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CHAPTER 3

Affected Environment

Location and Setting

The Ansel Adams, John Muir, and Dinkey Lakes Wildernesses are located in the central and southern Sierra Nevada. The entire planning area covers 840,581 acres both east and west of the Sierra Crest. It is contiguous with Yosemite National Park to the north and Sequoia and Kings Canyon National Park to the south.

John Muir Wilderness

This wilderness is located in the central Sierra Nevada. From Mammoth Lakes, California, in the north, it extends some 100 miles to the south, wrapping around the Sequoia and Kings Canyon Wilderness. The southern end is just west of Lone Pine, California. Elevations range from 4,000 feet to the summit of Mt. Whitney (14,497 feet) with numerous peaks over 12,000 feet. Deep canyons, lofty peaks, and meadows along the many lakes and streams characterize the John Muir. The South and Middle Forks of the San Joaquin River, the North Fork of the Kings River and significant drainages of the Owens River originate within this wilderness. Stands of Jeffrey and lodgepole pine, incense cedar, and red and white fir are found on the lower western slopes. The lower eastern slopes have white fir, Jeffrey, and lodgepole pine. Higher elevations are home to hemlock, red fir, and lodgepole, whitebark, foxtail, and western white pines. The highest elevations are composed of exposed granite.

Established in 1964 by the original Wilderness Act and enlarged by 81,000 acres by the California Wilderness Act of 1984, the John Muir is one of the most heavily visited wildernesses in the National Wilderness Preservation System. There are 351,957 acres administered by the Sierra and 228,366 acres by the Inyo National Forests (NF). There are 820 acres of private land within the wilderness boundary.

Ansel Adams Wilderness

The Ansel Adams extends from Highway 120 in the north to Lake Thomas Edison to the south. Elevations range from 3,500 feet to 13,157 feet at Mt. Ritter. Within the Ansel Adams are a numerous streams and lakes that form the headwaters of the North and Middle Forks of the San Joaquin River. Vegetation is typical of high elevations of the Sierra Nevada. Stands of red fir and some Jeffrey pine grow along the upper reaches of the San Joaquin. Other areas are alpine in character with scattered stands of lodgepole pine, mountain hemlock, and quaking aspen. There are numerous outcroppings of barren granite.

Originally established as the Minarets Wilderness in 1964 and enlarged by 119,000 acres in 1984 by the California Wilderness Act, the Ansel Adams is administered by the Inyo and Sierra NFs. It also encompasses 808 acres of Devils Postpile National Monument, but that area is not included in this analysis. There are 78,775 acres administered by the Inyo and 151,483 acres on the Sierra NFs. There are two acres of private land within the boundary.

Dinkey Lakes Wilderness

The Dinkey Lakes lies immediately west of the John Muir and is separated from it by the Dusy/Ershim Off-Highway Vehicle Route. Elevations range from 8,200 feet adjacent to Courtright Reservoir to 10,619 feet at Three Sisters Peak. Most of the area consists of timbered rolling terrain. Sixteen lakes are clustered in the west central portion with large meadows in the north central region and along Helms Creek.

Established by the California Wilderness Act of 1984, this 30,000-acre wilderness is located entirely within the Sierra NF. There are no private lands within the wilderness boundary. Cattle grazing occurred under permit for many years before the wilderness was established and continues today.

The Physical Environment

Climate

The Sierra Nevada range has a Mediterranean climate. Hot, dry summers and cool moist winters characterize this climate type. Most of the planning area is under snow from November to May, and in heavy snow years well into July and August. Precipitation falls during the summer months in the form of thundershowers. Droughts lasting three to five years have been common over the past few centuries. Severe droughts occurred in the late 1890s, mid-1920s, early 1960s, mid 1970s and in the late 1980s-early 1990s.

For the years 1963-1991, precipitation has ranged from 82.9 inches to 20.2 inches at Huntington Lake (elevation 6950'). Average annual precipitation for this period was just over 43 inches with an average annual snowfall of 252 inches.

Geology

The Sierra Nevada is the largest single mountain range in the contiguous United States. The core of this north-northwest trending range is an enormous intrusion of granitic rock, the Sierra Nevada batholith. The mountain range is tilted to the west resulting in a gradual western slope rising from the Central Valley to the crest and then plunging sharply, over 10,000 feet, to form

the eastern escarpment. The highest peak in the contiguous 48 states is Mount Whitney at 14,497 feet. At scattered locations, remnants of metamorphic roof pendants cap the granitic rocks, revealing the ancient sea floor that dominated the Sierra Nevada before the mountains existed. Volcanic rocks, such as andesite, basalt, pumice, and ash deposits, also occur throughout the Sierra Nevada. Glacial activity has sculpted these rock masses into many of the unique landforms that characterize this high country.

Soils

Soil quality and productivity depend on climate, inherent soil type, and soil condition. Specific information regarding soil condition, specifically compaction, disturbance, or loss of topsoil, soil cover, and nutrients is limited to a few site-specific monitoring reports and field notes.

Most types of disturbances occurring within the project area affecting soil condition are considered to be small and/or localized. Potential impacts to soil productivity include: 1) trail erosion, especially from user-created, unmaintained trails and campsites; 2) loss of nutrients by removal of duff and litter through trampling and woody debris through firewood collection; and 3) direct disturbance of the soil surface in campsites, grazing, or mining activities.

In 1995, the Forest Service Pacific Southwest Region established thresholds for maintaining organic matter, topsoil, and porosity and place emphasis on prevention and minimization of impacts, especially in high elevation habitats where recovery of soil damage can take decades. Most wilderness studies have shown that disturbances from campsites and trails are less than one percent of these ecosystems. However these disturbed areas often are concentrated near sensitive habitats such as riparian strips along streams or lakeshores (Cole 1985). Given the localized nature of impacts, it is reasonable to assume that soil quality and long-term soil productivity are being maintained.

Even though soil quality standards are generally being met, campsite inventory data, past Forest Service records (i.e. wilderness ranger reports and other watershed data) document instances where they may not be met at a specific site. These sites tend to be near sensitive habitats, such as springs or moist soils around lakeshores, or in areas of concentrated visitor use.

Soils within the project area are derived predominantly from granite. High elevation restricts the growing season and maintains cold soil temperatures for most of the year in all but the southern, lower elevation sites. This limits the activity of plants, burrowing animals, soil insects, and microorganisms. Essential plant nutrients, such as nitrogen, phosphorus, potassium, calcium, and magnesium are severely limited.

Other sources of parent material include areas of volcanics, including andesite, basalt, and rhyolite, and pyroclastic deposits. Most of the high elevation meadows are rich in volcanic ash. Soils formed in tephra and ash tend to be richer in nutrients and organic matter, but when exposed can also be exceptionally dusty.

Meadow soils are derived from alluvial deposits and glacial debris. They tend to be very deep, well stratified, and relatively free of rock fragments and rich in decaying organic matter. Most

wet and moist meadows have seasonally high water tables, primarily in spring and early summer. Meadow soils that are often saturated are more susceptible to rutting and compaction, which reduces infiltration and can lead to gully erosion.

Generally, most soils within the project area are highly susceptible to sheet and rill erosion. These soils do not compact well, making them particularly susceptible to erosion and dust formation on trails and in campsites. Impacts that activities might have on the soil resource are significant primarily along trail corridors, camping areas, and near bodies of water.

Water Resources

The major watersheds in this project area are the Mono and Owens Basins draining the east side, and the Tulare-Buena Vista Lakes and the San Joaquin Basins on the west side. Beneficial uses of water within the wildernesses include cold-water fisheries and wildlife. Downstream beneficial uses include cold-water fisheries, municipal water supply, power generation, and agriculture.

Water Quality

Streams and lakes within the project area generally exhibit excellent water quality with low temperatures, low conductivity, low turbidity, and high dissolved oxygen. Impacts to water quality are normally localized and of short duration. Following is a brief general discussion of the known impacts to water quality in the project area:

Acid Deposition

Rain is naturally acidic with a pH of approximately 5.6. Acid deposition can occur through precipitation, fog, cloud water, and dry deposition. Watersheds within the project area are extremely vulnerable to acidification because of their acidic soils, poorly weathered bedrock, coniferous vegetation, high rate of annual precipitation, and dilute waters (Melack, 1985). Even though Sierran lakes are “among the most poorly buffered in America”, there is no evidence of chronic acidification in the lakes of the project area (Tonnessen, 1991).

Trails

Trails can contribute sediment to ephemeral and perennial streams by intercepting and/or concentrating overland flow thereby altering the normal runoff pattern. Water bars are used on trails to drain water from the tread before the water velocity is high enough to erode the trail but water bars are not usually designed to contain major runoff events. Therefore during high flow events, concentrated runoff with high levels of sediment can reach stream channels. In these situations, water quality degradation will occur and can potentially cause localized changes in stream-channel morphology.

Stream crossings can present additional water quality problems. When people and stock disperse to cross a stream, erosion and sedimentation may occur as a result of stream bank trampling and widened trails. Stream crossings result in alterations of the channel morphology, including an increased width-depth ratio, both at the crossing and for a short

distance downstream. Trailing through steep, alpine meadows has resulted in gully formation in some areas. This can contribute to a lowering of the water table that supports the meadow and a potential increase in sediment load to the lakes and streams located below the meadows.

Campsites

Numerous campsites are located close enough to lakes and streams to adversely impact water quality. Some are large compacted sites, devoid of vegetation (USFS 1993). Like trails, campsites can intercept, concentrate, and increase the velocity of runoff resulting in erosion of the campsite and increased sedimentation in the downstream watercourse. Waste from humans and packstock near poorly located campsites can be transported into surface water causing temporary degradation of water quality.

Human and Animal Waste

Nutrients, bacteria, viruses, and protozoa have been introduced from animal and human waste (Backer, 1989). Cattle and recreational packstock often graze in riparian areas and wet meadows. Bacteria and nutrients from animal waste can enter into the surface water system resulting in local water quality degradation. Improper human waste disposal can also result in degraded water quality. Improper waste disposal in heavily used and/or sensitive areas has resulted in the presence of *Giardia lamblia*, elevated levels of bacteria, smell and unsightliness of fecal matter, and the presence of toilet paper.

Weather Modification

Weather modification, also known as cloud seeding, has occurred in the Sierra Nevada for many years. Projects with the potential to impact these wildernesses include the:

Tuolumne River, sponsored by Turlock & Modesto Irrigation Districts

San Joaquin River, sponsored by Southern California Edison, began in the 1950s and is the “longest continually operated cloud seeding program in the world” (Henderson, 1994)

Kings River, sponsored by the North Kern Water Storage District since the 1950s

Eastern Sierra, sponsored by the Los Angeles Department of Water and Power (DWP)

The primary objective of these projects is to increase precipitation and snowpack for water supply and/or power purposes (California, 1991). Silver iodide is the most common ice-nucleating material in use in the Sierra Nevada (Roos, 1992). Dry ice (carbon dioxide) has also been used in weather modification operations (DWP, 1988). Estimates of the amount of water produced from these activities range from two percent to fifteen percent increase in annual precipitation (California, 1991). The change in precipitation or runoff is difficult to prove due to the natural range of fluctuation of normal storm activity, the variability of runoff, and the accuracy of measurement techniques.

Snow Measurement

Snow measurement to determine snowmelt runoff has been an integral part of California water management since 1929 (Hart, per. com., 1994). Numerous snow courses have been established and correlations developed to provide water forecasts to guide hydroelectric power generation management of municipal water supplies, irrigation planning, and the prediction of flood potential. The snow pack is measured by the use of snow courses, aerial markers, and remote snow sensors.

Snow courses are generally from 200 to 1000 feet long and marked only by small, yellow snow course marker signs.

Aerial markers allow the snow depth to be measured by helicopter for locations that are too hazardous to be measured from the ground. Aerial markers are permanent, graduated metal stakes up to about 30 feet high. Markers are not as useful as snow courses or snow sensors because snow water content cannot be measured.

Snow sensors provide real time data to the water manager to predict snowmelt runoff volume in weekly runoff forecast updates.

Currently, there are 31 snow courses that are monitored every month from January through April. The primary method of conducting snow surveys continues to be by ski or snowshoe with use of snow survey cabins as listed in Appendix K. In rare occasions a helicopter is used and this requires Regional Office approval. Aerial markers are no longer used for fly over surveys. Seven snow sensors are in place and 16 snow survey cabins are used to provide shelter for the surveyors.

Air Quality

Air resources management in the Sierra Nevada is highly complex because the major sources of degradation are far from the lofty summits of the Sierra ridgeline. The 1977 Clean Air Act Amendments designated three-air shed protection classes, two of which are included within the project area. The John Muir and the Ansel Adams are Class I air sheds requiring the most stringent degree of protection. The Dinkey Lakes is a Class II air shed. The Forest Service has little direct control over the air quality degradation that is occurring, yet the agency is mandated to protect air quality related values as part of our wilderness management.

Current Monitoring Program

Air quality and air quality related value (AQRV) monitoring within the planning area is ongoing. Visibility in the John Muir and Ansel Adams has been monitored since July 1991. Lichen plots have been established on the John Muir and Ansel Adams within the Inyo NF. Lichens are sensitive bio-indicators of air quality degradation because mineral nutrients are obtained from dust fall, dew, fog, and rainwater by the thallus (plant body of the lichen).

Visual Resources

The two Forest Plans place all three wildernesses in the highest Visual Quality Objective (VQO) - Type I, Preservation. This means that the landscape will appear visually untouched and will be modified only by natural ecological processes.

Fire

Periodic changes due to fire are essential to a functioning natural system. Fire is a significant environmental factor that initiates and terminates key vegetation successions, regulates the age structure and species composition of vegetation, produces the vegetation mosaic on the landscape, affects insects and plant diseases, influences nutrient cycles and energy flows, regulates the productivity, diversity and stability of ecosystems, and determines habitats for wildlife (Mutch, 1992).

Western Sierra

The fire regime is high frequency and low intensity surface fires. In lower elevations, the historic fire-free intervals vary from five years in ponderosa pine on dry ridges to 15-18 years in more moist sites of white fir. Sub alpine-fir stands experience less frequent fire return intervals. In some fir and lodgepole stands at 10,000 feet elevation and higher, the fire return interval is 200-300 years.

Eastern Sierra

The fire regime in the eastern Sierra is low frequency and low intensity with long fire return intervals. Fire history indicates that a majority of fires burn less than one acre. Vegetation type and high elevation are usually not conducive for large fire occurrence. Extreme dry and windy conditions are usually needed for any ignition to spread more than ten acres.

Fire History

Evidence exists that Indians may have deliberately started fires when they traveled between the east and west sides of the range. Non-deliberate introduction of fire probably occurred from high altitude escaped campfires.

Lightning ignitions play a dominant role in maintaining fire regimes in these wildernesses. Summer thunderstorms generally develop over the Sierra from June through September. These storms rarely move over the foothills and San Joaquin Valley to the west.

During 1972-1990, records indicate that 847 lightning fires were reported within the planning area on the Sierra NF. On the Inyo NF, 332 fires were reported during 1972-1993.

Minerals

The Wilderness Act of 1964 closed all wildernesses to prospecting and new mining claims as of December 31, 1983. It provided for continued mining on unpatented claims where valid existing rights could be determined. Approximately six patented mining claims and a score of inactive diggings of various types are scattered throughout the planning area. The main minerals of interest are tungsten, molybdenum, silver, cobalt, and gold. Most of the remaining unpatented claims in wilderness are concentrated along the eastern escarpment.

The Biological Environment

Vegetation

The central Sierra Nevada rises gradually on the west from the foothills to elevations of over 14,000 feet at the crest, and drops abruptly on the east to elevations of 7,000 to 4,000 feet. On the west side the lowest portions of the planning area consist of chaparral, gray pine, and oak dominated vegetation. At elevations of 3000 to 4000 feet, brush gives way to coniferous vegetation dominated by ponderosa pine. At higher elevations the ponderosa pine changes to a mixed-conifer forest type, and then to stands of red fir and lodgepole pine. The coniferous forests and woodlands of the subalpine zone continue to higher elevations, where mountain hemlock and whitebark pine communities represent the last of the forested vegetation. Finally, above the timberline, an alpine zone of low forb and grass-dominated communities prevails. Vegetation becomes extremely sparse on the scree slopes and fell fields at the highest elevations of the crest. (Verner 1980; USFS 1981)

The west side vegetation pattern generally repeats down the steep slopes of the east side until Jeffrey pine forests emerge at elevations below 7,000 to 8,000 feet. Descending further, pinyon-juniper, sagebrush scrub, and/or bitterbrush scrub dominate in the increasingly arid climate. Other distinct communities, such as meadows, quaking aspen, and riparian areas exist throughout these vegetation zones within the planning area. (Verner 1980; USFS 1981)

Botanical Resources

No plants on the federal threatened or endangered species list are known to occur within the planning area. Father Crowley's lupine (*Lupinus padre-crowleyi*), found in the Shepherd Creek and North and South Forks of Big Pine Creek drainages, is listed as rare by the State of California. Ten sensitive plant species are known to occur within the planning area, with potential habitat for an additional twenty species. Refer to the Biological Evaluation for this project for further details on these individual species.

Generally sensitive plant species are listed as such because they are limited to one or a few highly restricted populations, very little information is known, or they are present in such small numbers that they are seldom reported. In addition, each National Forest maintains a "watch list" of plants

that are of special interest. “Watch list” plants are species that are locally rare, are of special interest such as cactus or orchids, are widely disjunct from the main distribution of the species, are largely endemic to the Forest, or species for which very little, if any, information is available but existing information may indicate some cause for concern. Watch list plants include those species that do not warrant listing as sensitive at this time, but for which there is still some concern if major or large scale projects are considered in their habitat.

Very little of the planning area has received any comprehensive survey for sensitive plants. Current knowledge is based on a few isolated surveys, historical records, and field reports from botanists. Over the past five years several new occurrences of some of the sensitive plants have been discovered. Known populations tend to be near trails or campsites, which reflects the areas that have been searched. This implies that additional undiscovered populations may exist in the wilderness, especially in less accessible areas.

Wildlife

The U. S. Forest Service wildlife management policy within wilderness is “...directed toward maintenance of native plants and animals in their natural setting.” Wildlife management objectives in wilderness should seek to keep wildlife wild, allow natural processes to control wildlife populations, and maintain natural distributions, numbers and interactions of indigenous wildlife and their habitats (Schoenfield and Hendee 1978). Today this task is confounded by the effects of non-native species introductions, human developments along the boundaries of wilderness that result in the loss of habitat for wide-ranging species, and the by-products of industrialization and agriculture outside of wilderness that end up affecting wilderness processes.

Wildlife management is a cooperative effort between the U.S. Forest Service (FS) and the California Department of Fish and Game (CDFG). The latter State agency sets hunting and fishing regulations, controls fish stocking, and coordinates with the Forest Service in endangered and threatened species population and habitat management. The Wilderness Act of 1964 states, “Nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of the several States with respect to wildlife and fish in the National Forests.”

The Forest Service also cooperates with the U. S. Fish and Wildlife Service (FWS) in implementing recovery plans and management actions for federally listed threatened and endangered species. The U.S. Fish and Wildlife Service is the agency that has legal authority over federally listed threatened and endangered species. It has legal responsibility under the Endangered Species Act, Section 7, to review all management actions by the other agencies within the wilderness to ensure management actions will not jeopardize the continued existence of any threatened or endangered species.

Yosemite and Sequoia-Kings National Parks are separate jurisdictions of wilderness that border the Ansel Adams and John Muir Wilderness areas and provide critical unfragmented corridors to maintain connectivity of habitats for wildlife species.

Examples of where multi-agency coordination is necessary to manage wildlife species in wilderness are the Sierra Nevada bighorn sheep and the mountain-yellow-legged frog. Bighorn

summer habitat lies within both National Park and Forest Service wilderness areas. Access to Park Service habitat is through the John Muir and Ansel Adams Wilderness Areas, which are managed by the Inyo National Forest. Human recreation use in bighorn summer range must be coordinated from both the Park Service and Forest Service access points to adequately manage habitats such as summer range for bighorn ewes and their lambs along the Sierra crest. In the case of the mountain yellow-legged frog management, fish stocking and fishing must be managed by the California Department of Fish and Game in order to ensure the recovery of frog populations in the wilderness. The Forest Service manages the trail system, trailhead quotas, camping, and packstock grazing that lead to, or occur in frog habitat.

Under Section 7 of the Endangered Species Act, the Forest Service is required to consult with the U. S. Fish and Wildlife Service when undertaking any action that may affect an endangered, threatened, or proposed species or its habitat. Species currently federally listed as threatened or endangered that are found within the wilderness areas are the bald eagle, Sierra Nevada bighorn sheep, and the Paiute and Lahontan cutthroat trout. Species currently under review as proposed species for potential listing that are found within the three wilderness areas are the mountain yellow-legged frog, Yosemite toad, Pacific fisher, and the California spotted owl. These species are discussed in detail in the Biological Assessment in Appendix J.

The State of California also lists species that are endangered, threatened, or rare. These may or may not correspond with the federal lists. Usually species recognized by the State are also recognized by the Forest Service as sensitive species discussed below.

Two other major categories of wildlife species are considered in wilderness management. They are known as “Sensitive Species” and “Management Indicator Species (MIS).” The Regional Forester of the U. S. Forest Service, Pacific Southwest Region, has identified a list of sensitive species that are known to occur or believed to occur within National Forests in California for which population viability, and the effects of management activities are a concern (FSM 2670.5). Forest Service policy is to prevent actions that will lead to a trend toward federal listing for any sensitive species as threatened or endangered, or lead to a loss of viability of any species within the planning area. Sensitive species which are suspected or known to occur, or for which there is suitable habitat in the three wilderness areas are the American marten, Pacific fisher, California wolverine, Sierra Nevada red fox, California spotted owl, great gray owl, northern goshawk, peregrine falcon, willow flycatcher (Sierra Nevada subspecies *brewsterii* and *adastus*), Townsend’s big-eared and Pallid bats, mountain yellow-legged frog, Yosemite toad, and Wong’s springsnail. These species are discussed in detail in the Biological Evaluation in Appendix J.

The second category are wildlife species identified in the Sierra and Inyo National Forest Land and Resource Management Plans (LRMP’s) as Management Indicator Species and that occur in the three wilderness areas. They were designated for attributes such as: hunting (mule deer, bear, and blue grouse); special interest (golden eagle and prairie falcon); ecological indicator potential; riparian area-dependent species (yellow warbler); and snag-dependent species (hairy woodpecker and Williamson woodpecker). Each species or group has specific standards and guidelines in the LRMP’s for their management. A management indicator species conceptually may represent larger groups of wildlife that share the use of a particular habitat such as riparian habitat, or snags and downed logs. For example habitat management standards and guidelines used to manage the yellow warbler assume adequate management is occurring for all riparian songbirds. The concept

has its limitations since often each wildlife species has its own unique niche and habitat requirements for each part of its life history.

The following is a short discussion of selected management indicator species or groups of public concern or notoriety:

Mule Deer

The three wilderness areas provide high quality mule deer summer range and migratory corridors from spring through fall. Does and fawns are particularly associated with meadow, and lake and stream corridor riparian habitats and adjacent forests, while bucks can be found anywhere including subalpine and alpine habitats. The planning area provides a significant portion of the summer range for the San Joaquin, Huntington, North Kings, Goodale, Casa Diablo, and Round Valley deer herds. Deer migrate out of wilderness to lower elevations in the fall as storms push them out of the high country.

Most of the planning area is contained within the eastern portion of hunting zone D7, with small portions in X9A and X9B. Hunting seasons vary in each area but are generally from mid-September through mid-October. In 1993, a total of 10,150 tags were allowed. In 1992 zone D7 had a 6 percent hunter success rate, zone X9A 30 percent, and zone X9B 5 percent. Hunting is a major source of business for commercial pack stations and the communities that surround the area on the west side of the Sierra.

Black Bear

Black bears are common throughout the planning area. The primary management issue facing wildlife managers today is keeping bears wild and assuring they do not become habituated to human food sources. Bears can aggressively seek campers to take their food. These encounters can range from humorous to catastrophic. Typically, visitors are encouraged to hang food and practice bear-safe camping following prescribed methods. Year 2000 was a particularly troublesome year on the east side of the Sierra with numerous trailhead vehicle break-ins by bears, as well as bears entering campgrounds. It is becoming more common for bears to have to be killed because of their habituation to human foods, careless food management by recreationists, and the increasing potential for bears to aggressively go after that food.

Sequoia and Kings Canyon National Parks have pioneered experiments using bear-proof plastic food canisters carried by the visitor, and metal bear-proof food storage boxes located in campgrounds. There are no food-storage boxes within the wilderness areas covered in this analysis.

There is currently a bear hunting season within the planning area from the second Saturday in October running for seventy-nine days or until a quota is met. However, bear hunting is not a significant activity within the wilderness at this time.

Birds

Wilderness habitats are diverse and support an equally diverse bird community across the 10,000 feet of elevation gradient from the lowland shrub and forested zones to the high alpine. In general these habitats are in excellent condition. Local changes have occurred primarily in the high use human recreation zones around lakeshores, riparian stream corridors, and meadows where camping, fishing, and commercial and recreational livestock grazing have modified habitat conditions. It is unknown how these uses have affected overall songbird populations in wilderness. Some birds like jays and nutcrackers have habituated to humans and seek their foods, while riparian associated songbirds such as the yellow warbler that nest in willows where trails and camps occur may have experienced localized habitat condition declines from a reduction in bushy shrubs, or human disturbance near their nest sites. Riparian habitats are generally limited in abundance and are also the focal points for recreation. Forest associated, and snag dependent birds such as woodpeckers and tree canopy nesters probably have been affected very little since montane and subalpine forests are relatively undisturbed in the wilderness landscape.

Brown-headed cowbirds are a non-indigenous bird species that has colonized the Sierra Nevada in the last century, mostly after 1940. The cowbird lays a single egg into the nest of over 22 species of our native Sierra songbirds. The songbird parents end up raising a single cowbird young, or a cowbird and fewer of its own young, instead of a full brood of their own. Sierra songbirds have not co-evolved with cowbirds and consequently have not developed defensive strategies to counter nest parasitism. This potentially makes them highly vulnerable to reproductive failure. The impact of cowbird nest parasitism in wilderness has not been investigated and remains unknown. The cowbird is known to congregate at places it can find food sources such as pack stations, corrals, meadows where livestock graze, and bird feeders at housing developments, recreational residences and campgrounds. Where these developments abut the wilderness cowbirds are able to parasitize nests up to six miles from these areas. Since a single cowbird female can lay up to 29 eggs it has the potential of parasitizing 29 songbird nests within its range of travel. Verner and Rothstein (1986) researched the situation in the eastern Sierra and suggested that nest parasitism by cowbirds would probably not threaten the total population of any host songbird species in the Sierra Nevada in the near future, with the possible exception of the willow flycatcher (*Empidonax traillii*). Warbling vireos (*Vireo gilvus*) common in aspen stands on the east side were noted to show reduced density in localized areas frequented by cowbirds. They recommended monitoring of songbirds, periodic review, and control of future locations of pack stations, campgrounds, and other sources of supplemental foods. An eastern Sierra riparian songbird monitoring study has been ongoing since 1998 in riparian habitats adjacent to the wilderness. Monitoring will continue for a number of additional years to gain insight into this problem over a large landscape such as the eastern Sierra.

Fisheries

Essentially all waters within the planning area were barren of fish prior to the arrival of European settlers. One exception may have been the San Joaquin River up to Rainbow Falls (E. Gerstung, CDFG, personal communication) where rainbow trout may have occurred. Glacier-carved cirques and hanging valleys created barriers to native fish, preventing upstream

migration. In the 1870s mountaineers, ranchers, sheepherders, and the U.S. Cavalry began introducing fish in the streams and lakes of the high country. Later sportsmen's groups, the Sierra Club and the CDFG made significant efforts to populate suitable waters with trout. In the 1940s, CDFG assumed the responsibility for fish stocking. Originally mules transported fish in everything from coffee cans to specially designed tanks. Since World War II almost all fish stocking has been done from aircraft. Traditionally, CDFG plants rainbow, golden, and brook trout fingerlings in high mountain lakes on a regular schedule. Recent petitioning of declining amphibian populations native to the high elevation Sierra lakes, streams, and wetlands has resulted in at least a temporary suspension of fish stocking in lakes where these declining amphibian populations occur. This suspension extends to basins where amphibian surveys have not been completed. Where surveys are complete, stocking management strategies are being developed to provide for viable and secure amphibian populations in addition to recreational fishing opportunities.

The primary species introduced into the area include: Brook trout, brown trout, rainbow trout, golden trout, golden shiners (*Notemigonus crysoleucas*), and cutthroat trout.

Although most of the fish planting has been to enhance sport fishing, some have been to protect certain individual species. For example, the Paiute cutthroat trout (*O. c. seleniris*), a federally listed threatened species, have been planted in two streams within the planning area which do not have any other trout species to provide a genetically isolated population.

Recent research in the John Muir indicates that a high percentage of lakes support self-sustaining populations of one or two trout species (Matthews and Knapp 1999). This research suggests that fewer lakes require stocking to maintain sport fisheries than was originally thought.

Angling remains one of the more popular activities within these wildernesses and to many is synonymous with a "wilderness experience." Studies have shown that about 40-50 percent of wilderness visitors pursue fishing as an activity (Hendee et.al.1990). Many of the outfitter/guides servicing the area depend on fishing opportunities to enhance the experience of their customers.

Current policy allows for the planting of fish by CDFG when one of the following criteria are met: 1) to reestablish or maintain a native species, 2) to restore a listed threatened, endangered or sensitive species, or 3) to maintain or enhance recreational values including those of non-native species identified in the Wilderness Management Plan as being permissible in specific water due to their presence prior to wilderness designation. Aerial fish planting is allowed only where it occurred prior to wilderness designation, unless the Chief of the Forest Service approves it.

Waters known to provide good fishing attract people who may cause bank trampling, create user defined social trails, and cause a loss of vegetation. Popular fishing lakes generally have more impacts than those not fished. Thus, the management of fish does affect the dispersal of people within the wilderness.

The Human Environment

Recreational Use

All three wildernesses are accessed easily by the urban populations of both southern California and the San Francisco Bay Area, which contribute to their associated high use. Both the John Muir and the Ansel Adams have been popular and experienced high visitation since the 1960s. With the advent of backpacking in the 1960s and 1970s, use levels grew and peaked in the mid-1970s. Use reached an apparent low in the early 1980s before steadily increasing again through the 1990s.

Although remote by California standards, the eastern Sierra is a popular starting point for wilderness trips. Approximately 70 percent of visitation associated with the John Muir and Ansel Adams originates from east side trailheads. Data shows use patterns funneling up the eastern canyons over the Sierra crest and dispersing on the west side (Gimblett 1999).

Throughout the planning area, there are a few popular destinations where use is concentrated and have been popular destinations for over thirty years. Use is also associated with access to adjoining Yosemite and Sequoia and Kings Canyon National Parks. Popular destinations and access to the Parks greatly affect use patterns in the planning area.

John Muir Wilderness

This is the second-most visited wilderness in the National Wilderness Preservation System. There are numerous trails, including portions the Pacific Crest and John Muir Trails. There are a total of 45 trailheads (10 Sierra NF and 35 Inyo NF) that access the wilderness. Stock use is moderate to high on the Inyo NF. Stock use is high on the Sierra NF, particularly in Mono Creek, Graveyard Meadows, French Canyon, Humphrey's Basin, Paiute Creek, and along the Pacific Crest Trail. Commercial pack operations provide service from many western and eastern trailheads. The Palisades, Bear Creek Spire, and the 14,000-foot peaks including the east face of Mt. Whitney are popular for experienced mountain climbers.

Ansel Adams Wilderness

This wilderness area experiences heavy visitation. There are numerous trails, including the Pacific Crest and John Muir Trails. There are a total of 27 trailheads (12 Sierra NF and 15 Inyo NF) trailheads that service the area. They are accessed by paved road on both the west and east sides. Overall, stock use is moderate on both the Inyo and Sierra NFs. Commercial pack operations service the area from Agnew, Reds Meadow, and June Lake on the east side and from Miller Meadow and Edison Lake on the west side. The Ansel Adams has excellent stream and lake fishing for rainbow, golden, and eastern brook trout. The Minarets are popular for experienced mountain climbers.

Dinkey Lakes Wilderness

This area has the highest number of visitors on the Sierra NF. The main lakes basin area, including Mystery, First Dinkey, South, and Swede Lakes, receives a heavy concentration of day and overnight use. Access to Dinkey Lakes is good from mid-June to late October. Willow Meadow, Cliff Lake, and Badger Flat trailheads service the area. Numerous trails provide access to the westerly portions of the area. Dinkey Lakes is well suited for stock travel. Two Commercial pack operations service the area and Outward Bound classes travel through Dinkey Lakes.

The primary season of recreational use in these wildernesses is June through mid-September. Hiking, riding, camping, climbing, and fishing are the predominant recreation activities. During the winter, cross-country skiing, ski mountaineering, and climbing are popular recreation activities.

Day Use

There has been a noticeable increase in day use in the past decade within the planning area. Part of this increase can be attributed to the popularity of short duration, high-energy activities. Day hikes are extending further into the backcountry. Trail running has become more popular and “ultra marathon” running in the mountainous terrain appeals to those that train for this activity.

Increases in day hiking on Mt. Whitney are a good example of this trend. In 1976, 2703 people day hiked there; in 1996, 7532 people day hiked there; and in 1999, 14,086 people day hiked to Mt. Whitney. Although the icon of Mt. Whitney as the tallest peak in the continental U.S. is the motivator for this extreme day hike, it indicates that more people are capable and willing to engage in these types of trips. Similar relative increases are being noticed in areas accessing other peaks.

Winter Use

Both the John Muir and Ansel Adams offer excellent opportunities for winter recreation. With the advent of better available winter backcountry equipment, activities such as snow shoeing, backcountry snow boarding, telemark and alpine skiing and with the trend towards more challenging and high risk sports in this country, these activities could result in an increase in winter use over the next ten years.

Rock Climbing and Mountaineering

Rock climbing and mountaineering are experiencing an increase in popularity within the planning area. The High Sierras have always been well known and a preferred location for mountaineering. There are many locations where this is the dominant use, including the east face of Mt. Whitney, Mt. Langley, Mt. Williamson, the Palisades, Bear Creek Spire, the Minarets, Mt. Ritter and Banner Peak.

Fishing and Hunting

Fishing continues to be a very popular activity. Data indicates that nearly every stream and lake along travel corridors is fished by a large percentage of backcountry users (Gimblett 1999). Some indications are that fishing has peaked and is beginning to decrease, but many visitors will continue to pursue for this activity in the unique setting of the wilderness environment. Hunting as an activity has declined on the east side where game numbers have declined.

Camping

These wildernesses continue to be premier areas for overnight backcountry recreation. Most of the popular destinations have remained the same throughout the years. The most popular camping destinations are usually near bodies of water. Both the Inyo and Sierra NFs prohibit camping within 100 feet of lakes, streams, and trails where terrain permits, but in no case closer than 25 feet. Additional site-specific prohibitions to camping exist, including no camping around Duck, Purple, Thousand Island, Shadow, and Ediza lakes in the Ansel Adams. Mirror Lake on the Mt. Whitney trail is also closed to camping. Common guidelines do not currently exist to determine when a site or area should be closed to camping. In the past, decisions to close sites have usually been based on resource impacts such as trampling, denuding, and erosion of fragile sites, or unacceptable camping conditions near lakes, streams or trails.

Wilderness Permits and Quotas

Wilderness permits for overnight use were first implemented in the John Muir and Ansel Adams Wilderness Areas in 1971. The purpose of wilderness permits is to collect data on visitation, manage visitor use and to provide an avenue to educate and inform visitors. Originally, the permit system did not limit visitation. This first occurred in 1972, responding to the National Park Service's need to reduce use in the Rae Lakes area accessed by the Kearsarge Pass trail on the Inyo NF.

Between the years of 1973 and 1980, a number of studies, plans and strategies were applied that resulted in the current system of limiting use through external controls, via trailhead quotas. Trailhead quotas were derived from capacity studies that quantified the number of acceptable people per day by trailhead. They were based on an assumption of probability that reducing use would reduce impacts and maintain a quality of wilderness experiences in the areas (DeGraff 1984).

There are 35 trailheads on the east side (Inyo NF) and 9 on the west side (Sierra NF) with quotas in place. Typically these quotas were developed for high use trails only. Many low use trails do not currently have quotas.

The quota season, (i.e. the period in which quotas are in effect) has fluctuated through the years. For most areas, the quota season currently begins the third Friday in June and ends on September 15th. The Maxon trail (Sierra NF) has a quota in effect from the Friday before July 4th – September 15th. The main Mt. Whitney trail (Inyo NF) has a quota in place from May 15th to November 1st.

Most recreation use is currently concentrated on weekends and in August. Even with the temporal dispersal of use achieved through trailhead quotas, there is still higher use on weekends and in August, but on popular trails more days in the week experience full quotas.

A complex permit and reservation system has been in place since 1980. Over the years the National Forests have managed the permit program to achieve maximum consistency across the multi-agency wilderness complex. Fees for reservations were initiated by the agency in the late 1980s in an effort to reduce over-booking of trails. Prior to the reservation fee, “no-shows” accounted for as much as 60 percent (Mt. Whitney trail, 1983) of permits issued, averaging as much as 30 percent. Recently fees have also been used to support the cost of the permit and reservation program.

Group Size

The maximum group size allowed within the planning area is 15 people and a maximum of 25 head of stock per party. These limits were established in 1991 to achieve consistency across the multi-agency wilderness complex of National Parks and National Forests in the central Sierra Nevada.

In 1993, the Inyo NF reported the average party size was 3.31 for foot access and 6.22 for stock supported parties within the Ansel Adams and 3.07 and 5.82 respectively for the John Muir. On the Sierra NF, the average party size was 3.5 for foot access and 4.4 for stock access parties. This is consistent with what Watson (1993) found in the John Muir in 1990 where hiking parties averaged 3.7 people and stock parties 5.0. Generally, it appears that stock parties tend to be larger than backpacking parties.

There is little difference in the length of stay between hiker and stock parties. Within the Ansel Adams Wilderness it is 3 days for foot and 4 days for stock. Within the John Muir it is 4 days for hiking parties and 5 days for stock parties. This is consistent with Watson's 1990 study in the John Muir where the length of stay was 4.1 and 5.6 days respectively.

Commercial Activities

Outfitters and guides (O/G) are commercial operators that provide services to people wishing to have assistance visiting the wilderness. These include transportation, providing equipment, supplies, and materials, furnishing personal services, including guiding, leading, or teaching. O/Gs are service providers that assist the agency in meeting management objectives. They are considered recreational partners who have the privilege to operate commercially on public lands. Commercial operators are required to obtain a Special Use Permit (SUP) authorizing their use. These permits can be temporary, annual, or long-term. O/Gs with facilities located on National Forest System lands are usually granted resort permits, while other outfitter and guides are issued annual or 5 year permits. There are a total of 17 pack stations, 9 mountain guides, and 25 temporary permittees in the planning area. Commercial use accounts for approximately 10 percent of total use on the east side. Commercial use on the west side is 14 percent of total use.

Table 3.1a. Current Service Day Allocations to Outfitters and Guides (East side entry)

Use is allocated to commercial operators in service days (SD). A SD is the number of days a client is on National Forest System lands. The following table describes both the allocations to commercial use and the actual use (i.e. the amount of the allocation that is actually used).

Activity	Current SD Allocation	Current SD Actual Use
Packstock supported	18,432	13,214
Backpacking	2,104	2,075
Mountain Guiding / Winter Guiding	2,218	1,883
Day hiking	50	49
Day rides	7,291*	5,396
Credited Educational	0	0
Nontraditional Packstock	0	0
Total	30,095	22,617

*Only 6 of the 12 pack stations have specific day ride service day allocations. There is also a resort that offers 2000 service days inside *and* outside of the wilderness.

Table 3.1b. Current Service Day Allocations to Outfitters and Guides (West side entry)

Activity	Current SD Allocation	Current SD Actual Use
Packstock supported	2,900	2,793
Backpacking	6,300	11,987
Mountain Guiding / Winter Guiding	0	0
Day hiking	0	0
Day rides	1000	419
Credited Educational	0	1,082
Nontraditional Packstock	200	162
Total	10,400	16,443

Currently, all commercial use in the Ansel Adams from east side entries, including pack stations and backpacking O/Gs, is estimated at 16 percent of total use calculated by the number of people in high use years. Most of this is pack station use, very little is backpacker O/Gs (it is estimated that less than two percent is backpacker use.) On the west side, pack station and backpacker O/Gs use is estimated at 29 percent of the total use in numbers of people. For the entire wilderness, commercial uses account for about 18 percent of total use.

In the John Muir Wilderness commercial operations on the east side are estimated at seven percent of total overall use. Commercial operations on the west side are estimated at 10 percent of total overall use.

Existing direction on the Inyo NF limits packstock outfits to those currently permitted in the John Muir and Ansel Adams. There are no stated use limitations on other services provided by O/Gs.

All pack stations and O/Gs on the Inyo NF have been allocated service days. On the Sierra NF some O/Gs have allocations and all are subject to daily trailhead quotas the same as the general

public. All pack stations except Minarets PS write their own wilderness permits. (See Appendix D and I for list of allocations).

At the time the trailhead quota system was established, it was not designed to control the packstock operations through a daily trailhead quota. Commercial pack station use was deducted from the daily quota over the seasonal period, allowing adjustments to use throughout the entire season. Daily quotas were reduced from the total carrying capacity to account for the pack station use at that time. This system is still in use today.

For more information on commercial use levels, operators, and recreational trends see Appendix I.

Education

Visitors to the wilderness are informed of rules, regulations, and its unique resource value in various ways. Brochures and Opportunity Guides for each wilderness have been developed and are available to users when they pick up their wilderness permits. The Central Sierra Wilderness Manager's group helped develop, and continues to support, a Wilderness Education Program. This program has successfully outreached to many groups including Boy Scout Troops, Backcountry Horsemen, and others throughout the state of California and provides training in "Leave No Trace" ethics. Commercial O/Gs also provide their clients with educational information about "Leave No Trace" camping techniques. Bulletin boards at wilderness trailheads are routinely posted with information more site-specific for those areas. The most common method of delivering an educational message is face-to-face contact when users pick up their permits or when they encounter a wilderness ranger in the area they are visiting.

Law Enforcement / Search and Rescue

The goal of the law enforcement program is that of prevention through education. Most wilderness rangers that patrol the planning area are trained and certified to issue violation notices and/or warnings when they encounter a situation that warrants such action. They are also required to complete an incident report for each violation they witness and for those violations that are not observed first hand but are found during their routine patrol.

The local county Sheriff's Offices have the primary responsibility for Search and Rescue (SAR) operations. On occasion, Forest Service personnel are asked to assist during a SAR. Typical SARs include looking for overdue parties, helping injured people leave the wilderness, and occasionally recovery after a fatality. Most SARs are conducted without the use of mechanized transport; however, there are situations that require transport by helicopter.

Visitor Use Impacts

Popular destination or junction points where both backpacker and stock parties congregate exist throughout these wildernesses. Such areas of concentrated use can result in ecological impacts to soils, water, and vegetation, and social impacts such as crowding, congestion, and use conflicts

Human/bear encounters are a problem in many areas. Most encounters occur in camp and usually consist of the search for food by bears. Loss of food and destruction of property can result. There is also the concern that non-natural food consumption by bears may be harmful to the bear. To date, food storage education has been the primary means to lessen this problem. The Inyo NF has a Forest Order (F.O. 04-97-1) in place requiring proper food storage. In Onion Valley (east of Kearsarge Pass), the order requires food storage containers. As a result of implementing this order, some of the human/bear conflicts have dispersed to other areas.

Dogs

Dogs are now prohibited within occupied Sierra Nevada bighorn sheep habitat as a result of a recent Emergency Forest Order (F.O. 04-00-01). There has been a prohibition on dogs in place for the California Bighorn Sheep Zoological Areas within the John Muir Wilderness on the Inyo NF for many years (F.O. 04-81-3).

Dogs are permitted in all other parts of the planning area.

Campsites

Impacts associated with campsites include the overall area of disturbance, loss of vegetation, compacted soils, high density of sites and social trails, depletion of dead and downed wood, scars from wood chopping and blackened fire scars left on the ground, rocks and trees. Campsites in the planning area were inventoried using a methodology modified from one used in Sequoia/Kings Canyon National Parks (Parsons and Stolghren, referenced in Cole 1989). Various attributes of campsites were rated out and a mean rating identified the site as a condition class 1 (least impacted) to a condition class 5 (most impacted).

Six hundred sixty-five campsites were inventoried in 1999 on the east side. Results of this inventory show where impacts are occurring and to what extent. Over 50 percent of the sites rated out as Condition Class 2. Approximately 27 percent rated out as Condition Class 3, 4, or 5. Most sites on the east side show different types of impacts because vegetation related qualities are not as discernable as on the west side. This generally resulted in lower ratings on the east side, and many more Condition Class 2 sites than on the west side.

Impacts on the increase include the proliferation of campsites and the availability of firewood. An example of this change can be seen in comparing with the 1982 campsite inventory. For example, in Cottonwood Lakes, 37 sites were recorded in the basin in 1982; in 1999, 202 sites were recorded. This correlates with the increased use observed over time in that basin. On the east side, the signs sites tend to show as impacts are in total size and density of sites. Many sites show evidence of years of packstock use. Impacts can be seen throughout the total area of the site, in the size of the bare mineral soil, as well as impacts to vegetation, including bark removal and root exposure due to tying stock to trees.

Campfires

To many visitors, campfires are part of the wilderness experience. Campfires may, however, led to unacceptable conditions such as an absence of dead/down wood and ground litter, damaged

green and dead trees, blackened rocks and in-place rock outcroppings, and partially burned trash. Both high use, concentration of camping and the ecological conditions of high elevations contribute to the conditions of firewood availability. Site-specific closures to campfires have been implemented to respond to these impacts on the Inyo NF. Campfires are currently prohibited in fourteen areas on the Inyo NF in both the Ansel Adams and John Muir Wildernesses. There are currently no campfire closures on the Sierra NF.

A study was conducted in the Ansel Adams Wilderness to determine the effects of packing firewood into closed areas (Gorsky 1989). This study concluded that packing in firewood did not lead towards a reduction of impacts.

Trails

The Forest Service uses two categories of trails. “System” trails are defined as “forest development trails wholly or partially within or adjacent to, and serving the National Forests and have been included in the Forest transportation plan.” “User-created” trails have been created by sustained use, have not been constructed and often are found around lakes, streams, or connect campsites. User-created trails are not maintained or recognized as part of the trail system by the Forest Service. Some abandoned system trails that continue to receive use are within this category.

Most system trails are currently maintained as “all purpose” trails for both foot and stock use. There are two types of maintenance: 1) routine, on-going maintenance that consists of debris removal, brushing, and cleaning of water bars, and 2) heavy, that consists of re-construction of trail segments to avoid or correct resource problems, causeway construction, rip-rapping and stair construction. Appendix F displays current inventoried trail maintenance levels. Existing trail maintenance plans have not been consistently implemented due to funding levels, catastrophic weather events (i.e. extreme snowpack, avalanches), changes in use patterns, etc.

The John Muir Wilderness is accessed by trails from both the east and west sides. There are 148 trails totaling 590 miles. Trails are generally in adequate condition though a number of trails are below maintenance level standards. The John Muir and Pacific Crest Trails traverse portions of this wilderness in a north-south direction. Some trails originating on the National Forests provide access into Sequoia and Kings Canyon National Parks. Conversely, some Park trails provide access to the John Muir Wilderness.

The Ansel Adams Wilderness is accessed by trails from both the east and west sides. There are 94 trails totaling 349 miles. In general, trail maintenance is adequate, although some trails are below maintenance level standards. The John Muir and Pacific Crest Trails traverse portions of the wilderness in a north-south direction. Some trails originating on the National Forests provide access into Yosemite National Park. Conversely, some Park trails provide access to the Ansel Adams Wilderness.

Cross-country travel is allowed, with the exception of the California Bighorn Sheep Zoological Area within the John Muir on the Inyo NF. Here, off trail travel is prohibited at specified times of the year.

The Dinkey Lakes Wilderness contains twenty-one trails totaling 50 miles. Trails are minimally maintained. The California Riding and Hiking Trail traverses the northern portion of the wilderness.

Most heavily used trailheads have been reconstructed over the last fifteen years. A designed trailhead typically has paved parking surfaces, restroom facilities, and indicated traffic flow patterns. Potable water and paved access roads are sometimes included.

Some trailheads have facilities for stock use. Stock facilities can include holding corrals, hitching rails, water facilities, loading ramps, parking for vehicle and trailer, and space for turn-around. On the Inyo NF, McGee, Shadow Lake, River, and Cottonwood Lakes trailheads all have stock facilities. On the Sierra NF, stock facilities are found at the Edison Lake, Bear Creek, Maxon, and Florence Lake trailheads. The Dinkey Lakes has no stock facilities.

Signs made from various materials are found within the planning area. Generally, signing is limited to passes and to aid in progressive travel (e.g. trail junctions signed; some distance and direction indicators).

Section 507 of the Americans With Disabilities Act of 1990 (ADA) states “in general, Congress reaffirms that nothing in the Wilderness Act is to be construed as prohibiting the use of a wheelchair in a wilderness area by an individual whose disability requires use of a wheelchair, and consistent with the Wilderness Act, no agency is required to provide any form of special treatment or accommodation, or to construct any facilities or modify any condition of lands within a wilderness area to facilitate such use.” Wheelchairs are allowed in the three wildernesses. No additional special provisions have been made to accommodate persons with disabilities in this planning area.

Recreational Stock Use

Stock use predates the establishment of these wilderness areas and is recognized as a historic and valid use. The use of stock is allowed within most all of the planning area although certain areas and trails are difficult or impossible for stock to use safely. Travel with stock is prohibited on the Mt. Whitney and Meysan Lake Trails on the Inyo NF. Several other areas are open to stock travel but with restrictions on grazing as shown in Table 3.2.

Horses, mules and burros remain the choice for most stock users. There has been an increase in the use of llamas within the last twenty years. Although commonplace, their use in the wilderness is not high at this time. Goats have also been used to a lesser degree than llamas (McClaran 1993). No serious conflicts have been reported between different stock user groups, however, some packers have reported conflicts when meeting llamas on the trail. The history of llama use, in the Sierra Nevada, lacks good documentation and it is not known when llamas were first used in the planning area. As mentioned above, goats are currently prohibited within the Bighorn Sheep Zoological Areas and other locations where occupied by bighorn sheep, to minimize possible disease transmission to the bighorn sheep.

Stock Use Specific To Each Wilderness

Ansel Adams Wilderness

Stock use varies significantly throughout the planning area. On the Sierra NF, approximately 23 percent of total use during the quota period is stock use (11 percent commercial/12 percent private). On the Inyo NF approximately 9 percent of use during the quota period is stock use (8.5 percent commercial/0.5 percent private) primarily in the Rush Creek drainage. Grazing areas, that have received moderate to heavy utilization, are found near Agnew Pass, Rodgers/Davis, Marie, Alger Lakes and below Parker Lake on the Parker Creek Trail. Approximately 5 to 10 percent of the total recreational use is stock use (95 percent commercial/5 percent private) in the Shadow and 1000 Island Lakes areas, the John Muir and High Trails to 1000 Island Lake, trails to Shadow, Emerald, Beck and Holcomb Lakes. Stock parties average 10 animals on the Inyo NF and 6 animals on the Sierra NF.

John Muir Wilderness

Stock use on the Sierra NF has been approximately 20 percent during the quota period (14 percent commercial/6 percent private). Popular destinations include Woodchuck Lake, Crown Lake, Blackcap Basin, Red Mountain Basin, and Burnt Corral Meadow. Areas with notable animal impacts include the shorelines of Crown and Woodchuck Lakes. Mono, Piute and Pine Creek Passes and trails out of Lake Edison and Florence Lake receive considerable stock use. Stock parties average seven animals on the Sierra NF.

On the Inyo NF, less than 10 percent of total use is commercial stock related. The more popular stock use areas include Kearsarge, Shepherd and New Army Passes, Mono Pass, McGee Creek, Pine Creek, Piute Pass, Duck Pass Trail, Cascade Valley and Fish Creek. Frequently used destination points include Hilton and Honeymoon Lakes. Stock parties average eight animals on the Inyo NF.

Dinkey Lakes Wilderness

Stock use visitation is estimated to be about five percent of the total recreational use. Of this amount, about 60 percent is commercial and 40 percent is private. Areas of most frequent use and concentration include the Cliff, Nelson, Little Lakes and Rock Meadow on the Sierra NF. The stock parties average five animals.

Recreational Stock Grazing

Current Management

Most of the planning area is open to recreational stock grazing. However, Minnow Creek Meadow, Pioneer Basin, Crown Lake, Shepherd Pass, and Cascade Valley are closed to grazing by Forest Order (ref. 36 CFR 261.57e). Hilgard Meadow has recently been re-opened to grazing under a rest-rotation schedule. Camping and/or grazing with stock is prohibited in the Shepard Pass area. Stock use is prohibited on Mt. Whitney and Meysan Lakes trails (ref. 36 CFR 261.57h).

Table 3.2. Restricted Transportation Livestock Activities by Forest Closures in Year 2000

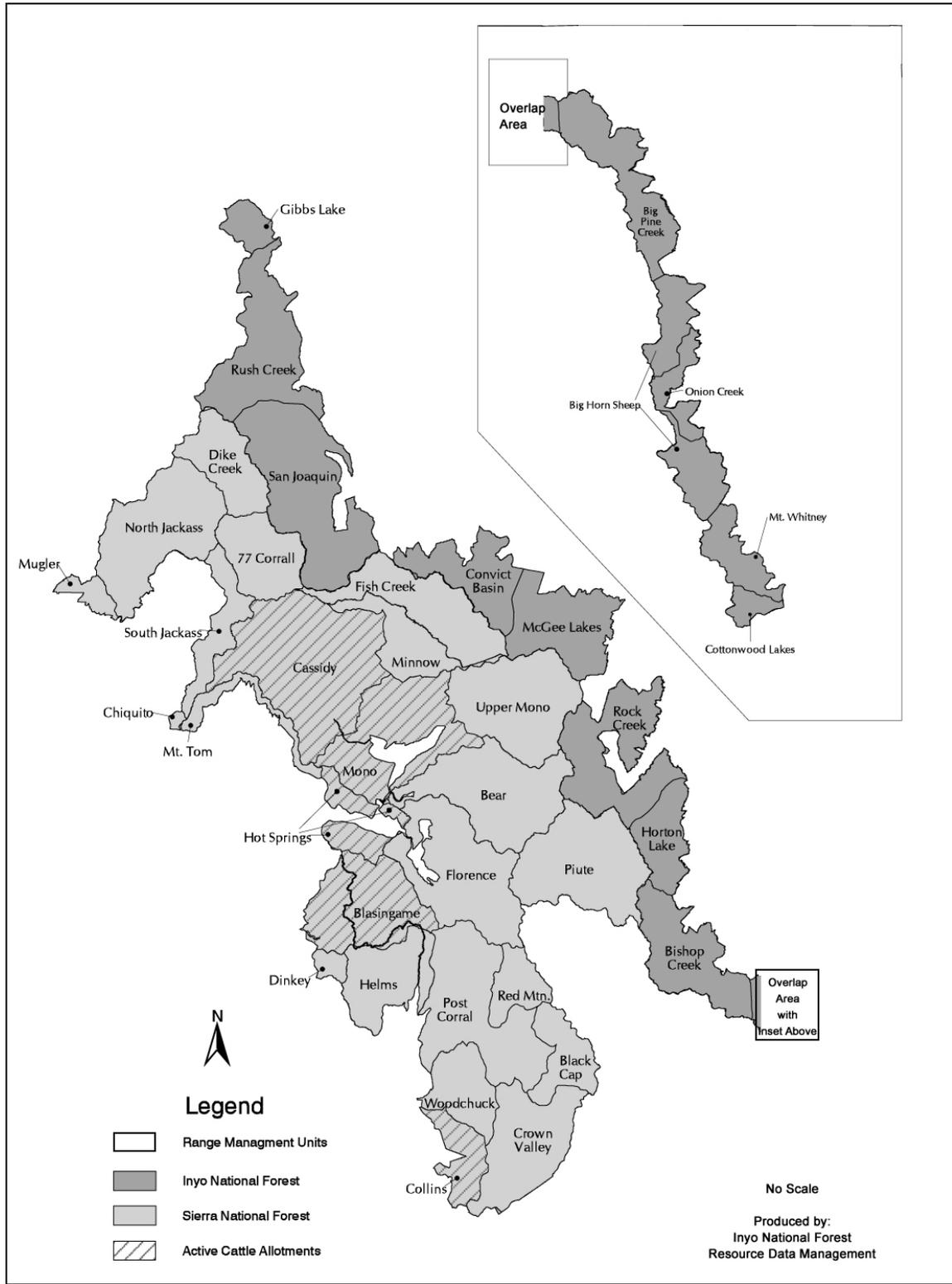
Resource Mgt Unit	Meadow Closure Areas	Meadow Acres	Riparian & Upland Acres	Reason for Closure
Bear Creek	Hilgard Branch	36	368	Λ, λ
Bear Creek	Rosemarie	14	6	Λ, λ
Crown Valley	Crown Lake	23	0	λ
Crown Valley	Crown Admin Site	6	0	Σ
Dinkey & Helms	Dinkey Lakes	133	300	λ, Θ, X
Fish Creek	Cascade Valley	0	415	λ, μ, X,
Minnow Creek	Cascade Valley	0	107	λ, μ, X,
Upper Mono	Pioneer Basin	119	700	μ, λ, ω
Post Corral	Big Maxson Admin Site	4	0	Σ, λ
Inyo NF				
Mount Whitney	Shepard Pass & Mt. Whitney Trail & Meysan Lakes Trail	No data	No data	Θ

μ = Unsatisfactory meadow conditions, transportation livestock allowed, no grazing allowed
 Λ = Unsatisfactory meadow conditions, transportation livestock allowed, alternate year grazing closures
 X = Congested camping area, transportation livestock allowed, no grazing allowed
 Θ = High use recreation area & public safety, no transportation livestock allowed
 Σ = Forest Service administrative site, no public transportation livestock allowed
 ω = Sensitive wildlife, fisheries or plant habitats, no transportation livestock allowed
 λ = Lake, shore, streamside or watershed protection



Thousand Island Lake, Ansel Adams Wilderness

Figure 3.1. Rangeland Management Units



Stock parties are currently limited by Forest Order to a maximum of 15 people (ref. 36 CFR 261.58f) and 25 animals (ref. 36 CFR 261.57a). No restrictions currently apply to travel on or off trail. With the exception for designated closed areas, visitors may graze stock anywhere. Current regulations prohibit (1) loose herding on the Inyo NF except Shephard Pass where loose herding is allowed; and (2) tying pack and saddle stock within 100 feet of lakes, streams, trails, and campsites except while loading and unloading (36 CFR 261.57a) on Inyo and Sierra NFs. Stock users are encouraged to use minimum impact techniques that allow stock some freedom of movement while preventing over utilization of key grazing areas.

Commercial pack operators are permitted to graze their stock under authorization of special use permits, as transportation livestock use permits or incidental use. These authorizations are often adjusted annually through annual operating plans based on seasonal conditions or site-specific problems or issues. Livestock restrictions that apply to the public, e.g. Forest Closures, are also applied to the commercial pack operators. Operators generally have additional terms and conditions in their permits specific to livestock management and resource protection. Commercial pack operators pay grazing fees to the U.S. Government on a head month (HM) basis, at the federal grazing fee rate in the same manner as production livestock operators. Some pack station and resort permits have authorizations for special use pastures which are planned into the overall operation. Most of these pastures are outside the wilderness in close proximity to the pack stations. There are no grazing allotments within the planning area that are obligated to transportation livestock.

Historic Rangeland

The wilderness planning area is inclusive of what originated, in 1893, as the Sierra Reserve. The Reserve included what is now the Sierra, Inyo, Sequoia National Forests and Sequoia-Kings Canyon National Parks. At one point it was estimated that nearly 500,000 sheep grazed illegally in the reserve (Rose 1994). Excerpts from a historic record filed by E.G. Dudley (1917) describe it this way “Settlements extended up and down the western foothills of the Sierra Nevada, in the fertile valleys of Inyo, and sagebrush desert...In this great region there were many summer camps of cattle and sheep men...Trespass sheep grazed in the Sierra Reserve in the summers of 1900, 1901 & 1902. In 1903 the number of sheep driven through the southern passes (Tehachapi) and up to the Inyo side was 50,850...Other bands were taken, coming in from the Park (Yosemite) on the north side and taken out. Individual ranger of great loyalty and courage had adventures in these sheep troubles between 1902 and 1906 that would fill a large book...The range, overstocked in places, was underutilized in others. But now (1917)...there has been study of local conditions so that the settlers who live in or near the Forest have first consideration to make the best possible use of the grazing...Sierra (NF) now grazes 15,000 cattle and horses, 500 hogs, and 26,000 sheep and goats...ten thousand of these sheep come over from the Inyo using range which is more or less inaccessible to the San Joaquin Valley stockmen and especially needed by the Inyo settlers.” (Dudley 1917). The establishment of cattle and sheep allotments during this period was the beginning of regulated management and range restoration. Evidence of deteriorated range from heavy sheep use is still readily evident in places such as Pioneer Basin near Mono Pass.

In 1944, a second effort was made to assess these high elevation rangelands and adjust grazing use. Waldo Wood noted that the carrying capacity of the Sierra grazing ranges had not been adjusted since 1922 and were badly out of date. Several of the high elevation allotments were closed to grazing following that assessment and many others had stocking adjustments to account for recreational stock use.

From 1956 to 1962 a third assessment was conducted by Shields and Snyder to analyze and inventory meadows and riparian areas of the High Sierra. Their objective was to establish new suitable acre and carrying capacity determinations based on key grazing areas (i.e. meadows).

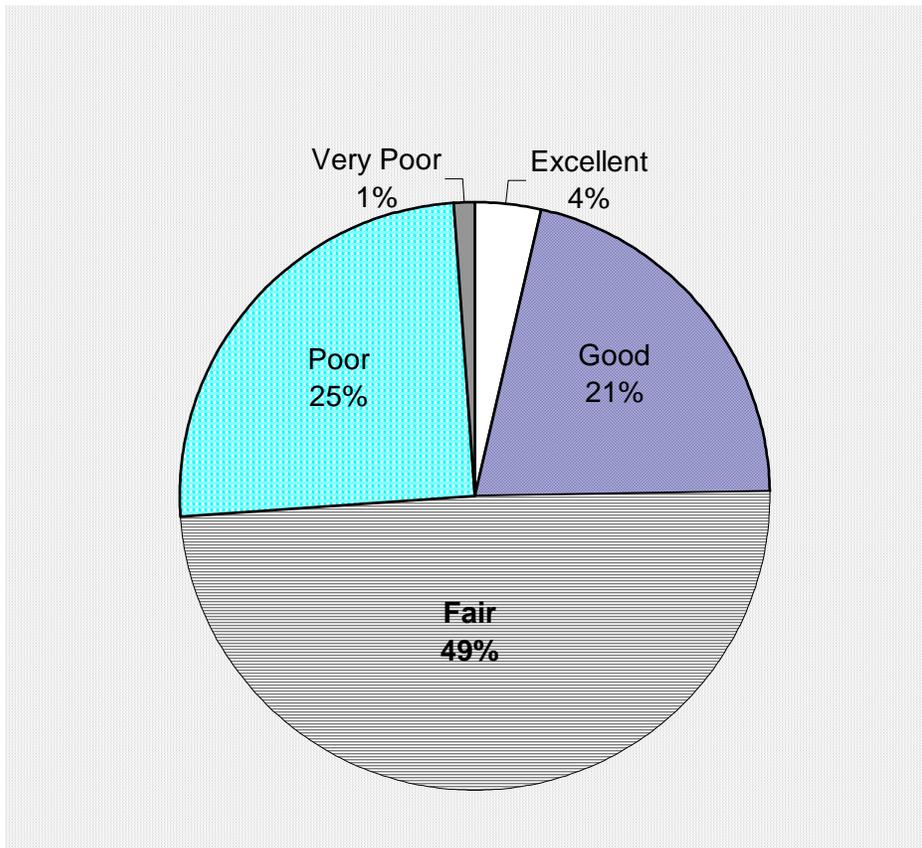
Table 3.3. Commercial Livestock Allotment Closures
With Allocation of Forage to Recreational Livestock

Allotment	Closure Dates
77 Corral	1964
Minnow Creek	1950
Upper Mono	1953
Bear Creek	1946
Piute	1946
Florence	1946
Red/Black Cap	1953
Woodchuck	1953
Crown Valley	1947

The effort was made to assign these key meadows forage condition ratings and adjust livestock stocking levels to improve overall rangeland conditions. It was determined at that time that approximately three-quarters of the key grazing areas surveyed had unsatisfactory conditions (Figure 3.2). This state of conditions reflects the earlier days of heavy and extensive commercial livestock. Following a 1962 analysis forage allocations were adjusted primarily to restore these watersheds while accommodating recreational stock. Most all the packstock management

plans and grazing capacities, being used today, are based on the Shields assessments. Many of these condition and trend locations have been re-analyzed during the mid 1980s and early 1990s by various range specialists at different times (Ratliff, Roberts, Lorenzana). These re-reads, with some exceptions, have generally indicated upward trends in range condition. A summary of the forage condition surveys is described in Appendix F and illustrated in Figure 3.2.

Figure 3.2. Forage Condition Ratings, 1956 thru 1992 Total Number of Benchmarks = 282



Rangeland Capability and Suitability

For this analysis rangelands within the planning area have been defined capable and suitable for grazing by one of two categories: (1) those areas which are allocated by grazing permit and allotment boundaries to commercial livestock producers; and (2) grazing, at large, which is authorized by livestock use permit for transportation livestock outfitters and forest visitors. A detailed description of capability and suitability analysis conducted for this RDEIS is described in Appendix E.

Rangeland Capability

“The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices and at a given level of management intensity. Capability depends on site conditions such as climate, slope, landform, soils and geology, as well as the application of management practices, such as silviculture or protection, insects, and disease.” (CFR 219.3)

Rangeland Suitability

“The appropriateness of applying certain resource management practices to a particular area of land as determined by an analysis of the economic and environmental consequences and alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices.” (CFR 219.3)

Grazing Allotments

Active grazing allotments occupy approximately 14 percent of the planning area. Those allotments are shown in Table 3.4. Grazing allotments and the associated impacts from commercial livestock have not been analyzed in detail for this analysis. However, each forest is conducting environmental analysis of active grazing allotments per the NEPA schedules required by the Recession Act of 1995. Other grazing allotments have overlap into the wilderness planning area. These allotments are vacant or have designated unsuitable range within the wildernesses as shown in Table 3.5.

Table 3.4. Active Production Livestock Allocations within John Muir, Ansel Adams, & Dinkey Wildernesses

Allotment	Season	No.	Type	Head Months
Blasingame #5317	06/21-09/15	135	Cattle	386
Cassidy #5319	07/01-09/30	100	Cattle	302
Collins #5410	06/21-09/15	130	Cattle	372
Hot Springs #5320	07/01-09/15	54	Cattle	137
Mono #5318	07/01-10/15	100	Cattle	352
Total	06/21-10/15	519	Cattle	1549

Table 3.5. Production Livestock Allotments which are Inactive within John Muir, Ansel Adams, & Dinkey Wildernesses

Allotment	Type	Status	Unsuitable Rangelands
Alger Lake #0102	Sheep	Vacant	Big Horn sheep habitat
Bloody Canyon #0105	Sheep	Vacant	Big Horn sheep habitat
Dinkey #5408	Cattle	Active	High recreation area
Helms #5409	Cattle	Vacant	Meadow restoration
Mount Tom #5316	Cattle	Active	Noncapable range
Mugler #5528	Cattle	Active	Noncapable range
North Jackass #5547	Cattle	Vacant	Meadow restoration
Post Corral #5445	Cattle	Vacant	Meadow restoration
South Jackass #5529	Cattle	Active	Noncapable range

Grazing At Large

The determination of capable and suitable rangelands is dependent upon the scope of grazing issues. Analysis is conducted at the level of planning where existing or reasonably attainable data is available for valid conclusions. Capability and suitability analysis at the Forest Plan level is generally not a decision to graze livestock on any specific area of land. Nor is it a conclusive decision on livestock grazing capacities. The analysis is meant to show where grazing could occur if there is a decision to graze livestock. In some situations livestock need not be prohibited from areas not identified in the plan as capable or suitable (Acting Deputy Chief, McDougle, 1997). For example, a remote stringer meadow with sufficient forage to support stock but considerable distance from trails or camps may not be identified as capable and suitable in this analysis. However, if use of the meadow does not conflict with other resources then the area would be available to graze with no restrictions on access. There would be no forage allocations made to stock operators in these situations.

Table 3.6. Capable and Suitable Acres for Grazing At Large by Recreation Packstock, Year 2000

Rangeland Management Unit	Total Acres	Lake Acres	Pvt. Acres	Capable Meadow Acres	Closed Meadow Acres	Suitable Meadow Acres	Capable Upland Acres	Closed Upland Acres	Suitable Upland Acres
All RMUs	838,459	18,770	1,711	12,796	335	12,461	63,778	1,896	61,882

Ecological State and Transition

A fourth assessment of rangeland conditions was initiated in 1994 and will continue for the next ten years over the entire wilderness planning area. Sixty-eight (68) key use benchmark locations have been identified which will be used in future analysis and monitoring. Those sites were selected based on (1) proximity to stock camps and known key use areas; (2) meadow and riparian community types in close proximity to water containing key forage species; (3) study plots which would show change over time with changes in management; areas within each meadow complex which have indicators of human disturbance; (4) limited or absent influences by commercial livestock; (5) well dispersed and representative benchmark locations which could be reasonably monitored and administered annually; and analyzed or re-analyzed for functional condition, ecological state and transition on a 10-year schedule.

Determinations of functional condition and ecological state will be made to determine which locations are in satisfactory condition or in need of restoration. Based on travel observations in 1995-1999, Frolli & Lorenzana (Forest Service Employees) were of the opinion that most uplands and riparian rangelands were properly functioning and in satisfactory condition. To date there were few meadows found with extensive degraded conditions. Those sites that were found to be degraded appeared to have an upward trend in conditions. Locations of most concern were those that had plant communities rated at low to mid seral ecological state over an entire meadow complex or stream reach combined with hydrological processes indicating a system which is

functioning at risk or nonfunctional (Figures 3.3 & 3.4). These locations are considered candidates for Forest Closure to all livestock grazing until restoration can be achieved.

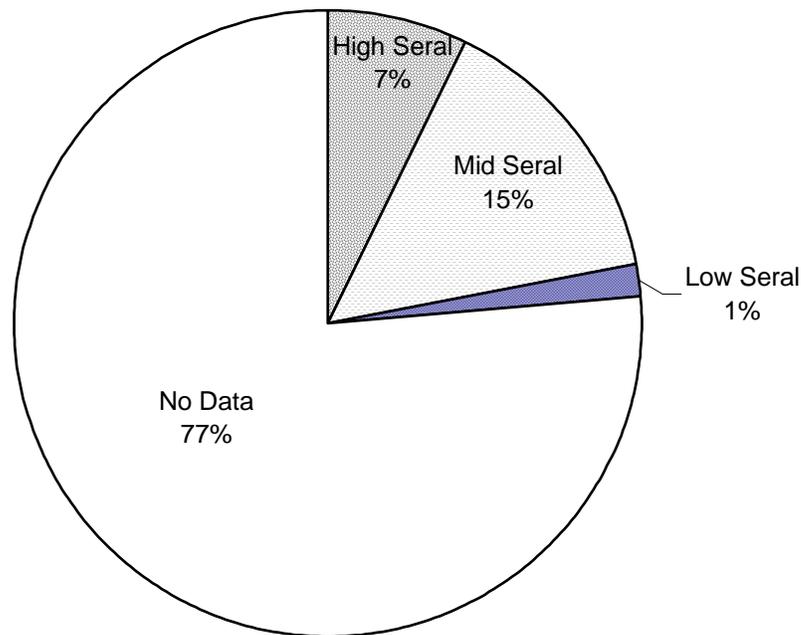
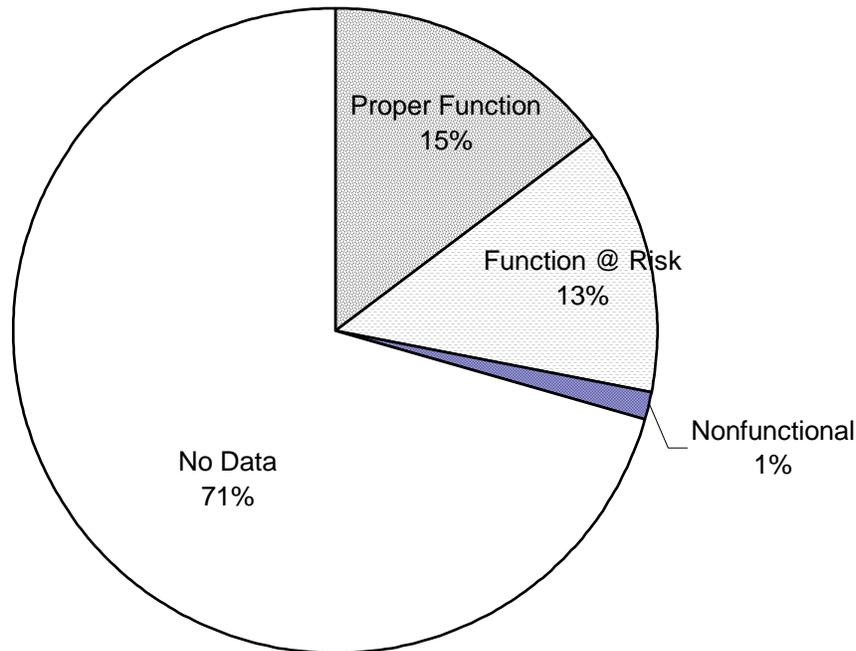


Figure 3.3. Ecological State of Key Grazing Benchmarks, 1994 to Present Total Number of Benchmarks = 68

Transect ratings often represent a very limited extent of condition for a meadow complex as a whole. For a given study, each transect, is representative of a single plant community type within a larger meadow complex. Plant community types are typically less than five acres in size. As mentioned above, study locations were selected to show change over time with change in management. The specific site within a meadow complex is selected based in large part on measurable and detectable levels of past or present human disturbance. Therefore, it is expected that a high percentage of selected benchmarks will show a level of condition that is less than what is desired. The studies listed here were not an inventory of total acres by condition class or ecological state. Inventory of total acres by functioning condition and ecological state will be addressed during NEPA analysis for each resource management area by watershed.

Figure 3.4. Proper Functioning Condition of Key Grazing Benchmarks, 1994 to Present
Total Number of Benchmarks = 68



Facilities

Many structures, buildings, and features exist within the planning area. These include drift fences, bridges, cabins, corrals, mines, dams, gauging stations, solar toilets, and seismic stations. All structures over forty years old are subject to a historic evaluation to determine the historic significance (see discussion on heritage resources).

An inventory of all structures within the planning area is in Appendix K. Many of the cabins are under permit to the California Department of Water Resources (DWR) to facilitate the states snow survey program for run-off predictions. These cabins were built and are maintained by the DWR. These cabins make it possible for the surveys to be done manually with surveyors as opposed to using helicopters or more technologically advanced means. Though snow sensors have been in place for the past decade to determine if sensor technology can predict similarly to manual surveys, decisions have not been made on methods and means for continuing this longstanding practice of gathering water resource data.

There are some cabins in the planning area that are used exclusively by the Forest Service for the administration of the area.

Two significant structures are the toilet facilities on the Mt. Whitney trail. Toilet facilities have been in place on Mt. Whitney for over thirty years, and have been modified throughout the years to handle the volume of human waste produced by the high visitation on the trail.

Dams within these wildernesses all predate the designation of the areas as wilderness and are all under Special Use Permit.

Heritage Resources

Based on previous archaeological research and radiocarbon analysis, the planning area has been inhabited by Native American Indian peoples and later European and Asian settlers for at least the past 7000 years (TCR 1984: 147). The region contains a wide variety of heritage resources, as well as sites that contain important information about past environmental conditions.

Documented and potential heritage resources include hundreds of highly significant archaeological sites such as major prehistoric and ethno historic obsidian tool production sites, Indian camps and village sites, food processing areas, ceremonial areas, burials and cremations, pictograph features, trails, and hunting locales. These important archaeological properties are known through documentation and anecdotal reference to abound throughout the mountainous landscape of the High Sierra. The Rush Meadow Archaeological District on the Inyo NF has had more scientific study than any other comparable area within the wilderness.

Based on known data, Native American traditional use areas and archaeological sites appear to be concentrated along prehistoric trans-Sierran travel routes that may have been used for at least 7000 to 10,000 years. Such resources provide the woven fabric of cultural history that is significantly unique to the area.

Historic period sites also abound throughout the planning area. Structures, buildings, and features related to the myriad of Euro-American activities in the Sierra Nevada during the 18th and 19th centuries can be found throughout the planning area. Activities related to mining and prospecting, lumbering, cattle grazing, Basque sheep grazing, homesteading, exploration, military activities, and public land management all left behind historic sites. One of the most significant historic structures, located on the Inyo NF, is an early 20th century cabin once owned by actor Lon Chaney and designed by the first African-American architect to be admitted to the American College of Architects.

In summary, a wide range of historic trails, roads, arborglyphs (tree blazes), mine structures and equipment, cabins, fences, camps, graves, and other features dot the countryside throughout these wildernesses.

Significance of Heritage Resources

Although only a very small percentage has been systematically examined, the potential exists for hundreds if not thousands of significant historic properties to exist within the planning area. Heritage resources are nonrenewable, fragile, and highly susceptible to deterioration. Cumulatively, they provide a valuable picture of Sierra Nevada cultural history for the past four to eight millennia. Archaeological sites are generally found to be significant because of the important research data that they contain. Integrity of setting and design is an important evaluative criterion for significance for all heritage resources.

The administrative and historic files on the Sierra, and Inyo NFs contain numerous interviews, photographs, and other memorabilia associated with residents and early settlers of the area. In summary, significant heritage resources are likely to exist throughout the planning area. They are vulnerable to damage and impact from most ground disturbing activities. Further research may demonstrate that there are concentrations of significant archaeological sites associated with prehistoric travel routes across the Sierra such as the Mono and Piute Trails.

Native American Tribal Issues

Currently, the Sierra NF has two specific Forest Plan standards and guidelines in place to protect Mono and Blayney Hot Springs. These areas are known to be places of spiritual and ceremonial significance to several Native American tribes.

Formal consultation between the Forest Service and area Native American tribes and organizations is underway to determine appropriate management practices for sacred sites, plant collection areas, use of traditional trails, and other places of cultural importance to contemporary Indian tribes.

Tribal Relations

Indian country is a complex pattern of reservations, rancherias, communities, and allotments. There are approximately 16 Indian tribes and communities associated with the wilderness study area. There are 10 federally recognized tribes and 6 tribes seeking recognition [with filed petition numbers (Bureau of Indian Affairs:1998)]. They are as follows:

Table 3.7. Planning Area Tribes

Federally Recognized Tribes	Tribes seeking Federal Recognition
Big Pine Tribe	Dunlap Band of Mono Indians
Big Sandy Rancheria	Kern Valley Indian Community
Bishop Indian Tribal Council	Mono Lake Indian Community
Cold Springs Rancheria	North Fork Band of Mono Indians
Fort Independence Indian Community	Southern Sierra Miwuk Nation
Lone Pine Community	
North Fork Rancheria	
Picayune Rancheria	
Table Mountain Rancheria	
Tule River Indian Tribe	

The cultural and spiritual survival of Indian people is to a large extent dependent upon National Forest System lands, including the wilderness, because areas of importance are located on them. There are ceremonial locations, traditional gathering areas, and archaeological sites, including linear sites. These areas contribute to the tribal communities way of life, their identity, their traditional practices and cohesiveness.

In order for the Forest Service to fulfill its legally mandated trust responsibility toward tribes and Indian communities, it must consult and collaborate with them. Tribes have indicated that consultation needs to be improved; many Forest Service personnel are unfamiliar with local tribes and the trust responsibility that is inherent to the relationship. There is a current trend for tribes to want to develop agreements with Forests. Of equal importance, with respect to management of resources that are significant to Indian people, is the fact that there has been limited inventory of the types of resources, resource locations and current cultural needs of Indian people. There is a very limited database from which to operate. Therefore, consultation at the local level in the absence of an adequate database is absolutely necessary.

At informational and tribal meetings held in the past, three concerns stand out: access and use of culturally important resources; access and use of traditional places, including traditional trails; protection of archaeological sites, including linear sites, such as trails.

Access and Use of Culturally Important Resources

Traditional gathering for food, medicine, dance regalia for ceremonial use, basketweaving materials, and other activities continue today. The present needs and gathering practices are not fully known. This is in part because there has been a revitalization in traditional activities. Another reason is because this source of information has not been a focal part of inventory of the Forest's Heritage Resources Program. There may be the beginning of some baseline data for some specific plants used by gatherers, but only a fragment of their needs are known, including future needs.

Access and Use of Traditional Places, Including Trails

Presently, ceremonial activities such as traditional healing ceremonies, traditional/ceremonial walks, or visits to sacred areas happen on National Forest System Lands including the wilderness. Sometimes they are held with little notice; sometimes there are large gatherings. Some of these activities, particularly those religious in nature, need to be performed in an environment conducive to the activity. As use and visitation increase, there is a concomitant increase in conflicting recreational use since these areas continue to draw people for their unique characteristics. In the last twelve years, local Native American tribes and organizations have worked to revitalize traditional walks, i.e., Bloody Canyon Trail, and the Mono and Paiute Trails. They are known to have cultural importance and are of significance to contemporary Native American tribes.

Protection of Archaeological Resources

Numerous archaeological sites have been identified, particularly along trail networks. They contain subsurface artifacts and data that is significant to the understanding of the culture of

past people and therefore are of importance to archaeological communities. These sites are also important to Indian people. Any discussion concerning the possible “mitigation” of impacts to a site must also be done in consultation with tribes. This is because the concept of mitigation is often viewed from totally different perspectives, i.e., the tribe may feel that the site(s) cannot be mitigated, or simply mitigated through archaeological excavation.

Economic

Introduction

There are at least three areas of influence for the decisions to be made in this plan: local, regional, and national. Locally, the decisions made in the plan will affect individual livelihoods and businesses that depend upon a consistent level of access to the planning area covered by this management direction. The local community level is where any economic consequences will be most direct and easy to observe. Unfortunately, it is virtually impossible to predict effects by community or by individual business for a programmatic plan such as this. Business practices vary considerably among firms and the long-term viability of any entity depends upon the business acumen of the owner and an ability to adapt to changing conditions.

Most economic data is collected and reported at a regional (i.e. county) level and the bulk of the discussion on socioeconomic conditions will focus on this area of influence. There are two distinct economic regions where secondary economic effects will occur from the proposed wilderness management decisions. Mono County and Inyo County on the eastern side of the Sierra form one economic region while the west side counties of Fresno and Madera form another. As discussed below, the regions are not in equal positions along the economic development spectrum. Thus, they have different capacities for absorbing and deflecting economic impact.

Finally, the national interest is reflected in the concept of wilderness and the interest in preserving and maintaining areas in their natural state. The wilderness resource is used and valued by people across the United States and internationally. Moreover, such value extends beyond actual use to include passive, or “non-use” values. For some, there is value just knowing wilderness exists even if they never actually set foot in the area. In short, national values run the full spectrum of interests. Although they are not quantified or measured here, the magnitude and scope of interest in wilderness management has been recognized and received in the extensive public comment received throughout this planning process.

Regional Economic Conditions

East Side - Mono County

Mono County covers 1.95 million acres and is centrally located on the eastern side of the Sierra mountain range and bordered on the east by the State of Nevada. Mammoth Lakes (pop. 5,325), a growing community and a center of winter sports activities is located in the southern part of

the county. Bridgeport, the county seat, is located in the north. In the year 2000, Mono County ranked 55 out of 58 California counties in terms of population, making it one of the most sparsely settled regions in the state. From 1990 to 2000, Mono County's population increased from 9,956 to 10,900 (9.5%). By the year 2020, the county population is expected to reach 14,200, an increase of over 30 percent from the current population base.

In 1999, average annual employment in Mono County was 5,870 with an unemployment rate of 6.7 percent (California's unemployment rate was 5.2 percent). Unemployment rates have steadily decreased from a high of 10.9 percent in 1995. The service sector is the largest employer in Mono County, accounting for 35 percent of employment. Other significant sectors include retail trade (27%) and government (20%). In 1999, Mono County outpaced the State in terms of the rate of job growth (5.4% vs. 2.8%). Forecasts through 2004 are for continued employment growth in services, retail trade and government. The county's largest employers include June Mountain Ski Area, Mammoth Hospital, Mammoth Mountain Ski Area, Mammoth Unified School District, Mono County, and Whiskey Creek, Inc.

East Side - Inyo County

Inyo County lies to the south of Mono County and is also bordered on the east by the State of Nevada. Although the total land base of Inyo County exceeds 6.5 million acres (nearly 6 times the size of Mono County), roughly half the area is located within the boundaries of the Death Valley National Park. Bishop (pop. 3,460) is the only incorporated community in the county. Interstate Highway 395 runs south through the Owens Valley, the heart of Inyo County. Small communities are clustered along the highway and include Big Pine, Lone Pine and Independence. In the year 2000, Inyo County ranked 52 out of 58 California counties in terms of population, making it one of the most sparsely settled regions in the state. From 1990 to 2000, Inyo County's population decreased slightly from 18,281 to 18,200 (<1%). By the year 2020, the county population is expected to reach 20,700, an increase of 12 percent over the current population.

In 1999, average annual employment for Inyo County was 6,840 with an unemployment rate of 5.7 percent (California's unemployment rate was 5.2 percent). Unemployment rates have steadily decreased from a high of 9.4 percent in 1995. Government is the dominant economic sector in Inyo County, accounting for 33 percent of total employment, the bulk of which is local government employment. Other significant industries are services (24%) and retail trade (24%). Within the retail trade sector, most of the jobs are located in eating and drinking establishments. Job growth in 1999 was reported at 1.6 percent, primarily within the communications and public utilities sectors. The County's largest employers are generally located in Bishop and Death Valley and include Bishop Paiute Gaming, Inyo County Government (*Independence*), Death Valley National Park Service, Fred Harvey Co. (Hotels/Motels), Furnace Creek Inn and Ranch, Los Angeles Aqueduct Systems (*Independence*), Northern Inyo Hospital and the Toiyabe Indian Health Project.

West Side - Madera County

Madera County, 1.37 million acres in size, is the smallest of the four counties included in the area of influence. It is located in the exact center of California, in the heart of the Central Valley and the central Sierra. The city of Madera (pop. 36,650) is the county's largest

population center. From 1990 to 2000, Madera County's population increased from 88,090 to 117,100 (25%), making it one of the fastest growing counties in the state. In the year 2000, Madera County ranked 35 out of 58 California counties in terms of population. By the year 2020, the county population is expected to reach 224,600, a 151 percent increase over current numbers.

In 1999, average annual employment in the county was 46,590 with an unemployment rate of 11.6 percent (California's unemployment rate was 5.2 percent). Historically, the unemployment rate for Madera County has been higher than the statewide average. However, in recent years, unemployment rates have steadily declined from a high of 15 percent reported in 1995.

Agriculture is the largest employer in the county, accounting for 29.9 percent of total employment. In 1997, 1,673 farms were reportedly operating in the county, covering 46.9 percent of the land area. Other significant sectors include government (19.5%) and services (16.8%). In 1999, the rate of job growth in Madera County was about half the statewide average (1.3% vs. 2.8%). Forecasts through 2004 are for employment growth in manufacturing, services and state and local government. The high rate of population growth anticipated for the county will contribute to the upward pressure on job growth in support sectors (retail trade, services, etc.). Madera County's largest employers are generally located in the town of Madera and include Almaden Winery, Canandaigua Wineries, D Papagni Fruit Co., Madera Community Hospital, Mission Bell Winery, Valley Children's Hospital, and Valley State Prison (in Chowchilla).

West Side - Fresno County

Fresno County, 3.82 million acres in size, is the second largest county in the area of influence and roughly half the size of Inyo County on the east side of the Sierras. It is located in the fertile, well-populated California Central Valley. Based on production levels, it is the top ranking agricultural county in the nation. With a 2000 population of 805,000, Fresno ranks 10th out of California's 58 counties in terms of population and far exceeds the combined population of the three other counties in the study area. The city of Fresno (pop. 415,400) is the county's largest population center and is nearly four times the size of the next largest city (Madera) in the four-county area of influence. From 1990 to 2000, Fresno County's population increased by 21 percent and it continues to be one of the fastest growing areas in the state. By the year 2020, the county population is expected to reach 1,114,400, an increase of 38 percent relative to current population estimates.

In 1999, average annual employment in the county was 328,500 with an unemployment rate of 13.4 percent (California's unemployment rate was 5.2 percent). Historically, the unemployment rate for Fresno County has been higher than the statewide average. Since 1995, Fresno County's annual unemployment rate has remained fairly constant at 13-14 percent.

The service sector is the largest employer in the county, accounting for 21.2 percent of total employment. Other significant sectors include government (19.1%) and agriculture (18.3%). In 1997, 6,592 farms were reportedly operating in the county, covering 49.3 percent of the land area. Based on the value of production, grapes, poultry and cotton were the leading commodities. In 1999, the rate of job growth in Fresno County was about half the statewide average (1.3% vs. 2.8%). Forecasts through 2004 are for employment growth in services,

government and retail trade. The high rate of population growth anticipated for the county will contribute to the upward pressure on job growth in support sectors (retail trade, services, etc.). Fresno County's largest employers include California State University, Del Monte Corp., Fresno Ag Labor Services, Fresno City College, Fresno Community Medical Center, Gerawan Farming, Glacier Foods, Gottschalks, Inc., Ito Packing Co., J & J Agri Services, Kreger Inc. (*vegetables and melons*), University Medical Center, U.S. Veterans Medical Center, and Wawona Frozen Foods.

Summary

The difference between the counties on the west side of the Sierras and those of the east is striking. The eastern Sierra is sparsely settled with slow to stagnant population and employment growth. The economy is heavily reliant on recreation and tourism-oriented businesses as well as federal, state, and local government. However, unlike many other amenity-based economies, the strong presence of the ski and winter sports industry maintains employment opportunities throughout the winter months. In contrast, the densely populated counties of Fresno and Madera are experiencing rapid growth and development. These economies are substantially more diversified than those of the east side, and therefore, less sensitive to fluctuations in any single economic sector.

Table 3.8. Regional Economic Statistics

	Population 1990	Employment 1999	Leading Economic Sectors
<i>Mono County</i>	9,956	5,870	Services, Retail Trade, Government
Mammoth Lakes-Town	4,785	3,230	
<i>Inyo County</i>	18,281	6,840	Government, Services, Retail Trade
Bishop - City	3,475	1,410	
Big Pine - CDP ¹	1,158	400	
Dixon Lane/Meadow Creek CDP	*	860	
Lone Pine CDP	1,818	640	
West Bishop CDP	*	1,170	
TOTAL East Side	28,237	12,710	
<i>Madera County</i>	88,090	46,600	Agriculture, Government, Services
Chowchilla City	5,930	2,710	
Madera Acres CDP	*	3,330	
Madera - City	29,281	14,210	
Madera Ranchos CDP	*	3,700	
Oakhurst CDP	2,602	1,270	
Oakhurst Mtn. Area	*	15,170	
Parksdale CDP	*	870	
Parkwood CDP	12,000	1,070	
Yosemite Lakes CDP	*	1,320	

¹ Census Designated Place (not an incorporated town or city)

	Population 1990	Employment 1999	Leading Economic Sectors
<i>Fresno County</i>	667,490	328,500	Services, Government, Agriculture
Auberry CDP	1,866	830	
Caruthers CDP	1,603	850	
Clovis - City	50,323	30,040	
Coalinga City	8,212	4,010	
Del Rey - CDP	1,150	330	
Easton - CDP	1,877	920	
Firebaugh - City	4,429	1,900	
Fowler - City	3,208	1,390	
Fresno - City	354,202	169,980	
Huron - City	4,766	2,470	
Herman - City	*	2,380	
Kingsburg - City	7,205	3,500	
Laton - CDP	*	470	
Mendota - City	6,821	2,570	
Orange Cove - City	5,604	2,230	
Parlier - City	7,938	3,350	
Reedley - City	15,791	7,500	
Riverdale - City	1,980	870	
Sanger - City	16,839	7,850	
San Joaquin - City	2,311	780	
Selma - City	14,757	6,350	
Squaw Valley - City	1,500	850	
TOTAL West Side	755,580	375,100	

Affected Industries

Commercial pack stations, mountain guides and other wilderness-based outfitter/guides will be directly affected by the changes in wilderness management direction proposed in this planning effort. This section describes the economic benefits to local communities and counties associated with these businesses and puts the outfitting and guiding industry into the broader perspective of the regional economy.

Commercial Pack Stations

Commercial packers have operated in the Sierra for over 100 years. Some of the pack stations in operation today have their roots in business established in the 1920's and 1930's. Few businesses can claim such a long track record in the face of continual change in local and national economic conditions, consumer tastes and preferences, and federal regulations. The perseverance of these small businesses is testimony to the ability of their owners to continually adapt to new challenges as they arise. Flexibility is key to survival.

In recent years, there has been a shift away from full-service pack trips (packers supply everything and accompany clients throughout the trip) to spot trips and dunnage trips (packer

transports gear and provisions for hikers). The demand for day rides has also been increasing. As described below, the commercial packer provides an array of services to meet the ever-changing needs of a diverse clientele who desire stock-supported access to the wilderness:

Spot Trips. The client brings provisions and gear, and everything is transported by horseback (gear and provisions by pack animal) to the campsite. After a designated period of time, the stock and packer return to pick up and return the client and gear to the point of origin.

Trail Rides. Fully outfitted, pre-designated, multi-day traveling trips. All stock, packers, cooks, provisions and gear are supplied by the outfitter.

All-Expense Trips. A customized itinerary is developed for the client and fully outfitted by the packer, including stock packers, cooks, food and gear.

Hiking with Stock. Fully outfitted pack trips. Clients hike instead of ride.

Base Camps. Client rides to a base camp location that is already set up and fully outfitted. Daily horseback rides occur from the base camp location.

Dunnage Trips. Packers transport the gear and provisions of their clients to a specified location. Clients arrange to ride or hike to the pre-designated campsite without the burden of carrying their own supplies.

Continuous Hire of Stock and Packer. The packer and stock remain with the client for the duration of the trip. Camp gear and provisions are supplied by the client.

Day Rides. Half-day or full-day guided horseback trips originating at the pack station.

Ten pack stations operate on the Inyo National Forest and are based out of towns located in the east side counties. Pack stations are authorized under “resort” permits with facilities such as cabins, corrals, sheds, etc. located on National Forest System lands outside of the wilderness boundary. All pack stations on the Inyo are authorized to issue their own wilderness permits. Six pack stations operate on the Sierra National Forest and are based out of towns located in the west side counties. Depending on the District where their permit is authorized, some of these packers can write their own wilderness permits.

The economic contribution of each set of pack station operations to the respective regional economy is shown in Table 2. An economic model (IMPLAN) was used to generate an estimate of annual average employment in pack station operations, total wages paid, and the “multiplier” effect of pack station operations as operating expenses and employee expenditures work their way through the economy. The economic statistics calculated by the model were compared with a sample of employment and gross income figures reported by pack station operators to verify accuracy.

Outfitter/guides

Currently over 30 outfitter/guide operations run trips in these wildernesses, under permit with either the Sierra or the Inyo NF. Eleven of these operators are mountain guides who conduct activities that require specialized skills and equipment. Although they have more locations that they access than do pack stations, they are still limited to locations that access mountaineering opportunities. Mountain guides generally have more flexibility in arranging trips and itineraries than pack stations with facilities and fixed costs in base operations. This flexibility allows them to adapt to changes in management of the wilderness. Other outfitters and guides have some flexibility to arrange trips, as they are not necessarily tied to certain locations like mountain guides.

The following table (Table 3.9) contains information regarding the economic profile of commercial pack stations in the area of influence. It provides a summary of the available economic information in terms of employment and income created by the operation of pack stations in the planning area.



Table 3.9. Economic Profile of Commercial Pack Stations

	East Side Counties (Mono, Inyo)	West Side Counties (Fresno, Madera)
Number of Pack Stations	10	6
Seasonal Full-Time Employees ²	125	21
Seasonal Part-Time Employees ³	71	22
Average Annual Employment⁴	62	10
Indirect Employment⁵	12	3
Total Employment (Direct + Indirect)	74	13
Employment Multiplier (Total Employment/Direct)	1.19	1.3
Wage and Salary Income⁶	\$495,961	\$88,780
Indirect Income³	\$222,315	\$67,525
Total Income (Direct + Indirect)	\$718,276	\$156,305
Income Multiplier (Total Income/Direct)	1.45	1.76
Percent of Two-County Employment	.5% ⁷	<.01%
Percent of Two-County Wage and Salary Income	.1%	<.01%
Communities with Pack Stations (number of stations in paren)	Bishop (5), Mammoth/June Lake (4), Independence (2), Big Pine (1)	O'Neals (1), Mono Hot Springs (1), Shaver Lake (1), Lakeshore (1), Auberry (1)

² Estimated. Based on contacting sample of packers.

³ Estimated. Based on contacting sample of packers.

⁴ Calculated using the IMPLAN economic model. Derived from estimates of gross income.

⁵ Calculated using the IMPLAN economic model. Includes employment supported by the operating expenses of the pack stations and the purchases made by employees in the local economy.

⁶ Calculated using the IMPLAN economic model.

⁷ Pack operations are more important to individual towns, representing an estimated 2% of total employment in Bishop and 1% of total employment in Mammoth Lakes.

Social

Attitudes and Values

Individuals and organizations have expressed concern about changes in commercial and dispersed recreation, grazing, and other Forest activities in these three wildernesses. A central issue is how to most appropriately manage the wilderness resource to balance protection and use. Some publics wish to preserve these areas as completely pristine, while others would like a level of use that accepts evidence of human activity. Although people in each group hold different views, environmental organizations and use-oriented groups usually differ in their view of the current situation and the best course of action. Many other people, both locally and outside of the area, see valid points in both perspectives and favor some equitable balance of preservation and sustainable land use. Because both viewpoints deserve serious consideration, some aspects of each are summarized below. This summary only generalizes the central tendency of each viewpoint. It is not meant to represent the viewpoint of all people within each group.

Environment Oriented

Since the 1960s, environmental groups have increased their membership and influence. Many are now nationally or regionally organized and have local chapters that focus on local and regional issues. In addition, growing numbers of private citizens are now more environmentally aware and support many of the political initiatives proposed by organized environmental groups. Environmental groups tend to believe that rapidly growing human populations and associated increases in consumption of natural resources seriously threaten environmental quality.

Ecosystem protection is a key concern of environmentalists. They feel that the National Forests belong to all of the people and are intended for many things beside human activities. Environmentalists believe that protection of the wilderness character and unique values should take precedence over human uses. Further, they tend to believe that government has the responsibility to force such protection even at the expense of local economies.

Use-Oriented Groups

Use-oriented groups are also concerned about the health of the environment. However, they tend not to feel a sense of urgency about the issue. In their view, expanding populations simply call for creative ways to serve human needs within the capacity of the land.

Many in this generally loose grouping feel that ecosystems in the backcountry are as healthy as they've ever been. They also tend to feel that nature is intended for human use and that such use takes precedence over rigid protection or preservation.

Use-oriented groups believe the government has the responsibility to foster local economic growth with a minimum of regulation. They do not see this as incompatible with preserving wilderness character.

Affected Publics

Forest Service policy and program changes for management of the three wildernesses could affect several categories of people. Many individuals fall within two or more of these categories and some of them may both benefit and be adversely affected by potential changes depending on the value systems (described above) they most closely hold.

Long Term Residents

Most Forest-related communities have a core of residents who have lived there a generation or more. This includes ranchers with grazing allotments on public lands, proprietors and employees of local businesses, professional people, and employees of local government. They value and use the wilderness for fishing, hiking, gathering food, and spiritual renewal. Many are convinced that ample opportunities remain for these activities, now and for the foreseeable future. Most long-term residents want to maintain their environmental quality and tend to support policies that protect and enhance forest health while permitting multiple uses. When people's livelihood depends on predictable access to the National Forests, many are likely to take a critical view of decisions to restrict that access.

Minorities

All affected counties exceed the state average in percentage of Native American residents. Traditional members of this group harvest plant foods, medicines, and ceremonial and basketry materials from the Forest and are concerned about possible restriction to access.

Women in the area hold jobs in government, in the professions, in finance and real estate, as well as in retail sales and services. Like others, they could be affected by changes that restrict access.

