



A Comprehensive Recreation Impact Monitoring System  
Dispersed Sites/Backcountry Sites  
for the Arizona Strip District  
Bureau of Land Management (Revised: May 25, 2006)

This Proposal Includes the Following Areas:

Arizona Strip Field Office  
Vermilion Cliffs National Monument  
Grand Canyon-Parashant National Monument  
(Including National Park Service Areas)

### Proposed Work

This project focuses on the development and maintenance of an on-going, comprehensive recreation impact monitoring system for the Arizona Strip District of the Bureau of Land Management (BLM) and Lake Mead National Recreation Area within GCPNM boundaries of the National Park Service. Specific resource areas to be included in the proposal include:

- 1). Arizona Strip Field Office (BLM);
- 2). Vermilion Cliffs National Monument (BLM); and
- 3). Grand Canyon Parashant National Monument (BLM and NPS).

This project is based on the planning approach entitled the Limits of Acceptable Change (LAC). While LAC includes nine detailed steps, there are four basic implementation concepts relevant to the wildland recreation planning process:

1. Specification of acceptable and achievable resource and social conditions. (Basically, what do you want in the area or on the site?)
2. Analysis of the relationship between existing conditions and those judged acceptable. (What do you currently have in the area or on the site? This includes baseline inventory data and how does baseline compare with desired conditions?)
3. Identification of management actions judged to best achieve desired conditions. (What do you need to do to get to your desired conditions? This includes recreation management prescriptions such as education, permits, allocations, site rehabilitation, user fees, and law enforcement, to name a few.)
4. A program of monitoring and evaluating management effectiveness. (How do you know when resource change occurs?)

LAC postulates that all users are consumptive users and that resource impacts are the inevitable result of site use. While human impacts may change the

nature of a site, the amount of change tolerated on any site is a managerial decision. It has been demonstrated that informed managerial decisions allow for the creation of sustainable recreation environments; however, effective decisions can only be made within an informed framework of social and physical site data collection. Monitoring programs, inventories, and standards are all critical to resource managers who make and justify their resource decisions and managerial directives to policy makers and a diversity of publics.

It is assumed that the number and extent of physical human impacts on any recreation site is a useful indicator of both visitor behaviors and visitor numbers. Furthermore, it is assumed that a variety of indicators or variables can be developed to measure the physical impacts. Finally, it is postulated that valid and reliable data collected on-site will enable managers to make informed decisions regarding future site management alternatives and potential recreation management prescriptions. This project extends beyond baseline data collection, in most cases, to an on-going monitoring program to determine longitudinal trend analysis related to on-site changes due to human use in the backcountry and dispersed areas of the Arizona Strip.

This comprehensive monitoring project builds upon recreation impact work (inventories and monitoring) completed to-date for the Arizona Strip Field Office (since 1995) and the Grand Canyon-Parashant National Monument (since 2002)(See Table 1). The project proposes to develop and implement a comprehensive recreation impact monitoring program (including variables, on-site data collection, and data analysis and reporting) for the Arizona Strip Field Office, Vermilion Cliffs National Monument, and the Grand Canyon-Parashant National Monument (BLM and NPS). The above areas may be further split into Special Recreation Management Areas (SRMAs) or Extensive Recreation Management Areas (ERMAs). Project work includes, as follows:

- 1). Inventories (Updated regularly based on site needs and use changes);
- 2). Monitoring (On a scheduled basis based on site needs);
- 3). Monitoring Standards (Adaptable to managerial needs and site conditions);
- 4). Data Analysis and Reporting (On an annual basis including a hard copy report, presentations, and additional reports as requested); and
- 5). A Web-Based Monitoring Management Tool to assist in determining significant site/resource changes and to evaluate the need for recreation management prescriptions.

Project Contributions to the Objectives of the CESU:

- 1). To provide a basis for high-quality scientific research and technical assistance to the implementation of adaptive recreation management.
- 2). To ensure objectivity and independence in evaluating the status of recreational impacts on resource areas.
- 3). To recreate an on-going, effective, and efficient partnership between NAU and the federal agencies to include: Arizona Strip Field Office, Vermilion cliffs National Monument, and Grand Canyon-Parashant National Monument.
- 4). To enable undergraduate and graduate students to interact with federal agency personnel and to experience on-the-ground recreation resource management.
- 5). To assist BLM and NPS managers in the efficient management of inventorying and monitoring systems.

Table 1: Recreation Impact Work Completed  
On the Arizona Strip Field Office, Vermilion Cliffs National Monument, and  
Grand Canyon-Parashant National Monument Since 1995

Grand Canyon-Parashant National Monument

Recreation Inventory:	Completed 2002	\$20,000
Recreation Monitoring:	Completed 2004/05	\$6,000
Monitoring Standards:	Completed 2005	No Cost

Vermilion Cliffs National Monument

Recreation Inventory:		
Coyote Buttes North	Completed 2003	\$400
Coyote Buttes South	Completed 2003	\$400
The Tee Pees	Completed 2003	\$400
Paria Canyon	Completed 1999	\$1,200
Paria Plateau	Completed 2003	\$10,500
Ferry Swail	Completed 2004	\$1,600
Recreation Monitoring:		
Coyote Buttes North	Completed 2006	\$400
Coyote Buttes South	Completed 2006	\$400
The Tee Pees	Completed 2006	\$400
Paria Canyon	Completed 2005	\$1,000
Paria Plateau	Not Completed	
Ferry Swail	Not Completed	
Monitoring Standards	Completed 2005	No Cost

## Arizona Strip Field Office

### Recreation Inventory:

House Rock Valley/Marble Canyon	Not Completed	
Kanab Creek Wilderness (Backcountry)	Completed 2002	\$1,000
Kanab Creek Wilderness (Boundaries)	Completed 2006	\$1,900
Other Dispersed Areas	Not Completed	

### Recreation Monitoring:

House Rock Valley/Marble Canyon	Not Completed	
Kanab Creek Wilderness (Backcountry)	Completed 2004	\$1,600 (USFS)
Kanab Creek Wilderness (Boundaries)	Integrated with Backcountry & Dispersed Monitoring	
Other Dispersed Areas	Not Completed	

Monitoring Standards	Completed 2005	No Cost
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Web-Based Monitoring Management Tool	In Development	\$2,000
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## Primary Goals of the Project

- 1). To develop a comprehensive recreation impact monitoring program for the Arizona Strip Field Office, Vermilion Cliffs National Monument, and Grand Canyon-Parashant National Monument:
  - A. Inventories on a regularly occurring basis;
  - B. Monitoring on a scheduled format, and
  - C. A web-based monitoring management tool to provide EASY access to the inventory/monitoring information and to determine when on-site assessment has exceeded standards or to track critical site variables.
- 2). To develop a recreation impact inventory/monitoring program which provides the Arizona Strip Field Office, Vermilion Cliffs National Monument, and Grand Canyon-Parashant National Monument, with the appropriate resource information in a valid, reliable, and timely manner in order for site managers to make decisions regarding recreation land use prescriptions.

## Final Product

The project will result in the following deliverables for the Arizona Strip Field Office, Vermilion Cliffs National Monument, and Grand Canyon-Parashant National Monument:

- 1). Monitoring and inventory schedules for all areas identified by the BLM and NPS.
- 2). Monitoring variables/forms specifically designed to assess the resource areas identified.
- 3). Monitoring standards which are specific, adjustable, and provide appropriate resource change information.
- 4). On-site data collection with an emphasis on validity, reliability, and economic feasibility by NAU personnel.
- 5). GIS coordinates, as appropriate, for all sites with correction assistance from Arizona Strip District's GIS personnel.
- 6). Digital images, as appropriate, for sites.
- 7). Data analysis and reporting on a yearly schedule including a hard copy report and presentation. In addition, annual reports submitted to NPS as required by the CESU.
- 8). A web-based monitoring management tool developed by Tim Carley which stores all inventory/monitoring data and generates on-going reports related to variables which exceed standards or are of critical importance to the

agency.

#### Proposed Implementation Schedule

January, 2005	Initial Project Proposal
Summer, 2005	Monitoring Standards Workshop
Fall, 2005	Project Work
Spring/Fall 2006	Project Work
Spring/Fall 2007	Project Work
Spring/Fall 2008	Project Work
Spring/Fall 2009	Project Work
Spring/Fall 2010	Project Work
	Final Project Summary/Workshop

#### Inventory/Monitoring Protocols

Due to the comprehensive nature of this project, three methodological protocols must be established:

1. Inventory Protocol (Backcountry or Dispersed),
2. Dispersed Monitoring Protocol, and
3. Backcountry Monitoring Protocol.

##### 1). Inventory Protocol Overview

Inventory projects focus on "baseline" recreation impact data collection in the form of a "Rapid Site Inventory (RSI)". An RSI is a "quick, snap-shot" of a site without quantitative analysis of the impacts. The assessment is focused on presence/absence of impacts and requires a maximum of 10 minutes on-site to complete the assessment. The objective of an RSI is to obtain as many sites as possible (in the 90-95% range of site capture) in any area prescribed for study. The RSI forms the basis from which the on-going physical impact monitoring program can be developed. As opposed to the RSI, the on-going monitoring program is a quantitative assessment of recreational physical impacts.

In an inventory program, it is assumed that the number, type, and extent of physical human impacts on a recreation site is a useful indicator of both visitor behaviors and visitor numbers. Based upon physical impact information (in combination with social information and managerial expertise), site managers have the ability to formulate recreation management prescriptions for a site (such as education, outreach, allocations, fees, limits, group size numbers, site closure, site rehabilitation, rest-rotation of sites, etc.). A representative copy of a

INVENTORY FORM is attached to this proposal.

2). Dispersed Monitoring Protocol Overview

Monitoring systems are based on longitudinal analysis of data collected on a sample of sites over time. The concept includes identification of "indicator sites" and repeated monitoring of these sites to determine resource base changes related to recreational use. Dispersed monitoring systems build upon Rapid Site Inventories and when combined with the Visitor Use Reporting Plan assist in creating a sustaining recreational experience for visitors to Arizona Strip District and Grand Canyon-Parashant National Monument. The project will use a quantitative monitoring approach using current techniques and procedures with a data dictionary developed to the specifications of the BLM. In the monitoring system, a sample of long-term sites will be established within the each area for monitoring comparisons over time periods.

**Monitoring Sites:** The following protocol will be followed when collection on-site monitoring data:

- 1). All site clusters or event sites, as identified in the most recent RSI or as encountered in the field, will be identified for monitoring as a Recreation Node (site).
- 2). All extremely impacted sites, as identified in the most recent RSI or as encountered in the field, will be identified for monitoring as a Recreation Node (site).
- 3). All heavily impacted sites, as identified in the most recent RSI or as encountered in the field, will be identified for monitoring as a Recreation Node (site).
- 4). At least 50% of all medium/slight/unimpacted sites, as identified in the most recent RSI or as encountered in the field, will be identified for monitoring as a Recreation Node (site).

Dispersed monitoring systems will include a variety of variable forms such as:

- 1). Road Descriptor Form (completed for each road),
- 2). Off Road Impact Form (tally type form completed for each road),
- 3). Recreation Node Impact Form (completed for each recreation site),
- 4). Climbing Impact Form (completed for each site), and
- 5). Other forms/variables may be developed as appropriate for the resource base being monitored. The goal is to collect appropriate

information on "indicator sites" to track recreation-caused changes to the resource base. In addition, data collection techniques may be revised to meet the most current approaches in the field.

A representative copy of a DISPERSED MONITORING FORM is attached to this proposal.

### 3). Backcountry Monitoring Protocol Overview

Based on the most recent RSI, a set of indicator sites will be established to track human impacts longitudinally across the monitoring horizon. In the backcountry, as in the dispersed areas, all extremely or heavily impacted sites, as indicated by the most recent RSI, will be included in the monitoring system. In addition, at least 50% of all moderately or slightly impacted sites will be included. Criterion for including moderately or slightly impacted sites include: relocation potential of the site, the ability of the site to reflect user changes in the backcountry area, any special circumstances or site variables (such as cultural features or inherent site conditions) that give cause for additional site concerns.

A representative copy of a BACKCOUNTRY MONITORING FORM is attached to this proposal.

**Note:** Additional forms/variables may be developed as appropriate for the resource base being monitored. The goal is to collect appropriate information on "indicator sites" to track recreation-caused changes to the resource base. In addition, data collection techniques may be revised to meet the most current approaches in the field.

## BLM Responsibilities

- 1). NAU may have access to BLM vehicles for on-site data collection as available and appropriate. NAU may have access to ATV's for on-site data collection as available and appropriate and following ATV training certification.
- 2). BLM will assist with field information, maps, GIS equipment (as available), and site locations during data collection.
- 3). BLM may provide access to BLM administrative areas during data collection as available and appropriate.

## NAU Responsibilities

- 1). Coordination and communication of data collection periods.
- 2). Development of the on-site monitoring systems to include: on-site data collection techniques, data forms/variables, and a data collection dictionary based on BLM/NPS specifications.
- 3). On-site data collection of recreational impacts as per the agreed upon schedule and protection of the integrity of the data following collection.
- 4). Data compilation and analysis in an Access database and posted to the web-based monitoring management tool.
- 5). Oral and written reports to BLM/NPS.
- 6). Responsibility and accountability for any BLM furnished supplies and materials such as: vehicles, ATV's, and radios.

## Project Contacts

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