2000 Summary Report: Archaeological Site Monitoring and Management Along the Colorado River Corridor in Grand Canyon National Park

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Grand Canyon National Park

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CHAPTER 1

INTRODUCTION

The River Corridor Monitoring Project (RCMP) is a joint program between the Grand Canyon National Park and Northern Arizona University (CA 8210-97-002). This report is a requirement of the Programmatic Agreement on Cultural Resources (1994) for National Register eligible archaeological sites affected by Glen Canyon Dam operations.

In FY2000 two archaeological river monitoring trips were completed. The river trips consisted of two, 16 day rowboat trips. Trip dates were April 15 – 30 and May 14 – 29, 2000. Sites listed on the semiannual or annual schedule (37 sites were monitored), maintenance was completed (as needed) at sites with checkdams (29 sites), and medium format photographs were taken at selected sites (7 sites). Trip participants included: Tim Stephensen, Boatman; J. P. Running, Boatman; Brian Dierker, Boatman; Dan Hall, Boatman; Lisa Gelczis, Boatman; Tyler Williams, Boatman; Lisa Whisnant, Boatman/archaeologist; Andres Cheama, Zuni Conservation Projects; Gabriel Yuselew, Zuni Conservation Projects; Lisa Leap, NPS RCMP Archaeologist; Jennifer Kunde, NPS RCMP Archaeologist; Adam Berg, NAU Archaeologist, Duane Hubbard, NAU Archaeologist; Andrea Miller, NAU Archaeologist; Eric Whiteman, Archaeologist/surveyor; Jennifer Burns NAU Archaeologist. Contrasting to previous years, no Programmatic Agreement representatives accompanied the trips.

The beginning of the fiscal year was spent completing the FY1999 synthesis report that was finalized in January. In February and March staff members prepared for the Protocol Evaluation Panel review by compiling hundreds of site records, photographs and monitoring forms for panel review, and attending a river trip. By May NAU staff members were no longer on this project and data entry, and photograph development and entry were completed by the two NPS staff members. Due to the lack of staffing, this year's annual report was delayed.

Monitoring of the 37 archaeological sites in April and May revealed 31 sites with physical impacts and 12 sites with visitor related impacts. Nine sites had both visitor-related and physical impacts.

Zuni personnel from the Zuni Conservation Projects office accompanied the April archaeological river corridor monitoring trip to conduct checkdam maintenance. All 29 sites with checkdams were visited and work was completed at 15 sites. Of the 294 checkdams built in the past five years as a result of the PA archaeological treatment program, 14% (42 checkdams) had maintenance performed and only nine new checkdams were constructed. Most of the work was completed on river-based drainages (14 sites).

Seven newly exposed features were uncovered at five sites. Some of these newly exposed features will enhance the understanding of cultural affiliation or function of the sites. Several other new features have the potential to provide additional information through carbon dating. Since the beginning of the monitoring program in 1992 more than 98 newly exposed features or diagnostic artifacts have been discovered at 61 sites and two newly recorded sites have been recorded.

Medium format photography continued this year at seven locations. These photographs have allowed for visually documenting changes in sediment distribution prior to the experimental flow of 45,000 cfs in 1996. The photographs demonstrate a slow, yet steady depletion in sediment on or proximal to archaeological sites. In FY2001 this technique of documenting change will be evaluated and compared to other photographic methods to determine if medium format photography is a valuable method for not only documenting change over time but for quantifying the observations.

February 2000 marked the first of a series of 12 Colorado River Fund (CRF) river trips planned for the next four years. CRF trips have been conducted the past eight years in coordination with NPS wilderness coordinators. The purpose of these trips is to focus on the rehabilitation of trails and beaches through the efforts of volunteers from the river-running community and the NPS. The program is designed to address visitor-related impacts, resource protection, and conservation priorities directly related to the impacts of river trip participants. This February, RCMP staff members accompanied the CRF trip and visited 32 sites with visitor-related impacts. Consultation with the CRF participants allowed for preservation assessments for future trips, and at some locations, work was completed. All information gathered during the trip was entered into the RCMP database in Flagstaff.

Project staff members participated in professional and public outreach events during FY2000. A paper was presented in Philadelphia at the 65th annual Society for American Archaeology meetings. A paper was also presented at the annual Guides Training Seminar, Marble Canyon, Arizona. Additionally, staff personnel were present at the 2000 Arizona Archaeology Expo in Phoenix, Arizona to answer questions with reference to the cultural history along the Colorado River corridor.

The work plan for FY2001 will include the monitoring of 38 sites listed on the semiannual and annual schedule, monitoring and maintenance on the 29 sites with checkdams, and additional medium format photography at selected sites. Assistance will be provided to initiate the PEP recommendations listed as priorities for this fiscal year (initiation of an Historic Preservation Plan, a Database Plan and Research Design and assistance with GIS information). RCMP staff will also oversee two projects contracted out to NAU research specialist ("Photographic techniques used to determine geomorphological processes proximal to cultural sites" and "Archiving archaeological photographs on CDROM for long-term monitoring, research, and education").

CHAPTER 2

CRF RIVER TRIP ASSESSMENTS

In addition to the BOR's NHPA Section 106 responsibilities for dam operations the NPS has Section 110 responsibilities mandating Grand Canyon National Park to adopt a preservation program and manage Register eligible properties to ensure preservation and value of the identified properties. One method of managing and preserving properties along the river corridor has been to combine archaeologists, trail rehabilitation, and revegetation crews to identify areas of concern, methods of preservation, and the manpower to complete objectives as efficiently as possible. Colorado River Fund (CRF) river trips are one such method.

All information gathered during CRF activities are entered into the RCMP database in Flagstaff, AZ. The monitoring information identifies the locations where the NPS is required to implement preservation work. Because the river corridor sites are known to many PA members, this information has been provided in the RCMP annual report. The BOR has not funded any part of the CRF program.

Over the course of the last eight years, Colorado River Fund (CRF) river trips have been conducted in conjunction with Kim Crumbo, NPS Wilderness Coordinator. These trips focussed mainly on the rehabilitation of trails and beaches through the efforts of a group of volunteers from the river-running community and the NPS. In FY2000, format and funding of CRF trips allowed for long-term planning for additional CRF trips and paid participants. February, 2000 marked the first of a series of 12 CRF trips planned for the next four years. The project statement of the CRF addresses mitigation on visitor-related impacts, resource protection and conservation projects within the Colorado River corridor. The focus of each trip is to be determined by NPS personnel on a trip by trip basis.

The purpose of this CRF river trip was to identify present and future areas of concern for the NPS Backcountry Archaeology, River Corridor Archaeology, Revegetation and Rehabilitation crews and initiate projects that could be completed jointly by the CRF participants and NPS. The River Corridor Monitoring Project (RCMP) has identified several locations where NPS project managers have aided in management of visitor-related impacts through the completion of trail obliteration, retrailing and the planting of vegetation to stabilize problem areas. The intent of participation by the RCMP on the CRF trip was to identify areas where the NPS should monitor visitor-related impacts and for other NPS staff to consult with RCMP staff on methods for increasing archaeological site stability in previously identified areas.

The consultation conducted with the CRF participants was invaluable. Members of the river-running community provided information on schedules, camp locales and attraction sites critical to understanding areas that should be prioritized for work and those areas that may require additional work. The collaboration between NPS and professional river guides is necessary and ideal for carrying out such work.

In all, 32 sites were visited with work completed, recommended or identified for potential future CRF trips. The following report describes the 32 sites identified by the RCMP as requiring additional work by the NPS. GRCA assessments follow each site description. Maps included of the work areas are stored at NAU with copies at the S. Rim. Table 1 lists the sites assessed and the work action completed or identified for future work. Table 2 lists the sites that were not assessed on this trip.

Table 1. River corridor sites and the work recommended or completed on the CRF river trip.

Site Number	Work Type
A:15:005	No work performed. Recommend trail maintenance and revegetation in November 2000.
A:16:151	No work performed, trails are recovering.
A:16:163	No work performed, no trails observed.
B:09:317	No work performed. Recommend consultation with Hualapai regarding future trail obliteration work.
B:11:272	No work performed, trail is recovering.
B:14:105	No work performed. Recommend collecting grass seed in March 2000 and planting grass/obliterating on-site trails in November 2000.
B:15:138	No work performed. Data recovery recommended for Features 1 and 2. Recommend trail maintenance and revegetation until data recovery is performed.
B:16:003	No work performed. Consultation with tribes regarding access to site before trail obliteration is performed.
C:02:097	No work completed.
C:02:098	Identified area to be treated with vegetation on future CRF trip.
C:06:006	Trail obliteration completed.
C:09:030	No work necessary.
C:09:031	No work necessary.
C:09:034	No work necessary.
C:09:051	No work necessary.
C:13:005	Partial trail obliteration was completed.
C:13:006	Identified grass species to seed and transplant on-site.
C:13:069	No work necessary.
C:13:098	Consider constructing a formal trail.
C:13:099	Consider developing a loop trail to deter visitation.
C:13:100	Consider developing a loop trail to deter visitation.
C:13:273	Identified potential preservation options.
C:13:291	Identified grass species to transplant on-site.
C:13:327	No work necessary.
C:13:339	Identified potential preservation options.
C:13:340	No work necessary.
G:03:003	No work performed. Recommend 2 to 3 day trail obliteration and revegetation project on the November 2000 trip. Hualapai tribe will be consulted regarding future work.
G:03:026	No work performed. Recommend 2 to 3 day trail obliteration and revegetation project on the November 2000 trip. Hualapai tribe will be consulted regarding future work.
G:03:028	No work performed. Recommend 2 to 3 day trail obliteration and revegetation project on the November 2000 trip. Hualapai tribe will be consulted regarding future work.
G:03:052	No work performed. Recommend planting small grass plugs and seed on the November 2000 trip.
G:03:067	On-site trail obliteration and trail maintenance performed. Recommend maintenance on the November 2000.
G:03:077	No work performed. Established trail is in good condition.

Table 2. River corridor sites not assessed on the CRF river trip.

Site Number	Work necessary
A:16:160	Not assessed, time constraints. Visit on November 2000 trip.
C:13:007	Not assessed, however, revegetation work has been destroyed.
C:13:272	Not assessed, consider trail re-routing.
C:13:336	Not assessed, consider trail re-routing.
C:13:362	Not assessed, trail obliteration should be monitored.
G:03:049	Not assessed, time constraints. Visit on November 2000 trip.
G:03:080	Not assessed, recommend consultation with Hualapai tribe.

A:15:005 Structure-Thermal Feature Complex
Annual Schedule

Three loci define this site. Locus A consists of hematite pictographs on fallen, angular, limestone boulders. Locus B contains two expedient single-coursed walls against a cliff base with lithics and groundstone. Charcoal concentrations are also identifiable on the surface. Locus C contains two roasting features and sparsely scattered artifacts. Artifacts include flakes, charcoal, groundstone and several brown ward sherds. This site may be associated with late prehistoric-early historic Pai or Paiute use.

Previous Work

R. Euler originally recorded the site in 1984. The site was re-recorded by NPS personnel in 1991 (Fairley, et al. 1994), and monitored by RCMP staff in FY93, FY95, FY96, FY97, FY98, and FY99 (Coder, et al. 1994b, Coder, et al. 1995b, Kunde 1998a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY97 GCMRC personnel completed a total station map of Locus C and trail work was conducted by GRCA. GRCA continues minor maintenance on an as needed basis by GRCA (Leap, et al. 1997a). The hematite elements were photographed with a medium format camera in FY97. The Southern Paiute Consortium visited this location to conduct ethnographic interviews regarding the pictograph panel. In FY99, the Zuni Conservation Projects personnel assessed the site for checkdam work. Upon assessment, five checkdams were installed in an active gully near Feature 1 (Kunde 1999a). This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). In FY93 it was noted that human trailing developed as a byproduct of visiting the pictograph panel (Locus A), thus creating the potential to degrade the cultural materials located at Loci B and C. The monitors speculated that visitation to the pictographs would be difficult to curtail, and as a result, a designated Park trail was created. More cairns were placed along the trail to eliminate multiple trailing. Trails continued to develop and deepen, showing signs of gullying by 1997. Annual maintenance of the trails by the GRCA has occurred since 1997.

GRCA Assessment

The trail work performed at this site in October 1999 appears unchanged. The trail work has been maintained several times over the last few years. The GRCA Revegetation crew proposes planting cactus in the trail to curtail long-term visitation to the site in November 2000. There are several large clumps of prickly pear in the area that could be procured for this project. After the pads are cut, they should be planted sideways in the ground, facing the sun. This technique will ensure the growth of the cactus. This site is mentioned in Tom Martin's newly published guidebook, and a new trail could develop due his description of how to access the large roaster at Locus B. Another possible suggestion to keep people away from Locus B includes placing large cairns inside the drainage, which would direct people up the side canyon.

Revegetation and trail obliteration work at this site should take place on the upcoming Fall 2000 CRF trip. The work will take an estimated one or two hours, and an RCMP archaeologist should be on-site during the project.

A:16:151 Roasting Feature
Five-year Schedule

This site consists of two loci that may reflect a late prehistoric-early historic Pai occupation with later historic (late 19th Century) use. Locus A contains several features. Feature 1 is a large roasting feature and its associated discard

pile, ash midden, and debris, plus a ground cobble. Feature 2 is a very highly deflated and much smaller fire feature. Between Features 1 and 2 are a lithic debitage concentration, a ground slick, a Pai sherd, and a battering device. A worked piece of brass horsetack and a soldered, reclosable can lid were also associated with Feature 1. Locus B, on the downstream side of the canyon mouth, consists of several lithics, a single Pai sherd, and a charcoal-rich midden associated with a shallow overhang.

Previous Work

Archaeologists originally recorded the site in 1990 (Fairley, et al. 1994). The RCMP monitored the site semiannually in FY93 and FY94 (Coder, et al. 1994b, Coder, et al. 1995a). In FY95, the RCMP changed the monitoring schedule to every three to five years and the site was monitored last in FY98 (Coder, et al. 1995b, Leap, et al. 1998d). FY94 monitors recommended trail obliteration work, which RCMP staff completed in FY97 (Leap, et al. 1997a). The completed obliteration work is monitored by GRCA Rehabilitation and Revegetation crews.

GRCA Assessment

The trail work at this site is in good condition. Grasses are beginning to grow in the obliterated trails on-site. It does not appear that people have recently visited the area and no work was necessary.

A:16:160 Roasting Feature
Five-year Schedule

This site consists of a cluster of six fire features and an artifact concentration including lithics, charcoal, bone, a mano and slab metate. The site is located on an alluvial terrace adjacent to a major side canyon drainage. Thick vegetation covers the site deterring erosional processes and human visitation.

Previous Work

The site was originally recorded in 1990 (Fairley, et al. 1994) and monitored in FY94 and FY98 (Coder, et al. 1995a, Leap, et al. 1998d). Trail obliteration work was completed in FY96 by GRCA. Continued trail work has been recommended with transplanting of vegetation to keep day-hikers off the site.

GRCA Assessments

The site was not visited due to bad weather conditions and time constraints.

A:16:163 Small Structure
Five-year Schedule

A:16:163 is a large multi-component site with five separate loci. Locus A is located along the base of a Bright Angel Shale cliff and contains several structural elements and pictographs. Locus B consists solely of pictographs along a rock overhang. Locus C is a lithic scatter. Loci D and E are both rock-outlined structures. The rock structure at Locus E is modern, according to the FY98 RCMP monitors. The "supposed" structure rocks look recently moved, unlike other rocks which have been cemented in cryptogamic soils. Together, these five loci combine to form a habitation and activity area along a major side canyon drainage. Virgin Puebloan and Pai/Paiute occupation is suggested by the artifact assemblage of flakes, sherds, bifacial tools, and groundstone.

Previous Work

The site was originally recorded in 1990 (Fairley, et al. 1994) and monitored in FY94 and FY98 (Coder, et al. 1995a, Leap, et al. 1998d). Medium format photographs were taken of Locus B in FY97 (Leap 1997b). The GRCA Revegetation crew maintains the trail work in the area.

GRCA Assessment

Trails lead upstream from the camp to the lower extent of the site. No on-site trails were observed. No work is recommended at this location.

B:09:317 Roasting Feature
Biennial Schedule

This site consists of two loci. Locus A is located on the upstream side of a major side canyon drainage overlooking the river and includes a large roasting pit with flakes and a complete projectile point. Locus B, located downstream of the drainage, is a thermal feature at the base of a Muav Limestone cliff. Cultural affiliation is Pai/Paiute. This site is significant to the Hualapai as it is associated with individuals who have living descendants at Peach Springs today.

Previous Work

J. Balsom originally recorded the site in 1986, and it was re-recorded by NPS personnel in 1990. The site has been monitored in FY93, FY94, FY95, FY96, and FY98 (Coder, et al. 1994b) (Coder, et al. 1995a) (Coder, et al. 1995b) (Leap, et al. 1996b) (Leap, et al. 1998d). Trail work was completed in FY97 and has successfully deterred visitation. Visitation continued to be the main concern of monitors with artifact movement, trailing, collection piles, and littering observed. One visitor had unearthed a perfectly preserved pair of bent twig prickly pear tongs and left them on the surface. The tongs were subsequently collected by RCMP archaeologists.

GRCA Assessment

The Hualapai have visited this site during their annual monitoring trips, however impacts are minimal. The Hualapai will be consulted regarding the management options for this site. If the Hualapai continue to visit this site then the GRCA will have to reevaluate the trail obliteration and trail maintenance efforts at this site.

B:11:272 Roasting Feature
Biennial Schedule

This site consists of a single, isolated roasting feature with no associated artifacts. The feature is situated on a diabase bench with a veneer of eolian sand overlooking the river. Surface runoff, gullying and active arroyo development exist on 50% of the site. Two distinct trails pass through the site due to the proximity of and the popularity of the camp at Dubendorf Rapid and the traditional hiking by boaters at Stone and Galloway Canyons.

Previous Work

This site was initially recorded in February 1991 (Fairley, et al. 1994) and monitored at least annually from FY92 through FY96 and once in FY98 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a, Leap, et al. 1996b, Leap, et al. 1998d). NPS personnel obliterated the trail west of the roasting feature in February 1995 and this has proven to be very effective. Detailed total station mapping was completed in FY96 (Leap, et al. 1996b). Trail maintenance will continue on an as-needed basis.

GRCA Assessment

The previous trail obliteration at this site looks great. It does not appear that anyone has used the trail since GRCA personnel obliterated it in FY95. New vegetation is growing inside the old trails and no footprints were observed. The on-site trailing is recovering and needs no additional preservation work.

B:14:105 Small Structure
Biennial Schedule

This Pueblo II Cohonina site consists of a small rockshelter with a single-room formed by a single-coursed wall of undressed, tabular and blocky sandstone elements. Adjacent to the wall is a light scatter of approximately 25 lithics and seven sherds. Three roasting features are present below the shelter as well as a single course wall, two meters long.

Previous Work

Archaeologists recorded the site in 1990 (Fairley, et al. 1994) and the RCMP staff monitored it in FY92, FY93, FY94, FY96, and FY98 (Coder, et al. 1994a, Coder, 1994 #11, Coder, 1995 #10, Leap, 1996 #25, Leap, 1998 #195). During the 1996 research flow, scientists used the camp below this site and severely trampled the site area (including camping on-site and rearranging artifacts). RCMP staff recommended trail obliteration work in FY96 and completed it in FY98. Monitors recommended planting vegetation in FY98 because the trails had become small river-based gullies. FY98 monitors recommended monitoring trail work during regularly scheduled monitoring visits. FY99 monitors assessed the site for more trail work and determined that none would be done due to heavy on-site vegetation. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). Human trails are present throughout the site and visitor-related and scientist impacts were consistently recorded since 1992. The intensive trailing and subsequent gullies, caused by scientists studying the 1996 research flow, are directly related to dam operations. The visitor impacts are also attributed to commercial river runners due to a primary camping beach located below the site.

GRCA Assessment

The on-site trails appear to be recovering, however, the active gully on-site shows signs of recent channel initiation. The GRCA Revegetation crew collected some local grass seed and briefly spread it throughout the site. The crew will collect seed in March 2000 around the site. The GRCA Revegetation crew recommends carefully placing dead brush in the active gully to help establish the seeds under and behind the deadfall. The river-based gully at this site has several nick points and it is located in a dunal area. The revegetation and trail obliteration work could be completed at this site in around two hours. A RCMP archaeologists should be on-site when this project is completed. November of 2000 would be a good time to complete the work.

B:15:138 Thermal Feature
Annual Schedule

RCMP archaeologist identified and recorded this site in April 1997 (Leap, et al. 1997a). This site consists of two concentrations of fire-cracked rock and a sparse scatter of lithics and sherds. Feature 2 appears to be the remains of a slab-lined roasting feature. Feature 1 has no intact morphology and is an array of fire-cracked rock with associated artifacts. Multiple trails are on or near the site due to its proximity to a popular side canyon hiked by river runners.

Previous Work

RCMP staff recorded the site in 1997 (Leap 1997c). The trail directly below Feature 2 was obliterated at the time the site was recorded and a new trail was outlined below the site. Visitors (river runners) destroyed the work the following summer. In September 1997 a total station map was completed (Leap, et al. 1997a). Though the trail work was destroyed, a second round of obliteration was conducted in October 1998. FY98 monitors recommended planting vegetation. Additional trail work was completed in FY99 (Hubbard 1999a). Access was blocked off to the drainage by using dead brush found in the side canyon drainage. It was determined that the features are most vulnerable to hikers (river runners) coming back down to camp from the upper Tapeats Sandstone ledges. A small rock cairn was constructed and hidden in the ledges so it is only visible from above. Theoretically, lost hikers will see the cairn from above, directing them down the ledges away from the site. RCMP staff placed deadfall in the drainage to block the upper portion of Feature 2. Approximately seven meters of the area was treated and all work was photographed. FY99 monitors recommended planting vegetation. Monitors and GRCA personnel have worked at this site in the past to divert trailing through the site and into the side canyon. Two camps are present near this site and the side canyon is a popular hike for commercial river passengers.

GRCA Assessment

Once again, visitors have obliterated the trail work at this site and Feature 2 has been further trampled. Feature 1 and 2 should be excavated due to their inevitable destruction by visitation and physical impacts. The trail should be obliterated at Feature 2 until work is completed, however, a RCMP archaeologist must be on-site while trail obliteration work is performed.

The GRCA Revegetion crew suggests that four to five people could collect and plant seed and bunch grasses if a revegetation project is to be implemented. Also, dead brush placed on top of the newly planted grass will propagate vegetation growth. The entire revegetation and trail obliteration project could be completed in about two hours.

B:16:003 Small Structures
Inactive Schedule

The site consists of five well-defined masonry structures aligned along the base of a schist slope. The structures are all multi-coursed of tabular schist. Sherds and lithics are lightly dispersed on the terrace, but are definitely concentrated in front of Feature 3 at the present time. Any other prehistoric remains, such as trash deposits, have been eroded away or taken by visitors. The 1990-91 surveyors reported an Elko Corner-Notched projectile point and a mano. Ceramics indicate a Pueblo II affiliation.

Previous Work

Archaeologists initially recorded the site in 1978 and NPS survey personnel re-recorded it in 1991(Hereford, et al. 1993). GRCA crews conducted trail obliteration work here prior to 1993. The RCMP monitored B:16:003 in FY93, FY95, FY97, FY99 [U.S. Department of the Interior, 1995 #129; Thompson, 1998 #278] (Coder, et al. 1995b) (Kunde 1998a, Leap, et al. 1997a). Monitors have not recommended any remedial actions for this site. Archaeologists recording this site observed that the 1983 highwater eroded and slumped the cut at the edge of the terrace upon which the site was located. The 1983 highwater also prompted increased visitation by river runners walking passengers around the rapid. Well-used river camps were known in the area. Visitation continued to occur from FY93 through FY97 as observed by the RCMP monitors. Trailing and collection piles were recorded, but the features themselves remained stable. The trail, now entrenched, was visible below the site. The site is monitored at least once a year by several tribes, so FY99 monitors recommended that the RCMP staff discontinue biennial monitoring and conduct appropriate preservation actions based upon the results gathered by tribal monitoring. It is recommended that the GRCA trail crew maintain the single-trail access to the site because many tribal groups stop here.

GRCA Assessment

GRCA Revegetation crew recommend spreading seed throughout the ephemeral trail that bisects the site. This trail is approximately 35 meters long. The Revegetation crew will collect seed on the March 2000 CRF trip because the seeds are currently not ready for procurement.

The obliteration of the trail leading from the side canyon to the site is the key to successful revegetation. Photos from the 1970s and 80s indicate that this trail formed as a scouting trail during the large floods of the early 80s. The trail extending from the side canyon to the top of the terrace (near F.4) is approximately 25 meters in length and .5 meters wide. The trail work on the lower section would take an estimated three hours to obliterate and the spreading of seed on-site would take approximately one hour.

The option of obliterating the trail to this site will be discussed with members of the River Corridor Monitoring Project and Programmatic Agreement (PA) signatories. A letter will be sent to the PA describing the management options at this site. The site contains one of the few areas with standing masonry architecture along the river corridor, and tribes visit it because due to traditional cultural significance. Management decisions will be made after consultation with the tribes.

C:02:097 Artifact Scatter
Biennial Schedule

The site consists of two Kaibab Limestone rockshelters with sparse but diverse artifacts within and on the slope below. Shelter 1 has a mostly bedrock floor (there is old alluvial sediment at the back) and contains lithic tools such as one core, a flake scraper, two uni-edged cobble flakes, and a thick biface. Other artifacts include bones, two manos, flakes, and six sherds. There is a historic/modern firepit with rusted cans, plastic, and tattered underwear. Shelter 2 is smaller, but has more interior fill and a possible one-course-high wall enclosure. A core and flake were found on the slope below. Ceramics suggest two possible occupations: Pueblo I and late to early Pueblo III. Tools range from expedient flake tools to bifaces and manos. The artifact assemblage is suggestive of more than just overnight or single activity use. FY95 monitors found a Tusayan Grayware corrugated sherd at Shelter 2.

Previous Work

Archaeologists recorded the site in 1991 (Fairley, et al. 1994) and the RCMP staff monitored it in FY95, FY97 and FY98 (Coder, et al. 1995b, Leap, et al. 1997a, Leap, et al. 1998d). FY95 monitors recommended trail work at

C:02:097. The GRCA trail crew performed retrailing and trail obliteration work in FY96. This site was also looked at closely during the research flow in 1996(Balsom and Larralde 1996). FY97 monitors recommended more extensive trail work in the area. However, FY98 monitors noted that the extensive trail work completed at C:02:098 will have positive repercussions for trailing around C:02:097. FY97 monitors noted that the 45,000 cfs research flow (1996) did not impact the site. Extensive visitor-related impacts were attributed to anglers. Angler impacts included trailing, on-site camping and abundant trash left on site.

GRCA Assessment

After observations by the GRCA Revegetation and Rehabilitation representatives, it was determined that obliterating the trail would not be successful due to the entrenched nature of the trail beginning at the parking area upstream of this location. A single trial will be maintained by the GRCA Rehabilitation crew. Russian olive branches, removed by the GRCA Revegetation crews from the river bank and placed up into the site overhang areas has successfully curtailed visitation to the shelter area. Minimal trash was removed from this area.

C:02:098 Artifact Scatter
Annual Schedule

The site consists of an overhang with a charcoal scatter, one sherd, one sandstone mano, and a flake scatter. The terrace at the base of the overhang has been cut by high water, and charcoal is eroding from this cut. Cultural affiliation is unknown.

Previous Work

Archaeologists recorded the site in 1991 (Fairley, et al. 1994) and RCMP staff monitored it in FY95, FY97, FY98, and FY99 (Coder, et al. 1995b, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1998d). FY95 monitors recommended trail work, planting vegetation and testing for subsurface cultural material. The GRCA trail crew completed trail obliteration work in FY96. This site was recommended for data recovery in FY97. FY98 monitors recommended installing checkdams and surveyors completed a total station map in FY98. FY99 monitors noted that no new trails were apparent, however, erosion has obliterated some of the previous trail work. FY99 monitors and Zuni conservation personnel assessed the gullies/trails for checkdam construction and scheduled work in FY00. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

Monitors have consistently recorded angler trails, trash, tackle and recent charcoal at one end of the overhang. FY97 and FY99 monitors observed channel initiation and several nick points within the old obliterated trails and the main trail.

GRCA Assessment

After observations by the GRCA Revegetation and Rehabilitation crew, it was determined that arrowweed would be planted in the active drainage leading from the overhang to the beach area. This location had previously been the focus of trail obliteration work by the GRCA during FY96 monitoring. Obliterating the trail would not be successful due to the entrenched nature of the trail beginning at the parking area upstream of this location. A replicated photograph was taken for use by the revegetation crew.

C:06:006 Artifact Scatter
Four-year Schedule

This is a Pueblo II site consisting of a sparse sherd and lithic scatter on an alluvial terrace. Three corrugated sherds (two from one vessel) and two decortication flakes from coarse-grained cobbles observed. Other remains may be buried, or have been collected, as the site is at a popular camping area. Based on surface evidence, this was probably a limited activity site associated with C:06:003. In September 1992, a rock alignment of six boulders was added to the site record and map. This site is located on a sandy alluvial terrace mantled with pea sized gravels derived from the Hermit Shale. The site is bracketed by two arroyos that drain the talus slope behind the site.

Previous Work

This site was re-recorded by NPS survey personnel in 1990 (Fairley, et al. 1994), and monitoring occurred in FY92, FY93, and FY97 (Coder, et al. 1994b, Coder, et al. 1994a, Leap, et al. 1997a). GRCA trail work conducted on-site

has successfully decreased visitation. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

GRCA Assessment

The GRCA Rehabilitation crew did extensive trail obliteration work here, blocking five distinct access points from the camp area to the upper terrace. 15 crew members conducted obliteration work for approximately 2 hours. The Rehabilitation crews monitor this location on a regular basis.

C:09:030 Special Activity Locus
Inactive Schedule

The site consists of two historic but unrelated graves, the grave of Peter Hansbrough from the Stanton-Brown expedition, 1889 and the grave of a Boy Scout named David Quigley, 1951. Locus A is the grave of Peter Hansbrough who died in July, 1889 on the Stanton and Brown expedition. His body was retrieved by the 1890 Stanton expedition and buried here. A carved inscription on a vertical face above the grave reads "PMH 1889". Hansbrough's grave is located under a Muav overhang. Locus B is the grave of a Boy Scout named David Quigley who drowned on June 26, 1951. It consists of an oval arrangement of river and talus cobbles with a taller rock as a headstone.

Previous Work

Locus A was recorded two times (1969 and 1985) prior to the NPS survey recording in 1990 (Fairley, et al. 1994). Locus B was also recorded twice (1963 and 1982) and was recorded yet a third time by NPS personnel in 1990. The site was monitored by the RCMP in FY93 (Coder, et al. 1994b). Trail obliteration and retrailing was completed in FY95 and medium format photographs were taken of the Hansbrough inscription in FY97 (Coder, et al. 1995b) (Leap, et al. 1997a). The trails surrounding the site were previously vegetated with short grasses, though this was now absent. There were signs of compaction in the trails. The trails are annually monitored and maintained by the NPS trail crew.

GRCA Assessment

Upon assessment by the GRCA Revegetation crew, no work was recommended here. There exists a single trail leading to both grave sites. Both areas are currently stable.

C:09:031 Special Activity Locus
Inactive Schedule

C:09:031 consists solely of the grave of Grand Canyoneer Wilson "Willie" Beigle Taylor who died of a heart attack during a river trip with Otis "Doc" Marston in June 1956. The grave is marked with a bronze plaque.

Previous Work

The grave site is a well-known and often visited location in the river corridor. It was recorded as an actual site by Euler in 1978 and was re-recorded in 1990 (Fairley, et al. 1994). The site was monitored in FY95 and FY99 (Coder, et al. 1995b, Hubbard 1999a). The RCMP & GRCA conducted trail work at this site in FY97 (Leap, et al. 1997a). This site was also included in the studies conducted by Thompson and Potochnik (Thompson and Potochnik 2000). NPS conducted trail work here in November 1996 to reduce the multiple trails originating at the river to a single trail leading to the grave. The trail work was successful because visitors currently use only one trail. It is recommended that GRCA conduct trail maintenance as needed.

GRCA Assessment

Trailing observed was identified as game trailing only. No human footprints were observed. This area was noted by the GRCA Revegetation crew as a location with the potential problem areas that may require future work.

C:09:034 Special Activity Locus
Inactive Schedule

The site consists of the remains of Bert Loper's wooden boat, which capsized in 1949 upstream at 24.5 Mile Rapids. Loper did not die as a result of the capsized boat, but from a heart attack that occurred in conjunction with the flip. Don Harris found the boat at this location that same year. The bow remains intact, although the rest of the hull is in

various stages of deterioration. A metal plaque commemorating Bert as the "Grand Old Man of the Colorado River" was cemented onto a piece of talus limestone about two meters upslope of the boat.

Previous Work

Archaeologists initially recorded the boat and commemorative plaque in 1972 and re-recorded it in 1990 (Fairley, et al. 1994). The Park monitored the boat annually since 1982, and the RCMP staff monitored it in FY95, FY97, and FY99 (Coder, et al. 1995b, Hubbard 1999a, Leap, et al. 1997a). FY95 monitors recommended trail work and planting vegetation to reduce visitor-related impacts at this site. The site was assessed for planting vegetation in FY97 and the staff determined that none would be planted. RCMP staff conducted trail obliteration and retrailing in FY97. Due to the boat's location near the river, RCMP staff conducted medium format photography prior to and after the research flow (Balsom and Larralde 1996). FY98 monitors recommended continued trail maintenance. Monitors consistently recorded visitor disturbance in the form of missing and moving boat parts. There is a designated trail that leads directly to the site and it is regularly used during the summer months. Because visitation is the primary impact at this site and RCMP staff have descriptively and visually collected all the information at this site, C:09:034 is on the inactive monitoring schedule and monitored annually by GRCA river patrol for ARPA violations. The GRCA trail crew will continue trail maintenance.

GRCA Assessment

No work was recommended here. The trail to the boat appears stable. There are two access points to the trail, one upstream and one downstream of Bert's boat. Social trailing will continue in this location due to the historical significance of this site.

C:09:051 Pueblo
Biennial Schedule

This is a large Pueblo II camp area on the lower side of Nankoweap delta. The site was recorded in 1989 as three separate loci. The GRCA crew retained this scheme and added a fourth locus, located on the bank of the creek to the north and northwest. Locus A contains an L-shaped roomblock of four to six rooms consisting of discernable cobble alignments, wall fall, clay daub, ash, scattered rock, ceramics, and a midden. Locus B is an area of fire-cracked rock, a broken mano, and a few sherds; no feature designations were assigned. Locus C consists of shattered cobbles, a few ceramics and flakes, and no definable features. Locus D is situated on the bank of Nankoweap Creek northwest of Locus A. It consists of a poorly-defined roomblock, carbon, sherds, and fire-cracked rock eroding from the bank. A large San Juan Redware sherd was collected eroding out of the cutbank; the possibility of intact vessels is high and some stabilization is warranted. The FY97 monitors found a newly exposed charcoal stain with several artifacts in a cutbank in Locus D.

Previous Work

The site was originally recorded in 1989 and re-recorded by the NPS survey crews in 1990 (Fairley, et al. 1994). The site was visited once in FY92 and FY93 (Coder, et al. 1994a) (Coder, et al. 1994b), monitored semi-annually in FY94 and FY95 (Coder, et al. 1995a) (Coder, et al. 1995b), and then annually since FY96 (Leap, et al. 1996b) (Leap, et al. 1997a) (Kunde 1998a, Leap, et al. 1998d). The site has been the focus of trail obliteration work by the NPS Trail Crew prior to 1990. The RCMP conducted trail obliteration in FY96 and FY99 (Kunde 1999a, Leap, et al. 1996b). Hereford et al. included this site in their geomorphic map of the Nankoweap area (Hereford, et al. 1996b). Medium format photographs were taken to document Locus D in FY95, FY96 and FY98 (Leap 1995a, Leap 1996b, Leap 1998b). The site was mapped with a total station instrument in FY97, and a portion of Feature 4 was excavated in July, 1997 (Yeatts and Leap 1997). See Hereford et al. (Hereford, et al. 1996a) for photogrammetric topography mapping of the immediate area.

GRCA Assessment

Because this area is so fragile, any visitation would be obvious. No work was required here because trail obliteration in FY99 has been successful and is presently in tact. The RCMP should continue to monitor this location.

C:13:005 Roaster Complex
Inactive Schedule

C:13:005 is an extensive site consisting of nine features with associated artifacts. The features include a small rock shelter (Feature 6) and numerous roasting/hearth features. Feature 1 consists of a two meter diameter fire-cracked rock midden comprised of fist-sized sandstone and limestone cobbles. Feature 2 is also an fire-cracked rock (FCR) midden of sandstone and limestone cobbles. A well-defined charcoal stain exists at the top of Feature 2. Feature 3, another FCR midden may be part of Feature 2. Feature 3 is a circular feature, 1 meter in diameter. Feature 4 consists of a concentration of fire-cracked rock over the edge of a dune and into the boulders below. The concentration covers roughly 15 meters. Feature 5 is a five meter diameter cleared area at the top of the dune. The feature is noted as a deflated area within the dune, with a large sandstone boulder acting as a windbreak along the southern edge of the feature. Sandstone slabs and cobbles are present along the surface. Feature 7 consists of a small fire-cracked rock pile eroding from a sand dune. Feature 8 consists of a fan of fire-cracked rock radiating from a dune area. Some charcoal is present on the surface. Feature 9 consists of more fire-cracked rock adjacent to Red Canyon. Charcoal is present at Feature 9. Two roasting features, recorded in 1988 were also observed. These roasters appeared completely blown out at the time of the river corridor survey. Fire-cracked rock remains are present and are scattered toward the river. Cobble-sized limestone and Hakatai Shale rocks are present. A Deadmans Black-on-Red and two Moenkopi corrugated sherds were originally identified at this location. There are few lithics overall, though chert and obsidian are present. Tools include large core scrapers, a hammerstone, a "pounding" tool, and utilized flakes. A broken sandstone mano was also observed. The 95-5 monitors found a unifacial chert scraper inside Feature 6. Sherds indicate a PII Puebloan affiliation with a later, historic Hopi occupation. The site is situated on riverside dunes and an adjacent structural bench.

Previous Work

The site was originally recorded in 1962 and revisited by NPS archaeologists in 1976 and 1988. GRCA monitored this site several times before turning over the responsibility to the river corridor project in FY95. The site has been monitored annually since FY95 (Coder, et al. 1995b, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d) (Hubbard 1999a). Extensive trailing exists on-site due to the location of the roasters along a major rapid scout trail. A toilet paper fire occurred at this location in FY95.

This delta receives heavy use by backpackers and boaters, and the scout trail leads directly through Features 1 through 4. NPS maintains the trails in this area at least biennially. Three checkdams in the gully near Feature 9 were constructed in February 1996 by the Zuni Conservation Project and NPS trail crew (Leap, et al. 1996b). Trail work was successful and the only footprints observed were at the scout trail running through Features 1-4. Visitors have used Feature 6 as a shelter, but it did not appear disturbed. The extensive brush piles, rocks and cacti transplants near Features 7 and 8 were still in place. Trail obliteration seemed to be working. Trail maintenance and checkdam maintenance will continue by GRCA.

GRCA Assessment

Trail obliteration work completed by the GRCA Revegetation and Rehabilitation crews has been destroyed. After conferring with the Revegetation crew, it was determined that work scheduled here on a subsequent CRF trip will require the presence of an archaeologist on-site. Minor obliteration was completed on the slope adjacent to the camp location. 15 crew members conducted obliteration work for approximately 1 hour. Future work is required through the site area and scout trail locations.

C:13:006 Small Structure
Annual Schedule

The site is eroding out of a reworked dune at the mouth of a major side canyon. It consists of a Pueblo II Kayenta ceramic and lithic scatter eroding from a dune face with a fire-cracked rock and cobble-strewn, ashy midden. Survey personnel identified four to five possible rooms present but in fair to poor condition (RCMP staff question this observation even after mapping the site in detail with a total station instrument). Due to active erosion in the dune area, several additional features have been recorded since the river corridor survey. In FY95 monitors made several additions to the site map, including walls eroding out of gullies, an additional roasting pit, an artifact concentration, and several new drainage channels. Groundstone is present though no formal tools have been observed.

Previous Work

The site was recorded in the early 1960s, 1965, and 1984 and again in 1990 (Fairley, et al. 1994). River corridor archaeologists monitored this site annually in FY92 and FY93, semiannually in FY94 and FY95, and back to annual from FY95 to FY99 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY95 a stationary camera was placed across from the site (Coder, et al. 1995b), but was removed after FY96 because the photographs only showed stochastic changes (Leap, et al. 1996b). In FY95 the Zuni Conservation Project personnel assessed the site for checkdam installation. In FY96 a GRCA recreational specialist and revegetation employee assessed the site for planting vegetation and placing jute mat on the deflated areas. The site was mapped with a total station in FY96 (Leap, et al. 1996b), and medium format photographs were taken prior to the BHBF in 1996. Twelve checkdams were built in the two active gully systems and jute mat was laid in the deflated dune areas (Leap 1996c, Leap, et al. 1997a, Leap, et al. 1996b). Additional vegetation work was completed at this site in FY97. In FY97 and FY99 Zuni Conservation Project personnel conducted minor maintenance on some of the original checks. Increased sediment deposition demonstrated at this site is a result of checkdam construction. This area was researched by Thompson and others in 1998 and 1999 (Thompson and Potochnik 2000)].

GRCA Assessment

Because previous GRCA Revegetation staff have accompanied RCMP monitors at this location, it was determined that a vegetation assessment would be appropriate at this location. It was determined that grass plugs and additional seed should be collected from the slope directly across 60 Mile drainage from this site. Grass plugs could then be transplanted on-site to further anchor and secure the dune area. A revegetation staff member should accompany the RCMP staff on a subsequent river trip to conduct this work.

C:13:007 Small Structure
Biennial Schedule

This is a mid-late Pueblo II-early Pueblo III Puebloan occupation consisting of three, possibly four structural outlines (Features 1-4). Feature 1 is an L-shaped structure open to the east. Feature 2 is the remains of a rectangular structure outline, also open toward the east. Feature 3 is another L-shaped structure. Feature 4 is the remnant corner of a single-course structure. Before 1993, campers used the structural elements to hold down tents, and the site has apparently gone through a phase of deterioration since its original recording. Many sherds and Features 3 and 4 have disappeared since originally recorded. Some fire-cracked rock, sherds, a few flakes, ashy soil, and rodent bones of questionable affinity are present. Archaeologists have not recorded any formal tools.

Previous Work

This site was discovered in the early 1960s and recorded in 1965 by Prescott College. GRCA archaeologists recorded the site in 1990 (Fairley, et al. 1994). RCMP staff monitored the site in FY93, FY94, FY95, FY97 and FY98 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Leap, et al. 1997a, Leap, et al. 1998d). In 1992 the GRCA trail crew stabilized a portion of the site by constructing a retaining wall and placing jute mat and grass seed across the site's surface. Heavy rains in 1993 obliterated the retaining wall, but the GRCA trail crew repaired the wall in 1994 (Coder, et al. 1995a). No other remedial actions were recommended after the trail project except for maintaining the stabilization work completed in FY92. R. Hereford completed a photogrammetric map in 1993 that includes the site area (Hereford 1993). This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). Monitors consistently recorded increased visitation and on-site camping.

GRCA Assessment

Due to a time constraint, RCMP staff did not stop at this location. M. Schroeder, Project Archaeologist for Grand Canyon National Park did stop here to observe previous stabilization and revegetation work. It was determined that science camps from either the Grand Canyon Monitoring and Research Center (GCMRC) or the NPS have stopped here and destroyed previous revegetation work. A formal assessment is required by the GRCA Rehabilitation crew.

C:13:069 Small Structure
Annual Schedule

This large site consists of several cists and masonry structures. Feature 1 is a slab-lined cist remnant. Feature 2 may be a masonry room with midden. Feature 3 is a masonry wall. Feature 4 consists of eroding slabs where additional

architecture may be present. Feature 5 is a well-preserved cist. Feature 6 is a masonry room. Feature 6B is another masonry room outside of the main dune area. Ceramics suggest a Pueblo II-early Pueblo III affiliation. The site is near the Tanner Trail and a well-used beach camp.

Previous Work

Prescott College personnel originally recorded this site in 1972. NPS personnel re-recorded this site in 1990 (Fairley, et al. 1994), and monitoring occurred in FY93, FY95, FY96, FY97 and FY99 (Coder, et al. 1994b, Coder, et al. 1995b, Leap, et al. 1997a, Leap, et al. 1996b) (Kunde 1998a). As part of the GCES Phase 1 program, Ted Melis took a carbon sample at this location. No information has been disseminated to the RCMP office concerning the results. In 1992, the GRCA Rehabilitation Project conducted trail obliteration, revegetation, and stabilization of minor drainages. Medium format photos were taken of this site in FY96 (Leap 1996a). Upon completion of a stabilization assessment in FY97, six checkdams were constructed along the drainage bisecting the features. One existing checkdam was reconstructed and five new checkdams were built. A total station map was also completed for this site in FY97. See Hereford (Hereford 1993, Hereford, et al. 1993)[Hereford, 1996 # 19] for photogrammetric topography mapping of the immediate area. Maintenance work on the checkdams was completed in FY99 (Hubbard 1999a). Monitoring staff observed that human impacts were high, and included distinct trails, trail caused erosion, and minimal site camping. This site was at particular risk due to the adjacent river camp that was highly used especially during the May to October season. Backpackers throughout the year also used the area and a major trail cut directly through the site. Retrailing and revegetation work carried out in 1992 has had a positive affect on the site.

GRCA Assessment

This area looks to be in good condition. Grasses may be a good candidate for planting along either side of the trail here. RCMP monitors should continue to watch this location with grass as a potential solution to trail problems.

Palisades Delta

The Palisades Delta complex, consists of several prehistoric and historic archaeological sites situated on predam alluvium and debris flows from Palisades Creek. Access to this delta is via two distinct trail networks extending north and south of the delta. Site types range from prehistoric multi-room pueblos to historic mining camps. The delta is accessed by via the backcountry hiking trails and the river corridor. Visitors to the Palisades delta will likely observe various cultural remains at sites C:13:098, C:13:099, C:13:100, C:13:272, and C:13:336. Recommended work such as additional revegetation along the Beamer Trail at C:13:099 may cause increased visitation to C:13:100 as visitors attempt to access the most visible site on the delta, C:13:098. Viewing work to be done in this location as improving visitor-related impacts to all the sites enables the NPS to complete the project more efficiently and considers the impacts of the region as a whole rather than treating one site at a time.

It has been suggested that C:13:098 be considered for a education and interpretation stop along the river corridor. Visitation to this site has resulted in impacts to the adjacent sites and increased gullying in places where incipient trailing exists. The creation of a loop trail around this site should be considered as a means for preventing further destruction to the other sites along the delta.

C:13:098 Historic Structure
Annual Schedule

This historic mine and cabin site contains two loci. Locus A consists of two mine adits at the base of the Palisades cliff along the Palisades fault. The main adit is situated about 10 m above the surrounding terrain with an extensive tailing pile below it. The second adit is located about 10 m below and 20 m south of the main adit. About 225 m S/SW is Locus B, which includes a log cabin constructed of driftwood logs. The cabin measures 2.6 x 4.1 m (interior) and is five courses high. The floor is partially paved with sandstone slabs, with a log/board bed frame in the northeast corner. A canvas tent probably formed the upper walls and roof. About four meters due south of the cabin door is a driftwood log "fence". This structure is made of stacked logs up to four courses high. It may have been a windbreak. Artifacts date from 1900-1920 to the mid-1930s. In FY98 monitors found a cist feature eroding in the drainage near the cabin.

Previous Work

This site was initially recorded by Euler and Jones in 1978 and then re-recorded by NPS personnel in 1990 (Fairley, et al. 1994). GRCA documents from 1929 and 1930 reveal an investigation made by the Park Service on the lode mining claims by George W. McCormick and others in May 1913 (Busch 1930, Daly 1929). RCMP staff monitored the site semiannually from FY93 to FY98 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY98 it was determined that annual monitoring would suffice, therefore monitoring only occurred once in FY99 (Kunde 1998a). See Hereford (Hereford 1996, Hereford, et al. 1996a) for a photogrammetric topographic map of the immediate area. In FY95 the cabin and associated artifacts were photographed with a medium format camera. Currently, and prior to the inception of this program, NPS trail crews have maintained the trails in the area. From FY93 to the present monitors have observed visitor impacts (trailing and collection piles). This site is very visible and is located near a heavily used backcountry trail. Most of the visitor impacts were observed in the fall, after the summer season.

GRCA Assessment

It was suggested by the GRCA Rehabilitation trail crew that a loop trail be created in this location. The trail would originate on the existing Tanner – Beamer trail with an arm extending toward the cabin along the existing shallow drainage. This type of trail may successfully divert visitation to C:13:099 and C:13:100 and should be considered by the PA signatories and the NPS as a practical alternative to continued trail obliteration work in this region.

C:13:099 Structure-Thermal Feature Complex
Semi-annual Schedule

This site contains two loci of fire-cracked rock, buried and collapsed structures and artifacts. Archaeologists identified several charcoal lenses, burned rock features and artifact concentrations. Many of the features are eroding out of the coppice dunes, bisected by a highly active drainage system. The drainage system has uncovered the majority of this site since 1978, evidenced by several newly exposed features recorded by GRCA and RCMP archaeologists. FY94 monitors recorded Features 6 and 7 eroding from the active drainage. FY95 monitors recorded Feature 8 eroding from the active arroyo. RCMP staff identified two new probable cists eroding from the active arroyo in FY98. RCMP archaeologists tested the probable features in FY99 and did not discover cultural material. Since 1990, RCMP staff discovered numerous lithics and sherds eroding from the active arroyo and scattered throughout the drainage system. An assemblage of forty sherds suggests an Early-mid Pueblo II Puebloan occupation. Lithic evidence from this site includes two mano-like objects, ground to create a knife-like edge, as well as pecked grinding stones and hammerstones. Five charcoal samples were taken from several features on-site in the early 1990s. Dates ranged from 140 years B.P. to 1410 years B.P.

Previous Work

Archaeologists originally recorded the site in 1978. Prior to the implementation of the monitoring program (late 1980s) GRCA conducted excavation and collected samples of a deteriorating feature (Feature 3). The RCMP staff monitored C:13:099 semiannually since FY93 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Kunde 1998a, Leap 1995b, Leap 1996a, Leap 1997c, Leap 1997e, Leap 1998b, Leap and Hubbard 1996c). FY94 monitors recommended trail work, installing checkdams, total station mapping and subsurface testing. FY95 monitors recommended trail work, planting vegetation, installing checkdams, subsurface testing, data recovery and total station mapping. In FY95 the GRCA trail crew performed trail obliteration work along the Beamer Trail, which relocated the hiking trail near the river to reduce visitor impacts.

In September 1995 RCMP staff and representatives from state and federal agencies, and tribal entities constructed 44 checkdams at C:13:099 (Leap 1995c). C:13:099 is the first location where Zuni-style checkdams were built in the river-corridor. Archaeologists used a photogrammetric map (Hereford, et al. 1993) for recording, prior to completion of a total station map in FY97. Each checkdam was photo-documented before and after its construction with 35mm prints and slides. FY96 monitors recommended additional trail work and planting vegetation. Trail obliteration work was completed in FY97. RCMP staff conducted additional monitoring efforts during the research flow of 1996 (Balsom and Larralde 1996). FY97 monitors recommended checkdam maintenance and data recovery. FY98 monitors recommended data recovery, planting vegetation and checkdam maintenance. Checkdam maintenance projects were completed in FY97 and FY98 (Leap, et al. 1997a, Leap, et al. 1998d). Monitors recommended medium format photography and projects were completed in FY95, FY96 and FY98 (Leap 1995a, Leap 1996a, Leap 1996b, Leap 1998a). FY99 monitors recommended trail work, planting vegetation and data

recovery. Archaeologists conducted feature excavation and exploratory testing at Features 1, 3, 7, 9 and 10 in FY99. RCMP will disseminate the results of this project after an analysis is completed. FY99 monitors recommended more extensive excavation. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

GRCA Assessment

Planting arrowweed, grasses and salt cedar along the side of the trail that borders this site may aid in curtailing increased visitation. It is recommended that a member of the GRCA Rehabilitation crew accompany RCMP personnel on an upcoming river trip to ensure the proper methods and species are used. The work would be completed by the GRCA with direction from RCMP archaeologists.

C:13:100 Pueblo
Annual Schedule

This site is an open Pueblo II habitation site. Feature 1 is a rectangular habitation room. Feature 2 is another probable habitation room with a possible south entrance; it has standing walls two to three courses high. Adjoining Feature 2 is Feature 3, a small, more difficult to define structure; there may be another room attached to the southwest wall of Feature 3. Feature 4 and Feature 8 are probably associated rooms. Both features are exposed in an arroyo, with walls two to three courses high. Features 5 and 6 are the remains of slab-lined cists of Dox Sandstone. A charcoal stain in a trail evidences feature 7. South of the dwellings is an eroding drainage two meters across and 50 cm deep. Lithics and ceramics are scattered down the slope directly above the drainage. There is a heavy groundstone concentration near Features 5 and 6. Groundstone/tools include six manos, four metates/slabs, eight hammerstones, and two sandstone knives. Seven ceramic sherds were also found. During the September 1995 erosion control project, archaeologists located a new feature (Feature 9) consisting of upright Dox slabs in an arroyo. FY97 monitors discovered two new features. Feature 10 is a charcoal lens north of Feature 7 and Feature 11 is a circular cist/hearth eroding from the drainage.

Previous Work

Archaeologists originally recorded C:13:100 in 1978 and it was monitored by GRCA archaeologists until FY92. Beginning in FY93, the RCMP staff monitored the site semi-annually (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Kunde 1998a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). FY94 monitors recommended revegetation work, trail work, checkdam installation, total station mapping and stabilization. FY95 monitors recommended planting vegetation and trail work due to heavy visitation. The RCMP staff conducted appropriate assessments and in FY95 trail work and checkdam installations were conducted (Leap and Coder 1995). FY95 monitors decided that no vegetation would be planted.

This site received additional monitoring during the research flow of 1996 (Balsom and Larralde 1996). FY96 monitors recommended additional trailwork. The area received further trail obliteration work in FY97 and surveyors completed a total station map in June 1997. Prior to completion of the total station map, RCMP staff used a photogrammetric topography map to plot additional features (Hereford 1996). Monitors recommended medium format photography and projects were completed in FY95, FY96, and FY98 (Coder, et al. 1995b, Leap, et al. 1996b, Leap, et al. 1998d). FY98 monitors recommended checkdam maintenance, testing and data recovery at Features 5, 6, 7, 9, 10, and 11 before losing more cultural information. The RCMP staff and Zuni conservators completed checkdam maintenance in February 1998. FY99 monitors again recommended data recovery at Features 5, 6, 9, and 11 and recommended annual maintenance of checkdams. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

An extensive photographic record of the Palisades delta extends back to the early 1900s. RCMP staff used this record to reconstruct the predam Palisades environment. Long-term photographic replications indicate the pervasive loss of beaches and sediment in this area since the construction of Glen Canyon Dam. A 1909 Stone expedition photo confirms that the predam Palisades shoreline consisted of broad beaches and abundant sediment. Currently, the shoreline is devoid of sediment consisting of a large expanse of exposed river cobbles.

GRCA Assessment

Someone has moved driftwood logs and created access to the site from the Beamer trail. These logs will be removed by the GRCA Rehabilitation trail crew on a subsequent CRF trip. It was suggested by the GRCA

Revegetation crew that intensive planting in this area between the trail the site occur, filling in the dune with arrowweed, grasses and salt cedar to curtail future visitation.

C:13:272 Small Structure
Biennial Schedule

This is a multi-component site with two separate loci. Locus A consists of two masonry structures (Features 1 and 2) with a sparse scatter of artifacts, and a more ephemeral feature (Feature 3) consisting of a curving cluster of mostly small sandstone rocks eroding out of a deflated area. These rocks seem too small for building elements, but do not look fire-cracked either. Artifacts are generally sparse at this locus, but include sherds, lithics, a metate, a two-handed mano, and a small mano with a beveled face that may also have been used as a knife. Locus B contains two concentrations of sandstone cobbles (Features 4 and 5) that may be hearths. No artifacts are associated. Ceramics suggest a PII date for Locus A and a protohistoric date for Locus B.

Previous Work

This site was originally documented by J. Balsom and H. Fairley in 1984 and recorded in greater detail by NPS survey personnel in 1990 (Fairley, et al. 1994). The site has been monitored annually since FY92 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). The drainages situated within the site have been studied by geomorphologists [Hereford, 1993 #20; Thompson, 1998 #278] and have been mapped on a topographic map using aerial photogrammetry (Hereford 1993, Hereford, et al. 1993). In 1991 H. Fairly collected carbon from Feature 5. The dates range from 330+/- 50 to 40+/- 60. C:13:272 was also one of the sites monitored prior to and after the spike flow (Balsom and Larralde 1996, Burchett, et al. 1996). This monitoring included medium format photography. In FY99 a soil description encompassing the site area was completed by NRCS (Lindsey and Fisher 1999). The Beamer Trail transected the site prior to FY93, adding to the adverse impacts. The GRCA trail and rehabilitation crews rerouted the trail below the site in 1993. Since then, the old trail has not received use. NPS trail maintenance will continue.

GRCA Assessment

Due to a time constraint, RCMP staff did not visit at this location. Time was concentrated on the most heavily impacted sites along the Palisades Delta. Because this site is located in the vicinity of sites that were assessed, the same assessment will be applied in this location. The existing trail will be assessed and the NPS Cultural Resource Program Manager will be consulted regarding creating a loop trail.

C:13:273 Roaster Complex
Annual Schedule

This site consists of four roasting features, a slab-lined cist and two artifact concentrations. The roasting features all contain fire-cracked rock and charcoal. The artifact concentrations at AC-1 include over 50 items of lithic debitage and about 15-25 ceramic items. The artifact concentration at AC-2 consist of seven flakes, ten sherds, and one piece of groundstone. Feature 1, a large donut-shaped roasting feature, is similar in morphology to many of the roasters in the western Canyon. Ceramics indicate an early Pueblo I to Pueblo II Cohonina and Puebloan occupation. Radiocarbon dates taken from Feature 5 indicate an earlier occupation of AD 575 to AD 775.

Previous Work

Archaeologists recorded the site in 1990 and the RCMP staff monitored it in FY93, FY95, FY96, FY97, FY98 and FY99(Coder, et al. 1994b, Leap 1994a, Leap 1995b, Leap and Hubbard 1996c, Leap and Kunde 1998a). FY95 monitors recommended stabilization and retrailing. In FY95 RCMP staff conducted archaeological clearance work prior to a GRCA trail crew retrailing project (Leap 1995d). FY96 and FY97 monitors recommended stabilization for Feature 3 due to its precarious location on the edge of an active drainage. FY97 monitors recommended data recovery for Features 3 and 5. In FY97 surveyors mapped the site with a total station instrument, RCMP staff conducted a data recovery assessment and archaeologists excavated Feature 5 (Yeatts 1998). FY98 monitors recommended data recovery at Feature 3 due to its precarious position on the cutbank of an arroyo. FY99 monitors obliterated an access trail from the side canyon that directly impacted Feature 4. Because the Beamer Trail bisects the site, access and visitation are continued impacts. The GRCA trail crew maintains the trail in this area.

GRCA Assessment

The GRCA Rehabilitation trail crew suggested that placement of a checkdam at the same elevation as the base, extending to the top height of Feature 1 and subsequent infilling in this area of the trail with river sand may successfully cover the section of Feature 1 that is exposed within the Beamer Trail. PA signatories and NPS personnel should discuss this alternative further.

C:13:291 Small Structure
Annual Schedule

The site consists of standing walls of several structures and Dox Sandstone cists. Feature 1 is a two-meter long wall and juniper post eroding downslope. Feature 2 is a slab-lined cist with a room exposed in a cutbank. Feature 3 is a wall exposed in a gully. Feature 4 is a hearth or cist. Feature 5 is a cluster of Dox slabs that may be coursed. Artifacts include nineteen sherds and lithics, including a chopper, a hammerstone, and a bi-edge tool. Sediment and slope wash cover the site to a depth of more than one meter in some areas. Apparently the site was constructed on a terrace, and has since been covered periodically by slope wash and fluvial sand. During the initial recording in 1988 a metate and mano were measured, documented and relocated. FY95 monitors noted that Feature 2 was completely obliterated by the river-based arroyo. FY96 monitors discovered a Tusayan Whiteware/Sosi Black-on-White sherd below Feature 3. Artifacts indicate a Mid-late Pueblo II Puebloan occupation.

Previous Work

Archaeologists originally recorded the site in 1988 and again in 1990 (Fairley, et al. 1994). During the initial recording a metate and mano were relocated above the site. The RCMP staff monitored the site annually since FY92 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a, Kunde 1998a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). Monitors recommended checkdams and total station mapping in FY94, but after further assessment, the RCMP staff and Zuni conservators concluded that the drainages were too mature for checkdams. FY95 monitors recommended some form of stabilization for Features 1 and 4. During the research flow of 1996, visitors created a trail through the site on their way to Unkar Delta. The research flow created extensive cutbank erosion below the site, obliterating the formerly used trail. The RCMP staff obliterated the newly created trail in FY97, at which time a total station map was completed. Additional monitoring efforts including medium format photography were also conducted during the research flow (Balsom and Larralde 1996). FY98 monitors recommended testing, data recovery, radiocarbon samples, and dendro samples. FY99 monitors recommended data recovery for Features 1, 4 and 5, and continued trail maintenance. Minor trail maintenance was conducted in FY99. RCMP staff could not collect charcoal from the site in FY99 due to the charcoal disappearance through intensive erosion. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). Continued on-site trailing has been attributed to river-runners walking from a nearby camp to the Unkar Delta.

GRCA Assessment

The GRCA Revegetation crew is checking to see if seed has previously been collected from this location. The cut bank has slumped off, blocking access from the upper Unkar camp through the site to Unkar Delta. The RCMP should watch for new trailing on the back side of the mesquite thicket. This is a potential problem area. The RCMP will take the lead in any trail work conducted here. Trailing on-site is a direct result of current flow regimes, as seen in the 1996 Beach Habitat Building Flow (Balsom and Larralde 1996). The trial leading to Unkar Delta is extremely overgrown and has not been used for quite some time.

C:13:327 Roasting Feature
Biennial Schedule

This is a campsite consisting of several fire features, concentrations of lithic debris, bone, and a single Moenkopi corrugated sherd. The site is situated on the edge of a high alluvial cutbank. It is also adjacent to the Hance-Tanner Trail. A roasting feature, slab-lined hearth and charcoal lenses in adjacent arroyo cuts were discovered during geomorphologic research activities on-site.

Previous Work

The site was originally recorded in 1990 (Fairley, et al. 1994) and monitored in FY96 and FY98 (Leap, et al. 1996b, Leap, et al. 1998d). NPS personnel conducted test excavations in conjunction with trail work in 1992. Carbon samples taken at this time date the site from the late Archaic age through the 16th century, indicating multiple use of

the area. This site is included in the Hereford et al. topographic map of the Tanner region (Hereford 1993). Retrailing took place during FY96 and obliteration of the old trail occurred in FY97. Checkdams were recommended in FY96 and an assessment for stabilization was conducted prior to construction of three checkdams and terrace fortification in FY97 (Leap 1997c). Total station mapping occurred in FY97 upon completion of stabilization work (Leap, et al. 1997a). In FY99 the Zuni Conservation Project staff performed maintenance on one checkdam (Hubbard 1999a). This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

GRCA Assessment

No work is needed at this location. Trail rerouting conducted by the GRCA Rehabilitation trail crew has been successful. The old trail is recovering nicely.

C:13:336 Thermal Feature
Three-year Schedule

This site consists of two concentrations of lithics and sherds, a possible hearth and a roasting feature. A cobble alignment eroding out of a dune may be the remnants of a possible structure. FY94 monitoring staff recorded a new artifact concentration, Feature 4, not recorded during the survey. C:13:336 is a Puebloan occupation site located within the predam high-water zone adjacent to the Beamer Trail. This site is located in the vicinity of the Palisades Complex on an alluvial terrace proximal (48 m) to the river. A veneer of reworked sand covers the surface of the terrace and the site can be seen in the deflated areas between the low dune crests. The Beamer Trail also transects this site adding in some unspecified degree to the adverse impact.

Previous Work

The site was originally recorded in 1986 and mapped in 1990 (Fairley, et al. 1994). This site has been monitored in FY92, FY94, FY96, and FY98 (Coder, et al. 1995a, Coder, et al. 1994a, Leap, et al. 1996b, Leap, et al. 1998d). This site is included in the topographic map produced by Hereford and others for the Palisades Creek region (Hereford 1993). Checkdam installation, recommended in FY97 was assessed in FY98. Five checkdams were constructed in FY98 (Hubbard 1999a). Trail obliteration work is on-going by the GRCA Rehabilitation trail crews.

GRCA Assessment

Due to time constraints, this location was not visited by the GRCA crews. The three most impacted sites along the Palisades Delta were the focus of this stop. Because this site is located in the vicinity of sites that were assessed, the same assessment will be applied in this location. The existing trail will be assessed and the NPS Cultural Resource Program Manager will be consulted regarding creating a loop trail.

C:13:339 Small Structure
Annual Schedule

The site consists of a mid-late Pueblo II habitation buried on an alluvial terrace, comprised of a burned rock midden, a buried hearth, and several rock alignments. The burned rock midden, with sparse lithics and ceramics, is located on the north side of the site. It is eroding out of a cutbank. Two historic hearths are also located on-site. The site is situated against a Dox Sandstone cliff.

Previous Work

The site was originally recorded in 1990 (Fairley, et al. 1994) and monitored in FY93, FY95, FY96, FY97, FY98, and FY99(Coder, et al. 1994b, Coder, et al. 1995b, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). Retrailing was conducted in FY95 after completion of archaeological clearance by the river corridor office (Leap 1994b). Total station mapping was also completed in September 1998. Mitigation was proposed for this site in FY95 (Leap 1995c). This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). Human impacts observed during the survey included distinct trails, trail caused erosion, and rearrangement of rocks. The Beamer Trail intersects this area down to a lower terrace. Planting vegetation may help stabilize the cutbank where Features 5 and 6 are located.

GRCA Assessment

According to the GRCA Revegetation staff, no vegetation can stabilize the cutbank at Features 1 and 6. The only option is to face-off the cutbank to determine the extent of Feature 6. The erosion observed adjacent to Feature 1 is a direct resulting of rilling and no preservation options can successfully be completed to curtail this continued erosion along the cutbank.

C:13:340 Roasting Feature
Four-year Schedule

This is a PII Puebloan site with two features and a small scatter of lithics, ceramics, and groundstone. Feature 1 is a one and a half-meter diameter roasting pit with Dox sandstone slabs around its periphery and heat-cracked river cobble in the center. Feature 2 is a slab-lined cist (50 centimeters in diameter), with at least three remaining upright slabs. Lithic flakes, sherds, and manos litter the slope. The site is situated on a gravel-strewn terrace within the upper mesquite zone.

Previous Work

The site was initially recorded by NPS survey personnel in September 1990 (Fairley, et al. 1994) and monitored in FY96 and FY99 (Hubbard 1999a, Leap, et al. 1996b). The NPS Trail Rehabilitation crew completed trail obliteration and retrailing work in 1996 (Leap, et al. 1996b). Hereford et al. included the site area in their geomorphic map of Eastern Grand Canyon (Hereford, et al. 1993). GRCA trail crew performs annual trail maintenance.

GRCA Assessment

This location does not require any work at this time. Rerouting of the trail has successfully curtailed visitation to this area. The GRCA Rehabilitation crew will continue to visit this location to perform annual trail maintenance.

C:13:362 Small Structure
Four-year Schedule

The site is located on the edge of a delta terrace. It is comprised of one rock wall (Feature 1) and four areas of fire-cracked rock (Features 2-5), plus an associated scatter of lithics and ceramics. The rock wall is located on the sloping terrace below the fire-cracked rock area. It is L-shaped and about two and a half by four meters in size. The northeast wall is eroding out of the soil and appears to be two to three courses high. Erosion has undercut the wall to some degree. Features 2-5 are all located along the edge of the terrace and all contain fire-cracked rock eroding out of the soil. Features 3-5 also have lithics and sherds. A stone pipe/tube fragment was observed. Ceramics suggest a Late PII-early PIII Puebloan affiliation.

Previous Work

The site was initially recorded in March 1991 by NPS survey personnel (Fairley, et al. 1994) and monitored for the first time in FY96 (Leap, et al. 1996b). Trail obliteration work was completed here in FY97 (Leap, et al. 1997a). Because the delta is a well-known archaeological area, human visitation is the greatest impact. A well-defined trail goes through the site and bisects Features 2-5. It was recommended that trail obliteration occur to protect Features 2-5, and the site placed on a five-year monitoring schedule. This work was completed in FY97, when 75 meters of trail were obliterated.

GRCA Assessment

Due to time constraints, this site was not visited by the RCMP, GRCA Revegetation or Rehabilitation crews.

Granite Park Delta

Several sites are located on the Granite Park Delta including G:03:002, G:03:003, G:03:024, G:03:025, G:03:026 and G:03:028. Trails on the delta have been a documented impact for over twenty years. GRCA, RCMP and the Hualapai have conducted trail obliteration proijects in the 1990s with some success. Recently, much of the access trail obliteration work conducted by GRCA in FY96 and FY97to close off the upper terraces has been removed and new access trails formed. However, several trails on the upper terrace show encouraging signs of recovery. Grasses and cryptogammic soil are abundant throughout the obliterated trails near G:03:026 and G:03:28 and G:03:025.

Despite some success to curtail visitor-related impact on the delta, a substantial work project is need in the future. GRCA Revegetation, Trail Crew, and RCMP archaeologist agreed that the trail obliteration project could take two to three days and bee conducted on a Fall CRF trip. Consultation with the Hualapai is currently under way to approve such a project and a request has been made to involve Hualapai cultural resources crew during the project. In depth discussions regarding the current condition and recommendations for sites G:03:003, G:03:026 and G:03:028 are presented below.

G:03:003 Roaster Complex
Annual Schedule

The rockshelter (Feature 1) was originally recorded by G. Gumerman and R. Euler on 9/4/69, and the GRCA survey crew added four roasting features (Features 2-5) in 1991. Feature 1 is a shallow overhang and midden. There is a large amount of lithic debris, including obsidian flakes, an Elko base, a biface tip, and groundstone fragments. Charcoal, ashy soil, and fire-cracked rock are also present. Ceramics suggest both late Pueblo I to early Pueblo II Formative and late prehistoric-early historic Pai affiliations. The remaining features (Features 2-5) are roasters of varying sizes, some with tools and/or flakes, ceramics, etc. In the monitoring episode of FY92 monitors noted nails, more projectile points, and sherds, and the FY96 monitors found a projectile point at Feature 2 near the dripline and trail.

Previous Work

Euler and Gumerman initially recorded this site in minimal fashion in 1969. Sherds were collected and an analysis was completed. Field notes state that the condition of the site was "undisturbed" and the potential for a rewarding excavation was "excellent." Euler and Jones visited the site again in 1981. More sherds were collected and a simple sketch map was made. G:03:003 was recorded in more detail by NPS survey personnel in January of 1991 (Fairley, et al. 1994).

River corridor monitors visited the site in FY92 and FY93, twice in FY94, once in FY95 and then semiannually beginning in FY96 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a, Hubbard 1999b, Kunde 1998a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY95 site overviews were taken with a medium format camera. In FY96 the features were plotted with a total station unit and overlain on a topographic map created by Thompson and others (Thompson, et al. 1996) (Leap 1997e, Leap, et al. 1996b). At this time the Zuni Conservation Projects personnel also assessed the site for checkdam installation (Leap 1996c). Three checkdams were built in the river-based drainage downstream of the site (Leap 1996c, Leap, et al. 1996b). They were placed in this drainage at the suggestion of K. Thompson and K. Burke in FY96. According to their aerial photogrammatic maps, this particular drainage could cause some substantial site destruction if untreated. From FY96 to FY98 the three checkdams were in good condition with little to no maintenance required. In FY99, however, a heavy rainstorm occurred, and as a result, the Zuni Conservation team and RCMP staff constructed ten new checkdams in the river-based drainage, and extensive work was completed on two of the original checkdams. A few large rocks were removed from the third original checkdam to define a central channel. The new checkdams need to be mapped in on the 1993 Hereford map with a total station. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

The site receives a great number of visitors, and as a result, multiple trails bisect features and several collection piles exist. Aerial photographs taken over the last 25 years show a geometric increase in the social trailing at Granite Park in general. This trend is enhanced by the local big horn sheep that spend considerable time in this area due to the lush grass growth accompanied by the wet winters. NPS and Hualapai representatives have performed retrailing and trail obliteration in FY96 and FY97, yet people continue to visit the site. A letter was published in the *Boatman's Quarterly* by L. Jackson and L. Leap requesting river runners and researchers to minimize their impact to the area (Jackson and Leap 1996 Summer).

GRCA Assessment

Trails on the Granite Park Delta are pervasive. Trails leading to the overhang at G:03:003 are present but appear faint since the last visit. It is difficult to determine how many access trails are present due to the recent vegetation

growth. It appears that two trails are noticeable near the checkdam areas. GRCA Revegetation and Rehabilitation crews agree that the trails could be successfully obliterated on a Fall 2000 CRF river trip.

Trail obliteration and planting cactus and grasses should be completed to curtail long-term visitor-impact. The work will take an estimated three days. Prickly pear planted in FY96 has established throughout some of the trails. Also, deadfall could be collected on the delta and across the river for use in the trail obliteration effort. The Hualapai will be consulted about the proposal for work in March 2000.

G:03:026 Roaster Complex
Three-year Schedule

The site consists of seven roasting pits and two activity areas exhibiting several different phases of use and existing in various stages of deflation, from pristine to nearly eroded to their original baselevel. The sherds (and other artifacts) indicate late prehistoric-early historic and mid-historic (1850-1900) Pai use. Some flakes and tools were observed, including two biface items and an obsidian point. Groundstone was also located. Two fragments of pressed purple glass were observed near activity area A; perhaps pieces of a small candy or relish dish.

Previous Work

The site was originally recorded in 1991(Fairley, et al. 1994) and monitored at least annually since FY92 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). Carbon samples for Hereford's geomorphological research were collected from Features 2, 3 and 8 prior to the RCMP. Dates range from 190 +/- 50 to 520 +/- 50 B.P. Trail obliteration, retrailing, and vegetation work was conducted in FY96 and FY97 by NPS and RCMP staff. Upon completion of the trailwork, the Hualapai and RCMP staff submitted a letter to the *Boatman's Quarterly* requesting no more visitation by commercial passengers and a decrease in the research conducted at Granite Park (Jackson and Leap 1996 Summer). In FY96 the features were plotted using a total station instrument and overlain onto a topographic map created by Thompson and others (Leap, et al. 1996b, Thompson, et al. 1996). The site was assessed in FY96 and as a result, five checkdams were constructed in the side canyon-based drainage (Leap 1996c, Leap, et al. 1996b). In FY99 four of these checks were slightly altered and one new check was built. In FY99 personnel from the Natural Resources Conservation Services (NRCS) conducted some soil sieving and wrote a small report on the findings (Lindsey 1999). This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). Since FY92 visitor-related impacts (by river runners and researchers) have been consistently recorded. Trailing from tourists and researchers has been evident everywhere, and the problem is compounded by bighorn sheep living in the area. FY93 monitors initiated the recommendation for retrailing and trail obliteration. This recommendation continued until FY98 when only trail maintenance was warranted. Impacts from visitors and researchers continued to come and go, therefore, trail maintenance was recommended on an as needed basis.

GRCA Assessment

The proposed CRF Fall 2000 project will take an estimated three days to complete the work at all the sites on the Granite Park Delta. The Hualapai will be consulted about the proposal for work on the delta in March 2000. There are three access trails that lead to this site. Two of the trails are on the west slope near the camp and one is near the side canyon. Both trails need extensive trail obliteration and revegetation. Some of the trails on-site have recovered since the FY96 trail obliteration effort, however, new trails are located along-side some of the previously obliterated trails.

Trail obliteration and planting cactus and grasses should be completed on a Fall 2000 CRF trip. Prickly pear planted in FY96 has established throughout some of the trails. Deadfall could be collected on the delta and across the river for use in the trail obliteration effort. G:03:028 Roaster Complex

G:03:028 Roaster Complex
Biennial Schedule

The site is divided into six loci of activity (A-F). Locus A consists of two roasting features with fire-cracked rock, ash, charcoal, a lithic concentration and some ceramics. Locus B is a light scatter of lithic debitage, including a point base, and a sherd. Locus C is a tight concentration of about 20 flakes and a sherd. Locus D contains three

"blow-out" or "dug-out" areas that may be wickiup depressions with associated flakes and fire-cracked rock, plus additional fire-cracked rock and lithic concentrations and a grouping of buried slabs. Locus E is an area of possible domestic activity, represented by four possible wickiup depressions--some with encircling stone "foundations", and associated lithics, sherds, groundstone, and fire-cracked rock. Locus F has one well-defined roaster, and other fire-cracked rock concentrations that may represent more roasting features. Lithic debitage consists of a wide variety of cherts and obsidian, and reflects expedient reduction. Pueblo II Formative sherds dominate at Loci A, B, and E, while late prehistoric-early historic Pai sherds are seen at Loci C, D, and also E. The site is located on low stabilized dunes covering an alluvial terrace.

Previous Work

The site was officially recorded in 1991 by NPS personnel (Fairley, et al. 1994) and monitored in FY93, twice in FY94, once in FY95, FY97, and FY99 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Hubbard 1999a, Leap, et al. 1997a). The GRCA trail crew obliterated extensive trailing in FY95. In FY96 the features were located with a total station instrument and overlain on the 1995 topographic map produced by Hereford (Hereford, et al. 1996a). In FY96 GRCA trail crew also completed trail obliteration, retrailing, and vegetation to deter visitation (Leap 1996c). This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

GRCA Assessment

Two of the trails impacting this site lead from the camp. One of the trails has developed next to the trail work conducted in FY96. All trails leading from the camp to the upper terrace need to be obliterated. Previously planted prickly pear has established in several of the trails.

Trail obliteration and planting cactus and grasses should be completed on the Fall 2000 CRF trip. All of the work on the delta will take an estimated three days. Deadfall could be collected on the delta and across the river for use in the trail obliteration effort. The Hualapai will be consulted about the proposal for work on the delta.

G:03:049 Artifact Scatter
Inactive Schedule

The site is located under columnar basalt boulder rockshelters on the first Tapeats Sandstone ledge outcrop above the river. These are multi-component shelters, possibly used temporarily/seasonally during food processing and lithic tool manufacture activities, as indicated by groundstone implements and abundant lithic debitage. There are 80-125 flakes on-site, most of which are located in front of the rockshelter area on the Tapeats ledges. Nearly all of the flakes in the shelter area have been placed in a collector's pile. The 15 or so sherds found on-site suggest Pueblo II Virgin occupation and late prehistoric-early historic Pai/Paiute occupations. Two metates, three manos, a grinding slab, and two tools are in the vicinity of the shelter. There is a sparse scatter of charcoal fragments in the southeast end of the rockshelter area.

Previous Work

This site was first discovered and recorded by NPS survey personnel in 1991 (Fairley, et al. 1994) and monitored for the first time in FY97 (Leap, et al. 1997a).

GRCA Assessment

We did not stop at this site due to time constraints. This site should be scheduled for future stop on the upcoming Fall 2000 CRF trip.

G:03:052 Roaster Complex
Three-year Schedule

The site is situated on a dune-covered sandstone bench. It is composed of three roasting pit features, one large area of fire-cracked rock, and an associated lithic scatter. A single sherd of Moapa Brown ware was also observed on the surface suggesting a late PI-early PII Virgin association. FY96 monitors identified an additional fire-cracked rock area only seven meters from one of the originally recorded features.

Previous Work

Archaeologists recorded the site in 1991 (Fairley, et al. 1994) and the RCMP staff monitored the site in FY96 and FY98 (Leap, et al. 1996b, Leap, et al. 1998d). FY96 monitors recommended trail obliteration, and gully stabilization. After an assessment in FY97, only minor trail obliteration was completed. Trail maintenance will continue on an as needed basis by NPS.

GRCA Assessment

The trail between Features 1 and 3 is very faint. Small grass plugs and seed could be planted to obliterate the trail in Fall 2000. Due to the amount of cryptogammic soil, a small crew of (no more than two) GRCA Revegetation personnel should complete the work. The revegetation could be completed in one hour and an RCMP archaeologist should be on-site during the project.

G:03:077 Rock Art
Inactive Schedule

G:03:077 consists of three hematite pictographs and an associated grinding slick located in a major tributary of the Colorado River. The site is located adjacent to a permanent water source and has a trail leading directly to it. Cultural affiliation is unknown. The Hualapai Tribe has indicated that this is a Traditional Cultural Property of the Hualapai tribe and they should be consulted regarding any action taken or change noted at this site.

Previous Work

This site was recorded in April 1991 (Fairley, et al. 1994) and was monitored in FY93, FY95, and FY99 (Coder, et al. 1994b, Coder, et al. 1995b, Hubbard 1999a). Medium format photographs have been taken of the pictographs (Leap 1997b). Additionally, GRCA trail crews have maintained the established trail over many years. There is a well-established trail leading to the panel that GRCA maintains. The site is an attraction site for river-runners. GRCA will continue to manage any visitor-related impacts that occur and will conduct trail maintenance as needed. The GRCA River Patrol will visit the site periodically to check on any ARPA violations.

GRCA Assessment

The trail established in this area is in good condition and in no need of maintenance. The trail does not impact the site in any way, and stops approximately 10 meters from the pictograph. Trail maintenance in the future can be performed without the assistance of an archaeologist because the trail stops short of the side canyon drainage that must be crossed before arriving at the pictograph. No work was completed at this site.

G:03:067 Roasting Feature
Biennial Schedule

The site consists of five fire-cracked rock middens with associated lithics and a dispersed flake scatter. Archaeologists discovered two thin bifaces and one Moapa Brown Ware sherd upslope of Feature 1, suggestive of a late Pueblo I-early Pueblo II Virgin affiliation.

Previous Work

Archaeologists recorded the site in 1991 (Fairley, et al. 1994) and the RCMP staff monitored it annually from FY92 to FY95 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a). In FY95 the monitoring schedule changed to biennial and the RCMP staff monitored the site in FY97 and FY99 (Leap 1995a, Leap, et al. 1997a). FY94 and FY95 monitors recommend obliterating on-site trails. The GRCA trail crew conducted trail obliteration in FY96. FY99 monitors recommended trail maintenance and assessment for brush and rock linings in the drainages near Features 1 and 4. RCMP staff assessed the site and determined that no checkdams would be built. GRCA trail maintenance is warranted due to three large and heavily used camps below this site.

GRCA Assessment

Several social trails were obliterated on this trip. A trail was established near the shoreline, linking all three camp sites together. In addition to this work, several social trails were obliterated throughout the delta. The NPS trail work completed in FY96 was maintained and further defined. An archaeologist walked around the site with the

trailcrew, located all of the features on the delta, and indicated that rock for the project could be taken from the slopes above and away from G: 03:067.

A trail near Feature 1 was obliterated. Feature 2 is in need of testing and is located directly in the path of the previously defined trail work. Feature 2 should be tested for subsurface extent and integrity. The other features are out of the trail area, and the newly performed maintenance should keep people off the other features.

G:03:080 Structure-Thermal Feature Complex
Annual Schedule

The site is divided into two loci. Locus A contains numerous lithics, sherds, hand tools, and extensive rock images. The pictographs and lone petroglyph are in poor condition. Spalling and salt seep have covered several of the images. This locus is on a sheltered bench at the base of a basalt cliff, just upstream from the dune that Locus B is located on. Locus B consists of nine separate structural and fire features. Numerous artifacts are present, including fire-cracked rock, lithics, ceramics, groundstone, tools, shell fragments, and charcoal. This site has excellent potential for buried materials and datable features. Ceramics suggest a late prehistoric-early historic Pai affiliation. In March of FY95 monitors recorded a newly exposed thermal feature (Feature 9).

Previous Work

The site was originally recorded in 1991(Fairley, et al. 1994), monitored once in FY92 and FY93, and annually since FY95 (Coder, et al. 1994b, Coder, et al. 1995b, Coder, et al. 1994a, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY97, medium format black-and-white and color prints were taken of Locus A, and an attempt was made to sketch several of the distinct rock art figures. In FY99 visitor-related impacts (trailing) were observed at an all time high. Trails led from the camp, across Locus B, to Locus A. The pictographs (Locus A) are a popular attraction stop for commercial river runners and Hualapai river-runners who make the uprun.

In FY99 RCMP staff suggested yearly monitoring. It was also recommended that several trails be obliterated by planting vegetation throughout the site. They noted that visitor-related impacts, in particular trailing, should be addressed and managed by the Hualapai Nation.

GRCA Assessment

We did not stop at this site due to time constraints. However, any work suggested at this area in the future should be in consultation with the Hualapai Tribe.

CHAPTER 3

NPS PHOTOGRAPHIC DOCUMENTATION

Photographic documentation is primarily used for comparative observation of site condition and remedial actions. RCMP personnel has visually documented physical and visitor-related impacts with the use of 35mm and medium format photography. Monitors reproduce previous site photos to illustrate presence, absence and degree of change. Near to exact replicas provide an objective visual record of site condition through time, while assisting personnel in completing the monitoring form.

Medium Format Photography

RCMP archaeologists began using medium format cameras (Mamiya and Pentax 6 X 7 cm) in 1995. The justification for a larger format camera was for the increase in clarity obtained from a larger negative. Several of the semi-annual and annual sites were targeted for this type of documentation as well as other projects including documentation of remedial actions, pre and post research flows, and rockart documentation. Table 3 lists the sites that have medium format photographs. RCMP staff consistently use medium format photographs for field and lab analysis of changes in site condition. The RCMP staff plan to continue medium format photography due to its valuable contribution to the overall quality of the photo archive and its potential to quantify change.

Table 3. List of sites with medium format photographic documentation (n = 46).

A:15:005	A:16:179	C:05:001	C:09:030	C:13:009	C:13:099	C:13:322	G:03:004
A:15:018	B:10:230	C:05:007	C:09:034	C:13:010	C:13:100	C:13:347	G:03:064
A:16:001	B:11:284	C:06:002	C:09:050	C:13:034	C:13:132	C:13:349	G:03:077
A:16:159	B:15:118	C:06:004	C:09:051	C:13:069	C:13:272	C:13:365	G:03:080
A:16:163	B:15:124	C:06:005	C:13:003	C:13:070	C:13:291	C:13:371	
A:16:172	C:02:094	C:06:007	C:13:006	C:13:098	C:13:321	G:03:003	

The following photographic comparisons demonstrate change over time. In FY2001, Mark Manone (NAU research specialist) will conduct photographic comparisons not only demonstrate change, but to allow for visually quantifying sediment erosion or aggradation on or near archaeological sites. Testing this method will assist in future archaeological monitoring and treatment efforts, as suggested by the PEP panel. It will also provide preliminary consolidation of the archaeological photographic record. Both projects are funded through GCMRC.

Figure 1. Site B:15:124

Figure 2. Site C:13:099

Figure 3. Site C:13:100

Figure 4. Site C:13:321

Figure 5. Site C:13:371

CHAPTER 4

RESULTS OF SITE MONITORING

Checkdam Monitoring and Maintenance

Andres Cheama and Gabriel Yuseluw of the Zuni Conservation Project, Zuni, New Mexico, accompanied the April archaeology river trip to conduct checkdam maintenance. All 29 sites with checkdams were inspected and maintenance was completed where applicable. Fifteen sites had checkdam maintenance performed. No work was performed on sites with side canyon-based drainages and only one site with a terrace-based drainage was worked on. The remaining sites all have river-based drainages.

Forty-two individual checkdams were altered, and nine new checkdams were built. All newly constructed checkdams were built for nickpoint treatment at eight sites. The structures were constructed of nearby cobbles and gravels and are identified as rock linings. Rock linings basically follow the contour of the bottom of the drainage, or nickpoint, forming a rippling effect not an actual obstruction, such as a traditional rock checkdam.

Alterations to the 42 checkdams varied in degree. Generally, all sites east of Phantom Ranch showed minor maintenance and the 10 sites west of Phantom Ranch exhibited more intensive maintenance, particularly at Granite Park. Only five sites needed maintenance in the eastern section of the canyon. Maintenance included adding half buckets of gravels to the checkdams. The western portion of the canyon demonstrated much more activity in the way of precipitation. At site (G:03:024), for example, seven buckets of rocks and gravels were necessary to repair the previously existing checkdams. See Appendix A for the list of individual checkdams that had maintenance performed.

New Features Identified

During the course of regular monitoring activities, new features and occassionally, new sites are identified. It is no surprise given the erosive nature of the river corridor that new discoveries will persist. The continued exposure of newly exposed cultural materials serves to reinforce the notion that depleted sediments in the river system and the absence of cyclical flooding of alluvial terraces due to dam operations directly effect the condition of properties downstream of Glen Canyon Dam.

When new features are identified, they are photographed, located on the site map and sketched whenever possible. In the lab, additions are made to the IMACs forms and on the “New Feature” table in Microsoft Access.

Since the inception of the monitoring program, more than 98 new features or diagnostic artifacts have been identified at 61 sites along the river corridor. Appendix B details the site and description of each feature or artifact identified.

In fiscal year 2000, although only ½ the regularly scheduled sites were monitored, seven new features were identified at five sites. As the following site specific discussions show, some of these newly identified features have already contributed to a better understanding of the cultural affiliation and function of the known sites. Several other new features have the potential to provide additional information through carbon sampling.

B:14:105

Feature 6: 2000-2 monitor staff identified a new feature during the course of regular monitoring activities. Feature 6 consists of a 1 meter in diameter, circular feature two to three courses high. The feature is constructed of granite and limestone rock averaging five to eight centimeters in size. Ash-stained soil is eroding from the basal courses of the feature. One chert flake was identified adjacent to the feature.

Limited ceramics identified during the river corridor survey revealed a long and varied occupation from Pueblo I through the late 1880’s. The features on-site do not suggest lengthy or multiple occupations at this location. The *in-situ* fill at Feature 6 may contribute to the cultural affilitation and occupation dates at B:14:105. No charcoal or ash-stained soil is present at any of the roasting features previously identified.

Feature 6 is located adjacent to a small gully identified as recently active. The fill of Feature 6 is potentially threatened by continued gullying and downcutting. If nickpoints develop or channel meanders change, the feature will be directly impacted by gullying and valueable chronometric material will be lost.

C:13:101

In May, 2000, monitoring staff were returning from a hike along the Beamer Trail to the Palisades Delta. Archaeologists discovered a turquoise pendant eroding from an active dune area near Locus B of the site. This is the first known occurance of turquoise along the river corridor in Grand Canyon. The potential for more buried materials is very high.

The pendant measures 1.5 x 1cm. Black and white photos and color slides were taken and the IMACs form was updated accordingly. The pendant was also plotted on the site map.

C:13:371

Feature 9: During regular monitoring activities, 2000-1 monitoring staff identified a 1 meter diameter circular alignment exposed in a drainage two meters to the south of Feature 5. The feature is constructed soley of Tapeats Sandstone. No artifacts were found in the feature though it may be a storage cist or hearth associated with the Feature 5 roomblock.

Continued erosion of the drainage where Feature 9 is located will result in the exposure and loss of the feature in time. As the sediments surrounding the feature slump into the drainage, it is possible that more cultural material will be discovered at this location.

Feature 10: This overhang is located 40 meters up the talus slope west of the fire-cracked rock concentrations, Features 6 and 7. The feature measures 10 meters by 4 meters with a small, eroded roasting feature located on the eastern edge of the overhang. The roasting feature, nearly 1.5 meters in diameter is located on a flat surface of the overhang and contains fire-cracked rock extending down the slope two to three meters. The fire-cracked rock is comprised of Limestone and Tapeats Sandstone cobbles. Six Redwall and Kaibab Chert secondary reduction flakes were discovered inter-mixed with the fire-cracked rock. Serveral chuncks of charcoal are also scattered throughout the roasting feature.

Charcoal samples collected in 1996 revealed dates of AD 1665 – 1950 and AD 1445 – 1655. The ceramic assemblage on-site suggests a mid PII Puebloan occupation. Additional sampling of charcoal at Feature 10 may shed light on the occupation of this site. Samples taken from off the flood plain of the Colorado River may more accurately reflect occupations in this region.

C:13:386

During the course of their geomorphological investigations, K. Thompson and A. Potochnik identified a ceramic vessel eroding from a dune in a region not known to be actively eroding. Most of the sites on this terrace have monitoring schedules of every three years or longer. Thompson and Potochnik reported their find and a vague location of where the vessel was located. On the RCMP 2000-1 river trip, two archaeologists and three monitoring assistants stopped to identify the location and classification of the vessel.

Ceramics: One-half of a Deadman's Black-on-Red bowl was identified eroding from the dune behind the slab-lined cist. During the survey, archaeologists identfied the slab-lined cist as the only feature at this site, cultural affiliation was unknown. The newly identified bowl was photographed with black and white and color slide film and left in the position in which it was found. In addition to the bowl, a mano and 2 sandstone slabs were identified with the vessel.

Less than 30 days later, this site was monitored during the 2000-2 river trip. Archaeologists discovered the bowl had eroded down the dune and fallen into the drainage at the base of the dune. A large amount of sand had also eroded from the dune face to reveal additional slabs, what appears to be the other portion of the Deadmans' Black-on-Red bowl and a complete Sosi Black-on-White ladle. The fragile context of these vessels and the rapid nature in which the erosion occurred caused the archaeologists to rebury the two vessels, on-site, away from the dune edge

in a more stable location. Prior to reburial, the vessels were photographed with color slide and black-and-white film with scale.

Structure 2: This structure consists of two upright Dox Sandstone slabs at the base of a Dox outcrop overlooking the dune where Structure 1 is located. There are no other slabs in the area and the positioning of the two slabs parallel to one another suggests they are a cultural manifestation, likely the remains of a structure.

Artifact Scatter: While recording Structure 2, an artifact concentration was observed five meters west of the structure. Artifacts include a two-handed mano, a sandstone metate, one upright Dox Sandstone slab, and a hammerstone. This concentration area also overlooks the dune where the cist and ceramic vessels are located.

Discovery of the two ceramic vessels has allowed the RCMP to identify cultural affiliation of the site as Kayenta Puebloan and the occupation date to be approximately AD 1050 – 1100. This has contributed greatly to a better understanding of occupations of this terrace along the river corridor. Function of the site can also be inferred from the presence of food processing tools. It is the belief of the RCMP monitors that the ceramic vessels signify the possibility of human remains in the dunefield where the vessels and Structure 1 are located.

G:03:030

Feature 8: This feature was identified during regular monitoring activities on the 2000-2 river trip. Monitoring staff identified Feature 8, a roasting feature, five meters west of Feature 7. The feature consists of a tight cluster of fire-cracked rock, primarily limestone cobbles located at the contact between the terrace and the talus slope. No artifacts were identified in association with Feature 8. The feature type is identical to the other features located on-site. No new information has been generated due to the discovery of this feature.

Site Specific Observations

For fiscal year 2000 only sites on the semiannual and annual schedule were monitored (37 sites). As a result, new physical impacts were observed at 31 sites, new visitor impacts were observed at 12 sites and 9 sites had new physical and visitor-related impacts. The prominent type of physical erosion recorded was surface erosion (21 sites), followed by gullying (16 sites).

As seen in the past eight years of monitoring archaeological sites along the river corridor, trailing continues to be the number one visitor-related impact recorded. Seventeen sites monitored had trailing. The second most visitor-related impact observed was collection piles (6 sites). Specific observations for all the sites monitored in FY00 are given below.

A:15:005 Structure-Thermal Feature Complex
Annual Schedule

Three loci define this site. Locus A consists of hematite pictographs on fallen, angular, limestone boulders. Locus B contains two expedient single-coursed walls against a cliff base with lithics and groundstone. Charcoal concentrations are also identifiable on the surface. Locus C contains two roasting features and sparsely scattered artifacts. Artifacts include flakes, charcoal, groundstone and several brown ware sherds. This site may be associated with late prehistoric-early historic Pai or Paiute use.

Previous Work

R. Euler originally recorded the site in 1984. The site was re-recorded by NPS personnel in 1991 (Fairley, et al. 1994), and monitored by RCMP staff in FY93, FY95, FY96, FY97, FY98, FY99 and FY00 (Coder, et al. 1994b, Coder, et al. 1995b, Kunde 1998a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY97 GCMRC personnel completed a total station map of Locus C and trail work was conducted by GRCA. GRCA continues minor maintenance on an as needed basis by GRCA (Leap, et al. 1997a). The hematite elements were photographed with a medium format camera in FY97. The Southern Paiute Consortium visited this location to conduct ethnographic interviews regarding the pictograph panel. In FY99, the Zuni Conservation Projects personnel assessed the site for checkdam work. Upon assessment, five checkdams were installed in an active gully near Feature 1 (Kunde 1999a). This site was also included in the studies conducted by K. Thompson and A. Potochnik

(Thompson and Potochnik 2000). The 2/2000 CRF trip stopped at this location to assess the use of revegetation and trail work to deter continued visitation and destruction of the roasting features by trailing.

Physical Comments

At Locus C, the river-based arroyo below Feature 2 is active with one new nickpoint at the top. Feature 1 looked stable, as did the trail/gully with the checkdams. Loci A and B were not monitored due to time constraints.

Visitor Comments

The trail work completed by GRCA trail crew has been successful and has cut down the foot traffic by at least 50%.

Recommendations

Continue annual monitoring with checkdam and trail maintenance.

A:16:004 Structure-Thermal Feature Complex
Biennial Schedule

The site consists of numerous roasting pits, shelters with alignments and a diverse and dense scatter of artifacts. Three possible components are indicated: Late Archaic, PI-III Formative, and late prehistoric-early historic Pai and Paiute. Features include: a shelter with lithics, bone, and several manos; a shelter with lithics, a few ceramics, and a grinding slab; a shelter with an extensive roasting pit and abundant sherds, lithics, and some groundstone; an ephemeral basalt wall on top of a limestone cliff; a shelter with two meter long rock alignments with lithics, sherds, manos, and a burned beam; a large donut-shaped roasting pit about 15 m in diameter; a roasting pit measuring 5 by 10 m; a roasting pit 10 m in diameter; a horseshoe-shaped pit eroding at the base; and a smaller pit eroding into a gully. The site is located on a variety of landforms, including; stabilized dunes, Tapeats Sandstone rock ledges, and a flattened basalt outcrop.

Previous Work:

The site was originally recorded by R. Euler in 1975 and was recorded and mapped in more detail by NPS survey personnel in January 1991(Fairley, et al. 1994). The site was monitored in FY92, FY93, FY94, FY96, FY98 and FY00 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1994a, Leap, et al. 1996b, Leap, et al. 1998d). This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

Physical Comments

Features 9 and 10 are both impacted by a gully that shows recent activity. There is a nickpoint directly below Feature 9 on the northwest side, 5 cm deep. This drainage filters into the mesquite about 20 meters below Feature 9 and then disperses toward the side canyon drainage. The same drainage flows on the north side of the features and contains 8 nickpoints between Features 8 and 9. Feature 7 is located adjacent to the side canyon drainage and could be obliterated by a side canyon flood. Feature 3 is stable and unchanged. Feature 5 has substantially changed since 1993 due to an active gully cutting directly through the shelter. This gully should be monitored and possibly treated in the future because it is exposing new cultural material, mostly lithic debris.

Visitor Comments

No visitor impacts were observed. Old trailing through the site is faint.

Recommendations

No specific preservation or recovery options are recommended at this time. The gully near Features 7-10 should be monitored for further downcutting. If monitors observe change on the next visit, then preservation options should be considered. Archaeologists and the Hualapai should evaluate some possible data recovery options at Feature 5.

B:11:272 Roasting Feature
Biennial Schedule

This site consists of a single, isolated roasting feature with no associated artifacts. The feature is situated on a diabase bench with a veneer of eolian sand overlooking the river. Surface runoff, gullying and active arroyo development exist on 50% of the site. Two distinct trails passed through the site due to the proximity of and the popularity of the camp at Dubendorf Rapid and the traditional hiking by boaters at Stone and Galloway Canyons.

Previous Work

This site was initially recorded in February 1991 (Fairley, et al. 1994) and monitored at least annually from FY92 through FY96 and once in FY98 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a, Leap, et al. 1996b, Leap, et al. 1998d). GRCA rehabilitation crew obliterated the trail west of the roasting feature in February 1995 and this has proven to be very effective. Detailed total station mapping was completed in FY96 (Leap, et al. 1996b).

Physical Comments

The feature is stable and unchanged.

Visitor Comments

No sign of human visitation was observed.

Recommendations

The site is very stable. Monitoring should continue due to the presence of a gully near the main roasting feature, though the monitoring schedule will be reduced to every 4 years.

B:14:105 Small Structure
Biennial Schedule

This Pueblo II Cohonina site consists of a small rockshelter with a single-room formed by a single-coursed wall of undressed, tabular and blocky sandstone elements. Adjacent to the wall is a light scatter of approximately 25 lithics and seven sherds. Three roasting features are present below the shelter as well as a single course wall, two meters long. A new circular hearth/cist feature (Feature 6) was identified in FY00.

Previous Work

Archaeologists recorded the site in 1990 (Fairley, et al. 1994) and the RCMP staff monitored it in FY92, FY93, FY94, FY96, and FY98 (Coder, et al. 1994a, Coder, 1994 #11, Coder, 1995 #10, Leap, 1996 #25, Leap, 1998 #195). During the 1996 research flow, scientists used the camp below this site and severely trampled the site area (including camping on-site and rearranging artifacts). RCMP staff recommended trail obliteration work in FY96 and completed it in FY98. Monitors recommended planting vegetation in FY98 because the trails had become small river-based gullies. FY98 monitors recommended monitoring trail work during regularly scheduled monitoring visits. FY99 monitors assessed the site for more trail work and determined that none would be done due to heavy on-site vegetation. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

Physical Comments

Feature 5 has minor rock movement on the southern edge. Feature 3 has had rock slump and some rocks have split in half. A small nickpoint is present at this feature though it does not appear active. Continued downslope erosion of fire-cracked rock occurs at Feature 2. Feature 1 is unchanged.

Visitor Comments

There are trails present on-site though the trail adjacent to Feature 4 is improving.

Recommendations

A new circular feature, Feature 6, was identified 3 meters from Feature 3 (towards the boat beach) see the Imacs form for description. The trail to the site from the dune is now a very active gully. There should be revegetation and checkdam assessments conducted here.

B:15:138 Thermal Feature
Annual Schedule

RCMP archaeologists identified and recorded this site in April 1997 (Leap, et al. 1997a). This site consists of two concentrations of fire-cracked rock and a sparse scatter of lithics and sherds. Feature 2 appears to be the remains of a slab-lined roasting feature. Feature 1 has no intact morphology and is an array of fire-cracked rock with associated artifacts. Multiple trails are on or near the site due to its proximity to a popular side canyon hiked by river runners.

Previous Work

RCMP staff recorded the site in 1997 (Leap 1997c). The trail directly below Feature 2 was obliterated at the time the site was recorded and a new trail was outlined below the site. Visitors (river runners) destroyed the work the following summer. In September 1997 a total station map was completed (Leap, et al. 1997a). Though the trail work was destroyed, a second round of obliteration was conducted in October 1998. FY98 monitors recommended planting vegetation. Additional trail work was completed in FY99 (Hubbard 1999a). Access was blocked off to the drainage by using dead brush found in the side canyon drainage. It was determined that the features are most vulnerable to hikers (river runners) coming back down to camp from the upper Tapeats Sandstone ledges. A small rock cairn was constructed and hidden in the ledges so it is only visible from above. Theoretically, lost hikers will see the cairn from above, directing them down the ledges away from the site. RCMP staff placed deadfall in the drainage to block the upper portion of Feature 2. Approximately seven meters of the area was treated and all work was photographed. FY99 monitors recommended planting vegetation. In February 2000 NPS rehabilitation crews completed another assessment for trail work. See Chapter 2 for a detailed description of this work.

Physical Comments

Active surface erosion and gullying are occurring in Features 1 and 2. This is a definite result of continuous trailing and camping on-site. The main gully at Feature 2 has widened and deepened. Numerous artifacts and fire-cracked rock debris are surfacing and eroding down slope. Three nickpoints were identified at Feature 2 and 1 nickpoint was identified at Feature 1.

Visitor Comments

Visitor impacts are not related to river fluctuations. The site is located at a popular lunch, camp and hiking spot. The route to the canyon cuts through the site causing severe trailing and advanced gully erosion. Efforts to obliterate the trails by GRCA have not improved the site. People are camping on-site and digging level platforms. The site is in poor condition.

Recommendations

Since 1997 trail obliteration has been conducted by GRCA staff, but to no avail. Again, in February of 2000, the Colorado River Funds (CRF) trip personnel assessed the area for trail maintenance and revegetation. However, the site is in such poor condition, retrailing and revegetation work would not benefit the site. GRCA river archaeologists submitted a proposal to the Park's Fee Demonstration program for dollars to excavate Features 1 and 2 of this site. It is anticipated that data recovery will occur in November 2000. More detail of the excavation will be disseminated to PA signatories this fall.

C:02:096 Structure-Thermal Feature Complex
Annual Schedule

The site consists of two sheltered areas separated by a drainage and talus cone. The upstream area (Locus A) consists of a shallow overhang with an ephemeral wall. The wall consists of small, local limestone cobbles in a single ground level course. The front of the shelter ledge might exhibit some alignment and level preparation. One large tertiary flake of white-orange Kaibab Chert was noted, as well as a long, tapered river cobble (pestle shape),

pecked on two faces with a smooth surface on another margin. Locus B is located about 60 meters downstream of Locus A under a west-facing Kaibab Limestone overhang. An arroyo flows beneath the overhang dripline, exposing layers of river-deposited silt/sand inter-bedded with coarser sand and gravel colluvium. Several layers of charcoal and cultural features are exposed in the arroyo sidewalls as well. O'Connor and others (O'Connor, et al. 1994) reported finding fluvial-transported charcoal at a depth of about 2.5 m below present ground surface, near the bottom of the stratigraphic section. The radiocarbon dates from this research dated from 4567-4125 B.P. FY97 monitors recorded a partially mineralized, worked stick in Locus A. FY97 monitors discovered new lithics and a Moenkopi corrugated sherd eroding from the Locus B arroyo. FY00 monitors recorded a point base, charcoal and other lithic debitage on the arroyo floor.

Previous Work

Archaeologists originally recorded the site in 1991 (Fairley, et al. 1994) and the RCMP staff monitored it in FY95, FY96, FY97, FY98, FY99 and FY00 (Coder, et al. 1995b, Leap, 1996 #25, Leap, 1997 #194, Leap, 1998 #195, Kunde 1998a). Monitors recommended checkdam installation in FY96. In FY97 the RCMP staff assessed this area for checkdam installation and determined that the arroyo system is at an active stage that would not be conducive to checkdam construction. Surveyors completed a total station map in FY97. In FY97, FY98, and FY99 monitors consistently recommended data recovery for the features exposed at Locus B. FY99 monitors collected charcoal samples for radio carbon dating from Features 2 and 9. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). The cultural PEP panel also visited this site.

Physical Comments

Features 4, 5, and 8 show an increase in bank slump. A new section of Feature 5 was exposed by active bank slump, causing a new nickpoint to form. The lens is now exposed to the floor of the arroyo. Two small arms of the arroyo above Features 4 and 5 are causing increased slump to both features. There is minor slump in the center of Feature 1. A large chunk of sediment slumped above Feature 7 but only brought about minor damage. There is a small charcoal lens 1.5 m below and 1 m west of Feature 8, it is unclear if this is Feature 2. Features 2, 3 and 6 were not located because of the lack of location reference in the photos and on the map. There are numerous artifacts of charcoal and lithics in the base of the arroyo. A base of a point was found eroding from Feature 8.

Visitor Comments

No sign of human visitation was observed.

Recommendations

Data recovery has been recommended at this site for the past 5 years because of the consistent increase of erosional activities to the features. If data recovery is not completed in the near future, the next substantial rainfall has the potential to obliterate the remaining features. This site has high potential for early human activity. The discovery of the point base at Feature 8 shows that data potential still exists at this time. Locus A was not monitored due to time constraints.

C:02:097 Artifact Scatter
Inactive Schedule

The site consists of two Kaibab Limestone rockshelters with sparse but diverse artifacts within and on the slope below. Shelter 1 has a mostly bedrock floor (there is old alluvial sediment at the back) and contains lithic tools such as one core, a flake scraper, two uni-edge cobble flakes, and a thick biface. Other artifacts include bones, two manos, flakes, and six sherds. There is a historic/modern fire pit with rusted cans, plastic, and tattered underwear. Shelter 2 is smaller, but has more interior fill and a possible one-course-high wall enclosure. A core and flake were found on the slope below. Ceramics suggest two possible occupations: Pueblo I and late to early Pueblo III. Tools range from expedient flake tools to bifaces and manos. The artifact assemblage is suggestive of more than just overnight or single activity use. FY95 monitors found a Tusayan Gray ware corrugated sherd at Shelter 2.

Previous Work

Archaeologists recorded the site in 1991 (Fairley, et al. 1994) and the RCMP staff monitored it in FY95, FY97 and FY98 (Coder, et al. 1995b, Leap, et al. 1997a, Leap, et al. 1998d). FY95 monitors recommended trail work at C:02:097. The GRCA trail crew performed retrailing and trail obliteration work in FY96. This site was also looked at closely during the research flow in 1996 (Balsom and Larralde 1996). FY97 monitors recommended more extensive trail work in the area. However, FY98 monitors noted that the extensive trail work completed at C:02:098 will have positive repercussions for trailing around C:02:097. The 2/2000 CRF trip stopped here to assess the need for continued trail obliteration work and revegetation work with GRCA.

Physical Comments

Minimal physical erosion is present throughout the sheltered areas. No impacts appear to threaten site integrity at this time.

Visitor Comments

A heavily used trail is located just below the sheltered areas. There is also a lot of trash but this is also located outside the sheltered areas.

Recommendations

See the 2/2000 CRF trip report (see Chapter 2) for information regarding trail work at C:02:098, the site adjacent to C:02:097. The work completed at site C:02:098 will extend onto C:02:097. Monitoring should only occur before and after flows of 45,000 cfs or greater. This is a good location for Reclamation to study various flow regimes that would effect archaeological sites because of the sites location proximal to the river.

C:02:098 Artifact Scatter
Annual Schedule

The site consists of an overhang with a charcoal scatter, one sherd, one sandstone mano, and a flake scatter. The terrace at the base of the overhang has been cut by high water, and charcoal is eroding from this cut. Cultural affiliation is unknown.

Previous Work

Archaeologists recorded the site in 1991 (Fairley, et al. 1994) and RCMP staff monitored it in FY95, FY97, FY98, FY99 and FY00 (Coder, et al. 1995b, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1998d). FY95 monitors recommended trail work, planting vegetation and testing for subsurface cultural material. The GRCA trail crew completed trail obliteration work in FY96. This site was recommended for data recovery in FY97. FY98 monitors recommended installing checkdams and surveyors completed a total station map in FY98. FY99 monitors noted that no new trails were apparent, however, erosion has obliterated some of the previous trail work. FY99 monitors and Zuni Conservation Projects personnel assessed the gullies/trails for checkdam construction and scheduled work in FY00. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). 2/2000 CRF trip participants assessed this location for trail obliteration and revegetation work.

Physical Comments

No new physical impacts were observed.

Visitor Comments

Trailing has increased since the last monitoring episode. As a result of the trailing, several gullies have formed.

Recommendations

The lower branch of the trail/gully should be obliterated. Revegetation work needs to be done below the overhang leading to the river. Angler and tourist traffic is the greatest impact to this site. Trailing has collapsed some gullies but the site appears stable regarding physical impacts. See the CRF 2/2000 trip report (Chapter 2) for more detail on the preservation assessments made for this location. As with all trail work recommended throughout the report,

GRCA trail crews and volunteers on the CRF trips will conduct the work and a GRCA archaeologist will be on-site while the work is being completed.

C:09:050 Special Activity Locus
Semi-annual Schedule

The site originally consisted of a single complete Tusayan Black-on-Red mug/pitcher eroding out of a cutbank, and nine rectangular rock cobbles in an alignment adjacent to Little Nankoweap Creek. After its discovery, the vessel was stabilized with local cobbles and boulders, then covered with sand. Park Archaeologist J. Balsom subsequently collected the vessel, and several others from the same locale, on a later visit. This is considered a Late Pueblo I-Early Pueblo II Formative site.

Previous Work

This site was discovered and initially recorded by NPS survey personnel in September of 1990 (Fairley, et al. 1994). Due to the site's proximity to a major river camp and the precarious nature of their depositional situation, the four vessels were subsequently removed to the South Rim at the discretion of the Park Archaeologist. The site was monitored once in FY92 (Coder, et al. 1994a) and semi-annually from FY93 through FY00 (Coder, et al. 1994b) (Coder, et al. 1995a) (Coder, et al. 1995b) (Leap, et al. 1996b) (Leap, et al. 1997a) (Hubbard 1999b, Kunde 1998a, Leap, et al. 1998d). Medium format photographs of the pot cache were taken in FY95 and FY98 (Leap 1995a, Leap 1998b). Hereford et al. included this site in their geomorphic map of the Nankoweap area (Hereford, et al. 1996b). In FY97 an extensive water diversion structure was constructed at the base of the cutbank to curtail further erosion from side canyon flooding and bank slump (Leap, et al. 1997a). Upon completion of the stabilization, a total station map was completed of the entire site. Andres Cheama from the Zuni Conservation Team noted that the NPS should plant grass seeds and possibly cacti on the slope for further stabilization. Frank Hayes from NPS revegetation could plant cactus on the slope on a future NPS river trip.

Physical Comments

More cryptogamic soils are present on the upstream side of the site, indicating some stability. However, there appears to be more surface erosion on the downstream side when compared to a photo taken about two years ago, 4/18/98.

Visitor Comments

No human visitation was noted.

Recommendations

No management recommendations are warranted at this time. Although surface erosion has increased, monitoring is the only management recommendation. Past recommendations by Zuni conservation personnel and GRCA staff included planting vegetation on the slope. The Park will take the lead on planting grasses along the slope.

C:13:006 Small Structure
Annual Schedule

The site is eroding out of a reworked dune at the mouth of a major side canyon. It consists of a Pueblo II Kayenta ceramic and lithic scatter eroding from a dune face with a fire-cracked rock and cobble-strewn, ashy midden. Survey personnel identified four to five possible rooms present but in fair to poor condition (RCMP staff question this observation even after mapping the site in detail with a total station instrument). Due to active erosion in the dune area, several additional features have been recorded since the river corridor survey. In FY95 monitors made several additions to the site map, including walls eroding out of gullies, an additional roasting pit, an artifact concentration, and several new drainage channels. Groundstone is present though no formal tools have been observed.

Previous Work

The site was recorded in the early 1960s, 1965, and 1984 and again in 1990 (Fairley, et al. 1994). River corridor archaeologists monitored this site annually in FY92 and FY93, semiannually in FY94 and FY95, and back to annual

from FY95 to FY99 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY95 a stationary camera was placed across from the site (Coder, et al. 1995b), but was removed after FY96 because the photographs only showed stochastic changes (Leap, et al. 1996b). In FY95 the Zuni Conservation Project personnel assessed the site for checkdam installation. In FY96 a GRCA recreational specialist and revegetation employee assessed the site for planting vegetation and placing jute mat on the deflated areas. The site was mapped with a total station in FY96 (Leap, et al. 1996b), and medium format photographs were taken prior to the BHBF in 1996 (Balsom 1996). Twelve checkdams were built in the two active gully systems and jute mat was laid in the deflated dune areas (Leap 1996c, Leap, et al. 1997a, Leap, et al. 1996b). Additional vegetation work was completed at this site in FY97. In FY97 and FY99 Zuni Conservation Project personnel conducted minor maintenance on some of the original checks. Increased sediment deposition demonstrated at this site is a result of checkdam construction. This area was researched by Thompson and others in 1998 and 1999 (Thompson and Potochnik 2000). Minor checkdam work was performed, including the addition of two new checkdams.

Physical Comments

The slope closest to the river looks the same since 1997 photos. The entire dune looks good. Only minor loss of vegetation has occurred since May, 1995. Upon additional investigation and research completed by Thompson and Potochnik (Thompson, 2000) the upstream drainage is river-based rather than terrace as previously categorized.

Visitor Comments

No sign of visitation was observed.

Recommendations

As discussed in Chapter 2, grass plugs from the downstream side of 60 Mile Canyon should be transplanted on this delta. The delta appears very stable overall with little change observed with the exception of vegetation loss. Refer to Chapter 2 for more detail on the preservation assessment.

C:13:007 Small Structure
Biennial Schedule

This is a mid-late Pueblo II-early Pueblo III Puebloan occupation consisting of three, possibly 4 structural outlines (Features 1-4). Feature 1 is an L-shaped structure open to the east. Feature 2 is the remains of a rectangular structure outline, also open toward the east. Feature 3 is another L-shaped structure. Feature 4 is the remnant corner of a single-course structure. Before 1993, campers used the structural elements to hold down tents, and the site has apparently gone through a phase of deterioration since its original recording. Many sherds and Features 3 and 4 have disappeared since originally recorded. Some fire-cracked rock, sherds, a few flakes, ashy soil, and rodent bones of questionable affinity are present. Archaeologists have not recorded any formal tools.

Previous Work

This site was discovered in the early 1960s and recorded in 1965 by Prescott College. GRCA archaeologists recorded the site in 1990 (Fairley, et al. 1994). RCMP staff monitored the site in FY93, FY94, FY95, FY97 and FY98 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Leap, et al. 1997a, Leap, et al. 1998d). In 1992 the GRCA trail crew stabilized a portion of the site by constructing a retaining wall and placing jute mat and grass seed across the site's surface. Heavy rains in 1993 obliterated the retaining wall, but the GRCA trail crew repaired the wall in 1994 (Coder, et al. 1995a). No other remedial actions were recommended after the trail project except for maintaining the stabilization work completed in FY92. R. Hereford completed a photogrammetric map in 1993 that includes the site area (Hereford 1993). This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

Physical Comments

Minor surface erosion is present throughout the site, mainly in the old trails.

Visitor Comments

A trail is currently being used that leads from the camp to the site.

Recommendations

The 2/2000 CRF trip discussed additional work that may be done at this site. See Chapter 2 for more details. RCMP monitoring will lessen the monitoring frequency to every four years because the main impacts are visitor-related.

C:13:010 Pueblo
Annual Schedule

This is a large, multi-component habitation site divided into three "locales." Locale 1 was recorded in 1965 and Locales 2 and 3 were discovered on a 1983 GRCA monitoring trip. Five structures and 21 features are assigned to Locale 1, including a pithouse, several one to two room masonry structures, a pueblo, cists/hearths, and rubble/wall alignments. Four structures and 16 features are noted at Locale 2, including rooms and rubble piles. Locale 3 contains two structures and five features, including a shelter, cists and wall/room remains. Testing results suggest the site may have had two to three occupations, including use by Pueblo I Cohonina and Pueblo II Puebloan; ceramics also suggest a late prehistoric-early historic Hopi connection. For details consult the 1984 excavation report (Jones 1986). The site contains numerous river-based drainages.

Previous Work

Archaeologists conducted data recovery at this site in 1984 (Jones 1986) as a result of high water releases that inundated cultural remains along the river. GRCA closed this site to visitors in 1985 due to the fragility of the terrain. Geomorphologists completed a topographic map of C:13:010 in 1993 using photogrammetry (Hereford, et al. 1993). The RCMP staff monitored the site annually since FY95 (Coder, et al. 1995b, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). FY95 monitors recommended stabilization and total station mapping. FY96 monitors recommended installing checkdams and data recovery. During the 1996 research flow, the RCMP staff conducted supplemental monitoring efforts at this site (Balsom and Larralde 1996). FY97 monitors recommended data recovery, total station mapping, stabilization, and checkdams. After an assessment in FY97, monitors determined that checkdams would not be effective. FY98 monitors recommended data recovery. The RCMP staff assessed the site for data recovery in FY97 and FY98. In FY98 and FY99 the RCMP staff implemented a limited data recovery project and completed medium format photography. The RCMP staff will complete a separate report detailing this work upon completion of the analyses. FY99 monitors recommended additional data recovery. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

Physical Comments

Feature 39 has lost some sediment and appears more eroded than previously. Feature 3 has had an increase in eolian deposition in the area just above the alignment. Feature 48 was an increase in eolian deposition in the drainage and some of the slabs have fallen. At Feature 49 there was an increase in eolian deposition, covering the vegetation present in the 1994 photo. Feature 4 has increased eolian deposition in the basal course. No change was observed on the eastern portion of the site at Features 10, 11, and 40-47.

Visitor Comments

Even though 31 people visited this site in March, (PEP trip) the footprints were completely erased. The manos at Feature 34 were moved and 2 additional manos were added to the metate.

Recommendations

Continued data recovery is highly recommended at this site. Though the features are unchanged since last monitored, they are in extremely poor condition and significant, *in situ* artifacts are being lost.

C:13:069 Small Structure
Annual Schedule

This large site consists of several cists and masonry structures. Feature 1 is a slab-lined cist remnant. Feature 2 may be a masonry room with midden. Feature 3 is a masonry wall. Feature 4 consists of eroding slabs where additional architecture may be present. Feature 5 is a well-preserved cist. Feature 6 is a masonry room. Feature 6B is another

masonry room outside of the main dune area. Ceramics suggest a Pueblo II-early Pueblo III affiliation. The site is near the Tanner Trail and a well-used beach camp.

Previous Work

Prescott College personnel originally recorded this site in 1972. NPS personnel re-recorded this site in 1990 (Fairley, et al. 1994), and monitoring occurred in FY93, FY95, FY96, FY97, FY99 and FY00 (Coder, et al. 1994b, Coder, et al. 1995b, Leap, et al. 1997a, Leap, et al. 1996b). As part of the GCES Phase 1 program, Ted Melis took a carbon sample at this location. No information has been disseminated to the RCMP office concerning the results. In 1992, the GRCA Rehabilitation Project conducted trail obliteration, revegetation, and stabilization of minor drainages. Medium format photos were taken of this site in FY96 (Leap 1996a). Upon completion of a stabilization assessment in FY97, six checkdams were constructed along the drainage bisecting the features. One existing checkdam was reconstructed and five new checkdams were built. A total station map was also completed for this site in FY97. See Hereford (Hereford 1993, Hereford, et al. 1993)[Hereford, 1996 # 19] for photogrammetric topography mapping of the immediate area. Maintenance work on the checkdams was completed in FY99 (Hubbard 1999a). The 2/2000 CRF trip assessed the trail for revegetation work.

Physical Comments

Features 3, 4, 5, and 6 are in stable condition. At Feature 1 there is new sediment fill at the base of the feature where it meets a large log (placed in the arroyo for stabilization efforts) in the drainage. The dune areas directly north and south of Feature 1 had an advancement of eolian erosion, exposing numerous sherds and lithics. The artifacts are moving towards the drainage. Feature 2 has recent bank slump and moderate evidence of eolian erosion and alluvial deposition.

Visitor Comments

A collection pile of 4 sherds was observed near Feature 5, this collection pile was dispersed. Footprints were observed adjacent to Feature 3 leading to the top of the dune. The main trail that leads out of camp to Hilltop Ruin travels through the site. There has been trail maintenance in the past but the trail still bisects the site.

Recommendations

RCMP staff recommends obliteration of the main trail through the site and retrailing downstream of the site. This would reduce future visitor impacts. Features 1 and 2 are highly recommended, again, for data recovery due to their location in the gully and the continuous dune activity that makes these features highly vulnerable.

C:13:070 Small Structures
Annual Schedule

This site has four loci (A-D) and is situated on a highly dissected structural terrace. Locus A has three artifact scatters near the drainage mouth and along the terrace edge to the northeast. Locus B is a rubble mound that suggests a small masonry structure. Abundant sherds and lithics are located around the structure and upslope. Locus C consists of a dense scatter of charcoal (historic) and artifacts scattered over the surface. Locus D includes several artifacts and three to four charred logs exposed in an arroyo that may be the remains of a roof. The quantity and diversity of artifacts suggests that this is a habitation site; however, few architectural features are visible. Artifacts indicate a Pueblo II-early Pueblo III occupation. In FY96 monitors found small mammal bones on the northeast edge of Locus A, and in FY97 they found a basalt axe fragment in the artifact concentration of Locus D. Both the roof remains and the axe fragment are rare in Grand Canyon.

Previous Work

The site was originally recorded in 1973 and re-recorded in 1991 by NPS personnel (Fairley, et al. 1994). The site was monitored in previous years by GRCA, and more recently monitored under the RCMP: once in FY93, twice in FY94, FY95, and FY96, and annually since then (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY95 medium format photographs were taken for drainage documentation. In FY95 PA members wanted RCMP staff to select certain sites to measure artifact movement within one-meter square. These surface analysis units were removed in FY96 as

per discussions with PA representatives (Leap, et al. 1996b). The results of one year were inconclusive and highly subjective. In May 1996 the Zuni Cultural Resource Advisory Team (ZCRAT) monitored the site and their recommendation was to install several checkdams. A total station map of Loci B, C and D was completed in September 1997 in anticipation of some type of preservation treatment (Leap, et al. 1997a). Upon further assessment in FY97 and FY99 with the Zuni Conservation Project personnel, they determined that installing checks "would be a time consuming, expensive and risky effort." It was determined that the arroyo systems were (are) too advanced for any practical stabilization effort. In FY99 samples were taken from the charred logs (possible roof fall) in Locus D. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). The PEP participants stopped at this location in March, 2000.

Physical Comments

Locus B is stable and unchanged since last monitored. No footprints were evident suggesting active eolian deposition and erosion since over 30 people visited this site 1 month ago on the 3/2000 PEP trip. The drainage at Locus D has been active, slumping below the burned logs. Locus C is stable and unchanged. Locus A is stable and unchanged.

Visitor Comments

Artifacts have been piled up in Locus C. These 2 collection piles were dispersed.

Recommendations

This site should be excavated, see FY99 synthesis report (Leap et al., 2000). Locus D, the burned logs, requires more than carbon sampling. Additional work should be done here to understand the relationship between this large multicomponent site, the adjacent sites, and Unkar Delta (across the river). More cultural remains will be exposed and displaced if recovery options are not taken soon. This location should also be investigated from the perspective of alluvial deposition and erosion contrasted with old high water shoreline deposits. One approach may be to investigate how the terrace bank retreats at different flow levels and if river flows cause the arroyo mouths to change.

C:13:098 Historic Structure
Annual Schedule

This historic mine and cabin site contains two loci. Locus A consists of two mine adits at the base of the Palisades cliff along the Palisades fault. The main adit is situated about 10 m above the surrounding terrain with an extensive tailing pile below it. The second adit is located about 10 m below and 20 m south of the main adit. About 225 m S/SW is Locus B, which includes a log cabin constructed of driftwood logs. The cabin measures 2.6 x 4.1 m (interior) and is five courses high. The floor is partially paved with sandstone slabs, with a log/board bed frame in the northeast corner. A canvas tent probably formed the upper walls and roof. About four meters due south of the cabin door is a driftwood log "fence". This structure is made of stacked logs up to four courses high. It may have been a windbreak. Artifacts date from 1900-1920 to the mid-1930s. In FY98 monitors found a cist feature eroding in the drainage near the cabin.

Previous Work

This site was initially recorded by Euler and Jones in 1978 and then re-recorded by NPS personnel in 1990 (Fairley, et al. 1994). GRCA documents from 1929 and 1930 reveal an investigation made by the Park Service on the lode mining claims by George W. McCormick and others in May 1913 (Busch 1930, Daly 1929). RCMP staff monitored the site semiannually from FY93 to FY98 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY98 it was determined that annual monitoring would suffice, therefore monitoring only occurred once in FY99 (Kunde 1998a). See Hereford (Hereford 1996, Hereford, et al. 1996a) for a photogrammetric topographic map of the immediate area. In FY95 the cabin and associated artifacts were photographed with a medium format camera. Currently, and prior to the inception of this program, NPS trail crews have maintained the trails in the area. Rehabilitation personnel made an assessment at this site in 2/2000.

Physical Comments

The physical impacts to this site are minimal to nonexistent.

Visitor Comments

Backpackers continually visit this site, however, it does not appear to be effecting site integrity.

Recommendations

See **Chapter** for the results of the assessment made on the CRF trip in February 2000. It was recommended to create and manage a public trail to this site.

C:13:099 Structure-Thermal Feature Complex
Semi-annual Schedule

This site contains two loci of fire-cracked rock, buried and collapsed structures and artifacts. Archaeologists identified several charcoal lenses, burned rock features and artifact concentrations. Many of the features are eroding out of the coppice dunes, bisected by a highly active drainage system. The drainage system has uncovered the majority of this site since 1978, evidenced by several newly exposed features recorded by GRCA and RCMP archaeologists. FY94 monitors recorded Features 6 and 7 eroding from the active drainage. FY95 monitors recorded Feature 8 eroding from the active arroyo. RCMP staff identified two new probable cists eroding from the active arroyo in FY98. RCMP archaeologists tested the probable features in FY99 and did not discover cultural material. Since 1990, RCMP staff has discovered numerous lithics and sherds eroding from the active arroyo and scattered throughout the drainage system. An assemblage of forty sherds suggests an Early-mid Pueblo II Puebloan occupation. Lithic evidence from this site includes two mano-like objects, ground to create a knife-like edge, as well as pecked grinding stones and hammerstones. Five charcoal samples were taken from several features on-site in the early 1990s. Dates ranged from 140 years B.P. to 1410 years B.P.

Previous Work

Archaeologists originally recorded the site in 1978. Prior to the implementation of the monitoring program (late 1980s) GRCA conducted excavation and collected samples of a deteriorating feature (Feature 3). The RCMP staff monitored C:13:099 semiannually since FY93 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Kunde 1998a, Leap 1995b, Leap 1996a, Leap 1997c, Leap 1997e, Leap 1998b, Leap and Hubbard 1996c). FY94 monitors recommended trail work, installing checkdams, total station mapping and subsurface testing. FY95 monitors recommended trail work, planting vegetation, installing checkdams, subsurface testing, data recovery and total station mapping. In FY95 the GRCA trail crew performed trail obliteration work along the Beamer Trail, which relocated the hiking trail near the river to reduce visitor impacts.

In September 1995 RCMP staff and representatives from state and federal agencies, and tribal entities constructed 44 checkdams at C:13:099 (Leap 1995c). C:13:099 is the first location where Zuni-style checkdams were built in the river-corridor. Archaeologists used a photogrammetric map (Hereford, et al. 1993) for recording, prior to completion of a total station map in FY97. Each checkdam was photo-documented before and after its construction with 35mm prints and slides. FY96 monitors recommended additional trail work and planting vegetation. Trail obliteration work was completed in FY97. RCMP staff conducted additional monitoring efforts during the research flow of 1996 (Balsom and Larralde 1996). FY97 monitors recommended checkdam maintenance and data recovery. FY98 monitors recommended data recovery, planting vegetation and checkdam maintenance. Checkdam maintenance projects were completed in FY97 and FY98 (Leap, et al. 1997a, Leap, et al. 1998d). Monitors recommended medium format photography and projects were completed in FY95, FY96 and FY98 (Leap 1995a, Leap 1996a, Leap 1996b, Leap 1998a). FY99 monitors recommended trail work, planting vegetation and data recovery. Archaeologists conducted feature excavation and exploratory testing at Features 1, 3, 7, 9 and 10 in FY99. RCMP will disseminate the results of this project after an analysis is completed. FY99 monitors recommended more extensive excavation. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). In 2/2000 the NPS Rehabilitation crewed made an assessment of the area for trail work.

Physical Comments

Most features have received minor physical impacts since last visited in the Spring of 1999. There is evidence of continual surface erosion and bank slump with minor movement of artifacts and sediments downslope towards the arroyo base. Feature 1 has minor bank slump on the southeast edge of the feature causing the terrace to collapse into the arroyo. Features 2 and 3 have experienced minor surface erosion. Features 4 and 5 are stable. The checkdams

appear stable and are adding to overall site stability, as seen by the amount of sediment (15 cm deep in some locations) behind the checkdams.

Visitor Comments

There are no trails on-site, however there is a trail located west of the site that is used by backpackers and boaters who visit the McCormick mines and cabin (C:13:098). C:13:099 is located behind a river camp that is used moderately by backpackers and boaters. A collection pile was located adjacent to the boat beach.

Recommendations

See the FY99 synthesis report (Leap et al., 2000) that explains data recovery options. The drainage effecting this site is river-based and continues to be the main cause of erosion. Data recovery options are recommended. Also see the 2/2000 CRF results in Chapter 2 for trail work and a long-term management assessment for the area.

C:13:100 Pueblo
Annual Schedule

This site is an open Pueblo II habitation site. Feature 1 is a rectangular habitation room. Feature 2 is another probable habitation room with a possible south entrance; it has standing walls two to three courses high. Adjoining Feature 2 is Feature 3, a small, more difficult to define structure; there may be another room attached to the southwest wall of Feature 3. Feature 4 and Feature 8 are probably associated rooms. Both features are exposed in an arroyo, with walls two to three courses high. Features 5 and 6 are the remains of slab-lined cists of Dox Sandstone. A charcoal stain in a trail evidences feature 7. South of the dwellings is an eroding drainage two meters across and 50 cm deep. Lithics and ceramics are scattered down the slope directly above the drainage. There is a heavy groundstone concentration near Features 5 and 6. Groundstone/tools include six manos, four metates/slabs, eight hammerstones, and two sandstone knives. Seven ceramic sherds were also found. During the September 1995 erosion control project, archaeologists located a new feature (Feature 9) consisting of upright Dox slabs in an arroyo. FY97 monitors discovered two new features. Feature 10 is a charcoal lens north of Feature 7 and Feature 11 is a circular cist/hearth eroding from the drainage.

Previous Work

Archaeologists originally recorded C:13:100 in 1978 and it was monitored by GRCA archaeologists until FY92. Beginning in FY93, the RCMP staff monitored the site semi-annually (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Kunde 1998a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). FY94 monitors recommended revegetation work, trail work, checkdam installation, total station mapping and stabilization. FY95 monitors recommended planting vegetation and trail work due to heavy visitation. The RCMP staff conducted appropriate assessments and in FY95 trail work and checkdam installations were conducted (Leap and Coder 1995). FY95 monitors decided that no vegetation would be planted.

This site received additional monitoring during the research flow of 1996 (Balsom and Larralde 1996). FY96 monitors recommended additional trailwork. The area received further trail obliteration work in FY97 and surveyors completed a total station map in June 1997. Prior to completion of the total station map, RCMP staff used a photogrammetric topography map to plot additional features (Hereford 1996). Monitors recommended medium format photography and projects were completed in FY95, FY96, and FY98 (Coder, et al. 1995b, Leap, et al. 1996b, Leap, et al. 1998d). FY98 monitors recommended checkdam maintenance, testing and data recovery at Features 5, 6, 7, 9, 10, and 11 before losing more cultural information. The RCMP staff and Zuni conservators completed checkdam maintenance in February 1998. FY99 monitors again recommended data recovery at Features 5, 6, 9, and 11 and recommended annual maintenance of checkdams. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

An extensive photographic record of the Palisades delta extends back to the early 1900s. RCMP staff used this record to reconstruct the predam Palisades environment. Long-term photographic replications indicate the pervasive loss of beaches and sediment in this area since the construction of Glen Canyon Dam. A 1909 Stone expedition photo confirms that the predam Palisades shoreline consisted of broad beaches and abundant sediment. Currently, the shoreline is devoid of sediment consisting of a large expanse of exposed river cobbles.

Physical Comments

Features 1, 2, 3, 4, 7, 8, 9, 10, and 11 are unchanged. One slab has eroded from Feature 5 (slab-lined cist). Feature 6 lost some sediment off the top and below, around the broken mano.

Visitor Comments

Hikers or campers removed brush along the Beamer Trail, in the drainage where the checkdams are located. It looks like brush and logs were moved to create camp spots adjacent to the site. FY2000-1 monitors obliterated these camp locations. The trail running through Feature 2 is still present. One set of footprints was observed in this trail.

Recommendations

The cists, Features 5, 6 and 11 should be excavated since sediment loss is occurring. The main drainage has been active and minor checkdam maintenance has been completed. As discussed in Chapter 2, vegetation should be planted adjacent to the Tanner Trail to deter visitation.

C:13:273 Roaster Complex
Annual Schedule

This site consists of four roasting features, a slab-lined cist and two artifact concentrations. The roasting features all contain fire-cracked rock and charcoal. The artifact concentrations at AC-1 include over 50 items of lithic debitage and about 15-25 ceramic items. The artifact concentration at AC-2 consist of seven flakes, ten sherds, and one piece of groundstone. Feature 1, a large donut-shaped roasting feature, is similar in morphology to many of the roasters in the western Canyon. Ceramics indicate an early Pueblo I to Pueblo II Cohonina and Puebloan occupation. Radiocarbon dates taken from Feature 5 indicate an earlier occupation of AD 575 to AD 775.

Previous Work

Archaeologists recorded the site in 1990 and the RCMP staff monitored it in FY93, FY95, FY96, FY97, FY98 and FY99(Coder, et al. 1994b, Leap 1994a, Leap 1995b, Leap and Hubbard 1996c, Leap and Kunde 1998a). FY95 monitors recommended stabilization and retrailing. In FY95 RCMP staff conducted archaeological clearance work prior to a GRCA trail crew retrailing project (Leap 1995d). FY96 and FY97 monitors recommended stabilization for Feature 3 due to its precarious location on the edge of an active drainage. FY97 monitors recommended data recovery for Features 3 and 5. In FY97 surveyors mapped the site with a total station instrument, RCMP staff conducted a data recovery assessment and archaeologists excavated Feature 5 (Yeatts 1998). FY98 monitors recommended data recovery at Feature 3 due to its precarious position on the cutbank of an arroyo. FY99 monitors obliterated an access trail from the side canyon that directly impacted Feature 4. The 2/2000 CRF trip stopped at this site for a trail assessment. See Chapter 2 for the suggested rehab project.

Physical Comments

Features 1, 2, and 4 are currently in stable condition. Feature 3 is in danger of complete obliteration from the arroyo and from a gully that has initiated headcut advancement. The gully is located 1 meter southwest of Feature 3 and extends from the arroyo bank. New slump was observed below Feature 3 on the arroyo cutbank.

Visitor Comments

The Beamer Trail is impacting the west side of Feature 1 although site integrity is not threatened. No other visitor impacts were observed on-site.

Recommendations

Feature 3 should be excavated to preserve valuable information before it is completely obliterated by the arroyo and new nickpoint in the gully. See the FY99 synthesis report (Leap et al., 2000) for additional excavation recommendations.

C:13:291 Small Structure
Annual Schedule

The site consists of standing walls of several structures and Dox Sandstone cists. Feature 1 is a two-meter long wall and juniper post eroding downslope. Feature 3 is a wall exposed in a gully. Feature 4 is a hearth or cist. Feature 5 is a cluster of Dox slabs that may be coursed. Artifacts include nineteen sherds and lithics, including a chopper, a hammerstone, and a bi-edge tool. Sediment and slope wash cover the site to a depth of more than one meter in some areas. Apparently the site was constructed on a terrace, and has since been covered periodically by slope wash and fluvial sand. During the initial recording in 1988 a metate and mano were measured, documented and relocated. FY95 monitors noted that Feature 2, a slab-lined cist, was completely obliterated by the river-based arroyo. FY96 monitors discovered a Tusayan White ware/Sosi Black-on-White sherd below Feature 3. Artifacts indicate a Mid-late Pueblo II Puebloan occupation.

Previous Work

Archaeologists originally recorded the site in 1988 and again in 1990 (Fairley, et al. 1994). During the initial recording a metate and mano were relocated above the site. The RCMP staff monitored the site annually since FY92 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a, Kunde 1998a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). Monitors recommended checkdams and total station mapping in FY94, but after further assessment, the RCMP staff and Zuni conservators concluded that the drainages were too mature for checkdams. FY95 monitors recommended some form of stabilization for Features 1 and 4. During the research flow of 1996, visitors created a trail through the site on their way to Unkar Delta. The research flow created extensive cutbank erosion below the site, obliterating the formerly used trail. The RCMP staff obliterated the newly created trail in FY97, at which time a total station map was completed. Additional monitoring efforts including medium format photography were also conducted during the research flow (Balsom and Larralde 1996). FY98 monitors recommended testing, data recovery, radiocarbon samples, and dendro samples. FY99 monitors recommended data recovery for Features 1, 4 and 5, and continued trail maintenance. Minor trail maintenance was conducted in FY99. RCMP staff could not collect charcoal from the site in FY99 due to the charcoal disappearance through intensive erosion. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). In 2/2000 NPS revegetation/rehabilitation crew assessed the site for trail work. See **Chapter** for details.

Physical Comments

Features 1 and 4 are very active as seen by bank slump and arroyo activity. Additionally the post at Feature 1 has split and part of it is located below the feature. The remaining post is still upright. Several nickpoints are present in this arroyo where Feature 1 is located. This is a good indication additional downcutting will continue to advance. At Feature 4 (cist), 2 large slabs have fallen and collapsed into the arroyo.

Visitor Comments

Trailing occurs directly below the site, through and around Feature 5. This is a direct effect of the current flow regimes because it is scouring the lower beach, thus people walk up and on the site on their way to Unkar Delta. Currently, the trail is not threatening site integrity.

Recommendations

See Chapter 2 for the proposed preservation treatment, including transplanting grasses on-site. See also the FY99 synthetic report (Leap et al., 2000) for data recovery recommendations. RCMP staff will continue annual monitoring until data recovery is completed.

C:13:321 Roaster Complex
Annual Schedule

This site consists of four roasting features and a rubble mound of Dox Sandstone. The rubble mound may be associated with a historic cabin (C:13:092) located south of this site. Ceramics, fire-cracked rock and a shaped Dox Sandstone “lid” were found on-site. Over thirty flakes were present in the roasting features, as well as groundstone including four mano fragments and two cobbles. Ceramic evidence includes several Puebloan sherds ranging from A.D. 1050-1200, though specific cultural affiliation remains undetermined.

Previous Work

Archaeologists originally recorded the site in 1989 and GRCA personnel monitored it until transferred to the River Corridor Monitoring Project. The RCMP staff have monitored the site annually since FY93 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Kunde 1998a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). FY94 monitors recommended total station mapping and radiocarbon dating of Feature 5. FY95 monitors recommended mapping, testing and stabilization of Feature 5 in FY95. This site was one of three sites selected for data recovery prior to the research flow in 1996. RCMP staff conducted excavation at Feature 4, the only feature that would have been impacted by the flood. After excavation, the RCMP staff determined that Feature 4 had no subsurface deposits (Balsom and Larralde 1996). Monitors also conducted medium format photography before and after the flood (Leap 1996a, Leap 1996b). See Hereford (Hereford, et al. 1993) for photogrammetric mapping used prior to the completion of a total station map of the site in FY97. FY97 and FY98 monitors recommended observation of Feature 5 due to ongoing erosion. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). FY00 monitors replicated medium format photographs taken prior to and following the 1996 research flow.

Physical Comments

Eolian deflation is present throughout the site. Feature 5 has new deflation located at the base of the slabs lining the roaster. Minor deflation was present at Feature 2. All of the other features appear stable.

Visitor Comments

The only visitor-related impact observed was disturbance in the center of Feature 1. A popular river camp and lunch beach are located directly below the site.

Recommendations

See FY99 synthesis report (Leap et al., 2000) for management recommendations. Feature 5 should be excavated before valuable data is lost due to erosion and visitation. Continue annual monitoring due to active eolian activity and the site proximity to a camping beach. Releasing high flows of at least 60,000 cfs would cover Feature 5. As seen through other research flows through medium format photographs (Chapter 3), it is obvious that deposition occurs at this location.

C:13:339 Small Structure
Annual Schedule

The site consists of a mid-late Pueblo II habitation buried on an alluvial terrace, comprised of a burned rock midden, a buried hearth, and several rock alignments. The burned rock midden, with sparse lithics and ceramics, is located on the north side of the site. It is eroding out of a cutbank. Two historic hearths are also located on-site. The site is situated against a Dox Sandstone cliff.

Previous Work

The site was originally recorded in 1990 (Fairley, et al. 1994) and monitored in FY93, FY95, FY96, FY97, FY98, FY99 and FY00 (Coder, et al. 1994b, Coder, et al. 1995b, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). Retrailing was conducted in FY95 after completion of archaeological clearance by the river corridor office (Leap 1994b). Total station mapping was also completed in September 1998. Mitigation was proposed for this site in FY95 (Leap 1995c). This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). The 2/2000 CRF trip stopped here to assess the use of revegetation work to stabilize Features 1 and 6.

Physical Comments

Feature 3 is the only feature that shows signs of active erosion. The feature has been completely obliterated by a gully. The feature is gone and should no longer be monitored, however, the gully may expose new cultural material. Feature 6, the possible wall alignment exhibited no change, however, it is in a precarious position.

Visitor Comments

The Beamer Trail bisects the site, however, it does not threaten site integrity. No other visitor-related impacts were observed at the site.

Recommendations

See the FY99 synthesis report (Leap, et al. 2000) and the 2/2000 CRF trip report (Kunde and Hubbard, 2000) for preservation treatments. J. Kunde recommended profiling Feature 6 to determine if any portion of an alignment remains below the surface. Burned slabs lining Feature 2 indicate that it is a slab-lined roaster, see D. Hubbard thesis (Hubbard, 2000) for more information on this type of feature.

C:13:343 Small Structure
Annual Schedule

This is a Pueblo II Kayenta/Virgin limited activity area with three slab-lined features, a small artifact scatter, a fire-cracked rock scatter, and a rock alignment. After testing Features 1 and 2 in FY99 archaeologists determined that they are not cultural features. Feature 3 is a small, circular, Dox Sandstone slab-lined feature. At the top of a dune are two rock alignments; one measures four meters long and the other consists of two Dox Sandstone slabs. Artifacts consist of sherds, lithics, and fire-cracked rock; one chert scraper was noted on the survey. FY98 monitors identified Dogozshi and Sosi Black-on-White sherds in the active side canyon cutbank.

Previous Work

Archaeologists recorded the site in 1990 (Fairley, et al. 1994) and the RCMP staff monitored it in FY92, FY93, FY95, FY97, FY98, FY99 and FY00 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1998d). Surveyors completed a total station map in FY97 (Leap, et al. 1997a). FY95, FY97 and FY99 monitors recommended testing at this site. RCMP staff tested Features 1 and 2 in FY99 and confirmed that the "probable cists" were actually naturally formed during a debris flow. RCMP staff performed a 100% surface collection of a 5 x 18 meter area on-site. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

Physical Comments

Feature 3 is stable and unchanged, however, charcoal is newly exposed below Feature 3.

Visitor Comments

No sign of human visitation was observed.

Recommendations

Continue monitoring for newly exposed cultural remains. See FY99 synthesis report (Leap et al., 2000) for more detailed information regarding the excavation of Feature 3.

C:13:347 Small Structure
Annual Schedule

This site consists of a masonry wall and metate eroding out of a steep arroyo. FY94 monitors discovered a serpentine pipe bowl fragment eroding from the arroyo next to the wall. The pipe was collected by RCMP archaeologists. FY95 monitors discovered a Black Mesa Black-on-White sherd eroding from the same location. RCMP staff collected the sherd during exploratory testing in FY99. No other artifacts were found.

Previous Work

Archaeologists recorded the site in 1990 (Fairley, et al. 1994) and the RCMP staff monitored it in FY92, FY93, FY95, FY96, FY97, FY98, FY99 and FY00 (Coder, et al. 1994b, Coder, et al. 1995b, Coder, et al. 1994a, Kunde 1998a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). Monitors collected the pipe bowl fragment and curated it at the South Rim in FY94. The pipe was discovered while producing a total station map of the site. FY95 monitors recommended more extensive total station mapping. FY96 monitors conducted medium

format photography before the Research Flow and recommended checkdam installation and data recovery. FY97 monitors recommended data recovery, testing and installing checkdams. Zuni conservators and RCMP staff assessed the site for preservation action in FY97 and instead determined that data recovery was appropriate. Surveyors completed a total station map for this site in FY97. FY98 monitors recommended data recovery before more cultural material was lost. RCMP staff conducted exploratory testing in FY99 to determine if the exposed wall continued into the arroyo cutbank. Testing indicated that the wall does extend into the sediment and that cultural materials are still intact. The large Black Mesa Black on White sherd was collected during exploratory testing in FY99 due to its vulnerable position in the arroyo. FY99 monitors recommended more extensive data recovery.

Physical Comments

The main drainage that has exposed at least 3 features in the past, has been recently active, as indicated by 3 new nickpoints. A large sandstone slab, possible metate, is newly exposed as a result of this activity.

Visitor Comments

No sign of human visitation was observed.

Recommendations

Continue annual monitoring because the drainage has been active and cultural remains continue to erode. The FY99 synthesis report (Leap et al., 2000) discusses, in more detail, site management suggestions which include additional excavation.

C:13:349 Historic Structure
Annual Schedule

This multi-component site consists of a historic cabin/dugout, fire-cracked rock, and artifacts. No artifacts indicating function were found in association with the structure. The prehistoric components are both pre-ceramic and PI-II Puebloan. Charcoal fragments were observed below the structure in a drainage but appear to pre-date the use of the historic structure. There are eight remaining wood pieces to the historic structure. The back of the structure, consisting now of just one foundation pine plank, is banked against a dune. The prehistoric fire-cracked rock midden/roasting pits have good assemblages of sherds and lithics, but no formal tools were noted. The site is located in mesquite-anchored dunes. New charcoal lenses and fire-cracked rock have been exposed since the initial recording of the site.

Previous Work

The site was originally recorded in 1990 (Fairley, et al. 1994) and monitored annually since FY93 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). A profile was examined at this site to better understand flood and debris flows along the terrace (Hereford, et al. 1993) and incorporated into the Lower Tanner section of that report. The site was photographed with a medium format camera in FY96, FY97, and FY98 (Leap 1996a) (Leap 1997b) (Leap 1998a). A total station map of the site was completed in 1997 and the site was remapped in September 1998. The site was assessed for stabilization by the Zuni Conservation Project in FY97. Stabilization was determined to be inappropriate at this location. Feature 2 was completely excavated in FY99 (Kunde 1998a). The report will be disseminated upon completion of artifact analysis. This site was also included in the studies conducted by K. Thompson and A. Potochnik [Thompson, 1998 #278].

Physical Comments

Feature 3 has increased eolian activity, more wood has moved down from the mesquite thicket above. The mesquite around the cabin is dying off and deteriorating. Sediments are blowing into the large arroyo where most of the features have been exposed in the past. The northern bank of the large arroyo continues to slump and actively fill with eolian sands. It does not appear that the headcut has migrated further upstream. The drainage north of the large arroyo has 5 new nickpoints and is approximately 10 centimeters in depth. Feature 1 appears stable and unchanged.

Visitor Comments

No sign of human visitation was observed.

Recommendations

Data recovery was completed at Feature 2 in FY99. No new site management treatments are recommended. The large arroyo is fairly stable and may be experiencing some infilling from eolian activity, although, the gully north of the arroyo should be watched. This demonstrates that the site is still very active and may expose new cultural materials, thus, monitoring will continue.

C:13:371 Structure-Thermal Feature Complex
Semi-annual Schedule

This is a mid-late Pueblo II Puebloan habitation area situated on a debris fan and on both sides of an unnamed side canyon. It consists of several rockshelter overhangs, some with dry-laid masonry walls, possible room rubble, several fire-cracked rock concentrations, and a lithic/ceramic scatter. Feature 1 consists of two small rock overhangs each with two to three course dry-laid masonry walls, possibly the remains of storage features. Features 2, 3, and 4 are fire-cracked rock concentrations. Feature 5 is an architectural unit consisting of two rooms. Feature 6 consists of two fire-cracked rock concentrations, one three meters in diameter and the other three by five meters with artifacts. Feature 7 is a fire-cracked rock scatter with a few artifacts. In general, each fire-cracked rock area has at least some artifacts associated with it. FY97 monitors found a Tapeats Sandstone mano below Feature 6. FY00-1 monitors identified a small circular alignment located 2 meters south of Feature 5, exposed in the drainage. An overhang shelter with roasting feature was also identified on the talus slope above the site. Redwall and Kaibab Chert flakes are present in the overhang and charcoal is present inter-mixed in the roaster with fire-cracked rock.

Previous Work

Archaeologists recorded the site in 1990 (Fairley, et al. 1994) and the RCMP staff monitored it semi-annually since FY92 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a, Hubbard 1999b, Kunde 1998a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). Monitors recommended a combination of data recovery, testing, planting vegetation, and installing checkdams since FY94 (Coder, et al. 1995b, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). FY94 monitors recommended total station mapping and collecting charcoal. In FY95 monitors recommended checkdams. In FY96 Zuni Conservation personnel, GRCA trail crew and RCMP personnel constructed three checkdams adjacent to Features 3 and 5 (Leap 1996c). FY95 also recommended planting vegetation. FY96 monitors assessed the site for planting vegetation and decided that none would be planted. FY96 monitors collected charcoal from Features 2 and 4. Radiocarbon dates with a 2 sigma, 95% probability indicate new Feature 2 dates ranging between AD 1665 and 1950 and a Feature 4 age range between AD 1445 and 1655 (Leap, et al. 1998d). Prior to the research flow of 1996, Feature 8 was tested for subsurface deposits. The results showed that Feature 8 was the remains of a debris flow (Balsom and Larralde 1996). In FY96 the site was mapped with a total station instrument and medium format photos were taken before and after the Research Flow (Leap 1996a, Leap 1996b, Leap, et al. 1996b). FY98 monitors recommended testing Feature 6 and 7, collecting a charcoal sample at Feature 3 and full data recovery of Feature 2. FY98 monitors also recommended obtaining a charcoal sample from Feature 3. FY98 monitors replicated medium format photos taken during the 1996 research flow. Zuni Conservation personnel completed checkdam maintenance at Checkdam 2 in FY99. FY99 monitors noted that Checkdams 1 and 3 were in stable condition. FY00 monitors replicated medium format photographs taken prior to and following the 1996 research flow.

Physical Comments

The only activity observed on this visit was minor side canyon erosion near Feature 5. A small, circular slab-lined feature, Feature 9, (1 m in diameter) is newly eroded fom the side canyon drainage, 2 m south of Feature 5. The gullies next to Features 2 and 3 are currently stable with no new activity since April 1999. All features appear the same since last year. See Imacs for new feature descriptions.

Visitor Comments

No visitor-related impacts were observed.

Recommendations

Continue semi-annual monitoring for newly exposed materials until excavations are completed (see data recovery recommendations in the FY99 synthesis report (Leap et al., 2000)). Although no new activity was observed on this trip, the fragile nature of the site makes it subject to future erosion. The observation of a newly exposed feature also warrants continued monitoring. No new remedial actions are recommended at this time. Monitoring of the 3 checkdams will continue annually by the Zuni Conservation Project personnel.

C:13:386 Small Structure
Semi-annual Schedule

The site consists of a slab-lined cist, a structure consisting of two upright sandstone slabs with a two-handed mano and trough metate. A pecked stone is also present. A Deadmans Black-on-Red partial bowl and a Sosi Black-on-White ladle have eroded from a dune between the cist and the activity area. The site is on a dune slope just above the mesquite and driftwood zone. Wind blown sands continue to uncover extensive materials.

Previous Work

This site was originally recorded in 1991 (Fairley, et al. 1994) and monitored in FY93, FY94, FY96, FY98 and FY00 (Coder, et al. 1994b, Coder, et al. 1995a, Leap, et al. 1996b, Leap, et al. 1998d).

Physical Comments

Two new features were identified south of the cist. These features are located at the heads of 2 different arroyos. How active these arroyos are will be determined during future monitoring episodes. The partial vessel, newly exposed in a dune and identified in April, 2000, has sloughed off the dune and is almost in the large arroyo. In addition, a Sosi B/W ladle and another portion of the Deadman's B/R bowl are exposed. The cist is unchanged as the northern portion of the dune is much more stable.

Visitor Comments

No sign of human visitation was observed.

Recommendations

This dune is extremely active as seen by an additional vessel being exposed in less than 1 month. Monitoring should increase to a semi-annual schedule to identify any newly exposed remains. Identification of these vessels and the two additional features has contributed valuable information to the date and function of this site. While monitoring the site in May, archaeologists reburied the partial bowl and the ladle on the site in a more stable location after appropriate documentation.

G:03:003 Roaster Complex
Annual Schedule

The rockshelter (Feature 1) was originally recorded by G. Gumerman and R. Euler on 9/4/69, and the GRCA survey crew added four roasting features (Features 2-5) in 1991. Feature 1 is a shallow overhang and midden. There is a large amount of lithic debris, including obsidian flakes, an Elko base, a biface tip, and groundstone fragments. Charcoal, ashy soil, and fire-cracked rock are also present. Ceramics suggest both late Pueblo I to early Pueblo II Formative and late prehistoric-early historic Pai affiliations. The remaining features (Features 2-5) are roasters of varying sizes, some with tools and/or flakes, ceramics, etc. In the monitoring episode of FY92 monitors noted nails, more projectile points, and sherds, and the FY96 monitors found a projectile point at Feature 2 near the dripline and trail.

Previous Work

Euler and Gumerman initially recorded this site in minimal fashion in 1969. Sherds were collected and an analysis was completed. Field notes state that the condition of the site was "undisturbed" and the potential for a rewarding excavation was "excellent." Euler and Jones visited the site again in 1981. More sherds were collected and a simple sketch map was made. G:03:003 was recorded in more detail by NPS survey personnel in January of 1991 (Fairley, et al. 1994).

River corridor monitors visited the site in FY92 and FY93, twice in FY94, once in FY95 and then semiannually beginning in FY96 (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a, Hubbard 1999b, Kunde 1998a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY95 site overviews were taken with a medium format camera. In FY96 the features were plotted with a total station unit and overlain on a topographic map created by Thompson and others (Thompson, et al. 1996) (Leap 1997e, Leap, et al. 1996b). At this time the Zuni Conservation Project personnel also assessed the site for checkdam installation (Leap 1996c). Three checkdams were built in the river-based drainage downstream of the site (Leap 1996c, Leap, et al. 1996b). They were placed in this drainage at the suggestion of K. Thompson and K. Burke in FY96. According to their aerial photogrammatic maps, this particular drainage could cause some substantial site destruction if untreated. From FY96 to FY98 the three checkdams were in good condition with little to no maintenance required. In FY99, however, a heavy rainstorm occurred, and as a result, the Zuni Conservation Project and RCMP staff constructed ten new checkdams in the river-based drainage, and extensive work was completed on two of the original checkdams. A few large rocks were removed from the third original checkdam to define a central channel. The new checkdams need to be mapped in on the 1993 Hereford map with a total station. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

The site receives a great number of visitors, and as a result, multiple trails bisect features and several collection piles exist. Aerial photographs taken over the last 25 years show a geometric increase in the social trailing at Granite Park in general. This trend is enhanced by the local big horn sheep that spend considerable time in this area due to the lush grass growth accompanied by the wet winters. NPS and Hualapai representatives have performed retrailing and trail obliteration in FY96 and FY97, yet people continue to visit the site. A letter was published in the *Boatman's Quarterly* by L. Jackson and L. Leap requesting river runners and researchers to minimize their impact to the area (Jackson and Leap 1996 Summer). This location is also used for several other GCMRC research projects and thus contributes to the impacted area.

Physical Comments

There were no new physical impacts observed.

Visitor Comments

Last year, only faint, near non-existent trails were present. This year was quite the opposite. Four new access trails lead from the Granite Park Wash up the steep slope to the top of the dune terrace. All trails lead to Feature 1, a shelter with a high concentration of artifacts. One trail leads along the ridge of the dune through Features 2 and 3. The trail is impacting soil and artifacts within these features. There are two new trails leading from the same wash to the base of the discard slope emanating from Feature 1. At the base, both trails split and lead up to Feature 1.

Recommendations

The Hualapai and GRCA should take the lead in site management. All impacts are related to visitation and have dramatically increased since previous monitoring.

G:03:004 Roaster Complex
Annual Schedule

The site is located at the mouth of a major side canyon and is situated less than 100 m from an established boat camp. This site contains several roasting features, two rockshelters, rock images, and historic remains. The two rockshelters have a midden containing charcoal, burned soil, fire-cracked rock, and artifacts. One shelter has several historic mason jars and other trash dating to the 1930s, plus the inscription "M BUNDY". The ceiling of this shelter, below the inscription, has some faint hematite figures. The remaining features are roasting pits. In addition to the historic component, the site may be affiliated with both Pueblo I-III occupation and late prehistoric-early historic Pai/Paiute. A fire-cracked rock concentration with no artifacts on the downstream side of Indian Canyon is probably affiliated with the main site. During FY96 monitors added historic cans to the site map, and in FY97 monitors discovered a newly exposed slab-lined feature (Feature 8) between Features 1 and 2. In FY98 archaeologists recorded a chert awl in the midden area that was not previously identified.

Previous Work

This site was initially recorded in 1972 and revisited several times throughout the 1970s. Sherds were collected and analyzed and a few notes were taken. No further descriptive work or mapping was completed, but on each occasion more sherds were collected and typed. NPS survey personnel re-recorded the site in 1991 (Fairley, et al. 1994). From FY93 to FY95 the site was monitored twice a year and, in FY96 the monitoring schedule changed to annual (Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Kunde 1998a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY95 retrailing and trail obliteration were completed and minimal work was completed on a total station map. In FY97 more trail work was needed and medium format black-and-white and color photographs were taken of the historic inscription. After trail work was completed in FY95 a letter was published in the *Boatman's Quarterly* requesting that visitors use the designated trail that leads directly to the "Bundy jars", and not traverse through the prehistoric areas (Bulletts 1995 Summer). Commercial users did not honor this request and more trail work was needed in April 1997. RCMP staff drafted a second letter to the Park's concessionaire representative in June 1997 regarding commercial use of the area. This letter requested that the commercial guides use the new, designated trail or the commercial outfitters would be responsible for any necessary mitigation. To date, NPS allocated funds to address recreational impacts. However, this work is contingent on tribal consultations. A final assessment for trail maintenance was conducted in FY99. This assessment was to implement trail work prior to excavations and to produce a plan for a new trail after excavations are completed. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). The features were mapped with a total station instrument in FY00 in preparation for data recovery work with the GRCA Fee Demo program.

Physical Comments

Active gullying on the north side of Feature 6 is occurring, as seen by 2 new nickpoints. Fire-cracked rock debris is moving downslope into the gully. There is an active gully north of Feature 5, containing fire-cracked rock debris, however, the gully has reached bedrock and will not increase in depth, but may widen. General surface erosion throughout the site is evident. All other features are stable.

Visitor Comments

Visitor impacts are concentrated at Features 1, 2, 8, and the midden. Heavy compaction of soils is increasing exposure of Feature 8 and the midden. This is a very popular site for boaters to see the Bundy jars and cultural remains.

Recommendations

See the FY99 synthesis report (Leap et al., 2000) and Chapter 2 of this report for trail maintenance and data recovery options recommended at this site. Data recovery for Features 2, 8 and the midden are scheduled for November 2000. The funding will be provided by the Park's Fee Demonstration program.

G:03:020 Roaster Complex
Annual Schedule

The site is comprised of seven main features divided into two loci: A and B, each on opposite sides of a large side canyon. Locus A contains Features 1, 2, 5, 6, 7, 8 (a newly exposed hearth feature recorded by RCMP staff last year), and 9, a newly exposed charcoal concentration found during the FY99 excavations at this site. Locus B contains Features 3 and 4. Feature 1 was originally described as being two charcoal lenses eroding from a high dune with associated fragments of burned bone. Feature 2 is a large "classic" donut-shaped roasting pit with a number of manos, charcoal, and a few flakes. Feature 3 is an eroding roasting pit with a discernable rock outline on top. Feature 4 is a diffuse scatter of fire-cracked rock. Feature 5 is a disturbed area of fire-cracked rock at the edge of the side canyon. Feature 6 is another eroding fire-cracked rock area with bone, and Feature 7 is a roaster deposit exposed by a small arroyo. Cultural affiliation is unknown, but presumed to be Pai and or Paiute.

Previous Work

The site was originally recorded in 1978 by R. Euler with further recording by NPS personnel in 1991 (Fairley, et al. 1994). The site has been monitored at least annually since FY92(Coder, et al. 1994b, Coder, et al. 1995a,

Coder, et al. 1995b, Coder, et al. 1994a, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). Zuni Conservation Project personnel assessed the site in the fall of FY99 and determined that checkdams were not an appropriate stabilization procedure. In FY97 a total station map of the site was completed (Leap, et al. 1997a). This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000). In the spring of FY99 Features 7, 8 and 9 were excavated. Results of the excavation will be written and sent to PA members after the collected samples are sent to the appropriate analysts. Currently, the samples are housed at the Flagstaff office until funding is provided. After excavations, trails were obliterated.

Physical Comments

Features 5 and 6 have minor sheet washing of artifacts downslope. Previous monitors (11/98) noted that a new gully formed on the southeast side of Feature 2. This gully has advanced approximately 4 meters northwest, up the discard pile of the roaster. The gully is 3 meters from the crown of the feature. The gully drains into a side canyon arroyo, spilling into Fall Canyon. This recent activity of gullies and arroyo runoff has produced 12 new nickpoints. From previous photos we see a substantial change in the depth and width of both gullies and the arroyo. In 1978 there was no sign of arroyo cutting. In 1997, the arroyo was a shallow depression, today it is at least 2 meters in depth and at its widest, 2 meters. The main headcut of the arroyo begins at the Tapeats Sandstone talus where gullies flow off the bedrock surface above and on the northeast side of the feature. The gullies are approximately 30 cm in depth and are heavily impacting Feature 2. Artifacts and fire-cracked rock are eroding out of the feature and downslope into Fall Canyon drainage. Surface erosion and channel initiation are occurring on the west side of Feature 2. All other features are stable. Feature 2 has received heavy physical impacts from runoff, it appears that these processes will continue to erode the integrity of the feature.

Visitor Comments

A set of footprints was observed around Feature 6. No other visitor-related impacts were noted.

Recommendations

The Zuni Conservation Project staff determined that the gullies and arroyo are too advanced to install checkdams. Mapping rate, depth and width of these drainages through time could provide excellent data on the progression and rate of erosional processes effecting cultural resources at this location.

G:03:030 Roaster Complex
Biennial Schedule

This is a roasting complex with seven roasting or hearth features and flakes. Locus A contains Feature 1, a conical-shaped roaster with fire-cracked rock, Feature 2 a hearth feature of limestone filled with fire-cracked rock, and Feature 3 a low, circular wall built up along the base of a large boulder. Locus B has 5 features. Feature 4 consists of a fan of fire-cracked rock with lithics. Feature 5 contains two adjacent piles of fire-cracked rock. Feature 6 is a concentration of fire-cracked rock and Feature 7 is a two-meter cluster of fire-cracked rock. Feature 8 consists of another cluster of fire-cracked rock, five meters west of Feature 7. The site is located on a dune-covered terrace split by a side canyon drainage.

Previous Work

The site was originally recorded in 1991 (Fairley, et al. 1994) and monitored in FY96, FY98 and FY00 (Leap, et al. 1996b, Leap, et al. 1998d). Locus A was mapped with a total station in FY97. In FY96 checkdams were recommended and an assessment for stabilization completed in FY99 (Hubbard 1999a). Checkdams are currently recommended for this site.

Physical Comments

Feature 4 has experienced minor surface erosion. A gully is present west of the feature though it is not yet impacting the feature. Feature 5 continues to slump downslope. Increased vegetation is present at Feature 7 but the feature is stable. Feature 1 could not be monitored due to a lack of previous photographs. A new roasting feature was also located 7 meters west of Feature 7, see the Imacs and site map. Features 2, 3 and 6 were unchanged.

Visitor Comments

Visitation was not observed.

Recommendations

Locus B is actively slumping and eroding downslope. A new feature was also identified as Feature 8, west of the four roasting features. Biennial monitoring will continue. Zuni Conservation Project personnel assessed the drainages for checkdams and concluded that they would be effective. Installation of these checkdams is scheduled for FY2001.

G:03:041 Roaster Complex
Three Year Schedule

This site consists of three large roasting features. Archaeologists recorded a sparse lithic scatter, two cores, a chopper, and one Tizon wiped sherd on-site. The late prehistoric-early historic Pai site appears to have been a temporary hunting camp, based on the absence of grinding implements and the abundance of bone.

Previous Work

Archaeologists recorded the site in 1991 (Fairley, et al. 1994) and the RCMP staff monitored it in FY96, FY98, FY99 and FY00 (Hubbard 1999a, Leap, et al. 1996b, Leap, et al. 1998d). The RCMP staff recommended stabilization in FY96. In FY97 the site was assessed for checkdams and Zuni Conservation Project personnel constructed three rock and brush linings in the drainages below the site. A total station map was completed in FY97. FY98 monitors recommended planting vegetation and obliterating trails caused by remedial work projects. RCMP staff assessed this area for trail obliteration and planting vegetation in FY99 and found that the trails were recovering naturally. Checkdam maintenance occurred at one checkdam and six additional checkdams were built in FY99. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

Physical Comments

Features 1, 2, and 3 are in stable condition. The checkdams in the drainages are also in excellent condition, adding to the stability of the site. Minor animal burrowing was observed behind Feature 3. This burrowing is not effecting the feature at this time but has the potential to progress into an active gully.

Visitor Comments

No sign of human visitation was observed.

Recommendations

The site is in good condition and appears stable. It is recommended that the monitoring schedule change from annual to every 3 years.

G:03:043 Thermal Feature
Biennial Schedule

This site consists of five eroded hearths and fire-cracked rock areas. Artifacts identified include lithics, charcoal and groundstone. No ceramics were recorded on the site. One thick biface/scraper and two pecked-slab metates were recorded. Cultural and temporal information are unknown.

Previous Work

Archaeologists recorded the site in 1991 (Fairley, et al. 1994) and the RCMP staff monitored it in FY94, FY98 and FY00 (Coder, et al. 1995a, Leap, et al. 1998d). See Hereford for photogrammetric mapping conducted in this area. Hereford also collected charcoal from a isolated hearth located near the site's upstream side. The radiocarbon dates from this sample indicated a date of 830 years B.P. (+/- 100 years). FY98 monitors recommended data recovery at Features 4 and 5.

Physical Comments

Feature 1 has increased surface erosion and gullying on the northwest side. Although no new nickpoints were identified, change has occurred since 1998. Feature 4 has new erosion in the center of the feature due to rodent burrowing and bank slump. Feature 3 is stable and in good condition, no new change was observed. Feature 4 is in the worst condition relative to the other features.

Visitor Comments

No new visitor impacts were observed at this site.

Recommendations

Features 1 and 4 are the two features primarily impacted by surface erosion and gullying. Feature 4 should be fully excavated before it erodes completed. As it stands, the majority of the feature is still present. See the FY99 synthesis report (Leap et al., 2000) for more excavation detail. No other work is recommended at this time.

G:03:044 Structure-Thermal Feature Complex
Biennial Schedule

This site is a large activity area divided into two loci. Locus A contains five dry-laid walls and a lithic scatter. Locus B contains three roasting features below the activity area. FY94 monitoring staff identified a .44 cal. cartridge (19th century) and two large utility ware sherds below the activity area.

Previous Work

Archaeologists recorded the site in 1991 (Fairley, et al. 1994) and the RCMP staff monitored the site annually from FY92 through FY98(Coder, et al. 1994b, Coder, et al. 1995a, Coder, et al. 1995b, Coder, et al. 1994a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d) and in FY00. FY96 monitoring staff recommended checkdam installation in the Locus B drainages. An assessment for checkdam installation was completed in FY97. Because the drainages appeared stable, no stabilization work was necessary.

Physical Comments

The features in Locus A (1 – 5) are in stable but fair condition. The arroyos in Locus B are filling and downcutting, and the roasters (2 and 3) are slowly slumping and collapsing into the drainage. Features 1, 3 and 4 are unchanged. Rocks from above Feature 2 have fallen onto the feature. Feature 5 has minor surface erosion; it appears that the charcoal stain is eroding up and becoming larger. One large chunk of charcoal is present on the surface. Roaster 1 is unchanged, and Roaster 2 is eroding into an arroyo due to bank slump. One side of Roaster 3 is nearly washed into the arroyo.

Visitor Comments

No sign of human visitation was observed except at Feature 5 where rocks were moved around on the surface floor.
***Recommendations*:** No new recommendations were made during this visit. Past recommendations include mapping the site and excavating Roasters 2 and 3. See the FY99 synthesis report (Leap et al., 2000) for more detail.

G:03:057 Thermal Feature
Biennial Schedule

The site consists of a Tapeats Sandstone rockshelter containing a large, eroding fire-cracked rock feature, a charcoal scatter, an ash stain, and a scatter of lithics, sherds, and groundstone. Lithics are densely concentrated along the front edge of the shelter floor, with some eroding downslope. No formal chipped-stone tools were seen. Two pecked and ground slabs, one of Tapeats Sandstone and one of Muav Limestone, were observed near the center of the site. The sherds are found in the north half of the shelter. Ceramics suggest a multi-component occupation of the site: possibly early Basketmaker III-Pueblo I Formative and late prehistoric-early historic Paiute. The fire-cracked rock feature is composed of angular, cobble-size rocks of sandstone and limestone. The site appears as a limited lithic manufacturing and food processing area based on the artifacts present.

Previous Work

The site was initially recorded in 1991 by NPS survey personnel (Fairley, et al. 1994) and monitored in FY97, FY99 and FY00 ((Hubbard 1999a, Leap, et al. 1997a).

Physical Comments

Minor surface erosion is occurring under the overhang within the fire-cracked rock, artifact, and ash concentrations. The gully observed in FY98 is now a small, shallow rill.

Visitor Comments

Two collection piles and a small trail leading from the river to the shelter were observed.

Recommendations

RCMP staff recommends biennial monitoring due to the high concentration of cultural materials and the potential for newly exposed materials. This site offers a good opportunity for quantifying erosional activities.

G:03:064 Roaster Complex
Annual Schedule

This site consists of 15 features including mostly roasting features. Charcoal lenses are present in several of the arroyo cuts. Artifacts associated with the roasting features include lithics, ceramics, a shell bead, and groundstone. Lithics include a flake drill and a reworked Elko Corner-Notched projectile point. The ceramic assemblage suggests a multi-component site: Pueblo I-III Formative and late prehistoric-early historic Pai/Paiute. This could be one of the most informative sites in western Grand Canyon with potential for dating and chronology-building. FY96 monitors discovered a large Redwall Chert point tip exposed in the river-based drainage across from Feature 1. FY97 monitors discovered a chert awl at Feature 6. RCMP staff on the September 1997 mapping trip discovered newly exposed Jeddito Yellow ware sherds, obsidian flakes, an olivella shell bead, and two new probable roasting features/fire-cracked rock scatters exposed by the river-based arroyo. FY98 monitors discovered new fire-cracked rock features exposed by the arroyo. FY99 monitors discovered seven new charcoal lenses exposed in the river-based arroyo.

Previous Work

Archaeologists recorded the site in 1991 (Fairley, et al. 1994) and RCMP staff monitored it at least annually since FY94 (Coder, et al. 1995a, Coder, et al. 1995b, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY93 archaeologists collected radiocarbon samples resulting in a range of dates from 170 +/- 50 BP to 2670 +/- 140 BP. FY94 monitors recommended planting vegetation, installing checkdams, and total station mapping. FY95 monitors conducted medium format photography of the active drainage (Leap 1995a). FY95 and FY96 monitors recommended testing and total station mapping. In FY95 total station mapping began and in FY97 a complete map was produced. During the intensive mapping, archaeologists discovered two new roasting features, new lithics, ceramics and an olivella shell bead. FY96 monitors also recommended either an attempt at stabilization or full site excavation. FY98 monitors recommended obliterating trails caused from five days of intensive site mapping and data recovery. After further assessment it was determined that the trails were recovering naturally. FY99 monitors recommended data recovery and remapping of the arroyo headcuts to identify their rate of advancement. The RCMP collected charcoal samples from Charcoal Lens D and Feature 1 in FY99. The samples will be sent for dating in the near future. This site was also included in the studies conducted by K. Thompson and A. Potochnik (Thompson and Potochnik 2000).

Physical Comments

The arroyo adjacent to Features 13 and 14 increased in activity as seen by 8 new nickpoints around the features. The arroyo surrounding the perimeter of Feature 12 has active sheet washing, and new nickpoints have formed in the arms of the arroyo. Feature 12 is being pedestaled and "excavated" by the erosional activities of this arroyo. Features 1, 2, 3, 5, 9, 10, and 11 are stable. Features 4 and 8 are stable but the north sides of the features are directly adjacent to the main arroyo and have the potential to completely erode due to arroyo activity. Large mammal bones

are eroding out of the cutbank at the central junction of the main arroyo adjacent to the area where charcoal samples were taken in 3/99. The main arroyo continues to actively erode away the dune terraces. Erosional processes, including bank slump, sheet washing, undercutting, gullying, and new nickpoints are contributing to the widening and deepening of the arroyo and the erosion of features. The arroyo has widened an average of 1 meter and downcut 20 centimeters since last monitored in 1998. All artifacts are flowing towards the river.

Visitor Comments

No visitation was observed.

Recommendations

The Hualapai and Paiute should be consulted on preservation and recovery options for this site. This area, referred to as Arroyo Grande, continues to exhibit extensive erosional activity on an area that is very significant to these tribes.

G:03:072 Roaster Complex
Annual Schedule

This is an extensive roasting feature complex that includes an overhang shelter previously recorded as historic site G:03:023. The prehistoric component of that site is described here as G:03:072. Fourteen features (Features 1-14) are present. All but Feature 1 are roasting features or hearth/fire-cracked rock scatters of various shapes and sizes, some with associated groundstone, lithics, and sherds. Feature 1 is the overhang shelter, which, in addition to the historic component described as site G:03:023, has a prehistoric component consisting of a lithic scatter downslope of the shelter and in the shelter fill. Ceramics observed indicate that this may be a multi-component site, with both late Pueblo I-early Pueblo II Virgin occupation and late prehistoric-early historic Pai and Paiute occupations. On a total station mapping trip in FY98 RCMP monitors identified newly exposed diagnostic artifacts in a gully. They include one biface, sherds and groundstone.

Previous Work

The site was originally recorded in 1991(Fairley, et al. 1994), monitored once in FY93, and monitored annually since FY95 (Coder, et al. 1994b, Coder, et al. 1995b, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY96 an assessment was made for checkdam installation. In FY97 a total station map was completed and 14 checkdams were placed in three river-based and side canyon-based drainages (Leap, et al. 1997a). In FY99 checkdam maintenance resulted in building two new checkdams and altering one original checkdam. Minor to moderate alluvial deposition as a result of building checkdams is evident in two of the four drainages with checkdams.

Physical Comments

Two of the six major arroyos that cut through this site were very active since last monitored in 1998. However, only one of the active drainages impacted features. The drainage with Features 11 and 12 exhibited several new nickpoints and extreme downcutting. Feature 14 continues to erode at a slow, yet constant pace due to surface erosion. The 11 remaining features were unchanged.

Visitor Comments

No impacts related to visitation were observed.

Recommendations

Data recovery is recommended for Features 11, 12, and 14. See the FY99 synthesis report (Leap, et al. 2000) for more detail.

G:03:080 Structure-Thermal Feature Complex
Annual Schedule

The site is divided into two loci. Locus A contains numerous lithics, sherds, hand tools, and extensive rock images. The pictographs and lone petroglyph are in poor condition. Spalling and salt seep have covered several of the

images. This locus is on a sheltered bench at the base of a basalt cliff, just upstream from the dune that Locus B is located on. Locus B consists of nine separate structural and fire features. Numerous artifacts are present, including fire-cracked rock, lithics, ceramics, groundstone, tools, shell fragments, and charcoal. This site has excellent potential for buried materials and datable features. Ceramics suggest a late prehistoric-early historic Pai affiliation. In March of FY95 monitors recorded a newly exposed thermal feature (Feature 9).

Previous Work

The site was originally recorded in 1991(Fairley, et al. 1994), monitored once in FY92 and FY93, and annually since FY95 (Coder, et al. 1994b, Coder, et al. 1995b, Coder, et al. 1994a, Hubbard 1999a, Leap, et al. 1997a, Leap, et al. 1996b, Leap, et al. 1998d). In FY97, medium format black-and-white and color prints were taken of Locus A, and several of the distinct rock art figures were sketched.

Physical Comments

Active surface erosion and gullying is present at Features 3 and 5. Eolian erosion and deposition are present but fairly inactive on the dune where Features 1-7 are located. Animal burrows are present throughout the site and in the shelter area (Locus B). Minor surface erosion is present in Locus B. The drainages located in and around Features 1-7 have the potential to become more entrenched due to the active dunal area on which the features are located. The drainages should be watched for future exposure of new cultural remains. All other features are in good condition and have not changed since last monitored, in 1999.

Visitor Comments

The increase in visitation at this site is substantial. Four cairns were recorded, 3 by Locus B and 1 near Feature 2. Two large wood caches are located on the upstream side of Locus B. It is obvious that people are camping in this area. The gullies that lead from the lower camp to the site have new gully entrenchment. Five collection piles were located throughout Locus B.

Recommendations

The RCMP staff will inform the Hualapai Cultural Resources Department about the substantial increase in visitor-related impacts at this site. Whatever both parties agree upon should be implemented immediately before more of the site integrity is lost. The Hualapai Tribe should also contact the Hualapai River-runners regarding upruns to this site. If the Hualapai decide to bring tours here, they should consider data recovery or the development of the area as an interpretive site. See the FY99 synthesis report (Leap, et al. 2000) for an expansion of these ideas.

CHAPTER 5

NPS INVOLVEMENT FOR FY2001

The Monitoring and Remedial Action Plan (MRAP) will be updated and amended to, to represent the proposed work for FY2001. This update is called for by the Cultural PEP panel until the HPP and supplementary plans are completed. Amendments to the MRAP will include general statements representing the following tasks.

1.) Provide assistance to the HPP and Supplemental Plans as called for by the PEP.

2.) Site protection work with Zuni and geomorphologists.

3.) Medium format photography

a. Continue shoreline, oblique photography at selected sites and research new locations (possibly using a larger lens). This information will aid in the study completed through USGS (repeat photography research), as called for in the PEP.

Supervise, and identify photographs for the repeat photography research funded by USGS.

Supervise and identify the medium format photographs that will be placed on CDROM. The actual work will be completed by a contractor and funded by USGS.

4.) Oversee the Colorado River Fund (CRF) and Fee Demo funded excavation projects at two sites along the river corridor (B:15:138 and G:03:004). These excavations are taking place due to site impacts caused by visitors (boaters).

5.) Work with contractor (funded by USGS) to select and scan in 35 mm photographs illustrating the various stages and types of checkdams. This will be combined with GIS (arcview) information and available to NPS and USGS for future research. This will directly aid the research completed to quantify checkdam effectiveness.

Provide field assistance for the research completed to quantify the effectiveness of checkdams.

6.) Cultural Database Plan -- Update database and help develop a database plan (database design), as called for in the PEP report. The design is intended to link cultural data more efficiently and effectively with the other research being conducted in the Canyon (i.e., the biological and physical sciences.

7.) Treatment Plan – Research and identify other methods of site protection with Zuni personnel and geomorphologists, as called for in the PEP.

8.) Have artifacts analyzed and complete the three outstanding excavation reports, as called for by the PEP. The excavations occurred at sites: A:15:048, C:13:010 and C:13:099.

9.) Complete data entry for the ASMIS condition assessment. This will supplement recommendations made by the cultural PEP concerning baseline site condition assessment. This task will also supplement the foundation of the cultural database plan, as called for by the PEP.

10.) Support LIDAR research.

Identify specific flow regimes near archaeological sites in conjunction with GCMRC surveyors.

Identify and work with surveyors on the total station mapping efforts.

Conduct in-field drainage measurements to supplement studies completed by LIDAR and total station mapping.

GPS sites and plot them on orthophotographs. This will aid in the LIDAR studies that are currently being proposed by USGS.

Proposed NPS River Trips
Two archaeology trips (PA-funded).
Each trip will include:

4 boats, Zuni, Geomorphologist, NPS personnel, PA personnel
Continue monitoring (sites on a semiannual and annual schedule and possibly sites on a biennial schedule. See Table 3)
Continue checkdam maintenance (archaeological sites with checkdams. See Table 4)
Locate archaeological sites with a GPS unit
Complete measurements of selected drainages
Take medium format photos (complement GCMRC funded studies)

River Trips NPS personnel will accompany
Two CRF/Fee Demo Trips (NPS-funded)

Visitor impact assessments and implementation to deter further impact that may threaten site integrity.

For the following river trips NPS personnel will aid in identifying the locations of selected sites and archaeological features.

Sediment study-trips (USGS funded)

Lidar research trips (USGS funded)

Table 4. List of sites selected for monitoring in FY2001 by the RCMP staff (n = 38).

B:11:281*	C:05:031*	C:13:010	C:13:100	C:13:329*	C:13:371	G:03:020	G:03:067*
B:15:138	C:09:050	C:13:069	C:13:272*	C:13:339	C:13:385*	G:03:028*	G:03:072
C:02:094*	C:09:051*	C:13:070	C:13:273	C:13:343	C:13:386	G:03:034*	G:03:080
C:02:096	C:13:006	C:13:098	C:13:291	C:13:347	G:03:003	G:03:041	
C:02:098	C:13:009*	C:13:099	C:13:321	C:13:349	G:03:004	G:03:64	

* indicates sites on a biennial schedule.

Table 5. List of sites with checkdams that will be monitored for maintenance by Zuni Conservation Project and NPS personnel, accompanied by a geomorphologist (n = 29).

A:15:005	C:02:101	C:13:099	C:13:348	G:03:003	G:03:040
A:16:149	C:09:050	C:13:100	C:13:359	G:03:024	G:03:041
A:16:174	C:13:005	C:13:327	C:13:371	G:03:025	G:03:058
A:16:180	C:13:006	C:13:336	C:13:381	G:03:026	G:03:072
B:14:107	C:13:069	C:13:346	G:03:002	G:03:038	

REFERENCES CITED

Balsom, J. R. and S. Larralde (editors)
1996 *Mitigation and Monitoring of Cultural Resources in Response to the Experimental Habitat Building Flow in Glen and Grand Canyons, Spring 1996*. Final report submitted to the Grand Canyon Monitoring and Research Center, Bureau of Reclamation, December 31, 1996, Flagstaff, AZ.

Bulletts, A.
1995 Summer Respecting the Bundy Jars. *Boatman's Quarterly* 8(No. 3).

Burchett, T. W., C. M. Coder and D. Hubbard
1996 Monitoring of Archaeological Sites Below Glen Canyon Dam Along the Colorado River in Response to the Experimental Habitat Building Flow of 1996. In *Mitigation and Monitoring of Cultural Resources in Response to the Experimental Habitat Building Flow in Glen and Grand Canyons, Spring 1996*, edited by J. R. Balsom and S. Larralde. Final report submitted to the Grand Canyon Monitoring and Research Center, Bureau of Reclamation, December 31, 1996, Flagstaff, AZ.

Busch, J. E.
1930 McCormick mining claims. U.S. Department of the Interior, General Land Office, Phoenix.

Coder, C. M., L. M. Leap, N. B. Andrews and D. C. Hubbard
1994b *1993 Summary Report: Monitoring of Archaeological Sites Along the Colorado River Corridor in Grand Canyon National Park*. Report prepared by Grand Canyon National Park and Northern Arizona University. Submitted to the Bureau of Reclamation, Upper Colorado Region, Salt Lake City, UT. Copies available from RCMP #12.

Coder, C. M., L. M. Leap, N. B. Andrews and D. C. Hubbard
1995a *1994 Summary Report: Monitoring of Archaeological Sites Along the Colorado River Corridor in Grand Canyon National Park*. Report prepared by Grand Canyon National Park and Northern Arizona University. Submitted to the Bureau of Reclamation, Upper Colorado Region, Salt Lake City, UT. Copies available from RCMP #18.

Coder, C. M., L. M. Leap, N. B. Andrews, D. C. Hubbard and J. L. Kunde
1995b *1995 Summary Report: Monitoring of Archaeological Sites Along the Colorado River Corridor in Grand Canyon National Park*. Report prepared by Grand Canyon National Park and Northern Arizona University. Submitted to the Bureau of Reclamation, Upper Colorado Region, Salt Lake City, UT. Copies available from RCMP #27.

Coder, C. M., L. M. Leap, N. B. Andrews, D. Kline and D. C. Hubbard
1994a *Summary Report for 1992: GCES Monitoring of Archaeological Sites from Lees Ferry to Separation Canyon, Grand Canyon National Park*. Report prepared by Grand Canyon National Park and Northern Arizona University. Submitted to the Bureau of Reclamation, Upper Colorado Region, Salt Lake City, UT. Copies available from RCMP #6.

Daly, R. M.
1929 McCormick mining claims. U.S. Department of the Interior, General Land Office, Phoenix, Arizona.

Fairley, H. C., P. W. Bungart, C. M. Coder, J. Huffman, T. L. Samples and J. R. Balsom
1994 *The Grand Canyon River Corridor Survey Project: Archaeological Survey along the Colorado River between Glen Canyon Dam and Separation Canyon*. Glen Canyon Environmental Studies. Copies available from RCMP #1.

Hereford, R.
1993 *Description of Map Units and Discussion to accompany Map showing Surficial Geology and Geomorphology of the Palisades Creek Archeologic Area, Grand Canyon National Park, Arizona.* U.S. Geological Survey. Copies available from U.S. Geological Survey Open-File Report 93-553.

Hereford, R.
1996 Geoarchaeology of the Colorado River in the Eastern Grand Canyon, Grand Canyon National Park, AZ. Paper presented at the 61st Annual Meeting of the Society for American Archaeology, New Orleans, LA.

Hereford, R., K. J. Burke and K. S. Thompson
1996b *Description of Map Units and Discussion to Accompany Map Showing Quaternary Geology and Geomorphology of the Nankoweap Rapids area, Marble Canyon, Arizona*. U.S. Geological Survey. Copies available from U.S. Geological Survey Open-File Report 96-502.

Hereford, R., H. C. Fairley, K. S. Thompson and J. R. Balsom
1993 *Surficial Geology, Geomorphology and Erosion of Archaeologic Sites along the Colorado River, Eastern Grand Canyon, Grand Canyon National Park, Arizona*. Grand Canyon National Park in cooperation with the U.S. Bureau of Reclamation, Glen Canyon Environmental Studies. Copies available from U.S. Geological Survey Open-File Report 93-517.

Hereford, R., K. S. Thompson, K. J. Burke and H. C. Fairley
1996a Tributary debris fans and the late Holocene alluvial chronology of the Colorado River, Eastern Grand Canyon, Arizona. *Geological Society of America Bulletin* 108(1):3 - 19.

Hubbard, D. C.
1999a *FY99-2 Archaeological Monitoring Trip, November 8 - 23, 1998*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #59.

Hubbard, D. C.
1999b *Fiscal Year 99-4 Archaeological River Trip, April 14th - April 29th, 1999*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #64.

Jackson and Leap
1996 Summer The Sand, the Wind, and the Willow. *Boatman's Quarterly* 9(No. 3).

Jones, A. T.
1986 *A Cross Section of Grand Canyon Archaeology: Excavations at Five Sites Along the Colorado River*. Western Archaeological and Conservation Center. Copies available from Publications in Anthropology No. 28.

Kunde, J. L.
1998a *FY99-1 Archaeological Monitoring River Trip, October 6 - 21, 1998*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #58.

Kunde, J. L.
1999a *Fiscal Year 99-3 Archaeological River Trip, February 22 - March 9, 1999*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #63.

Leap, L. M.
1994a *Fiscal Year 95-2 River Monitoring Trip Report*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #22.

Leap, L. M.
1994b *Proposed Mitigation for Sites C:13:273 and C:13:339 to Provide Clearance for Trail Maintenance in the Colorado River Corridor, Grand Canyon National Park.* River Corridor Monitoring Project. Copies available from RCMP #20.

Leap, L. M.
1995a *Fiscal Year 95-3 River Monitoring Trip Report*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #24.

Leap, L. M.
1995b *Fiscal Year 96-1 Resource Monitoring Trip Report*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #28.

Leap, L. M.
1995c *Mitigation of Archaeological Sites Along the Colorado River in Response to the Proposed Research Flow of 1996*. River Corridor Monitoring Project. Copies available from RCMP #31.

Leap, L. M.
1995d *Testing Results from C:13:273 and C:13:339 to Recommend Clearance for Beamer Trail Maintenance in the Colorado River Corridor, Grand Canyon National Park.* River Corridor Monitoring Project. Copies available from RCMP #23.

Leap, L. M.
1996a *Archaeological River Monitoring Trip Report for Fiscal Year 96-3*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #34.

Leap, L. M.
1996b *Fiscal Year 96-2 Archaeological River Monitoring Trip Report*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #33.

Leap, L. M.
1996c *Remedial Actions Conducted at Sites C:13:006, C:13:371 and Granite Park, Grand Canyon National Park*. River Corridor Monitoring Project. Copies available from RCMP #36.

Leap, L. M.
1997b *Archaeological River Trip Report for Fiscal Year 97-3 (February 19 - March 6, 1997)*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #47.

Leap, L. M.
1997c *Fiscal Year 97-4 Archaeological River Trip Report (April 12 - 27, 1997)*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #48.

Leap, L. M.
1997e *Archaeological River Monitoring Trip Report for Fiscal Year 98-1 (October 6 - 25, 1997)*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #52.

Leap, L. M.
1998a *Archaeological River Monitoring Trip (98-3), February 22 - March 10, 1998*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #55.

Leap, L. M.
1998b *Archaeological River Monitoring Trip (98-4), April 16 to May 1, 1998*. River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #56.

Leap, L. M., N. B. Andrews, D. C. Hubbard and J. L. Kunde
1997a *1997 Summary Report: Archaeological Site Monitoring and Management Along the Colorado River Corridor in Grand Canyon National Park.* Grand Canyon National Park. Copies available from RCMP #50.

Leap, L. M., N. B. Andrews and J. L. Kunde
1996b *1996 Summary Report: Monitoring of Archaeological Sites along the Colorado River Corridor in Grand Canyon National Park.* Grand Canyon National Park. Copies available from RCMP #37.

Leap, L. M., T. Burchett, J. L. Kunde, N. B. Andrews and D. C. Hubbard
1998d *1998 Summary Report: Archaeological Site Monitoring and Management Along the Colorado River Corridor Below Glen Canyon Dam.* Grand Canyon National Park. Copies available from RCMP #57.

Leap, L. M. and C. M. Coder
1995 *Erosion Control Project at Palisades Delta along the Colorado River Corridor, Grand Canyon National Park.* River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #29.

Leap, L. M. and D. C. Hubbard
1996c *Archaeological River Monitoring Trip Report for Fiscal Year 97-1 (October 1 - 18, 1996).* River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #38.

Leap, L. M. and J. L. Kunde
1998a *Archaeological River Monitoring Trip (98-2), November 6 - 21, 1997.* River Corridor Monitoring Project. Report prepared for Grand Canyon National Park. Copies available from RCMP #53.

Lindsey, B.
1999 *1999 Sand Sieve Analysis for G:03:026.* National Resources Conservation Service.

Lindsey, B. and F. Fisher
1999 *Soil Description--Palisades Creek Area*. National Resources Conservation Service.

O'Connor, J., L. Ely, Wohl, Ellen, L. Stevens, T. Melis, V. Kate and V. Baker
1994 A 4500-Year Record of Large Floods on the Colorado in the Grand Canyon, Arizona. *The Journal of Geology* 102:1-9.

Thompson, K. and A. Potochnik
2000 *Development of a Geomorphic Model to Predict Erosion of Pre-dam Colorado River Terraces Containing Archaeological Resources*. SWCA Environmental Consultants, Flagstaff, Arizona. Copies available from SWCA Cultural Resources Report No. 99-257 SWCA Project No. 2362-1383.

Thompson, K. S., K. J. Burke and R. Hereford
1996 *Topographic map showing drainage basins associated with pre-dam terraces in the Granite Park area, Grand Canyon, Arizona.* U.S. Geological Survey. Copies available from Open-file report 95-592.

Yeatts, M.
1998 *1997 Data Recovery at Five Sites in the Grand Canyon, Final Report*. River Corridor Monitoring Project and The Hopi Tribe. Copies available from RCMP #60.

Yeatts, M. and L. M. Leap
1997 *Proposed Testing at AZ:C:09:051 (GRCA).* The Hopi Tribe and River Corridor Monitoring Project. Copies available from RCMP #49.

APPENDIX A
LIST OF SITES WITH CHECKDAM MAINTENANCE

Site	Total Number of Checkdams	Status	Date	Comments
A:16:174	9	Alteration	04/26/2000	Checkdam #8 - 1 bucket of rock was added to the nickpoint.
		New	04/26/2000	Checkdam # 9 - rock alignment placed in a nickpoint.
		Alteration	04/26/2000	Checkdam # 4 - 2 buckets of rock were added.
		Alteration	04/26/2000	Checkdam # 6 - 1 bucket of rock was added to the nickpoint.
		Alteration	04/26/2000	Checkdam # 7 - 1bucket of rock was added to the nickpoint.
A:16:180	6	New	04/26/2000	Checkdam # 6 - 1.5 buckets of small rocks and gravels were used to create a lining in the nickpoint just below Feature 2.
C:02:101	14	Alteration	04/15/2000	Checkdam # 4 - 1.5 meter extension of rocks was added to the checkdam.
		Alteration	04/15/2000	Checkdam # 3 - 1 meter extension of rocks was added to the checkdam.
		Alteration	04/15/2000	Checkdam # 1 - the checkdam was extended 40 centimeters more with cobble-sized rocks.
		New	04/15/2000	Checkdam # 6 - a rock alignment placed within the nickpoint located between Checkdams 2 and 3.
		Alteration	04/15/2000	Checkdam # 5 - the checkdam was extended by 1 meter with additional cobble-sized rocks and gravels.
C:13:006	16	Alteration	04/17/2000	Checkdam # 2 - added additional rocks increasing the original size of the checkdam by .5 meters.
		Alteration	04/17/2000	Checkdam # 6 - added .5 meters of rock to the top portion of the checkdam where a new nickpoint was forming.
		New	04/17/2000	Checkdam # 13 - built a rock alignment in the large nickpoint below checkdams 2 and 3.
C:13:100	26	Alteration	04/18/2000	Checkdam # 13 - added 2 handfuls of basalt rock to the area where piping occurred.
		Alteration	04/18/2000	Checkdam # 9 - added 1/2 bucket of rock as a bed-liner due to piping.
		Alteration	04/18/2000	Checkdam # 7 - added 1/2 bucket of basalt to the top of the checkdam due to piping.
		Alteration	04/18/2000	Checkdam # 12 - added 1 bucket of basalt and sand to the bottom, downstream portion of the checkdam.
C:13:359	5	New	04/20/2000	Checkdam # 5 - small rock lining was added to a nickpoint .5 meters below Checkdam 1.
		Alteration	04/20/2000	Checkdam # 2 - added 1/2 bucket of rock to a plunge pool.
		Alteration	04/20/2000	Checkdam # 3 - added 1/2 bucket of rock to a plunge pool.

C:13:381	3	Alteration	04/20/2000	Checkdam # 1 - 2 buckets of cobbles were used to extend the lining 2 meters downslope.
		Alteration	04/20/2000	Checkdam # 2 - 2 buckets of rock were added to the upstream flanks of the check, not altering the overall size.
G:03:002	7	Alteration	04/28/2000	Checkdam # 1 - 1 bucket of rock was added as a nickpoint treatment, not altering original size of checkdam.
		Alteration	04/28/2000	Checkdam # 2 - 1 bucket of rock was added as a nickpoint treatment, not altering size of the checkdam.
G:03:003	18	Alteration	04/28/2000	Checkdam # 7 - 1/2 bucket of rock was added as a nickpoint treament.
		Alteration	04/28/2000	Checkdam # 13 - 1 bucket of rock was added to the center of the lining to even out the checkdam.
G:03:003		Alteration	04/28/2000	Checkdam # 8 - 1 bucket of gravels was added as a nickpoint treatment.
G:03:024	15	Alteration	04/28/2000	Checkdam # 4 - 3 buckets of limestone rock and 2 buckets of gravel were added to treat a nickpoint
		Alteration	04/28/2000	Checkdam # 10 - 1 bucket of cobbles to treat a nickpoint.
		Alteration	04/28/2000	Checkdam # 11 - 1 bucket of cobbles and 2 buckets of gravel to treat a nickpoint.
		New	04/28/2000	Checkdam # 15 - 2 buckets of large rock were used to fill in headward migration above Checkdam 10.
		Alteration	04/28/2000	Checkdam # 14 - 5 buckets of large rock and 2 buckets of gravels were used to fill headward migration.
G:03:025	3	Alteration	04/28/2000	Checkdam # 2 - 3 buckets of large rock and 1/2 bucket of gravel was used to fill in a large nickpoint at Checkdam 2.
G:03:038	23	Alteration	04/26/2000	Checkdam # 17 - added 1/2 bucket of limestone rock and lined the front of the checkdam.
		Alteration	04/26/2000	Checkdam # 15 - relined the checkdam
		Alteration	04/26/2000	Checkdam # 18 - small rock lining was added as a nickpoint treatment.
		Alteration	04/26/2000	Checkdam # 19 - small rock lining was added as a nickpoint treatment.
		Alteration	04/26/2000	Checkdam # 14 - rock was added to the downstream portion of the checkdam to fill a plunge pool.
G:03:041	9	Alteration	04/28/2000	Checkdam # 4 - 1 bucket of small limestone cobbles was used to armor the downstream portion of the drainage banks.
		Alteration	04/28/2000	Checkdam # 3 - 1 bucket of small limestone cobbles was used to fill in a nickpoint.
G:03:058	9	Alteration	04/29/2000	Checkdam # 3 - angular granite cobbles were used to armor the sides of the checkdam and small gravels were added below the checkdam.

		Alteration	04/29/2000	Checkdam # 4 - reconstructed this checkdam using agnular granite rock and 1 bucket of granite gravles.
		Alteration	04/29/2000	Checkdam # 5 - reconstructed this checkdam using angular granite rock and 1 bucket of granite gravels.
		Alteration	04/29/2000	Checkdam # 6 - angular granite cobbles were used to fill in and lining and were extended upstream to the headcut.
		Alteration	04/29/2000	Checkdam # 7 - small angular granite cobbles were used as a nickpoint treatment below Checkdam 2.
		New	04/29/2000	Checkdam # 8 - small angular granite cobbles were used as a nickpoint treatment on the bend in the channel below Checkdam 7.
		New	04/29/2000	Checkdam # 9 - small angular cobbles were used as a small nickpoint treatment above checkdam 3.
		Alteration	04/29/2000	Checkdam # 1 - angular granite cobbles baseball sized were added to the top and bottom of the checkdam where water had once pooled.
G:03:072	16	Alteration	04/29/2000	Checkdam # 9 - added small limestone gravels to the rock lining.
G:03:072		New	04/29/2000	Checkdam # 16 - large limestone boulders and cobbles were added to this large nickpoint feeding into the main drainage on-site.

APPENDIX B
CUMULATIVE LIST OF SITES WITH NEWLY EXPOSED FEATURES OR DIAGNOSTIC ARTIFACTS