this WSP, desired conditions are defined for the four primary qualities of wilderness character. More specific desired conditions are also provided under the qualities that relate specifically to visitor use management.

- The untrammeled quality of wilderness character would be preserved by limiting deliberate manipulation of ecological systems except as necessary to promote another quality of wilderness character.
- The natural quality of wilderness would be preserved by mitigating the impacts of modern civilization on ecosystem structure, function, and processes. The NPS aspires to minimize or localize adverse impacts caused by visitor use and administrative activities. In the wilderness, natural processes 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
    - soundscapes, dark skies and viewsheds
- The undeveloped quality of wilderness character would be preserved through the removal of installations that are unnecessary for the protection of other wilderness character qualities.
- Outstanding opportunities for solitude or primitive and unconfined recreation would be provided to support visitor use and enjoyment of the parks' wilderness areas in balance with the protection of other wilderness character qualities.
    - Visitors with diverse backgrounds and capabilities would have opportunities to use and enjoy wilderness.

These overarching element-specific objectives are:

Visitor-use Levels – Visitor use and enjoyment of wilderness would be balanced with the preservation of wilderness character.

Trails – The trail system would facilitate access for visitor use and enjoyment of the wilderness. Trails would be well suited to the types and levels of visitor use.

Campfires – Visitors would have the opportunity to enjoy campfires where campfires are compatible with the protection of vegetation and downed wood resources.

Food Storage – Native wildlife would subsist only on naturally obtained food, uninfluenced by the presence of human food.

Human-waste Management – Human waste would not contaminate water or create unsanitary or unsightly conditions. Management of waste would not unduly impact the undeveloped quality.

Party Size – Party size would be set at levels high enough to allow for a variety of experiences, but low enough to protect wilderness character from impacts associated with large groups.

Camping/Campsites – Visitors would have the opportunity to choose camping locations, except in areas where camping would result in unacceptable impacts.

Stock Use – Visitors would have opportunities to travel with stock, from day rides to multi-day trips, in a manner that is compatible with the protection of wilderness character.

Administrative Structures and Development – Installations and developments would be the minimum necessary for the administration of wilderness.

Frontcountry Facilities to Support Wilderness – Frontcountry facilities that support activities in wilderness would encourage and/or facilitate visitor use and enjoyment of wilderness.

Commercial Services – Commercial services may be performed to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the areas. Commercial services would support visitor use and enjoyment of wilderness in a variety of appropriate ways.

Alternative 2	Alternative 3	Alternative 4	Alternative 5
This alternative recognizes that SEKI wilderness can be broadly understood as three different types of locations: day use areas close to frontcountry, highest-use overnight areas like the HST, RLL, and PCT, and low-use overnight areas like the Middle Fork of the Kings and the Hockett Plateau. It further recognizes that current and projected visitor use levels pose few threats to wilderness character in the low-use areas under current management, but that there are some threats in highest use areas (or areas with very sensitive resources) that can be mitigated through targeted improvements to current management.	This alternative seeks to increase opportunities for primitive recreation by allowing additional use, which is mostly expected to occur at high-demand areas. Allowing increased use could result in decreased opportunities for solitude wilderness-wide. In order to preserve the natural quality of wilderness, SEKI's high use areas would require additional development and restrictions on visitor behavior.	This alternative seeks to emphasize the undeveloped and non-commercial qualities of SEKI wilderness. Removal of development and reduction of commercial services would increase the self-reliant nature of wilderness recreation. In order to preserve the natural quality of wilderness with less resource-protecting development, the amount of use would need to be reduced.	This alternative seeks to enhance the quality of solitude available in SEKI wilderness. Total numbers of visitors allowed and party sizes would be reduced, which would mean that reduced levels of development and reduced restrictions on visitor behavior would serve to protect natural resources.

Alternative 2		Alternative 3		Alternative 4		Alternative 5	
Element	To what degree does this alternative meet goals, objectives, and desired conditions?	Element	To what degree does this alternative meet goals, objectives, and desired conditions?	Element	To what degree does this alternative meet goals, objectives, and desired conditions?	Element	To what degree does this alternative meet goals, objectives, and desired conditions?
Permits and Quotas		**Permits and Quotas**		**Permits and Quotas**		**Permits and Quotas**	
Trails and Signs		**Trails and Signs**		**Trails and Signs**		**Trails and Signs**	
Campfires		**Campfires**		**Campfires**		**Campfires**	
Food Storage		**Food Storage**		**Food Storage**		**Food Storage**	
Human Waste Mgmt.		**Human Waste Mgmt.**		**Human Waste Mgmt.**		**Human Waste Mgmt.**	
Party Size		**Party Size**		**Party Size**		**Party Size**	
Camping		**Camping**		**Camping**		**Camping**	
Stock use access and travel		**Stock use access and travel**		**Stock use access and travel**		**Stock use access and travel**	
Stock Grazing		**Stock Grazing**		**Stock Grazing**		**Stock Grazing**	
Administrative Structures and development		**Administrative Structures and development**		**Administrative Structures and development**		**Administrative Structures and development**	
Frontcountry Facilities		**Frontcountry Facilities**		**Frontcountry Facilities**		**Frontcountry Facilities**	
Commercial Services		**Commercial Services**		**Commercial Services**		**Commercial Services**	

KEY	
Mostly Meets Goals, Objectives, Desired Conditions	
Partially Meets Goals, Objectives, Desired Conditions	
Does Not Meet Goals, Objectives, Desired Conditions	

SEQUOIA AND KINGS CANYON NATIONAL PARKS WILDERNESS STEWARDSHIP PLAN MINIMUM REQUIREMENTS ANALYSIS FRAMEWORK

Part 3 - How Does Each Alternative Affect Wilderness Character?

This table includes a summary of the analysis. A complete analysis is found in the WSP Chapter 4, Environmental Consequences - Wilderness Character.

Alternative 2	Alternative 3	Alternative 4	Alternative 5
This alternative recognizes that SEKI wilderness can be broadly understood as three different types of locations: day use areas close to frontcountry, highest-use overnight areas like the HST, RLL, and PCT, and low-use overnight areas like the Middle Fork of the Kings and the Hockett Plateau. It further recognizes that current and projected visitor use levels pose few threats to wilderness character in the low-use areas under current management, but that there are some threats in highest use areas (or areas with very sensitive resources) that can be mitigated through targeted improvements to current management.	This alternative seeks to increase opportunities for primitive recreation by allowing additional use, which is mostly expected to occur at high-demand areas. Allowing increased use could result in decreased opportunities for solitude wilderness-wide. In order to preserve the natural quality of wilderness, SEKI's high use areas would require additional development and restrictions on visitor behavior.	This alternative seeks to emphasize the undeveloped and non-commercial qualities of SEKI wilderness. Removal of development and reduction of commercial services would increase the self-reliant nature of wilderness recreation. In order to preserve the natural quality of wilderness with less resource-protecting development, the amount of use would need to be reduced.	This alternative seeks to enhance the quality of solitude available in SEKI wilderness. Total numbers of visitors allowed and party sizes would be reduced, which would mean that reduced levels of development and reduced restrictions on visitor behavior would serve to protect natural resources.

Alternative 2	Alternative 3	Alternative 4	Alternative 5
Natural	**Natural**	**Natural**	**Natural**
Designated campsites could protect the natural quality of wilderness by restricting where people camp. Grazing would be managed so as to maximize protection of natural and cultural resources while allowing visitors traveling with stock continued access to forage for their animals.	Designated campsites could protect the natural quality of wilderness by restricting where people camp. Grazing would be managed so as to maximize protection of natural and cultural resources while allowing visitors traveling with stock continued access to forage for their animals.	No grazing. Improvement to the natural from the removal of developments and the restoration of those areas to natural conditions.	Current methods of grazing management (such as opening dates, head limits and night limits, grazing capacities, and temporary closures) would continue to be implemented.
Protects the natural quality	Protects the natural quality	Protects the natural quality	Protects the natural quality
Untrammeled	**Untrammeled**	**Untrammeled**	**Untrammeled**
Trammeling associated with the restoration of trails, campfires, and the removal of development.	Trammeling associated with the restoration of trails, campfires, and the removal of development.	Trammeling associated with the restoration of trails, campfires, and the removal of development.	Trammeling associated with the restoration of trails, campfires, and the removal of development.
Short-term adverse effect on untrammeled.	Short-term adverse effect on untrammeled.	Short-term adverse effect on untrammeled.	Short-term adverse effect on untrammeled.

Alternative 2	Alternative 3	Alternative 4	Alternative 5
Undeveloped	**Undeveloped**	**Undeveloped**	**Undeveloped**
Development associated with campfires would be restricted (depending on location) above certain elevations. Some privies and restrooms would be removed. The park would retain 48 of the existing 86 food-storage boxes (FSB), and would remove 25. An additional 13 food-storage boxes would be considered for removal. Under this alternative, 29 hitch rails would be retained, and 23 hitch rails would be removed. Also, 42 fences/gates would be retained; 12 would be removed Most ranger stations would be retained; the Monarch tent platform would be removed and the Bearpaw Ranger Station would be relocated and reconstructed. The facilities at the Redwood Canyon cabin would be reduced in size and unnecessary installations would be removed. Existing pastures/fences would remain. Existing crew camps would be retained, but reduced in size and with fewer installations.	Development associated with campfires would be removed above 9,000 ft but would continue to exist below that elevation. FSB would be retained; more could be added. Privies and restrooms would be retained; more may be installed. Designated campsites would be retained and more would be developed. 14 hitch rails would be removed, and 38 would be retained. Under this alternative, 14 hitch rails would be removed and 38 hitch rails would be retained. Five fences/gates would be removed, 49 would be retained, and one new fence with a gate would be constructed All existing ranger stations and patrol cabins would be retained. Some would be improved/ relocated/ converted to hard sided stations. The Redwood Canyon research cabin would be retained. Existing pasture/fences would be retained. The number of crew camps would be increased to support additional trail development.	All evidence of campfires would be removed. All FSB would be removed. All privies and restrooms would be removed. All designated campsites would be removed. All grazing facilities would be removed. Seven ranger stations and two patrol cabins removed. Redwood Canyon Cabin would be removed. Administrative pasture fences would be removed. Permanent crew camps would be removed.	All privies and restrooms removed. Under this alternative, 24 hitch rails would be retained and 28 hitch rails would be removed. A total of 36 fences or gates would be retained, 18 fences and gates would be removed, and one gate would be added Five ranger stations would be removed. Redwood Canyon cabin would be removed. Permanent crew camps would be removed.
Improves undeveloped quality.	Increases development more than any other alternative.	Improves undeveloped quality more than any other alternative.	Improves undeveloped quality.

Alternative 2	Alternative 3	Alternative 4	Alternative 5
Solitude or Primitive and Unconfined Recreation	**Solitude or Primitive and Unconfined Recreation**	**Solitude or Primitive and Unconfined Recreation**	**Solitude or Primitive and Unconfined Recreation**
Quotas would remain similar to current conditions. On-trail party size would remain similar to alternative 1 (no-action), with some reduction in the largest allowable stock party sizes to reduce trail and social impacts. Off-trail party sizes would be reduced for stock and foot parties Camping would be allowed in a few close in areas. Designated campsites would be retains and more may be developed. Stock would be allowed on most trails, and in four off trail areas.	Quotas would be increased. Campfires would be allowed up to 9,000 feet. Party size limits would be increased more than other alternatives. Night limits would be more restrictive than current conditions. Designated campsites would be retained and more may be developed. Stock would be allowed on most trails, and in four off trail areas.	Quotas would be reduced slightly. There would be fewer permits for commercial service providers. No campfires would be allowed wilderness-wide. Party size would be reduced from current conditions. Night limits would be established. Stock would be allowed on most trails. Off trail travel by private stock parties would be allowed in four areas of the wilderness (but prohibited for commercial and admin). Grazing would be prohibited.	Quotas would be reduced and day use permits would be instituted in some locations. Party size most restrictive when compared to other alts. More restrictive night limits than the other alternatives. Designated campsites would be removed. Stock use would be allowed on trail (but not off trail).
Improves solitude in highest use areas; maintains opportunities for primitive and unconfined recreation similar to existing levels.	Decreases solitude; decreases unconfined character of wilderness with increased restrictions. Increases opportunities for primitive recreation.	Increases solitude; decreases opportunities for primitive and unconfined recreation.	Increases solitude; decreases opportunities for primitive and unconfined recreation.
Other features of Value	**Other features of Value**	**Other features of Value**	**Other features of Value**
Retains the historic structures in wilderness. Removes one historic structure (Bearpaw Meadow Ranger Station).	Retains the historic structures in wilderness. Removes one historic structure (Bearpaw Meadow Ranger Station).	Removes four historic structures and one historic district from wilderness.	Retains the historic structures in wilderness. Removes one historic structure (Bearpaw Meadow Ranger Station).
Beneficial and adverse effect on historic features.	Beneficial and adverse effect on historic features.	This alternative results in the removal of the most historic structures.	Beneficial and adverse effect on historic features.

SEQUOIA AND KINGS CANYON NATIONAL PARKS WILDERNESS STEWARDSHIP PLAN MINIMUM REQUIREMENTS ANALYSIS FRAMEWORK

Part 4 - Recommended Alternative and Justification

All of the alternatives serve to protect wilderness character to different degrees.

Some alternatives protect the undeveloped quality better (alternatives 4 and 5); alternative 2 would reduce development slightly; alternative 3 would increase levels of development.

Some alternatives provide more opportunities for solitude by reducing trailhead quotas and commercial services (alternatives 4 and 5). However, alternatives 4 and 5 both limit opportunities for primitive and unconfined recreation. Alternative 2 provides opportunities for primitive and unconfined recreation near current levels, and Alternative 3 expands opportunities. Alternative 2 better protects solitude in popular areas, while alternative 3 would reduce opportunities for solitude. All alternatives have similar levels of trammeling.

All alternatives protect the natural quality of wilderness from the impacts associated with visitor use, however the natural quality is more at risk in alternatives that remove food-storage boxes (alternatives 4 and 5) and other facilities that help the park manage wilderness impacts (such as ranger stations and privies). Alternative 4 protects the natural quality by prohibiting grazing, but it does this at the expense of providing opportunities for primitive and unconfined recreation. Alternative 3 provides the greatest opportunities for primitive and unconfined recreation, but it does so at the expense of opportunities for solitude, particularly in the most popular areas.

Conclusion

Overall, alternative 2 best meets the goals, objectives and desired conditions while preserving wilderness character. While it is does not result in the most reduction in development, the developments maintained in wilderness, such as designated campsites, food storage boxes, privies, ranger stations, and fences, serve to protect the natural quality of wilderness, and promote opportunities for primitive and unconfined recreation. Opportunities for solitude would be enhanced in the most popular areas by reducing use (reductions in trailhead quotas, reductions in commercial services, reduced night limits), while opportunities for a range of primitive and unconfined recreation would continue to be available.

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Appendix N

Strategy for Reducing Nonnative Plants in Wilderness

ON THE PREVIOUS PAGE
Whaleback in Kings Canyon National Park
NPS Photo

APPENDIX N:

STRATEGY FOR REDUCING NONNATIVE PLANTS IN WILDERNESS

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CONTENTS

STRATEGY FOR REDUCING NONNATIVE PLANTS IN WILDERNESS N-5
Purpose and Background N-5
Need for Strategy N-6
Best Practices for Preventing Introduction and Spread of Nonnative Plants into Wilderness N-7
Soil-Disturbing Activities N-7
Construction, Facilities Maintenance, and Disturbed Lands Restoration N-8
Fire Management N-9
Import of Stock and Feed N-10
Travel To and Within Wilderness N-11
Early Detection and Rapid Response N-12
Background N-12
History N-12
Active and Passive Surveillance N-13
Priority Species, Vectors, and Sites N-13
Data Collection and Management N-16
Field Protocols N-16
Rapid Response N-17
Monitoring N-18
Attachment 1: Public Participation and Outreach N-19
Attachment 2: Invasive Nonnative Plant Observation Card N-23
Attachment 3: Data Collection and Management N-27
Attachment 4: Early Detection Field Protocols N-31

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STRATEGY FOR REDUCING NONNATIVE PLANTS IN WILDERNESS

This strategy is based on the parks' best practices established in 2004 (Management Directive 38, Preventing Introduction and Spread of Invasive Nonnative Plants). These practices continue to be improved as additional knowledge is gained from implementation of prevention, early detection, and rapid response procedures.

PURPOSE AND BACKGROUND

This strategy establishes guidelines to (1) prevent the introduction and spread of nonnative plant species within the wilderness of Sequoia and Kings Canyon National Parks, and, (2) where new introductions do occur, to detect and control them early, before they spread. It covers activities performed by government employees, parks' concessioners, permittees, contractors, partners, and visitors.

National Park Service (NPS) policies on preventing the introduction and spread of nonnative plants include the following:

- The NPS is directed by its founding document, the NPS Organic Act (16 USC 1) to "conserve the scenery and the natural and historic objects and wild life 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."
- Sections 2 (a) and (c) of the Wilderness Act (1964) direct managers to protect and preserve various qualities of wilderness character. Nonnative invasive plants threaten the natural quality of wilderness, opportunities for primitive recreation, and features of ecological value.
- Nonnative species will not be allowed to displace native species if displacement can be prevented (NPS Management Policies 2006, 4.4.4).
- New nonnative species will not be introduced into parks, except in specific rare situations (NPS Management Policies 2006, 4.4.4.1).
- Livestock grazing will use best management practices to protect the parks' resources, with particular attention being given to protecting wetland and riparian areas, sensitive species and their habitats . . . Managers must regulate livestock so that ecosystem dynamics and the composition, condition, and distribution of native plants and animal communities are not significantly altered (NPS Management Policies 2006, 8.6.8.2). Note that in these parks grazing is limited to recreational and administrative saddle and packstock, so this policy is applied for stock, not livestock.
- Activities may not be categorically excluded from NEPA if they contribute to the introduction, continued existence, or spread of federally listed noxious weeds (DO-12 Handbook 3.5N, Federal Noxious Weed Control Act).
- Activities may not be categorically excluded from NEPA if they contribute to the introduction, continued existence, or spread of nonnative invasive species or actions that may promote the introduction, growth, or expansion of the range of nonnative invasive species (DO-12 Handbook 3.5O, Executive Order 13112).

By far the most efficient and cost-effective actions that can be taken to keep invasive nonnative plants from displacing native species are to (1) prevent the entry of nonnative plants into the parks, (2) prevent the spread of existing nonnative plant populations within the parks, and (3) detect and control newly

introduced nonnative plants early, before they establish and spread. Preventing the entry of nonnative plants into the parks' frontcountry is the essential first step for preventing their movement into wilderness. This is because many nonnative plants that become established in wilderness first become established in the parks' frontcountry. Once new populations of nonnative plants establish they may multiply rapidly. As a consequence, removal can be extremely difficult and costly, especially in remote wilderness. Sometimes treatment is not even possible. The importance of a strong prevention, early detection, and rapid response program as a vital component in protecting native ecosystems from the impacts of invasive nonnative plants cannot be overstated.

Seeds and other propagative parts (hereafter generalized as "seeds") of nonnative plants can travel wherever and whenever people, stock, vehicles, equipment, or earthen and plant materials are moved from one location to another. Seeds can lodge in the treads of car tires, bicycle tires, or shoes. Soil, sand, or gravel imported for construction or other activities can contain nonnative plant seeds. Hay, used to feed stock, or straw, used for soil stabilization, can contain nonnative plant seeds from the fields where the hay was grown. Some nonnatives, such as puncture vine (*Tribulus terrestris*), have spiny or hook-like seed coats and can arrive in the parks stuck to the fur of pets, wildlife, and stock or on people's clothing, shoelaces, and camping gear. Nonnative plants installed around the parks' residences for landscaping can spread to surrounding natural areas. Seeds can blow in from the gardens of neighboring private landowners or can wash down rivers and streams.

The objectives of this strategy are to:

1. Establish best practices to prevent introduction and spread of invasive plants to wilderness by the following mechanisms:
    a. Soil-disturbing activities resulting from construction, facilities maintenance, disturbed lands restoration, and fire management;
    b. Import of stock and their feed;
    c. Travel to and within wilderness.
2. Establish a framework for planning and implementing an early detection and rapid response program in wilderness.

NEED FOR STRATEGY

Once introduced, invasive nonnative plants can spread across landscapes and quickly become difficult or impossible to control. Invasive plants can out-compete native vegetation, displacing native plants and animals from previously occupied habitat, diminishing native plant diversity, and endangering plant and animal species that are already rare. Invasive plants can reduce or degrade wildlife habitat and forage and cause illness, injury, and sometimes death in wildlife and stock. Invasive plants can alter soil nutrient and moisture levels, increase fire frequency, and change the burning season. These altered environmental conditions may favor further nonnative plant invasions. For example, areas previously dominated by woody vegetation may become dominated by annual nonnative grasses and forbs. Invasive plants can cause the deterioration of wetland meadows. Finally, many invasive plants are spiny and can turn a formerly pleasant recreational experience into a painful encounter for visitors.

One of the primary purposes of Sequoia and Kings Canyon National Parks is to protect, restore and maintain the parks' diverse natural resources against external threats. The parks are committed to preserving the diverse native flora against the threat of invasive plants by using Integrated Pest Management (IPM). Integrated Pest Management provides a framework for planning a comprehensive invasive plant management program and for combining tools (physical/ mechanical, chemical,

cultural/fire, and biological) for controlling existing infestations. Integrated Pest Management strongly emphasizes preventing the introduction and spread of new nonnative plants and the early detection and control of new infestations. Prevention of new introductions requires the cooperative efforts of the parks' staff in all divisions, as well as concessioners, contractors, frontcountry visitors, wilderness users, residents, owners of private inholdings, permittees, and neighboring communities.

One of the outstanding qualities of Sequoia and Kings Canyon National Parks is their large expanse of continuous, intact ecosystems, spanning over 13,000 feet of elevation and diverse vegetation types, and largely unfragmented by roads, dams, or other development. As a result, these parks' middle and high elevations retain diverse habitats that are relatively uninvaded by nonnative plants. In comparison to other areas of California, where native plants can be hard to pick out among the tangle of invaders even in natural preserves, this makes protecting the parks' intact ecosystems through prevention all the more important. Large areas of relatively uninvaded, unfragmented, undeveloped habitat are increasingly rare in the world, and therefore of immense ecological, cultural and other value. Finally, climate change is expected to make some habitats more suitable for some nonnative plants, so invasion rates may increase. Preventing these invasions is one of the few things that can be done to increase ecosystem resistance and resilience in the face of unprecedented human-caused climatic change.

BEST PRACTICES FOR PREVENTING INTRODUCTION AND SPREAD OF NONNATIVE PLANTS INTO WILDERNESS

While this strategy focuses on the protection of wilderness ecosystems, the following best practices include those frontcountry activities and locations that have a strong connection to wilderness. Other activities that have a weaker connection to wilderness nonnative plant introductions, such as landscaping, planting of vegetation, and maintenance of cultural landscapes, are addressed in other documents but excluded here.

These best practices are a menu from which necessary mitigations can be chosen when invasive plant staff are reviewing proposed projects and routine operational activities during planning and compliance. For each project or operational activity, the risk of introducing or spreading nonnative plants will be assessed and best practices prescribed accordingly. For example, a trail construction project at high elevation, with no nearby nonnative plant populations, no use of imported earthen materials, and use of hand tools only, is at low risk of introducing nonnative plants and would not require post-project surveys for invasive plants to be funded by the project. By contrast, a frontcountry road construction project adjacent to invasive plant populations, using imported gravel, and requiring earthmoving equipment is at high risk of introducing nonnative plants and would require pre-project surveys, post-project surveys, and post-project treatment to be funded by the project. The highest-risk situations, for which the practice is most necessary, are described in the descriptions below as applicable. To be most effective, all these practices will require invasive plant staff to provide active outreach to project and operations staff, partners, and the public to explain their importance, describe the high-risk situations where the practice is most necessary, and work together to adjust the practices when they are not feasible.

SOIL-DISTURBING ACTIVITIES

The soil disturbance inherent in construction, coupled with the import of equipment and materials that may harbor nonnative plant seeds, make many construction sites high-risk areas for invasion by nonnative plants. Construction projects affecting the spread of invasive plants into wilderness include projects occurring both in frontcountry and wilderness because invasive nonnative plants can spread rapidly from disturbed frontcountry construction sites into adjacent wilderness ecosystems. Recent disturbed lands restoration sites, areas that have sustained high-intensity fire, fire lines, fuel breaks, and trails are also

vulnerable to import and spread of nonnative plants. Soils are disturbed to restore natural topography, to build fire line, or by repeated foot traffic. Vehicles, equipment, clothing, and boots brought to a work site can harbor nonnative plant seeds from the previous work site. Materials that are imported to help mitigate soil erosion, such as straw, can contain nonnative plant seeds.

CONSTRUCTION, FACILITIES MAINTENANCE, AND DISTURBED LANDS RESTORATION

The following practices will be followed in construction, facilities maintenance and disturbed lands restoration activities:

1. Before any equipment is brought into the parks or moved to new areas within the parks after being used off pavement, it will be pressure or steam washed in order to remove seed-containing soil and plant parts. Examples of equipment are backhoes, tractors, loaders, excavators, dozers, bobcats, wheeled compressors, street sweepers, or trucks and trailers that have traveled off-road. Trained staff of the parks will inspect equipment to verify cleanliness before it enters the parks.
2. Topsoil will not be imported into the parks.
3. Before moving vehicles or equipment that have been used off paved surfaces to a new job site within the parks, visually inspect and clean the vehicles or equipment (including the undercarriage) thoroughly to remove all mud, dirt, and plant parts, particularly when moving from lower to higher elevations, from areas of known weed infestations, or into meadows, riparian areas, or other wetlands.
4. Do not use straw- or hay-based erosion control materials, even those certified as weed-free. Other fibrous materials, such as shaved aspen (excelsior) and coconut fiber (coir) are available at much lower risk. Because wood and coconut fibers are innately free of plant seeds, weed-free certification is not required for these products.
5. Use weed-free, locally-staged fill or on-site fill (mineral) materials when it can be extracted from the project site without causing adverse impacts to the native vegetation, soils, or hydrology.
6. Imported mineral materials will come from an approved source. Such materials include boulders, gravel, sand, road base, fill dirt, and all other earthen materials. Consult with the invasive plant ecologist at least a month in advance of project work. Quarries are rarely, if ever, free of invasive plants. Invasive plant staff will work with project managers to minimize the risk of importing invasive plants with mineral materials by inspecting proposed materials at the quarry or other source sites for presence of invasive plants. Mitigations to lower the risk may include washing coarse materials (boulders, rock, and coarse gravel), stripping the top 12 inches of material in a stockpile, requiring freshly-produced material stored less than one month, or other prescriptions specific to the situation. Some high-risk materials may be rejected. Material from quarries participating in the Sierra Nevada Region Weed Free Aggregate Program, managed by Yosemite National Park, may be used if the quarry receives a certification of “Full Compliance.” Material from quarries receiving a “Conditional” certification will need to be inspected by the parks’ invasive plant staff. Use of material from participating quarries is encouraged in order to provide incentive and recognition to quarry operators that implement good weed management practices. Consult with the invasive plant ecologist about participating quarries.
7. Do not move low-elevation (foothills) road materials to higher elevations.
8. Minimize the area of soil disturbance. Consider realigning trails or reducing the trail width to minimize disturbance. Scrape road shoulders only where steep, material-shedding slopes make this action necessary. When removing invasive plants, consider using herbicides rather than digging out roots, where appropriate.

9. Consider the location of soil disturbance. To avoid patches of invasive plants when aligning new trails, consult invasive plant staff when planning projects.
10. Minimize the frequency of soil disturbance. For example, disturbing an area once every five years creates less risk than disturbing it every year. If a site has to be cleared of vegetation yearly (such as road ditches) and the site is outside wilderness, consider paving as an alternative.
11. After completing construction or when otherwise stabilizing disturbed soils, revegetate the area or cover bare soil with local litter and duff mulch prior to fall rains in October-November. This mulch will provide a source of seeds to reestablish native vegetation and reduce the risk of nonnative seeds germinating. Ideally, the litter and duff should be collected from surrounding areas, but do not denude the collection area. Leave at least 50 percent of the material in place and do not disturb vegetation.
12. As a desired practice for planned construction sites, survey for and remove invasive plants at least one year before the start of construction. For sites where priority invasive plants are likely to be present, include funding for one year's pre-project survey when planning projects. Contact invasive plant staff to conduct surveys.
13. As a desired practice after construction and until sites are fully revegetated, schedule annual invasive plant surveys by qualified botanical technicians so that new introductions are detected early and prevented from becoming problems. For sites where there is substantial risk of introducing or spreading non-native plants through construction activities, include funding for one to three years of follow-up surveys when planning projects.
14. Consider the risk of nonnative plant invasion when locating perpetually disturbed facilities, such as campgrounds, corrals, and trails. For example, campsites adjacent to meadows and trails through meadows create a high risk for nonnative plants to become established in meadows. Future planning should consider closure of such high-risk campsites and rerouting of such trails.

FIRE MANAGEMENT

The following practices will be followed when disturbing soils in the fire management program:

1. Before any equipment is brought into the parks or moved to new areas within the parks after being used off pavement, it will be pressure or steam washed in order to remove seed-containing soil and plant parts. Examples of equipment are fire engines, crew buggies, dozers, water tenders, or trucks and trailers that have traveled off-road. This restriction will not apply to equipment responding to initial attack of wildland fire where fire spread is threatening life or property. For equipment responding to extended attack of wildland fire where fire spread is threatening life or property, the Fire Management Officer will request exceptions with the Chief of Resources Management and Science.
2. Minimize the area of soil disturbance. In frontcountry fire units, use hand line rather than dozer line where possible. Construct fire lines to minimum width required relative to fire behavior and terrain.
3. Consider the location of soil disturbance. Fire planners, resource advisors, and incident staff should consult the parks' invasive plant staff when locating hand line and dozer line in areas known to have populations of invasive plants. Dozer line and hand line should be located well away from invasive plant populations whenever possible.
4. When rehabilitating fire line, return windrowed soils to original position and cover bare soil with local litter and duff mulch prior to fall rains in October-November. This mulch will provide a source of seeds to reestablish native vegetation and reduce the risk of nonnative seeds

germinating. Ideally, the litter and duff should be collected from surrounding areas, but do not denude the collection area. Leave at least 50 percent of the material in place and do not disturb vegetation.

5. On fires, invasive plant staff should be consulted by the resource advisor, or when appropriate for large fires, assigned as an additional resource advisor to the incident management team whenever the spread of invasive plants is probable. Invasive plant staff should be consulted in the development of fire line and burned area rehabilitation plans.
6. As a desired practice in planned burn units at high risk for spreading known invasive plant populations, survey for and remove invasive plants at least one year before a planned ignition, if funding and staff are available.
7. As a desired practice in post-burn units, schedule annual invasive plant surveys by qualified botanical technicians so that new introductions are detected early and prevented from becoming problems. One to three years of follow-up surveys should be funded by projects. In recognition that current funding structures may not allow for dedicated surveys, post-fire invasive plant detection may need to rely on limited searches conducted by fire effects monitoring crews while traveling to and from plots.

IMPORT OF STOCK AND FEED

Hay, unprocessed feed, and straw may contain nonnative plant seeds. Invasive plants can be introduced into previously unoccupied areas during transport of feed materials, by laying out hay at pack stations or trail heads, and in manure deposited by stock throughout the parks. A portion of plant seeds remain live and viable as they pass through the digestive systems of horses and mules, and their manure can act as fertilizer. Use of straw as mulch is covered in the preceding section.

No stock feed is truly “weed free,” but the types of stock feed vary in their risk of containing undesirable plants. California certified weed-free forage is produced from hay, feed, or straw products grown in a field that has received reasonable and prudent visual inspection and where no propagative parts or seeds of state- or federal-listed noxious weeds were detected. Unfortunately, many of the plants that cause problems in the parks’ wilderness areas, such as reed canarygrass, orchard grass, timothy grass, and velvet grass, are not on the California or federal noxious weed lists, are desirable for hay production, and therefore may be present in certified weed-free forage. Even processed pellets can contain trace amounts of viable seed. However, the risk of importing viable seeds decreases with the level of processing: highly milled, heat-treated pellets have many fewer viable seeds than raw hay. More risk can be tolerated in frontcountry sites, where the probability of detection is higher and there are fewer barriers to effective treatment of established plants, than in wilderness sites, where probability of detection is low and there are more barriers to effective treatment of established plants.

The following practices will be followed when importing stock and feed into the park:

1. California, Nevada, or other state-certified weed free forage (baled or loose hay, hay cubes, or straw bedding) is required when hay products are used as supplemental forage or bedding in the parks’ frontcountry zones. This requirement will be included in pack station concessions contracts and commercial use authorizations.
2. Feed carried into the wilderness will be commercially-processed pellets, rolled grains, or fermented hay (e.g., Chaffhaye™). These products have a high level of mechanical milling, heat treatment, and/or anaerobic fermentation that destroys seeds. Other feed products that have similar levels of processing that destroy nearly all seeds may be permitted. Baled or loose hay and

compressed hay cubes, which have little to no processing, will not be used in wilderness. This applies to all users: administrative, commercial, and private.

3. Stock users are encouraged to purge their animals for three days on pellets, rolled grains, fermented hay, or certified weed free forage prior to entering the park.
4. As a desired practice, stock should be inspected and cleaned by handlers prior to entering the parks, or prior to moving from frontcountry to wilderness within the parks. Inspect for and remove any plant parts, seeds, or soil that may have adhered to animals, tack, or equipment, and handle loads and tack in such a way as to avoid picking up plant parts, soil, or mud. This desired practice will be included in pack station concessions contracts and commercial use authorizations. Private stock users will be informed of this practice through outreach and education. Because this desired practice is difficult to achieve operationally, it will be a topic for ongoing discussion and improvement between invasive plant staff and animal handlers.
5. Manure that accumulates in corrals will be removed from the parks and not stockpiled or burned within the parks. This requirement will be included in pack station concessions contracts.
6. As a desired practice, NPS administrative corrals and concessioner pack stations will be kept free of invasive plants within a 50-foot buffer of the facility. This will be the responsibility of the NPS corrals and concessioner pack station staff. Invasive plant staff will monitor sites for invasive plants and consult on appropriate management strategies. Because there is limited time and funding to accomplish this practice, invasive plant staff will continue to work with corrals and concessioner staff to control invasive plants in the highest-risk facilities.

TRAVEL TO AND WITHIN WILDERNESS

The wilderness of Sequoia and Kings Canyon National Parks remains relatively uninvaded by nonnative plants. Even those species, such as cheatgrass and bull thistle, that have managed to colonize wilderness sites have left many wilderness drainages untouched. Protection of the wilderness, which is nearly 97% of the parks' acreage, from invasion by nonnative plants is among the highest priorities of the invasive plant management program.

The following practices will be followed to protect wilderness vegetation:

1. Frontcountry helibases and helispots are focal points for the movement of nonnative plant seeds from the frontcountry to the wilderness. As a desired practice, the Ash Mountain helibase and frontcountry helispots will be kept free of invasive plants within a 50-foot buffer of the facility to reduce the risk of contaminating clothing, shoes, gear, and external loads. Cargo nets will be inspected and cleaned after use, particularly after use outside the parks or in low elevations. This will be the responsibility of heliport staff. Invasive plant staff are available to consult.
2. Helicopter users will be responsible for inspecting and cleaning their gear, clothing, boots, and external load items for plant seeds, plant parts, and caked dirt and mud before loading. Helitack staff will inspect and clean helicopter skids.
3. Heliport staff will track helicopter landing sites and cargo net drops and provide locations to a designated contact annually. Invasive plant, heliport, and wilderness ranger staff will work together to survey for new introductions and control invasive plants in wilderness helispots.
4. Trailheads will be inspected for invasive plants and kept weed-free. Invasive plant staff will work with trailhead rangers and trail crews to inspect for and remove invasive plants.
5. When travelling from frontcountry to wilderness, from areas of known weed infestations (communicated in training), or from foothills to higher elevations, wilderness users will inspect,

remove, and properly dispose of plant seeds, plant parts, and caked dirt and mud found on clothing, boots, tools, and camping equipment. Disposal consists of removing the seed, plant parts, and dirt from clothing and equipment at the origin of the material, or bagging the seeds, plant parts, and dirt and disposing in bagged garbage. Public users will be informed of this practice through outreach efforts.

6. Wilderness rangers, trailhead rangers, and trail crews will be trained in invasive plant identification and will be key personnel in early detection of new invasions.
7. As a desired practice, invasive plant staff will train all parks personnel in invasive plant identification, early detection, and reporting. The parks' newsletters, pamphlets, reference books in the parks' libraries, herbaria, and invasive plant observation cards are available for this purpose.
8. The parks' visitors will be informed of the threat of nonnative plant species and how they can help prevent nonnative plants from entering the parks. See attachment 1 for details of the public participation and outreach components of this strategy.

EARLY DETECTION AND RAPID RESPONSE

BACKGROUND

Early detection and rapid response (EDRR) is a management approach that capitalizes on managers' ability to most effectively eradicate invasive plant populations when they are small. By detecting a new invasive plant introduction before it has a chance to spread or build a large seed bank, managers can respond early enough in the invasion process to fully eradicate the species from a given area. Through EDRR, well-informed surveillance can prevent costly long-term control efforts, for which success is not ensured. After prevention, EDRR is the most effective and cost-efficient set of actions that can be taken to protect the parks' resources from the impacts of invasive plants. EDRR is recurring and cyclic in nature, so is best provided by an operational program.

Fortunately, the invasion of nonnative plants into the parks' montane, subalpine and alpine habitats is still in its early stages. While there are some established wilderness populations requiring expensive and intensive control, such as velvetgrass in the Kern Canyon, the relatively uninvaded condition of the parks' mid to upper elevation wilderness points to the importance of EDRR as the primary strategy to be employed to protect these intact ecosystems. The threat to these mid and upper elevation ecosystems does exist: cheatgrass has been found as high as 9,819 feet elevation, several pasture species introduced to Rock Creek have reproduced at 10,600 feet elevation, and several highly-invasive perennial grasses, including reed canarygrass, have been detected in scattered mid-elevation wilderness meadows.

HISTORY

Past EDRR at the parks has been both active and passive. Active EDRR has been conducted in wilderness by the parks' meadow monitoring program since 1995, when the establishment of a professional plant ecologist in charge of the program coincided with heightened awareness and understanding of invasion biology, which led to increased focus on EDRR as a part of meadow monitoring. The USGS Sequoia-Kings Canyon and Yosemite field stations conducted a nonnative plant inventory throughout the parks from 1996 through 1998, including in wilderness. The parks' invasive plant management program was established in 2002, when project-focused survey and control efforts in wilderness also began. Program staff conducted widespread early detections surveys along wilderness trails and in wilderness meadows in 2012 and 2013. Active surveys are also conducted by the parks' disturbed lands restoration program during the course of restoring disturbed lands, and by the plant ecology program during the course of

surveying for and monitoring rare plants. Passive detections have been reported by other staff of the parks, partners, volunteers, and visitors while engaged in other work or recreational activities.

ACTIVE AND PASSIVE SURVEILLANCE

Early detection surveillance is either active (ongoing and systematic) or passive (occurring as other activities are being conducted). Because the area within Sequoia and Kings Canyon National Parks that is designated or managed as wilderness is vast—838,000 acres—and newly introduced nonnative plant populations are small, finding them can be analogous to finding a needle in a haystack. The addition of large numbers of passive surveyors— the parks' staff, volunteers, partners, and visitors—to the relatively few active surveyors has the potential to contribute significantly to the overall success of EDRR efforts in wilderness.

Active early detection is performed by staff and volunteers who have botanical expertise, who regularly work in wilderness, whose dedicated tasks include surveying for and mapping invasive plants, and who participate in a planned EDRR program that includes training, implementation of monitoring protocols, and detailed data collection and management. Active ED staff are expected to identify and detect a target list of nonnative plants, plus unknown plants that appear "out of place" and could potentially be nonnative. Active early detection is expected to have a significantly higher probability of detection per observer than passive early detection. Observation data recorded by active ED staff are more detailed than those recorded by passive observers. Currently, the invasive plant management program conducts active, dedicated nonnative plant survey and control actions with staff and volunteers when project funding is available for such surveys. Other parks programs such as the disturbed lands, plant ecology, and meadow monitoring programs also perform active EDRR annually as they carry out restoration, rare plant, meadow monitoring, and other tasks.

Passive early detection is performed by non-resource staff (interpreters, wilderness rangers, trail crews, etc.), partners, researchers, volunteers, and visitors who usually do not have botanical expertise, but through outreach and training, are asked to look for a short target list of invasive plants as they conduct other activities. Staff participating in passive early detection are asked **not** to remove plants, since many non-native plant species are difficult to distinguish from closely related natives, and observations must be confirmed by a qualified botanist prior to removal. Passive early detection is expected to have a significantly lower probability of detection per observer than active early detection, but the much greater number of passive observers increases the area of the parks that is searched annually. Observation data recorded by passive ED staff are less detailed than those collected by active observers. For passive ED to be effective, a substantial, sustained investment in developing training materials and conducting outreach by both invasive plant and interpretive program staff is necessary.

PRIORITY SPECIES, VECTORS, AND SITES

Early detection is especially challenging in the parks' wilderness because the area that needs to be surveyed is large, nonnative plant occurrences are scattered and infrequent, and resources for surveillance are limited. To focus EDRR efforts where they are most needed, nonnative species, vectors, and areas (locations) have been prioritized. Some species are more likely to invade and cause problems than others, some of the parks' management actions and recreational activities contribute more to invasion than others, and some areas are more likely to be invaded. Prioritization ensures that surveyors maximize resource protection by searching for the species that are most likely to damage the most important resources in the locations where those species are most likely to be found.

Priority Species: A shortlist has been developed for species that have been assessed as having high priority for prevention and EDRR in wilderness (table N-1) based on their likelihood of being present in wilderness and their potential ecological impacts. This is a short list of species used for training passive observers with limited expertise. A larger watch list is also maintained and is shared with ecologists in the USGS Sequoia-Kings Canyon Field Station, the Sierra Nevada Network Inventory & Monitoring Program, and the forestry, plant ecology, and disturbed lands restoration programs. When new populations of transformer species such as reed canarygrass and Himalayan blackberry are found, observers are asked to: 1) notify invasive plant management program staff immediately, and 2) provide detailed information about where the species was discovered, and additional information about patch size, abundance, habitat, and feasibility of control.

Table: N-1 List of Priority Nonnative Plants for Wilderness Early Detection and Rapid Response Activities

Grasses	Other Species
Cheatgrass (*Bromus tectorum*)	Italian thistle (*Carduus pycnocephalis*)
Smooth brome (*Bromus inermis*)	Yellow star thistle (*Centaurea solstitialis*)
Orchard grass (*Dactylis glomerata*)	Bull thistle (*Cirsium vulgare*)
Velvet grass (*Holcus lanatus*)	Prickly lettuce (*Lactuca serriola*)
Reed canarygrass (*Phalaris arundinacea*)	Oxeye daisy (*Leucanthemum vulgare)*
Kentucky bluegrass (*Poa pratensis*)	Himalayan blackberry (*Rubus armeniacus*)
	Dandelion (*Taraxacum officinale*)
	Woolly Mullein (*Verbascum thapsus*)

This is a dynamic list and will be modified through future planning.

Regular early detection monitoring is especially important for species that form monotypic stands or alter ecosystem processes, such as reed canarygrass, velvet grass, Himalayan blackberry, and yellow star thistle. The larger watch list includes species such as medusa head (*Taeniatherum caput-medusae*), spotted knapweed (*Centaurea maculosa*), Canada thistle (*Cirsium arvensis*) and rush skeletonweed (*Chondrilla juncaceae*), which aren't yet in the parks but are problems in similar wilderness habitats. Other species, such as bur buttercup (*Ranunculus testiculatus*), lambsquarters (*Chenopodium album*) and bulbous bluegrass (*Poa bulbosa*), are common in corrals, burns, and other disturbed frontcountry areas. However, as it is not certain whether these species will spread or become problems in wilderness, they were not included. Although wilderness extends into lower elevation foothill woodlands, nonnative grasses and forbs have displaced foothills native plants to such an extent that common foothill invasives were not included unless, like Italian thistle, they are thought have the potential to expand into undisturbed middle and higher elevation habitats. Kentucky bluegrass, which has naturalized in many of the parks' meadows, is difficult even for trained botanists to distinguish from native bluegrasses, but is included because more information is needed about its distribution and expansion in the parks. Similarly, although dandelion and cheatgrass also have established populations in some parts of the wilderness and thus may not always be subject to rapid response efforts, they remain a priority for detection and documentation.

Note that the absence of a species from the wilderness priority nonnative plant list does not mean that it is not of concern in wilderness, or that it will not be controlled if detected. In addition to searching for particular species, ED staff will search priority sites where a great variety of non-native plants are likely to be introduced. In these relatively confined areas within the larger intact ecosystem, such as wilderness stock hitching rails, the goal is to detect and eradicate all newly-introduced non-native plants, if feasible. Prioritization of vectors and sites is discussed further below.

Priority Vectors: Known vectors for the introduction and spread of nonnative species are prioritized for prevention and EDRR based on their likelihood of resulting in the introduction or spread of these species into wilderness (table N-2). Equipment, materials, and stock brought into the parks, park operations and maintenance activities that result in soil or vegetation disturbance, and visitor activities can all result in the introduction and spread of nonnative plants. See the Prevention section above for a more detailed description of the activities that act as vectors. Ongoing outreach and education is necessary to keep staff, partners, and visitors aware of the risk of introducing nonnative plants via these vectors. Regular early detection surveys are necessary where these vectors are active.

Table N-2: Vectors for the Introduction and Spread of Nonnative Plants, Prioritized for Prevention and ED&RR Activities*

Priority Materials and Equipment	Priority Actions or Uses
High Priority • Fire vehicles, equipment, clothing and shoes • Helicopter cargo and helitack staff clothing and shoes • Imported earth-moving equipment • Imported earthen materials (gravel, etc.) • Imported landscaping and nursery plants • Imported erosion-control materials (straw, etc.) • Imported stock and stock feed **Lower Priority** • Staff, outside crews, and visitor equipment, clothing and shoes	**High Priority** • Road and utility corridor construction and maintenance projects • Trail and wilderness facility construction and maintenance projects • Fire suppression and prescribed fire • Stock grazing, trail use and overnight stays **Lower Priority** • Routine park operations and maintenance activities • Wilderness hiking and camping

*This is a dynamic list and will be modified through future planning.

Priority Sites: Sites are prioritized for prevention and EDRR based on the likelihood of nonnative plant introduction, the presence of high-value resource or habitats, the difficulty of control, and other factors such as the existing distribution of nonnative plants. Both frontcountry and wilderness sites are discussed here. This is because activities that involve soil and vegetation disturbance, or the import of earthen or other materials into the parks, can result in the introduction or spread of invasive plants to frontcountry corrals, helispots, campgrounds, trailheads, and other areas that are known jumping-off points for the introduction of nonnative plants into wilderness. Priority sites also include threatened and endangered species habitats and sensitive habitats such as meadows and riparian areas. Riparian sites are also a priority because species introduced there can spread to areas downstream where they may not be detected before they become too large to control. Burned areas are considered high priority because some invasive plants such as cheatgrass are known to spread rapidly after fire. Note that because of the tremendous size of the parks, most of the parks' acreage will never be actively surveyed and will only rarely be passively surveyed.

Ideally, high priority sites would be actively surveyed annually, medium priority sites every 3 to 5 years, and low priority sites every 5 to 10 years. However, the parks may not have the capacity to implement this rotation schedule. With invasive plant staff putting sustained effort into outreach to passive surveyors, many sites can be passively surveyed annually. However, a significantly lower level of detection per passive surveyor vs. active surveyor would be expected. Active surveys would be conducted by the meadow monitoring program and invasive plant program when funds are available.

Table N-3: High, Medium, and Low Priority Sites for Early Detection and Rapid Response Actions[1]

High Priority Sites	Medium Priority Sites	Low Priority Sites
• Frontcountry corrals • Wilderness stock camps and hitch rails • Grazed meadows • Riparian wetlands crossed by stock • Frontcountry helibase and helispots • Wilderness helispots • Trailheads • Recently burned areas • Construction sites • Utility corridors • T&E[2] species habitats, if threatened by invasive plants	• Frontcountry campgrounds • Frontcountry visitor facilities • Maintenance facilities • High-use trails • Ungrazed meadows near invaded meadows • Riparian reaches downstream of trails and grazed meadows • Ranger stations • Trail crew camps • Trails entering wilderness from outside the parks • High-value, accessible giant sequoia groves • Other rare species habitats, if threatened by invasive plants	• Roads near trailheads • Ungrazed meadows • Frequently-used off-trail routes and camps • Roads approaching the parks • Frontcountry trails • Other maintained trails

[1]This is a dynamic list and will be modified through future planning.
[2]T&E=Threatened and Endangered

DATA COLLECTION AND MANAGEMENT

Systematic and repeated data collection and proper data management are essential for locating and tracking infestations over time, prioritizing threats, clarifying factors that contribute to the introduction and movement of invasive plants, and refining priorities and management actions. For most active surveys, spatial data are collected using Geographic Positioning System (GPS) units that contain a specialized data dictionary for collecting attributes. Data is maintained in the parks' ArcMap spatial geodatabase. Other staff and partners conducting passive surveys collect more limited data using paper Invasive Plant Observation Cards (attachment 2). A smart phone app, currently in development, will greatly expand the ability of non-resources staff, the parks' partners, volunteers and visitors to identify, map and assist in the control of nonnative plants.

Details of planned data collection and management are shown in attachment 3.

FIELD PROTOCOLS

The methods for conducting simple, rapid early detection are described in detail in attachment 4. Simple, repeated surveys are performed in likely locations to find the species most likely to invade. Surveys are guided by information about likely vectors for introduction. The goals are to work efficiently and safely, and to find and control the greatest number of invasive plant populations with relatively low effort and expense, before these populations can damage or displace native plants and other wilderness resources. When invasive plant populations are found, simple tools are used to describe and map these populations, and simple tools are used to control them. Data are collected and analyzed in order to learn more about where invasive plants are moving and why, to inform sound management, to improve EDRR over time, and to disseminate information and help other agencies and groups improve their own EDRR.

RAPID RESPONSE

The primary objectives of rapid response are to: (1) stop further seed production and dispersal to ensure that no further contributions are made to the seed bank, and (2) eradicate the infestation where possible, or contain the infestation so that no further resource damage is done while a long-term plan for control is developed.

In general, treatment of a non-native plant population is considered rapid response if treatment can be accomplished before the next reproductive cycle: at the time of detection, in the same growing season of detection, or in the first year after detection. Several years of follow-up treatment may be needed, but those efforts can generally be accomplished with existing staff and resources, and treatment is likely to lead to complete eradication. Control of larger, established populations that require additional project planning, funding, or compliance are not considered rapid response.

Immediate removal may be considered if:

- The work and treatment method is within the scope of an approved NEPA compliance document and an approved wilderness minimum requirements analysis.
- Staff are qualified to identify plants, are confident in the species identification, and a voucher specimen has been collected.
- Treatment can be accomplished safely with the staff present and within the time period available.
- The appropriate treatment tools are available.

Other factors influencing immediacy of removal include travel time to the location; the ecological threat, current distribution, and difficulty of control for the species; proximity to high-value habitats or sensitive species; the need to prevent imminent seed dispersal, and the priority of other work.

Thresholds and treatment methods for rapid response vs. longer-term planning and control will differ based on the species and situation. However, a typical rapid response effort will be by hand-pulling, cutting, or digging; by one to three people over one to three days; and will be scattered plants on less than one acre.

The types of control methods that would be considered in wilderness include the following:

- Manual (cutting, pulling, or digging out roots using hand tools),
- Flaming with propane torches,
- Tarping with black fabric for several years to deprive plants of light, or
- Application of herbicide with spray bottles or backpack sprayers. The herbicides clopyralid, glyphosate, and rimsulfuron have been approved by the superintendent to date.

Control methods will be chosen based on preservation of wilderness character and natural resources, expected effectiveness of the treatment, and operational efficiency and cost effectiveness. The specific choice of treatment method will depend on species characteristics (annual, biennial, rooting depth, presence of rhizomes, population density) and setting (proximity to water, visibility, avoiding damage to native plants and soils). If immediate control cannot be considered, is not desired, or is not feasible, staff will collect information needed for future assessments of long-term control need and feasibility.

MONITORING

Monitoring is the periodic repetition of systematic early detection surveys over time. Ideally, monitoring would occur following all management actions that could result in the introduction or spread of invasive plants. Data collected systematically over time will answer such questions as:

- Which species are being introduced, spreading and impacting resources in wilderness?
- What vectors contribute most to introduction and spread?
- Which habitats or species in wilderness are most threatened?
- Are ED&RR actions effective and sufficient for protecting the parks' resources from invasive nonnative species?

Ideally, repeated mapping and attribute data collection will result in a detailed picture of how managed and unmanaged invasive plant populations are changing in cover and spatial extent over time. Monitoring frequencies were described above for high, medium, and low priority areas. Suggested frequencies are based upon best professional judgment, as few models exist to inform monitoring frequency. Ongoing monitoring and other data collection will inform adaptive management so that monitoring frequency and the other methodologies described here can be improved over time.

ATTACHMENT 1:
PUBLIC PARTICIPATION AND OUTREACH

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Public participation in a prevention program is vital, for several reasons:

- Visitors need to be informed of appropriate practices to keep invaders from being introduced as a result of their actions;
- The power of an early detection program is increased immensely if even a fraction of the parks' 1.5 million annual visitors watch for and report suspected invasive plant locations; and
- Public understanding of the environmental challenges and costs posed by invasive species leads to support for and compliance with management efforts.

The following education and outreach efforts take place subject to adequate resources:

1. All staff, but particularly those in the division of interpretation, the wilderness office, and the Sequoia Natural History Association (SNHA), will share information about invasive plants and best practices to limit their spread with visitors heading into the wilderness.
2. Interpretive rangers offering walks, talks, slide shows, and informal programs and contacts may draw upon any of the following primary interpretive themes that could be used to expound on invasive species and provoke visitor responses to them:
    a. The natural resources of the southern Sierra Nevada have undergone a series of human uses and impacts as values for those resources have evolved.
    b. Because of the enormous topographic relief of the southern Sierra Nevada, the range creates a wide range of climates, shaping a diversity of interconnected habitats, each of which is occupied by carefully adapted, interdependent organisms.
    c. The Sierra Nevada environment, which plays a critical role in defining the region's climate, geography, and economy, is greatly affected by human activities within the region.
    d. Sequoia and Kings Canyon National Parks protect a large wilderness area where natural forces prevail and which provides significant social and scientific values to the world.
3. With the general public, staff will look for ways to share the following messages:
    a. Plant invasions are biological pollutants with long-lasting effects. Invasive plant populations can grow to unmanageable levels over short time periods.
    b. Prevention, followed by early detection and rapid response, is the first line of defense in protecting ecosystems from being degraded by nonnative plants.
    c. Check before you go: Check carefully for mud or seeds in tires, shoes, clothing, camping gear, and pets before entering or traveling within the park. Remove and dispose of mud and seeds in bagged garbage.
    d. Hikers, especially those traveling into wilderness, need to be vigilant about cleaning shoes, clothing, and equipment.
    e. Do not pick flowers or plants. Those that are not protected as native wildflowers may be invasive weeds, and you may spread their seeds inadvertently.
    f. At home, consider landscaping with plants that won't escape into wild surroundings. Contact your local extension office, county weed-control supervisor, land manager, garden club, and nature center to find out about attractive native or non-invasive alternatives.
    g. Handouts and websites are available to help you identify weeds. Keep an eye out for any invasives around campsites and as you walk trails. Inform a ranger if you find any; call or stop in at a visitor center, where Invasive Plant Observation Cards are available.

4. These messages are currently communicated in one or more of the following ways. Additional efforts are under development:
   a. **The parks' guide/newspaper**: Awareness and prevention message is included.
   b. **Handouts**: are available at visitor centers
   c. **Invasive Plant Observation Cards and Identification Cards**: available at visitor centers and campground kiosks, posted at trailhead permit offices
   d. **The parks' website**: Information includes "What Can I Do?" actions and describes twelve important invaders.
   e. **Interpretive wayside exhibits**: Emphasizes native plants and ecosystems.
   f. **Trailhead orientation panels**: Information on how to avoid transporting invasives is included on panels at most of the parks' trailheads
   g. **Indoor interpretive exhibits**: An exhibit for the greenhouse in the Giant Forest Museum is under development in 2014.
   h. **Film permits**: Information packets for filming projects that will be working in the parks include guidelines for invasive "invasive plant prevention hygiene"
   i. **Smart-phone app** to report invasive plant observations: Under development; to be added to the parks' website.
   j. **Boot brushes**: Available at 12 trailheads as of 2013.
   k. **In-person outreach**: This includes stock groups (e.g., Backcountry Horsemen) and other groups (e.g., presentations at sporting-goods stores).
   l. **Training** for internal staff groups (e.g., annual training for fire staff, wilderness and trailhead rangers, trail crew, and natural resources staff; and wilderness operations meetings for packstock handlers).

ATTACHMENT 2:
INVASIVE NONNATIVE PLANT OBSERVATION CARD

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2014 WILDERNESS WATCH LIST OF HIGHLY INVASIVE NON-NATIVE PLANTS

Scientific Name	Common Name	Type	Likely to be Found
Extremely Invasive, Report Immediately if Found Anywhere in Parks:			
Centaurea solstitialis	yellow star thistle	Herb A	Foothills & Montane
Holcus lanatus	velvet grass	Grass P	Montane, Meadows & Streams
Phalaris arundinacea	reed canary grass	Grass P	Montane, Meadows &Streams
Rubus discolor	Himalayan blackberry	Shrub P	Foothills & Montane, Moist Areas
Still Manageable, Report Soon:			
Bromus inermis	smooth brome	Grass P	Montane
Carduus pyncnocephalus	Italian thistle	Herb A	Up to Montane, Report above 6000'
Dactylis glomerata	orchard grass	Grass P	Montane, Moist Areas
Lactuca serriola	prickly lettuce	Herb A	Montane, Moist Areas
Poa bulbosa	bulbous bluegrass	Grass P	All, Report if found above 6000'
Verbascum thapsus	woolly mullein	Herb B	Report if found in wilderness
Widespread, Search in Natural Areas, Report at End of Season:			
Bromus tectorum	cheatgrass	Grass A	All, Report if found above 6000'
Cirsium vulgare	bull thistle	Herb B	Montane, Moist Areas
Poa pratensis	Kentucky bluegrass	Grass P	All, Report if found above 6000'
Taraxacum officinale	dandelion	Herb P	All, Report if found above 6000'

2014 WATCH LIST FOR HIGHLY INVASIVE PLANTS NOT YET IN PARKS

Scientific Name	Common Name	Type	Likely to be Found
Watch For in Frontcountry and Report Immediately:			
Aegilops triuncialis	barbed goat grass	Grass A	Foothills
Cardaria draba	whitetop	Herb P	Foothills & Montane
Carduus nutans	Musk thistle	Herb B	Foothills &Montane
Centaurea diffusa	diffuse knapweed	Herb A/P	Foothills & Montane
Centaurea maculosa	spotted knapweed	Herb B	Foothills & Montane
Cirsium vulgare	Canada thistle	Herb B	Montane, Moist Areas
Chondrilla juncaceae	rush skeletonweed	Herb A	Foothills & Montane
Genista monspessulana	French broom	Shrub P	Foothills
Lepidium latifolium	perennial pepperweed	Herb P	Montane
Sesbania punica	red sesbiana	Shrub P	Foothills, Riparian
Silybum marianum	milk thistle	Herb A/B	Foothills & Montane
Taeniatherum caput-medusae	medusa head	Grass A	Foothills

A = Annual B = Biennial P = Perennial

INVASIVE NON-NATIVE PLANT OBSERVATIONS FOR SEQUOIA AND KINGS CANYON NATIONAL PARKS (SHORT FORM)

Sequoia and Kings Canyon National Parks need your help detecting non-native (exotic) plants that threaten native plant communities. Early detection of invasive plants allows the Parks to control them before they become difficult, expensive problems. The more people looking, the better chance we have to detect them early.

Here are some guidelines for completing this form:

1. DO NOT REMOVE PLANTS unless you are trained in plant identification and have made a positive ID! Many of these species closely resemble native species, and verification by Park staff is necessary before plants can be removed.
2. Please be specific about location. Include a landmark and explicit directions from that point (e.g. on eastern stream bank of Marble Fork, 100 ft. upstream of intersection with Generals Highway). If you have a 7.5 minute map available, mark the location and submit the map or a copy of the map (include map name if submitting a copy). Report location as Universal Transverse Mercator (UTM) coordinates if GPS unit is set to "NAD83" datum.
3. Please print clearly. If you are willing to gather more information on these species or would like to see a more comprehensive list, please ask for a "Long Form" card.
4. For photographs and descriptions to help identify these species, visit SEKI's web site at http://www.nps.gov/seki/snrm/nnp/nnp_index.htm, or CalIPC's website at http://www.cal-ipc.org/ip/management/plant_profiles/; or look at the books Weeds of the West, and Invasive Plants of California's Wildlands. Both are available in the Visitor Center libraries. Call (559) 565-4476 for more ID information.
5. If in doubt about plant identification, enclose a single specimen in a zip-lock bag when you return your observation card.

ABUNDANCE CODES
(The number of individuals within the patch you are reporting)

1.....1 to 10 plants
2.....11 to 100
3.....101 to 1,000
4.....1,001 to 10,000
5.....more than 10,000

COVER CODES
(The percent of ground surface covered by non-native plant foliage within the patch you are reporting)

T.....0 to 1%.....Trace, a few
L.....1% to 5%..... Low, scattered plants
M.....5% to 25%..... Moderate, patches of plants
H.....> 25%..... High, predominant plant

INVASIVE NON-NATIVE PLANT OBSERVATION REPORT

DATE (Yr-M-D)	SPECIES (Common or Latin)	LOCATION (detailed description of plant location, or attach 7.5 minute map with location marked)	SIZE OF PATCH (L X W, feet)	ABUNDANCE (see reverse)	COVER (see reverse)	OBSERVER (name)
02-7-15	*Foxglove*	*Lodgepole Campground: B-Loop, 100 feet upslope from Site 44 (Sample)*	*10 x 6*	*3*	*M*	*Muir, J.*

Please return to: Division of Natural Resources Office or any Visitor Center, Sequoia and Kings Canyon National Parks. Questions? Call 559-565-4476.

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ATTACHMENT 3:
DATA COLLECTION AND MANAGEMENT

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GPS data and Invasive Plant Observation Reports are turned into the parks' invasive plant management program data manager and uploaded to the geodatabase daily, or backed up daily (to field computer, memory card, etc.) and turned in as frequently as possible. Contact the invasive plant management program staff through the program website at: http://www.nps.gov/seki/naturescience/nnpmain.htm.

When sufficient data have been collected, these data will show which species are most likely to be introduced into and spread in wilderness; which features (grazed v. ungrazed meadows, riparian areas, heavily used trails, helispots, etc.), which locations (ranger stations, trailheads, etc.), and which vectors (stock use, construction, recreation, fire management, etc.) are the best predictors for invasive plant introduction and establishment; and which ecological systems (wetlands v. uplands, etc.) are most sensitive to damage or displacement. These data will also help resource managers decide what frequency and intensity of monitoring are sufficient to protect the parks' resources from damage or displacement.

Data collected include:

- Spatial data, including points (for infestations less than 10 meters in diameter, or when time does not allow for mapping polygons), lines (along streams, trails and roads), and polygons;
- Attribute data (name of data collector, infestation number, patch radius, estimated cover, disturbance, phenology, control methods, etc.);
- Negative data (absence of nonnatives along surveyed trails or in camps and meadows);
- Voucher specimens for new species are documented and collected in a plant press for preservation; unknown specimens are collected for later identification;
- Photographs and associated documentation.

A sample Wilderness Invasive Plant Observation Card is available in attachment 2.

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ATTACHMENT 4:
EARLY DETECTION FIELD PROTOCOLS

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EARLY DETECTION

Basic early detection protocols include:

- Ideally, baseline surveys would be conducted for all designated trails in the parks, and other priority areas in wilderness, where they have not already been completed. These surveys would be repeated, as necessary, based upon priority.
- High priority areas, and areas near or downstream of existing priority species populations, are searched with more frequency and intensity than low priority areas.
- Active survey routes, whether trails, off-trail routes, or roads in the frontcountry, are mapped on GPS units (preferred) or paper maps so that both invasive plant presence and absence data are captured.
- For species such as cheatgrass, which are widely distributed along roads and trails, more coarse monitoring than points, lines, and polygons may be warranted. For example, populations mapped as lines generally include all plants within 100 feet of each other. The starting of new lines may be warranted where there is a significant change in patch density or line width.
- Search areas are divided into areas with well-defined boundaries such as trails and streams. Watersheds, valleys and habitat types can provide good boundaries for larger scale searches.
- In meadows and other wetlands, the perimeter, two longest axes, trail and stream crossings, grazing disturbances, and camping areas are generally surveyed. The methodology has not been further refined as wetlands vary in size, and because water, terrain, and dense vegetation can restrict access.
- Surveys of ranger stations, the Bearpaw High Sierra Camp, and other stock, trail crew, administrative camps, and high-use sites should focus on areas of high use, disturbance, and grazing; social trails; and points of water access.
- Where surveys are conducted in areas that contain abandoned and historic trails (especially those that cross meadows or riparian areas) and also historic cabins and mines, these historic features should get at least a preliminary survey.

In wilderness, active EDRR surveys are conducted using Trimble Juno GPS units by trained individuals and small teams, during day trips or extended backpacking trips. Data may also be recorded on Invasive Plant Observation Reports or in field notebooks. Multi-day trips are sometimes necessary because of the remoteness of many survey locations, and to maximize the area surveyed. Training, safety, and wilderness communication procedures are detailed in other documents. For identifying native and nonnative plants in the field, crews use the Jepson Manual (Baldwin et al. 2012), Flora of the Yosemite Sierra (Taylor 2010), and similar texts. Electronic versions of some texts are available for use with portable electronic readers. Crews should also carry hand lenses, gloves and hand trowels, cardboard presses, plastic bags for collecting seeds.

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Appendix O

Analysis of Park Sensitive Plant Species

ON THE PREVIOUS PAGE
Waterfalls
NPS Photo

APPENDIX O:

ANALYSIS OF PARK SENSITIVE PLANT SPECIES

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ANALYSIS OF PARK SENSITIVE PLANT SPECIES

The table below provides a summary of the park sensitive vascular and nonvascular plant species considered for inclusion in the analysis of environmental effects. Those species with the potential to be measurably affected by the proposed actions are evaluated in the "Plants of Conservation Concern (Park Sensitive Plant Species)" section of chapter 4.

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Bryaceae - Pohlia Moss									
Pohlia tundrae	tundra thread moss	2B.3	G2G3	S2S3	Moss	2,700-3,000	Damp gravelly soils of alpine boulder and rock fields	Potentially present in meadows open to grazing	Evaluated
Meesiaceae – Meesia Moss									
Meesia triquetra	three-ranked hump moss	4.2	G5	S4	Moss	1,300-2,953	Saturated fens and meadows in subalpine coniferous forests	Potentially present in meadows open to grazing	Evaluated
Meesia uliginosa	broad-nerved hump moss	2B.2	G4	S2	Moss	1,300-2,804	Wet meadows and fens in upper montane and subalpine coniferous forests	Potentially present in meadows open to grazing	Evaluated
Mniaceae – Copper Moss									
Mielichhoferia elongata	elongate copper moss	2B.2	G4?	S2	Moss	500-1,300	Metamorphic substrate, cismontane woodland; usually with high levels of heavy metals	Rocky outcrops in foothills; very low likelihood of impact by cross-country travelers	Dismissed

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Bruchiaceae – Bruchia Moss									
Bruchia bolanderi	Bolander's bruchia	2B.2	G3	S2	Moss	1,700-2,800	Wet places in lower and upper montane conifer forests	Potentially present in meadows open to grazing	Evaluated
Ditrichaceae – Trichodon Moss									
Trichodon cylindricus	trichodon moss	2B.2	G4G5	S2	Moss	50-2,002	Sandy exposed soil, meadows and seeps; upper montane coniferous forest	Single documented collection (1982) from parks; very low likelihood of impact by cross-country travelers	Dismissed
Helodiaceae – Helodium Moss									
Helodium blandowii	Blandow's bog moss	2B.3	G5	S1	Moss	1,862-2,700	Meadows and seeps, Subalpine coniferous forest/damp soil	Present in meadows open to grazing	Evaluated
Pterigynandraceae – Myurella Moss									
Myurella julacea	small mousetail moss	2B.3	G5	S1S2	Moss	2,700-3,000	Damp soil, boulder and rock fields, fens; subalpine coniferous forest, alpine	Potentially present in meadows open to grazing	Evaluated
Ophioglossaceae – Adder's-tongue Family									
Botrychium minganense	Mingan moonwort	2B.2	G4	S1.2	Perennial Herb	1,500-3,100	Meadows, along streams or around seeps; lower montane coniferous forest	Potentially present in meadows open to grazing	Evaluated

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Aspleniaceae – Spleenwort Family									
Asplenium septentrionale	northern spleenwort	2B.3	G4G5	S2.3	Perennial Herb	2,500-3,350	Crevices in granitic rocks, montane and subalpine coniferous forest	Very low likelihood of impact by cross-country travelers	Dismissed
Juncaginaceae – Arrow-grass Family									
Triglochin palustris	marsh arrow-grass	2B.3	G5	S2.3	Perennial Herb	2,100-3,450	Wet meadows, flats, stream and lake margins; upper montane, subalpine	Present in meadows open to grazing	Evaluated
Cyperaceae – Sedge Family									
Carex congdonii	Congdon's sedge	4.3	G3	S3.3	Perennial Herb	2,600-3,900	Alpine talus fields	Common in high elevation talus; very low likelihood of impact by cross-country travelers	Dismissed
Carex incurviformis [*Carex incurviformis* var. *danaensis*]	Mount Dana sedge	4.3	G4G5T3	S3.3	Perennial Herb	3,700-4,000	Open dry gravelly or rocky slopes of the alpine	Very low likelihood of impact by cross-country travelers	Dismissed
Carex tahoensis	Tahoe sedge	4.3	G5	S3	Perennial Herb	3,200-3,700	Open rocky slopes of the alpine	Very low likelihood of impact by cross-country travelers	Dismissed
Carex praticola	meadow sedge	2B.2	G5	S2S3	Perennial Herb	(20)500-3,200	Moist to wet meadows, riparian edges, open forests	Potentially present in meadows open to grazing	Evaluated

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Poaceae – Grass Family									
Elymus scribneri	Scribner's wheatgrass	2B.3	G5	S2?	Perennial Herb	2,900-4,200	Alpine boulder and rock fields	Very low likelihood of impact by cross-country travelers	Dismissed
Poa lettermanii	Letterman's bluegrass	2B.3	G4	S2.3	Perennial Herb	> 3,500	Sandy soil around boulders; high alpine	Very low likelihood of impact by cross-country travelers	Dismissed
Agrostis humilis	mountain bent grass	2B.3	G4	S1.3	Perennial Herb	1,500-3,350	Moist meadows to dry slopes; subalpine, alpine	Present in meadows open to grazing	Evaluated
Cinna bolanderi	Bolander's woodreed	1B.2	G1	S1.2	Perennial Herb	1,850-2,400	Streambanks, wet meadows, moist sites; upper montane coniferous forest	Potentially present in meadows open to grazing	Evaluated
Juncaceae – Rush Family									
Juncus hemiendytus var. *abjectus*	Center Basin rush	4.3	G5T4	S3.3	Annual Herb	1,400-3,400	Wet sands and gravels; subalpine and alpine	Single location documented in parks; very low likelihood of impact by cross-country travelers	Dismissed
Iridaceae – Iris Family									
Iris munzii	Munz's iris	1B.3	G2	S2.3	Perennial Herb	540-800	Moist rocky areas under live oaks; foothills	No known locations in wilderness	Dismissed

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Liliaceae – Lily Family									
Allium abramsii	Abrams' allium	1B.2	G2G3	S2S3	Perennial Herb	1,400-2,000	Granitic sands of montane uplands	Very low likelihood of impact by cross-country travelers	Dismissed
Erythronium pusaterii	Kaweah Lakes fawn lily	1B.3	G2	S2.3	Perennial Herb	2,100-2,775	Rocky ledges and openings, on metamorphic or granitic substrates; coniferous forest	Very low likelihood of impact by cross-country travelers	Dismissed
Fritillaria pinetorum	pinewoods fritillary	4.3	G4	S3.3	Perennial Herb	1,800-3,200	Shaded granitic slopes; montane	Very low likelihood of impact by cross-country travelers	Dismissed
Asteraceae – Aster Family									
Carlquistia muirii	Muir's raillardella	1B.3	G2	S2.3	Perennial Herb	1,100-2,500	Dry, open sites on granitic soils in montane chaparral, lower and upper montane coniferous forest	Very low likelihood of impact by cross-country travelers; potential for trail impacts at HST and Copper Creek populations mitigated through project level compliance	Dismissed

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Erigeron aequifolius	Hall's daisy	1B.3	G2	S2.3	Perennial Herb	1,500-2,100	Granitic rock ledges and crevices, lower montane coniferous forest, pinyon/juniper woodlands	Very low likelihood of impact by cross-country travelers	Dismissed
Eriophyllum lanatum var. *obovatum*	woolly sunflower	4.3	G5T3	S3.3	Perennial Herb	1,300-2,500	Lower and upper montane coniferous forest	Very low likelihood of impact by cross-country travelers	Dismissed
Hulsea brevifolia	short-leaved hulsea	1B.2	G3	S3	Perennial Herb	1,500-2,700	Gravelly soils and outcrops; montane forest	Very low likelihood of impact by cross-country travelers	Dismissed
Tonestus peirsonii	Peirson's serpentweed	4.3	G3	S3.3	Perennial Herb	2,900-3,700	Rocky sites, crevices in granite; alpine	Very low likelihood of impact by cross-country travelers	Dismissed
Antennaria pulchella	beautiful pussy-toes	4.3	G3	S3.3	Perennial Herb	2,800-3,700	Meadows, streambanks, snow basins, ridges and boulder fields; alpine	Potentially present in dry meadows open to grazing	Evaluated

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Erigeron multiceps	Kern River daisy	1B.2	G2	S2.2	Perennial Herb	1,500-2,500	Well-drained alluvial woodlands and sandbars associated with riverine habitats; openings in coniferous forest, pine or aspen woodland	Potentially present near meadows open to grazing	Evaluated
Packera indecora *[Senecio indecorus]*	rayless mountain butterweed	2B.2	G5	S1.2	Perennial Herb	0-2,300	Damp areas along streams, meadows, woodland; subalpine, alpine	Potentially present in meadows open to grazing	Evaluated
Boraginaceae – Borage Family									
Hackelia sharsmithii	Sharsmith's stickseed	2B.3	G3	S2S3.3	Perennial Herb	3,150-3,700	Rocky areas in alpine boulder and rock fields; protected crevices in cliffs, talus slopes	Very low likelihood of impact by cross-country travelers; restricted to and sheltered by talus	Dismissed
Phacelia orogenes	mountain phacelia	4.3	G3	S3.3	Annual Herb	2,060-3,400	Gravelly slopes, meadow edges in conifer forests	Very low likelihood of impact by cross-country travelers	Dismissed

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Cryptantha glomeriflora	Truckee cryptantha	4.3	G3Q	S3.3	Annual Herb	1,800-3,750	Open slopes, dry meadows, creekbeds; montane, subalpine coniferous forest	Potentially present in dry meadows open to grazing	Evaluated
Lentibulariaceae – Bladderwort Family									
Utricularia intermedia	flat-leaved bladderwort	2B.2	G5	S2.2	Perennial Herb	1,200-2,700	Aquatic; shallow water in foothill woodland	Single documented location in parks, low elevation; very low likelihood of impact by cross-country travelers	Dismissed
Scrophulariaceae – Figwort Family									
Cordylanthus rigidus ssp. *brevibracteatus*	bird's beak	4.3	G5T3	S3.3	Annual Herb	850-2,560	Pine forest, chaparral, blue oak woodland; montane	Very low likelihood of impact by cross-country travelers	Dismissed
Mimulus inconspicuus	small-flowered monkeyflower	4.3	G3	S3.3	Annual Herb	160-2,000	Hillside streams or seeps, foothill oak woodlands	Very low likelihood of impact by cross-country travelers	Dismissed
Mimulus laciniatus	cut-leaved monkeyflower	4.3	G3	S3.3	Annual Herb	> 900	Seeps on granitic outcrops in chaparral, montane coniferous forest	Very low likelihood of impact by cross-country travelers	Dismissed

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Mimulus norrisii	Kaweah monkeyflower	1B.3	G2	S2.3	Annual Herb	600-1,300	Marble outcrops in chaparral, cismontane woodland	Very low likelihood of impact by cross-country travelers	Dismissed
Polemoniaceae – Phlox Family									
Eriastrum sparsiflorum	few-flowered eriastrum	4.3	G3G4	S3?	Annual Herb	1,075-1,710	Open areas of granitic sand, yellow pine forest; lower montane	No known locations in wilderness	Dismissed
Phlox dispersa	High Sierra phlox	4.3	G3	S3.3	Perennial Herb	gen 3,600-4,200	Alpine boulder and rock fields, dry flats of loose granite	Very low likelihood of impact by cross-country travelers	Dismissed
Leptosiphon oblanceolatus [Linanthus oblanceolatus]	Sierra Nevada linanthus	4.3	G3	S3.3	Annual Herb	2,800-3,700	Open flats near meadows; subalpine coniferous forest	Present in and near meadows open to grazing	Evaluated
Caryophyllaceae – Pink Family									
Silene aperta	Tulare campion	4.3	G3	S3.3	Perennial Herb	1,800-2,800	Open areas, conifer forest	Very low likelihood of impact by cross-country travelers	Dismissed
Minuartia stricta	bog stitchwort	2B.3	G5	S2	Perennial Herb	3,500-3,900	Moist granitic sands and gravels, meadows; alpine	Potentially present in meadows open to grazing	Evaluated

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Portulacaceae – Purslane Family									
Calyptridium pygmaeum	dwarf calyptridium	1B.2	G2	S2	Annual Herb	2,100-3,200	Sandy to gravelly soils; subalpine conifer forest, alpine	Very low likelihood of impact by cross-country travelers	Dismissed
Claytonia palustris	marsh claytonia	4.3	G3	S3.3	Perennial Herb	1,000-2,500	Mesic meadows, marshes, swamps, springs, streambanks; foothill and montane	Present in meadows open to grazing	Evaluated
Claytonia parviflora ssp. *grandiflora*	streambank springbeauty	4.2	G5T3	S3.2	Annual Herb	150-1,200	Vernally moist, often disturbed uplands of the foothills	Very low likelihood of impact by cross-country travelers	Dismissed
Polygonaceae – Buckwheat Family									
Eriogonum nudum var. *murinum*	mouse buckwheat	1B.2	G5T2	S2.2	Perennial Herb	400-700	Marble outcrops in chaparral, cismontane woodland	Very low likelihood of impact by cross-country travelers	Dismissed
Eriogonum polypodum	Tulare County buckwheat	4.3	G3	S3.3	Perennial Herb	(2,400) 2,800-3,500	Granitic sands and gravels, subalpine coniferous forest	Very low likelihood of impact by cross-country travelers	Dismissed

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Eriogonum prattenianum var. *avium*	kettle dome buckwheat	4.2	G4T3	S3.2	Perennial Herb	2,500-2,900	Granitic outcrops in the upper montane coniferous forest	Single known population in Kings Canyon; very low likelihood of impact by cross-country travelers or rock climbers.	Dismissed
Brassicaceae – Mustard Family									
Draba cruciata	Mineral King draba	1B.3	G2	S2.3	Perennial Herb	2,500-3,050	Gravelly slopes, subalpine	Very low likelihood of impact by cross-country travelers	Dismissed
Draba monoensis	White Mountains draba	1B.2	G1	S1.2	Perennial Herb	3,600-4,000	Moist gravels and rock crevices; alpine	Very low likelihood of impact by cross-country travelers	Dismissed
Draba praealta	tall draba	2B.3	G5	S2.3	Perennial Herb	2,500-4,100	Meadows, streambanks, alpine fell fields	Very low likelihood of impact by cross-country travelers	Dismissed
Streptanthus farnsworthianus	Farnsworth's jewelflower	4.3	G3	S3.3	Annual Herb	400-1,400	Rock outcrops and foothill, lower montane woodlands	Very low likelihood of impact by cross-country travelers	Dismissed
Streptanthus fenestratus	Tehipite Valley jewelflower	1B.3	G2	S2	Annual Herb	1,050-1,800	Granite ledges, carbonite limestone, upland sands; open mixed-conifer/oak woodland	Very low likelihood of impact by cross-country travelers	Dismissed

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Boechera pygmaea *[Arabis pygmaea]*	Tulare County rock cress	4.3	G3	S3	Perennial Herb	2,100-3,400	Meadow edges, sand and gravel flats; upper montane and subalpine coniferous forest	Present in and near meadows open to grazing	Evaluated
Draba sharsmithii	Mount Whitney draba	1B.3	G1	S1.3	Perennial Herb	3,300-3,800	Rocky slopes, boulder fields, moist uplands; alpine	Present in meadows open to grazing	Evaluated
Streptanthus gracilis	alpine jewelflower	1B.3	G3	S3.3	Annual Herb	2,600-3,600	Dry rocky uplands; montane and subalpine coniferous forest, alpine	Present in alpine areas and adjacent to meadows open to grazing	Evaluated
Ericaceae – Indian Pipe Family									
Pityopus californica	California pinefoot	4.2	G4G5	S3.2	Perennial Herb	<1,800	Deep litter and duff, understory of montane coniferous forest	Very low likelihood of impact by cross-country travelers	Dismissed
Fumariaceae – Fumitory Family									
Dicentra nevadensis	Tulare County bleeding heart	4.3	G3	S3.3	Perennial Herb	2,200-3,100	Moist gravels, meadows, boulder and rock fields; openings in subalpine coniferous forest, alpine	Present in meadows open to grazing	Evaluated

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Apiaceae – Carrot Family									
Angelica callii	Call's angelica	4.3	G3	S3.3?	Perennial Herb	1,000-2,000	Streambanks in mesic cismontane woodland, lower montane coniferous forest	Streamside species which may be subject to trampling by fishermen, but known populations show no impacts. Potential administrative impacts addressed through project-level compliance.	Dismissed
Eryngium spinosepalum	spiny-sepaled button-celery	1B.2	G2	S2.2	Biennial Herb	100-1,270	Vernal pools, swales; foothill woodland	Very low likelihood of impact by cross-country travelers	Dismissed
Oreonana purpurascens	purple mountain-parsley	1B.2	G3	S3.2	Perennial Herb	2,375-2,860	Metamorphic sands and gravels on ridges and slopes; upper montane broadleaf and coniferous forests	Present in meadows open to grazing	Evaluated

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Fabaceae – Pea Family									
Astragalus kentrophyta var. *danaus*	Sweetwater Mountains milkvetch	4.3	G5T3	S3	Perennial Herb	2,900-4,000	Alpine boulder and rock fields, subalpine coniferous forest on rocky substrate	Very low likelihood of impact by cross-country travelers	Dismissed
Oxytropis parryi	Parry's oxytrope	4.3	G5	S3.3	Perennial Herb	3,100-3,800	Dry knolls and rocky ridges, near timberline and above; alpine fell-fields	Single known observation from parks in 1981; locality too general to assign coordinates. Very low likelihood of impact by cross-country travelers	Dismissed
Astragalus ravenii	Raven's milkvetch	1B.3	G1Q	S1.2	Perennial Herb	3,400-3,450	Metamorphic gravels, boulder and rock fields; subalpine coniferous forest, alpine	Present in alpine areas open to grazing	Evaluated
Hosackia oblongifolia var. *cuprea* [*Lotus oblongifolius* var. *cupreus*]	copper-flowered bird's foot trefoil	1B.3	G5T2	S2.3	Perennial Herb	2,400-2,800	Obligate wetland plant of montane meadows within pine woodlands and coniferous forest	Potentially present in meadows open to grazing	Evaluated

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Lupinus lepidus var. *culbertsonii*	Hockett Meadows lupine	1B.3	G3?T1	S1.3	Perennial Herb	2,500-3,000	Mesic rocky slopes, meadows; subalpine forests, alpine	Present in meadows open to grazing and in areas open to off-trail stock use	Evaluated
Onagraceae – Evening Primrose Family									
Epilobium oreganum	Oregon fireweed	1B.2	G2	S2.2	Perennial Herb	550-1,800	Wet meadows, bogs, and small streams; montane	Potentially present in meadows open to grazing. Reported occurances of this NW CA species in the central & southern SN are likely erroneous determinations of *E. ciliatum*; although this may be a case of misidentifi-cation, the NPS will continue to survey for this plant in meadows used by pack stock	Evaluated

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Rhamnaceae – Buckthorn Family									
Ceanothus pinetorum	Kern ceanothus	4.3	G3	S3.3	Evergreen Shrub	1,050-2,750	Granitic outcrops, slopes, ridges and flats; lower montane to subalpine coniferous forest	Woody species; very low likelihood of impact by visitors or pack stock	Dismissed
Grossulariaceae – Currant Family									
Ribes menziesii var. *ixoderme*	canyon gooseberry	1B.2	G4T2	S2.2	Deciduous Shrub	900-1,100	Chaparral, foothill and lower montane woodlands	Woody species; very low likelihood of impact by visitors or pack stock	Dismissed
Ribes tularense	Sequoia gooseberry	1B.3	G2	S2.3	Deciduous Shrub	1,660-1,740	Lower and upper montane coniferous forest	Woody species; very low likelihood of impact by visitors or pack stock	Dismissed
Hydrangeaceae – Hydrangea Family									
Jamesia americana var. *rosea*	cliffbush	4.3	G5T3	S3.3	Deciduous Shrub	2,070-3,700	Rocky outcrops, boulders; subalpine coniferous forest, alpine	Woody species; very low likelihood of impact by visitors or pack stock	Dismissed
Rosaceae – Rose Family									
Rosa pinetorum [Sierra Nevada populations now treated as *R. bridgesii* which is common]	Sierran dwarf rose				Deciduous Shrub	700-2,500	Open forest, rocky areas	Woody species; very low likelihood of impact by visitors or pack stock	Dismissed

Scientific Name (after Baldwin 2012) [synonym]	Common Name	CNPS Rare Plant Rank	Global Rank	State Rank	Life Form	Elevation Range (meters)	Habitat	Potential Impacts	Result
Ivesia campestris	field ivesia	1B.2	G3	S3.2	Perennial Herb	2,200-3,100	Meadow edges; upper montane and subalpine coniferous forest	Present in meadows open to grazing	Evaluated
Petrophytum caespitosum ssp. *acuminatum*	marble rockmat	1B.3	G5T2	S2	Sub-shrub	900-2,350	Limestone/ marble and granite cliffs and rocky outcrops; montane conifer forest	Potential impacts from rock climbers in the Kings River Canyon	Evaluated

The following information explains the column headings.

CNPS Rare Plant and Threat Ranks. Plants with a California Rare Plant Rank of 1B are rare throughout their range with the majority of them endemic to California. All of the plants constituting California Rare Plant Rank 1B meet the definitions of sec. 1901, chapter 10 (Native Plant Protection Act) or secs. 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for state listing. Plants with a California Rare Plant Rank of 2B are considered rare, threatened, or endangered in California, but more common elsewhere. Plants with a Rare Plant Rank of 4 are those with limited distribution in California; this is considered a watch list for plants of concern throughout the state.

CNPS listing also includes Threat Ranks which are signified by a decimal number after the Rare Plant Rank. These Threat Ranks are to be considered guidelines in the assessment of threat level.

0.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2 = Fairly threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3 = Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

The California Department of Fish and Wildlife maintains the California Natural Diversity Database (CNDDB) using the same ranking methodology employed by all state Heritage programs. This methodology was originally developed by The Nature Conservancy and is now maintained by NatureServe. It includes a Global rank (G-rank), describing the rank for a given taxon over its entire distribution and a State rank (S-rank), describing the rank for the taxon over its state distribution. For subspecies and varieties, there is also a “T” rank describing the global rank for the subspecies. The global and state ranks for each of the species retained for analysis is also included in the table.

The *global rank* is a reflection of the overall status of a plant throughout its global range. Both Global and State ranks represent a letter + number score that reflects a combination of Rarity, Threat, and Trend factors, with weighting being heavier on Rarity than the other two.

G1 = Critically Imperiled — At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2 = Imperiled — At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
G3 = Vulnerable — At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors
G4 = Apparently Secure — Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5 = Secure — Common; widespread and abundant.

Subspecies receive a T-rank attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies or variety. For example: *Hosackia oblongifolia* var. *cuprea*. This plant is ranked G5T2. The G-rank refers to the whole species range i.e., *Hosackia oblongifolia*, while the T-rank refers only to the global condition of var. *cuprea*.

The *state rank* (S-rank) is assigned much the same way as the global rank, but state ranks refer to the imperilment status only within California's state boundaries.

S1 = Critically Imperiled—Critically imperiled in the state because of extreme rarity (often 5 or fewer populations) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state.
S2 = Imperiled—Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state.
S3 = Vulnerable—Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation from the state.
S4 = Apparently Secure—Uncommon but not rare in the state; some cause for long-term concern due to declines or other factors.
S5 = Secure—Common, widespread, and abundant in the state.

Uncertainty about the rank of an element is expressed in two major ways:

By expressing the ranks as a range of values: e.g., S2S3 means the rank is somewhere between S2 and S3.

By adding a "?" to the rank: e.g., S2? represents more certainty than S2S3, but less certainty than S2.

A "Q" added to the rank indicates that the taxon is very rare, but there are taxonomic questions associated with it.

Appendix P

Permitted Research Program and Process

ON THE PREVIOUS PAGE
Moose Lake
Photo Courtesy of Rick Cain

APPENDIX P:

PERMITTED RESEARCH PROGRAM AND PROCESS

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PERMITTED RESEARCH PROGRAM AND PROCESS

Sequoia and Kings Canyon National Parks (the parks) has a rich history of scientific research that has contributed to the stewardship of the parks, the advancement of science, and the science education of broad audiences. Research in the parks includes studies, inventories, and monitoring conducted by National Park Service (NPS) staff as well as permitted research performed by external scientists from other federal agencies, state and local governments, universities, and non-profit organizations. Some of this permitted research is performed by cooperators working with and sponsored by the NPS through formal agreements. Others are collaborators working closely with NPS staff on scientific questions important to NPS stewardship but are not supported financially by NPS funds nor are part of a formal federal agreement. Additional researchers are independent, and while their studies may be of interest to the parks, they are not working directly with NPS staff nor are they financially supported by the NPS.

Over the past three years, 73% of the parks' permitted research included activities in wilderness. This research covers a wide range of disciplines (figure P-1). The most frequent topics for research in wilderness in the past three years were vascular plants/plant communities, herpetology (amphibians and reptiles), geology, cave/karst, invertebrates, and fire (behavior, ecology and effects).

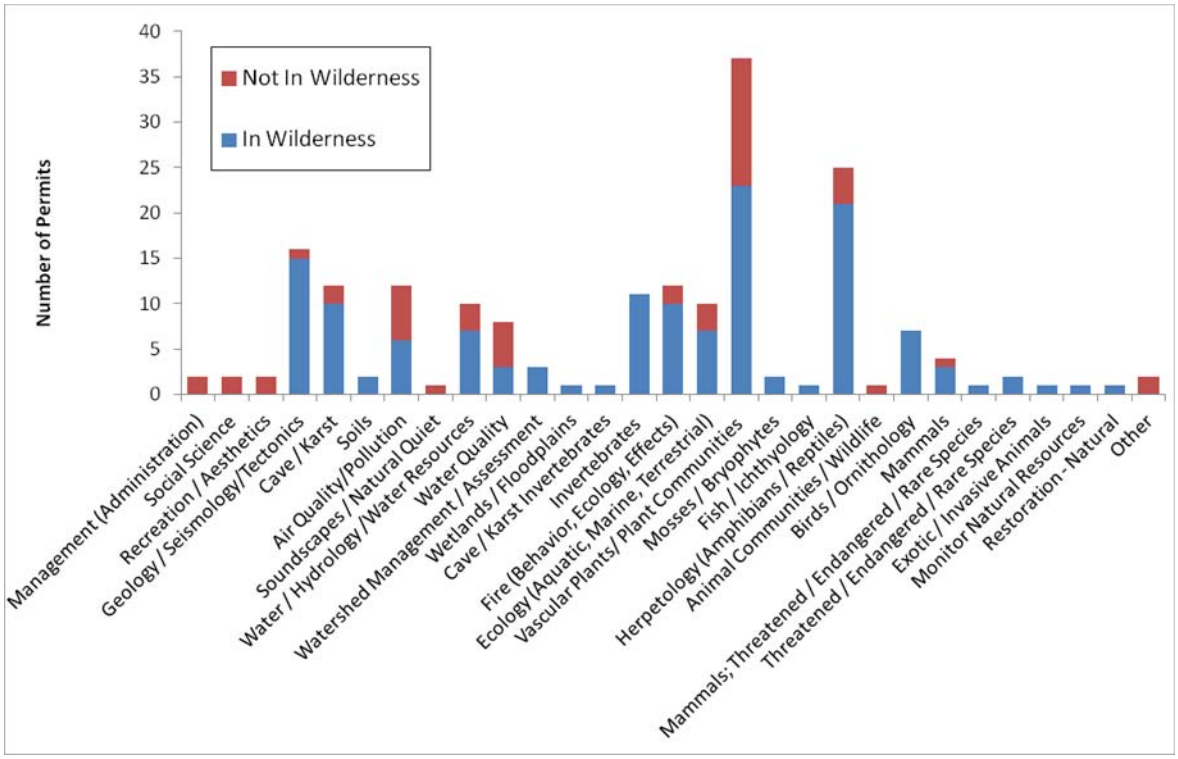

Figure P-1: Permitted Research in 2011-2013 (until 8/30/2013) Includes a Variety of Scientific Disciplines

Some of this research is specifically designed to improve the understanding of the natural quality of wilderness. For example, researchers documented the condition of mountain yellow legged frogs and Yosemite toad populations, which are in dramatic decline. A U.S. Geological Survey long-term study demonstrated that the mortality rate of conifers in wilderness and non-wilderness areas of the parks has increased significantly in recent decades. Additionally, several projects investigate water (hydrology),

water quality, air quality, and various ecological and wildlife topics. Researchers have studied the effects of atmospheric deposition of nutrients on a high elevation watershed for decades and more recently began using the long-term record to understand climatic changes.

APPLICABLE LAWS, EXECUTIVE ORDERS, MOUS, ETC. FOR PERMITTED RESEARCH

> "NPS welcomes proposals for scientific studies designed to increase understanding of the human and ecological processes and resources in parks and proposals that seek to use the unique values of parks to develop scientific understanding for public benefit" (NPS 2009).

THE ORGANIC ACT OF THE NATIONAL PARK SERVICE

The Organic Act directs us "to conserve the scenery and the natural and historic objects and the wild life 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." The 1978 Amendment (a.k.a. Redwoods Act) strengthened the protective functions of the NPS and influenced recent decisions regarding resource impairment. "…the protection, management, and administration of these areas shall be conducted in the light of the high public value and integrity of the NPS and shall not be exercised in derogation of the values and purposes for which these various areas have been established…"

While the Organic Act does not specifically direct the NPS to conduct, facilitate, or allow research in parks, it is now recognized that the mandate to maintain ecological integrity requires the NPS to apply current scientific understanding to stewardship. For example, a National Park Science Committee Report to the National Parks Advisory Board states, "The National Park Service has no choice: mastering the science required to maintain ecological integrity is central to its unimpairment mission" (National Parks Science Committee 2009). More recently, in 2012 the National Park System Advisory Board Science Committee stated, "The NPS needs a specific and explicit policy for park stewardship and decision making based on best available sound science, accurate fidelity to the law, and long-term public interest. Best available sound science is relevant to the issue, delivered at the appropriate time in the decision-making process, up-to-date and rigorous in method, mindful of limitations, peer-reviewed, and delivered in ways that allow managers to apply its findings…Existing policies and procedures must be improved to encourage participation of external scientists, scholars, and students in scientific and scholarly research conducted in national parks, and the expand the use of parks as national laboratories for science" (Knowles and Colwell 2012).

NATIONAL PARKS OMNIBUS MANAGEMENT ACT OF 1998

The National Parks Omnibus Management Act of 1998 directs the Secretary of the Interior "to assure that management of units of the National Park System is enhanced by the availability and utilization of a broad program of the highest quality science and information."It established the framework for fully integrating natural resource monitoring into the management process of the NPS. Section 5934 of the Act requires the Secretary of the Interior to develop a program of "inventory and monitoring of NPS resources to establish baseline information and to provide information on the long-term trends in the condition of the National Park System resources." The message of the Parks Omnibus Management Act of 1998 was reinforced by Congress in the FY 2000 Appropriations bill. In 2001, NPS began the Natural Resource Challenge with the following goals: (1) Increase inventory and monitoring capability; (2) Increase support to maintain and restore park natural resources; (3) Increase awareness of parks as "natural laboratories" for use by scientists; (4) Increase science education of visitors, local communities, and general public

about results of research in parks; and (5) Partner with universities, other agencies, and local organizations.

THE WILDERNESS ACT OF 1964

The Wilderness Act directs the Service to manage wilderness areas for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness. Scientific activities are one of the public purposes of wilderness as described in the Act.

NPS *MANAGEMENT POLICIES 2006*

NPS *Management Policies 2006* includes many references to research and permitted research in particular. Some of these policies describe the need for current scientific understanding for stewardship that underlies the rationale for research in the parks, while other references describe the policy for reviewing proposals to conduct research in the parks and parks' wilderness. For example:

2.3.1.4 Science and Scholarship - Decisions documented in general management plans and other planning products, including environmental analyses and documentation, will be based on current scientific and scholarly understanding of park ecosystems and cultural contexts and socioeconomic environment both internal and external to the park. The collection and analysis of information about park resources will be a continuous process that will help ensure that decisions are consistent with park purposes.

4.2.1 NPS-conducted or Sponsored Inventory, Monitoring, and Research Studies – The Service will:

- identify, acquire, and interpret needed inventory, monitoring, and research, including applicable traditional knowledge, to obtain information and data that will help park managers accomplish park management objectives provided for in law and planning documents;
- define, assemble, and synthesize comprehensive baseline inventory data describing the natural resources under NPS stewardship, and identify processes that influence those resources;
- use qualitative and quantitative techniques to monitor key aspects of resources and processes at regular intervals;
- analyze the resulting information to detect or predict changes (including interrelationships with visitor carrying capacities) that may require management intervention and provide reference points for comparison with other environments and time frames; and
- use the resulting information to maintain – and where necessary restore – the integrity of natural systems.

6.3.6 Scientific Activities in Wilderness – The statutory purposes of wilderness include scientific activities, and these activities are encouraged and permitted when consistent with the service's responsibilities to preserve and manage wilderness.

8.10 Natural and Cultural Studies, Research and Collection Activities - Studies, research, and collection activities by non-NPS personnel involving natural and cultural resources will be encouraged and facilitated when they otherwise comport with NPS policies. Scientific activities that involve field work or specimen collection, or that have the potential to disturb resources, the visitor experience, or park operations require a permit issued by the superintendent that prescribes appropriate conditions for protecting park resources, visitors, and operations. Such studies may require additional permits from other jurisdictions.

PERMITTED RESEARCH REVIEW PROCESS

Sequoia and Kings Canyon National Parks' research permit review process is designed to comply with legal mandates, including the Organic Act of 1916 and the Wilderness Act of 1964. The review process incorporates recommendations in *White Paper Guidelines: Scientific Activities and Research in NPS Wilderness, Version 1, January 2011* and *Landres et al. 2010. A framework to evaluate proposals for scientific activities in Wilderness, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.* The following steps outline the process.

1. **Submit Permit Application Via Research Permit and Reporting System (RPRS):** Researchers submit applications via https://irma.nps.gov/rprs/ and are encouraged to do so at least 90 days prior to the start of proposed activities in the parks. Permits are issued on a calendar-year basis and must be renewed annually. The application should include a more detailed study proposal if one has not been submitted in a previous year. Additionally, if the researcher proposes to store specimens in a non-NPS repository, they are required to submit a signed appendix A of the application to provide information about the repository.
2. **NPS Review:** While the parks support research and monitoring activities for their benefit to stewardship and science, it is critical to be intellectually honest and rigorous in analyzing the impact of proposed activities. The parks' science coordination staff conduct an impact-benefit analysis that incorporates input from additional resource management or visitor experience subject matter experts. The current impact-benefit analysis scores the proposed research for 23 metrics to assess impact to wilderness character and for 12 metrics to assess benefit to stewardship and science (table P-1). The metrics may be altered as more is learned about the impacts of rapid and unprecedented climatic change and other stressors. Impact and benefit summary scores are used to determine: 1) if the potential impact is negligible or not and 2) if this impact is an acceptable tradeoff for the benefit of the research. All proposed studies, even those conducted outside wilderness, are assessed for impact and benefit.

Depending on the level of potential impact and if research is proposed within wilderness, wilderness and environmental compliance staff provide additional review, including a minimum requirement analysis (MRA). The review process may result in changes to the research method or location. For example, conditions of an approved permit may require researchers to reduce the number of samples, limit activities to a reduced or different geographical area, or use less impactful methods.

a. **Wilderness Minimum Requirement Analysis (MRA):** For research in designated or proposed wilderness, a MRA is required if the researcher proposes activities prohibited in Section 4(c) of the Wilderness Act (i.e., installations, use of motorized equipment, or use of mechanical or motorized transportation) or if the activity would have an effect on wilderness character (per Director's Order 41). The MRA and its accompanying instructions lead the researcher through a series of questions to first determine if the research is necessary in wilderness. If the research is determined to be necessary in wilderness, then step 2 determines the minimum activity required to accomplish the research. If NPS reviewers do not agree with the responses provided by the researcher, and/or there is not enough information to make a determination, the researcher is asked to revise the analysis. If the researcher has difficulty understanding the MRA process, they are directed to free online training and may be assisted by NPS staff if workload permits.

b. **Compliance with Other Federal and State Mandates:** Depending on the research proposed, other steps may be required, such as compliance with the Clean Water Act, Endangered Species Act, National Historic Preservation Act, or Animal Welfare Act. Compliance with all applicable laws could be a substantive step and if not accomplished in a timely manner may justify denial of the permit.

Table P-1: Current Metrics Used in the Impact Benefit Assessment

Impact Assessment		Benefit Assessment	
Wilderness Character	**Impact Metrics**	**Benefits**	**Benefit Metrics**
Untrammeled Quality	Manipulation	Stewardship	Would the results address an *urgent* stewardship issue?
	Disturbance		
Natural Quality	Type of collections		How would the results address an *important* stewardship issue?
	Quantity of collections		
	Scarring potential		Would the results be applicable *immediately* to stewardship?
	Sound character		
	Sound continuity		Would the results likely be applicable to *future* stewardship issues?
	Sound volume		
	Duration of project		Would the results allow *effective action* on a stewardship issue?
	Risk of unintended effects		
	Scope of manipulation		Would the results improve stewardship of this *local wilderness*?
	Trampling vulnerability		
	Threat of invasive species		What is the importance of contributions from this research?
Undeveloped Quality	Type of transportation		
	Volume of transportation	Science	How broad *geographically* will the results benefit science?
	Type of equipment		
	Amount of equipment		How far over *time* will the results benefit science?
	Footprint of equipment		
	Visibility of equipment		How many different *people* or types of people will benefit from the results?
	Duration of installation		
Solitude or Primitive and Unconfined Quality	Group size		How *important* is the activity to the scientific field of study
	Person days/season		
	Visitor surveys		What is the *breadth* of scientific inquiry?

3. **Permit Issued, Cancelled or Denied:** The superintendent has ultimate decision authority, which can be delegated, to approve or deny research and collecting permits. Research may be denied for a variety of reasons, such as: 1) the impact to resources or the visitor experience is too high, 2) the benefit does not justify the level of impact, 3) the research is not deemed necessary to occur in wilderness (and a site outside wilderness is not identified), 4) the researcher does not agree to the minimum activity required to accomplish the research, or 5) the research is considered too risky in terms of safety. Additionally, a research application may be cancelled if the applicant fails to provide adequate information to allow a thorough review.

   The NPS reviewer transmits the decision to the researcher via email. If the application is approved, a permit, including required conditions and supplementary materials will be attached to the email. If an application is cancelled or denied, a researcher may start the process over by submitting a new (revised) application to RPRS. It is recommended that researchers discuss required changes with the science coordinator before submitting a new application. A permit subsequently may be cancelled if a researcher fails to comply with safety requirements or any other permit conditions.

4. **Sign Permit and Return Copy:** If the research is approved, the researcher must sign and date the permit and return a copy to the parks' science coordinator.

5. **Conduct the Research:** Researchers must follow the conditions included with their permit. Some permits require that the researcher meet with one or more of the parks' staff prior to conducting the research. Researchers and their field teams must have a copy of the permit on hand while conducting research in the parks.

6. **Submit Spatial Data:** Researchers must submit spatial data for field locations before submitting a new application (even for a different study) or by March 31 of the following year, whichever is earlier. The parks will not approve a new or renewal permit without receiving spatial data.

7. **Submit Investigator Annual Report (IAR) Via the RPRS:** Researchers must submit their IAR before submitting a new application (even for a different study) or by March 31, whichever is earlier. The IAR is submitted directly via the RPRS website. Researchers receive an email from the RPRS coordinator with instructions, usually in January.

8. **Submit Final Report/Publications for Each Study:** The parks require researchers to provide final reports, manuscripts, and journal articles for all their permitted research. The parks encourage researchers to present their results to the parks' staff. In certain cases, the parks will request detailed information (i.e., raw and/or analyzed data).

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