

**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 *untrammelled* qualities);
- fire-management actions and reports (affecting the *natural* and *untrammelled* qualities);
- aquatic ecosystem re-establishment / mountain yellow-legged frog actions (the *natural* and *untrammelled* 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	<ul style="list-style-type: none"> <li>- Campsite conditions (Weighted Value per Campable Mile by management sub-zone)</li> <li>- Grazing capacities (expressed as stock use nights) reflecting maximum utilization rates and site-specific factors for all the parks' meadows (appendix D).</li> </ul>	N/A	N/A	<ul style="list-style-type: none"> <li>- Trail Encounters (encounters per hour on 90% of quota-season days, by trail-class)</li> </ul>	N/A
Measures that do not include explicit standards for management action but provide valuable information about visitor use and Wilderness Character condition	<ul style="list-style-type: none"> <li>- Wilderness ranger end-of-season reports</li> <li>- Snow/precipitation data gathering</li> <li>- Wildlife surveys</li> <li>- Fire-ecology monitoring</li> <li>- NPS Inventory and Monitoring program; lakes, high-elevation forests, wetlands, birds, climate, and rivers</li> <li>- Air quality and pollutant deposition</li> <li>- Park-sponsored and independent research on: water quality, hydrology, forest health, fire, wildlife, climate, plant and animal invasives, caves, etc.</li> </ul>	<ul style="list-style-type: none"> <li>- 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.</li> <li>- Unauthorized actions (e.g., marijuana grow sites)</li> </ul>	<ul style="list-style-type: none"> <li>- Facility numbers and condition (FMSS - database)</li> <li>- Research installation numbers</li> <li>- Actions to remove unneeded facilities</li> <li>- Helicopter use inventories and assessments</li> <li>- Climbing installations (future)</li> <li>- Motorized tool use assessments</li> </ul>	<ul style="list-style-type: none"> <li>- Visitor Use Days (from permits)</li> <li>- Stock use nights</li> <li>- Full-quota events</li> <li>- Wilderness ranger end-of-season reports</li> <li>- Commercial Use Authorizations / Concession Use</li> <li>- Low-flyer reports</li> <li>- Visitor comment letters (may relate to other qualities as well)</li> <li>- Soundscapes and night-sky research and monitoring</li> <li>- Agency recreation structures</li> <li>- Use restrictions</li> <li>- Social trail observations</li> </ul>	<ul style="list-style-type: none"> <li>- Cultural-resource inventories/assessments</li> <li>- Wilderness ranger end-of-season reports</li> <li>- Law-enforcement actions for cultural-resource violations</li> </ul>

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.

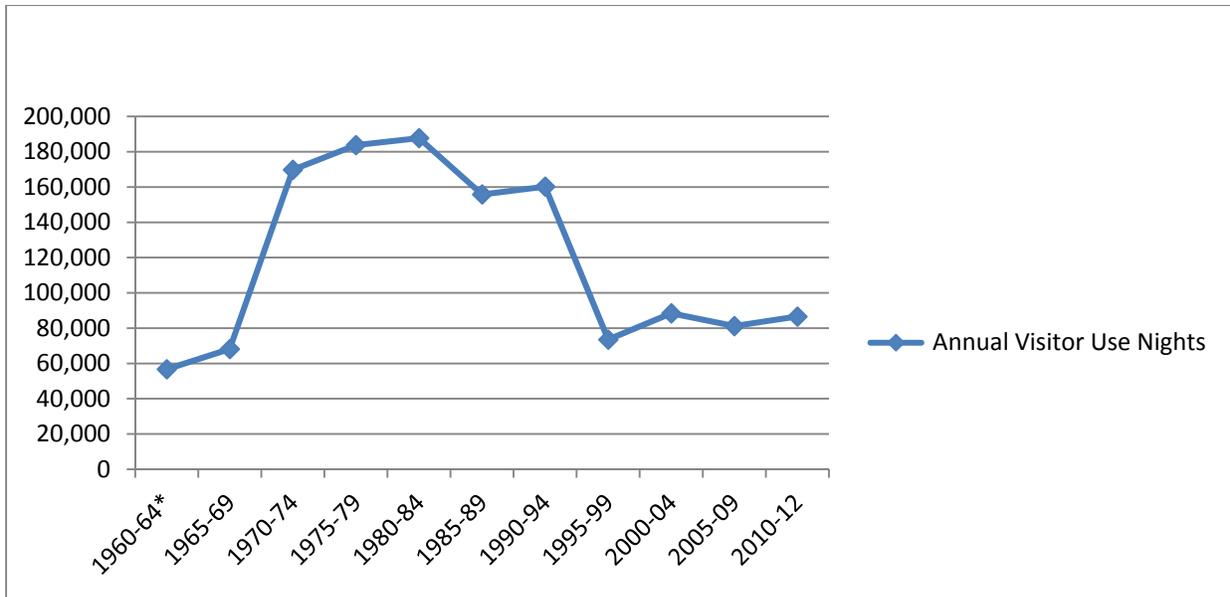
**Table A-2: Current Use Levels of the Parks’ Wilderness**

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.

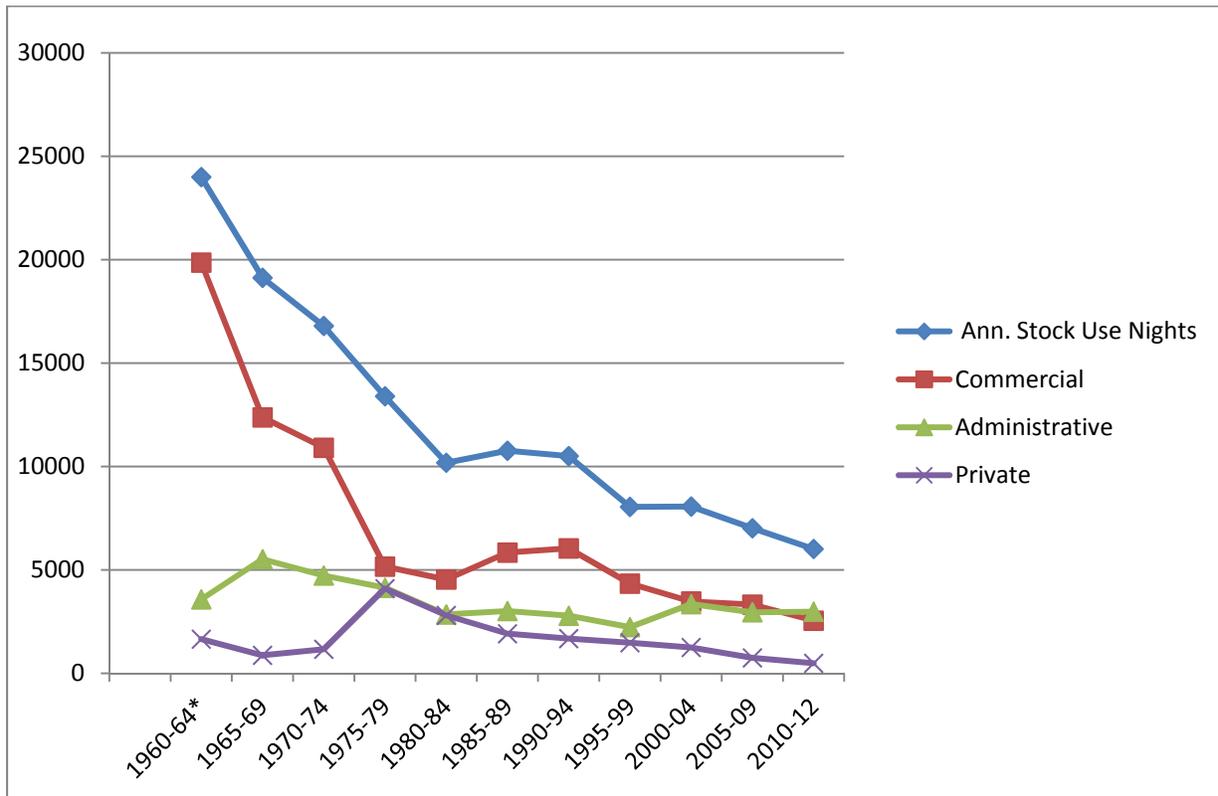
Use levels vary significantly by season. The majority of use, nearly 90%, occurs in the four summer months, June through September. The busiest month of the year, August, alone accounts for one-third of the year’s total. The six months of the winter season, November through April, account for less than 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 1 segment; 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

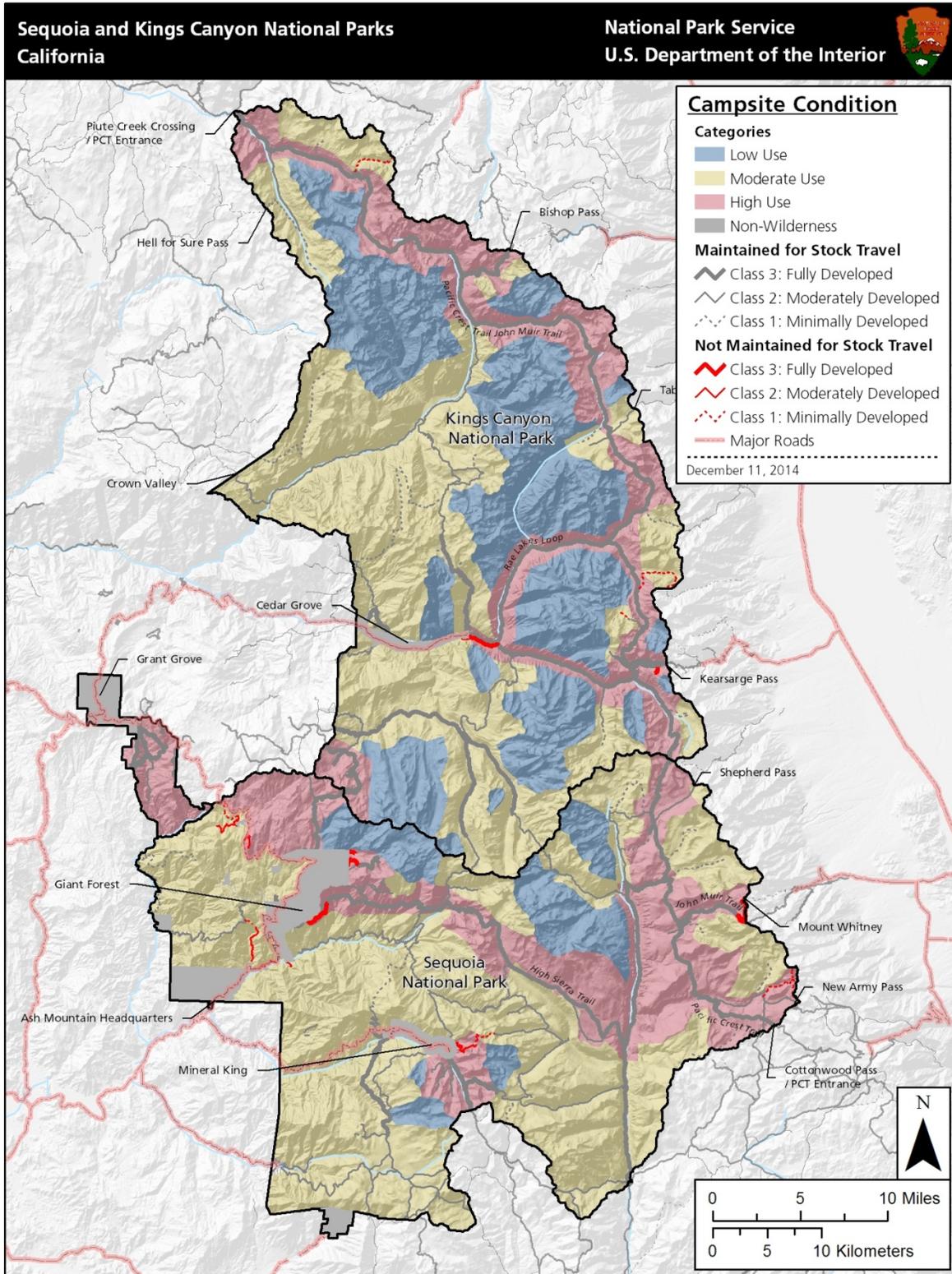
WVCM = Weighted Value per Campable Mile [from Cole (2013), and specific Dusy Basin Survey (2012) – those not surveyed in 2006-07, or 2012 would have the first read/survey serve as baseline – noted as TBD in Alt. 1]; WVCM is calculated by a formula that includes miles of campable area (which consists 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 90<sup>th</sup> quantile estimates from the three years of aggregated data (2012-2014) using a 90% confidence interval.

Confidence intervals (90%) for the 90<sup>th</sup> quantile estimates were calculated using bootstrapping methods. For a given 90<sup>th</sup> 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 (RockCreek-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 90<sup>th</sup> 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.]

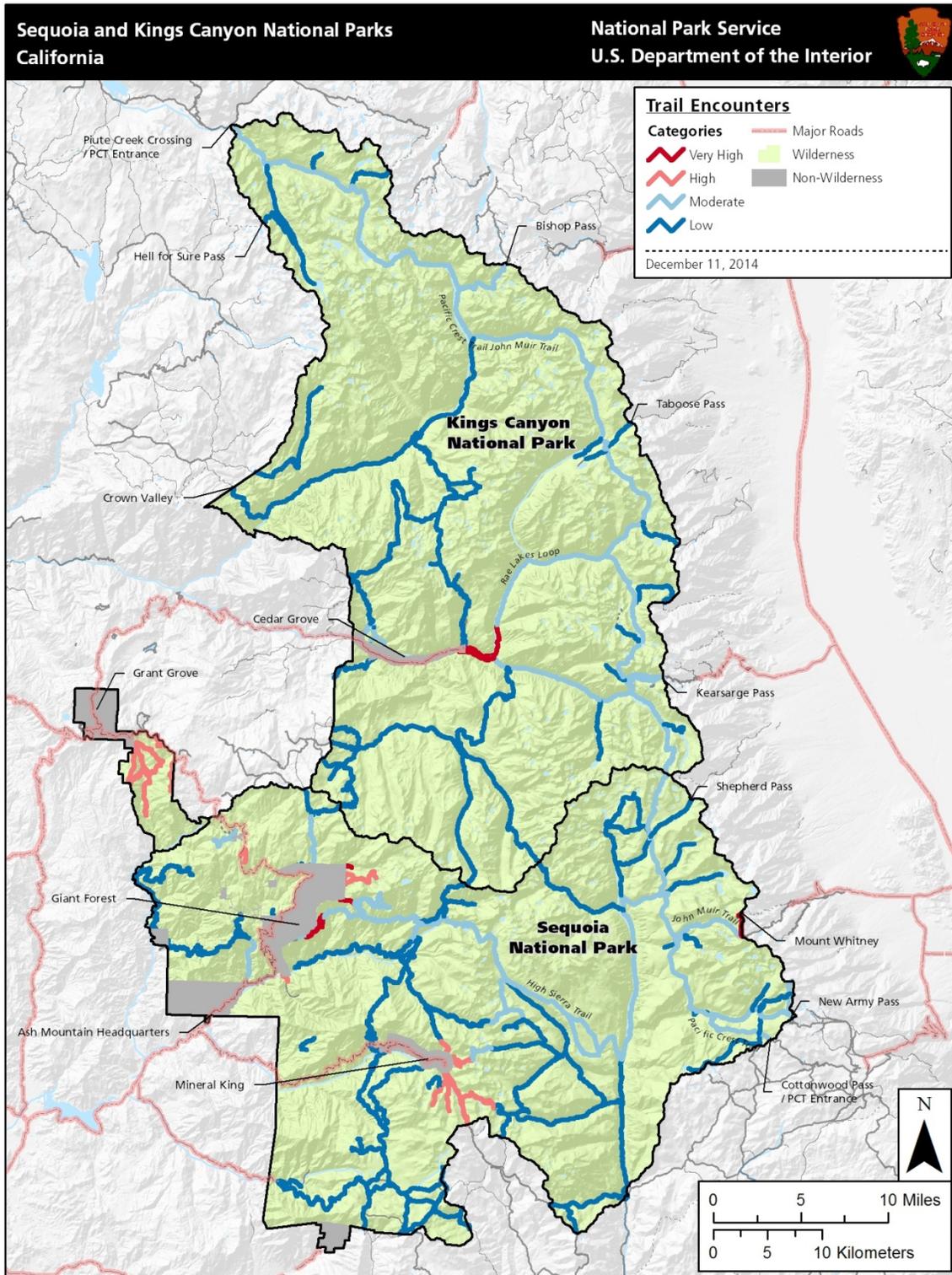


Figure A-4: Map of Encounter Categories

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