# Carrying Capacity and Commercial Services in the Southern Sierra Nevada

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## Background

Commercial recreation providers are diverse; they include those who provide wilderness access and support using horses or mules, as climbing guides, on boats or rafts, and other modes of recreation. They provide a variety of recreational, scenic, scientific, educational, conservation, and historical experiences to visitors of the USDI's National Park Service (NPS) and Bureau of Land Management (BLM) areas, and the USDA's National Forest System (NFS). Regulation under a Special Use Permit allows trips within NFS designated areas involving for-profit businesses or nonprofit enterprises. NFS Special Use Permits authorizes operators use of NFS land provided it benefits the public while protecting public and natural resource values. Specifically, a Special Use Permit is required for commercial activity defined as, "any use or activity on National Forest System lands (a) where an entry or participation fee is charged, or (b) where the primary purpose is the sale of a good or service, and in either case, regardless of whether the use or activity is intended to produce a profit" (Forest Service, USDA, 2013, p. 341). Basic requirements for holding a permit include technical and financial capability, payment of a fee, and insurance listing the US Government as additionally insured. Each year, the NFS receives thousands of individual and business applications for authorization for use of NFS land for such activities as water transmission, agriculture, outfitting and guiding, recreation, telecommunication, research, photography and video productions, and granting road and utility rights-of-way. In general, NFS land is not made available if the overall needs of the individual or business can be met on nonfederal lands.

However, regulating commercial operations on public lands is a highly contentious issue and particularly acute in federally designated Wilderness. As alluded to above, commercial operations include guiding for hunting, fishing, climbing, river rafting, snowmobiling, wildlife

viewing, and other forms of nature tourism. The combination of these commercial services operating alongside associated tourism-centered businesses represents a multi-billion-dollar industry in the U.S. The regulation of commercial activities within federally designated Wilderness areas has been a contentious issue among Wilderness resource users. These conflicts generally involve issues of Wilderness preservation, endangered species protection, watershed protection, and economic decline in rural areas. At a policy level, these conflicts revolve around the increasing use and commodification of Wilderness. More specific to this report are disputes involving commercial packstock operations with some possible carryover to river trip operators and other permitted commercial services. There have been protracted and high profile lawsuits against the NPS and the NFS in California, Montana, Washington, Idaho, and throughout the mountain west. Recent litigation has created uncertainty among managers and operators regarding what policies and procedures to follow and, for the NFS, how best to design scientific studies that can provide direction for the non-arbitrary management of commercial stock in Wilderness areas.

Recent federal court rulings, namely those brought forth by plaintiffs representing the High Sierra Hikers Association, have questioned the NFS's procedures and issuance of Special Use Permits to commercial packstock operators to guide within designated Wilderness areas. With specific focus on the Sierra Nevada, litigation has proceeded and decisions have been rendered by the courts requiring the USDA Forest Service to show the *extent necessary*, not need, in their allocation of Special Use Permits to commercial operators within the eleven national forests spanning California's Sierra Nevada. It is these recent decisions that serve as the impetus for this report. Given these recent court rulings, it is now necessary to more broadly understand the activities commercial packstock operators facilitate which are necessary for

realizing the recreational or other Wilderness-related purposes of designated Wilderness areas. There is also a need to provide managers with guidance concerning what activities to monitor, regulate, or administer to maximize users' experience and minimize the negative effects on both their experiences and the resource base.

To achieve a broad understanding of the activities and experiences provided by commercial operators of the Sierra Nevada, the format of this report is primarily based upon a review of literature from scientific and non-technical sources focusing on the issues of commercial packstock, non-packstock recreation, and rafting/boating on Wild and Scenic Rivers in the Sierra Nevada. The structure of this report outlines (1) summary of commercial service conflicts in the Sierra Nevada, (2) the impacts of recreational use in Wilderness, (3) resource use and value conflicts with packstock operators, and (4) the necessity of commercial services.

## Summary of Commercial Service Conflicts in the Sierra Nevada

### Commercial Packstock Operations

Recreational livestock use in Wilderness areas is authorized under Section 4(d)6 of the Wilderness Act of 1964 (16 U.S. C. § 1131-1136) as it conforms to the recreational mission of the Act and is subject to full discretionary interpretation by agencies to manage that use within levels consistent with a goal of maintaining the Wilderness character of an area. Additional use of livestock for production is one of five uses (mining, aircraft and motorboats, control of fire, disease and insects, water resources facilities, and livestock grazing) that were granted special status to continue in Wilderness if they existed prior to designation. Aside from their authorization to provide recreational Wilderness experiences, commercial packstock operators can and do serve as sources of Wilderness information and education, model behavior and techniques for low impact Wilderness use, and are often sources of unique information for

clients and other visitors. The most recent statistics of packstock use (those utilizing horses, mules, llamas, and goats) estimate commercial enterprises account for approximately 30% of recreational livestock use, while 60% of recreational livestock is used by private parties, and about 10% by agencies for administrative purposes such as trail maintenance and ranger patrols (McClaran, 2000). In terms of visits, at the turn of the century, approximately 11% of Wilderness visits were recreational packstock parties. In contrast, recreational packstock use from 1960-80 represented the dominant (now secondary) form of Wilderness recreation in comparison to hiking/backpacking (McClaran, 2000). Proportionally, commercial packstock use accounts for a minority of both livestock use and total Wilderness recreation. Yet potential for conflict between user groups persist.

Capozza (2004) has detailed the history of packstock use and conflict in the Sierra Nevada and summarized these issues into four relatively distinct periods that lend a necessary perspective to understand present conflicts. First, from 1900-1964 the Wilderness recreation industry began to emerge in the Sierra Nevada. This era centered on travel with pack and saddle stock and represents the basis for much of the historic and tradition-based arguments for the inclusion of packstock in Wilderness. Additionally, the historic and traditional merits of packstock in Wilderness during this era served as precedent for packstock as a central component of the Wilderness experience. The second period began after the Wilderness Act (1964-1979) wherein recreation in these designated areas increased and coincided with the emergence of the recreational industry. This era also witnessed the emerging conflicts between hikers and recreational packstock users and operators. Recreational users were beginning to change as backpacking grew in popularity and packstock was no longer the primary means by which groups experienced Wilderness. The third period began in the 1980s with increased management

effort to address impacts associated with recreational packstock use and growing conflicts with other Wilderness users. The fourth phase began in the mid-1990s and continues today as these conflicts have escalated and entered the political and judicial realms. Both supporters and critics of packstock use have become more sophisticated in presenting and defending their positions as access to information and the organization of their constituents has increased.

In the 1970s, the Forest Service instituted trailhead quotas in high-use zones of the Ansel Adams and John Muir Wilderness areas to address the increasing number of users. These quotas were based on estimated capacities of various zones within the areas. By the 1990s and early 2000s, the quota system became a catalyst for conflict between packstock and non-packstock recreationists but with the important addition of more organized special interest groups and associations. At this point in time, the political and judicial realms came to the forefront with claims that the Forest Service deviated from its management directives and failed to limit visitation numbers to these popular areas. In particular, the Forest Service Employees for Environmental Ethics (FSEEE), a non-profit advocacy group, alleged that the USDA Forest Service illegally exempted commercial outfitters and guides from the quotas and allowed commercial operators to issue their own Wilderness permits to clients while continuing to limit access for private citizens (FSEEE, 2000). In 2000, the FSEEE, Wilderness Watch, and High Sierra Hikers Association (HSHA) filed suit in the U.S. Ninth District Court arguing that the USDA Forest Service violated federal law by issuing permits to outfitters for commercial packstock in the Ansel Adams and John Muir Wilderness Areas without appropriately investigating the environmental impact of horses (see, High Sierra Hikers Association v. Blackwell, 2004; High Sierra Hikers Association v. Weingardt, 2007).

More recently, the Ninth Circuit Court found that the Forest Service's grant of Special Use Permits and the corresponding Commercial Authorizations by the NPS to commercial packstock operators for purposes of allowing pack trips and day rides into Wilderness areas of the Sierra and Inyo National Forest and Sequoia and Kings National Parks was inadequately administered with respect to the Wilderness Act, which generally prohibits commercial enterprise within Wilderness areas. But, as outlined earlier, the Act includes a provision that "commercial services may be performed within the Wilderness areas … to the extent necessary for activities which are proper for realizing the recreational or other Wilderness purposes of the areas" (p. 1135). The Ninth Circuit Court concluded this requires the management agency to not only determine that a particular commercial service is *necessary* but also to determine the *extent* of that necessity. The ruling, based on not only the Wilderness Act but also the Endangered Species Act and Administrative Procedure Act, held that agency officials failed to conduct the requisite need and impact studies for issuance of Special Use Permits for commercial packstock. The broader implications of this decision for all Wilderness management agencies is that they are now required to examine how commercial packstock use in Wilderness areas impacts the landscape and "balance... their potential consequences with the effects of preexisting levels of commercial activity" (Repanshek, 2012; High Sierra Hikers Association v. United States Department of Interior, 2012a and High Sierra Hikers Association v. United States Department of Interior, 2012b**).**

Determining whether packstock operators and guide services are necessary, the number of Special Use Permits to issue, and the manner of administration of Special Use Permits for compliance in accordance with the Wilderness Act is a challenging task for Forest Service Wilderness managers given their mandate and responsibilities for multiple use. Initially,

Wilderness management agencies identify the allocation of Wilderness recreation capacity in the forest plan by addressing the need for and role of outfitters and guides. Typically, this is accomplished through preparation of a Commercial Services Needs Assessment. In addition, a Needs Assessment is developed to articulate why the extent of commercial services authorized is necessary for achieving the goals of the Wilderness Act. These protocols are in place so that agencies can consider the potential, cumulative impacts that result from a group of individual service providers acting collectively and the potential for conflict among recreational users.

The recent decisions regarding commercial packstock operations in USDA Forest Service Wilderness Areas may have ramifications across the National Wilderness Preservation System. Given the dual or multiple roles of many protected areas agencies, particularly the USDA Forest Service, that stem from their mandate to wisely manage resources for a variety of sustainable uses, it is now understood that a National Environmental Policy Act (NEPA) analysis may be deemed necessary to support the Commercial Services Needs Assessment. If the forest plan (or Wilderness Plan tier to the forest plan) provides adequate direction, standards, and guidelines, this amendment to the forest plan may not be necessary. If an amendment is necessary, a NEPA analysis may also be necessary depending on the significance of the action to be taken (Wilderness.net, 2008). The consequences of these court decisions over the past decade are yet to be fully understood, articulated, or implemented from the policy and management perspective within the USDA Forest Service. The relevant implications for the purposes of this report is the need to further understand the *need* and *extent necessary* for and the *impacts* of commercial packstock operations. This requires ongoing assessment of both the biophysical condition of the Wilderness and the needs and preferences of Wilderness recreationists.

**Commercial river guide operators**

The Wild and Scenic Rivers Act of 1968 (16 USC § 1271-1287; Public Law 90-54; 82 Stat. 906) established a National Wild and Scenic Rivers System (NWSRS) and prescribed the methods and standards through which additional rivers may be identified and added to the system as wild, scenic, or recreational. The Act serves to protect "certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations" (p. 1271).

Recreation based on water dependent amenities has become economically important to many communities throughout the Sierra Nevada. In the southern Sierra Nevada, the Kern River represents one of the countries' most popular Wild and Scenic-designated rivers for whitewater sports, and includes sections in the Golden Trout Wilderness. The Kern River, from the North Fork on the Tulare-Kern County line to its headwaters in Sequoia National Park and from the South Fork from its headwaters in the Inyo National Forest to the southern boundary of the Domelands Wilderness in the Sequoia National Forest, was established as a designated Wild and Scenic River in 1987. Its classifications include 198.1 km (123.1 miles) of Wild, 11.2 km (7.0 miles) of Scenic, and 33.6 km (20.9 miles) of recreational river. The Wild and Scenic portions of the Kern River are managed by the NPS-Sequoia/Kings Canyon and the USDA Forest Service-Sequoia National Forest.

The USDA Forest Service is mandated to "provide river and similar water recreation opportunities to meet the public needs in ways that are appropriate to the National Forest recreation mandate and are within the capabilities of the resource base [and] protect the free-

flowing condition of designated wild and scenic rivers and preserve and enhance the values for which they were created" (USDA Forest Service, 1994, p. 3). In addition to this mandate, the Forest Service established eight policies to manage National Wild and Scenic River areas located on the Kern River. These include:

1. Plan and manage river recreation in a context that considers the resource attributes, use patterns, and management practices of nearby rivers;
2. Emphasize activities that harmonize with the natural settings of the National Forest;
3. Manage the use of rivers by establishing as few regulations as possible;
4. Emphasize user education and information;
5. Coordinate river management with other Federal, State, or local agencies having primary or concurrent jurisdiction;
6. Ensure that proposed and ongoing projects and activities conform to the purpose of the Act;
7. Establish use limits and other management procedures that best aid in achieving the prescribed objectives for a river and in providing sustained benefits to the public; and
8. Acquire water rights needed to ensure sufficient water to achieve management objectives (USDA Forest Service, 1994).

Similar to Wilderness recreation, commercial river guides and whitewater operators of the southern Sierra Nevada facilitate recreational, scenic, scientific, educational, conservation, and historical experiences to visitors. Although commercial river operators are not currently subject to the same level of scrutiny as commercial packstock operators they do not operate within designated Wild and Scenic Rivers without impunity from public opinion and Federal regulation. The recent judicial proceedings and rulings focused on commercial packstock operators are

likely to have implications for commercial river operators as they are reliant upon the same Special Use Permit issuance from the USDA Forest Service.

## Understanding Impacts of Recreational Use in Wilderness

Much of the conflict and controversy associated with recreational packstock within designated Wilderness stems from the perceived impacts of packstock use. Within the context of Wilderness recreation, the term “impact(s)”, in general, implies a negative connotation and tends to prompt objections from many recreational users who view some “others” as negatively impacting “their” preferred Wilderness experience. However, for the purposes of this report the term “impact(s)” is not limited to negative impacts on Wilderness environments and encompasses both negative and positive environmental and economic impacts associated with commercial and non-commercial recreation in Wilderness. Another caveat concerning the impacts of recreational use in Wilderness is that although the differentiation between commercial/non-commercial and packstock/non-packstock is necessary for the purposes of this report, the negative impacts of recreational use in Wilderness areas – those being defoliation, trampling, concentration of animal waste, reduction of wildlife, conflicts with other users, and as vectors for the spread of noxious species – are actively (and passively) caused by all Wilderness recreation users. As this review outlines, the differences among commercial/non-commercial and packstock/non-packstock are essentially issues of context and suggests a move from generalizations to more specific frames of reference in order to understand the issue more accurately and usefully.

**Commercial Packstock Use**

Commercial packstock use has the potential to produce negative environmental impacts ranging from defoliation, trampling, concentration of animal waste, reduction of wildlife, conflicts with other users, and as vectors for the spread of noxious species. The severity of impacts varies in relation to the intensity, timing, and type of packstock use. Past studies (for reviews see, Stankey & Manning, 1986; McClaran, 2000; Buckley, 2004; Capozza, 2004; Newsome, Smith, & Moore, 2008; Pickering, Hill, Newsome, & Leung, 2010; Marzano & Dandy, 2012) have quantified the impact of non-commercial and commercial packstock, mostly horses, on Wilderness environments pertaining to vegetation trampling (Weaver & Dale, 1978; Strand, 1979a; Cole & Spildie, 1998), over-grazing (Olson-Rutz, Marlow, Hansen, Gagnon, & Rossi, 1996; Moore, Cole, van Wagtendonk, McClaran, & McDougald, 2000), soil erosion (DeLuca, Patterson, Friemund, & Cole, 1998), and animal waste (Johnson, Wickler, Filkins, & Kalush,1997; Atwill, McDougald, & Perea, 2000).

McClaran and Cole (1993) estimated that in 1990 about half of all Wilderness areas had some packstock use with packstock use being prohibited in 14% of Wildernesses. They also estimated that approximately 11% of Wilderness visitation was by packstock users (commercial and private). Evidence from Burns, Smaldone, Absher, and Mestrovic (2011) corroborates these data with an estimate of 11% stock use on the Stanislaus National Forest. Thus, in terms of percentages, packstock use remains low in Wilderness areas. However, although they observed low use, McClaran and Cole (1993) suggested that this level of packstock may still harm vegetation, soils, water quality, wildlife, and visitor experiences and that the monitoring and management of packstock should focus on soil erosion and defoliation near stream banks and popular camping areas. Similarly, although specific to stock grazing areas, Belsky, Matzke, and

Uselman (1999) reviewed the results of a number of peer-reviewed experimental and comparative studies on grazed versus naturally or historically protected areas. They found livestock grazing negatively affects water quality seasonally, stream channel morphology, hydrology, riparian zone soils, instream and streambank vegetation, and aquatic and riparian wildlife. However, they emphasized that these impacts are likely due to cattle, not packstock operations. The context of their review was geographically broad, encompassing a majority of arid ecosystems of the western U.S. and was not specifically focused on Wilderness areas (although Wilderness areas were included in the studies reviewed). Within the Sierra Nevada, grazing by packstock can alter subalpine meadow ecosystems in significant and various ways, depending on timing, intensity, and frequency of use (Strand, 1979b, Belsky, Matzke, & Uselman, 1999). Plant productivity appear to be more sensitive to changes in grazing intensity (animals/area/time or percent utilization of available plant biomass) than the timing of grazing (Shryrock, 2010). Within montane and subalpine ecosystems, grazing can influence species composition and interactions with abiotic elements such as sediment filtration, dissipation of high-energy stream currents, and capture and retention of snowmelt to a higher degree compared to other ecosystems. Montane and subalpine meadows comprise only about 10% of the land area in the Sierra Nevada, yet provide a disproportionate number of important ecosystem services (Ratliff, 1985). However, few studies have directly researched the impacts of packstock grazing in these areas. Shryock (2010) investigated the interrelated effects of hydrology and packstock grazing in subalpine meadows of the John Muir and Ansel Adams Wilderness of the Sierra Nevada and found subalpine meadows with grazing tended to be drier.

Along with unwanted or unexpected encounters and campsite degradation, these direct, physical impacts tend to be the most obvious and referenced transgressions levied against

packstock by other recreational users. But in addition to these impacts, there are also indirect impacts on water quality and contamination stemming from packstock in high-use Wilderness areas. Derlet, Ali Ger, Richards, and Carlson (2008) conducted a 5-year study to understand the risk factors and effects of coliform bacteria in backcountry lakes and streams in Yosemite, Sequoia, and Kings Canyon National Parks and Carson-Iceberg, Emigrant, Hoover, and John Muir Wilderness areas. Samples from 364 sites revealed a significant difference between backpacker, packstock, and livestock areas. Specifically, coliforms were observed in 9% of non-recreation Wilderness samples, 12% within day-use sites, and 18% overnight sites. In contrast, 63% of packstock trails yielded coliforms, and 96% of cattle and sheep tracts yielded coliforms. Clow et al. (2013) evaluated the influence of packstock and backpackers on lake and stream water quality in Sequoia and Kings Canyon National Parks (SEKI). Their study had three components, (1) a general survey of water quality in Wilderness areas of the parks, (2) paired water quality sampling above and below several areas with differing types and amounts of visitor use, and (3) intensive monitoring at six sites to document temporal variations in water quality. Data from the general water quality survey indicated that Wilderness lakes and streams are dilute and have low nutrient and *E. coli* concentrations. These paired sampling sites were categorized as minimal-use, backpacker-use, or mixed-use (stock and backpackers), depending on the most prevalent type of use upstream from the sampling locations. Results indicated that sites with mixed-use tended to have higher concentrations of *E. coli*, total coliform, and particulate phosphorus concentrations upstream as compared to downstream than minimal-use and backpacker-use sites. These results were not unexpected given the increased volume of waste generated by an individual packstock animal as compared to a backpacker. The authors concluded that water quality in SEKI Wilderness was good, with the exception of during and

shortly after storms or high visitor use. Thus, packstock use may have localized impact on water quality but the more general trend is for all use to be problematic.

In another investigation conducted in Finland, Törn, Tolvanen, Norokorpi, Tervo, and Siikamäki (2009) studied the impacts of hiking and horse riding on trail characteristics and vegetation. Their results corroborate previous evidence (Weaver & Dale, 1978; Liddle, 1997) of horses having a greater per capita impact as compared to backpackers. They reported that erosion along horse trails is similar to that along backpacking trails even though the annual number of backpackers was 150-times larger than horses. However, they also measured vegetation cover with survey plots and found backpacking trails had little or no vegetation cover while horse trails had significantly more vegetation cover. In this regard, horse trails had more forbs and grasses, many of which were non-natives to this particular forest (further surveys from this study found these species were limited to riding trails and closely adjacent areas). In response to these results, Törn, Siikamäki, and Tolvanen (2010) experimentally investigated the risk of spreading non-native plants through recreational horseback riding. They found the addition of horse manure, specifically from those fed hay containing germinable seeds, coupled with soil disturbance, enhanced the germination of seeds, and introduced grass and forb species that were otherwise absent from adjacent forest and prohibited trails.

Additional studies have shown that horses can trample ground cover, defoliate vegetation, and cause changes in soil nutrient status and water resources by urination and defecation (Archer & Smains, 1991; McClaran & Cole, 1993) and can increase erosion and degradation along trail networks (Dale & Weaver, 1974; Cole & Spildie, 1998). Most reviews tend to conclude that per capita horse riding impacts are quantitatively greater than those caused by hikers (Liddle 1997; Weaver & Dale 1978; DeLuca et al. 1998). Newsome, Cole, and Marion

(2004) suggest that the most common and widely recognized impact from packstock is ground-level damage. Cole (1989) and Newsome et al. (2004) also suggest that many of the impacts from packstock are and continue to be similar to those caused by hikers but impacts from packstock are more pronounced and occur more rapidly. However, the authors note that factors such as long and steep slopes, high elevation, high rainfall events, non-vegetated or unsurfaced slopes, low soil organic matter, poor soil structure or fine texture, impeded infiltration of water, and close proximity to streams or groundwater discharge areas all contribute to trail degradation (Newsome, Milewski, Phillips, & Annear, 2002). Thus, there is evidence of at least localized effects from large animals. It is less clear what proportion of these impacts is attributable to commercial stock operations because much, if not most, of the impactful stock use comes from cattle grazing permits or private stock use. Nor is it clear whether the impact commercial outfitters have on the ecosystem materialize beyond localized settings given trails and campsite areas are generally a very small percentage (<1%) of total Wilderness area. Even with the inclusion of dispersion or water quality/run-off issues, the additional impact of trampling, invasive species, or other ecological disruptions cannot be shown to be exclusively or primarily due to commercial outfitters' activities.

**Non-commercial, Non-packstock Use**

Biophysical impacts from non-commercial, non-packstock hiking/backpacking are better researched than those from packstock but identify similar forms of disturbance (Pickering et al. 2010). Impacts of hikers include soil compaction and loss, reduced soil moisture, loss of organic litter, loss of ground cover vegetation, loss of native plant species, introduction of weeds and pathogens, and change in vegetation composition. Similar to packstock, the relative impacts from

hikers are dependent upon the level of use, and use under different environmental conditions such as vegetation type, slope, soil type, season, and weather conditions. Comprehensive reviews of hikers' impacts within Wilderness areas have been conducted by Leung and Marion (2000), Cole (2004), Pickering et al. (2010), and Marzano and Dandy (2012).

From an empirical standpoint, the use of a hiking resistance indices – the number of passes by a hiker required to reduce vegetation cover by 50% (Liddle, 1997) – have been documented for 55 vegetation types internationally (Hill & Pickering, 2009). In the U.S., hiking resistance indices are available for twenty-eight vegetation types, ranging from twenty passes in a subalpine forest understory (Cole, 1995) to one-thousand passes in subalpine grasslands (Weaver & Dale, 1978). Based on these studies, general patterns of hiking resistance within different environments become apparent with resistance declining from subtropical to alpine, temperate subalpine arctic to montane, sand-dune grasslands to forest understory, and finally with heaths and herb fields being the least resistant to hiking. Within each environment, there is still considerable variation (Hill & Pickering, 2009) but an important, indirect impact of hiking that has cumulative effects is the spread of non-native or noxious weed species. Once established in a protected area, non-native or noxious weed species can continue to spread even without further trail use; i.e., they manifest as a self-sustaining impact (Buckley, 2003). Just as with packstock, there is considerable potential for clothing on hikers to act as vectors for seed with trails acting as corridors for dispersion. Timing, type, and/or amount of use can exacerbate this effect (Pickering & Mount, 2010; Pickering et al., 2010).

**Economic Impact of Recreational Uses of Wilderness**

Local and regional economies directly benefit from Wilderness recreation and ancillary tourism activities associated with user visitation. Packstock and non-packstock recreational users account for a majority of these economic impacts. Cosgrove, Niemi, and Field (2000) estimate that pack/non-packstock recreation accounts for approximately 85% of the economic benefits derived from Wilderness recreation. Over the past three decades within the Sierra Nevada extractive, goods-focused industries (i.e., mining and logging) have declined or remained stagnate and have been superseded by non-extractive, service-focused industries (i.e., recreation and tourism) as the main driver of economic activity (Sierra Forest Legacy, 2012). On a national scale, recreation within the National Forest System, including hunting and fishing, contributes 38 times more to the GDP than logging programs, many of which are subsidized (Sierra Forest Legacy, 2012). Additionally, recreation from the National Forest System contributes approximately $108.4 billion to the GDP and 3.3 million jobs (Cosgrove et al., 2000). Recreational activities account for 50-60 million recreational visitor days per year in the Sierra Nevada (Duane, 1996). Analysis of USDA Forest Service's Sierra Forest Plan Amendment (generally known as the Sierra Nevada Framework) estimates recreational activities protected under the Framework produce wages of $2.66 billion annually (Sierra Forest Legacy, 2012), with the Inyo National Forest contributing more than $447 million and Lake Tahoe Basin Management Unit more than $866 million (Richardson, 2002). Richardson (2002) also found that the eastern Sierra Wilderness areas contribute over $700 million per year and support more than 2,800 jobs in Mono and Inyo Counties. Loomis and Richardson (2001) calculated the recreational opportunities created by the Pacific Region's roadless areas, a majority of which are in the Sierra Nevada, contribute approximately $137 billion annually to the national economy.

Loomis (2000) valued wilderness recreation at $39 per day, or about $7 billion dollars for the lower 48 states. When breaking this into geographic segments, in California estimate is slightly higher at $43.28. When calculated with the 2.9 million recreation visitor days at wilderness and natural areas in the eastern Sierra Nevada region, the aggregate value of recreation benefits is $124.9 million per year ($66.5 million in Mono County; $58.5 million in Inyo County). Estimates for Wilderness areas relevant to this report would value the Ansel Adams Wilderness at approximately $10.0 million, the John Muir Wilderness at $28.2 million, and the Sequoia-Kings Canyon Wilderness at $33.2 million. These estimates indicate that commercial services and economic impacts created by Wilderness contribute substantially to local and regional communities.

The benefits to local businesses not only include revenue created through recreation dollars but also increased property values and provide invaluable ecosystem services to local towns and nearby cities. Rural areas near Wilderness tend to experience higher and faster regional economic growth with population, income, and employment growth increasing as the percentage of wilderness increases (Headwaters Economics, 2012). A significant share of recreational activities are related to commercial service opportunities dependent on properly managed and regulated NFS lands (Wilderness.net, 2014). Especially within the Sierra Nevada, Wilderness management agencies are often either the sole or largest facilitator of these services, commercial or otherwise, serving as the intermediary between the recreation users and recreation service providers. The National Forest System helps support private sector annual outdoor product sales of $10 billion, which includes items such as footwear, backpacks, camping gear, mountain bikes, winter sports equipment, and outdoor accessories (Moskowitz, 1999).

**Economic Impact of Recreational Uses of Wild and Scenic Rivers**

In the context of Wild and Scenic Rivers, an understanding of the economic impacts stemming from recreational use, of any sort, is limited. There is a pressing need for data documenting both the biophysical and social impacts that can better inform decision-making. A number of studies, however, have explored the economic benefit stemming of recreational uses of Wild and Scenic rivers. Similar to Wilderness recreation, Wild, Scenic, and Recreational rivers provide substantial economic benefit to local communities and regional economies. Wild and Scenic River recreation can include swimming, rafting, kayaking, canoeing, whitewater activities, and fishing. Aside from the fees collected to participate in these activities (whether as an unguided or guided recreationist), river recreation and tourism activities account for 16% of the Sierra's annual estimated payroll value, as compared to only 3% of total payroll elsewhere in the state (Sierra Nevada Wealth Index, 2000). For local communities, these impacts stem from recreationists utilizing retail operations and other services for food, lodging, logistics, and outfitting, as well as cultural interests and other businesses catering to recreationist and tourists. For smaller communities along the southern Sierra Nevada, recreation and tourism for Wild and Scenic River and/or Wilderness recreation impact the local economy to such a degree that a large proportion of local businesses rely solely upon the on-season to sustain themselves throughout the year.

Specific data on the economic impact of commercial river recreation is less available than commercial packstock data. In reviewing the impact of Wild and Scenic River designation, Keith, Jakus, Larsen, Burr, Reiter, and Zeitlin (2008) identified only 11 studies related to Wild and Scenic Rivers, of which only five dealt exclusively with recreation use and economic impact. Most often, the economic impacts of designated Wild and Scenic Rivers are elicited using

contingent valuation (stated preference or willingness to pay) methodologies. These methods ask users or potential users to estimate the amount of money they would be willing to pay to have access and utilize a service or resource that does not necessarily have a market value but does provide utility to a consumer. Colby and Smith-Incer (2005) found visitor's willingness to pay for habitat restoration and preservation along the Lower South Fork of the Kern River was US$77 per visitor. Additionally, this study estimated the economic impact from Lower South Fork of the Kern River to be approximately three-quarters of a million dollars, annually. Again, not specific to the entirety of Wild and Scenic River areas of the Kern River, the economic benefits of recreational fishing in the Golden Trout Wilderness (which contains portions of North and South Forks of the Kern River) have been estimated between $148,000-713,000, annually (Alkire, 2003).

**Conclusions**

- Social dimensions are generally assumed but seldom studied. There appears to be an over reliance on biophysical data at the expense of socio-cultural, economic, and experiential indicators.
- Horse trails are less impactful when limited to drier forest types because the risk of alien species establishment is greater in nutrient-rich mesic forests.
- Underlying policy and procedural issues are the differences among NFS, BLM, and NPS and may exacerbate commercial use concerns on federal land. BLM and NFS lands are under a broad multiple use legislation whereas the NPS has a narrower mandate for preservation and use.

- Planning and management may incorporate careful consideration of the type of activities and the sensitivity of habitats to different activities, not the total quantity of users.
- Studies seeking to elucidate the impacts of all users simultaneously with commercial services, whether stock-dependent or not, only vaguely address the concept of ‘need’.

## Resource Use and Value Conflicts with Packstock Commercial Operators

Management decisions in protected areas are often choices among very different and often conflicting values. A salient but often tacit observation that evidenced from both the literature and litigation is that recreational hikers tend to view recreational commercial packstock users as impinging upon their Wilderness values more often than the reverse (Capozza, 2004). Criticisms levied against packstock operators in Wilderness suggest their presence is incongruent with the Wilderness ideal, is damaging to the resource, inadequately prepares clients to recreate safely in Wilderness, and increases use beyond capacity (Parker & Avant, 2000). Alternately, support of packstock use is given because it is a distinct form of outdoor recreation, provides opportunities to underserved groups, or because it represents a Wilderness experience that can be traced back to European settlement. Commercial operators primarily tend to offer economic arguments suggesting local communities depend on the tourism industry in which packstock operations have a significant role. An in-depth review by McClaran (2000) stressed the importance of understanding that these conflicts between livestock and other Wilderness users come in two forms: conflicts with firmly held attitudes of appropriateness, which can be considered a predisposition to conflict (i.e., valued-based conflict), and conflicts with activities

encountered during a visit to Wilderness that can be considered situational conflicts (i.e., activity-based).

The conflict between seemingly disparate user groups has been studied and reviewed at multiple periods within the history of the Wilderness Act. Absher and Absher (1979) was one of the first studies to document these conflicts and noted that backpackers generally responded negatively to encountering packstock more often than the reverse. Additional studies have been conducted with the intent to manage conflicts between backpackers and packstock (Watson & Kajala, 1995; Watson, Niccolucci & Williams, 1994), to address resource impacts of packstock (McClaran, 2000; Spildie, Cole, & Walker, 2000; McClaran & Cole, 1993) and to determine management preferences of both backpackers and packstock users (Kajala, 1994). Cordell et al.'s (2004) review suggests that backpacking has grown by approximately 180% since 1983. By their estimations, packstock has also grown in popularity, but by only 37%. This shift in the composition of Wilderness recreationists represents one of the main factors underlying the increased number and scale of conflict. In the context of this report, few studies have reviewed the social aspects of packstock and backpacker conflicts, namely, in the broader Sierra Nevada region (Capozza, 2004) and the Sequoia and Kings Canyon National Park and the John Muir Wilderness (Watson et al. 1994). Similar to the conclusion made by Absher and Absher (1979), Watson et al. (1994) and Capozza (2004) concluded that an asymmetrical, value-based conflict exists between packstock and non-packstock users. For example, about one-third of non-packstock hikers who met packstock users disliked the encounter, while more than half of all non-packstock hikers generally found it undesirable to meet packstock in Wilderness areas. Conversely, only one-fifth to one-seventh of packstock users indicated they did not like meeting non-packstock hikers or generally found meeting hikers undesirable (Watson et al., 1994).

Similarly, non-packstock hiking groups suggest that the social and traditional experiences sought by packstock users might be more appropriate outside of wilderness. Given that packstock users represent a minority of Wilderness users, non-packstock users may perceive that they incur unreasonable and disproportional impacts while the commercial use benefits a relatively small segment of Wilderness users (Capozza, 2004).

Perspectives from outside the U.S. show similar conflicts. Beeton (1999) surveyed hikers regarding their conflicts with packstock operators in the Australian Wilderness and found that social conflict was not as great as anticipated. Her study indicated that group-specific attitudinal norms, especially misinformation, served as the major catalyst for conflict and was instrumental in their predisposition for disaffection for others, as opposed to direct experience. Her survey found that direct experience with packstock operation was minimal but that direct experience while in the Wilderness mitigated some of the negative attitudes stemming from misinformation held by those who had not previously had direct experience with packstock. Her conclusions stressed the importance for land managers to increase their understanding of visitor's attitudes and motivations among operational staff and to include these dimensions in the planning processes.

Similar findings outlined by McClaran (2000) found that approximately 40% of hikers in USDA Forest Service Wilderness areas (San Juan, Gunnison, Uncompahgre, White River National Forests, Wasatch-Cache, and Ashley National Forests) were predisposed to conflict with livestock legally allowed in designated Wilderness. That is, they held negative opinions of livestock in Wilderness prior to direct experience with livestock in Wilderness (see also, Johnson et al., 1997). Other studies have found that the severity of those conflicts are greater for visitors who reside in urban versus rural areas (Mitchell, Wallace, & Wells, 1996) and that a

predisposition to believe that horses are inappropriate in Wilderness was the most consistent contribution to severe hiker conflict with recreation livestock in Wilderness, although most hikers did not express conflicts (Watson et al., 1994). Additionally, two-thirds of hikers indicated Wilderness quality diminished when encountering cattle and sheep. This is comparable to rates of nearly 75% of visitors when encountering fences and 50% of visitors when encountering recreation livestock or any type of visitor. The most conflict-inducing and sensitive encounters with livestock were when observing stock animals near water and camps, overgrazing or excessive defoliation of plant biomass (visitors also reported they perceived overgrazing and defoliation as improper management by the Forest Service), manure on trails, large packstock groups, and litter (McClaran 2000). Interestingly, at least one study suggests that the severity of these conflicts is inversely related to the intensity of recreation livestock use, i.e. conflicts were less severe in areas with higher amounts of livestock use (Stankey, 1973). This suggests that other Wilderness users' level of acceptance of packstock may increase with their level of experience with packstock in Wilderness (Moore & McClaran, 1991).Surveys have also illustrated that hikers are more accepting of llamas than horse and mule (Blahna, Smith, & Anderson, 1995; Watson, Christensen, Blahna, & Archibald1998). Several studies (Blahna et al., 1995; Johnson et al., 1997; Watson et al., 1998; McClaran, 2000) have revealed that conflict is often the product of recreationists with a predisposition for conflict owing to their values that these shape their thoughts on what a Wilderness experience ought to be. The authors recommend increasing non-packstock user's awareness that encountering both production and recreation livestock is possible to relieve conflicts and discouraging visits by those with the greatest predisposition against these uses. Likewise, zoning Wilderness areas to separate recreation livestock from sensitive visitors is also suggested alongside situating animals and manure away

from water and camps, reducing the level of defoliation, and encouraging greater familiarity with a Wilderness experience that includes recreation livestock.

Additional research has surveyed individual users and attempted to quantify the "conflict of values" between packstock and hikers from the perspective of both these users and the land management personnel responsible for implementing and enforcing policy. Moore and McClaran (1991) surveyed Wilderness land management agency personnel placing them along a value continuum anchored by traditionalistic views of Wilderness (e.g., packstock has a place in the Wilderness because it has traditional and historic value) through ecologistic orientations, where Wilderness serves as a model of ecological perfection. Their results indicated that land management agency personnel who identified with traditionalistic packstock items were as likely to identify with ecologistic measures as personnel who did not identify with packstock items. These results suggest that Wilderness land management personnel tend to hold both packstock and Wilderness values that, in their view, are not diametrically opposed. Parker and Avant (2000) found that Sierra Nevada packstock operators held more utilitarian views of Wilderness and tended to disregard some ecological considerations to emphasize the Wilderness experience as the most valuable asset of Wilderness. They reported that operators and guides tend to value Wilderness in multiple ways. They value it for the experience it provides clients, its mere existence, for individual and youth development, and for its financial and vocational benefits. Their findings illustrate that operators' and guides' values may not always align with those held by Wilderness managers but they exist in their own form. The most prevalent theme observed among packstock operators was their tendency to behave in environmentally responsible ways because it was part of the permit. Further, packstock operators held and valued Wilderness and environmental ethics, specifically stemming from their central role in developing Wilderness

recreation. They also felt the Wilderness ethic and environmentally sound practices had evolved and were struggling to remain current with contemporary best practice. Parker and Avant's interviews indicated that Sierra Nevada packstock operators' desired to work with the natural resource management agencies to maintain the condition of Wilderness; e.g., work on trails, decrease impact, monitor Wilderness conditions, work in search and rescue operations, and aid the Forest Service in a mutually beneficial relationship. But as Tranel and Hall (2003) point out, management decisions and their implications in protected areas have become more controversial and overtly value-laden. The spectrum of tangible and intangible values held by Wilderness recreation users triggers various value-laden responses to management decisions. When compared with the results from Parker and Avant (2000) we see that there can be important differences between non-packstock recreation users who tend to hold intangible Wilderness values as compared to packstock operators who tend to hold more tangible, utilitarian values and motivations associated with the use and protection of Wilderness.

**Conclusions**

As noted by Tranel and Hall (2003), "decision-making in parks and protected areas is becoming increasingly more complex and politicized. The role of park planners and managers as 'arbiters of value' is to make sure all values are included in the discussion, defining park values broadly to reach more than one interest group. All protected areas, regardless of size and fundamental purposes, tend to have intangible values, the protection of which is essential to the long-term viability of the area" (p. 265). Thus, from the literature we have reviewed above, we offer the following recommendations:

- Because managers require accurate and thorough information, it is better if they recognize the limits of scientific information or the lack thereof.
- It is critical that Wilderness managers involve the public at all levels of planning and decision-making and incorporate the diversity of views into practice. Ideally, this might include participatory involvement of the public, stakeholders, and managers given the discretionary and guideline approach to planning and implementation by agencies.
- Managers might further clarify the purposes of Wilderness areas to the public and manage more explicitly to provide for these purposes.
- Planning proactively and carefully considering how decisions today will affect the area well into the future will enhance decisions.
- Recognize that not all protected areas can provide for all opportunities. Look at park planning and management in a regional context and emphasize the role of each element at various scales.
- Effective use of standardized decision-making processes can lead to a more defensible decision while assuring setting specific outcomes and decisions.

## The Necessity of Commercial Services

The legislative basis for commercial packstock operations in federally designated Wilderness areas comes from portions of the Wilderness Act of 1964, i.e., “commercial services *may* be performed……to the extent *necessary*…for activities which are *proper* for realizing the recreational or other Wilderness *purposes* of the areas” (p. 1131). The language of these statements implies that commercial services for recreational purposes may occur, not that they

must occur. The Wilderness Act's inclusion of commercial services, and the subsequent mandate to Wilderness managing agencies, stems from those services being necessary for "recreational or other Wilderness purposes" (p. 1135).

More specifically, the Act elaborates that:

> …except as otherwise provided in this Act, each agency administering any area designated as Wilderness shall be responsible for preserving the Wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its Wilderness character. Except as otherwise provided in this Act, Wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use. (pp. 1133-1134)

In complying with this mandate, an administering agency is required, by law, to document how the activities provided by commercial services are "*proper*" in Wilderness, determine the spatial and temporal scope of commercial services that will be allowed to provide such activities and what portion of recreation use will be provided by commercial services, and document the recreation or other Wilderness purpose achieved by the commercial service (Wilderness.net, 2008). To date, there is little empirical evidence available that would adequately guide the development of agency management plans that take into consideration the public's perception of what is proper or necessary.

The Wilderness Act prohibits commercial enterprises (e.g., ski resorts) in Wilderness. Interpreting the language of the Act, the Ninth Circuit Court (High Sierra Hikers Association v. United States Department of Interior, 2012b) concluded that authorizing commercial services in Wilderness was distinct and proper, but must follow "…among other things, that the assigned

agency make a finding of '*necessity'* before authorizing commercial activities in Wilderness areas." Furthermore, a previous ruling by the Ninth Circuit Court concluded that a "finding of necessity is required, but not wholly sufficient" (High Sierra Hikers Association v. Blackwell, 2004). In their decision, the Ninth Circuit Court (High Sierra Hikers Association v. United States Department of Interior, 2012b) concluded that a finding of necessity must be "specialized" and permit commercial activities "no more than is necessary to achieve the goals of the Act" (p. 7),describing the goals of the Act as preserving the Wilderness and providing the public with access to its natural condition. These conclusions reached by the courts were based on an interpretation of the concepts of need and extent necessary. Wilderness.net, a collaborative partnership between the College of Forestry and Conservation's Wilderness Institute at The University of Montana, the Arthur Carhart National Wilderness Training Center, and the Aldo Leopold Wilderness Research Institute (Wilderness.net, 2008), defines need "as a shortage of opportunities for the public to experience Wilderness and/or an agency need for assistance with implementation of management objectives which can be addressed through commercial services providers" (Definitions section, para. 1). Extent is defined as "the amount of commercial services that can operate in Wilderness defined by the number, type, location, and timing of the use that is consistent with preservation of the Wilderness character" (Definitions section, para. 2). Extent is further defined and constrained by "the capacity or capability of the Wilderness to support the activity without impairment of social and biophysical conditions" (Definitions section, para. 2). Necessary commercial services are those that "serve the public's need to experience Wilderness and support management objectives within the capability of the Wilderness resource" (Wilderness.net, 2008, Definitions section, para. 3).

The NPS has recognized the need to develop standardized operational definitions of need and extent necessary in its recent Wilderness Stewardship Plan and Draft Environmental Impact Statement (WPS/DEIS) for Sequoia and Kings Canyon National Parks (USDI-NPS, 2014). Within the Extent Necessary Determination section of the report they point out that the Wilderness Act does not define “activities,” “commercial services,” or “necessary.” Furthermore, as alluded to earlier, when definitions of important terms within Federal statute are not made explicit, it is implied that Congress relies upon agencies to interpret and act with discretion based on commonly accepted definitions. As mentioned above, the courts have been called upon to interpret the word “necessary” and in a statutory context have frequently upheld a non-absolutist definition and adopted a more flexible definition of necessary. In relation to the Ninth Circuit Court’s 2012 ruling (High Sierra Hikers Association v. United States Department of Interior, 2012b), the Wilderness Stewardship Plan and Draft Environmental Impact Statement’s Commercial Services Extent Necessary Determination section (USDI-NPS, 2014)does not use the word “necessary.” Rather, the use of “necessary” in relation to commercial services is defined as “a service that is important to achieve objectives for visitor use and enjoyment of Wilderness in such a manner that the Desired Conditions for Wilderness character are achieved, and Wilderness character is thereby preserved” (p. B-4) Relatedly, the NPS recognizes, based on the Ninth Circuit Court’s decision, that this language requires agencies to determine the amount of use that can be allowed and that commercial services can only be authorized to the extent necessary for activities deemed proper. Thus, both the type (i.e., “proper”) and amount (i.e., “extent”) of commercial services must be determined by NPS and NFS, jointly or separately.

It should be understood that commercial service activities are necessary if they help achieve the public purposes of Wilderness: recreational, scenic, scientific, educational,

conservation, and historical use. The Department of the Interior, NPS, and NFS recognize that agencies must balance competing interests in determining necessity, i.e. “The Wilderness Act requires a delicate balancing between Congress’ desire to maintain untouched lands, and its… recognition that such an idealistic view is subject to some practical limitations” (High Sierra Hikers Association v. United States Department of Interior, 2012b, p.7). A consequence of this language and interpretation is that courts generally defer to an agency’s chosen form or content for conducting the specialized findings that determine need and extent necessary. Thus, the court’s decisions further suggest that if an agency determines a commercial service should be permitted within the Act’s general policy of Wilderness management, it has the burden of proof in showing the court that, in balancing competing interests, it prepared the requisite findings of necessity.

Given the discretion afforded to agencies by the courts in determining whether commercial services should be allowed in Wilderness, agencies must place proper emphasis on “need,” “extent necessary (necessity),” and to a lesser extent, “proper,” to warrant commercial services within the context of the Wilderness Act and other federal regulation (i.e., NEPA and ESA). However, past arguments, though framed with similar terminology, tend to characterize and focus almost exclusively around the historical aspects of packstock, its representativeness as a traditional Wilderness experience to explore as our ancestors might have, and because it is a form of outdoor recreation (Capozza, 2004). Although not necessarily representative of present management schemes, past studies (McClaran & Cole, 1993) have shown that many Wilderness areas have relied primarily on the agency’s discretionary powers of legal interpretation and subsequent managerial professional judgment to form recreational packstock policy. Given the political and legal climate of the past decade associated with commercial services and Special

Use Permits in Wilderness, this mode of policy and decision-making has shifted. This also shifts the manner in which Wilderness packstock operation are characterized.

Similar to the WPS/DEIS, the Forest Service Needs Assessment of commercial services in Wilderness areas is used to make decisions regarding the programmatic (allocation) and project (use) level of Special Use Permits (Merigliano, 2004). Forest Service Management policy on Wilderness management (Section 2323.13g) does aim to "…address the need for and role of outfitters and guides in the forest plan" (p. 21). To assess commercial service need through this process the Forest Service must identify and quantify *public need* for outfitted services (identification of the types of outfitted services that will help meet agency objectives), *capacity* (meeting management desired conditions and standards), and *allocation* (division of total capacity estimate among difference sectors of the public). Public need is based on the following Forest Service Wilderness objectives: conservation and stewardship of natural and cultural resources, public service, visitor safety, retain lands in the public domain so people of all races, gender, and economic categories have the opportunity to re-connect with nature and experience their common heritage, and contribute to the people's quality of life and economic sustainability in communities. Establishing a basis for need contributes to determining the extent to which commercial services are necessary and is closely related to determining the capacity for all recreation visitor use. It includes determining the capabilities of the social, biological, and physical components of the Wilderness resource to accommodate use without impairment of the Wilderness character. In the Wilderness contexts that lie at the heart of the recent litigation, very little empirical evidence is available informing agencies on the extent or type of need.

In terms of assessment, the WPS/DEIS determined packstock activities are proper within Wilderness and determined the extent necessary/necessity based on prior allocation of Special

User Permits and Commercial Service Days (CSD; one commercially supported visitor on a single day) proportioned for alternative scenarios (e.g., no-action/status quo, levels near current levels, allow for increased use, reduce development and commercial services, reduce use) (USDI-NPS, 2014). These alternatives scenarios adhere to the Ninth Circuit Court's determination that it was immaterial whether the NPS or NFS increased commercial permits but rather the agency's decisions did not balance all relevant factors and potential consequences in permitting continued or increased commercial activity. To paraphrase the Court's decision, such balance is essential because the agency's primary responsibility is to protect the Wilderness, not concede to commercial business needs. An agency can only override its responsibility to preserve Wilderness character and promote competing interests (such as those related to commercial activity) if it first engages in a comparative and qualitative analysis where the variables are considered in relation to one another and the interests at stake are weighed. Once this analysis is complete, the administering agency must determine the most important value and justify its decision to protect that value (High Sierra Hikers Association v. United States Department of Interior, 2012a; 2012b).

Thus, the question is not whether a Wilderness management agency is maintaining or increasing permits for commercial activity, but rather *whether the agency has conducted a sufficient comparative and qualitative analysis* in determining that it has the legal right to do so. It is not yet clear whether the methodology employed in the WPS/DEIS is a sufficient comparative and qualitative analysis that balances all relevant factors and potential consequences to continue permitting at current levels or potentially increase the level of commercial activity. Therefore, uncertainty remains as to whether a similar methodology could be employed by other Wilderness management agencies in their attempts to determine need and extent necessary.

## Conclusions

With this literature in mind, we draw the following conclusions:

- It is important that Outfitters and Guides be included in Wilderness education plans and provided with information on Leave No Trace ethics, Wilderness management issues, and the Wilderness resource. Outfitters and Guides may also be used as sources of information for managers and can often be a valuable resource, providing insight not only on the condition of the resource but also the visitor experience.
- Open disclosure of decision-making processes that provide stakeholders with insight on the determination of “necessary” will more likely build trust.
- Support for outfitter and guiding services might include consideration of the local/regional economic implications of commercial services provided in Wilderness.
- Baseline data on the social, economic, and ecological impacts of the provision of outfitters and guide services is required. Periodic monitoring of key indicators will enable agencies to act in ways that maintain the integrity of both the resources and experience for all visitors.

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