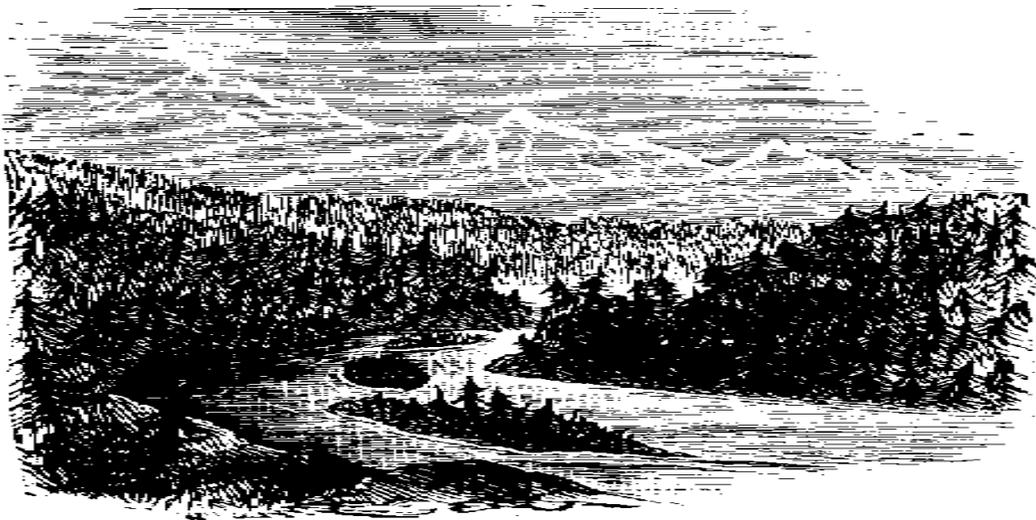


SEQUOIA & KINGS CANYON

NATIONAL PARKS



WILDERNESS PLANNING

WORKBOOK

May 1998



United States Department of the Interior

NATIONAL PARK SERVICE
Sequoia and Kings Canyon National Parks
Three Rivers, California 93271-9700

N1623

May 15, 1998

Dear Friends of Sequoia and Kings Canyon:

We have been very pleased with the level of interest in the development of our Wilderness Management Plan. Your involvement has brought to light a variety of concerns about wilderness management issues.

The enclosed Workbook is a way for you to learn more about the major issues that have been raised. It is also a way for us to learn from you if there are other ideas about these topics. We want to be sure we address all relevant concerns in the Draft Wilderness Management Plan. Please take the time to read through the Workbook, then use the response form to record your comments. Be sure to mail these back to us by **August 31, 1998**.

We want to thank everyone for their input during our scoping phase of the plan. We look forward to receiving more of your ideas on how best to manage the incredible resources of the Sequoia-Kings Canyon Wilderness.

Sincerely,

Michael J. Tollefson
Superintendent



Sequoia-Kings Canyon Wilderness Planning Workbook

Greetings!...and a word about plans...

There are currently several major planning processes underway at Sequoia and Kings Canyon National Parks. The Wilderness Management Plan, the General Management Plan (GMP) and the Fire Management Plan are all at different stages of development.

The GMP sets conceptual direction and deals with broad, general issues, such as wilderness allocation. For example, determining the future of the 91,750 acres proposed for wilderness designation, but never formally designated, is a GMP level issue. Plans at the next level below the GMP are called implementation plans. The Wilderness Management Plan and Fire Management Plan are types of implementation plans. Once an area has been designated as Wilderness, how it will be managed is set forth in the Wilderness Management Plan.

If you wish to become involved in either the GMP planning process or the Fire Management Plan planning process, please send your name and address to: Sequoia and Kings Canyon National Parks, Three Rivers, CA 93271, and indicate which plans you are interested in.

Wilderness Management Plan Background

In 1996, Sequoia and Kings Canyon National Parks began the process of developing a wilderness management plan for the 736,980 acre Sequoia-Kings Canyon Wilderness. Public scoping workshops were held in 7 cities during the summer of 1996; 219 people attended and approximately 150 letters were received. After reviewing the public comments, the National Park Service published a Notice of Intent to prepare a Draft Wilderness Management Plan and Environmental Impact Statement (EIS) as part of the National Environmental Policy Act (NEPA) process. This appeared in the Federal Register on April 30, 1997, re-opening the scoping period until June 30.

As part of the public scoping, you identified *Desired Conditions* you would like to see, and *Strategies* to achieve those conditions. "Sideboards" were presented during the scoping period to give you an idea of some of the legislative constraints within which we must focus our planning. Thus, not everything is negotiable within the framework of this planning process, and a few of the comments received were outside the scope of what is legally mandated. Despite diverse outlooks, common ground was apparent. For the most part, we found the public largely supports the wilderness management goals listed below.

The next step is to look at the major issues that were raised and see if we heard you correctly...and see if you have any more excellent ideas! We truly appreciate your participation in the planning process.

Goals of the Wilderness Management Plan

In 1984, 85% of Sequoia and Kings Canyon National Parks was designated Wilderness. These lands thus were provided an additional layer of administrative protection and must receive greater care. A more conservative management approach is warranted in order that these resources might be used and enjoyed in a way that "will leave them unimpaired for future use and enjoyment as wilderness" (16 USC 1131).

The goals of wilderness management within the Sequoia-Kings Canyon Wilderness are derived from the Wilderness Act of 1964:

** To manage the Sequoia-Kings Canyon Wilderness for the use and enjoyment of the American people in such manner as will leave it unimpaired for future use and enjoyment as wilderness.*

** To protect and manage the Sequoia-Kings Canyon Wilderness so as to preserve its natural conditions and wilderness character.*

** To gather and disseminate information regarding the use and enjoyment of this area as wilderness.*

** To serve the public purposes of wilderness designation including recreation, scenic preservation, scientific study, education, conservation, and historical use.*

What is this Workbook?

There are different ways to achieve the wilderness management goals described above. Presented within this workbook are the major issues identified through public scoping during 1996-1997. In February, 1998, a professionally facilitated workshop was held at the park. In a very productive 1-1/2 day session, representatives from six major interest groups (Backcountry Horsemen of California, Commercial Packers, Commercial Mountain Guides, High Sierra Hikers Association, National Parks and Conservation Association, Sierra Club) raised additional concerns; these are also included within this workbook.

This workbook is a way for you to learn more about these issues. It is also a way for us to learn from you if there are other ideas out there about these topics. We want to be sure we address all relevant concerns in the draft wilderness plan. Below is what we heard from you. Are there other concerns that we should address?

Also presented are different ways to resolve these issues as identified through public and in-park scoping workshops, written comments submitted during the scoping period, and subsequent in-park discussions. Unless specifically articulated, the choices presented would apply to everybody (NPS administrative use, commercial use and the general public). Again, this is what we heard from you and from discussions among park staff. Can you think of any other ways to resolve these issues? (Note: This is not a comprehensive list of all issues raised, only those provoking the most comment. The Draft Plan will address additional issues.)

The following topics are presented:

- 1) Campfires
- 2) Bears and Food Storage
- 3) Party Size
- 4) Camping/Campsites
- 5) Toilets/Sanitation
- 6) Trails
- 7) The "Minimum Requirement"

- 8) Stock Use and Meadow Management
- 9) Commercial Use and Wilderness Permits

We Need Your Input!

Please read through this workbook carefully. We need your ideas. In reading over the material, are your concerns presented? Does at least one of the ways of resolving these issues reflect your point of view? Each choice has tradeoffs. We are asking for your help to find creative solutions to the issues raised in this workbook, so we want to know if there are any other ideas out there before we begin drafting the plan. We are also interested in knowing what combination of choices you feel best address the concerns raised.

What is the next step in the planning Process?

We will take the feedback we receive from this workbook and use it to help shape alternatives for the draft wilderness plan. We want to be very sure we are considering all of the important issues, and we want to consider a range of reasonable alternatives. You play an important role in providing feedback to this workbook. We hope to have the draft plan completed by May, 1999. Please read the wilderness management goals again carefully, then read through the workbook.

Thank you for taking the time to help us plan the management of this incredible wilderness.





1. Campfires

Summary

Fuelwood consumption exceeds production in some areas. Also, existing elevational limits may be too high in areas where scientifically valuable subfossil (very old but not mineralized) wood occurs. Existing campfire policies are confusing to visitors due to many different regulations for different areas. As a result, campfires occur in areas where they are prohibited.

Current Situation

Currently, wood fires are permitted only in:

- * *Kaweah River drainage below 9,000 ft* (except fires are prohibited in Hamilton Lakes basin and in the Mineral King drainage).

- * *Kern River drainage below 11,200 ft* except fires are prohibited at:
 - Little Claire Lake within 1200 ft of the lake;
 - Little Five Lakes above 10,400 ft;
 - Lower Soldier Lake within 1200 ft of the lake;
 - Milestone Creek basin and Kern headwaters (north of Milestone trail junction) above 10,400 ft; Miter Basin above 10,800 ft;
 - New Army Pass trail above 10,800 ft (fires permitted at the camp at the junction of New Army Pass and Rock Creek trails);
 - Nine Lakes Basin and upper Big Arroyo above 10,000 ft;
 - Tyndall Creek crossing of John Muir Trail within 1200 ft of the crossing;
 - Tyndall Creek frog ponds within 1200 ft of the ponds;
 - Wallace and Wright Creek drainages above 10,800 ft (fires permitted on Wallace Creek up to Waterfall Meadow at 10,860 ft);

- * *Kings and San Joaquin River drainages (all of Kings Canyon National Park) below 10,000 ft*, except fires are prohibited in Granite Basin and Redwood Canyon. Fires are permitted above 10,000 ft only at the lowest State Lake (10,250 ft).

What Concerns Have Been Raised?

Campfires provide a unique social opportunity and a primitive, aesthetically enjoyable recreational experience for many visitors. Campfires serve as a gathering place, and are part of a traditional and treasured part of a wilderness camping experience. Many people feel that campfires are appropriate where natural or cultural resources are not compromised, and where aesthetic impacts can be kept to a minimum. Some people feel that campfires should be allowed, regardless of those impacts.

In some high elevation areas, however, fuelwood regeneration does not keep up with the depletion of wood (Davilla 1979). Ground fuel inventories in the upper Kern River drainage between 10,400 ft (3170 m) and 11,200 ft (3414 m) show that inadequate fuelwood exists to sustain campfires in these areas (Atkinson et al. 1990).

Subfossil (very old but not mineralized) wood generally occurs above 9000 ft (2743 m); some is 3000-5000 years old. This valuable scientific resource provides a climatological record for thousands of years more than would be possible using living trees alone. Information can also be obtained concerning the ecological processes controlling the elevational distribution of species, stand dynamics in high country trees, and the role of fire in these stands (Hughes 1996; Stahle and Cleaveland 1992).

Aesthetically, standing dead snags are an important component of the natural beauty of the Sierra high country. Where fires have been allowed in places where available dead and downed fuelwood is limited, damage to trees and snags has resulted from chopping of live branches and trees.

Less apparent than the aesthetic impacts are the subtle ecological impacts resulting from the collection of firewood, both living and dead. The removal of coarse woody debris (more than 3 inches in diameter) can have a great impact in the ecosystem (Harvey et al., 1979). Decaying coarse woody debris has an unusually high water-holding capacity, accumulates nitrogen, phosphorus, and sometimes calcium and magnesium. It serves as an important site for nitrogen-fixing microorganisms and serves as a substrate for seedling establishment. Ectomycorrhizal fungi are concentrated in decayed wood. These organisms develop a symbiotic relationship with a plant's roots, improving the plants' ability to extract water, nitrogen, and phosphate from less fertile soils. As a result, elimination of the coarse woody debris is likely to reduce site productivity, particularly on dry and infertile soils (Hendee, Stankey and Lucas 1990). Further, if coarse woody debris is not collected, axes and saws can be left at home, and there is less likelihood that trees (living and dead) will be damaged. Wood collection also extends the area of impact around a campsite (Cole and Dalle-Molle 1982).

Some groups burn garbage in fires, and the garbage burns incompletely, leaving a smell that attracts bears, rodents and flies to a campsite. Fires that burn garbage consume a significant amount of wood. Firewood consumption rates for fires used to incinerate organic garbage use 30% more wood per hour than the general campfire used for cooking and/or aesthetic reasons (Davilla 1979). Occasionally trail crews need to be based in areas closed to campfires to facilitate their work. Some people have questioned the administrative use of fires to burn garbage by trail crews based in these areas, yet if garbage

is hauled out by helicopter or stock, additional impacts and cost are involved.

Wilderness education in the last 15-20 years has shown some improvement in site conditions. "Leave No Trace" principles, for example, strongly urge the use of portable stoves. By planning ahead and preparing prior to a wilderness trip, the amount of fuelwood needed for food preparation can be greatly reduced. By prepackaging food, and by giving consideration to the types of meals to be prepared in areas where wood production is moderate to low, the need to burn garbage can be reduced. While education of users plays an important role in wilderness management, unfortunately it has thus far not kept pace with the impacts generated. Restrictions have become necessary.

One criterion for determining generally where a campfire may be permitted, and specifically whether campfires may be allowed at a given site, would be those areas where fuelwood consumption does not exceed an acceptable percentage of production. Duriscoe (1994) suggests allowing at least half the total wood produced to decay, preserving the visual character and microhabitat provided by down logs. Monitoring over time would allow this figure to be refined. The upper limits for those areas with adequate fuelwood regeneration are generally between 9,000 and 10,000 feet for both parks. The area between 9,000 (2743 m) feet and 10,000 feet (3048 m) is a subalpine transition zone where many campfires currently occur.

In some cases, adequate fuelwood regeneration occurs, in other areas it does not. A maximum elevational limit of 10,000 feet (3048 m) for campfires would include most

areas that would adequately regenerate wood, however, some areas where regeneration is insufficient would also be included.

Existing campfire policies are confusing to visitors due to the existence of different regulations for different areas. As a result, campfires occur in areas where they are prohibited. Where collection of firewood has been prohibited but fires allowed if the wood has been packed in (such as State Lakes), some groups have observed these fires and, not realizing the wood had been packed in, illegally collected firewood locally. Some groups would like to use fire pans and charcoal in areas closed to campfires. Some people feel the use of small battery-operated stoves that burn twigs should be allowed in areas closed to fires. Others feel that since twigs are an important part of the natural system, these stoves should not be permitted in areas closed to fires.

Choices:

A) General campfire policy:

1. Campfires would be permitted everywhere within the Sequoia-Kings Canyon Wilderness.
2. Campfires would be permitted everywhere except where specifically prohibited.
3. Campfires would be permitted only in designated areas, but regulations would be consistent throughout the wilderness.
4. Campfires would be permitted only in designated areas. Site-specific rules would apply and may vary from one part of the wilderness to another.
5. Campfires would be prohibited throughout the Sequoia-Kings Canyon Wilderness.

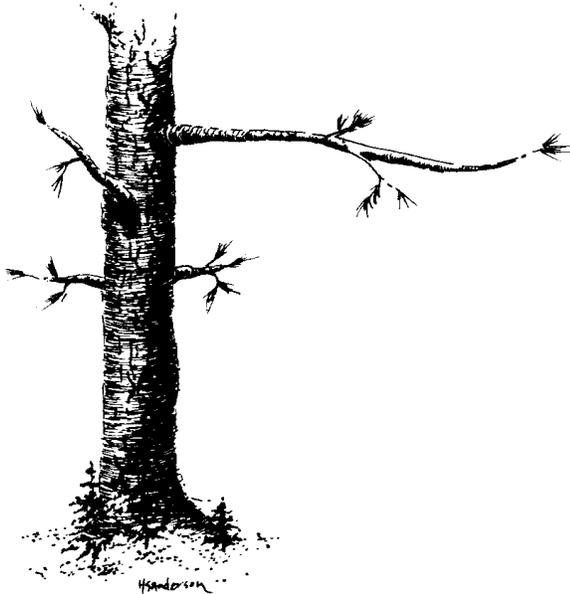
B) The following have been offered as a campfire policy based on elevation: (Note: In the choices below, elevations are given based on different levels of fuelwood availability, campfire impacts and differences in the amount of subfossil wood that would be preserved):

1. Continue the existing policy. The above restrictions would remain in effect. Different parts of the Sequoia-Kings Canyon Wilderness would have different restrictions, largely based on park boundaries, drainages, and elevation, with local conditions guiding exceptions. (status quo)
2. Campfires would only be permitted **below 10,000 ft (3048 m) in the Kings Canyon** portion and **below 10,800 ft (3292 m) in the Sequoia** portion of the Sequoia-Kings Canyon Wilderness. Site-specific variations in campfire policy by drainage or basin may occur, resulting in additional prohibitions where conditions warrant.
3. Campfires would only be permitted **below 10,000 ft (3048 m) in the Kings Canyon** portion of the Sequoia-Kings Canyon Wilderness. In the Sequoia portion, campfires would be permitted **below 10,800 ft (3292 m) in the Sequoia** portion of the Sequoia-Kings Canyon Wilderness, **but only in areas where designated between 10,000 and 10,800 ft**. Site-specific variations in campfire policy by drainage or basin may occur, resulting in additional prohibitions where conditions warrant.
4. Generally, campfires would only be permitted **below 10,000 ft (3048 m) throughout** the Sequoia-Kings Canyon Wilderness, but site-specific variations in campfire policy by drainage or basin may occur, resulting in additional prohibitions where conditions warrant.

5. Generally, campfires would only be permitted **below 9,000 ft** (2743 m) throughout the Sequoia-Kings Canyon Wilderness, but site-specific variations in campfire policy by drainage or basin may occur, resulting in additional prohibitions **below 9,000 ft** (2743 m) where conditions warrant.

C) Packing in of firewood, charcoal or similar fuels into areas closed to campfires:

1. Firewood, charcoal or similar fuels may be packed in to some designated sites where campfires are prohibited, and campfires may be built with these materials. (status quo)
2. Firewood, charcoal or similar fuels may be packed in to closed areas and campfires may be built with these materials, **but** fires must be built in fire pans and all unburnt wood, charcoal and other signs of fires must be hauled out upon leaving the area.
3. Firewood, charcoal or similar fuels may not be packed in to areas where campfire restrictions apply. No exceptions would exist for campfires in areas closed to campfires.





2. Bears and Food Storage

Summary

Food storage boxes have been placed within the Sequoia-Kings Canyon wilderness to maintain natural wildlife behavior and to reduce conflicts between bears and humans. Questions have arisen as to the appropriateness of the lockers within wilderness, and to the extent to which these boxes should be placed to meet visitor demand. It has been suggested that bear-resistant canisters and panniers be required in some areas to ensure proper food storage.

Current Situation

Food storage boxes are placed in response to existing or potential problems and are placed only near or adjacent to maintained trails in sites that are already impacted by humans and/or in the most durable site available (based on flora, soil, proximity to water, slope, space).

The current goal is to provide sufficient food storage space for all users along the maintained trail corridors 95% of the time. Counter-balancing is permitted, but discouraged since most people do not do it correctly and because some bears can get the food even when hung correctly. The use of portable bear-resistant food storage canisters and bear-proof panniers is highly recommended.

What Concerns Have Been Raised?

Black bears are an important wildlife resource generally found below timberline throughout the Sequoia-Kings Canyon Wilderness. For many visitors, the knowledge that bears are in the area contributes to a heightened sense of wilderness. Though most bears subsist on natural foods, some have learned to seek human foods.

Human food may become available to bears in the wilderness from several sources: intentional feeding by visitors, improper food storage, improper use of bear-resistant food storage boxes, food left unattended, and improperly handled garbage. Once bears discover human food, they often alter their wild behavior and foraging habits to continue to obtain it. The ensuing conflicts between bears and humans result in injuries to bears, damaged property, personal injuries, and (occasionally) destruction of some bears. The unnatural behavior and resultant losses of these wild animals are unacceptable.

The goal of bear management within the Sequoia-Kings Canyon Wilderness has been to restore and perpetuate the natural distribution, ecology, and behavior of black bears free of human influences (USDI 1992). In managing black bears within this wilderness, the National Park Service has had three objectives:

- 1) To eliminate the availability of human food sources and human activities which may significantly modify bear populations.
- 2) To minimize and mitigate human/bear interactions that result in a learned orientation of bears toward people, a negative experience for people and/or a need to destroy bears.
- 3) To provide opportunities for visitors to understand and appreciate the black bear in its natural environment. (USDI 1992)

Poles, cables, and counter-balancing of food were once an adequate method of keeping it from bears (although it damages trees). But as bears became more habituated to humans in the backcountry, even poles and pulley-type cables were ineffective. In 1987, the first food storage boxes were placed in the backcountry in areas where serious problems with bears obtaining human food were occurring. There are now about 80 of these low-profile brown metal boxes in the wilderness.

As these boxes proliferated, the question arose as to what the limits to their installation should be. Some people questioned the appropriateness of such structures within wilderness. Others justified the boxes as the minimum tool necessary to solve a problem.

With the boxes has come a loss in the sense of individual responsibility---the self-reliance that is an important component of the wilderness experience. Many people now plan their backcountry trips around the locations of these boxes (thus increasing use in these areas), and demand more and larger boxes be placed to support use patterns.

High use areas with numerous bear incidents

have been chosen as sites for food storage boxes. Following installation, use has become concentrated around the boxes. Some view this as a resource benefit; others do not. As a result of the boxes going in, use was no longer dispersed, and some areas outside the core camping areas began to recover. These boxes have thus been a valuable management tool in indirectly regulating campsite use. Since a very little amount of use can cause the majority of impact at a site, concentrating use in highly impacted areas is generally a better management approach than dispersing use (Hammitt and Cole 1987). When the boxes become full, however, groups have problems storing their food. Boxes do require periodic maintenance, but unless full, broken or unlatched, they are virtually 100% reliable.

The use of portable bear-resistant food storage canisters and panniers is highly recommended. Both are virtually 100% reliable. Canisters weigh about 2-1/2 pounds and can be carried in a backpack. Each canister can hold food for one person for about 5 days. Carrying a canister promotes a sense of responsibility and gives the backpacker the freedom to camp anywhere without concern for food storage. Portable canisters minimize conflicts between humans and

black bears, minimize other wilderness effects, and permit a wild and natural black bear population in the Sierra Nevada (Graber 1986). For people doing extended trips, however, it may be impractical to carry several canisters. Bear-proof panniers for food storage are available for stock parties. Many large parties have a 24 hr presence with their food, but this is not always effective (particularly at night when there is no alert guard), and determined bears have caused injury to people in the area.

Unless the food is adequately guarded around the clock by an alert person, incidents can occur. Some have suggested that large groups consider the use of portable electric fences to protect food; others have said this method is not always successful.

Many feel a combination of food storage techniques is acceptable, depending on the situation. For example, some feel that food storage boxes should be used; if the boxes are full, counterbalancing should be an option; if there are no trees, food should be covered with rocks and pans to alert party members if the food is disturbed.

Choices

A) When should counterbalancing of food be permissible?

1. Counterbalancing should be an option at all times. (status quo)
2. Counterbalancing always should be an option if an alert, 24 hr (human) guard is present.
3. Counterbalancing should be permissible **only** when there space is unavailable in food storage boxes, canisters, or panniers.
4. Counterbalancing should not be permissible at any time.

B) When and where should food storage boxes be placed?

1. Continue the existing situation, and increase the capacity and number of boxes in targeted high use areas along maintained trails. (status quo)
2. Continue the existing situation, but no new food storage boxes will be installed (except replacements).
3. Continue the existing situation in targeted high use areas along maintained trails, but **move** the lockers proactively to areas where problems are anticipated to occur, and in response to incidents.
4. Continue the existing situation in targeted high use areas (whether along maintained trails, unmaintained trails, or cross-country areas), but stop there.
5. Remove all food storage boxes from the wilderness.

C) Should the use of bear-resistant food canisters be required?

1. Bear-resistant canisters should be optional at all times. (status quo)
2. Bear-resistant canisters should always be required when camping beyond the reach of food storage boxes.
3. Bear-resistant canisters should be required temporarily in certain areas in response to incidents or high bear activity, and permanently in known, recurring problem areas.
4. Bear-resistant canisters should be required in certain areas.

D) Should stock parties be required to use bear-proof panniers?

1. Bear-proof panniers should be optional at all times. (status quo)
2. Bear-proof panniers should be required of all stock parties when camping beyond the reach of food storage boxes.
3. Bear-proof panniers should be required of all stock parties greater than 8 people when camping beyond the reach of food storage boxes.
4. Bear-proof panniers should be required only temporarily in response to incidents or high bear activity in certain areas.
5. Bear-proof panniers should be required at all times

E) Should a 24 hour guard be permitted for protecting food in some cases?

1. A 24 hour **presence** is permitted for stock parties, large groups or if backpacking parties are camping above treeline. The person need not be alert (may be asleep).
(status quo)
2. A 24 hour **alert (human) guard** should be permitted for stock parties, large groups or if backpacking parties are camping above treeline.
3. A 24 hour **alert (human) guard** should be permitted for stock parties, large groups or if backpacking parties are camping above treeline, or if bear-resistant canisters, panniers, or food storage boxes are full.
4. A 24 hour **guard/presence** should never be permissible as the only means of protecting food.



3. Party Size

Summary

Large parties can generate greater resource and social impacts than smaller parties. Current party size levels may conflict with the provision of outstanding opportunities for solitude within designated wilderness. Sociological studies in these parks indicate that both hikers and stock users prefer smaller parties than are currently allowed; beyond a certain party size both groups feel the solitude they are seeking has been compromised. While public scoping revealed a strong demand for reduction of party sizes, some felt the current levels should be maintained; a few comments were received suggesting larger party sizes.

Current Situation

The party size limit for hikers is 15 people; for stock users it is 15 people and 20 head of stock. These limits apply to all areas within the Sequoia-Kings Canyon Wilderness unless specifically excepted.

What Concerns Have Been Raised?

The size of a party directly affects the quality of the experience had by members of that party as well as that of other wilderness users. One of the reasons for creating a National Wilderness Preservation System was to provide outstanding opportunities for solitude. Some contend that the opportunities for solitude exist regardless of party size, and some question the relationship between encounters (number or type) and solitude.

The principles of "Gentle Use" and "Leave No Trace" emphasize the importance of keeping party size small. Since rate of impact tends to increase with party size, a small party will find it much easier to leave little trace of their visit than a large party. Organized groups, on the other hand, often feel that larger party sizes are required to accomplish their objectives. NPS administrative work parties, such as trail crews, feel it may be necessary to have large crews; splitting crews may add considerable time and cost to a project. Large parties in wilderness (groups larger than 8 to 10 members) tend to make up a small proportion of all parties, but they can contribute a disproportionate amount of environmental impact (Hammitt and Cole 1987; Cole 1986). It is easier for a smaller party to leave less sign of their passage than it is for a larger party. Large groups are likely to create larger disturbed areas simply because they need a larger area for their activities. A large group can also disturb an area more rapidly. Wildlife, however, may be less disturbed by occasional large parties than by frequent small groups (Hammitt and Cole 1987).

Some feel determinations of party size should be based on impacts, and that stock parties and hikers should have different party sizes. Different approaches to determining party size have been offered, such as counting the number of people and stock separately, or combining the number in a method such as "number of beating hearts" or "number of legs". The assumption inherent in such combination systems is that each living being, be it human or animal, generates impact. Under these systems, visitors can choose the type of trip they wish, but may be faced with choices of whether to include more (or less) people or more (or less) stock to have the type of trip they desire. Such combination systems

could have the potential for generating larger party sizes than at present, particularly in terms of number of hikers.

Generally, stock parties contribute more to the physical impact of an area than do hiking parties. Dale and Weaver (1974) examined the effects of horses and hikers in the Rocky Mountains in Montana and found that trails used by horses and hikers were 2.5 times deeper than trails used only by hikers. Cole (1983) studied campsite impacts in the Bob Marshall Wilderness and found that stock sites were six times as large, with a bare area four times larger than backpacker sites. Stock sites also had more than ten times as many damaged trees, had been much more severely compacted, and had many more introduced plant species. The greater compaction occurs because stock are heavier than humans, with their weight on a smaller surface area.

Large parties contribute inordinately to perceived crowding problems (Stankey 1973). Party size limits can be an effective way to avoid or mitigate social conflicts, and work best in conjunction with an educational effort to expand awareness of appropriate use of wild places.

Watson (1993) surveyed hikers and stock users in the Sequoia-Kings Canyon Wilderness on the maximum acceptable number of social contacts each would tolerate. For hikers, the mean (average) maximum number of horses seen in a single group that would be acceptable was 8; for stock users this number was 15. For hikers, the mean maximum number of hikers seen in a single group that would be acceptable was 10; for stock users this number was 13. For hikers, the mean maximum number of horse riders in a single group that would be

acceptable was 7; for stock users, this number was 13.

Watson also surveyed wilderness visitor recommendations for group size limits. For number of people in hiking parties, hikers recommended 9; stock users recommended 12. For number of people in horse parties, hikers recommended 6; stock users recommended 10. For number of horses in one party, hikers recommended 6; stock users recommended 13. All are lower numbers than are currently in place for party size in the Sequoia-Kings Canyon Wilderness. Most stock users (72%) and hikers (85%) supported group size limits.

Recent (USDI 1995) statistics for the Sequoia-Kings Canyon Wilderness show an average of 2.76 people for hiking parties; 4.43 people and 5.75 stock for stock parties. Party size limits are of most value in reducing damage in lightly used parts of wilderness areas where impact is likely to occur quickly and use is currently dispersed (Cole 1989; Hammitt and Cole 1987). Limits on party size must be quite low, ten (10) or fewer, to be effective (Cole 1989; Hendee, Stankey and Lucas 1990). Some people feel the current party size limits (15 people, 20 head of stock) are too high for cross-country areas. The limit for parties traveling in cross-country areas in Yosemite National Park, for example, is 8. Some people feel party sizes could be different in summer and winter, particularly since resource impacts (with the possible exception of sanitation) in winter are extremely minimal.

Party size consistency with surrounding wilderness areas is important to some stock users who feel the current party size should be raised to 25 head of stock (current limit of surrounding National Forest wilderness

areas). Consistency enables a party to travel among different wilderness areas under similar regulations. Other advocates of consistency feel that party size limits within the Sequoia-Kings Canyon Wilderness should be more in conformance with NPS wilderness group sizes nationwide (most NPS party size limits are about 12 people and 15 head of stock along maintained trails, with smaller party sizes off-trail, usually 6-8). A majority of visitors in most wildernesses support a 12-person limit (Lucas 1980, 1985).

Some feel that only resource impacts should be considered in determining party size. Others feel that both resource and sociological impacts should be considered. Some commercial groups feel safety and economic reasons should also be considered, and that large parties are justified for these reasons. They feel that educational benefits of larger parties outweigh impact considerations.

Leaders of some large organized groups feel the cumulative impacts of a small number of large groups are less than those generated by a large number of small groups.

Studies show that impacts often depend on behavior of the party and where the groups camp (Hammit and Cole 1987; Lime 1972). Some educational groups feel that since their leaders are well-versed in Leave No Trace techniques, they are better able to accommodate larger parties than are less skilled parties of the same size. For this reason, they believe the ability to have a large party should be linked to the training level of the instructors.

Variances in Party Size

Currently, variances in party size may be granted for a specific work project "which directly benefits the resource and is consistent with the wilderness or resource management plans for the area....for the recognition, reenactment, or commemoration of events of regional, state, or national historic significance....for traditional Native American ceremonies which a) are dependent on wilderness location, b) do not adversely affect the resource, and c) are reasonable to be allowed in compliance with the Native American Indian Religious Freedom Act and each agency's regulations and management policies for the implementation of this Act....and for non-commercial disadvantaged or disabled groups on a case-by-case basis provided no reasonable alternatives exist" (USDC 1996). Some feel that administrative variances for NPS work projects should not be granted and that the project should be planned so as to prevent the need for large groups. Others feel that such exceptions are an integral part of getting the work done in a timely manner.

Choices:

A) Variances to party size:

1. Party size restrictions should apply to all groups, except those identified in the current variance policy. (status quo)
2. Party size restrictions should apply to all groups, including NPS administrative work projects, except those other groups identified in the current variance policy.
3. Party size restrictions should apply to all groups. No exceptions should be made at all for parties larger than the determined group size.

B) How party size is determined:

1. Continue the **current situation for determining party size**. Party size is determined by a set number of people and stock. Number of people and number of stock are determined separately. (status quo)

A. Maximum number of people:

6 8 10 12 15 (status quo)

B. Maximum number of stock:

0 6 8 10 12 15 16 20 (status quo) 25

2. There should be **one number** for party size. This number would be the **same** for people and stock, but there should be a **reduction of stock** from current levels. The number of people would be the same for both hiking and stock parties.

Maximum number in party:

6 people, 6 stock 8 people, 8 stock 10 people, 10 stock

12 people, 12 stock 15 people, 15 stock

3. Party size limits should be determined by the combined number of "**beating hearts**." For hiking parties this would be the number of people in the group. For stock users, party size would be a combination of the number of people and number of stock.

Maximum number of "beating hearts":

6 8 10 12 15 20 25 30 35

4. Party size limits should be determined by the number of "legs" in the party. Under this system stock would count twice as much as people. A group of four hikers would have eight legs. A group of three riders with two pack animals would have 26 legs (six legs for the three people and 20 legs for the five animals).

Maximum number of "legs":

_12 _16 _20 _24 _30 _40 _50 _80 _110

C) Maximum party size for cross-country travel:

1. Continue the current situation with **no difference in party size** between those using only the trails and those groups travelling via cross-country routes. (status quo)

2. There should be different party sizes for trail users and cross-country parties, with **fewer people and stock** allowed in the cross-country areas. Party size would be determined in one of the following ways:

A. Maximum number of people in cross-country areas:

_4 _6 _8 _10

B. Maximum number of stock in cross-country areas:

_0 _4 _8 _12 _15 _16

C. Maximum number of "legs" in cross-country areas:

_8 _12 _16 _20 _24 _30

D. Maximum number of "heartbeats" in cross-country areas:

_6 _8 _10 _12 _15 _20 _25 _30

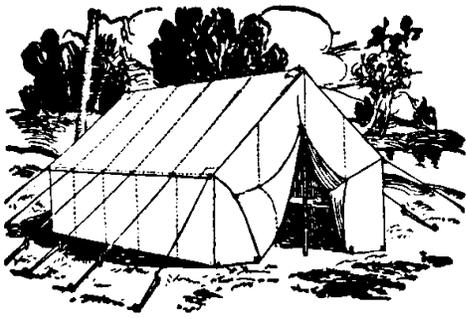
3. There should be different party sizes for trail users and cross-country parties, with **greater numbers of people and/or stock** allowed in the cross-country areas than at present. Party size would be determined in one of the following ways:

A. Maximum number of people in cross-country areas:

_15 _16 _20

B. Maximum number of stock in cross-country areas:

_20 _25



4. Camping/Campsites

Summary

Some people feel that campsites should be designated in high-use areas to concentrate impacts, while others feel the designation of sites within wilderness is inappropriate and that use should be regulated at levels that would preclude site designation. Many wilderness visitors desire separation from other user groups in high-use areas; others are indifferent; and some don't recognize or respect the desires of other groups. Since currently separation is not a requirement, conflict results.

Current Situation

Designated wilderness campsites exist in the following areas: Paradise Valley, Emerald Lake, Pear Lake, Bearpaw, Kern Hot Springs, Upper Funston, and Lower Funston. Sites are not specifically assigned, but established camping areas are marked and camping must be confined to those locations. Several areas (Upper Funston and Lower Funston) are designated as stock camps, but camping there with stock is currently not required. The following areas have limits on length of stay: Hamilton Lakes (two night camp limit), Kearsarge Lakes (one night camp limit), and Rae Lakes (one night camp limit per lake).

What Concerns Have Been Raised?

Wilderness visitors spend more of their time at campsites than other areas, thus focusing impacts. Vegetation impacts from camping

activities include reduction in plant cover (usually to bare ground in the core area of the campsite), damage to surrounding brush and trees, and changes in species composition (reduction of diversity and introduction of exotic species). Changes in soil condition include loss of the organic litter layer, exposure of bare mineral soil, and soil compaction. Factors that can influence how much change occurs on an individual campsite are: the amount and frequency of use on the site, party size and length of stay, the type of user group (whether or not the group uses packstock), the behavior of those who use the site, season of use, and the environmental conditions of the site (Hendee et al. 1990; Cole 1982).

The aesthetic appearance of campsites affects the experience of wilderness users. Lee (1975) found that the presence of horse manure or facilities such as hitch rails were key sources of dissatisfaction with backcountry campsites in Yosemite National Park. Also, free-roaming stock may wander through campsites, disturbing campers.

Most people will tolerate other user groups along trails more than they will at their campsites (Hendee et al. 1990). Watson (1993) surveyed hikers and stock users in the Sequoia-Kings Canyon Wilderness to find out how different factors influenced the quality of their wilderness visits. Hikers gave "the number of horse groups that camp within sight or sound" the highest ranking; stock users gave "the number of hiker groups that camp within sight or sound" the highest ranking. This study indicates the value of separating user groups at campsites as one way to mitigate conflict and enhance the experience of both groups.

Large groups often re-join after leaving the

trailhead, creating very large groups at campsites. One way of managing this would be to require large groups to split up with no more than the maximum party size limit at any campsite, and campsites for such groups must be at least one mile apart. Another way would be to require these enlarged groups to separate and be out of sight and sound of each other when camping.

The longer a party stays at a site, the more impact generally results. Beyond a certain point, additional impacts to soils and vegetation on well-impacted sites may not be significant, but campsite "improvements" (rock walls, tables, benches, etc.) tend to appear the longer they stay.

Consider Rae Lakes Basin---the most heavily used part of the wilderness in Kings Canyon National Park. In 1970, a limit of one night per lake was imposed. This, combined with several other restrictions, resulted in a dramatic improvement (vegetation recovery, reduction of site "improvements", less garbage, etc.) in the area (Parsons 1983). In 1996, 400 parties stayed in the Rae Lakes basin; 289 parties spent one night, 97 spent two nights, 12 spent three nights, one spent four nights, and one spent five nights. In light of this trend, some feel that a 2-night limit per basin might be appropriate. Rae Lakes is often the midpoint of a 42-mile loop trip, and allowing people to spend a layover day within the basin without requiring them to move would benefit wilderness visitors. Having two camps in this area may actually have more impact than using one heavily impacted site for two nights.

It is important to understand, however, that the amount of impact at a campsite is not a direct function of the amount of use. Most of the impact occurs with a low level of use, and

beyond this point, the additional impact is not substantial. The only way to completely eliminate all impact of campsites is to eliminate all use, or to regulate use at a level that it could be widely dispersed without campsites being used repeatedly. Neither approach is desirable along major travel corridors. Cole (1989) showed that where regular use of campsites occurs, vegetation loss is minimized by concentration of use on a small number of sites, rather than dispersing the use and spreading out the impacts over a larger number of sites. In very lightly used, remote areas, dispersal is appropriate and effective because then no sites become heavily impacted.

NPS trail crews often set up camps in areas away from main trails, but may remain in one spot for several weeks in order to complete their work. Some feel that for efficiency, these crews should be permitted to camp in areas closed to the public. Others feel that these crews should comply with the same regulations as the general public, and the additional time thus needed for projects should be factored into the overall time and cost of the project.

Sequoia and Kings Canyon National Parks are among the few western national parks that still allow camping at-large. In some high-use areas of the Sequoia-Kings Canyon Wilderness, however, designated campsites have been established. Most are within one day's travel from the trailhead. Well-chosen, durable areas have been selected and identified as campsites and camping must be confined to these locations. Those getting a permit are not assigned a specific site; indirect regulation occurs through the trailhead quota system. Some feel that camping in these identified, durable sites is a limitation on their personal freedom. Others

feel that this practice should be extended to additional high-use areas in order to limit the increased number of informal, established campsites resulting from repeated use of what were formerly dispersed campsites. They feel that to meet the requirements of the Wilderness Act, designated sites should be held to a minimum and placed only in areas within one day's travel from the trailhead. They also feel there should be no designated sites in low-use areas. Still others feel that site designation is inappropriate within wilderness, and that use should be regulated to prevent the need for designation.

Only the minimum amount of structures are provided at designated camping areas; such structures may not be present at all designated campsites.

Structures may include a primitive toilet, fire ring, food storage locker, and a sign to indicate where these are located. At some sites, hitch rails are present. Generally, hazard trees are not surveyed, nor are they cut down, in the vicinity of wilderness campsites, unless there is a compelling reason to do so.

Suggested criteria for determining when designated sites should be established include when unacceptable resource and/or social impacts occur. Some feel a more proactive approach should be taken and sites should be designated in anticipation of these impacts occurring.

Choices

A) What should be the criteria for determining if separate campsites for different user groups should be designated/established?

1. Continue the current situation. Some campsites are specifically designated for stock users, but others may stay there. Only the areas currently listed would have designated campsites, and in some of these sites, both stock users and hikers could camp. No additional sites would be designated in other areas, but camping restrictions (closures) may be instituted or trailhead quotas may be adjusted if use increases or unacceptable impacts occur. (status quo)
2. Separate campsites should be designated/established only if unacceptable resource impacts occur.
3. Separate campsites should be designated/established only if unacceptable social conflicts occur.
4. Separate campsites should be designated/established if both unacceptable resource impacts and unacceptable social conflicts occur.
5. Separate campsites should be designated/established if either unacceptable resource impacts or unacceptable social conflicts occur.
6. Separate campsites should be designated/established if either unacceptable resource impacts or unacceptable social conflicts are likely to occur.

7. There should not be separate designated/established campsites for different user groups within the wilderness. Regulate use such that no designated sites within wilderness are required. Camping restrictions (closures) may be instituted or trailhead quotas may be adjusted if unacceptable impacts occur.

B) If sites were designated for different user groups, where should they be located?

1. All sites would be along main trails.
2. All sites would be off the main trails and not be visible from the main trail and would be accessible by a spur trail, where terrain permits.
3. Sites for stock parties should be off the main trails as in # 2, preferably near the meadow where the stock would be grazing. Backpacker sites would be along main trails.
4. Sites for backpackers should be off the main trails. Sites for stock parties should be along main trails.



5. Toilets/Sanitation

Summary

Human waste has created a problem in some high-use areas such as Guitar Lake, the summit of Mt. Whitney, and along the Rae Lakes Loop. In some areas, pit toilets have been constructed to serve the high visitor use. Some view this as the "minimum tool" necessary to administer the area as wilderness. Others feel that such structures are inappropriate within wilderness and that use should be regulated at levels that would preclude the need for toilets.

Current Situation

In some high use areas (the Rae Lakes Loop and the summit of Mt. Whitney), toilets have been constructed to serve the high visitor demand. Proposals for wilderness pit toilets are reviewed by the park's Environmental Management Committee which makes recommendations to the Superintendent. The alternative of reduced levels of use is considered as part of this process. No clear criteria have been established, however, regarding where (or if) wilderness toilets should be placed. Where toilets are not present, wilderness visitors are required to bury their body wastes in "catholes" at least 6 inches below the surface, at least 100 feet from lakes, streams, trails and campsites.

Sometimes the "catholing" system does not work well for large groups, particularly those who stay for several nights (or longer) in the same spot. NPS trail crews (administrative use) often dig a pit toilet when they are stationed for several weeks at one spot. The site is rehabilitated when they leave.

What Concerns Have Been Raised?

Human waste in the wilderness has created a sanitation problem in some areas such as Guitar Lake. Improper burial of human waste and digging by animals have led to exposure of toilet paper and feces. In areas above timberline, it may take years for feces to decompose. Some feel that toilets should be constructed in areas of heavy use to serve the high visitor demand and protect aquatic resources. The ecological impacts of a properly sited toilet are reversible and don't greatly harm the functioning of natural systems (Hammit and Cole 1987).

Others feel a toilet is an intrusion and detracts from the wilderness experience. They feel that visitor use should be regulated such that toilets are not needed. Lee (1975) found that in Yosemite National Park, facilities such as toilets detracted more from enjoyment of backcountry campsites than did other impacts, such as ecological impacts. Nationwide, attitudes toward toilets vary by area with perceived need and with local practice (whether or not toilets have become established in a given area) (Stankey and Schreyer 1987). Toilets may tend to concentrate campsite use and related impacts. Some types of toilets, such as composting toilets, require considerable maintenance. Some types of toilets do not work well at high elevations and cold temperatures. Some suggest having toilets only in heavily used

camping areas one night's travel from the trailhead, at low elevations where there is adequate natural screening.

Regarding water quality, studies of alpine lakes in Kings Canyon National Park (Silverman and Erman 1977) showed insignificant levels of coliform bacteria. In Kings Canyon, only 10% of the water samples had positive total or fecal coliform, and at most only 2 colonies/ml per sample. Fecal streptococci levels were higher than coliform (52% positive samples and a maximum count of 8 colonies/ml per sample), implicating wildlife as the source. Even in areas of dispersed use there may still be background levels of fecal coliform and streptococci present in water sources, often from wildlife.

Proper siting of toilets, however, is important. If pit toilets are located on shallow soils and near water, they can be a source of coliform bacteria and associated pathogens.

While intestinal pathogens may persist for years, proper burial of human waste will reduce the chances that wildlife or insects will come into contact with feces and spread disease. A requirement to bury waste 100 feet from water sources often results in variable perceptions of that distance; some suggest a 200 feet setback as a more effective way to ensure adequate distances are achieved.

Where toilets are not present in high use areas, there is a recurring problem of exposed human waste and toilet paper. In areas of decomposed granite (where soil is limited), human waste is frequently left under rocks and discovered by future parties. Visitor education may be a long-term solution since it is helping somewhat, but it is not working in the short-term.

Some have suggested a pack-out of human waste in high-use alpine areas. This would require both a means of transport from the site and disposal at the trailhead. Such a system is currently implemented in areas such as Mount Rainier National Park. Some groups currently use portable toilets and transport the waste to suitable lower elevation sites where it is buried. Many support packing out toilet paper regardless of whether a pack-out of human waste is implemented.

Some feel that the problem of human waste should be dealt with via the trailhead quota system. The amount of use in a particular area could be indirectly regulated through this system, since these quotas were determined based on impacts within a given travel zone and with consideration of where visitors to a certain area began their trip.

Choices

1. **Problems will be dealt with on a case-by-case basis.** When an area shows human waste problems, a proposal for a toilet will be made to the Park Environmental Management Committee, who will evaluate the need and ensure compliance with the National Environmental Policy Act. The type of toilet may vary (pit toilet, solar toilet, composting toilet) depending on the nature of the area. In all cases, the type and size of toilet chosen will be that which has the least visual and resource impact. **The option of reduced use levels is considered** as part of this process. (status quo)

2. **To meet visitor demand in all areas of high use, toilets will be installed. Reduction of visitor use in the area will not be considered.** The type of toilet may vary (pit toilet, solar toilet, composting toilet) depending on the nature of the area. In all cases, the type and size of toilet chosen will be that which has the least visual and resource impact.

3. To meet visitor demand, **toilets will be constructed in areas of high use where rock is predominant and soil is at a minimum. In high-use areas where soil is abundant, toilets will not be constructed and use will be regulated** at levels that sanitation problems do not exist.

4. To meet visitor demand, **toilets will be constructed in areas of high use where soil is abundant. In areas of high use where rock is predominant and soil is at a minimum, toilets will not be constructed and use will be regulated** at levels that sanitation problems do not exist.

5. **Use levels will be managed throughout**

the wilderness so that toilets are not necessary. When an area shows human waste problems, steps will be taken to modify use patterns in the area.

6. **No toilets** (primitive or sophisticated structures) will be permitted **within cross-country areas within the wilderness, but may be allowed in other areas. If sanitation problems occur, use will not be regulated and education will be used to remedy the situation.**

7. **No toilets** (primitive or sophisticated structures) will be permitted at all **within the wilderness. If sanitation problems occur, use will not be regulated if sanitation problems occur and education will be used to remedy the situation.**



6. Trails

Summary

Trails within the Sequoia-Kings Canyon Wilderness are currently classified as "maintained" or "unmaintained". Despite these classifications, both are actually maintained, although the maintenance interval and level of maintenance varies. Further, not all trails within each category are maintained to the same standard. Current trail maintenance depends largely on funding and availability of crews. Some abandoned trails and cross-country routes fit into neither category, but are used to the point where erosional damage occurs following spring runoff or during heavy rains. If trail maintenance does not match use levels or types of use, resource problems result.

The public has also expressed a desire for a greater variety of trail experiences than currently exist. Trails open to stock travel were initially designated in the Stock Use and Meadow Management Plan (USDI 1986), but since that time a large portion of the public has expressed a desire that trails be established that provide different kinds of experiences for different user groups.

Current Situation

There are currently two formal classifications of trails: "maintained" and "unmaintained" (USDI 1986). "Unmaintained" trails include "pass-through" trails that are open to stock travel, but use of associated forage areas is prohibited. (Appendix 1 presents a list of all trails.)

695 miles of trails within the Sequoia-Kings Canyon Wilderness are classed as "maintained" and are maintained to a high standard. Regular trail maintenance includes removing rocks and downed trees, clearing brush, constructing and cleaning water bars, filling washed-out trails, and repairing bridges. Along these corridors revegetation projects are done to eliminate multiple trails that have developed. The quality of "maintained" trails depends on terrain, the amount of use and the weather in that area.

"Maintained" trails consist of two types: those trails that were surveyed, engineered, and constructed; and those trails that were never designed, but have been maintained to a high standard and provided with appropriate erosional control. The latter do not sustain use nearly as well as those of the former type.

Thus, while both the faint (and often boggy) trail up the Big Arroyo and the highly engineered trail to Kaweah Gap from Hamilton Lake are classified as "maintained" trails, the experience one gets on each type of trail is quite different.

Trails classified as "unmaintained" are seldom maintained largely due to lack of funds and low frequency of use. Since these trails are irregularly maintained, they cannot support consistent use, nor can they support regular stock use. In order to provide a more primitive and unconfined type of experience these trails are not maintained except in situations where erosion potential exists. Some of these trails may be maintained as resources (trail crews, time and money) become available. Because maintenance of these trails is uncertain, they are in varying conditions. Their lower maintenance priority results in resource damage, typically from erosion. There are no criteria for determining if one of these

trails will be maintained, and if so, to what standard.

The primary guiding standard for trail maintenance within the Sequoia-Kings Canyon Wilderness is one of environmental integrity. Problems and projects are approached from an environmental perspective which allows natural processes to prevail. Standards for trail construction techniques are presented in the park Trail Handbook (Griswold 1991).

The majority of all wilderness stock use occurs on the maintained trail system in the Sequoia-Kings Canyon Wilderness. To a lesser degree, stock use occurs on unmaintained trails and in off-trail areas, as permitted by regulations.

Three types of "off-trail" stock travel occur at present. First is traditional use of undeveloped routes (e.g., Ferguson Creek, Upper Goddard Canyon). Second is cross-country travel to infrequently visited destinations. Third is use of trails removed from the maintenance inventory (e.g., Shepherd Pass, Sixty Lakes Basin, John Dean Cutoff) (USDI 1986). Current regulations (36CFR 2.16 (b)) require that the Superintendent designate areas and trails that are open to stock travel; these were so designated in the 1986 Stock Use and Meadow Management Plan, and are included in Appendix 1. Trips with stock to areas not open to off-trail travel may be allowed. Approval for such trips is at the Superintendent's discretion.

What Concerns Have Been Raised?

Public scoping revealed that many people desire the establishment of trails that provide different kinds of experiences for different user groups. One way of doing this is to have

separate trails for different user groups in some areas. Another way is to vary the level of maintenance on different trails, since this is a factor in visitor experience.

In general, maintaining trails to support hikers and stock require different standards. Overhead clearance, width of trail corridor, and durability of trail tread will vary, as will the magnitude of structures such as bridges. But if trails are not maintained to a certain standard, they will not be able to sustain long-term or heavy use, and will require more frequent maintenance. If a trail is maintained to a high standard, it can withstand extensive long-term use by all users but it will also attract more use. Concern has been expressed that the trails within the National Parks and the trails they connect with on the surrounding National Forests should be maintained to similar standards. Such consistency prevents the wilderness traveler from having an abruptly different experience upon reaching the Sierra crest and facilitates travel across agency boundaries.

There is not a consistent policy of which trails (other than those designated "maintained") will be maintained, and to what standard, within the Sequoia-Kings Canyon Wilderness. A network of trails designated "unmaintained" is maintained as resources (trail crews, time and money) become available. To provide a more primitive and unconfined type of experience these trails are generally not maintained except in situations where the system presents a potential source of degradation of the natural resources.

Some commercial stock operators have shoveled passes clear of snow in the spring to allow earlier entry into certain areas. Sometimes the shoveling involves taking gravel or dirt from nearby areas and putting it on the snow to hasten melting. This practice can disturb vegetation, particularly in slow-growing alpine areas. Doing so has resulted in entry by stock into areas with wet trails and saturated meadows that are not yet open to grazing. Some feel

that shoveling of passes should be continued in order to serve their clients. Others feel that over-snow travel, waiting for the route to be established to the trail tread, is the best way to protect the resources in these fragile areas.

Some people feel that abandoned trails should be closed to use due to recurring resource damage. Some feel that a further step should be taken to obliterate the trail and restore the area. Others feel that abandoned trails should be open to limited use, but a minimal amount of stabilization should be done to prevent erosion.

Inevitably, trails begin to form along cross-country routes when groups do not disperse as they travel. Education and subtle, creative management are needed to prevent new trail formation. Some feel that in highly used cross-country areas, such as in parts of Dusy Basin and Palisade Basin, one carefully selected and well-cairned route should be marked to prevent multiple trailing. Others feel that certain areas should be designated as "trailless", and that visitor use should be managed at levels such that impacts from multiple trailing do not occur in these areas. Use would have to be quite light and dispersed in these "trailless" areas to be effective.

Some feel that cross-country travel should be restricted by terrain and the experience or qualifications of the visitor, and that any user should have the opportunity to try any cross-country route he/she desires.

Another view is that some cross-country areas should be accessible only when visitors are accompanied by a guide, similar to the system in place in the Galapagos Islands and other highly sensitive ecological areas.

Some feel that while three types of "off-trail" travel have been considered in the current Stock Use and Meadow Management Plan, a fourth type---"off-trail" travel to nearby forage areas, should also receive attention. Stock are often set free once a party arrives in camp, and it is not uncommon for these animals to wander several miles in search of food. "Off-trail" travel by stock can result in trampling of vegetation, ground disturbance, and deposition of manure in water supplies. Concern has been raised that education efforts have thus far been limited in their effectiveness in preventing these impacts.

Choices

A) How many categories of trails (and levels of trail maintenance) should there be?

1. Continue the current situation. There will be **two** major categories of wilderness trails. Those trails designated "maintained" will be maintained to a high standard. Those trails designated "unmaintained" will be worked on only periodically, if at all. (status quo)
2. There will be **two** major categories of wilderness trails. Those trails designated as "maintained" will be maintained to a high standard. Those trails designated "unmaintained" will be worked on only periodically, if at all, to correct resource problems.
3. There will be **two** major categories of wilderness trails. Those trails designated as "maintained" will be maintained to a hiker-passable standard. All wilderness trails designated "unmaintained" will be worked on only periodically, if at all, to correct resource problems.
4. There will be only **one** category of wilderness trails. All wilderness trails will be maintained to a high standard. Those trails currently designated "unmaintained" will be maintained regularly, and to a high standard.
5. There will be **three** categories of trails. Those trails designated as "maintained" will be maintained to either a high standard or to an intermediate (hiker-passable) standard. All wilderness trails designated "unmaintained" will be worked on only periodically, if at all, to correct resource problems.

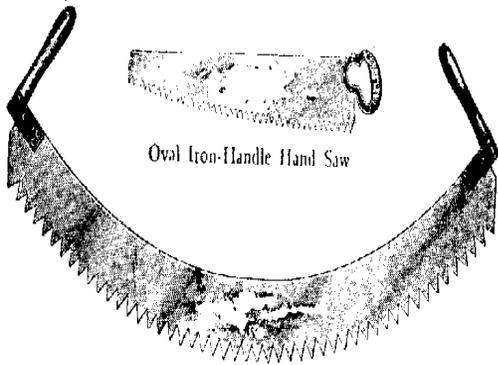
B) What criteria should be used for selecting trails within each category?

1. Continue the current situation. Use the system of trails within each category as identified in the 1986 Stock Use and Meadow Management Plan. (status quo)
2. Identify trails for each category based on current use patterns.
3. Determine desired conditions and management goals for particular portions of the Sequoia-Kings Canyon Wilderness, and mesh the categories of trails with different desired conditions for different areas.

C) How should use be allocated for the different categories of trails?

1. Stock parties and hikers will be allowed on all "maintained" and "unmaintained" wilderness trails with no restrictions in party size beyond those currently in place. (status quo)

2. Stock parties and hikers will be allowed on all "maintained" and "unmaintained" wilderness trails, but only stock parties of 6 or fewer animals will be permitted on "unmaintained" trails.
3. Stock parties and hikers will be allowed on all "maintained" trails; only hikers will be allowed on "unmaintained" trails.
4. "Unmaintained" trails will be open only to hikers with no restrictions in party size beyond those currently in place. Some "maintained" trails will be open only to hikers; others will be open to both hikers and stock parties; some will be open only to stock parties.
5. Some "maintained" trails will be open only to hikers; others will be open to both hikers and stock parties; some will be open only to stock parties. Only hikers will be allowed on "unmaintained" trails.
6. Stock parties and hikers will be allowed on all wilderness trails. Those trails currently designated "unmaintained" will be maintained regularly and open to stock parties and hikers with no restrictions in party size beyond those currently in place.
7. Hikers will be allowed on all "maintained" and "unmaintained" trails. Stock parties will not be allowed in the wilderness.



7. The "Minimum Requirement"

Summary

In managing wilderness, NPS policy mandates that the "minimum requirement" concept be used. The National Park Service is directed to select the minimum tool or administrative practice necessary to successfully and safely accomplish the management objective with the least adverse impact on wilderness character and resources (USDI 1988). Applying the minimum policy, device, force, regulation, instrument, or practice to bring about a desired result uses the most "light handed" approach (Hendee, Stankey and Lucas 1990).

Administrative use of motorized equipment or mechanical transport is allowed within wilderness if it is considered the minimum requirement necessary to achieve the purposes of the area, or in emergency situations involving human health or safety or the protection of wilderness values. Potential disruption of wilderness character and resources and applicable safety concerns must be considered before, and given significantly more weight than, economic efficiency. If some compromise of wilderness resources or character is unavoidable, only those actions that have localized, short-term adverse impacts are acceptable (USDI 1988). Determining the "minimum requirement" is difficult. Decisions must be well-justified and documented.

Current Situation

The "minimum requirement" is determined informally through the Parks' Environmental Management Committee and/or by the appropriate supervisor. A formal decision-making process ("decision tree") to evaluate options and determine the "minimum requirement" is lacking. Selection of the "minimum requirement" is sometimes made without examining the full ramifications that may result. Decisions are sometimes made for the short term and without considering the "minimum requirement."

What Concerns Have Been Raised?

To some, primitive tools and methods equate to the "minimum requirement", or "minimum tool". Practicing primitive wilderness skills enable work crews to preserve a tradition of using the tools (double-bit axe, crosscut saw, and pack string) of the pre-motorized, or pioneering era. In deciding the minimum tool, such as between using a crosscut saw and a chain saw, or between using a helicopter and using stock, however, there are tradeoffs. As a result, primitive tools are not always the minimum tools. The decisions are never simple or clear-cut. Blasting of large trees, seen by some as inappropriate within wilderness, occasionally may be viewed as the "minimum tool", since blasting leaves a more natural look than the marks made by either type of saw.

Decisions should not be based on cost or convenience within wilderness, so choosing the minimum tool is difficult. Some people feel that in portions of the wilderness, higher "minimum tool" standards should be applied than in other areas. Some feel there should be more formal oversight on administrative activities within wilderness.

In considering those actions "necessary to meet

minimum requirements for the administration of the area for the purpose of this (Wilderness) Act (including measures required in emergencies involving the health and safety of persons within the area)", much more is considered than "tools" in the literal sense. In assessing the "minimum requirement", evaluation is made of: the presence of backcountry ranger stations (and accompanying support structures such as unobtrusive toilets and solar panels), research projects within wilderness, bridges (and the materials of which they are constructed), signs (including the type of information and/or mileages), and the manner in which regulations are applied to wilderness visitors.

In recent years, for example, some wilderness visitors have not assumed personal responsibility for their actions and searches/rescues have resulted. Relying on a cellular phone is irresponsible; cellular coverage in much of the Sequoia-Kings Canyon Wilderness is undependable. Many people feel that if groups must take their safety net with them in the form of electronic technology, perhaps these groups are ill-prepared to tackle a wilderness trip. The NPS will not seek to provide "service" (such as transmitters or dishes) to cell phone users while in the wilderness; many people feel it would be inappropriate for the agency to do so.

One example of applying the "minimum requirement" is deciding if trail signs should be placed within wilderness, and if so, determining where and how they should be placed, the materials of which they should be made, and the extent of the information they should contain. Some feel trail signs should be primitive, made of natural material (wood) that blends in with the surroundings, and placed on wooden posts. Wooden signs, however, are easily vandalized or damaged by natural events, and require frequent replacement. Metal signs and signposts are more durable and require less maintenance, therefore

less resource impact from fewer extended trips into the wilderness for sign replacement and repair. Some feel that signs should be placed at junctions of maintained trails, and that the information included should include mileages. Others are bothered by sometimes inaccurate mileages (occasionally the result of trail relocations), and feel that each time a trail is modified, new mileage signs should be made and installed. Others feel that sign wording should be limited to general natural features, and that the wilderness traveler should learn to rely more on reading topographic maps and similar primitive navigational skills, rather than following from sign to sign without knowing where they actually are. Some feel that visitors should be prevented from getting lost if at all possible, that becoming disoriented is not a part of a wilderness experience. They feel it is the agency's responsibility to ensure that wilderness visitors find their way safely; others feel that an important component of wilderness travel is self-reliance and adventure.

Some feel that visitor use should be controlled to minimize intervention and application of the "minimum requirement". An example of this might be to temporarily close a trail with many large fallen trees (such as following a heavy snow year) until it has been cleared, to reduce impacts from hiking or riding around such obstacles in early season. Others feel that restrictions of any sort, temporary or permanent, infringe on personal freedom and are not the "minimum requirement"..

Choices

A) How should the "minimum requirement" be determined?

1. When a project or activity is proposed that may require mechanized equipment or motorized access, an evaluation of the **necessity** of that project or activity must take place. If it is determined that this project or activity is the minimum to achieve the purposes of wilderness management, then an evaluation will be made of the **least impacting method to accomplish the project or activity**. Mitigation strategies (such as timing of use) will be developed and implemented. This policy would apply to all areas within the Sequoia-Kings Canyon Wilderness. (status quo)
2. Continue status quo as in #1, but with a more formal process to evaluate proposals for projects or activities within wilderness.
3. Continue status quo as in #1 except in **designated areas where no motorized equipment or mechanical access** will be used except in emergency situations.
4. Continue status quo as in #1 except that the "minimum requirement" will be that which results in the **least impact**, with consideration given to both the short-term and long-term.
5. **Only primitive tools** will be used throughout the Sequoia-Kings Canyon Wilderness. Motorized equipment or mechanical transport will not be used except in emergency situations.

B) As you have probably discovered in reading through this workbook, many of the issues are interrelated. There are many applications of the "minimum requirement" concept, including consideration of trail signs, bridges, toilets, etc. Signs are currently placed to protect wilderness resources and for visitor safety where necessary. As an example of deciding the "minimum requirement", what do you think is the appropriate function of signs within the wilderness?

1. Continue the current situation. Signs will be made of metal, placed at junctions of maintained trails, and provided with directional arrows and mileages in most cases. (status quo)
2. Signs should contain **more information** to serve the wilderness visitor, including **elevation**. Signs will be made of metal, placed at junctions of maintained trails, and provided with directional arrows and mileages.
3. Signs should be made of **metal**, placed at junctions of maintained trails, and provided with directional arrows, but should point only to natural features and should not contain mileages.

4. Signs should be made of **wood**, placed at junctions of maintained trails, and provided with directional arrows and mileages in most cases.
5. Signs should be made of **wood**, placed at junctions of maintained trails, and provided with directional arrows, but should point only to natural features and should not contain mileages.
6. Directional trail signs are unnecessary. There should be **no signs** within the wilderness, except temporary signs for resource protection.

Below are two scenarios. Please indicate what and how you would decide.

Scenario #1. It has been a year where there are a large number of trees across many of the trails. Opening the trails could be done by crews with crosscut saws or chain saws.

If the trails are opened with a crosscut saw, the following will result:

Primitive skills will be preserved. There will be an opportunity for visitors to observe primitive skills at work. This may enhance their wilderness experience. Crews using these skills will preserve a wilderness heritage of those who maintained trails in times past. Crews will take longer to clear trails, resulting in more impact as visitors walk or ride around trees that have not yet been cut. Since crews will be in the area longer, there is more need for supplies (and need for resupply). Because more time will be needed to clear trails, less time will be available to work on other major projects (e.g., a bridge destroyed from winter flooding, repair of erosional damage to a trail on a steep pass caused by intense spring rains, etc.).

If the trails are opened with a chain saw, the following will result:

Trails will be cleared quickly. Access will be provided to visitors earlier. Less resource damage from walking or riding around trees will result. Because trails will be cleared more quickly, there will be more time to complete other projects. Both the bridge project and the trail on the steep pass will be worked on. Because a chain saw will be used, noise will be more widespread, at a higher volume, but of shorter duration than if hand tools were used. Visitors may sense a feeling of technology in the wilderness, and this may adversely affect their experience. However, if work requiring a chain saw is prioritized for early season, few visitors will be affected by noise.

What would you choose to do? Why?

Scenario #2. A trail crew is doing work along the John Muir Trail in a fragile alpine area. The project is to relocate the trail from the edge of a very wet meadow. This is one of the park's top priorities for the summer, and they have a short time in which to get the work done. Stock parties and hikers are calling the park each day to check on the status of the trail because, until the work is completed, the trail will be impassable. Their project site is 2 days from the nearest trailhead by foot, 1-1/2 days by stock, and 30 minutes by helicopter. The work has gone slower than expected, and the crew needs to be resupplied.

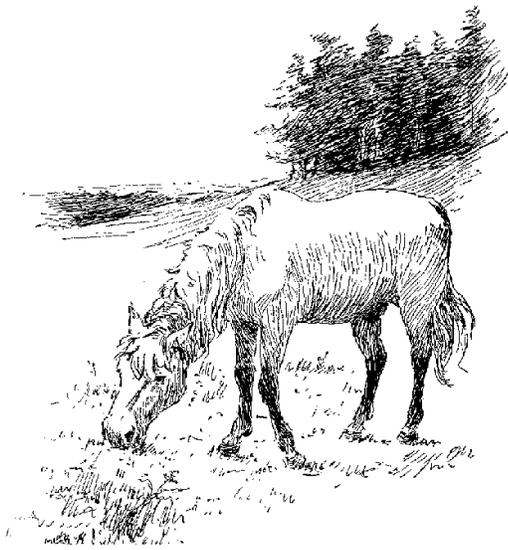
If you resupply by stock, the following will result:

Primitive skills will be preserved. There will be an opportunity for visitors to observe primitive skills at work. This may enhance the wilderness experience of visitors. Resupplying by stock will preserve a wilderness heritage of those who have used pack stock to perform trail maintenance. More time will be involved in doing the resupply. The impact of stock along the trails, and in the area of the fragile alpine meadow, will be increased. Some visitors will find the increased stock in the area objectionable.

If you resupply by helicopter, the following will result:

There will be noise from the helicopter. Some visitors will find the sight and sound of aircraft objectionable. Less time will be involved in doing the resupply. There will be less impact to natural resources on the ground.

What method would you choose? Why?



8. Meadow Management and Stock Use

Summary

Public scoping revealed disagreement about the goals of meadow management within the Sequoia-Kings Canyon Wilderness. Some feel that continuation of the historical use of meadows by packstock is an important part of the wilderness experience, and that grazing restrictions constrain personal freedom (also an important component of the wilderness experience). Some people feel that grazing is acceptable, but resource preservation should be the primary goal of meadow management.

Others feel that meadow preservation, both in the long-term and short-term, is important for ecological and aesthetic reasons and both should be considerations in determining grazing levels. Others view grazing as a consumptive use and feel it is inappropriate within wilderness.

Background

The recent human history of these parks and that of stock use in the Sierra Nevada are inherently interconnected, beginning with the

advent of intensive livestock grazing in the mid-1890s and continuing through the present, with the current use of pack and saddle stock for recreational and administrative use. The advent of grazing began when large numbers of domestic sheep and cattle were first brought to the area of these Parks during the great drought years of 1862-1864 (Burcham 1957). This marked the beginning of a 40-year period of heavy, unregulated use, during which time virtually all of the areas now included within the Parks that were accessible to sheep or cattle were grazed. With establishment of these parks during the period 1890-1940 (Strong 1968), grazing by sheep and cattle was virtually eliminated.

Recreational use of pack and saddle stock on land now included within these parks also predates their establishment. Early visitors to the region, from the cavalry troops first sent to patrol these parks to the large Sierra Club outings of the early 1900s, relied heavily on packstock in order to travel in the backcountry. Use of pack and saddle animals for recreational purposes increased steadily after World War I and peaked in the 1930s (Loughman 1967). Following a decline in the 1940s, use increased in the early 1950s only to decline again through the early 1960s (Briggle et al. 1961). This decline coincided with an increase in backpacking during the 1960s and 1970s, after which pack and saddle stock use leveled off to the amount we see today.

Current Situation

Meadows, including woodland meadows, forest grasslands, and alpine vegetation, are important and attractive resources within the Sequoia-Kings Canyon Wilderness. They are

also relatively scarce: within the two parks, less than 2% of the land area supports meadow vegetation. Meadows contain a rich diversity of plants and animals, and some of the meadow fauna is dependent on meadow flora for cover and food. Many meadows are jurisdictional wetlands that support aquatic communities. As meadows and their surroundings frequently serve as principal destinations for wilderness travelers, they become a focal point of the wilderness experience. For those who ride and/or pack into the wilderness, these areas also provide forage for their stock.

Stock use levels vary with the persistence of the snowpack each year, but have been fairly constant when averaged over the last 20 years. Comparing use levels recorded prior to establishing the 1986 Stock Use and Meadow Management Plan (1976-1985) with those from the following decade (1986 to 1995), use levels for the first decade totaled 106,710 stock use nights; for the period from 1986-1995, use totaled 101,008 stock use nights. Current use is about one third of the level of the early 1950s, and is about one sixth of the peak levels reported in the 1930s. In 1996 this use was broken down as follows: 54% commercial use, 32% administrative use, 14% private use (Schelz 1996).

The 1986 Stock Use and Meadow Management Plan is the primary document that currently guides stock use within Sequoia and Kings Canyon National Parks. This plan identified the use of pack and saddle stock as a traditional, historically and culturally significant, and legitimate activity within the backcountry of these parks. The plan also recognized that some disruption of natural ecosystems and processes by these animals was an inevitable consequence of their presence in the backcountry. Although many park meadows are open to grazing, there are

some areas that are permanently closed to stock because of heavy visitor camping use, small size, research purposes, or relative sensitivity. In other areas, stock are permitted but feed must be packed in. All park meadows open to grazing are subject to seasonal opening dates, which are determined according to soil moisture conditions. While a few exceptions exist, in most cases there are no regulations concerning the maximum grazing nights per meadow.

While use has remained fairly constant in the last 20 years, varying only with the type of snowpack year, several trends have become apparent. Modern recreational use and its associated impacts are more localized than historic livestock use. Stock groups repeatedly use the same meadows and campsites. As a result, some meadows open to grazing receive little or no use and others are receiving impacts sufficient to necessitate temporary use restrictions. Administrative and recreational stock use is sometimes concentrated in order to deflect use from more sensitive sites. This practice results in a small number of very heavily impacted meadows within the wilderness area. At the present time, restrictions only are imposed after damage has occurred.

What Concerns Have Been Raised?

Sierra Nevada meadows have been extensively studied (Ratliff 1985; Ratliff 1987), with research showing that meadows are complex ecosystems, varying widely in character and composition (Benedict and Major 1982; Ratliff 1982). Meadow systems also vary in their sensitivity to impact and in their ability to recover. In some cases, human and stock impacts on meadow ecology are quite obvious; in many cases, however, these impacts are more subtle. Even when grazed meadows are healthy and productive, removal of forage by stock diverts nutrients and

energy from the natural system, depriving native decomposers and herbivores (including, but not limited to, insects, rodents and large mammals such as deer and bear), and the predators that feed on these herbivores, of essential resources.

The Parks' Stock Use and Meadow Management Plan (USDI 1986) recognized these effects of pack and saddle stock: removal of vegetation which may affect plant vigor, reproduction, and ultimately, density and composition; displacement of native animals; trampling of vegetation and underlying soils, particularly in wet meadows (trampling changes water quality by muddying, damages plants, and can produce significant detrimental erosional effects such as damage to streambanks and changes to meadow drainage patterns); and deposition of stock urine and feces on trails, in streams, and near camps. Horse manure can also introduce non-native plant species that can quickly become established along trails and in meadows. Drift fences that are required for control of stock, although useful for protecting some sensitive areas and for keeping animals from wandering into camp areas, are viewed by some as a compromise of wilderness values.

Some people feel that existing regulations do not adequately prevent or mitigate impacts on wilderness meadows. For example, many Sierra Nevada meadows are technically wetlands that are subject to regulation under section 404 of the Clean Water Act, and concern has been raised that they should be afforded appropriate protective measures. Concern has also been raised regarding the ability of high elevation meadows to sustain current levels of grazing. The shorter growing season and more stressful environment found at high elevation results in naturally less productive meadow systems. A

useful indicator of meadow function is residual biomass, the amount of above ground plant material remaining in a meadow at the end of the growing season. Data from residual biomass monitoring of 34 meadows in Sequoia and Kings Canyon National Parks show that biomass production decreases markedly with increasing elevation (Schelz 1996). At elevations above 9,780 feet, residual biomass averaged only 375 lbs./acre (about 4 stock nights per acre per season). These meadows are small (most are less than 2 acres), and receive little use. The use they do receive, however, causes substantial impacts and the feed is exhausted quickly. Some feel that sensitive high elevation, low productivity meadows should be closed to grazing, with day trips to these areas encouraged as the minimum impact alternative.

Others believe increasing stock use regulations is unwarranted since use levels have not increased and resource impacts have not been clearly demonstrated. To this group, each restriction is then seen as an infringement on personal freedom within wilderness. Some would rather see an increase in educational efforts and voluntary implementation of minimum impact techniques by stock users as opposed to increased regulation in order to protect resources. Still others feel there is a need for regulating use of the meadows open to grazing at sustainable levels---balancing both meadow integrity and grazing by stock. Concern has also been expressed regarding the lack of a formal methodology for re-evaluating temporary meadow closures, to ensure that these closures do not become permanent and thus result in additional use restrictions.

Many popular meadows are currently receiving use in excess of their estimated capacity to support grazing. From 1993-

1996, reported use of 14 of 34 meadows monitored exceeded estimated grazing capacity (Schelz 1996). To some, this condition is acceptable. Others suggest that many heavily grazed meadows are being treated as "sacrifice areas", and that this is inappropriate within wilderness. On National Forest Service lands, utilization guidelines target sustainability of maximum forage production. Some believe that if similar standards were applied to park wilderness meadows, the meadows would remain healthy and appear aesthetically appealing in perpetuity. Others feel meadow management goals within the Sequoia-Kings Canyon Wilderness should be more restrictive, with an emphasis on meadow health and the maintenance of natural processes. Still others feel that use restrictions are unnecessary since some human and stock impacts are an acceptable part of the wilderness experience.

Grazing impacts also raise aesthetic concerns for many people. The unnatural appearance of meadows grazed by stock and related impacts affect the wilderness experience of visitors (Watson 1993). Some feel the current management system gives inadequate attention to the aesthetic aspects of the wilderness experience. Wilderness contains many basic resources—air, water, wildlife, soil and vegetation—but what makes wilderness unique is the setting that ties these basic resources together. Varying levels of grazing in wilderness meadows results in changes in the perception of wilderness qualities. Others feel that aesthetic values are inherently qualitative and subjective and therefore cannot be measured.

Given that it is not possible to allow grazing in wilderness meadows without sustaining environmental impacts (Archer and Smeins 1991), we must determine in which meadows grazing should be allowed to occur, and at

what level use can be sustained without resulting in unacceptable impacts. Although the Wilderness Management Plan will supersede the 1986 Stock Use and Meadow Management Plan, meadows set aside under the 1986 plan will remain closed. These continued closures are necessary to provide a baseline against which to measure change, or to protect sensitive areas.

The Wilderness Management Plan will then provide guidance and future direction for meadow management. Recognizing that there are fundamental philosophical differences in the goals of meadow management, we have developed the following choices, which represent a range of conceptual approaches to managing meadow use. In this context, the concept of grazing capacity is offered in a broad, ecologically based sense. We define grazing capacity as the amount of grazing and associated impacts a meadow may sustain without exhibiting unacceptable changes in ecosystem structure or function.

Choices

A) Grazing capacity:

1. Meadow use will continue to be managed as described in the 1986 Stock Use and Meadow Management Plan. When use of a particular meadow or area results in unacceptable damage to the resource, actions will be taken, including restriction of use. Meadows that are temporarily closed, however, run the risk of staying closed for lengthy periods to allow rehabilitation as action is not taken until unacceptable damage has occurred. By waiting until unacceptable impacts have occurred, however, the possibility of irreversible damage emerges as does the potential for loss of species. The goal of this approach is to keep meadows open to the maximum amount of use possible until unacceptable damage occurs. (status quo)
2. Meadow use will be managed using grazing capacity as the basis for implementing use restrictions. Grazing capacities for each meadow will be set based on the best scientific data available and will take into account sustainability of the diverse biotic and abiotic factors that contribute to the structure and function of native meadow communities. Use will be allowed up to the **maximum** grazing capacity of a specific meadow. If conditions indicate overgrazing, the meadow will be temporarily closed to allow for recovery. The goal of this approach is to allow the maximum amount of use while preventing irreversible changes in ecosystem structure and function.
3. Meadow use will be managed using grazing capacity (see above) as the basis for implementing use restrictions. Use will be limited to **25-35% of the maximum** grazing capacity of a specific meadow. The goal of this approach is sustainability of both meadow resources and foraging by stock. Use will be tracked in real time and permits allocated accordingly.
4. Meadow use will be managed using grazing capacity (see above) as the basis for implementing use restrictions. Use will be limited to **15-25% of the maximum** grazing capacity of a specific meadow. The goal of this approach is sustainability of meadow resources while providing for more conservative levels of foraging by stock. Use will be tracked in real time and permits allocated accordingly.
5. All meadows will be closed to grazing by stock. All feed must be packed in, all the time.

B) If a meadow management system based on grazing capacity is implemented, the following have been offered as ways to allocate use:

1. Use would be allocated as described in the 1986 Stock Use and Meadow Management Plan. Permits would be issued for overnight use, but specific meadow use (except in special cases) would not be limited or otherwise regulated. (status quo)

2. Permits would be issued for overnight use, and for use of specific meadows by stock parties. This would entail a real-time method of tracking use. If the capacity of a meadow were reached, that meadow would be closed for the remainder of the season and stock users redirected to other lesser used sites.

3. Permits would be issued for overnight use, and for use of specific meadows by stock parties. Allocation of permits would be based on percent of historical use: commercial, administrative and private. These figures would be determined prior to the beginning of the summer season. Once the number of permits for each group had been exceeded, no further trips by that group would be allowed for the season.

4. Permits would be issued for overnight use of specific meadows by private stock parties, based on the estimated grazing capacity of each meadow. Commercial users would also be issued permits, but would be required to pack in all feed.

C) High elevation, low productivity meadows:

1. All high elevation, low productivity meadows will continue to be managed as described in the 1986 Stock Use and Meadow Management Plan. When use of a particular meadow or area results in unacceptable damage to the resource, actions will be taken, including restriction of use. Meadows that are temporarily closed, however, run the risk of staying closed for lengthy periods to allow rehabilitation, as action is not taken until unacceptable damage has occurred. (status quo)

2. All high elevation, low productivity meadows would be open to grazing for a limited number of animal nights. Use would be tracked in real time and meadows would be closed when grazing capacity was met.

3. All high elevation, low productivity meadows would be closed to grazing. Stock users would be required to carry feed into these areas.



9. Integration of Commercial Use with the Wilderness Permit System

Summary

A perceived inequity exists in the wilderness permit system as it relates to commercial use.

Commercial pack stations are guaranteed of getting wilderness permits under the current system, but all other commercial operators, private stock parties and private hiking parties must compete for available space within the trailhead quota system.

Current Situation

Wilderness-oriented commercial services that contribute to achieving public enjoyment of wilderness values or that provide opportunities for primitive and unconfined types of recreation may be authorized if they

meet the "necessary and appropriate" tests of the Concessions Policy and Wilderness Acts and if they are consistent with the park's wilderness management objectives (USDI 1988). Commercial services within wilderness will be limited to those identified as necessary and appropriate by the Superintendent, and will be regulated so that the opportunity for visitors to experience the wilderness on their own is not unduly affected.

Commercial operations provide wilderness visitors with the opportunity to accompany an experienced and knowledgeable guide, to learn about the area from people who know it intimately, and to gain an appreciation for wilderness values from people whose love for, and sensitivity to, the environment runs deep.

There are two types of commercial operators: those operating through an Incidental Business Permit or IBP (business is based outside the parks; these were formerly known as commercial use licenses), and those operating through a Concessions Permit (business is based within the parks). Regulation of commercial operations is through the Park Concessions Management Office. The Park Backcountry Management Plan (1986) stated that the number of commercial stock operations offering backcountry operations within these parks would remain at the levels then in place. The 1986 Plan incorrectly reflects current NPS policy. NPS Management Policies (1988) state that there will be no limits on the number of businesses operating through commercial use licenses (now IBPs) as long as they meet the "necessary and appropriate" test. Similarly, there is no limit on the number of backpacking, mountaineering, and

ski touring operations that can be authorized.

Currently, three concessioners operate within the Sequoia-Kings Canyon Wilderness: Cedar Grove Pack Station, Mineral King Pack Station and Wolverton Pack Station. In 1986 there were 12 pack stations operating within Sequoia and Kings Canyon National Parks under commercial use licenses, but based outside the parks. As of 5/20/96, there were 20 pack stations operating through incidental business permits. There were 22 backpacking and mountaineering guide services, and 4 ski touring guide services operating under incidental business permits.

What Concerns Have Been Raised?

A major concern raised during public scoping focused on the equity of the current permit system in regards to commercial use. The 1986 Backcountry Management Plan states: "On days that the trailhead quotas are full, the commercial pack station operator may override the quota for that day since the quotas are structured with the commercial pack station use included." Under the current system, other commercial guide services, however, may not override the permit system.

If the commercial guide services haven't used the reservation system and have opted for getting a walk-up permit, they run the risk of being turned away (and their trips canceled) if the quotas have been filled for the trailhead and dates they desire. They may not override the quota system, as their use was not factored into the existing quotas. The 1986 Backcountry Plan also stated that the proportion of quotas used by commercially guided groups will be continually monitored to assure that visitors have fair access to the wilderness, through either commercially guided trips or do-it-yourself trips.

Several related problems have occurred in recent years. Some commercial operators have failed to get wilderness permits. Some

have not fully reported their use, as evidenced by backcountry ranger observations. Others have failed to submit Stock Use Reports at the end of the season. If the posted trailhead quota numbers were reached on a particular day, a commercial pack station operator could still issue a permit for his/her party, since an allowance for commercial stock use had been made in determining the original quota numbers. These operators thus were not "overriding" the quota system; their historical use had been factored in.

The commercial pack station use figures, however, looked at **total** use for each zone to come up with trailhead quota figures, and reported commercial use was a part of that total use (Parsons 1996). There was thus no need to "double count" the commercial use. The trailhead numbers were then adjusted by averaging commercial use over a three year period (Fodor 1996) to arrive at the trailhead quota numbers now in place. The underlying assumption was that commercial stock use would remain constant over time.

This has not been the case. There are now more commercial packers, both in number and type, operating within these parks, than were operating when the trailhead quota numbers were established. In 1986 there were 12 pack stations operating within Sequoia and Kings Canyon National Parks under commercial use licenses, but based outside the parks. As of 5/20/96, there were 20 pack stations operating through incidental business permits. With an increase in the number of commercial pack stations running trips within these parks in the last decade has come a 34.6% increase in the number of commercial stock nights spent in the backcountry. During the decade from 1977-1986, commercial stock use totaled 44,070 stock use nights. In the following decade from 1987-1996, stock use totaled 53,211 stock use nights. As a percent of total stock

use, commercial stock use shifted from an average of 43.8% in the first decade to 53% between 1987-1996.

The trailhead quota system was developed using campsite impact data as the basis of determining use capacities and trailhead quotas (Parsons 1986). For a quota system based on carrying capacity to work, numbers (and visitor behavior) must conform to certain standards of acceptability. If the numbers are exceeded, unacceptable resource and social impacts can occur.

Permits for some areas are in high demand. Although commercially guided hikers are required to enter the wilderness on the date that space is available within the daily trailhead quota system, the commercial pack stations may enter at any time. Since the greatest demand for permits is on weekends and holidays, use can be concentrated and crowding can result when pack stations write their own permits. The solitude and dispersed use intended through trailhead quotas can thus be diminished. Further, non-commercial hiking parties unable to get a permit can go to a pack station and get one through them by hiring their services. Spot trips are becoming increasingly common.

Some have suggested that allocation of wilderness permits be based on current or historical percentages of use, averaged over a combination of wet, dry and normal years. Others feel that all commercial operators operating through an incidental business permit should be required to fit their trips within existing trailhead quotas. Some commercial pack stations feel they need the assurance of knowing they will have a permit in order for them to have a viable business; other commercial operators say that **all** incidental business permit holders could make this argument. Some people have suggested issuing "service days" to incidental

business permit holders, based on historical (or current) use percentages. This type of system, however, may not adequately address the current (potential) problem of crowding on weekends and holidays. Another system proposed specifically for pack stations involves regulation by the total number of head of stock used over the course of a season rather than service days.

Some feel an incentive system should be developed based on performance of the commercial operator. Such a system could reward additional resource protection efforts beyond those specified in their incidental business permits through an augmentation of the number of permits (or service days) that a commercial operator would be allotted. Others feel that commercial businesses running trips within these parks should be the outstanding examples of Leave No Trace techniques, and that high levels of performance should be a minimum requirement in order to keep their incidental business permits.

Another concern is the issue of consistency between the NPS and the Forest Service regarding commercial use policies. Some feel that better criteria need to be developed for "necessary and appropriate". They feel a coordinated region-wide "Needs Assessment" should be done among different agencies and land management units to determine the acceptable amount of commercial use within wilderness. Some suggest that such a "needs assessment" could also link the amount of commercial use to the carrying capacity of a given area

Choices

How should wilderness permits be allocated to commercial operators with incidental business permits?

1. Continue the current situation. Commercial pack stations are guaranteed of getting a wilderness permit; other commercial operators (those holding an incidental business permit) have to compete for available space within the trailhead quota system. (status quo)
2. Require that **all** commercial operators with incidental business permits compete for wilderness permits within the trailhead quota system. Availability of permits would depend on space available for a particular date and number of people within the party.
3. Set aside a certain number of permits or service days for each commercial operator with incidental business permits each year based on current use percentages. As new businesses received incidental permits, these percentages would be adjusted.



Sequoia-Kings Canyon Wilderness Planning Workbook Response Form

At this point in the wilderness management planning process, we would like you to take a close look at the major issues that have been raised. Keep in mind the stated goals of wilderness management in these parks:

** To manage the Sequoia-Kings Canyon Wilderness for the use and enjoyment of the American people in such manner as will leave it unimpaired for future use and enjoyment as wilderness.*

** To protect and manage the Sequoia-Kings Canyon Wilderness so as to preserve its natural conditions and wilderness character.*

** To gather and disseminate information regarding the use and enjoyment of this area as wilderness.*

** To serve the public purposes of wilderness designation including recreation, scenic preservation, scientific study, education, conservation, and historical use.*

This workbook presented background material and choices on eight different topics that were of interest to people responding to our scoping sessions. In our planning process, we want to consider all the reasonable options that will address the concerns that have been raised. Specifically, we would like to know:

- 1) if there are other concerns about the topics listed that should be considered; and
 - 2) if a choice that you prefer is presented (if not, please indicate what your choice would be).
- These are not the only issues to be addressed in the Wilderness Management Plan, only those provoking the most comments. If you feel there are other major issues that should be addressed, please let us know. For each issue, please identify the concerns you have with the current situation, and give possible ways to address those concerns.

After carefully reading through the workbook, please complete this form. This requires some time on your part. We feel, and hope you do too, that the future of the wilderness in Sequoia and Kings Canyon National Parks is worth a few minutes or hours of your time. Please record your responses on the following sheets. We are very interested in your comments on these topics. If you can think of a better choice than those listed, it is important that you write down your recommendation. You are welcome to attach additional sheets.

The responses to this workbook will contribute to the formulation of the Draft Wilderness Management Plan, which should be ready for public review in late Spring of 1999.

Please return these forms by August 31, 1998 to:

**Wilderness Coordinator
Sequoia and Kings Canyon National Parks
Three Rivers, CA 93271**

Use these sheets in conjunction with the workbook. The numbers under each category refer to the choices presented in the workbook. Circle your preference, if it is indicated. If it is not shown, please circle "Other" and list your preference on a separate sheet of paper.

1. Campfires

A) *General campfire policy:*

1 2 3 4 5 Other

B) *Elevational campfire policy based on different levels of fuelwood availability, campfire impacts and differences in the amount of subfossil wood that would be preserved:*

1 2 3 4 5 Other

C) *Packing in of firewood, charcoal or similar fuels into areas closed to campfires:*

1 2 3 Other

2. Bears and Food Storage

A) *When should counterbalancing of food be permissible?*

1 2 3 4 Other

B) *When and where should food storage boxes be placed?*

1 2 3 4 5 Other

C) *Should the use of bear-resistant food canisters be required?*

1 2 3 4 Other

D) *Should stock parties be required to use bear-proof panniers?*

1 2 3 4 5 Other

E) *Should a 24 hour guard be permitted for protecting food in some cases?*

1 2 3 4 Other

3. Party Size

A) *Variances to party size:*

1 2 3 Other

B) *How party size is determined:*

1 A. Maximum number of people:
 6 8 10 12 15 Other (specify)

B. Maximum number of stock:

_0 _6 _8 _10 _12 _15 _16 _20 _25 _Other (specify)

2 One number: _6 _8 _10 _12 _15 _Other (specify)

3 _6 _8 _10 _12 _15 _20 _25 _30 _35 _40 _Other

4 _12 _16 _20 _24 _30 _40 _50 _80 _110 _130 _Other

C) *Maximum party size for cross-country travel:*

1

2 A. _4 _6 _8 _10 _Other

B. _0 _4 _8 _12 _15 _16 _Other

C. _8 _12 _16 _20 _24 _30 _Other

D. _6 _8 _10 _12 _15 _20 _25 _30

3 A. _15 _16 _20 _Other

B. _20 _25 _Other

4. Camping/Campsites

A) *What should be the criteria for determining if separate campsites for different user groups should be designated/established?*

1 2 3 4 5 6 7 Other

B) *If sites were designated for different user groups, where should they be located?*

1 2 3 4 5 6 7 Other

5. Toilets/Sanitation

1 2 3 4 5 6 7 Other

6. Trails

A) *Categories of trails (and levels of trail maintenance):*

1 2 3 4 5 Other

B) What criteria should be used for selecting trails within each category?

1 2 3 Other

C) How should use be allocated for the different categories of trails?

1 2 3 4 5 6 7 Other

7. The "Minimum Requirement"

A) How should the "minimum requirement" be determined?

1 2 3 4 5 Other

B) Considering the "minimum requirement", what do you think is the appropriate function of signs within the wilderness?

1 2 3 4 5 6 Other

C) Scenario #1 Trail clearing: Hand (crosscut) saw vs. chain saw

Which option would you choose? Why? Are there other possibilities for getting the work done?

D) Scenario #2 Resupplying trail crew: Pack stock vs. helicopter

Which option would you choose? Why? Are there other possibilities for getting the work done?

8. Stock Use and Meadow Management

A) *Grazing capacity:*

1 2 3 4 5 Other

B) *Ways to allocate use if a meadow management system based on grazing capacity is implemented:*

1 2 3 4 Other

C) *High elevation, low productivity meadows:*

1 2 3 Other

9. Integration of Commercial Use with the Wilderness Permit System

Allocation of wilderness permits to commercial operators with incidental business permits?

1 2 3 Other

Additional Comments (attach additional sheets if necessary):

Please return these forms by August 31, 1998 to:

**Wilderness Coordinator
Sequoia and Kings Canyon National Parks
Three Rivers, CA 93271**