



**COLORADO RIVER MANAGEMENT PLAN
ANNUAL REPORT
FOR FISCAL YEAR 2010**



Soap Creek Restoration Project

Project Number 133023

For Official Use Only

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Table of Contents

Executive Summary.....	6
Introduction	9
Purpose and Need.....	9
Mitigation Program.....	10
General Summary	10
Objectives	11
Results and Observations.....	11
Problems Encountered and Solutions.....	12
Recommendations for Future.....	12
Monitoring Program	12
General Summary	12
Natural Resources Campsite Monitoring.....	12
Table 1: Integrated Monitoring Program Survey Panel 2007-2010.....	13
Objectives	13
Results and Observations.....	14
Table 2: Summary of Integrated Monitoring, 2010	14
Problems Encountered and Solutions.....	14
Recommendations for Future.....	14
Cultural Resources Monitoring	15
Objectives	15
Results and Observations.....	15
Summary of Partnerships and Cooperation	16
Overall Recommendations for Future	16
Appendix A - February Mitigation Trip Report	17
Trip Itinerary	17
Table 1A: February 23-March 2, 2010 River Trip Itinerary	17
Trip Objectives	18
Logistics and Personnel.....	18
Table 2A: February 23-March 2, 2010 Participant List.....	18
Results and Observations.....	19
Problems Encountered and Solutions.....	20

Appendix B – November Mitigation Trip Report	21
Trip Itinerary	21
Table 1B: November 1- 20, 2010 River Trip Itinerary	21
Trip Objectives	23
Logistics and Personnel.....	24
Table 2B: November 1- 20, 2010 River Trip Participants	24
Table 3B: November 1- 20, 2010 Additional Personnel.....	25
Results and Observations.....	25
Problems Encountered and Solutions.....	27
Appendix C - April Monitoring Trip Report	28
Trip Itinerary	28
Table 1C: April 3-20, 2010 River Trip Itinerary.....	28
Trip Objectives	31
Vegetation.....	31
Recreation.....	32
Cultural.....	32
Logistics and Personnel.....	32
Table 2C: April 3-20, 2010 Participant List	32
Results and Observations.....	33
Vegetation.....	33
Table 3C: Total Invasive Plant Removal in Camps Along the Colorado River, April 2010	33
Recreation.....	33
Cultural.....	34
Unkar Delta trail rehabilitation work.....	34
Problems Encountered and Solutions.....	35
Vegetation.....	35
Recreation.....	35
Appendix D - May Avian Monitoring Trip Report	36
Trip Itinerary	36
Table 1D: May 17-31, 2010 River Trip Itinerary.....	36
Trip Objectives	38
Logistics and Personnel.....	39

Table 2D: May 17-30, 2010 Participant List	39
Results and Observations.....	39
Problems Encountered and Solutions.....	40
Appendix E - September Monitoring Trip Report	41
Trip Itinerary	41
Table 1E: September 4-20, 2010 River Trip Itinerary.....	41
Trip Objectives	44
Vegetation.....	44
Recreation.....	44
Logistics and Personnel.....	44
Table 2E: September 4-20, 2010 Participant List	44
Results and Observations.....	45
Vegetation.....	45
Recreation.....	45
Problems Encountered and Solutions.....	45
Vegetation.....	45
Recreation.....	46
Appendix F – Archeological Monitoring Trip Report	47
Trip Itinerary	47
Table 1F: February 10- 27, 2010 River Trip Itinerary	47
Trip Objectives	48
Logistics and Personnel.....	49
Table 2F: February 10-27, 2010 Participant List	49
Results and Observations.....	50
Problems Encountered and Solutions.....	50

Executive Summary

The 2006 CRMP and associated Record of Decision (ROD) prescribed a multi-resource monitoring and mitigation program to focus on areas affected by river recreation where the integrity of natural and cultural resources may be at risk and where visitor experience may be negatively affected. The ROD also prescribed a site-specific restoration program to address campsite impacts, trails and campsite maintenance and mitigations.

Shortly after the ROD was signed, the NPS, in coordination with Northern Arizona University developed a monitoring plan to examine long-term trends in changes campsite conditions from recreational use. The campsite monitoring program was designed to capture changes to vegetation, avifauna, and general impacts from visitation during low and high-use periods. The monitoring program was implemented in April 2007, and continued through September 2010.

The CRMP Mitigation Program was initiated in November 2006. Projects are identified, planned, and implemented by an Interdisciplinary Team that includes River Rangers, Backcountry Rangers, Resource Management Specialists, Trails Specialists and others. Most of the fieldwork is conducted in partnership with the Grand Canyon River Outfitters Association, and some projects have been completed in cooperation with the Hualapai Tribe and the Grand Canyon Private Boater's Association.

In 2010, the NPS teams completed six CRMP monitoring and mitigation river trips. The objectives and outcomes of each trip are summarized below. The details of each trip and projects are outlined in the appendices of this report.

Archeological Site Monitoring, a.k.a. "Arch Blitz" (February 2010)

Monitoring archeological sites is necessary to determine if the sites have been impacted by visitation or by erosion due to sediment depletion in the river system from Glen Canyon Dam operations. The team visited 107 only minor impacts from visitation and/or erosion. The crew also monitored sites that were excavated by the Museum of Northern Arizona and the NPS in a joint project between 2007 and 2009 to determine whether or not backfilling and rehabilitation of the excavation units was successful. The next Arch Blitz is scheduled for February 2012.

Lower Gorge Monitoring and Mitigation (February-March)

Conducted in cooperation with staff from the Hualapai Tribe's Natural and Cultural Resources Programs, the team visited all camps in the Lower Gorge (river miles 226 to 277). This was the first joint effort since CRMP implementation to inventory and establish the baseline campsite conditions. Primary activities included mapping, assessments and installation of long-term photopoints for all named campsites. Nine cultural sites were monitored and several camps between river miles 260 to the GRCA boundary at mile 277 were evaluated for resource damage due to pirate campsite development by river users in the years since the waters of Lake Mead have receded. Wildlife biologists inventoried campsites for potential habitat for the endangered Southwestern Willow Flycatcher. Among the user developed campsites that were observed, several appeared to be within potential habitat, and five sites were identified for monitoring in 2011.

Integrated Campsite Monitoring (April and September 2010)

The objective of the integrated campsite monitoring is to determine long term trends and changes to campsite conditions. The interdisciplinary team conducted recreation surveys, mapping, and vegetation transects at 41 campsites in April and 40 campsites in September. In April, additional wildlife (avifauna) vegetation transects were completed at corresponding control sites. This work is not conducted during the September trip. Other work conducted in April site condition assessments at 13 historic properties and a project day at Unkar Delta, a popular archeological site. The work was aimed at improving trails to the interpretive sites and the rapids scouting area.

Vegetation and recreation project leaders continue to wrestle with some aspects of the monitoring plan. Specifically, the selection of certain campsites and the transect locations. It is questionable whether the placement of transects are capturing the visitor use traffic and potential impacts of use. In September, the team noted that three camps scheduled for monitoring were not really useable as camps anymore. They had changed for a variety of reasons, including erosion due to tributary or mainstem flows, and vegetation overgrowth. Further discussion is needed to determine whether to keep these sites or to replace with like sites on the survey panel. The recreation staff is also evaluating the variables and the methods. The data to this point will be evaluated for evidence of inconsistency in methodology and test on future trips. The team also identified the need to reconsider whether invasive plant removal (and other projects) should continue to occur on these trips. It appears that the invasive work may be accomplished with the addition of one staff or volunteer.

Avian Monitoring (May): The primary objective of this trip was to conduct point counts at all camps and controls sites prescribed in the monitoring plan, and conduct Southwestern Willow Flycatcher (SWFL) surveys along the river corridor in areas identified as suitable habitat, as required by the CRMP's Biological Opinion. Two staff from the NAU/USGS and Tamarisk Coalition conducted tamarisk beetle monitoring at one-mile intervals (when possible) along the river corridor.

For CRMP monitoring, the wildlife team conducted a total of 126 point counts from Lees Ferry to Diamond Creek, resulting in the detection of 70 species and a total of 1180 birds. Slightly more birds were detected in campsite (n=593) than controls sites (n=587), and there was a minor difference in the number of species detected between camps and controls. The control sites averaged more birds per site (11.4 birds/point) than campsites (8.9 birds/point).

SWFL surveys were conducted at five historical sites and one new site between Lees Ferry and Phantom Ranch; and four historical and nine new sites between Phantom and Pearce Ferry, six of the new sites were below Diamond Creek. Of the 15 sites assessed for SWFL habitat, three sites were classified as suitable habitat and four as potential habitat.

Camp and Attraction Site Mitigation (November): In partnership with the Grand Canyon River Outfitters Association, guides from Arizona Raft Adventures joined the NPS interdisciplinary team to conduct various site rehabilitation and maintenance projects at camps and attraction sites. The partnership aspect of this program is its greatest asset. The major project areas included Soap Creek, Kwagunt, Unkar Delta, Hance Rapids, Deer Creek, and 202 Mile. Phase II of the Soap Creek restoration projects was the continuation of experimenting with ollas (passive irrigation system) and live plantings to address impacts in the old high water zone. The work at the other sites consisted of campsite clean-up, social trail

eradication and delineation of primary access trails. The cyclic program also includes monitoring past projects using photopoints and assessments, completed at 10 sites this trip. The team also conducted site assessments at 16 camps. The assessments serve as the primary tool for determining whether any site treatments are needed and to determine a monitoring schedule for the site.

Recommendation Summary

In early 2011, conduct a review of integrated campsite monitoring program. Assess the status of reporting and protocols documents.

Draft protocols for vegetation, recreation and avifauna components.

Compile data for comprehensive analysis to determine if management questions are addressed.

Finalize CRMP Mitigation Plan to include site planning strategy, monitoring and assessment protocols, and incorporating methods outlined in draft restoration handbook.

Introduction

This report documents the accomplishments associated with the CRMP monitoring and mitigation program. In 2010, the NPS teams completed five river trips: Archeological site monitoring (February), Integrated campsite monitoring (April and September), Avifauna campsite monitoring (May) a CRMP campsite and trails mitigation trip (November). The report provides an overview of the programs and recommendations for future actions. The details of the work accomplished are documented in the individual trip reports included in the Appendices.

Purpose and Need

The purpose of this report is to provide an overview of the Colorado River Management Plan (CRMP) monitoring and mitigation activities in 2010.

The update CRMP was implemented in 2007 following a 2006 Record of Decision. The major changes to recreation and resource management include the establishment of a launch-based system of distributing use (to ensure capacity standards were met), a decrease in maximum group size (from 44 to 32), and an increase in use during the spring, fall, and winter months (due primarily to an increase in noncommercial launch opportunities).

The CRMP monitoring and mitigation program was implemented in 2007. The 2010 report is the first year an annual report was completed; however, the type of monitoring and work completed since 2007 is reflected in this report.

The CRMP management objectives emphasize managing river recreation to minimize impacts to resources while providing a quality visitor experience. To ensure these objectives are met the NPS must determine, through a research, monitoring and mitigation program, what impacts are occurring, how these impact alter resource condition, and how adverse impacts can be effectively mitigated. The objectives of the CRMP monitoring and mitigation program include:

- ✚ Determine status and conditions trends of selected resources
- ✚ Establish reference points and provide data to compare resource condition
- ✚ Understand and identify meaningful resource condition change associate with visitor use
- ✚ Provide early warning of deteriorating resource conditions that trigger mitigation (management action toward restoration)
- ✚ In response to monitoring results, identify appropriate changes to management practices
- ✚ Assess efficacy of management actions and restoration methods
- ✚ Develop effective approach to impacted-site mitigation and restoration

Mitigation Program

General Summary

Visitation and management activities inevitably have impacts to park resources, some beneficial and some harmful. The CRMP Mitigation Program requires that Park staff mitigate the adverse effects of visitation and management activities along the Colorado River corridor. Mitigation activities range from rock lining trails, obliterating trails to and into archeological sites, actively planting a highly degraded campsite, to limiting sand erosion and include everything in between. Grand Canyon National Park staff in conjunction with many other invested stakeholders performs restoration activities to mitigate the effects of concentrated human impacts in the backcountry and to maintain natural processes throughout the Colorado River watershed. Under the current CRMP, each of these disciplines is represented on a core planning team that develops site assessment, restoration implementation, and follow-up monitoring schedules and priorities. Staff from each of the disciplines completes planning work off the river as well as two assessment/work trips each year, typically in February and November. The work and assessments prescribed by the core team are implemented by the team and a group of support staff that include trail workers, biological science technicians, and other park staff. Between 2009 and 2010, the work and assessments were also supported through the Colorado River Conservation Program, which partners guides from a host river outfitter with park staff to complete conservation work.

Under the CRMP, restoration is first prescribed through an assessment system and is then completed according to priority ranking and available resources. As of 2010, baseline assessments on all river camps along the trail corridor are still underway. To date, 115 out of 234 camps have been assessed. Attraction sites, research sites, rapid scouts, and other heavily impacted areas also fall under the assessment system. Once a site is assessed, it enters into a cyclical schedule for further assessment based on the severity of impacts at the site, which are determined by the interdisciplinary CRMP Mitigation Team. The interdisciplinary CRMP Mitigation Team is led by the Outdoor Recreation Planner. The rest of the team is composed of a Restoration Biologist, Trails Supervisor, Archaeologist, and a River Ranger. This team also determines which sites will undergo restoration and maintenance at any given time. In order to develop the priorities for a site, the team uses a single data form in conjunction with aerial maps and photographs.

The team uses the CRMP Assessment/Monitoring Data Sheet to do both the initial site assessment as well as to monitor work or to re-assess a site once restoration work has been completed. The CRMP Mitigation Data Sheet is used to document the work completed at each site, along with aerial maps to delineate where work has been completed. And finally, the team also uses long term photopoints to visually monitor work that has been completed.

Once a site has been assessed and determined a priority, then has been restored, it falls into the cyclical reassessment phase. If the team determines during the reassessments that work is needed again, the site goes back into the queue for restoration or maintenance work.

The assessment and reassessment system through the CRMP Mitigation Program should not be confused with the CRMP Monitoring Program. That program is directed at gathering data on *long term* impacts to vegetation, wildlife, and visitor experience at campsites and attraction sites. The mitigation component of the CRMP Program addresses *immediate* impacts to all campsites and attraction sites whether those impacts be to vegetation, wildlife, trails, archaeology, visitor experience or other. As more data is collected and analyzed, the long term monitoring program will eventually help to inform the mitigation component on big picture issues. However, the assessment and reassessments system are the only way to maintain a long lasting body of knowledge that focuses on specific impacts at a local scale.

Through the reassessments, mapping, and long-term photopoints, the team can determine if the methods are effective. If a method is not proving effective, the team has the flexibility to try something new. The Approved Methods table outlines all work that is currently approved for the inner canyon and river corridor. That table can be modified and accepted through the compliance process by a larger reviewing committee. New methods for restoration are being explored with each restoration event. No two sites are exactly the same, and each requires creativity and consensus to complete with success.

After all the forms have been filled out (assessments, mitigation data sheets, reassessments, and photopoints), they are stored in the Vegetation Office with the Restoration Biologist in hard copy form. They are also summarized after each trip in an Excel table, also maintained by the Restoration Biologist. Those records are accessible by anyone at any time, with prior notice to the Restoration Biologist. Eventually, these records will be stored in a network accessible database.

Objectives

General

- Review and update the approved methods table for mitigation activities through the Office of Planning and Compliance (OPAC)
- Expand stakeholder involvement with river corridor restoration under the CRMP by actively seeking volunteer participation on park trips.
- Expand outreach and education efforts by conducting lectures and orientations for park staff and stakeholder groups, publishing articles in river journals, and distribution of site bulletins to the public.

Zone 1

- Continue to complete written assessments and prescriptions to establish baseline data for all 234 camps that lie within the area of effect for CRMP implementation.
- Continue to perform mitigation actions at campsites according to the priorities established through the CRMP mitigation assessment process.
- Continue mitigation monitoring at previous restoration sites and maintain documentation as prescribed in mitigation assessment forms.

Zones 2 and 3

- Establish baseline campsite conditions and install long term photo points for all 17 camps below Diamond Creek at river mile 225 to the park boundary at river mile 277.
- Assess campsite availability in critical reaches and develop a work plan to address any deficiencies and needed improvements.

Results and Observations

Lower Gorge, February 23 – March 3, 2010. (See Appendix A for detail)

This trip was conducted in cooperation with the Hualapai Tribe. In addition to NPS staff, four members of the Hualapai Natural and Cultural Resources program participated in all aspects of work. They also brought to bear some important perspectives about resources management.

The team visited all named campsites from Diamond Creek (mile 226) to the park boundary (mile 277). Campsite assessments and long-term photopoints were established. Nine cultural sites were monitored. In addition, several locations between Quartermaster and Pearce Ferry were evaluated for resource damage due to pirate campsite development by river users in the years since the waters of Lake Mead have receded.

Several legacy campsites have become inaccessible due to either vegetation encroachment and/or the development of steep cut banks as the Colorado River reclaims a channel through the exposed lake bottom sediments. Campsites at 264.7 R, 273.L have become quite well established, with several others showing clear signs of overnight use.

November 1 – 20, 2010 CRMP Mitigation Trip (See Appendix B for detail)

This trip was conducted in cooperation with Arizona Raft Adventures (AzRA) under the Cooperative Resource Conservation Program (CRCP). Multi-day projects were conducted at six locations. Additional work includes trash and fire ring clean-up at two camps, photopoint monitoring, and mitigation planning assessments at 16 sites.

Problems Encountered and Solutions

Lower Gorge Trip: Among the user developed campsites that were observed, several appeared to be within potential habitat for the endangered Southwestern Willow Flycatcher (SWFL). The wildlife biologist committed to researching the status of habitat assessment and point counts for these areas to inform future management actions that may become necessary in the future. Five camps were identified for SWFL surveys in the coming season, to prepare for mitigation work to be accomplished in 2011.

Many of the historic cultural sites contain numerous artifacts. Monitoring efforts should be geared at understanding the cycle of collection pile accumulation and distribution to better understand how these artifact scatters may be impacted by increased visitation.

November River Trip: No problems encountered.

Recommendations for Future

The approved methods table for mitigation measures under the CRMP needs to be reviewed and updated to reflect current resource concerns and accurately describe necessary methods for all river resource areas. The Lower Gorge is not adequately represented for treatment options under the existing methods table.

Prepare draft plan for the CRMP Mitigation Program. This document should include methods and describe strategies for prioritizing work projects.

Monitoring Program

General Summary

The CRMP Record of Decision (2006) called for resources monitoring program that will focus on areas affected by river recreation where visitor experience may be negatively affected and where the integrity of natural and cultural resources may be at risk. The primary components of the CRMP monitoring program include an integrated campsite monitoring program to establish baseline conditions and to monitor long-term trends in campsite condition, and an archeological site monitoring program to document and monitor archeological resources that may be affected by visitation along the Colorado River corridor. Campsite monitoring trips are conducted twice each year to monitor conditions in April following a low-use period, with the avifauna point counts in May, and in September, following the high use period. Archeological site monitoring is conducted on a biannual basis, typically in the winter.

Natural Resources Campsite Monitoring

Indicators and measures should be sensitive to visitor use, in other words, the variables that are measured must relate to the types of activities and behaviors that take place along the river corridor. The integrated

monitoring program attempts to measure recreation-use effects by documenting some standard human impact variable such as campfire and human waste impacts, trailing, and litter. In addition, the plan attempts to measure recreation-use effects integrating understanding of all river corridor resources by incorporating vegetation and avifauna in the river corridor's new and old high-water zones. Using aerial photographic maps, the team also documents changes to the campsite boundary and campable area polygons. A campsite atlas of maps was developed for all campsites in Zone 1 (Lees Ferry to Diamond Creek) in coordination with the GCMRC beginning in 2007. The campsite monitoring program incorporates those changes for the campsites in the monitoring design as described in the *Vegetation and Avifauna Monitoring Plan (2007)*. Panel 1 sites are sampled repeatedly every trip to increase statistical power to detect trends. Panels 2 through 7 are sampled for three consecutive surveys, then not visited for the next three surveys in a rotating manner.

Table 1: Integrated Monitoring Program Survey Panel 2007-2010

		1	2	3	4	5	6	7	
2007	Spring*	15	10				10	10	45
	Fall	14	9	8				9	39
2008	Spring	14	9	8	8				39
	Fall	14		8	8	9			39
2009	Spring	14			8	9	9		40
	Fall	14				9	9	9	41
2010	Spring	14	9				9	9	41
	Fall	14	9	8				9	40

*Following the first field session campsites were dropped from survey sample.

Objectives

The overall objectives for this part of the CRMP monitoring program are to determine trends of conditions at representative campsites by examining changes to vegetation and avifauna in new and old high water zone areas, and to determine impacts from river runner use. The combined methodology is intended to provide an overall long-term look at changes to campsite condition resulting from human use. Repeated mapping of campsites documents changes resulting primarily from the effects of dam operations including river flow levels and vegetation growth.

Results and Observations

The year 2010 represents year four of the campsite monitoring program. As in past years, two trips are conducted annual to assess impacts following the low use period (April) and high use period (September). In May 2011, the wildlife team conducted avifauna point counts at selected camps and control sites. The field work is summarized in the table below and the trip details are included as Appendix C (April), Appendix D (May) and Appendix E (September).

Table 2: Summary of Integrated Monitoring, 2010

	Recreation	Archeology	Vegetation	Avifauna
April 3-20	41 RCA & mapping Unkar Delta mitigation	13 Site Assessments Unkar Delta compliance	61 Transects at 41 campsites Exotic species removed at 6 sites	49 TVV at 41 campsites and controls
May 17-31	Lower Gorge Campsite assessments	n/a	Tamarisk Beetle surveys Deploy HOBOS	126 point counts at camps & controls SWWFL at 19 sites
September 4-20	40 RCA & mapping	n/a	62 transects at 40 campsites Removed 261 Ravenna Tamarisk Beetle surveys	n/a

Problems Encountered and Solutions

There is continued discussion about the selection of certain camps for monitoring. In September, three campsites were identified as sites that were no longer campsites. There was discussion on the value of keeping them in the rotation versus replacing with other like camps. The placement of vegetation transects in some of the camp is also a concern, including the impacts from reading OHWZ transects. Some of the NHWZ transects are located in areas with dense tamarisk and/or arrow-weed thickets. These sites do not likely capture changes from visitation. There is also continued concern with the absence of completed protocols for the recreation Rapid Site Assessments. Vanya will be developing protocols to cover data collected to this point.

Recommendations for Future

- Complete Protocols document for vegetation, avifauna and rapid campsite assessments
- Analyze data. Determine if management questions are being answered.
- Consider eliminating or combining some of the indicators and clarify methods for rapid campsite assessments. Create a pilot form and protocol to pilot for the next monitoring trip in 2011.

Cultural Resources Monitoring

Implementation of the Colorado River Management Plan required the development of a Historic Property Monitoring and Mitigation Program to outline the identification, documentation, monitoring, and treatment of archeological resources within the project area. The project encompasses 277 miles of the Colorado River corridor and adjacent side canyons with over 674 recorded archeological sites.

This program seeks to balance resource preservation, archeological site integrity, and visitor use along the river corridor. The program incorporates archaeological site condition documentation conducting field monitoring visits. Thresholds determine when to recommend and implement mitigation treatments to prevent resource or integrity loss.

Throughout the project area, desert and riparian habitats sustain abundant plants and animals. Approximately 674 archaeological sites contain the remains of nearly 12,000 years of human occupation within the canyon between Lees Ferry and river mile 277. Many of these locations remain connected to Native Indian tribes living on the Colorado Plateau. The park maintains active dialogue with 11 tribes with ancestral ties to the canyon.

Objectives

Cultural Program objectives focus on the identification of processes affecting National Register integrity. Cultural resource monitoring results in the identification of observed processes and disturbance levels and the assessment of the potential threats associated with a site and threat timeframes. The observed threats and disturbances are assessed to determine what the effects on integrity are, and which aspects of integrity are affected. Treatment (mitigation) recommendations are made during the monitoring observation.

CRMP management objectives for cultural resources include the maintenance of site integrity with site stability and preservation as the desired state. If site stability cannot be maintained, and preservation is not viable, minimizing effects to site integrity is required. Preservation of historic property significance and integrity are keys to continued access by traditionally associated American Indian tribal members. The CRMP seeks to balance the goal of providing access and education while protecting resources from the adverse effects of visitation (USDOI GRCA 2005:13). Monitoring objectives relate to both site condition and the effectiveness of mitigations previously implemented.

Results and Observations

Site Condition assessments were conducted at 107 sites. The 9 sites excavated during the NPS/MNA were visited to determine if the mitigations were successful, only the Blacktail site seems to have any signs of erosion.

There are 29 river corridor sites with check dams installed. Maintenance work was required at three structures and the crew constructed one new check dam. Two full days were spent at Unkar Delta documenting the appropriateness of current monitoring protocols and collecting GIS spatial data for site boundary documentation. The management of the delta has been under a single site number with different subsites, we designated 22 unique sites to more effectively manage visitation and erosional impacts.

Summary of Partnerships and Cooperation

The CRMP projects and river trips were accomplished in cooperation with several internal and external partners. Partnership projects ranged from hands on campsite mitigation, tamarisk beetle surveys and trails maintenance to data collection and on-site consultations.

GRCA Interdisciplinary Teams included staff from River District, Canyon District, Trails, Backcountry & River Permits Office, Resources Management and Concessions.

Hualapai Departments of Natural Resources and Cultural Resources staff participated in Lower Gorge trip lending expertise and perspective on resources and values.

Cooperative Resource Conservation Program, a cooperative agreement with the Grand Canyon River Outfitters Association. Arizona Raft Adventures (AzRA) provided logistical support and labor for the November mitigation trip

The Tamarisk Coalition: provided a volunteer researcher that conducted Tamarisk Beetle monitoring on the May avifauna trip.

Northern Arizona University Cooperative Ecosystem Studies Unit: Research assistant to conduct Tamarisk beetle monitoring

Grand Canyon Association grant in support of Tamarisk beetle monitoring program in 2010.

Overall Recommendations for Future

Finalize Protocols for long-term campsite monitoring program.

Analyze data to determine if CRMP management questions are being addressed.

Finalize CRMP Mitigation Plan – include methods and protocols; describe strategy for developing site plans and prioritizing monitoring and mitigation of sites.

Report on Visitor Experience Monitoring Program in future years. Determine if management questions are being addressed.

Appendix A - February Mitigation Trip Report

Trip Dates: February 23, 2010 – March 2, 2010

Trip Itinerary

Table 1A: February 23-March 2, 2010 River Trip Itinerary

Date	Day	River Mile	River Side	Work Location	Project Details	Campsite Name
2/23/10	1	226.2	R	Various	CRMP orientation Campsite assessment and install photopoint @ 226.2	Truck Stop
2/25/10	3	236.1		Various	Pruning at Travertine, assessments and photopoints at 231R, 234.4, 235.1L, 235.3L, plant inventory at Bridge	Bridge Canyon
2/26/10	4	239.8		Various	Assessments and photopoints at Gneiss, 236.7L, 238.7L, Separation, archaeology at Bridge dam site and Bridge City	Separation
2/27/10	5	248.7		Various	Assessments and photopoints at 243R, Spencer, and Surprise, archaeology at Spencer, plant inventory at Surprise	Surprise
2/28/10	6	260.9L		Various	Assessments and photopoints at 250 Mile and Burnt Springs	Quartermaster
3/1/10	7	280.9L		Various	Document impacts at unnamed camps, prescribe improvements	Below Pearce Rapid
3/2/10	8	0			Run out to South Cove	

Trip Objectives

- Establish baseline campsite conditions and install long term photo points for all 17 camps below Diamond Creek at river mile 225 to the park boundary at river mile 277.
- Establish a framework and recommended intervals for Lower Gorge campsite and resource monitoring.
- Assess campsite availability in critical reaches and develop a work plan to address any deficiencies and needed improvements.
- Historical and cultural site inventory and documentation.
- Identify and plan for addressing gaps in vegetation and wildlife inventory for this reach
- Provide an opportunity for NPS resource management staff and Hualapai tribal representatives to examine and discuss resource management issues related to visitor use and encourage cooperation between the tribe and the park.

Logistics and Personnel

Table 2A: February 23-March 2, 2010 Participant List

Role	Division	Name
Trip Leader	Visitor and Resource Protection	Dave Loeffler
Boatman	Visitor and Resource Protection	Jake Blackwell
Wilderness Coordinator	Science and Resource Management	Linda Jalbert
Recreation Planner	Science and Resource Management	Vanya Pryputniewicz
Restoration Biologist	Science and Resource Management	Kassy Theobald
Archaeologist	Science and Resource Management	Steven Schooler
Trails Lead	Facility Management	Chris Brothers
Wildlife Biologist	Science and Resource Management	Rosa Palarino
River Permits Office	Visitor and Resource Protection	Elysha Iversen

Table 2A: Trip Participants Continued

Role	Division	Name
Lake Mead Representative	Visitor and Resource Protection	John Bland
Vegetation Specialist	Sonoran Desert Museum	Wendy Hodgson
Hualapai Tribal Representative	Hualapai Cultural	Joshua Gordon
Hualapai Tribal Representative	Hualapai Cultural	Shawn Gordon
Hualapai Tribal Representative	Hualapai Water Quality	Adina Hunter
Hualapai Tribal Representative	Hualapai Water Quality	Joe Montana
VIP	PRO	Beth Rosier
VIP	Prescott College Intern	Stephanie Obsitnik

Results and Observations

The following applies to all named camps between river mile 226 and 277:

- Long term photopoints were established
- Digital orthographic images were used to map available suitable camping areas
- A CRMP Rapid Campsite Assessment form was completed to establish baseline conditions for this reach
- A CRMP Mitigation Pre-assessment form was completed to document current condition and establish an appropriate monitoring interval for each camp in this reach
- Vegetation specialist recorded plant inventories, documented rare plant species such as the Hualapai Blazing Star

The following cultural sites were monitored:

- 5 historic sites related to dam prospecting by the BOR
- 4 other cultural sites

In addition, several locations between Quartermaster and Pearce Ferry were evaluated for resource damage due to pirate campsite development by river users in the years since the waters of Lake Mead have receded. Several legacy campsites have become inaccessible due to either vegetation encroachment and/or the development of steep cut banks as the Colorado River

reclaims a channel through the exposed lake bottom sediments. Campsites at 264.7 R, 273.L have become quite well established, with several others showing clear signs of overnight use.

Problems Encountered and Solutions

Among the user developed campsites that were observed, several appeared to be within potential habitat for the endangered Southwestern Willow Flycatcher (SWFL). The wildlife biologist committed to researching the status of habitat assessment and point counts for these areas to inform future management actions that may become necessary in the future. Five camps were identified for SWFL surveys in the coming season, to prepare for mitigation work to be accomplished in 2011.

Many of the historic cultural sites contain numerous artifacts. Monitoring efforts should be geared at understanding the cycle of collection pile accumulation and distribution to better understand how these artifact scatters may be impacted by increased visitation.

The approved methods table for mitigation measures under the CRMP needs to be reviewed and updated to reflect current resource concerns and accurately describe necessary methods for all river resource areas. The Lower Gorge is not adequately represented for treatment options under the existing methods table.

Appendix B – November Mitigation Trip Report

Trip Dates: November 1- 20, 2010

Trip Itinerary

Table 1B: November 1- 20, 2010 River Trip Itinerary

Date	Day	River Mile	River Side	Work Location	Project Details	Campsite Name
11/1/10	-1	0	R	South Rim	Pre-rig and tool gathering	
11/2/10	1	0	R	Lee's Ferry	Lee's Ferry Private Boater's Camp work	Lee's Ferry
11/3/10	2	11.3	R	Soap Creek	Jack-ass clean-up, Orientation	Soap
11/4/10	3	11.3	R	Soap Creek	Major Planting and Obliteration	Soap
11/5/10	4	35	R	Transit	Mitigation monitoring and photopoints at South	Nautiloid
11/6/10	5	56	R	Transit	Monitoring and photopoints, Nankoweap Camps	Kwagunt
11/7/10	6	56	R	Kwagunt	Social trail obliteration, pruning, trail definition	Kwagunt
11/8/10	7	72	R	transit/photopoints, various stops	Monitoring and Photopoints, Mitigation Work	Upper Unkar
11/9/10	8	72	R	Unkar	Obliteration, Pruning, Loop Trail Work	Upper Unkar
11/10/10	9	79	L	Hance	2 in , 1 out Social trail obliteration/beach cleanup	Hance
11/11/10	10	79	L	Hance	Social trail obliteration/gully stabilization RR scout	Hance
11/12/10	11	91.7	R	Transit/Phantom Exchange	Run Hance etc, Phantom exchange, run Horn and camp	Trinity
11/13/10	12	119.8	L	Transit	Hendy out Hermit	119.8

Table 1B November 1- 20, 2010 River Trip Itinerary Continued

Date	Day	River Mile	River Side	Work Location	Project Details	Campsite Name
11/14/10	13	137	L	Owl Eyes, Deer Creek	Toilet Maintenance, Photopoints, Camp Assessments	Football
11/15/10	14	137	L	Football, OC's	Photopoints, Assessments	Ledges
11/16/10	15	174.5	R	Transit/Assessments	Photopoints, Assessments	Upper Cove
11/17/10	16	187	R	Whitmore Camp and Panel	Whitmore camp and arch panel trail clean-up	Whitmore
11/18/10	17	202	R	202 Mile	Social trail obliteration and pruning at 202	202 Mile
11/19/10	18	226	L	Transit	Transit	Diamond Creek
11/20/10	19	226	L	Takeout	early takeout; drive and derig	Home!

Trip Objectives

As a part of the Colorado River Management Plan (CRMP) Mitigation Program, the main objectives of this trip are to address the following:

- Social trails: excessive and damaging trails leading from the post dam riparian zones of camps and attraction sites to the pre dam high water zones; usually typified by damaged soil crust, gully formation, broken vegetation, and compacted soils.. The pre dam high water zone is home to fragile plants as well as biological soil crusts that are easily damaged and take many years to recover, if at all.
- Vegetation damage: usually caused by social trailing and trampling of grasses, shrubs, cactus, and biological soil crust; tree, shrub and cactus damage from campsite pioneering or illegal firewood gathering; and tree and shrub damage from unauthorized and improper pruning at campsites and attraction sites.
- Trail erosion: combination of weather or natural conditions that wear away trail features. This usually occurs when water runoff is captured within the existing trail resulting in down cutting or soil loss.

Specifically, an interdisciplinary team of Grand Canyon National Park staff and guides from Arizona River Adventures (AZRA) under the Cooperative Resource Conservation Program (CRCP) conducted various rehabilitation and maintenance projects at camps and attraction sites along the Colorado River. The major multi-day work projects for the November 2010 trip will be conducted at Soap Creek, Kwagunt, Unkar Delta, Hance Creek, Deer Creek, and 202 Mile Camps. The team will also accomplish smaller one to two hour projects at other locations, which will include completing campsite assessments for identification of impacts and project planning for future trips.

At Soap Creek Camp, the team continued to experiment with ollas (passive irrigation systems) and live plantings as they expand last year's work in the pre dam high water zone to obliterate extensive social trailing and campsite problem areas. The team's work at Kwagunt Camp included main trail delineation, social trail obliteration, and pruning. The team also delineated the interpretive loop trail at Unkar Delta and eradicated social trails in sensitive areas. The work at Hance Camp consisted of vigorous beach cleanup and social trail obliteration in the pre dam high water zone. Other work was completed at Deer Creek and 202 mile camps.

Logistics and Personnel

Table 2B: November 1- 20, 2010 River Trip Participants

Role	Division	Upper	Lower
Trip Leader	Visitor and Resource Protection	Dave Loeffler	Dave Loeffler
Boatman	VIP	Jake Skeen	Jake Skeen
Boatman/Trails Lead	Facilities Maintenance	Chris Brothers	Chris Brothers
Boatman	AZRA TL	Jeff Pomeroy	Jeff Pomeroy
Boatman	AZRA	Laura Fallon	Laura Fallon
Boatman	AZRA	Holly Gardiner	Holly Gardiner
Boatman	AZRA	Paul Giffin	Paul Giffin
Boatman	AZRA	Sommer Morris	Sommer Morris
Boatman	AZRA	Dave Edwards	Dave Edwards
Recreation Lead	Science and Resource Mgmt	Vanya Pryputniewicz	
Vegetation Lead	Science and Resource Mgmt	Kassy Theobald	Kassy Theobald
Vegetation	Science and Resource Mgmt	Jenny Kapp	Christi Sorrell
Laborer	Facilities Maintenance	Dawn Doran	Dawn Doran

The following participants hiked into the trip at a few key locations. These staff members hiked in to help as laborers and to get educated about the CRMP Mitigation Program and establishing consistent messages to the park's user groups.

Table 3B: November 1- 20, 2010 Additional Personnel

Role	Division	Name	Location
Laborer	Visitor and Resource Protection	Steve Bridgehouse	Soap Creek
Laborer	Visitor and Resource Protection	Lisa Hendy	Soap Creek
Laborer	Science and Resource Mgmt	Rosa Palarino	Soap Creek
Laborer	Science and Resource Mgmt	Hattie Oswald	Soap Creek
Laborer	Visitor and Resource Protection	Matt Slater	Hance Camp
Laborer	Visitor and Resource Protection	Elysha Iversen	Hance Camp
Laborer	Visitor and Resource Protection	Lisa Hendy	Hance Camp

Results and Observations

The following is a list of the major work completed during the course of this trip:

Soap Creek:

265 plants planted in phase II of the olla project, 12 plant species planted
 5 social trails obliterated
 100 meters of trail pruned and delineated
 3 eroded areas of trail repaired

Kwagunt:

9 trails obliterated
 2 tent pads obliterated
 1720 meters of trail pruned and delineated
 130 rocks buried as liners
 1 rock staircase built

Unkar Delta and Camp:

950 meters of trail pruned, raked, and delineated

5 trails obliterated
1 rock staircase built

Hance:

5 social trails obliterated
750 meters of trails pruned and delineated
7 backpacker campsites further delineated
Lots of human waste removed!

Cove Camps:

4 trails obliterated
170 meters of trail pruned and delineated

Whitmore:

1000 meters of trail pruned and delineated
3 social trails obliterated

202 Mile Camp:

2 trails obliterated
30 meters of trail pruned

Trash and fire rings clean up:

Jackass Camp
South Canyon Camp

Photopoint monitoring:

Soap Creek Camp
South Canyon Camp
Little Nankoweap Camp
Main Nankoweap Camp
Nankoweap Point Camp
Tanner Camp
Unkar Delta
Hance Camp
Owl Eye's Camp
202 Mile Camp

Completed assessments:

Jackass Camp
Bert's Beach
South Canyon
Little Nankoweap Camp
Main Nankoweap Camp
Nankoweap Point Camp
Tanner Backpacker's Camp
Cardenas Camp

Upper Cove Camp
Lower Cove Camp
Upper National Camp
Lower National Camp
Junebug
Owl Eye's Camp
Fern Glen Camp
Mohawk Camp

Toilet maintenance:

Tanner Backpacking Camp
Deer Creek Campground

Problems Encountered and Solutions

This trip ran very smoothly. It is a great benefit to work with the commercial guiding companies with the CRCP Program. No major problems were encountered during this trip.

Appendix C - April Monitoring Trip Report

Trip Dates: April 3-20, 2010

Trip Itinerary

Table 1C: April 3-20, 2010 River Trip Itinerary

Date	Day	River Mile	River Side	Work Location	Project Details	Campsite Name
4/3/10	Sat	5.9	R	Six Mile	2 Vegetation transects 4 Wildlife sites Recreation survey	Soap
		11.3	R	Soap Creek	2 Vegetation transects 2 Wildlife sites Recreation survey	
4/4/10	Sun	16.6	L	Hot Na Na	1 Vegetation transect 2 Wildlife sites Recreation survey	20 Mile
		18.4	L	18 Mile Wash	1 Vegetation transect 2 Wildlife sites Recreation survey	
		20.2	L	20 Mile	1 Vegetation transect 2 Wildlife sites Recreation survey	
4/5/10	Mon	30.6	R	Fence Fault	2 Vegetation transects 4 Wildlife sites Recreation survey	Nautiloid
		34.2	L	Little Redwall	1 Vegetation transect 2 Wildlife sites Recreation survey	
		35	L	Nautiloid	1 Vegetation transect 2 Wildlife sites Recreation survey	

Table 1C. Continued

Date	Day	River Mile	River Side	Work Location	Project Details	Campsite Name
4/6/10	Tue	38.7	L	Martha's Camp	1 Vegetation transect 2 Wildlife sites Recreation survey	Little Nankoweap
		47.5	R	Upper Saddle	2 Vegetation transects 6 Wildlife sites Recreation survey	
		52.1	R	Little Nankoweap	2 Vegetation transects 4 Wildlife sites Recreation survey	
4/7/10	Wed	56.5	R	Kwagunt	2 Vegetation transects 6 Wildlife sites Recreation survey	Opposite Malgosa
		58.4	L	Opposite Malgosa	2 Vegetation transects 2 Wildlife sites Recreation survey	
4/8/10	Thurs	60.2	L	60 Mile	2 Vegetation transects 2 Wildlife sites Recreation survey	Upper Unkar
		71.6	L	Cardenas	2 Vegetation transects 4 Wildlife sites Recreation survey	
		72.6	R	Unkar Delta	Mitigation work	
4/9/10	Fri	72.6	R	Unkar Delta	Mitigation work	Upper Unkar
4/10/10	Sat	75.7	L	Upper Nevills	1 Vegetation transect 4 Wildlife sites Recreation survey	Zoroaster
		76.1	L	Nevills	2 Vegetation transects 4 Wildlife sites Recreation survey	
		77.1	L	Hance	2 Vegetation transects 2 Wildlife sites Recreation survey	
4/11/10	Sun	93.8	L	Granite	1 Vegetation transect 4 Wildlife sites Recreation survey	Boucher
		97.2	L	Lower Boucher	2 Vegetation transects 2 Wildlife sites	

Date	Day	River Mile	River Side	Work Location	Project Details	Campsite Name
4/11/10	Sun	97.2	L	Lower Boucher	Recreation survey	Boucher
4/12/10	Mon	103.7	R	103 Mile	1 Vegetation transects 2 Wildlife sites Recreation survey	Ross Wheeler
		108.3	L	Ross Wheeler	1 Vegetation transect 2 Wildlife sites Recreation survey	
4/13/10	Tue	110	R	110 Mile	2 Vegetation transects 2 Wildlife sites Recreation survey	122 Mile
		122.8	R	122 Mile	2 Vegetation transects 2 Wildlife sites Recreation survey	
4/14/10	Wed	125.5	L	Fossil	2 Vegetation transects 4 Wildlife sites Recreation survey	Football
		131.7	R	Below Bedrock	1 Vegetation transect 2 Wildlife sites Recreation survey	
		136.8	L	Across Deer Creek	2 Vegetation transects 2 Wildlife sites Recreation survey	
4/15/10	Thurs	137.8	L	Backeddy	1 Vegetation transect 4 Wildlife sites Recreation survey	Matkat Hotel
		143.9	L	Above Kanab	1 Vegetation transect 4 Wildlife sites Recreation survey	
4/16/10	Fri	145.9	L	Above Olo	1 Vegetation transect 2 Wildlife sites Recreation survey	Tuckup
		150.3	R	Patch Camp	1 Vegetation transect 4 Wildlife sites Recreation survey	
		165.2	R	Tuckup	1 Vegetation transect 2 Wildlife sites Recreation survey	

Table 1C Continued

Date	Day	River Mile	River Side	Work Location	Project Details	Campsite Name
4/17/10	Sat	167.5	L	Below National	1 Vegetation transect 3 Wildlife sites Recreation survey	Lower Chevron
		167.7	L	167.7 Mile	1 Vegetation transect 4 Wildlife sites Recreation survey	
4/18/10	Sun	183	R	Lower Chevron	2 Vegetation transects 6 Wildlife sites Recreation survey	Fat City
		185.9	R	Lower 185 Mile	2 Vegetation transects 4 Wildlife sites Recreation survey	
4/19/10	Mon	192.3	L	Fat City	2 Vegetation transects 4 Wildlife sites Recreation survey	Fall Canyon
		196.9	L	Froggy Fault	1 Vegetation transect 4 Wildlife sites Recreation survey	
4/20/10	Tue	214.5		214 Mile	1 Vegetation transect 2 Wildlife sites Recreation survey	Diamond
		216.1		Opposite 3 Springs	1 Vegetation transect 2 Wildlife sites Recreation survey	
		218		217 Mile	1 Vegetation transect 2 Wildlife sites Recreation survey	

Trip Objectives

Vegetation

1. Collect vegetation and ground cover data at 61 transects at 41 camps
2. Assist with the removal of camelthorn at the Unkar Delta Pull-in
3. Assist with mitigation work at the Unkar Delta Pull-in
4. Provide an opportunity for volunteers to work with the Vegetation Program staff in the canyon
5. Provide an opportunity for education and awareness of the CRMP monitoring program
- 6.

Recreation

1. Perform assessments for human impacts at 41 campsites
2. Update trails and campable area polygons on digital images for each of the 41 campsites
3. Clarify methodology for data collection and refine protocols if necessary
4. Provide an opportunity to integrate the CRMP monitoring team with the CRMP mitigation team by completing some mitigation at Unkar Delta
5. Complete mitigation pre assessment forms at any camp currently missing from baseline as time allows

Cultural

1. Conduct site condition assessments
2. Identify and document site disturbances
3. Identify and recommend treatments for future mitigation work

Logistics and Personnel

What were the logistics associated with implementing the trip and who was involved (including table provided here). Include information regarding other agency personnel or partner groups, unusual travel logistics, helicopter use, etc.

Table 2C: April 3-20, 2010 Participant List

Role	Upper	Lower	Division
Trip Leader	Mike Harris	Mike Harris	Vis & Res Protection
Boatman	Sam Jones	Sam Jones	Vis & Res Protection
Boatman	Ariel Neill	Ariel Neill	Vis & Res Protection
Boatman	Alan Neill	Alan Neill	Vis & Res Protection
Boatman	Chelly Kearney	Chelly Kearney	Vis & Res Protection
Recreation Lead	Vanya Pryputniewicz	Vanya Pryputniewicz	Sci & Res Mgmt
Vegetation Lead	Melissa McMaster	Melissa McMaster	Sci & Res Mgmt
Wildlife Lead	Jeremy White	Jeremy White	Sci & Res Mgmt
Archeology Lead	Steven Schooler	Steven Schooler	Sci & Res Mgmt
Vegetation Technician	Steve Till	Steve Till	Sci & Res Mgmt
Vegetation Technician	Laura Dickson	Talise Dow	Sci & Res Mgmt

Vegetation Technician	Amy Prince	Amanda Kuenzi	Sci & Res Mgmt
Wildlife Technician	Mike Wolcott	Hattie Oswald	Sci & Res Mgmt
Recreation Technician	Maddie Tighe	Elysha Iversen	Sci & Res Mgmt

Results and Observations

What were the results of the trip and your observations resulting from the trip.

Vegetation

1. All 61 transects at 41 different camps were re-read. Twenty of those transects were in the old high water zone and the remaining 41 were in the new high water zone.
2. Photopoints at all 61 transects were re-taken.
3. Eight different exotic plant species were manually removed from six different camps (Table XX)

Table 3C: Total Invasive Plant Removal in Camps Along the Colorado River, April 2010

Camp	Scientific Name	Common Name	Number of Plants Pulled
6 Mile	<i>Brassica tournefortii</i>	Sahara mustard	24
Martha's	<i>Lepidium latifolium</i>	broadleaved pepperweed	64
Lower Boucher	<i>Malcolmia africana</i>	African mustard	355
	<i>Salsola tragus</i>	Russian thistle	3252
122 Mile	<i>Salsola tragus</i>	Russian thistle	500
Fat City	<i>Cannabis sativa</i>	marijuana	1
	<i>Melilotus officinalis</i>	yellow sweetclover	200
	<i>Sonchus oleraceus</i>	sowthistle	50
	<i>Xanthium strumarium</i>	rough cocklebur	500

Recreation

1. Rapid Campsite Assessment forms were completed at all 41 campsites

2. Campable area polygons and social and access trails were drawn on campsite maps at all 41 sites.
3. Refined understanding of methodology for campsite assessment parameter readings.

Cultural

1. Site condition assessments were conducted at 13 historic properties.
2. Conducted Unkar Delta rehabilitation work

Unkar Delta trail rehabilitation work

Trail work was scheduled in the hopes of minimizing further visitor impacts during the upcoming busy summer season. The CRMP crew (wildlife, archaeology, and recreation) struck a layover camp at the Upper Unkar campsite, and all hands pitched in for an intensive day of trail rehabilitation. This work was aimed at making visitor navigation of the Unkar trails easier and less impactful to the cultural and natural resources there, thereby simultaneously improving the overall visitor experience and protecting irreplaceable resources. Among the activities, a scout trail was improved and more clearly delineated along the base of Unkar Delta, near river level, that will allow river runners to easily access the river bank adjacent to Unkar Rapid. The improvement of this trail will hopefully alleviate the practice which has developed of people walking up and down the slope leading from the top of the Delta to the river at several random points. Several social trails have developed in this way, passing directly through sensitive unexcavated archaeological deposits, and creating considerable slope erosion and damage to native vegetation. Concurrent with defining the scout trail, then, these various social trails were also visually and physically obscured at their entry and exit points in an effort to deter their continued use.

In addition, the interpretation loop trail atop the Delta itself has become degraded over the last many years, with several social trails forming that spur off of the intended, official trail. In some cases these undesirable social trails had become much better defined than the official trail, along with unchecked vegetation growth that nearly obscured some portions of the trail. Some initial work had already been undertaken in November, 2009 to identify and remedy the most egregious flaws, but it was recognized that more work requiring a team of people would be required to get things back in shape. Much effort was expended on this trip to more clearly define the official trail by reinforcing liner rock in several critical locations, with particular emphasis on several junctures where unwanted but well-defined social trails had led people astray. In addition, the most visible portions of these social trails were obscured using locally collected gravel, rocks, dirt, and dead vegetative matter to reduce their visual appeal (all materials were collected in such a way as to minimize overall impact), while also trying to mimic the natural landscape as closely as possible. Most of the social trails were actually much too long to make obscuring them in their entirety practical, but by focusing on the critical junctures and the most visible portions, it's

hoped that foot traffic on them can be substantially eliminated. This should give the remaining portions a better chance to heal naturally on their own, or until further work can be undertaken as deemed necessary. Further trimming of encroaching vegetation was also conducted, not only to clear the proper path, but to make the point-to-point progress of the trail more visually discernible as it is walked. Additionally, the two crossings made by the interpretive loop trail across Unkar Creek had become vague and unclear, so these were improved with much larger cairns and guiding stones laid out upon the ground at critical spots.

More trail work will likely occur at Unkar Delta in November, 2010, including possible realignment of one particularly confusing creek crossing. Additionally, a new and updated brochure is being developed for the interpretive trail; in the interim, a site bulletin advising of the basic culture history of Unkar Delta and the work currently underway will be provided. Upon completion of the major trail rehabilitation and brochure redesign, it is hoped that only periodic, routine maintenance will be required to allow visitors to fully enjoy and appreciate this premier Grand Canyon archaeological zone in a way that protects it adequately.

Problems Encountered and Solutions

Note any problems you encountered related to field activities, how you solved (or not) those problems, and any recommendations you have for future trips.

Vegetation

1. There is continued discussion about the selection of certain camps for monitoring and the placement of the transects in some of the camps. We will continue the discussion and plan to determine whether the panel and overall protocols should be updated in 2012.
2. We need to determine whether invasive plant removal should continue to occur on these trips. With the addition of one volunteer or seasonal, this type of mitigation action could be expanded greatly on these trips.

Recreation

1. Continuing concern with the absence of a written data collection protocol for the Rapid Assessment Form. The recreation planner shall evaluate the existing data set for evidence of inconsistency in methodology and test results on future trips.
2. Continuing concern with components of the assessment forms that are very subjective, such as the numerical rating for vegetation damage based on visual observation, and the condition class rating system that contains ambiguous language and does not refer to the multi-parameter data being recorded to help establish this rating. Discussion with other recreation specialists has led to the development of a numerical scoring system, based on the findings during the assessment for various indicators. The numerical scoring system, while in need of refinement, has more sensitivity than the existing condition class system, and further

promises to provide trending and mitigation trigger threshold information that will facilitate the integration of the CRMP Monitoring and CRMP Mitigation programs.

Appendix D - May Avian Monitoring Trip Report

Trip Dates: May 17 – 30, 2010

Trip Itinerary

Table 1D: May 17-31, 2010 River Trip Itinerary

Day	Date	Work Site Name	River Mile	Camp / Control	River R/L	# of Sites	Camp	River Mile	
1	5/17/2010	Rig and drive to Lee's Ferry Float to Six Mile Camp	Mid-morning departure to Lees Ferry, finish the rig, and float to Six Mile.					Six Mile Camp	5.9
2	5/18/2010	6 Mile Camp 6 Mile Camp Soap Creek Camp Soap Creek Camp Hot Na Na Hot Na Na 18 Mile Wash 18 Mile Wash 20 Mile Camp 20 Mile Camp	5.9 6.7 11.2 11.3 16.4 16.6 18.2 18.3 19.6 20.1	Camp Control Control Camp Camp Control Control Camp Control Camp	R R R R R L L L L L	2 2 1 1 1 1 1 1 2 2	28.5	28.5	
3	5/19/2010	SWWFL Fence Fault Fence Fault Little Redwall Little Redwall Nautiloid Nautiloid Marthas Camp Marthas Camp	28.5 30.6 30.8 32.9 34.2 35 35.4 38.7 38.8	Camp Control Control Camp Camp Control Camp Control	L R R L L L L L L	1 2 2 1 1 1 1 1 1	Duck N Quack	47.5	
4	5/20/2010	Upper Saddle Upper Saddle SWWFL SWWFL Little Nankoweap Little Nankoweap SWWFL SWWFL	47.5 48.2 50.7 51.8 52.0 52.1 53.9 56.0	Camp Control Control Camp Control	R R L L R R L R	4 2 1 1 2 2 1 1	Kwagunt	56.5	

5	5/21/2010	Kwagunt	56.5	Camp	R	4	Upper Nevills	75.7
		Kwagunt	56.7	Control	R	4		
		Opposite Malgoas	57.5	Control	L	1		
		Opposite Malgoas	58.1	Camp	L	1		
		60 Mile	59.9	Control	R	1		
		60 Mile	60.1	Camp	R	1		
		SWWFL	71.6		L	1		
		Cardenas	71.4	Control	L	2		
Cardenas	71.6	Camp	L	2				
6	5/22/2010	Upper Nevills	75.1	Control	L	2	Phantom Ranch/ Granite	93.8
		Upper Nevills	75.7	Camp	L	2		
		Nevills	76.1	Camp	L	2		
		Hance	76.8	Control	L	1		
		Hance	76.1	Camp	L	1		
7	5/23/2010	Granite	93.8	Camp	L	2	122.8 Mile	122.8
		Granite	96.4	Control	L	2		
		Lower Boucher	96.9	Control	R	1		
		Lower Boucher	97.2	Camp	L	1		
		103-Mile	103.7	Camp	R	1		
		103-Mile	103.9	Control	R	1		
		Ross Wheeler	108.2	Control	L	1		
		Ross Wheeler	108.3	Camp	L	1		
		110 Mile	110	Camp	R	1		
110 Mile	110.2	Control	R	1				
8	5/24/2010	122.8 Mile Camp	122.8	Camp	R	1	June Bug/Railroad Tie	136.6
		122.8 Mile Control	123	Control	L	1		
		Fossil	125.5	Camp	L	2		
		Fossil	126.3	Control	L	2		
		Below Bedrock	131.7	Camp	R	1		
		Below Bedrock	131.9	Control	R	1		
9	5/25/2010	Across Deer Ck	136.5	Control	R	1	Matkat Hotel	148.9
		Across Deer Ck	136.8	Camp	L	1		
		SWFL Survey	137.7		R	1		
		Backeddy	137.8	Camp	L	2		
		Backeddy	139.0	Control	R	2		
		SWFL Survey	143.5		R	1		
		Above Kanab	143.4	Control	L	2		
		Above Kanab	143.9	Camp	L	2		
		Above Olo	145.5	Control	L	1		
Above Olo	145.8	Camp	L	1				

10	5/26/2010	Patch Camp	150.3	Camp	R	2	Below National	167.5
		Patch Camp	150.5	Control	R	2		
		SWFL Surveys	156.7		L			
		Tuckup	165.5	Camp	R	2		
		Tuckup	165.4	Control	R	2		
		SWFL Surveys	166.0		R			
11	5/27/2010	Below National	167.5	Camp	L	2	Fat City	192.3
		167.2	167.8	Camp	L	2		
		167.2	168.3	Control	L	2		
		Below National	168.4	Control	L	2		
		Lower Chevron	183	Camp	R	2		
		Lower Chevron	183.1	Control	R	2		
		185 Mile	185.9	Camp	R	2		
		185 Mile	186	Control	R	2		
12	5/28/2010	Fat City	192.3	Camp	L	2	214 Mile	214
		Fat City	192.6	Control	L	2		
		SWFL Surveys	193		R			
		SWFL Surveys	196		R			
		Froggy Fault	196.9	Camp	L	2		
		Froggy Fault	197.5	Control	L	2		
		SWFL Surveys	204.4		R	2+		
13	5/29/2010	214 Mile	214	Camp	L	1		
		214 Mile	215.1	Control	L	1		
		Opp 3 Springs	216.1	Camp	R	1		
		Opp 3 Springs	216.9	Control	L	1		
		Below 217 Mile	217.7	Control	L	1		
		Below 217 Mile	218	Camp	L	1		

Trip Objectives

1. Conduct avifauna point counts at all Camp and Control Sites within panels 1, 2, 6, and 7 of the CRMP Monitoring Plan.
2. Conduct SWFL surveys at historic sites, and in areas identified as suitable habitat.
3. Complete SWFL habitat surveys in previously un-surveyed patches, and develop a prioritized list of habitat patches for surveys on subsequent trips.
4. Maintain two sound recording systems deployed in April, 2010 to supplement southwestern willow flycatcher surveys.
5. Conduct Tamarisk Beetle surveys systematically along the Colorado River corridor from Lee's Ferry to Peirce Ferry.

6. Deploy HOBO samplers systematically along the Colorado River corridor in conjunction with tamarisk Beetle survey sites.

7. Conduct campsite assessments from Diamond Creek to Peirce Ferry to determine potential campsite development.

Logistics and Personnel

The National Park Service (NPS) and United States Geological Survey (USGS) participated in this monitoring trip, which was funded by the NPS (CRMP), BOR (SWFL surveys) and USGS (beetle surveys). NPS boatmen. Point count surveys and flycatcher surveys began approximately 15 minutes before sunrise and were completed before 10:00 A.M. Tamarisk beetle surveys did not have time constraint; therefore the two boats could travel on separate schedules and complete the day's work load within the appropriate time frame. We had one individual hike out at Phantom Ranch, four depart at Diamond Creek and three individuals join the trip at Diamond Creek.

Table 2D: May 17-30, 2010 Participant List

Role	Upper	Lower	Division
Trip Leader/Boatmen	Dave Loeffler	Dave Loeffler	River District
Boatmen	Nate Alvord	Nate Alvord	River District
Avifauna Crew Lead	Jeremy White	Jeremy White	S & RM
Avifauna Biologist	Rosa Palarino	Rosa Palarino	S & RM
Avifauna Technician	Emily Slayton	Emily Slayton	S & RM
Avifauna Technician	Jean Lawrence	Jean Lawrence	S & RM
Tamarisk Beetle Monitoring	Levi Jamison	[none]	USGS
Tamarisk Beetle Monitoring	Chris Holmes	Chris Holmes	USGS
Campground Assessment	[None]	Vanya Pryputniewicz (Diamond Down)	S & RM
River Permitting	[None]	Robin Martin (Diamond Down)	Concessions

Results and Observations

A total of 126 point counts were conducted from Lees Ferry to Diamond Creek, resulting in the detection of 70 species and a total of 1180 birds. Fifty-six point counts were conducted in new high water zone (NHWZ) camp areas and 52 counts in the corresponding control NHWZ sites. Ten old high water zone sites were surveyed in camp areas, and eight OHWZ sites were surveyed in control sites. Slightly more birds were detected in camp sites (n=593) than controls (n=587). Differences in number of species detected were also minor between camp sites (n=38) and controls (n= 40). Control sites averaged more birds per site (11.4 birds/point) compared to camp sites (8.9 birds/point). Lucy's Warbler was the most common species detected (n= 303) followed by House Finch (n=144), Yellow Warbler (n=86), and Common Yellowthroat (n=70).

Interestingly, detections of Canyon Wren decreased significantly from previous years. Mean detections from 2007-2009 were 149 ± 24 , and in 2010 only 46 were detected.

We had a few rare or unusual sightings during the trip. A male Rose Breasted Grosbeak was detected in a Honey Mesquite patch at Lower Chevron Camp. Rose-breasted Grosbeaks are considered “irregular” in Grand Canyon. We detected a pair of adult Loggerhead Shrikes, and two juveniles at the control site for Fossil Camp, located near a spring at river mile 126.3 L. Loggerhead Shrikes are considered “uncommon” in Grand Canyon. This is the second year a shrike has been detected at this location. Finally, a Brown Crested Flycatcher was detected (not on a point count survey) at the control site for Froggy Fault camp, located at river mile 197.5 L. Brown-crested flycatchers are considered “uncommon” in Grand Canyon riparian habitats.

A total of 19 sites were surveyed for southwestern willow flycatcher presence; five historical sites and one new site between Lee’s Ferry and Phantom Ranch, and four historical and nine new sites between Phantom Ranch and Pearce Ferry. Completing river trips at Pearce Ferry instead of Diamond Creek allowed for six additional sites to be surveyed. Four southwestern willow flycatchers were detected during the trip. One singing male was detected at river mile 28.5 L, one singing male at 196.3 R, and a pair of singing and calling flycatchers were detected at river mile 218 L. The pair at 218 represents a new territory for southwestern willow flycatchers, while the other detections were within historic detection areas. Habitat assessments were conducted at 15 sites from Lee’s Ferry to Peirce Ferry. From these assessments three sites were classified as suitable habitat, and four additional sites classified as potential habitat. These classifications will help to prioritize survey efforts on future monitoring trips.

To capture southwestern willow flycatcher vocalizations we used two systems provided by the Grand Canyon National Park Soundscape Monitoring Program. These units provide continuous decibel level and audio data. These systems consisted of Larson-Davis 831 Sound Level Meters (Larson Davis, Gold Canyon, AZ, USA) to monitor sound pressure levels, Edirol R-09 (Roland Corporation, Los Angeles, CA, USA) to record Mp3 data, and were powered by a solar charged lithium ion battery (Figure 6). These units were initially deployed in April, 2010, and maintained during this May trip. The soundscape monitoring systems were placed at river miles 50.4 and 194 in April and retrieved in July, approximately 3.5 months later. The unit at river mile 50.4 collected 1,278 hrs of data while the remaining unit failed following 5 hrs of recording.

Problems Encountered and Solutions

- We had issues with one sound system at river mile 194 which only recorded 5 hours of data. This issue was traced back to a bad connection between the solar panel and battery leaving the system with no re-charges capabilities. Although the systems were set up and tested prior to deployment they were not run for any length of time. Prior to future deployment each system should be set up and run for at least 24 hours to ensure proper connections.

Appendix E - September Monitoring Trip Report

Trip Dates: September 4-20, 2011

Trip Itinerary

Table 1E: September 4-20, 2010 River Trip Itinerary

Date	Day	River Mile	River Side	Work Location	Project Details	Campsite Name
9/4/10	Sat	5.9	R	Six Mile	2 Vegetation transects Recreation survey	8.4 Mile
		8.8	L	8.5 Mile	2 Vegetation transects Recreation survey	
9/5/10	Sun	11.3	R	Soap Creek	2 Vegetation transects Recreation survey	22 Mile
		18.4	L	18 Mile Wash	1 Vegetation transect Recreation survey	
		20.2	L	20 Mile	1 Vegetation transect Recreation survey	
9/6/10	Mon	30.4	L	30 Mile	1 Vegetation transect Recreation survey	Above Martha's
		30.6	R	Fence Fault	2 Vegetation transects Recreation survey	
		34.2	L	Little Redwall	1 Vegetation transect Recreation survey	
		35	L	Nautiloid	Sweep for Beetles	
9/7/10	Tue	38.7	L	Martha's Camp	1 Vegetation transect Recreation survey	Little Nankoweap
		47.5	R	Upper Saddle	2 Vegetation transects Recreation survey	
		50.4	R	Dinosaur	Sweep for beetles	
		52.1	R	Little Nankoweap	2 Vegetation transects Recreation survey	
9/8/10	Wed	56.5	R	Kwagunt	Sweep for beetles	Carbon
		58.1	L	Opposite Malgosa	2 Vegetation transects Recreation survey	
		60.2	L	60 Mile	2 Vegetation transects Recreation survey	

Table 1E: River Trip Itinerary Continued

Date	Day	River Mile	River Side	Work Location	Project Details	Campsite Name
9/9/10	Thurs	70.1	R	Basalt	2 Vegetation transects Recreation survey	Upper Nevills
		71.6	L	Cardenas	2 Vegetation transects Recreation survey	
9/10/10	Fri	75.7	L	Upper Nevills	1 Vegetation transect Recreation survey	Cremation
		77.1	L	Hance	2 Vegetation transects Recreation survey	
9/11//10	Sat	93.8	L	Granite	1 Vegetation transect Recreation survey	Boucher
		97.1	L	Upper Boucher	2 Vegetation transects Recreation survey	
9/12/10	Sun	97.2	L	Boucher	2 Vegetation transects Recreation survey	110 Mile
		108.3	L	Ross Wheeler	1 Vegetation transect Recreation survey	
		110	R	110 Mile	2 Vegetation transects Recreation survey	
9/13/10	Mon	122.3	L	122.3 Mile	1 Vegetation transect Recreation survey	122 Mile
		122.8	R	122 Mile	2 Vegetation transects Recreation survey	
9/14/10	Tue	131.7	R	Below Bedrock	1 Vegetation transect Recreation survey	Football
		132.4	R	Stone	Sweep for beetles	
		136.8	L	Across Deer Creek	2 Vegetation transects Recreation survey	
		137.7	L	Football Field	2 Vegetation transects Recreation survey	
9/15/10	Wed	137.8	L	Backeddy	1 Vegetation transect Recreation survey	Ledges
		145.9	L	Above Olo	1 Vegetation transect Recreation survey	
		150.3	R	Patch Camp	1 Vegetation transect Recreation survey	

Table 1E: River Trip Itinerary Continued

Date	Day	River Mile	River Side	Work Location	Project Details	Campsite Name
9/16/10	Thurs	161.3	R	161.3 Mile	1 Vegetation transect Recreation survey	Below National
		165.2	R	Tuckup	1 Vegetation transect Recreation survey	
		167.5	L	Below National	1 Vegetation transect Recreation survey	
9/17/10	Fri	180	L	Lava Rapid	Sweep for beetles	Upper 185
		183	R	Lower Chevron	2 Vegetation transects Recreation survey	
9/18/10	Sat	185.8	R	Upper 185 Mile	2 Vegetation transects Recreation survey	Fat City
		185.9	R	Lower 185 Mile	2 Vegetation transects Recreation survey	
9/19/10	Sun	192.3	L	Fat City	2 Vegetation transects Recreation survey	Indian Canyon
		196.9	L	Froggy Fault	2 Vegetation transects Recreation survey	
9/20/10	Mon	214.5	R	214 Mile	1 Vegetation transect Recreation survey	Diamond
		216.1	R	Opposite 3 Spring	Sweep for beetles 1 Vegetation transect	
		218	L	217 Mile	Recreation survey	

Trip Objectives

State the objectives and goals for the trip.

Vegetation

1. Collect vegetation and substrate data at all 62 transects located at 40 different camps
2. Re-take all photopoints at those 62 transects
3. Sweep for tamarisk beetles as often as possible, aiming for every mile along the river corridor
4. Stop at all previously recorded Ravenna grass and Russian olive sites and either confirm absence, remove plants or note the location for treatment in October of 2010.
5. Provide an opportunity for volunteers to work with the vegetation program in the canyon
6. Promote and enhance our relationship with the river community

Recreation

1. Perform assessments for human impacts at 40 campsites
2. Update trails and campable area polygons on digital images for each of the 40 campsites
3. Refine methodology for completion of the Rapid Campsite Assessment forms in preparation for protocol review and rewrite and data analysis.
4. Complete mitigation pre assessment forms at any camp currently missing from baseline as time allows
5. Provide an opportunity for developing small craft operator to row a full trip.

Logistics and Personnel

Table 2E: September 4-20, 2010 Participant List

Role	Upper	Lower	Division
Trip Leader	Mike Harris	Mike Harris	Vis & Res Protection
Boatman	Sam Jones	Sam Jones	Vis & Res Protection
Boatman	Jake Blackwell	Jake Blackwell	Vis & Res Protection
Boatman	Chelly Kearney	Chelly Kearney	Vis & Res Protection
Boatman/Recreation Lead	Vanya Pryputniewicz	Vanya Pryputniewicz	Sci & Res Mgmt
Vegetation Lead	Melissa McMaster	Melissa McMaster	Sci & Res Mgmt
Vegetation Technician	Steve Till	Steve Till	Sci & Res Mgmt

Vegetation Technician	Kate Watters	Rich Crawford	Sci & Res Mgmt
Vegetation Technician	Amy Prince	Gisela Kluwin	Sci & Res Mgmt

Table 2E Continued

Role	Upper	Lower	Division
Vegetation Technician	Lori Makarick	Brooks Hart	Sci & Res Mgmt
Vegetation Technician	Matt Jenkins	Christine Stirling	Sci & Res Mgmt
Recreation Technicain	Linda Jalbert	Jennifer Jones	Sci & Res Mgmt

Results and Observations

Vegetation

1. All 62 transects were read at 40 camps, with 22 transects in the OHWZ and the remaining 40 in the NHWZ.
2. We removed 261 Ravenna grass (*Saccharum ravennae*) plants.
3. We sampled for tamarisk leaf beetles as frequently as possible. Beetles were found from Lees Ferry to river mile 28.5, around Kanab Canyon and then again between river mile 164 (Tuckup) and 175 (Cove). There was evidence of the beetle from river mile 130 (Bedrock canyon) all the way to Kanab Canyon but no beetles were found. We also noted defoliation in a large patch of tamarisk on river left at the bottom of Lava Rapid, but no beetles were present.

Recreation

1. Rapid Campsite Assessment forms were completed at 40 campsites
2. Campable area polygons and trails were redrawn on campsite maps for all 40 campsites
3. Training boatman completed trip without incident or injury

Problems Encountered and Solutions

Note any problems your encountered related to field activities, how you solved (or not) those problems, and any recommendations you have for future trips.

Vegetation

1. There are three camps in this panel rotation that are not really camps anymore: 122 on the left, 161.3 on the right and the Below Lower National camp. We discussed the value of keeping these camps in the rotation, but perhaps adding more camps in addition. This is still unresolved but we are working towards a solution.
2. We noted that there were some camps where OHWZ transects were never installed (due to a lack of time) although there is space and it would be possible. We need to revisit this site on the next trip and install new OHWZ transects.

3. We stopped at Matkatamiba Canyon to collect a plants for Jan Busco to grow out in the herbarium and there was a commercial trip that came behind us with 2 big motor boats and wanted to pull in but could not because we were there. They were a little perturbed that an NPS trip was pulled in the mouth of this canyon and let it be known. We attempted to explain what we were doing, but without success. While we did provide the rangers at Lees Ferry with our itinerary, it may be prudent to send a short letter and itinerary to the outfitters directly to make them aware of our purpose and needs to hopefully avoid conflict in the future.

Recreation

1. The protocols for the Rapid Assessment form need to be written retroactively to cover the data that has been collected to this point.
2. After the data has been analyzed., it may be prudent to eliminate or combine some of the indicators and clarify the methodology for the future of the campsite monitoring program.
3. Create a pilot form and protocol to test in the interim between this and the next monitoring trip.

Appendix F – Archeological Monitoring Trip Report

Trip Dates: February 10 – 27, 2010

Trip Itinerary

Table 1F: February 10- 27, 2010 River Trip Itinerary

Date	Checkdam Crew	Condition Assessment Crew	Survey Crew	Camp	Details of Day
2/10/2011	1 site		1 site	North Canyon	All boats together Checkdam Monitoring and Transit
11-Feb	Transit	Transit	Transit	Buckfarm?	All boats together, hydro
2/12/2011	2 sites	15 sites	Complete CA work on Nankoweap Delta	Little Nanko	All boats @ Little Nankoweap Hydro, 1 new Checkdam assessment, Checkdam Monitoring, Condition Assessments on the Nankoweap Delta, Survey Trail/Route
2/13/2011	Transit to Camp	Complete CA work & Polygons on Kwagunt Delta 5 sites	Temple Butte Route, CA for C:09:0139	Kwagunt	All boats straight to Kwagunt Hydro, Condition Assessments on Kwagunt Delta, Ceramic analysis at Kwagunt Village
2/14/2011	7 sites	Checkdam assist 2 MNA sites	Beamer Trail to Palisades stroll for CAs 4 sites	Palisades	3 boats for checkdams, 2 boats straight to LCR for Beamer Condition Assessments Possible 3 sites up Lava Chuar for Cas, hydro
2/15/2011	7 sites	6 sites	4 MNA sites	Upper Unkar	1 boat Tanner condition assessments 1 boat other condition assessments 3 boats checkdam, hydro
2/16/2011	Unkar Creek Checkdam installation assessment	Ground Truth polygons Unkar Delta	unkar creek sites Record rock art up Unkar creek	Upper Unkar	All at Unkar Delta
2/17/2011	2 sites	Complete Unkar Delta CA and Polygons	2 sites	Nevills	2 boats to 75 mile for checkdams 2 boats at Unkar to complete unfinished work. 1 boat to monitor
2/18/2011	Transit	1 site	Transit	Parkins Insc	All boats together, hydro
2/19/2011					
2/20/2011	Assist fish			Parkins Inscr	All boats together
		17 sites	CA assist to Bass Camp		
2/21/2011	3 sites plus 1 MNA site	7 sites	Stone Creek Sites CAs Profile of roaster	Talking Heads	2 boats for checkdam monitoring and assessment 3 boats for condition assessments. Profile at Stone?
2/22/2011	CA along river 2Archs Deer Creek up canyon	CA Tapeats Creek to Deer Segments	CA Surprise Valley to Deer Creek	Opposite Deer Creek or Below	1 boat stays until noon at Tapeats Creek, 1 boat completes checkdam assessment along the river, 1 boat completes river condition assessments, 2 boats to Deer Creek to hike up.

Date	Checkdam Crew	Condition Assessment Crew	Survey Crew	Camp	Details of Day
2/23/2011	1 site	5 sites		National area	1 boat for checkdam assessment, 1 boat at backeddy camps, 3 boats for remaining condition assessments
2/24/2011	5 sites			190 Mile	All boats for checkdam assessments and monitoring
2/25/2011	6 sites	2 sites	survey	Above Arroyo Grande	1 boat for survey, 1 boat for condition assessments, 3 boats for checkdam monitoring and assessments.
2/26/2011	7 sites	1 site	checkdam assist	Granite Park	1 boat for condition assessments, 4 boats for checkdam monitoring and assessments
27-Feb	complete Granite Park sites	6 sites	complete Granite Park sites	Below Granite Park	All boats together at Granite Park
2/28/2011	2 sites	3 sites	2 sites	Above Diamond Creek	2 boats for checkdam monitoring, 1 boat for condition assesments, 2 boats for float

Trip Objectives

Archeologists from Grand Canyon National Park's Division of Science and Resource Management and the Museum of Northern Arizona (MNA) visited 107 archeological sites to assess their condition. Monitoring archeological sites is necessary to determine if the sites have been impacted by erosion due to sediment depletion in the Colorado River system from the operation of Glen Canyon Dam and by visitation by river runners and hikers. Most of the sites were in good condition having only minor impacts from erosion and/or visitation. The crew also monitored sites that were excavated by MNA and the NPS in a joint project between 2007 and 2009 to determine whether or not backfilling and rehabilitation of the excavation units was successful. The project assessed erosion control features called check dams at 29 sites that have been impacted by significant erosion. Participants also improved documentation of a number of sites. Steve Rice investigated seeps and springs adjacent to archaeological sites, and Brian Healy joined the trip at Phantom, worked at Shinumo with Steven Rice and Christopher Tressler, and hiked out at Havasu Creek.

Logistics and Personnel

Table 2F: February 10-27, 2010 Participant List

Role	Upper	Lower	Division
Trip Leader	Mark Piller	Mark Piller	Vis & Res Protection
Boatman	Sarah Klinger	Sarah Klinger	Vis & Res Protection
Boatman	Ariel Neil	Ariel Neil	Vis & Res Protection
Boatman	Al Neil	Al Neil	Vis & Res Protection
Boatman	Clint Kalan	Clint Kalan	Vis & Res Protection
Cultural Lead	Jen Dierker	Jen Dierker	Sci & Res Mgmt
Cultural	Charlie Webber	Charlie Webber	Sci & Res Mgmt
Cultural	Shelley Szeghi	Shelley Szeghi	Sci & Res Mgmt
Cultural	Ian Hough		Sci & Res Mgmt
Cultural	Steven Schooler		Sci & Res Mgmt
Check Dam Volunteer	Christopher Tressler	Christopher T.	Sci & Res Mgmt
SRM	Jane Rodgers	Jane Rodgers	Sci & Res Mgmt
Hydro	Steve Rice	Steve Rice	Sci & Res Mgmt
SRM	Jane Rodgers	Jane Rodgers	Sci & Res Mgmt
Fish		Brian Healy	Sci & res Mgmt

Results and Observations

Site Condition assessments were conducted at 107 sites. The 9 sites excavated during the NPS/MNA were visited to determine if the mitigations were successful, only the Blacktail site seems to have any signs of erosion.

There are 29 river corridor sites with check dams installed. Maintenance work was required at three structures and the crew constructed one new check dam. , there was no maintenance work required.

Two full days were spent at Unkar Delta documenting the appropriateness of current monitoring protocols and collecting GIS spatial data for site boundary documentation. The management of the delta has been under a single site number with different subsites, we designated 22 unique sites to more effectively manage visitation and erosional impacts.

A smaller group from the trip hiked the Surprise Valley. This group was able to relocate two sites that had been documented via helicopter in 1996 and not been found since.

Problems Encountered and Solutions

No technical difficulties or problems were encountered. The group was able to accomplish the goals of the trip.

