

Research Proposal For Backcountry Visitors and Stakeholders at Grand Canyon National Park

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Background

Of the 1.2 million acres of Grand Canyon National Park, close to 98% is considered “backcountry.” Most of the 4.3 million people who came to the Grand Canyon in 2002 viewed the park’s backcountry from distant points on the rim. However about 34,000 people took the opportunity to camp overnight in the park’s backcountry, and an estimated one million more day-hiked into it (personal communication with S. Sullivan and M. Oltrogge, 2003). For the purposes of this proposal, the park’s “backcountry” includes areas of the inner canyon, including corridor trails and campgrounds and non-corridor trails and routes, areas on the south rim outside of the South Rim Village and beyond the paved roads, and areas on the north rim outside of North Rim Village and beyond the paved roads of the north rim. “Backcountry visitors” are primarily people who hike or ride horses/mules into these backcountry areas. The proposed study is directed at facilitating management planning through the development of scientific evidence related to visitors and stakeholders of the park’s backcountry.

It has been almost 20 years since the last comprehensive study of overnight backcountry users at Grand Canyon National Park was conducted (Underhill, et al., 1986). This proposal is directed at providing a current examination of backcountry users (both day and overnight). Results will provide an updated scientific basis to elicit current backcountry use patterns and user characteristics, as well as comparable data to establish historic use trends. The results from the study will provide user-based data and analysis: (1) fundamental for the development of backcountry management planning documents, (2) to provide and promote a variety of backcountry recreational opportunities for visitors compatible with wilderness values, resource protection, and visitor safety, (3) to protect and preserve natural resources and to maintain natural ecosystem processes within the park, and (4) to protect and preserve historic and prehistoric cultural resources.

Grand Canyon has a history of employing scientific evidence to inform its planning processes. Some of the first concerns for backcountry management emerged in the 1970s due to crowding, recreational impacts, and sanitation issues within the campgrounds of the Bright Angel Corridor (Grand Canyon Backcountry Use and Operations statement, 1974; Towler, 1977). Through visitor contacts and systematic observations, backcountry user problems were identified and a trailhead quota system was developed as one of the few restrictions on overnight backcountry use. Demand for backcountry recreational opportunities continued to increase throughout the 1970s and problems with crowding, recreational impacts, and sanitation continued to grow. The

Park developed a Backcountry Management Plan in 1983 that classified land parcels in the backcountry and allocated use according to 79 use-areas each related to one of four types of zones (i.e., developed, threshold, primitive, and undeveloped). At that time, Grand Canyon was one of the first backcountry areas to implement a fixed itinerary system to allocate recreational use (Stewart, 1989). The 1983 plan called for a comprehensive research and monitoring program to collect baseline data on visitor characteristics, impacts, and use patterns, and to evaluate the effectiveness of the newly implemented permit system (both advanced reservations and walk-in application processes, as well as the trip itinerary system). Based upon both sociological and ecological research (Cole, 1985; Underhill et al., 1986), a revised plan was completed in 1988.

During the 1990s, the most notable revisions to backcountry management were: (1) the relocation of Indian Gardens Campground to its current location on the bench above the cottonwood grove, (2) public access to the permit process was improved and communication enhanced between permittees and park staff, and (3) increased managerial attention to day-hikers, including the development of a day-hiker education campaign.

Recent Issues

Several issues are currently facing the park, and surfaced in July, 2003 during meetings between researchers and the park staff. These issues generally were linked to the following inter-related topics: day hikers, conflicts between user types, stakeholder initiatives including appropriateness of various kinds of commercial use, quality of visitor experiences, and review of the 1988 LAC planning framework.

Day hiker safety and preparedness. There continues to be concerns related to day hikers, including their hiking preparedness, safety, and recreational impacts. Given that the Corridor trails attract more than 1,000 day-hikers on most summer days (Stewart & Cole, 1997), they comprise a substantial proportion of backcountry users. During the unusually hot summers of the mid-1990s, day-hiker safety and preparedness became an issue due to an increase in search and rescue operations (SARs). The “Heat Kills, Hike Smart” campaign emerged as a response to the increase in SARs, and has been evaluated and slightly revised since its inception (Manning et al., 1999). Along with increase in number, day users may be hiking on trails outside of the Corridor, and may not be aware of minimum impact practices. However, systematic evidence to support both the increased number and changed use patterns of day hikers, as well as their information needs, requires further development.

Conflicts between user types. Grand Canyon backcountry attracts a variety of different types of users, each having distinct patterns of use. Recreational conflict between two different types of user groups has been a recurrent theme within leisure research, and the sociological impact of increased stock use could be related to increased level of user conflicts in the backcountry. In addition, several other user types have potential for conflict during encounters with each other: river runners, day-hikers,

overnight backpackers, and stock users. Conflict may be influenced not only by differing user types but also by encountering large groups. The maximum group size for river runners is larger than for backcountry users, and may be an issue. For example, at places like Thunder River, there is potential for backpackers to encounter large groups of river runners. However the extent of recreational conflict at Grand Canyon and ways in which users cope with, or avoid, such conflict are neither well-documented nor understood.

Appropriateness of commercial use. Concessionaires have a long history of operating mule rides into the canyon's backcountry for day and overnight trips. On the south rim, these rides travel to Indian Gardens, Plateau Point, and Phantom Ranch. On the North Rim, a different concessionaire takes park visitors down to Roaring Springs and along the rim trails. The experience of these visitors, and their expectations and satisfactions with their Grand Canyon trip, are important aspects to monitor and insure compatibility with the mission of the park. In addition, there is some evidence on the North Rim that commercial and/or private stock users has increased over the past decade, and traveling beyond their traditional use patterns. Although changing use numbers and patterns of stock trips are not inherently problems, the extent of change is not well-known nor is their degree of ecological and sociological impact. In addition, there are several requests each year for Incidental Business Permits to take visitors into the park's backcountry. The quality of these visitors experience, and their expectations and satisfactions with their trip, are important to assess.

Stakeholder initiatives. There are several stakeholder groups interested in the park's backcountry policies, including: Native Americans who live in and around the park, stock users and their organizations, backpacker and hiker groups of various kinds, special interest groups, concessionaires, incidental business permit holders (IBP's), and the NPS staff themselves, to name a few. Each of these stakeholders has distinct meanings they associate with various places in the backcountry due to their own agenda and initiatives for backcountry. As an example, Native American issues have become more visible to backcountry managers. Encounters between Native Americans and backcountry visitors have increased particularly where access to the park requires visitors to travel over tribal lands. Park staff has become more aware of tribal beliefs, sacred places, and archaeological sites, and recognizes the need to address tribal concerns within park policies and planning processes. Understanding place-based meanings has become important for backcountry management -- a spot may be a lunch location for a visitor, an archaeological site to the park staff, and imbued with sacred meaning to someone from a native tribe. By understanding the park's stakeholders and their priorities, there may be potential to form partnerships that facilitate backcountry management.

Quality of visitor experiences. The park's backcountry areas "offer visitors opportunities for solitude and primitive recreation. The management of these areas should preserve wilderness values and character" (General Management Plan, 1995). Following from this vision, the recreational opportunities provided by the park's backcountry should be consistent with a broad range of wilderness experiences. The extent to which the park provides recreational opportunities for a range of wilderness experience requires assessment, including an identification and understanding of the current qualities of

wilderness expectations and experiences among visitors. The quality of visitor experiences, and its compatibility with wilderness values, across the various use zones of the park's backcountry is a concern.

Review of 1988 LAC planning framework. The 1988 Backcountry Management Plan was based upon a Limits of Acceptable Change (LAC) framework that incorporated goals, objectives, standards, and indicators for the park's use zones. The indicators and standards should be re-assessed to evaluate their appropriateness; in addition, the goals and objectives would require review as part of the upcoming backcountry planning process. Although the 1988 plan required periodic monitoring to collect and analyze user-based data (and comparing standards with indicators to check for compliance with plan), the implementation has been difficult due to lack of resources and techniques to effectively monitor. An important need is to assess the current sociological conditions and compare them to the standards of the 1988 Plan. In particular, an assessment of distinct conditions between use zones and the extent that variability in conditions effects experiences, would be meaningful questions to address. In addition, an assessment of longitudinal changes in use is important, and would examine differences in visitor characteristics, experiences, and behavior between 1984-5 and current day.

Proposed Research

The history of backcountry issues identified above inform this research project by grounding the research approach with the management issues of the park. This project entails four related activities, each with distinct objectives to address the managerial issues and to provide essential information to the upcoming park planning process. The four activities are:

- (1) Overnight Backcountry User Study
- (2) Backcountry Day-user Study
- (3) Backcountry Special Places Study: A Stakeholder Analysis
- (4) Workshop to Integrate Grand Canyon Backcountry Research, including sociological, ecological, archaeological, and other research that has recently been conducted within the backcountry

Research instruments (e.g., questionnaires, interview items) for each study will undergo a review, comment, and revision process between researchers and park staff. In addition, each research instrument will undergo an approval process at the University of Illinois for ethical considerations in use of human subjects, and an Office of Management and Budget (OMB) review as standard procedure of social science research on public lands. Each of the six activities is discussed below, including the detail of separate budgets for each study (see end of proposal).

Overnight Backcountry User Study

To develop plans for effectively managing the Park's backcountry there is a need for updated information regarding visitor characteristics, spatial and temporal use patterns of backcountry visitors, their ability to understand and successfully navigate the current permit system including their trip itinerary, their satisfaction with various aspects of their park experience including the planning process of their hike, their understanding of "leave no trace" hiking behavior, and impacts related to visitor behavior in the backcountry. Commercial use has a long history in Grand Canyon's backcountry, particularly with overnight mule rides to Phantom Ranch; the quality of these visitor experiences and their satisfaction needs assessment to provide insight for the upcoming planning process. Along with these issues, there are also questions regarding the quality of visitor experiences, their expectations for their experiences, particularly as they are connected with solitude. The situational conditions and managerial policies (i.e., attitudes toward aircraft, use of "wag bags", preferences for ranger patrols, awareness of emergency medical services, and so forth) that influence their hiking experience are meaningful to understand (Stewart & Cole, 1999). Previous studies have indicated that Grand Canyon's backcountry provides opportunities for a variety of experiences across all use zones (Stewart & Carpenter, 1989), and an updated assessment of the quality of opportunities is necessary (e.g., Underhill, 1986; Stewart & Cole, 2001). Such information is essential for the development of backcountry management planning documents, and will form the foundation of user-based information necessary for effective planning.

The research objectives are:

1. To identify and characterize the overnight users of the park's backcountry, including private permittees and patrons of concessionaires
2. To determine users motivations, expectations, and preferences
3. To measure users level of satisfaction with their Grand Canyon experience
4. To evaluate user reaction to present and potential policies, including the reservation and permit system, pre-trip information, and the potential for conflict between various types of visitors
5. To suggest management actions that best meet social needs of overnight backcountry users

The study will sample 2,000 trip leaders who obtain and use overnight backcountry permits during a 12-month calendar year, such as between November 1, 2003 and October 31, 2004. To insure the ability to reach statistically valid conclusions about hikers of each of the four use zones, permits will be stratified by use zone and randomly sampled within zone. Responses will be weighted in order to generalize to the population of permittees, The sample size allows for a 95% confidence level of the results on dichotomous variables. The sampling ratio will be based upon the previous year's use distribution. The sampling frame will be drawn from permit information including name and address of trip leaders. On a periodic basis, information from trip permits will be sent from the BCO to the University of Illinois for sampling. Survey

administration will follow the guidelines of Dillman (2000), a widely accepted and proven set of techniques to improve response rates, and ultimately insure that the results will represent the population of overnight backcountry users. The Dillman technique prescribes personalization of procedures with persistent follow-up of sampled visitors including a “thank you / reminder” post-card after the first mailing, and two additional mailings of the questionnaire, if necessary, for non-respondents.

In addition to the above post-trip mailback questionnaire, a secondary study will take a small sample of hikers and assess their pre-trip expectations for their upcoming visit to Grand Canyon and follow through with during-trip and post-trip assessments of their resulting experience. The method for this study will combine mailback questionnaire with diary-like techniques. The purpose of this smaller study is to provide further insight to the findings from the above survey, and to assess the effects of expectations on the quality of experiences in Grand Canyon’s backcountry.

Backcountry Day-user Study

Day-users in the park’s backcountry generally hike on the Bright Angel Trail, with much smaller proportions on the North and South Kaibab, Hermit, and Grandview Trails. However few studies have systematically counted the number of day-use hikers on various trails, so their numbers are still considered estimations. Stewart and Cole (1997) estimated an average of 1,164 hikers per day on the Bright Angel Trail during the summers of 1994 and 1995, however their sampling design was limited and the estimation was based on a composite of 21 days with 66 hours of observation for counting. Since that time, infra-red trail counters have been developed and provide reliable data. The park may also have data on trail use that will be useful to compare with the results of this study. In addition to basic information about use distribution of day-use hikers, this study will assess some open points from the previous study of day-use hikers. Manning et al. (1999) found that the day-hiker education campaign was partially effective, however they found that day-use hikers on the BA Trail were more prepared for their hike than hikers on either the Hermit or Grandview Trails in terms of water, electrolyte replacement, food, and other supplies for a day hike, and they also found significant portions of summer hikers that did not carry electrolyte replacement. Manning et al. (1999) also found a tendency for day-use hikers to support “indirect” management actions (such as information campaigns) as opposed to “direct” management actions (such as instituting use permits). In addition, the experience and expectations of patrons of concessionaires (mule riders) and Incidental Business Permittees (e.g., jeep riders, backpackers) requires assessment to provide baseline information for the upcoming planning process. There are needs for updated information about the experiences and behavior of day-users, and to provide reliable baseline information about use distribution.

The research objectives are:

1. To estimate the number of day-users in the park's backcountry
2. To identify the various day-users (including commercial use patrons) of the park's backcountry including socio-demographic characteristics, attitudes, and hiking behavior
3. To measure day-users level of satisfaction with their Grand Canyon experience
4. To evaluate user reaction to present and potential policies, including their reactions to PSAR-related policies and campaigns
5. To suggest management actions that best meet social needs of day-users

The study will provide counts of day-users on the Corridor trails (BA, and North and South Kaibab) two threshold trails from the South Rim (Hermit and Grandview), one primitive trail (Tanner) and a selection of North Rim backcountry trails (e.g., Ken Patrick, Widforss). Along with counts of selected backcountry trails during the high-use months of May through October, 2004, the study also will sample day-users (both hikers and mule-riders). Information from day-users will be collected through onsite interviews using commonly accepted interview procedures by trained interviewers.

Backcountry Special Places Study: A Stakeholder Analysis

Grand Canyon backcountry has a diversity of stakeholders that care about backcountry management and policies of the park. These stakeholders identify with the backcountry for different reasons related to their purposes in using the backcountry, their cultural heritage, and their value system (Phillip, 1993). Stakeholders have the potential to affect backcountry policies in a variety of ways to achieve their goals. The purpose of this study is to develop further understanding of stakeholders by assessing their goals and values related to the various places within Grand Canyon's backcountry. With such an assessment, the park will have a deeper understanding of stakeholders and the meanings of their special places. Rather than a use area, a trail, or a designated campsite, the locales of the backcountry are filled with meaning by stakeholders; it's these meanings and the sharing of the meanings that transform backcountry spaces into personal places (Proshansky et al., 1983; Puddifoot, 1996). These special places may not important to the park, or to other stakeholders, but be connected with important meanings for a given stakeholder.

The research objectives are:

1. To identify stakeholder special places in Grand Canyon's backcountry
2. To understand stakeholder-based meanings and significance of these places

Meanings of places are not easy to articulate (Kruger & Shannon, 2000). These meanings usually connect oneself to both nature and society. A set of methods developed for this purpose uses photography to facilitate discussion, and is referred to as photo-elicitation (Banks, 2001). Stakeholders will be issued a disposable camera and asked to

take pictures of some places in Grand Canyon's backcountry that are important to them. Most stakeholders will not be able to capture an exhaustive collection of places that are special to them; however the photographic documentation is instrumental in evoking a discussion about the meanings of places they hold special in Grand Canyon. Upon development of the film, photographs are used during the interview to elicit stakeholder values for the special places of Grand Canyon. Both the photographs and text of interviews serve as data for analysis. Stakeholders will be asked to review the interview transcripts to check for its ability to represent their perspectives. If necessary, a second interview will be scheduled to insure reliability and trustworthiness of the data. The final results will present the special places of the stakeholders of Grand Canyon's backcountry through both stakeholder-based photographic imagery and identified themes that detail the meaning of these places (Stewart et al., 2003). If some stakeholders are not comfortable capturing their special places with photographic imagery, alternate options for characterizing meaning of places will be explored. Other methods have been used to evoke meanings of special places, and the photo-elicitation method may not be effective for all stakeholders, or for all places that stakeholders hold special. It may be the case that some stakeholders will not want to identify, nor characterize the meanings of, their special places and such perspectives will be respected and acknowledge within the analysis and write-ups. Backcountry planning will be enhanced with an improved understanding of placed-based meanings of stakeholders, and an analysis that provides general themes of overlap and tension among stakeholders.

Workshop to Integrate Grand Canyon Backcountry Research

Over the past decade, numerous research activities have been conducted within Grand Canyon's backcountry. These research efforts cover a variety of issues including ecological monitoring, archaeological site impacts, human wastes disposal, and water resources, to name a few (e.g., Cole, 1992; Jalbert, 1996; Mazzu, 1995; Rihs, 1997). There is currently research being conducted to assess ecological conditions and trends of backcountry campsites (Foti, 2003, personal communication), as well as other ongoing research relevant to the park's mission for backcountry management. There is a substantial need for a dialogue forum that encourages presentation of backcountry research at Grand Canyon and allows interaction between managers, stakeholders, and researchers.

A workshop to promote dialogue and discussion of ideas, and ultimately to integrate backcountry research at Grand Canyon for a managerial focus, will be developed. The workshop will encourage participation from the full diversity of researchers connected to Grand Canyon's backcountry. The purposes of the workshop will be to inform managers, stakeholders, and researchers about the various research projects in Grand Canyon's backcountry, and to explore ways to integrate and enhance the managerial contribution of the research beyond the individual impact of any given study. A published proceedings will be part of the outcome of this workshop.

The workshop would be scheduled in the second year of this project and in consultation with the planning process of the park. A potential date to consider for the workshop would be June of 2005.

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