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1995 Summary Report: Monitoring of Archaeological Sites Along the Colorado River Corridor in Grand Canyon National Park (Cooperative Work Order 8005-8-002)

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Abstract

This report summarizes archaeological monitoring activities conducted during fiscal year 1995 (October 1, 1994 - September 30, 1995) as outlined by the Programmatic Agreement for the Operations of Glen Canyon Dam. This work was conducted by a team of archaeologists and technicians from Grand Canyon National Park and Northern Arizona University. Physical (geologic forces related to dam operations or natural processes) and visitor-related (directly caused by human visitation to cultural resources) impacts were monitored and evaluated at sites along the Colorado River corridor within Grand Canyon between October 1994 and September 1995. Monitoring revealed that 88% of the sites have some form of physical or visitor-related impact. Physical impacts are occurring at a higher rate than visitor-related impacts.

Recommended measures to reduce site impact, protect site integrity, and site management are outlined for each site monitored during FY95. In addition to monitoring, the project incorporated total station mapping, artifact tracking units, stationary cameras, and a summary of Grand Canyon geomorphological research. The FY96 work plan includes remedial actions based on priority rankings, video and medium format cameras to supplement 35 mm prints, computerization of site maps in conjunction with GCES topographic maps, and continued monitoring of selected sites.

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I. Introduction

From August 1990 through May 1991 the National Park Service (NPS) conducted an intensive archaeological survey along the Colorado River corridor from the base of Glen Canyon Dam to Separation Canyon. The survey report (Fairley et al. 1994) was finalized and distributed during fiscal year 1995 (FY95). The information contained in that report is the basis for the monitoring project. The survey documented 475 archaeological sites between the river's edge and the 300,000 cfs level. Of these 475 sites, 336 are in locations that have the potential to be impacted by the operations of Glen Canyon Dam.

Beginning in 1992, a monitoring program was initiated with the object of determining what was actually happening to the 336 sites with regard to erosional impacts. 1995 represents the fourth complete year of this project. A total of 144 sites were monitored in FY95, twenty-one monitored twice for a total of 165 monitoring episodes.

In addition to the regular monitoring, a stabilization workshop was held at Marble Canyon, Arizona May 24-26, 1995. The event was organized and co-sponsored by the Bureau of Reclamation (Reclamation) and the Grand Canyon National Park. The workshop was well attended and acted as an introduction for the remedial actions to be completed at Palisades this September. The work plan for Palisades will be sent to the signatories under a separate cover.

Each year the project becomes more attuned to the pervasive nature of erosion in the river corridor and its consequences on archaeological sites. The work plan for FY96 outlined in the appendices of this report includes the continued monitoring of select sites in the project area as well as the tasks of completing detailed mapping, conducting remedial actions and incorporating the geomorphological work done by the USGS.

II. FY95 Scope of Work

Fiscal year 1995 objectives and perspectives are based on recorded results, recommendations, and detailed photographic documentation of site conditions. Below are brief explanations of how the project works and some background on projects the monitoring program has undertaken to improve the management of river corridor archaeological sites.

A. Site Selection

The river corridor archaeological sites selected for monitoring are derived from the original group of 475 sites inventoried during the 1990-91 survey. A total of 336 sites (BOR/NPS 1994) comprise the number of properties that are either impacted or potentially impacted by river flows (identified as the "I" group). Within the "I" group are 263 sites located on sediment deposits subject to erosion

(identified as the "SI" group). By the end of FY96, all 263 "SI" sites will be monitored and a monitoring schedule devised. Of the remaining sites within the "I" category, 10% will be sampled for monitoring on a yearly basis with replacement.

An additional 130 sites along the river corridor are classified as the "N" group -- no impact. A 10% sample (13 sites) was randomly selected as a control group for FY95. Monitoring of these sites will continue on a yearly basis. The remaining 117 sites will never be monitored.

One hundred and forty-four sites were monitored in FY95, 21 were monitored twice, for a total of 165 monitoring episodes. They include: 20 "N" sites, 23 "I" sites, and 101 "SI" sites. Seven sites from the "N" category were discontinued due to the changed sampling strategy initiated in FY94. Additional "I" sites were monitored because time permitted.

B. Field and Lab Methods

Five river monitoring trips were completed in FY95, October 1994 to May 1995, ranging from 11 to 17 days in length. Individual trip reports were prepared and sent to all PA signatories. The trips launched from Lee's Ferry, AZ with takeouts at Diamond Creek, 225 river miles downstream. The takeout for the FY95-5 trip was at Pearce Ferry on Lake Mead. Field personnel consisted of at least one project archaeologist and one or two archaeological technicians.

Monitoring consists of in-field evaluation of site condition, documented by photographs, and the completion of a monitoring form. Photo documentation involves comparing previous photos to current field conditions and duplicating photographs where change is evident. Pentax Zoom 105-R, Olympus Twin, and Nikon FM2 are used with black-and-white Kodak Plus-Xpan 125 film. Medium format 6x7 cm negative prints are taken at selected high impact sites to supplement 35 mm prints. Color slides are occasionally taken. On average five rolls of film (36 exposures) are taken every monitoring trip, resulting in 700 photo images produced in FY95. The photographs are mounted on cards with site number, date, description, and directional information. Negatives are archived in polypropolene sleeves, stored in acid free archival binders, and archived in a fire-proof filing cabinet.

The site monitoring form is a compilation of quantitative and qualitative observations designed to reflect the condition of each site (Appendix A). The archaeologists record physical and visitor-related impacts to sites and make site-specific management assessments and recommendations. The location of any impacted or deteriorated feature or structure is noted on the site form and map, and comparisons are made with previous observations.

Monitoring data are entered into a relational database program (Paradox) and analyzed using both Paradox and SYSTAT (statistical analysis) software. Raw data and associated graphs are available at the project office. Final copies of monitoring forms are printed and filed at the project office.

C. Total Station Mapping

Since April 1994, Reclamation has generated total station maps for river corridor sites as part of the Programmatic Agreement on Glen Canyon Dam operations. These maps have the potential to serve as a form of detailed archaeological information and aid in site management. Thus, total station mapping is considered a remedial action. The maps include levels of detail which allow the project personnel to discern minor changes in erosional impacts, growth of trails, dissolution of features and artifact movement.

To date, 30 sites have been visited. Thirteen site maps are complete and 17 are partially complete. Mapping will continue in FY96 with emphasis on surveying in cross sections at sites with active erosion channels. Additionally, the USGS completed several topographic maps of various locations at a 1:2,000 scale. In FY96 Reclamation and project staff will elevate communication with the USGS and Glen Canyon Environmental Studies (GCES) to obtain mapping data to avoid duplicating unnecessary points, and to improve upon the maps that already exist. Site maps completed in FY95 are listed in Table 1.

Table 1. Total Station Maps Completed in FY95.

Site Number (N = 13)	
A:15:003	A:15:021
A:15:030	A:16:004
C:13:070	C:13:099
C:13:100	C:13:273
C:13:339	C:13:371
G:03:004	G:03:020
G:03:064	

D. Surface Analysis Units

Defining surface analysis units was suggested by Programmatic Agreement (PA) representatives in FY94 as a means of tracking artifact movement on sites substantially impacted by visitor-related and/or physical effects. After much consideration and many suggestions by the Programmatic Agreement signatories, the decision was made to use one-by-one meter square units to track artifact movement. These units offer minimal site impact and serve as a low visibility means of observation. The goal is to successfully quantify rates of impact at selected river corridor sites.

In FY94, ten units were placed at nine sites in five separate locations; three at Nankoweap, one at 60 Mile Canyon, two below Unkar, three at Palisades, and one at Basalt. On-site placement of the units was subjective and limited to areas with fewer than 20 cultural items. The unit location was plotted on the site map, each unit was photographed, and all artifacts, rocks, vegetation, etc. were identified

and mapped on grid paper. A datum nail was placed on a corner on most units to aid in locating them in FY95. Below is a brief description of the surface analysis units monitored.

NANKOWEAP

C:09:051A

This unit originally contained 20 prehistoric artifacts of groundstone, ceramics, and lithics. During the second observation, seven originally identified artifacts were not observed and five new artifacts were identified.

C:09:051B

Four cultural artifacts were initially identified in this unit. It was noted that three of the original artifacts were not located during the second observation and three new artifacts were identified. Monitors observed that artifacts had moved across the unit, and that the three new artifacts could have been those originally present, a lack of detailed descriptive data may have hampered interpretation.

C:09:052

In FY94, 19 artifacts were identified. The second observation revealed that two of the original artifacts were missing and nine new artifacts were identified.

C:09:082

Eleven artifacts were identified during the initiation of this unit. Three of the original artifacts were not identified during the second observation. Three new artifacts were identified.

60 MILE CANYON

C:13:006

Two charcoal deposits and nine cultural artifacts were initially plotted. During the second observation, five original artifacts could not be identified. Six new artifacts were plotted. It was noted that while all the fire-cracked rock within the unit was moved, yet charcoal deposits remained.

BELOW UNKAR DELTA

C:13:070

Ten artifacts, including two upright manos, were plotted during the original mapping of this unit. Two artifacts were not identified during the second observation and four new artifacts, all gray ware ceramics, were plotted. The manos remain upright but they are situated in a very fragile and unstable environment.

C:13:385

Eighteen artifacts, primarily corrugated ceramics, were observed at this unit. The unit was not revisited during the FY95-5 monitoring trip due to time constraints. The unit will be analyzed during the FY95-6, September 1995 river trip.

PALISADES

C:13:100

Fifteen lithic and ceramic artifacts were identified in this unit with several unmodified sandstone slabs. During the second observation two of the original artifacts were not found and two new artifacts were identified. Overall, there was minimal movement of both artifacts and sandstone.

C:13:272

Two ceramic artifacts were identified and plotted during the initiation of this unit. These artifacts were also identified during the second observation. One larger piece of sandstone shifted slightly as did one sherd. This was the only movement observed.

C:13:101

Four flakes and one ceramic sherd were observed. This unit could not be located in FY95 due to incomplete field data and a lack of any locational photographs. This unit will be omitted from the sample.

BASALT

C:13:321

Five cultural artifacts were originally identified at this unit with several sandstone slabs and a large twig. During the second observation four of the original artifacts were not identified but four new cultural artifacts, including two separate pieces of fire-cracked rock were located. The twig remains within the unit, only slightly shifted. There was slight movement of sandstone slabs and a cobble.

Results

FY95 marked the second observation for the surface analysis units. Through photographs, semi-permanent datums and detailed unit maps, nine of the ten units were located on trips FY95-4 and FY95-5. After 45 minutes, the attempt to locate the unit at C:13:101 ended and, as a result, is exempt from the sample. The unit at C:13:385 was not analyzed due to time constraints. It will be observed this September on the FY95-6 trip.

Once a unit was located, much time was spent finding the datum. Initially, the datums were covered by approximately 2 centimeters of sand. During the second observation, over half the units had datums buried approximately five centimeters below the surface, suggesting eolian deposition. After the datum was found, the unit was outlined in quarter sections and a duplicate photo was taken. Items were plotted on a copy of the original map to observe and record any differences while in the field. Analysis length varies from 30 to 45 minutes in duration. Lab responsibilities included computerizing the units to illustrate Time 1 (T1 = FY94 observations) versus Time 2 (T2 = FY95 observations) changes. Specific changes observed on the nine units are outlined below, and Table 2 summarizes the findings. Appendix B shows the visual results and summary statistics.

Analysis of the units will continue in FY96. However, it is important to note that this is a pilot project. Thus far, data suggests that artifacts are moving across the units. Artifacts observed on the first analysis have disappeared in the time between observances and additional artifacts have been

identified within the boundaries of the analysis units. The processes working to transform the units have not been identified. There has been no data generated on the types of movement or how artifacts are moving. There has also been great variation in the consistency of recording. We have found that this type of analysis is more than laying a grid on the surface of the landscape and observing change. It is an extensive, timely process that should consider artifact type, size, and weight in conjunction with the cultural and non-cultural processes working to alter surficial remains. Without detailed information on the random and non-random causes of movement, interpretation of the archaeological record will remain incomplete.

A more rigorous method of tracking artifact movement is required to determine if non-random movement is affecting the interpretation of the archaeological record and to measure the extent of erosional/depositional processes. The present method of tracking artifact movement offers no new insight on site stability, aside from that already obtained via routine monitoring activities and photo comparisons. Observations made at these units are to date, very generalized and unreliable. More accurate, precise, and consistent methods are necessary if this type of study is to continue.

Table 2. Summary of the Surface Analysis Units.

Site Number	River Location	T1 Date vs. T2 Date	T1 Artifacts vs. T2 Artifacts	Artifact Movement
C:09:051	Nankoweap A	2-30-94 vs. 3-28-95	20 vs. 13	Yes
C:09:051	Nankoweap B	2-30-94 vs. 5-02-95	4 vs. 4	Yes
C:09:052	Nankoweap	2-26-94 vs. 3-28-95	19 vs. 26	Yes
C:09:082	Nankoweap	2-26-94 vs. 3-29-95	11 vs. 11	Yes
C:13:006	60 Mile	3-31-94 vs. 5-02-95	11 vs. 12	Yes
C:13:321	Basalt	2-28-94 vs. 5-03-95	5 vs. 5	Yes
C:13:070	Below Unkar	3-01-94 vs. 5-02-95	10 vs. 12	Yes
C:13:385*	Below Unkar	3-01-94	18	N/A
C:13:100	Palisades	2-27-94 vs. 3-30-95	15 vs. 15	Yes
C:13:272	Palisades	2-27-94 vs. 3-30-95	2 vs. 2	Yes
C:13:101**	Palisades	3-31-94	5	N/A

* = Will complete in September, 1995.
** = Omitted from the sample.

E. Stationary Camera

Since March 1992, stationary cameras have been used on sites with moderate to extensive erosion. The cameras are automated to take 36 daily black-and-white photographs of select areas, to document erosional change.

The cameras are located at three sites for this fiscal year: C:13:003, C:13:006 (put in on the FY95-5 trip) and C:13:371. On the FY95-3 trip the camera photographing C:13:359 was taken out due to the lack of any noticeable activity. The only change noted is still at C:13:003 after the Little Colorado River flood in January 1993 (See 1993 Annual Monitoring Report). It is recommended that the camera at C:13:371 remain through this fiscal year, although no erosion has been documented on film.

Analysis of the hundreds of photographs that are taken consists of visual inspection. Thus far, there are few observable changes and these have been to beaches and sandbars at river level. No changes to cultural features have been noted. The most dramatic change recorded was the large accumulation of sand deposited at river level in front of C:13:003 (the Hopi Salt Mine) in January and February of 1993. Since that time most of the sediment has been removed and the beach front has returned to the situation prior to the Little Colorado flood.

Changing and archiving the film is delegated to the GCES beach erosion program headed by NPS Researcher Brian Cluer. This project will continue through FY96, however, the beach erosion program may not carry over into FY97.

III. Impacts to Cultural Resources

Cultural resources along the river corridor are at risk because of the existence of Glen Canyon Dam. The dam is a sediment barrier that prevents the replenishment of beaches, dunes, and terraces with river-derived sand. Without the necessary cycle of natural deposition, these landforms can and have become unstable. Cultural deposits embedded in or on these unstable landforms will eventually erode. "Archeological sites and traditional cultural properties once protected by sandbars and terraces have become increasingly exposed to erosion by the river and rainfall-induced terrace erosion" (Bureau of Reclamation 1995:263). It is the very presence of the dam, then, which sets in motion a sedimentary cycle different from the one nature intended. The absence of large, periodic, sediment-laden floods will eventually expose many archaeological sites along the river corridor. This report evaluates impacts to archeological resources, while individual tribes evaluate other cultural resources such as traditional cultural places, sacred sites, and plant-, animal-, or mineral-gathering locales.

A. Physical Impacts

Eight physical impact categories were monitored in FY95. With slight modifications, these are the same categories used since the formal river corridor monitoring program began in FY92. These particular impacts were chosen because they commonly occur in this canyon environment and are relatively easy for monitors to recognize. Physical impacts are those erosional processes caused by wind, rain, the river, gravity, dam operations, and animals. Some impacts, such as bank slumpage, gullying, and arroyo cutting, are more directly related to the existence or operation of Glen Canyon Dam.

The physical impact categories are: surface erosion, gullying, arroyo cutting, bank slumpage, eolian/alluvial erosion or deposition, side canyon erosion, animal-caused erosion, and an "other" category. Surface erosion is defined as channels, rills, or sheetwash occurring on the surface of the ground or up to 10 cm. in depth. Gullies are trenches or channels cut by an ephemeral stream or running water after rains, and occur from a depth of 10 cm to 1 meter. Arroyos are the same as gullies, except they are deeper channels (greater than 1 meter). Bank slumpage is the sudden sinking, falling, or collapsing of the rising ground bordering the river. Eolian refers to sediments borne, deposited, produced, or eroded by the wind. Alluvial sediments are those materials (clay, silt, sand, or gravel) deposited by running water. Side canyon erosion includes such events as rainfall-induced flooding and debris flows from side canyons, which then drain into the Colorado River. Animal-caused erosion includes digging, burrowing, nesting, or tracking through or under site deposits, and trailing through sites. These impacts are often caused by bighorn sheep, packrats, or ants. The "other" category includes such disturbances as spalling of rocks onto a site's surface, or roots imbedded in cultural deposits.

In FY95, 144 unique sites were monitored. Twenty-one of these sites were monitored twice because of their semiannual schedule, resulting in 165 monitoring episodes. No data were obtained at one site (G:02:032), which is located high up a side canyon and is out of the currently-

defined impact zone. Thus, the following tables refer to 164 (rather than 165) monitoring episodes.

The results show that most monitored sites (76%) are experiencing some form of erosion. This proportion is almost identical to the 77% of physically impacted sites found in FY94. As in the previous year, the greatest site impact is surface erosion (45% of sites). The remaining physical impacts are animal-caused erosion (38%), gullies (37%), eolian/alluvial erosion/deposition (34%), "other" erosion (24%), arroyos (17%), bank slumpage (13%), and side canyon erosion (11%). New impacts (since the last monitoring visit) were noted at 81 sites (49%). See Table 3 for the frequency of physical impact types.

Table 3. Frequency of Physical Impact Types (N = 164 Monitoring Episodes)

Physical Impact Type	Present		Absent	
	Freq.	Percent	Freq.	Percent
Surface Erosion	74	45	89	55
Gullying	61	37	102	63
Arroyo Cutting	27	17	136	83
Bank Slumpage	22	13	141	87
Eolian/Alluvial Erosion or Deposition	56	34	107	66
Side Canyon Erosion	18	11	145	89
Animal-caused Erosion	62	38	101	62
Other Impacts	39	24	124	76

Figure 1 depicts the relative frequency of physical impact observations (N = 586). Monitored sites often had more than one type of impact present. For example, 136 (23%) of the 586 physical impacts observed were due to surface erosion.

Figure 1. Relative Frequency of Physical Impacts (N = 586 Observations)

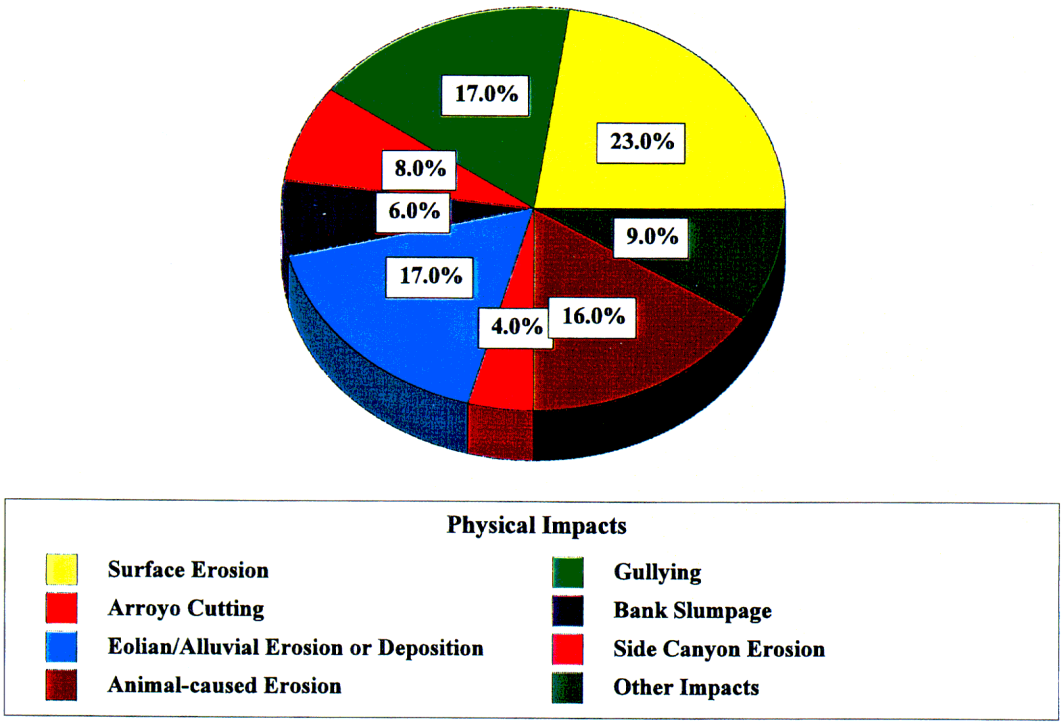
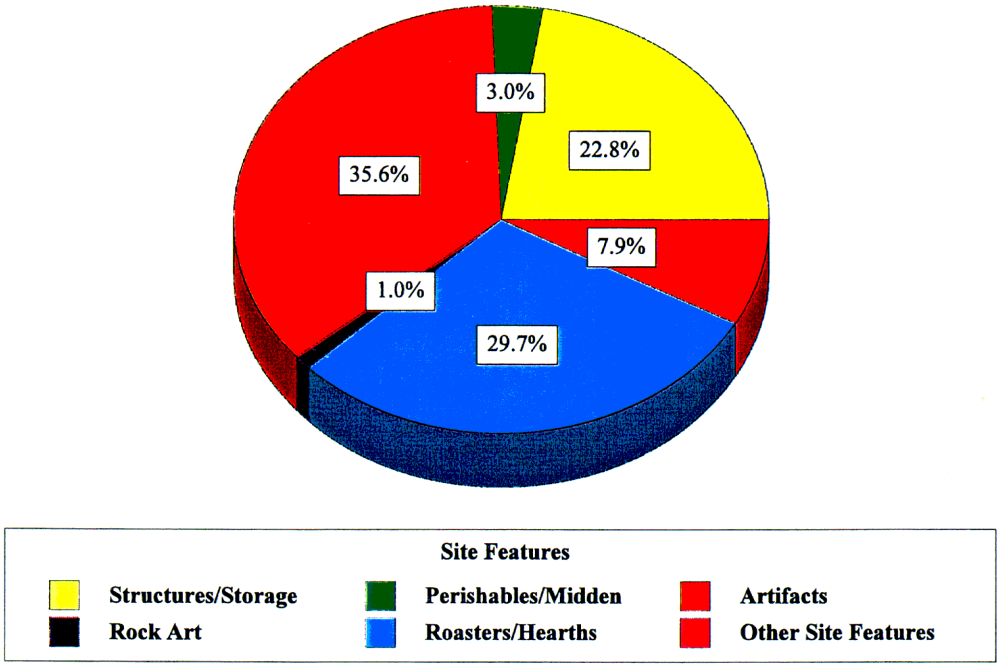


Figure 2 shows where on the sites erosion is occurring. Artifact scatters, roasting pits, and structures are receiving the most impact. Rock art features (which includes historic inscriptions) are receiving the least impact.

Figure 2. Impact Frequency at Various Site Features (N = 586 Observations)



When arroyos or gullies were present, the archaeologists recorded whether they drained to the river. This involved following the channel as far as it travelled. Some drainages die out in dune fields or on terraces before reaching the river (terrace-based streams). The assumption is that channels that drain to the river (river-based streams) are effected by the river's base level, and thus any lowering of the base level may geometrically increase erosion in the channels (Hereford et al. 1991). FY95 data indicate that 33 sites (20%) have arroyos or gullies that drain to the river.

There are 50 sites (35%) showing increased erosion. Of the physical impact types, surface erosion, gullying, and eolian/alluvial erosion or deposition have increased the most. This is seen in Reach 5 (river mile 61.5 - 77.4) and Reach 10 (river mile 160.0 - 213.9). Table 4 depicts the frequency of increased erosion episodes (observations) by physical impact category and location on-site (i.e. site feature). The number of observations is equal to 153 because this is a subset of the site population consisting only of those sites with increased erosion. Artifact scatters and roasting pits continue to receive the most impact from increased erosion (108 of 153 observations or 71%).

Table 4. Frequency of Increased Erosion Episodes at FY95 Monitored Sites (N = 153 Observations)

Physical Impact Types	Site Features							
	Structures /Storage	Artifacts	Roasters /Hearths	Perishables /Midden	Rock Art	Other	Total Row	Percent Row
Surface Erosion	5	15	10	2	0	3	35	23
Gullying	7	9	11	0	0	2	29	19
Arroyo Cutting	3	6	6	0	0	2	17	11
Bank Slumpage	2	5	7	0	0	3	17	11
Eolian/Alluvial Erosion or Deposition	4	9	11	0	0	1	25	16
Side Canyon Erosion	0	1	1	0	0	1	3	2
Animal-caused Erosion	3	5	5	2	0	1	16	10
Other Impacts	2	3	4	0	1	1	11	7
Total Column	26	53	55	4	1	14	153	100
Percent Column	17	35	36	3	1	9	100	

B. Visitor-Related Impacts

Information was recorded on five different visitor-related impacts. These include the formation of trails to or through archaeological sites, moving or rearranging artifacts such as creating collection piles, camping on or near sites, criminal vandalism (intentional destruction or removal of artifacts or features), and an "other" category. These impacts were selected because they are a problem along the river corridor, and are indirectly a result of the existence of Glen Canyon Dam.

Eighty-eight sites (54%) showed some form of visitor-related impact in FY95. The most frequently occurring visitor-related impact along the river corridor was the formation of trails. Seventy-five (46%) of the 164 monitoring episodes showed the presence of trails made by humans. This percentage is only slightly higher than the 43% of sites with trails monitored in FY94. The majority of these trails were made by river-runner parties and Glen Canyon Environmental Studies researchers. Monitoring visitor-related trails through archaeological sites is important because they can turn into gullies, creating an avenue for further erosion.

Table 5 shows the frequency of visitor-related impact types. As stated above, trails are the most common visitor-related impact (46%), followed by collection piles (12%). Camping on sites and criminal vandalism are relatively infrequent. At 46 sites (28%) monitors indicated that the visitor-related impacts occurred since the last time the site was monitored.

Table 5. Frequency of Visitor-Related Impact Types (N = 164 Monitoring Episodes)

Visitor-Related Impact Type	Present		Absent	
	Freq.	Percent	Freq.	Percent
Trails	75	46	89	54
Collection Piles	19	12	145	88
Camping on Site	9	5	155	95
Criminal Vandalism	1	1	163	99
Other	12	7	152	93

The majority of trailing (48%) occurred in Reaches 5 and 10 of the river corridor. These are the same reaches where most trails were recorded last year and where most of the physical impacts occurred this year. Both reaches are places where popular river-runner camps are located near archaeological

sites. Monitors indicated that trails increased at six sites: C:13:099 and C:13:005 in Reach 5, B:15:091 in Reach 6, A:15:005 and G:03:028 in Reach 10, and G:03:080 in Reach 11. Trailing is most prevalent at small structures and roaster complexes. These are the most common site types in Reaches 5 and 10, are larger and more visible to the hiker or boater, and are located on some of the same river terraces and stabilized dunes that are used as camping beaches or as transportation routes to scout rapids or visit other campsites.

At sites B:11:272 and B:15:091, monitors indicated that visitor-related impacts were directly related to river fluctuations and/or dam operations. Boaters trail through B:11:272 to scout Deubendorff Rapid. At B:15:091 there is a popular camping beach below and upstream from the site.

There was one instance of criminal vandalism recorded at site C:02:098, a prehistoric overhang shelter with flakes, one sherd, and charcoal. Monitors noted additional graffiti on the overhang wall.

In addition to recording the types of visitor-related impacts, monitors record where on the site these impacts occur, or to what site type. This information helps cultural resource managers decide how to reduce such impacts, if possible, and the level of work needed. Table 6 depicts visitor-related impact at various site features. These data show that the greatest impacts, in terms of frequency, were to artifacts, structures, and roasting pits. Rock art, perishables, and "other" features received the least visitor-related impact. They are also the least common site type along the river corridor.

Table 6. Frequency of Visitor-Related Impacts at Various Site Features (N = 164 Monitoring Episodes)

Site Features	Present		Absent	
	Freq.	Percent	Freq.	Percent
Artifacts	43	26	121	74
Structures/Storage	20	12	144	88
Roasters/Hearths	20	12	144	88
Other	7	4	157	96
Perishables/ Midden	3	2	161	98
Rock Art	2	1	162	99

C. Summary of Impacts

The natural processes of canyon erosion and human visitation are effecting archaeological sites along the Colorado River corridor. Eighty-eight percent of the FY95 monitored sites have some form of physical or visitor-related disturbance. Physical impacts are more prevalent than visitor-related impacts (76% vs. 54% of sites), based upon the frequency of occurrence. The monitors indicated that more of the physical impacts are new, or happened since the last monitoring visit, than the visitor-related disturbances (49% vs. 28%).

Artifact scatters, roasting pits, and structures bear the most damage from surface erosion, animal-caused erosion, gullying, and human visitation. Many of these features are located in or on sand dunes and alluvial terraces which easily erode when, for example, hiking trails criss-cross over them. Artifact scatters and roasting pits are relatively horizontal and lie on top of the ground surface, thereby exposing a larger surface area to natural elements and human foot-traffic.

D. Geomorphic Research

The geomorphological work being carried out in the river corridor is essential to the proper interpretation of archaeological sites. It is also an important tool used in the future planning of the monitoring project. Not only does this work allow us to better understand the processes which created the ancient and modern landscapes of the Colorado River, but it also helps paint a more complete picture of the world in which the native inhabitants lived.

There are currently several projects in progress being carried out in the river corridor concerning geological and geomorphic processes. The two which have the most practical applications to archaeological monitoring are USGS projects led by Richard Hereford and Ivo Lucchita.

Hereford et al. have focused on the more recent surface history of the late Holocene. Their studies interpret the modern landscapes that have developed along the river corridor in response to debris flows and the residual effects of large predam floods.

This year has produced a detailed report examining debris fans and alluvial chronology in the eastern end of Grand Canyon (Hereford, et al. 1995), and a report identifying areas of potential erosion in the vicinity of Granite Park (Hereford, et al. In review). A detailed contour map of the Lees Ferry area including all of the historical features located there was also completed this year.

Previous work by Hereford that identified a causal relationship between river-based and terrace based erosional channels found in the river corridor has been adopted by the archaeological monitoring project as a concept related directly to the determination of priority ranking for each site (Hereford et. al. 1991). This concept is explained in last years annual report and put simply describes drainages occurring along the river as either river-based, emptying directly into the Colorado River and affected by releases from Glen Canyon Dam, or terrace-based, dying out in dune or boulder fields before reaching the actual river.

The work being done by Lucchita and his team focuses on the larger picture of Quaternary geology, expanding the work done in the corridor back to at least one million years. Lucchita explains it as "establishing long term insight to better determine the more finite processes of today" (Lucchita, Personal Communication 1995). Because of the greater span of time involved with geochronological work, Lucchita's team includes paleo-soil scientists Sid and Marie Davis, particle physicists Mark Caffee and Bob Finkle from the Lawrence-Livermore Laboratory, and Garnis Curtis co-inventor of Potassium-Argon dating. Their work includes base maps for the following areas; Lees Ferry, Nankoweap to Kwagunt, Palisades to Unkar, and the vicinity of Granite Park.

Although acknlowledged previously by other researchers, it was officially documented in the1994 annual monitoring reports that Lucchita believes Glen Canyon Dam, in it's role as a man-made barrier, has imposed an artificial altithermal environment, causing a significant lack of sediment in the system. This lack of sediment has repercussions on archaeological sites throughout the river corridor. When a protective cover of sand is removed from a site, there is no supply available to replace it. Once a site is exposed in this fashion not only is it more vulnerable to the immediate effects of erosion, but it's complete dissolution is imminent.

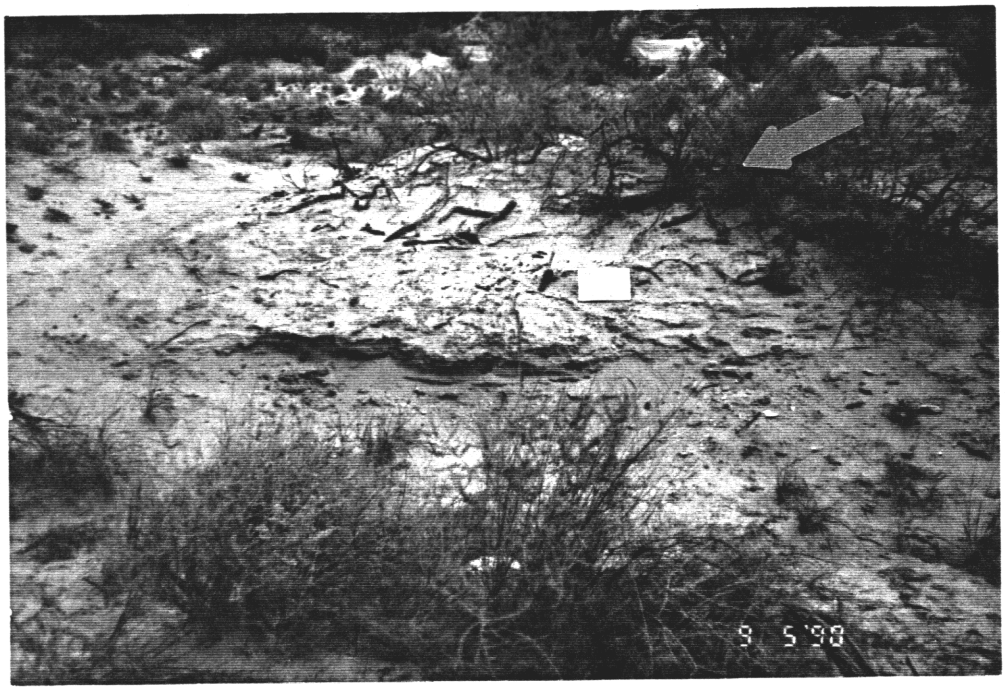
The next FY will see the monitoring project make use of this body of work to establish where stabilization of erosional channels can be most effective. Geomorphological data will also aid us in understanding where we can expect drainage networks to evolve, allowing the project to stabilize the situation before it becomes a problem.

E. Photographic Documentation

During FY95, over 700 photographic images were developed and archived. Project photographs include 3x5 black-and-white prints, color slides, archival artifact photographs, 6x7 cm medium format prints of C:09:050, C:09:051, C:13:099, C:13:098, C:13:070, G:03:003, G:03:034, and 8 mm video cassettes of C:13:098, C:13:099, and G:03:064. Experimentation with medium format prints and 8 mm videotape during FY95 has increased site-image clarity and the number of photographic resources available for comparative analyses. Improvements in the lab included purchasing archival binders for storage and a fire-proof filing cabinet to archive project negatives.

When a site is monitored and change is evident, monitors attempt to reproduce the previous photograph. Producing exact photo replications is a procedure that requires precise articulation between cameras, crew, outside conditions, and time. Unfortunately monitors are confined by time, therefore precise replication is often impossible. The photographs presented in this section show obvious changes when compared to prior photographs. Arrows and dashed lines point out specific areas of change.

The figures in this section include: photographs illustrating physical and visitor-related impacts to river corridor archaeological sites, successful actions taken to preserve site integrity and reduce impacts, a surface analysis unit established to track artifact movement, and medium format prints taken on the FY95-4 trip. Figure 18 illustrates an example of long-term photo replication, showing nearly 17 years of change.

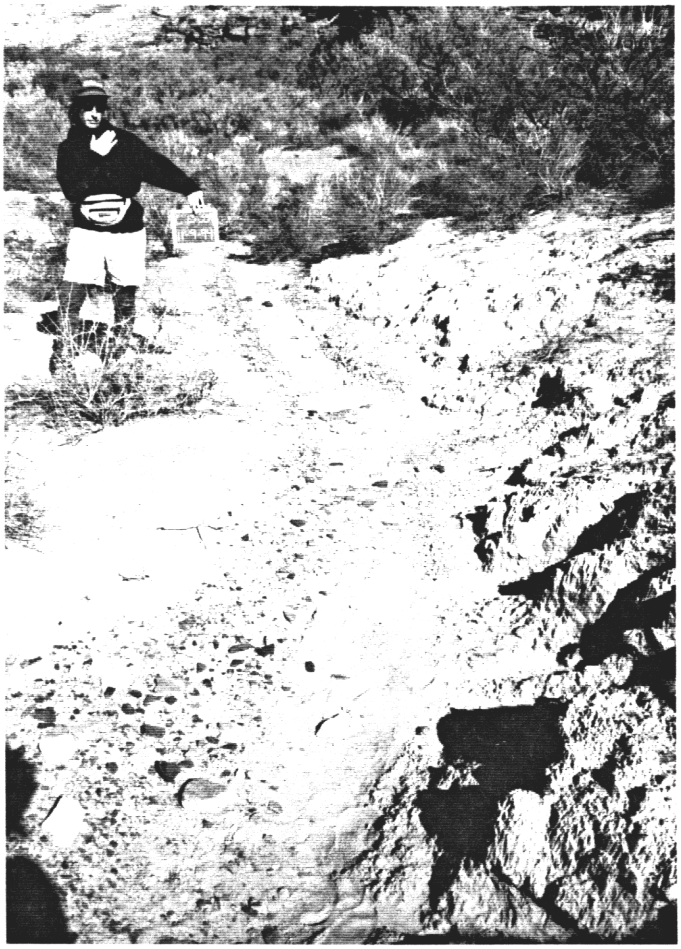


September 5, 1990

March 30, 1995

Figure 3 illustrates the increasing loss of sediment caused by an active drainage at C:13:099A. Due to recent changes Feature 2, an artifact scatter, could not be located in FY95.

April 29, 1993



November 9, 1994

Figure 4 illustrates a trail, sediment loss and formation of rills at C:13:339. Parts of the trail were moved to reduce human disturbance at features.

October 8, 1994

March 28, 1995

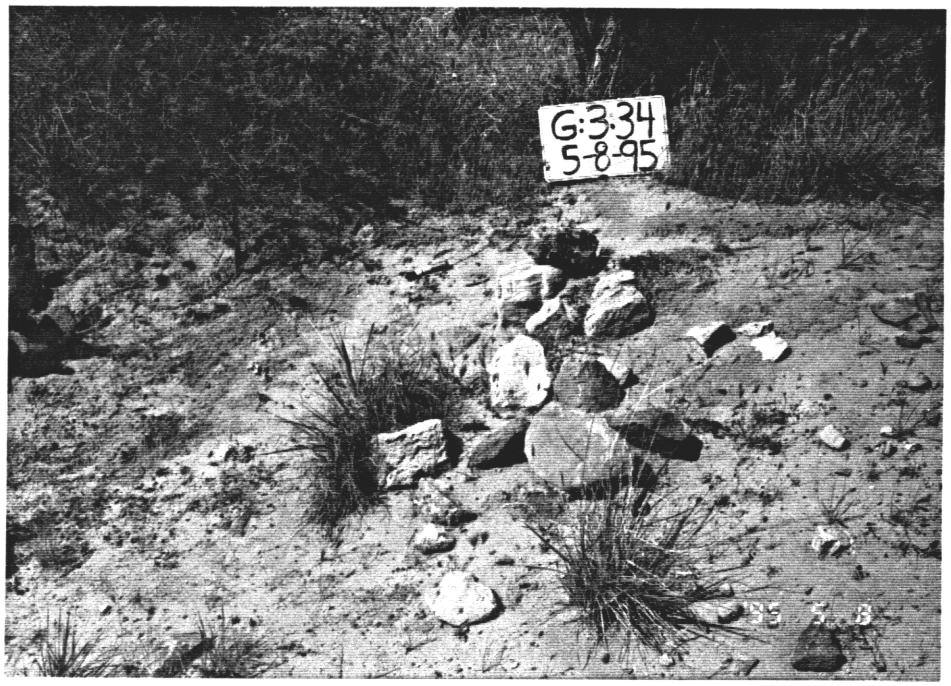
Figure 5 illustrates the impact of side canyon flash flooding caused by heavy rainfall at C:09:051D. Nankoweap Creek has truncated a roomblock, sherds and FCR located on the cutbank. Notice the dashed line indicating sediment loss caused by the flood.

April 30, 1993

February 25, 1995

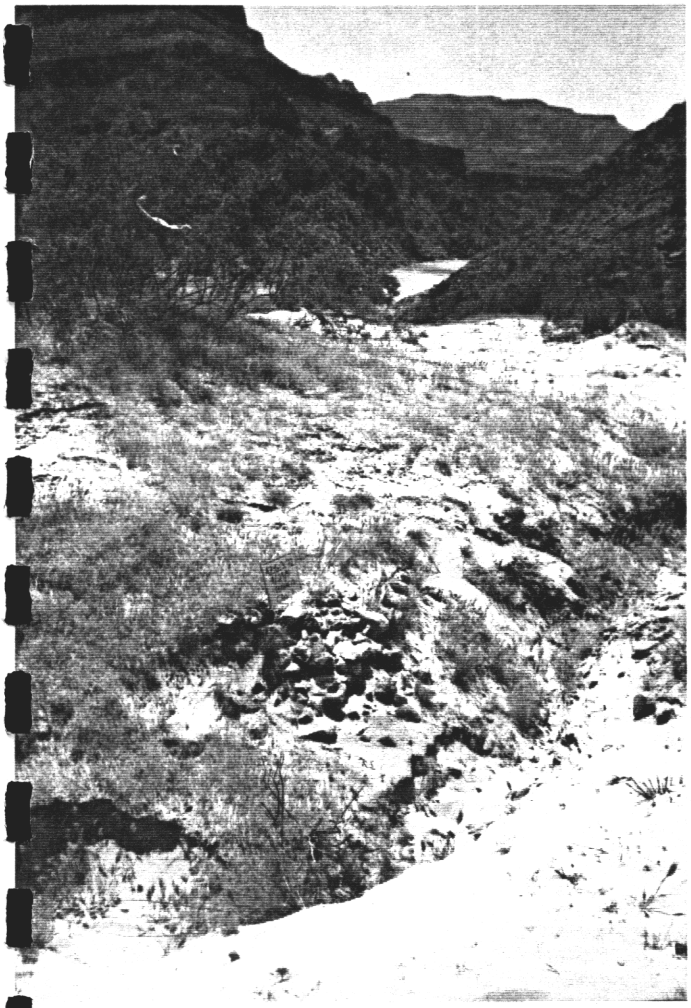
Figure 6 illustrates the increasing entrenchment of a drainage resulting from heavy precipitation at C:13:349. Several features are located in the cutbanks or in close proximity to the drainage edge. Notice the re-entrenchment of the drainage, indicated by arrows, and its impact on Feature 2.

February 2, 1991

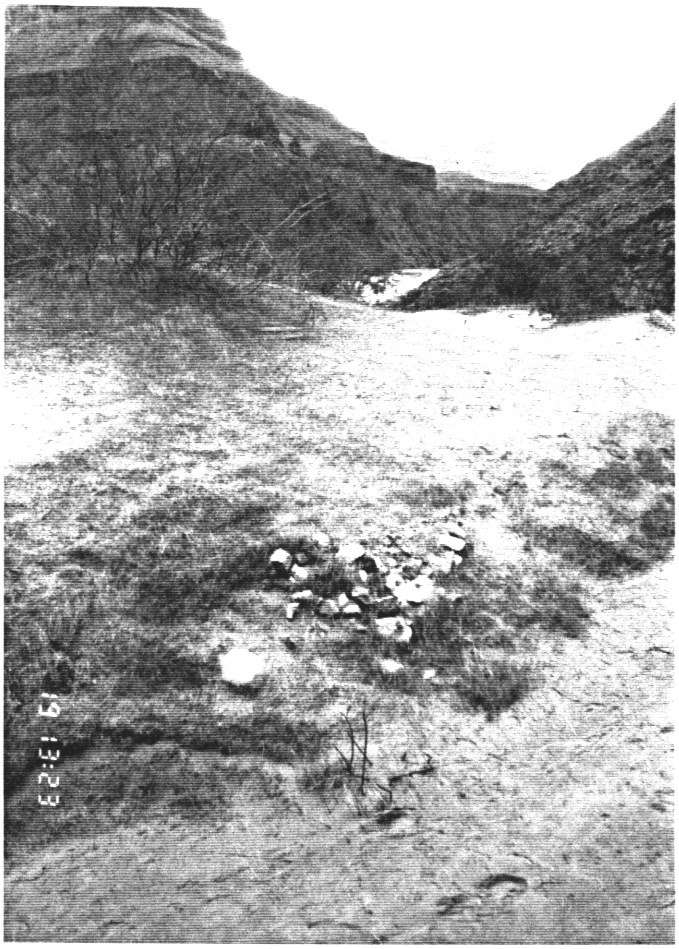


May 8, 1995

Figure 7 illustrates sediment loss due to an insufficient amount of sand available in the system at G:03:034. Notice the new rocks uncovered by deflation.

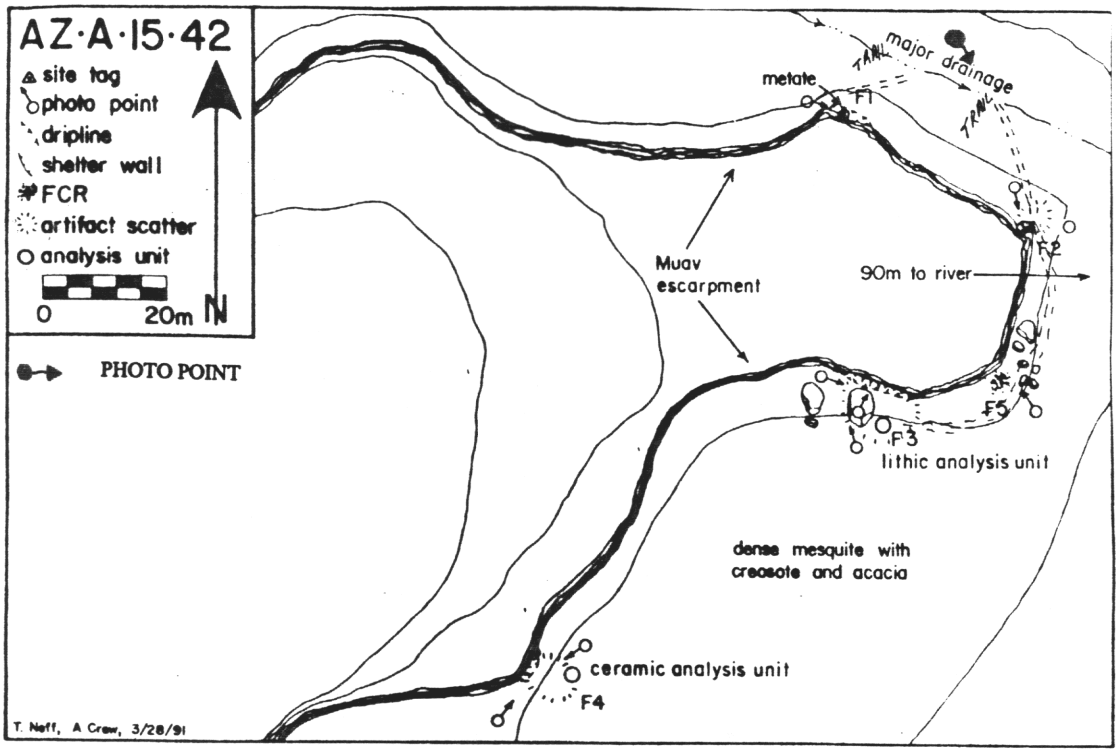


April 29, 1991



November 19, 1994

Figure 8. The erosional channel was active prior to 1991 but has subsequently filled in at G:03:072. Vegetation has reestablished the stability of the impacted hearth.



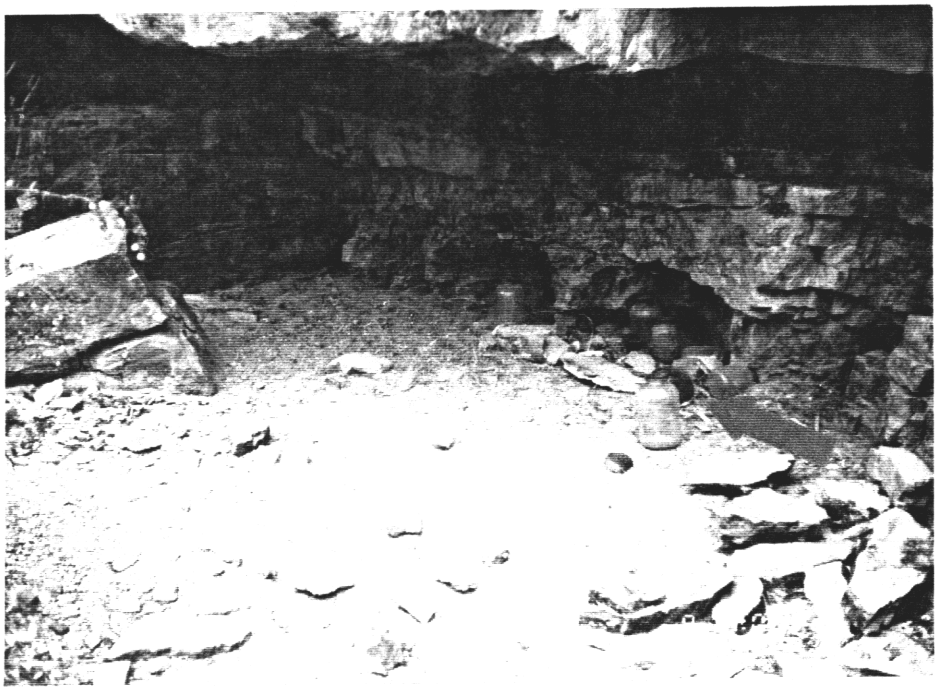
Site map with photo location

April 3, 1995

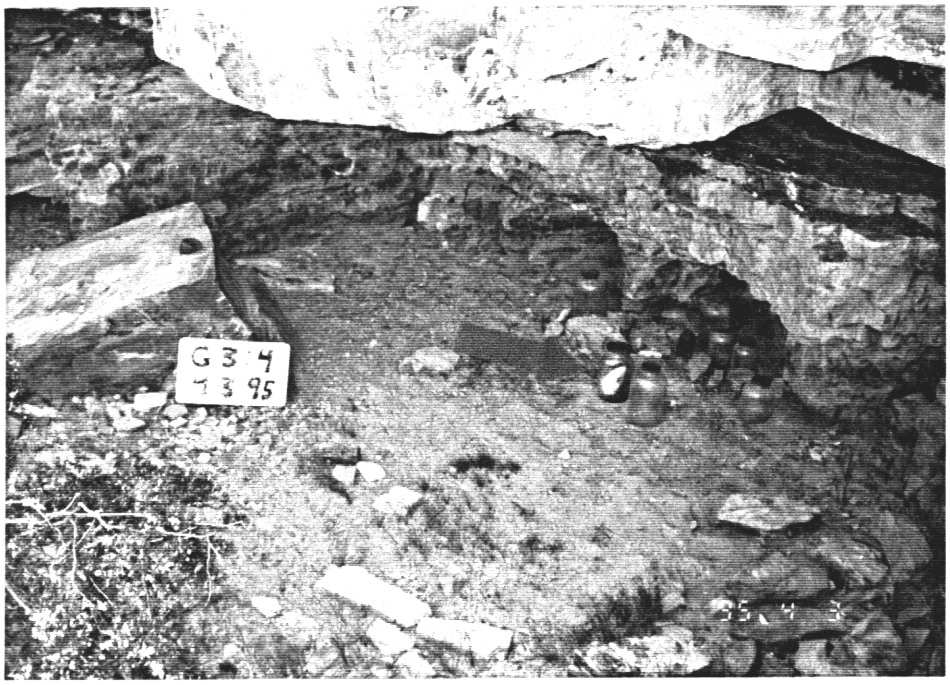
Figure 9 illustrates impacts caused by side canyon flooding due to localized, heavy rainfall at A:15:042. No previous photos were available to replicate. The map illustrates the photo point and damage caused by the flood. The flood removed sediment while cutting a path to the Muav escarpment.

March 2, 1995

Figure 10 illustrates an example of animal disturbance which uncovered a yucca fiber sandal at B:10:230. The sandal was photographed and sketched in detail and reburied in place. Small animal disturbance is common on sites with associated overhangs. Notice the dashed lines and arrows pointing to the sandal.

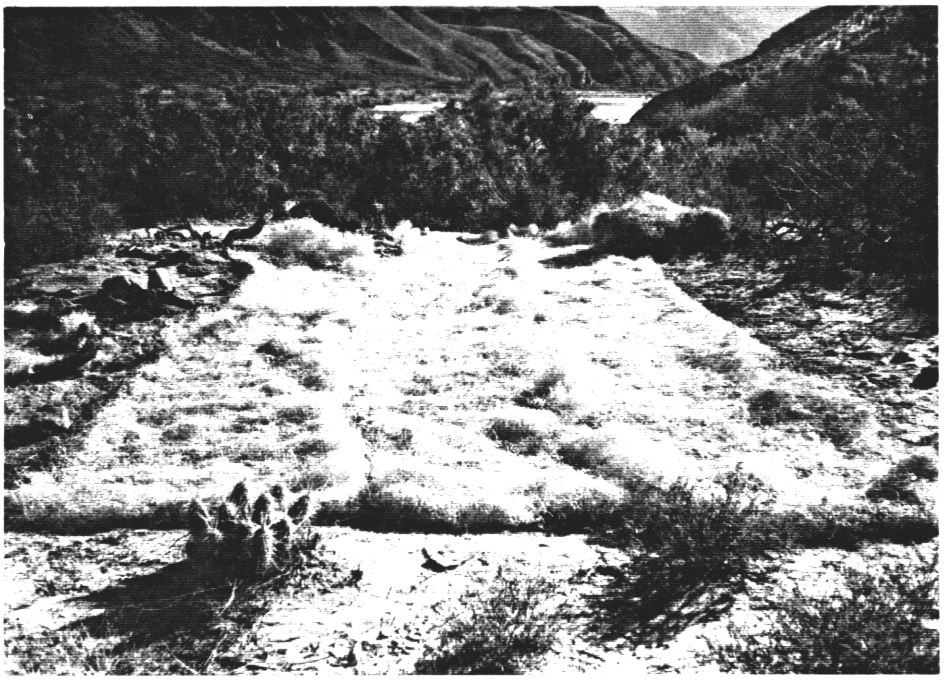


May 8, 1994

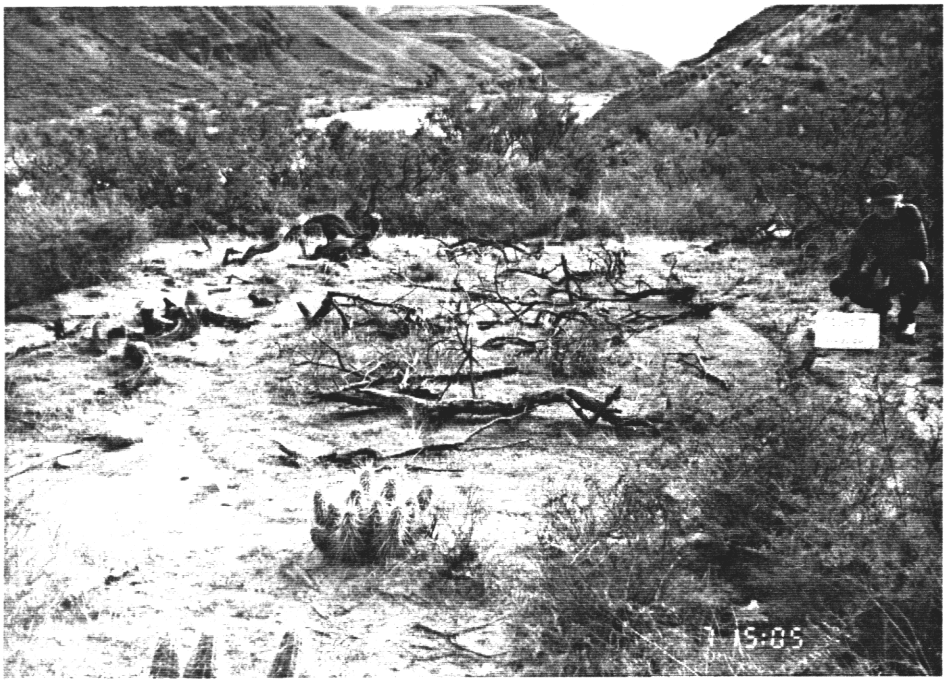


April 3, 1995

Figure 11 illustrates human disturbance of artifacts at G:03:004. A trail to the jars has developed through several roasting features below the overhang. Remedial action is scheduled in FY96 to reduce impacts and preserve the sites integrity.



November 8, 1992



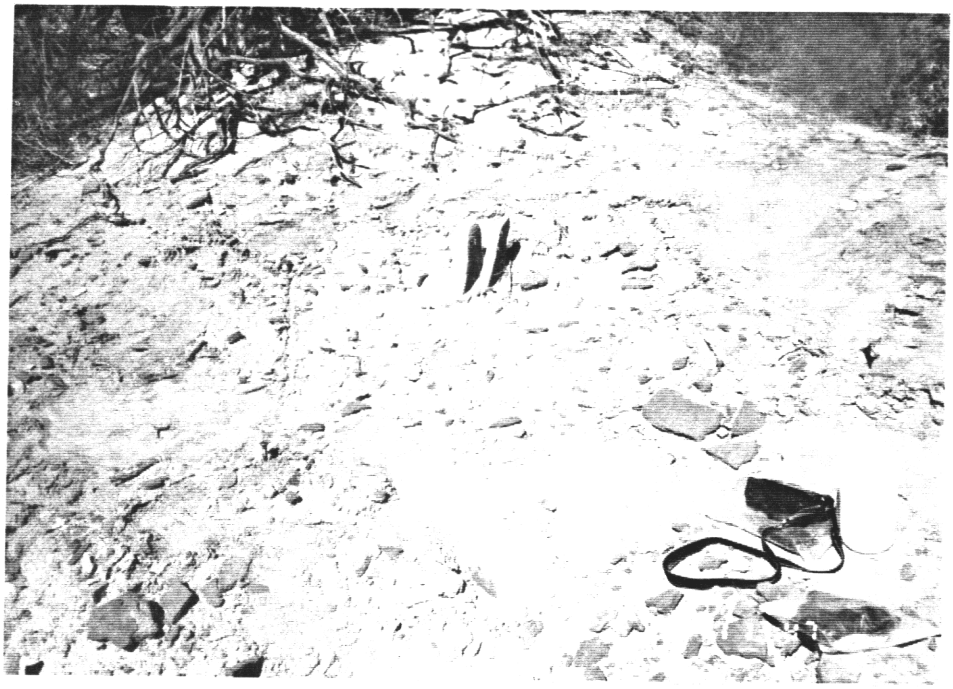
November 4, 1994

Figure 12 illustrates procedures used at C:13:007 in revegetating Feature 4. This action is proving to be a very successful technique in site preservation.

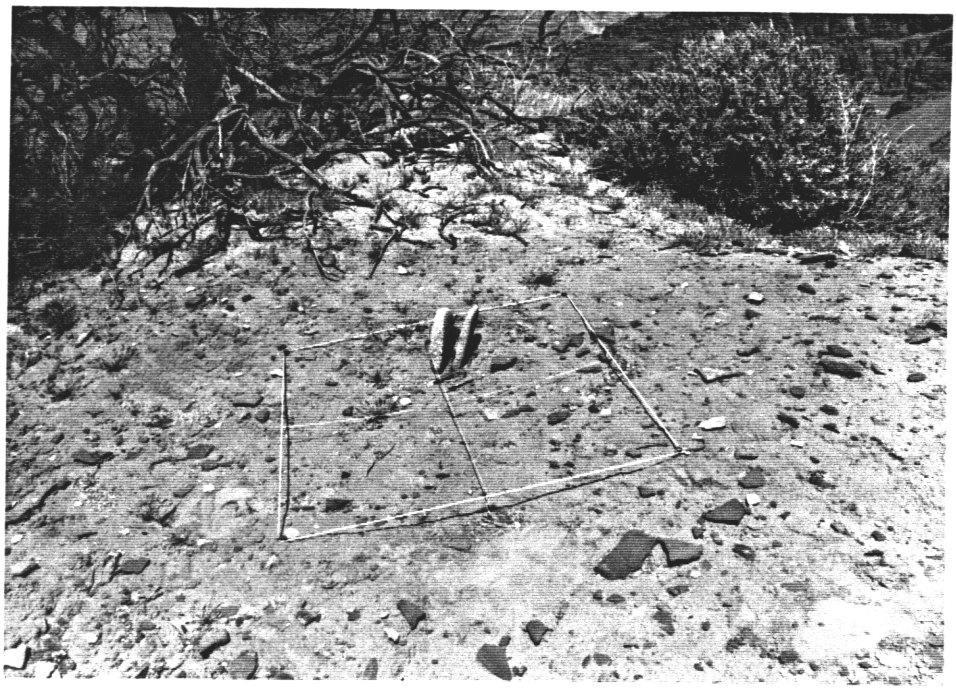
March 31, 1994

November 4, 1994

Figure 13 illustrates a stabilization wall that collapsed due to heavy rains and was rebuilt in November 1994. The wall at C:13:007 represents the importance of long-term monitoring and maintenance.

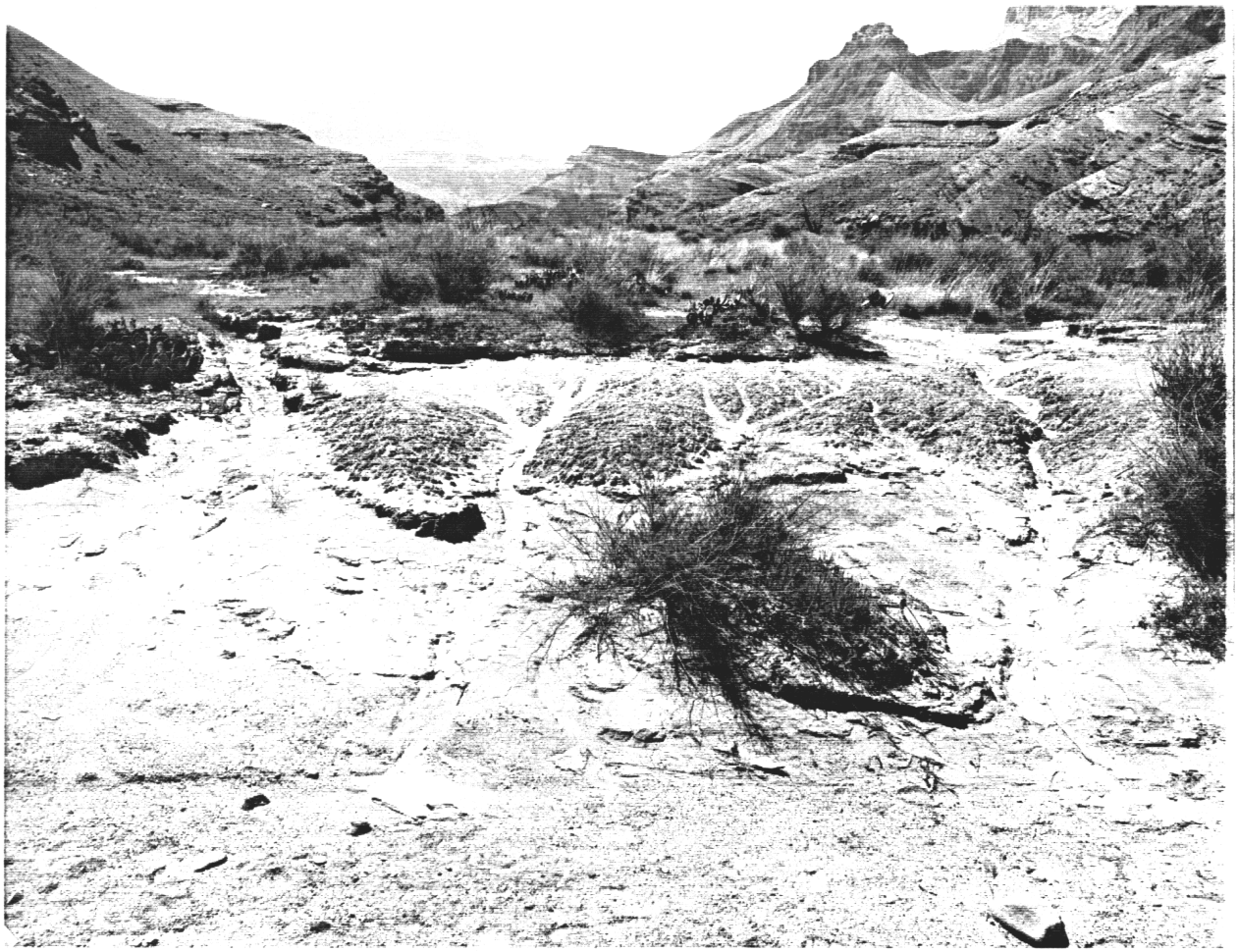


March 1, 1994



March 31, 1995

Figure 14 illustrates a 1x1 meter surface analysis unit at C:13:070B. The unit was placed in an area with two upright manos and several grayware sherds. Several sherds and rocks had shifted position since the last monitoring visit.



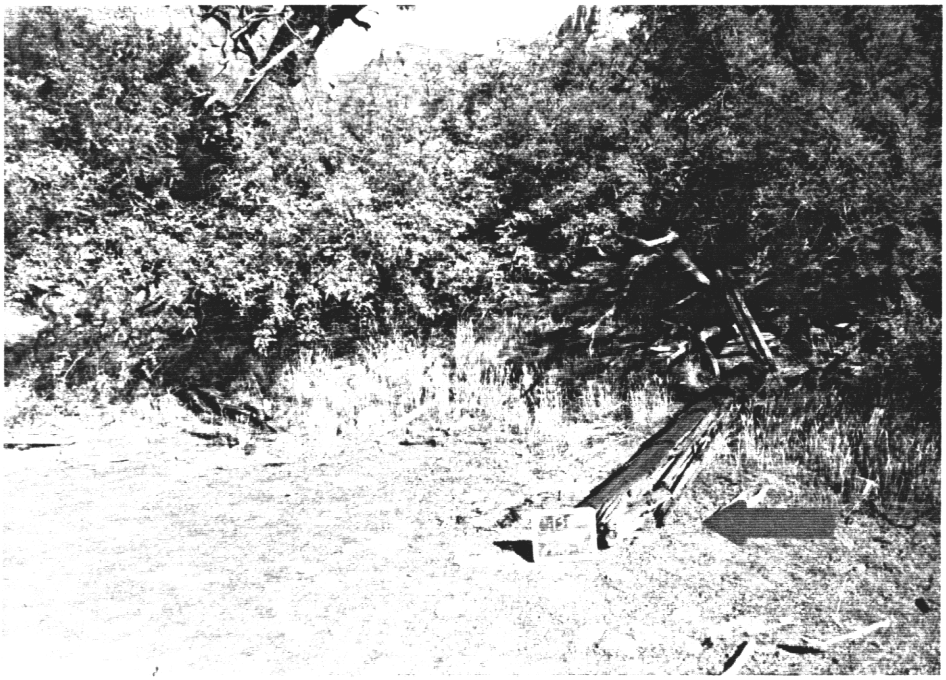
March 30, 1995

Figure 15 illustrates the detail and clarity of a medium format camera at C:13:099. The photo shows rills and gullies near a large site complex. Over two hundred prints were taken using the 6x7 cm medium format camera on the FY95-4 monitoring trip.

March 30, 1995

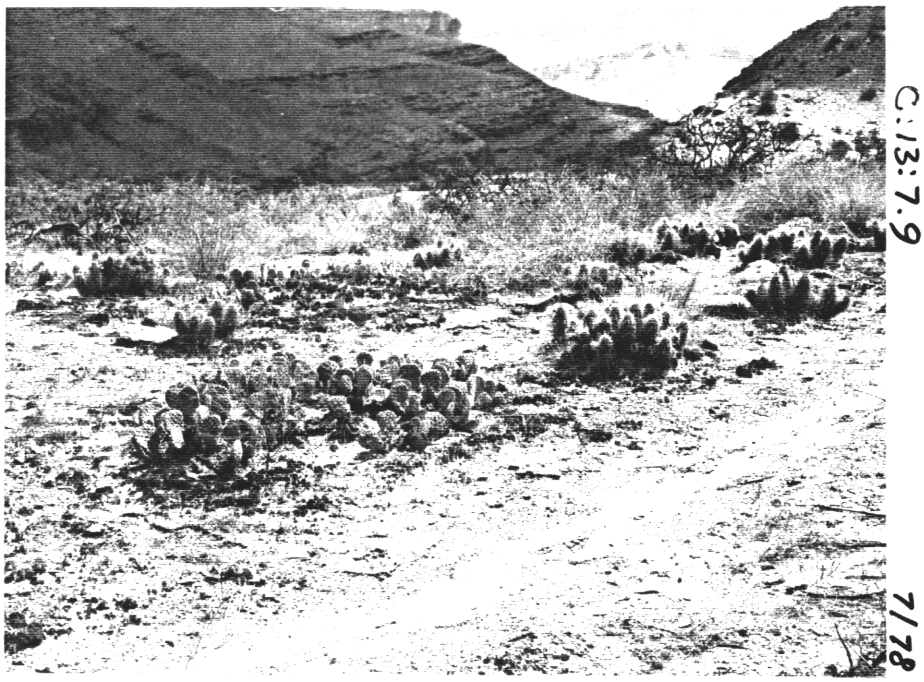
Figure 16 is another example of the detail and clarity of a 6x7 cm medium format camera. The photo illustrates bank slump at C:13:099.

July 1978



October 10, 1994

Figure 17 illustrates a long-term replication photo at C:13:131. Notice the deterioration of the wood and increase in vegetation. Arrows indicate similar features in each photograph.



July 1978

November 4, 1995

Figure 18 illustrates a long-term replication photo at C:13:007. Notice the effects of trailing and sediment loss that have pedestalled the cacti over seventeen years.

IV. Site Specific Results and Recommendations

A:15:005

A:15:005 consists of several cleared areas located on a series of narrow benches and shallow rock shelters, special activity areas, artifact concentrations and an extensive pictograph panel. The site has Paiute as well as prehistoric Pai affinity as evidenced by sherds observed on the surface. The site is situated on a variety of landforms including; alluvial terrace, talus slope, cliff base and cliff face.

PREVIOUS WORK: The site was initially recorded by Robert Euler in May 1984 and was rerecorded in greater detail in January 1991. A:15:005 was monitored in FY93 and FY95. The Southern Paiute Consortium also visited this location to conduct Ethnographic interviews regarding the pictograph panel.

STATUS AND RECOMMENDATIONS: The site is currently stable with regard to physical impacts. However human trailing has developed as a byproduct of visitation to the pictograph panel and this has created the potential to degrade the cultural materials located at Loci B and C. It will be difficult to curtail visitation to the pictograph panel so it is recommended that the trail be obliterated and relocated to a less sensitive spot such as the drainage bottom to avoid the fragile part of the site. After this action has been taken it is advised to monitor the site the following year to determine a protocol for the future.

A:15:017

A:15:017 is a rock shelter with associated lithic and ceramic materials indicating multiple occupations through time including a Puebloan, Southern Paiute and undetermined modern presence. Chipped stone and groundstone tools along with collected wood infer this was a preferred habitation to various people over the last millennium. A Jeddito Black-on-yellow sherd suggests a protohistoric trade connection to Hopi.

PREVIOUS WORK: This site was located and expediently recorded by Helen Fairley in October 1989 on a reconnaissance trip and was revisited and recorded in greater detail by NPS survey personnel in November 1990.

STATUS AND RECOMMENDATIONS: This site is currently stable. A:15:017 belongs to the "N" control sites (no impact) and will be checked on an annual basis.

A:15:021

A:15:021 is multicomponent camp consisting of a slab and block fire feature, an obsidian Desert side-notched point, a bone shirt button, several late historic metal artifacts, a brown ware pot bust, a Moapa Gray Ware sherd and an Elko series projectile point/knife. The site is located on a stabilized mesquite covered dune and extends onto the rocky benches above the dune.

PREVIOUS WORK: The site was initially recorded in November 1990. A:15:021 was monitored for the first time since the survey in April 1994 and again during the current FY. The site was mapped in detail using a total station in May 1995.

STATUS AND RECOMMENDATIONS: Although the bulk of the site is currently stable, the feature is deteriorating due to exposure. It is recommended that A:15:021 be monitored every three years.

A:15:025

A:15:025 is a well-used hematite mine associated with prehistoric and late historic utilization. The pigment obtained and processed at this location by the Hualapai and Paiute was traded all over the Southwest. Although the site was visited by Native Americans into late historic times, it has lain dormant most of the 20th century until recently when the current archaeological project brought it to the attention of tribal representatives involved with the project. Presently small amounts of the pigment are being obtained for ceremonial use by members of the tribes.

PREVIOUS WORK: A:15:025 was officially recorded in November 1990. The site was monitored in FY93 and FY94.

STATUS AND RECOMMENDATIONS: The site itself is currently stable. However, a trail has developed in response to the considerable traffic generated by the project since 1990. Tribal representatives have requested that the site be monitored on an annual basis. Surface runoff does reach the river and there are no river related impacts associated with the site other than the current increased visitation. The project staff is also concerned about the safety factor involved with the climb up to and extraction of the hematite. It is recommended that A:15:025 be removed from the River Corridor Monitoring project and included in a non-Glen Canyon Dam related monitoring program.

A:15:026

A:15:026 consists of two intact roasting features. No artifacts were observed on the surface. The site is located on stable dune deposits overlying high water and colluvial debris. The site is virtually invisible due to the thick cover of grasses.

PREVIOUS WORK: A:15:026 was initially recorded in January of 1991. It has subsequently been monitored in FY92, FY93 and FY94.

STATUS AND RECOMMENDATIONS: The site is very stable. A Bighorn sheep trail runs through the site, though causing no discernable impact. Surface runoff does not reach the river. A:15:026 should be monitored every three to five years.

A:15:027

A:15:027 consists of roasting features and an assemblage of artifacts indicating Virgin Puebloan as well as a later Pai presence. The site is located on a dissected terrace remnant.

PREVIOUS WORK: The site was first recorded in November 1990 and was monitored in FY92, FY93 and FY94.

STATUS AND RECOMMENDATIONS: The site is currently stable and in good condition. Some recent, minor impacts are due to the continued presence of Bighorn sheep. Water draining off the surface of the site flows directly into the Colorado River. It is recommended that A:15:027 be monitored every three years to watch for potential formation of gullies or arroyos.

A:15:030

A:15:030 is a site consisting of a single roasting feature. No artifacts were observed on the surface and cultural affiliation is unknown.

PREVIOUS WORK: This site was recorded in January 1991 by NPS survey personnel. It was monitored for the first time since the survey during FY95.

STATUS AND RECOMMENDATIONS: The site is currently in a fragile and precarious position. The feature has been bisected by a local drainage and fire-cracked rock has been removed downslope since it was recorded. The erosion occurred in such away as to reveal the internal morphology of the feature. It is suggested that a C-14 sample be taken before the site is completely removed to better determine a cultural affiliation. It is recommended that A:15:030 be monitored in alternate years.

A:15:031

A:15:031 consists of four distinct concentrations of fire-cracked rock, a sherd and lithic scatter as well as an activity area delineated by a circular rock alignment with the presence of at least three metates and several manos. Ceramics observed on the surface indicate a Puebloan occupation.

PREVIOUS WORK: This site was recorded in January 1991. It was last monitored in October 1992.

STATUS AND RECOMMENDATIONS: The site is currently stable. It is suggested that monitoring be discontinued.

A:15:039

A:15:039 consists of a well-defined roasting feature as well as two others that are more diffuse. An artifact scatter is associated with the fire features and contains a complete projectile point, obsidian flakes and processing slabs. Cerbat Brown Ware present on the surface indicates a Pai occupation and the features combined with the presence of grinding slabs suggests a camp with repetitive use.

PREVIOUS WORK: This site was initially recorded in January 1991. A:15:039 was monitored in fiscal years 1992 and 1993.

STATUS AND RECOMMENDATIONS: Although erosion is occurring on the margins of the site the cultural materials are currently stable and a thick growth of vegetation acts as a protective shield. It is recommended that this site be monitored every five years.

A:15:040

A:15:040 is a rock shelter containing groundstone, hand tools and some fire-cracked rock. No ceramics or lithic materials were observed on the surface. Cultural affiliation has not been determined.

PREVIOUS WORK: This site was initially recorded in February 1991 and was last monitored in FY92.

STATUS AND RECOMMENDATIONS: The site is not visible from the river and access is difficult due to the thick protective cover of vegetation. It is recommended that the site be monitored every five years. It is further suggested that one of the locally active arroyos in this stretch of the river be cross-sectioned and periodically measured to see if the removal of terrace based alluvium is occurring and to what degree.

A:15:042

A:15:042 consists of several activity areas with associated artifact concentrations and a historic inscription of unknown origin.

PREVIOUS WORK: The site was initially recorded in March 1991 and has been monitored annually since the completion of the survey.

STATUS AND RECOMMENDATIONS: The majority of the site is stable. However, Feature 2 is threatened by annual side canyon flooding (one which occurred this spring) and another feature was found this field season in alluvium closer to the river. In addition, trailing has developed from visitation to the inscription but was obliterated this FY. It is recommended that monitoring of the site continue every other year.

A:16:002

A:16:002 is a large rockshelter/cave located in a basalt flow. A single "unclassified brown ware" sherd was found during the survey in 1991. No other artifacts were observed in the shelter. Four sherds of Lower Colorado Buff Ware were noted by Euler during an earlier visit to the site indicating a Pai affiliation. Some charcoal was found at the mouth of the cave but it could be modern judging by other items found in association (a prophylactic, a gum wrapper, and a yellow golf tee).

PREVIOUS WORK: This site was initially recorded by Bob Euler during September 1967. At that time only the four sherds mentioned above and some charcoal were observed. The site was rerecorded in January 1991. It was last monitored in FY93.

STATUS AND RECOMMENDATIONS: The site is currently very stable with the potential for buried materials being very high. The modern trash mentioned above was found in 1991 and currently no items were observed. It is recommended that this site be removed from the monitoring schedule and revert to a non-Glen Canyon Dam related monitoring program for future work.

A:16:151

A:16:151 consists of a large roasting feature, minimal artifacts and a rock shelter. The site is divided into two distinct loci with Pai affinity. A:16:151 is located on reworked dune deposits which overlay a bedrock terrace.

PREVIOUS WORK: A:16:151 was initially recorded in November 1990. The site has been monitored annually since 1992.

STATUS AND RECOMMENDATIONS: The site is currently stable with minor impacts from Bighorn sheep trailing. Some portions of the site drain surface water directly into the river and others do not. It is recommended that A:16:151 be monitored every five years.

A:16:156

A:16:156 is a rock shelter and a cleared activity area with two separate wall alignments, lithic debitage and scattered charcoal. No tools were observed on the surface and cultural affiliation is unknown.

PREVIOUS WORK: This site was initially recorded in November 1990 and was monitored for the first time in FY95.

STATUS AND RECOMMENDATIONS: This site is located above the zone of potential impact. It is recommended that this site be dropped from the monitoring schedule.

A:16:158

A:16:158 is an aceramic site of unknown cultural affiliation located in a Muav Limestone rock shelter. Artifacts on site include a large grinding slab and a few chert flakes.

PREVIOUS WORK: The site was initially recorded in November 1990. A:16:158 has been monitored annually since FY92.

STATUS AND RECOMMENDATIONS: This site is situated less than three meters above the 28,000 cfs level. Water was present in the site during the high water of 1983 and 1984. Site location presupposes that it has been underwater untold times since its creation. At some point a test unit could be placed to determine subsurface integrity. 1994 showed an increase in eolian sand inside the shelter. This was probably derived from the large sandbar located just downstream. This bar was refurbished during the Little Colorado River floods in January 1993. It is recommended that the site be monitored annually.

A:16:159

A:16:159 consists of a rock shelter with an artifact assemblage including sherds, lithics, groundstone and hand tools as well as a small pictograph panel. Ceramic evidence indicates Pai affinity with a possible earlier Virgin Puebloan presence.

PREVIOUS WORK: This site was initially recorded in November of 1990. A:16:159 has been monitored annually since 1992.

STATUS AND RECOMMENDATIONS: The site is currently stable, but it receives more visitation than previously. A Moapa spindle whorl observed during the survey has subsequently been hidden or removed. This year a projectile point was found on the surface. Occasionally, trash is found on site. It is recommended that the site be monitored annually and spot checked as often as is practical.

A:16:185

A:16:185 is a probable human burial consisting of numerous shell beads from the Pacific coast, a finely worked rhyolite desert side-notched point, a few flakes, some Moapa Gray Ware sherds and a single human metatarsal. The site is located in a stabilized set of riverside dunes.

PREVIOUS WORK: This site was discovered during the intensive survey of 1990-1991 and was recorded in February 1991.

STATUS AND RECOMMENDATIONS: The site is located in vegetation anchored sand dunes in a nondescript swale within 60 meters of the river. Even though a boating camp is nearby the site is so subtle as to not arouse curiosity and exhibits no sign of modern visitation or impact. Due to the very sensitive nature of sites containing human remains it has been requested by the Hualapai Tribe this site be monitored at a minimal level and that a tribal member be present on site during any scheduled visit. It is recommended this site be monitored on a five year schedule and spot checked after episodes of localized severe weather.

B:09:317

B:09:317 is located at the mouth of a major side canyon. The site consists of two separate loci, one on each side of the drainage. An intact fire feature, lithics, groundstone and a projectile point were recorded during the survey. The site is situated on a bedrock bench where the cliffs meet the top of the talus. Runoff does not drain directly into the river.

PREVIOUS WORK: This site was initially recorded by Janet Balsom in 1986 and included the upstream locus. The site was re-recorded in November 1990. B:09:317 has been monitored in FY93 and FY94.

STATUS AND CURRENT RECOMMENDATIONS: The site is currently stable concerning physical impacts. However, the surface is being adversely impacted from a steady stream of visitation. The site suffers to a greater extent because of its proximity to a highly used camping beach. B:09:317 is located on Hualapai Tribal lands (above the historic high water zone). It is recommended that the trail be obliterated leading to the site and that monitoring take place annually

B:10:121

B:10:121 is a small structural site located in a major side canyon. The site consists of a slab-coursed set of three walls which make use of an isolated boulder to create a room. A single corrugated sherd and one Redwall chert flake were the only artifacts observed.

PREVIOUS WORK: This site was initially recorded in 1990 and was monitored for the first time in FY95.

STATUS AND RECOMMENDATIONS: The site is currently stable and shows no adverse impacts. B:10:121 belongs to the "N" group in the monitoring program which are monitored solely to provide a stable group database for comparison. This site will be monitored on an annual basis. It is further recommended that the trail leading from the boat beach to the terrace above the river be obliterated to reduce any future visitation to the site.

B:10:224

B:10:224 consists of two fire features adjacent to a major drainage. No artifacts were observed on the surface. Feature 1 is a 1.5 meter diameter mounded roaster in pristine condition rising 40+ cm above the surface. Feature 2 is the remnants of a burned sandstone slab cist eroding out of the edge of the cut-bank into the main drainage.

PREVIOUS WORK: This site was initially recorded in September 1990 and has been monitored in FY92, FY93, and FY94.

STATUS AND RECOMMENDATIONS: Presently Feature 1 is stable. Feature 2 is 80% gone with no hope or possibility of reversing that trend. Human visitation is virtually nonexistent. Bighorn sheep use this area extensively, trailing and feeding through the site on a daily basis. It is recommended that B:10:224 be monitored every three years.

B:10:229

B:10:229 consists of several naturally caused rock alignments appearing as perpendicular arrangements in locally occurring drainages. No artifacts were located on the surface.

PREVIOUS WORK: This site was recorded in April of 1991 by NPS personnel. In retrospect and on consulting with other archaeologists in the field it is our conclusion that this is not a cultural manifestation.

STATUS AND RECOMMENDATIONS: The site in question is located on a steep and active talus slope adjacent to the river. It is recommended that this site be removed from the monitoring program. Furthermore it is important for future planning that B:10:229 be made ineligible for nomination to the NRHP.

B:10:230

B:10:230 is a rock shelter/habitation with an intact midden and artifact assemblage including; hand held cobble tools, a flake scraper, a projectile point, burned stone, bone, sherds and a woven fiber sandal. The sherds indicate a Puebloan and a later Paiute occupation.

PREVIOUS WORK: This site was initially discovered and recorded in March 1991. B:10:230 was monitored for the first time in March 1995. It was at that time a complete yucca fiber sandal was observed eroding from the fill. It was photographed, sketched, and then reburied where it was found.

STATUS AND RECOMMENDATIONS: The site is currently being impacted by wall spall, animal burrowing, minor surface erosion across the midden and slope creep. Some downslope movement of artifacts occurred on site since it was recorded in 1991. It also appears that nobody has been to this location since that time. Monitoring will continue annually because this is an "N" (control) site.

B:10:236

B:10:236 is a light-density lithic scatter with two fire features and several tools. Tools included , a side-notched projectile point, a biface , a chopping/pounding tool and a chert core. No sherds were observed on the surface and the tools present indicate a possible Archaic affinity.

PREVIOUS WORK: This site was recorded in September 1990 and was monitored for the first time this year.

STATUS AND RECOMMENDATIONS: The site is currently stable with no indication of visitation since it was recorded. B:10:236 belongs to the "N" site category and will be monitored annually.

B:10:260

B:10:260 is a small lithic scatter with a single fire feature located on a dune covered terrace. No diagnostic materials were found on the surface.

PREVIOUS WORK: This site was initially discovered and recorded in October of 1990. It was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: The site is stable. It is recommended that this site be deleted from the monitoring program.

B:10:262

B:10:262 is the remnants of a Puebloan habitation including an altered wall, a few flakes, and a single corrugated sherd.

PREVIOUS WORK: This site was recorded in November 1990 and was monitored for the first time this FY.

STATUS AND RECOMMENDATIONS: This site is so heavily impacted by visitation and camping that all integrity has been lost. All information available was exhausted during the initial recording of the site. No artifacts were relocated during the monitoring visit and the site tag was gone. It is recommended that this site be removed from the monitoring schedule, there is nothing left to monitor.

B:11:271

B:11:271 is a rock shelter located at the base of the Bass Limestone. Sherds and lithics are present on the surface eroding out below the shelter. Ceramics indicate a Puebloan occupation.

PREVIOUS WORK: This site was discovered and recorded in January 1991 and was monitored for the first time this FY.

STATUS AND RECOMMENDATIONS: The site is currently stable and no observable change has occurred since the initial recording in 1991. It is recommended that B:11:271 be monitored again in three to five years and its status be reevaluated at that time.

B:11:272

B:11:272 is an isolated roasting feature with no associated artifacts. The site is located on a small levelled area of a diabase bench.

PREVIOUS WORK: This site was initially recorded in February 1991. Since then, the location has been monitored annually. NPS personnel obliterated the trail west of the roasting feature in February of 1995.

STATUS AND RECOMMENDATIONS: Presently, B:11:272 is stable. Erosional scars from gullying and local rains in 1991 and 1992 have since been stabilized by naturally occurring vegetation. In general, more vegetation is growing across the site. Recommend monitoring annually until it has been determined if the retrailing has been successful.

B:11:275

B:11:275 consists solely of two partial walls in a rock shelter at the base of the Bass Limestone. Although cultural affiliation is unknown it is presumed that the site is prehistoric.

PREVIOUS WORK: This site was discovered and recorded in January of 1991 and was monitored for the first time during FY95.

STATUS AND RECOMMENDATIONS: There has been no apparent visitation since the site was recorded in 1991. A small gully has formed on the upstream side of the site but it poses no threat to site integrity. It is recommended that B:11:275 be monitored every three years.

B:11:277

B:11:277 is an open site situated on sand dunes adjacent to the Colorado River and consists of a large concentration of fire-cracked rock, groundstone, lithics, and plain gray ware sherds indicating a formative Puebloan occupation. There is a high potential at this location for more materials to be buried in the extensive sand dunes.

PREVIOUS WORK: This site was discovered and initially recorded in January 1991 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: In general the site remains stable. Minor surface erosion and wind deflation is occurring along the southeast face of the dunes but this is probably a steady state problem depleting and correcting itself on a seasonal or annual basis dependent on winds and vegetation. A faint game trail crosses the site below the fire feature. The site has good grass cover and there is mature cryptogamic soil across the site. It is recommended that B:11:277 be monitored every five years to lessen impacts to the fragile surface of the dunes.

B:11:279

B:11:279 consists of four distinct loci of alignments and associated artifacts situated on a structural terrace overlooking a major rapid. Ceramics indicate a Pueblo II occupation. Lithic evidence indicates a Paiute presence. .

PREVIOUS WORK: This site was initially recorded in 1990 and was monitored in FY93 and FY94 and the current FY.

STATUS AND RECOMMENDATIONS: Gullying has increased in the vicinity of Feature 1. Headward erosion of all the secondary channels on the site has increased since 1993. The erosion is not effecting the cultural materials. The site is situated on a bedrock bench above the high water zone. Recommend monitoring be discontinued at this location.

B:11:280

B:11:280 is a rock shelter situated amongst a group of large detached Tapeats Sandstone boulders. Artifacts on site include a granite anvil stone, a cobble hammerstone and a Tapeats Sandstone grinding slab. No chipped stone tools or sherds were observed on site. The assemblage is suggestive of a Pai/Paiute occupation.

PREVIOUS WORK: This site was initially discovered and recorded in February 1991 and was monitored for the first time during FY95.

STATUS AND RECOMMENDATIONS: The site is presently stable with no apparent change since the site was recorded in 1991. Given the stable substrate, it is recommended that monitoring be discontinued.

B:11:281

B:11:281 is an open artifact scatter with sherds, flakes, groundstone, chipped stone tools and fire-cracked rock. Ceramics indicate a PII Puebloan affiliation. A complete Parowan point was observed at this location indicating a trade connection to the north.

PREVIOUS WORK: This site was discovered and initially recorded in January 1991. It was monitored for the first time this year.

STATUS AND RECOMMENDATIONS: A gully formed near Feature 1 on the downstream end of the site. It is recommended that this site be monitored every five years.

B:11:282

B:11:282 consists of a single roasting feature and an associated structural outline. A single flake was found on the surface, no ceramics were observed on the surface. Probable Pai affinity is indicated by the wickiup ring. Surface runoff drains directly into the river.

PREVIOUS WORK: This site was initially recorded in February 1991. B:11:282 has been monitored annually since it was recorded.

STATUS AND RECOMMENDATIONS: The site is presently stable and in excellent condition. However, the structural outline rests on the first flood terrace in the side canyon where the site is located. A small, single side canyon flood could remove it completely. Recommend monitoring every other year and watch for indications of side canyon flooding. Spot check as required.

B:13:002

B:13:002 consists of a Hualapai habitation including two shallow rock shelters, fire features, lithics, ceramics, hand tools, and milled lumber. The assemblage indicates long term use of the locality. Oral history confirms seasonal Hualapai occupation into the 20th century.

PREVIOUS WORK: This site was initially recorded by Robert Euler in 1972. A "digging stick and mescal cutting tool" were collected off the surface at that time and are now at the Museum of Northern Arizona. The site was more recently recorded in greater detail in September 1990. B:13:002 has been monitored annually since 1992.

STATUS AND RECOMMENDATIONS: The site is presently stable. B:13:002 is technically located outside the parameters of what defines the ongoing project and should be deleted from the monitoring program. Because the site is located on Hualapai lands it is also recommended that during trips which include Hualapai Tribal members, stops will be made at B:13:002 on request.

B:14:095

B:14:095 is an open site consisting of sherds, lithic debris, chipped stone tools and roasting features. Sherds indicate a Puebloan PI-PII affiliation. The site is located on sand dunes.

PREVIOUS WORK: This site was discovered and recorded in September 1990 and was monitored in 1993.

STATUS AND RECOMMENDATIONS: Some wind deflation and minor surface erosion is apparent across the surface of the dunes. This is a seasonal occurrence and the site is stable and relatively unchanged since 1990. It is recommended that B:14:095 be monitored every five years.

B:14:107

B:14:107 is a small rock shelter located in a Tapeats Sandstone overhang and consists of a few flakes, a cobble mano, a corrugated sherd, and a wall segment. A crescent shaped concentration of fire-cracked rock and stained soil is eroding out of the slope below the shelter.

PREVIOUS WORK: This site was discovered and recorded in October of 1990 and was monitored for the first time in FY95.

STATUS AND RECOMMENDATIONS: The site is stable at the present time. Gullys have developed adjacent to Feature 2 and it is not clear whether this occurred prior or subsequent to the survey. It is recommended that B:14:107 be monitored in FY96 and reevaluated at that time.

B:15:091

B:15:091 consists of two masonry structures and five distinct granaries located over 230 feet above the river. No artifacts were found in association with this site but it is presumed to be Puebloan in age.

PREVIOUS WORK: This site was originally recorded in 1978 and rerecorded in 1990. The site was last monitored in FY93.

STATUS AND RECOMMENDATIONS: Minor spalling from the cliff face and animal burrowing are the only physical impacts observed at this location. Human visitation is common and it is recommended that retrailing take place to lead people away from the site. Due to the distance above the river level it is further recommended that the site be placed back into a non-Glen Canyon Dam related monitoring program.

B:15:096

B:15:096 consists solely of the celebrated "Ross Wheeler" a boat constructed by Bert Loper and used on the Quist-Tadjie trip of 1915. The boat was abandoned by the ill-fated expedition and left to its own devices. It has become a physical reminder in the river corridor of the hair-raising trips of the pre-dam era. In 1984, Kim Crumbo, NPS, chained the boat to the rocks to prevent theft. The boat can be clearly seen on the rocky slope, seven meters above the river.

PREVIOUS WORK: This historic period site was recorded in October 1990. An excellent sketch of the craft appears in the recently completed survey project report. The site has been monitored annually since 1978.

STATUS AND RECOMMENDATIONS: B:15:096 is presently stable. Due to its proximity to the river and its historical significance, it is recommended that the "Ross Wheeler" be casually observed from the river and officially monitored after flows in excess of 60,000 cfs.

B:15:118

B:15:118 consists solely of a group of historic names placed in a travertine cave above the historic high water zone. The names are executed in charcoal. A single red chert flake was also observed on the surface indicating an earlier occupation.

PREVIOUS WORK: This location has been visited by Anglo-Americans since at least 1899 as indicated by the dates occurring with the names. B:15:118 was recorded in October of 1990. The site was officially monitored for the first time in FY94 and again in FY95.

STATUS AND RECOMMENDATIONS: B:15:118 is heavily visited by groups en masse from river trips. A distinct trail leads from the beach to the site. New graffiti adjacent to historic panel #1 on the west facing wall states "Power 93". Due to the sites location above the 300,00 cfs level, monitoring should continue through a non-Glen Canyon Dam related monitoring program.

B:15:121

B:15:121 is a lithic and charcoal scatter. No diagnostic artifacts or ceramics were observed on site.

PREVIOUS WORK: This site was discovered and recorded in February of 1991 and was monitored for the first time during 1995.

STATUS AND RECOMMENDATIONS: This site is very stable and exhibits no visitor-related impacts. B:15:121 belongs to the control group (N) and will be monitored on a yearly basis.

B:15:124

B:15:124 consists of a single historic inscription in water polished granite adjacent to the river. The name was carved by George Parkins in 1903.

PREVIOUS WORK: This site was initially recorded in October 1990. The site has been monitored annually since 1992.

STATUS AND RECOMMENDATIONS: B:15:124 is presently stable. Potential impacts include flows in excess of 50,000 cfs and vandalism. Because of the proximity to the river it is recommended that the inscription be monitored after flows in excess of 50,000 cfs. Due to the easy access the site can be spot checked periodically for vandalism.

B:15:126

B:15:126 is a large rock shelter containing several granaries, a walled structure, flakes, a single North Creek Gray Ware sherd, Tapeats Sandstone grinding slabs, charcoal, and the horn core of a Bighorn sheep. The site is located at the top of a talus slope over 70 feet above the 28,000 cfs level.

PREVIOUS WORK: This site was discovered and recorded in January 1991. It was monitored for the first time since the survey during the current FY.

STATUS AND RECOMMENDATIONS: There is minimal animal trailing on the site and no evidence of human visitation. Minor changes have taken place at a few of the granaries since 1991 but this is due to the natural course of events not the dam, the river, or human intervention. It is recommended that this site be monitored every five years.

B:15:127

B:15:127 consists of a shallow rock shelter defined by a roughly circular stone alignment. A single flake, three North Creek Gray Ware sherds, and some scattered charcoal complete the site. The site is apparently of Puebloan affinity.

PREVIOUS WORK: This site was discovered and recorded in October 1990 and was monitored for the first time this FY.

STATUS AND RECOMMENDATIONS: Some minor rock movement occurred downslope since October 1990 along with minor changes on the surface of the site. Faint animal trailing is present at this location. No impacts from human visitation are apparent. It is recommended that B:15:127 be monitored every three years due to its location on potentially eroded sediment.

B:15:132

B:15:132 consists of several rock wall structures incorporated into large locally occurring boulders. No prehistoric artifacts were observed on the surface. There were however several historic cans found dating from 1900 to 1920. This is not surprising as William Bass' trail to Copper Canyon passes through this location. It is not known to what age the structures belong, but they seem older than the historic period.

PREVIOUS WORK: This site was discovered and recorded in April 1991 and was monitored for the first time during FY95.

STATUS AND RECOMMENDATIONS: No changes have taken place on the site since it was last visited in 1991. The site is located outside of the zone of potential impact. It is recommended that B:15:132 be removed from the monitoring program.

B:15:135

B:15:135 consist of a rock shelter with a small artifact assemblage indicating a Pai occupation. The site is located on Tapeats Sandstone ledges.

PREVIOUS WORK: This site was initially recorded in October 1990. B:15:135 was monitored in FY93, FY94 and FY95.

STATUS AND RECOMMENDATIONS: Minor fluctuations of eolian sand on the surface of the site has taken place since 1993. Recommend monitoring every five years to lessen project impacts.

B:15:143

B:15:143 is a sparse lithic scatter with two small concentrations of charcoal exposed on the surface situated on a stepped bench of Tapeats Sandstone. No sherds were observed on the site and cultural affiliation is unknown.

PREVIOUS WORK: This site was discovered and recorded in December 1990 and was monitored for the first time during the current fiscal year.

STATUS AND RECOMMENDATIONS: The site is very stable with no changes apparent since recording took place in 1990. It is recommended that B:15:143 be removed from the monitoring schedule.

B:16:003

B:16:003 consists of five well defined masonry structures. Sherds are lightly dispersed across the site and indicate a Puebloan occupation of PII age. The site is situated on a flat open area where the schist slope meets a structural terrace.

PREVIOUS WORK: This site was initially recorded by Robert Euler in July 1978. It was recorded and mapped in greater detail in February 1991. B:16:003 was monitored in FY93 and FY95.

STATUS AND RECOMMENDATIONS: Physical impacts are minor at this location. There is heavy visitation on site due to its location on the spot of a scout for one of the largest rapids on the Colorado River. There is no problem regarding vandalism here only trailing caused by the never ending foot traffic that goes on to get a better view of the rapid. As long as the single foot trail remains the only impact, we will make no other recommendations than to monitor the site every other year.

C:02:085

C:02:085 consists entirely of a carbon stain revealed in a cutbank one meter below the present ground surface. Some bone fragments were found in association with the stain.

PREVIOUS WORK: This feature was discovered and documented in April 1991 and it was monitored in FY93 and FY95.

STATUS AND RECOMMENDATIONS: A C-14 sample was obtained from this location and the results were discussed in O'Connor et al. 1994. Dates range from 3919-2062 cal. B.P. The present condition reveals the dune is unstable, no charcoal lens can be identified. Continue monitoring.

C:02:092

C:02:092 is a rock shelter located in the Kaibab Limestone overlooking the Colorado River. Groundstone and handtools were observed on the surface but no sherds or flakes were noted.

PREVIOUS WORK: This site was recorded in April of 1991. C:02:092 was monitored in FY92 , FY93, and FY95.

STATUS AND RECOMMENDATIONS: The site is relatively stable suffering some physical impacts due to wall spall. The biggest impact is from human-related visitation. There is often trash found including; cigarette butts, toilet paper, fishing gear and soda pop cans. Apparently the shade which was appreciated by the people of the region prehistorically is also appreciated today. It is recommended that this site be monitored every three years. It is further suggested that a more detailed site map be completed. This can be accomplished with a hand held compass on a day trip to Lee's Ferry.

C:02:096

C:02:096 consists of two distinct areas of habitation located on a dissected alluvial terrace truncated by the river during high flows. A partial wall and some slight overhangs are utilized to create a modicum of shelter. Artifacts include a worked stick, lithic debris, corrugated sherds, and buried hearths with flakes *in situ*. The site is probably multicomponent.

PREVIOUS WORK: This site was documented in April 1991. Further materials uncovered during localized storms in the summer of 1991 discovered by GCES biologists, were recorded and added to the already existing site record. C-14 samples were taken from this location in February 1995 and are currently being processed . C-14 dates retrieved from this location in 1993 are available in the Journal of Geology (O'Connor et al. 1994).

STATUS AND RECOMMENDATIONS: As is common throughout the Southwest in general, and the Grand Canyon in particular, locations that have apparently been stable for generations or even centuries can destabilize and be altered in a moment if a threshold is reached or an episode of severe weather strikes at the wrong time. This is the case at C:02:096. The gullying and arroyo formation that has taken place in the last few years affords the project the chance to witness first hand the dissection of a remnant alluvial terrace containing cultural materials at depth in the upper canyon. It is recommended that C:02:096 be monitored yearly. Access to the site needs to be done with care as the approaches are fragile, vertical cuts in loosely consolidated alluvium.

C:02:097

C:02:097 is a set of adjacent rock shelters located in the Kaibab Limestone. Artifacts include groundstone, chipped stone tools and sherds indicating a PII Puebloan occupation. Some historic materials are also present dating to the turn of the century.

PREVIOUS WORK: This site was recorded in May 1991 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: The site is stable concerning physical impacts. However, because it is easily accessible from Lees Ferry, visitation has had some negative effects on the surface including; trailing, compaction, and litter. It is recommended that the site be monitored again next FY and reevaluated. It is further suggested that this site be considered for retrailing to lessen the impacts from visitation.

C:02:098

C:02:098 is a rock shelter located in the Kaibab Limestone overlooking the Colorado River. Artifacts include flakes, a broken mano, and a single brown ware sherd. Charcoal is presently eroding out of the slope below the overhang.

PREVIOUS WORK: This site was located in April 1991 and recorded a month later by the same crew. During the month that passed between location and recording, several sherds disappeared and evidence of illicit digging was apparent at several places on site. The site was officially monitored for the first time during the current fiscal year.

STATUS AND RECOMMENDATIONS: The site is unstable due to a lack of protective cover and is further compromised from heavy visitation. It is recommended that C:02:098 be monitored on a yearly basis. It is further recommended that a surface analysis unit be placed at this location.

C:05:007

C:05:007 consists solely of the initials "H Mc" carved by Harry McDonald into the trunk of a rare juniper tree in Marble Canyon sometime in the 1890s. McDonald was a prospector/mountain man and was present on the lower half of Stanton's first trip in 1889 and the upper half of Stanton's second trip in 1890.

PREVIOUS WORK: This site was recorded in October 1990 and was monitored for the first time during FY95.

STATUS AND RECOMMENDATIONS: The site has remained stable since the survey. It is recommended that this site be removed from the monitoring program.

C:05:009

C:05:009 is a small rock shelter with an ephemeral wall, a few flakes and three sherds. The sherds include two corrugated and a single brown ware. Charcoal is also present on the surface.

PREVIOUS WORK: This site was initially recorded in October 1990 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: The site is very stable and exhibits no sign of visitation or adverse visitor-related impact. It is recommended that monitoring be discontinued.

C:05:031

C:05:031 consists of several concentrations of fire-cracked rock and some artifacts including a sandstone slab metate and a single sherd of Tusayan White Ware. The site is located on dune covered bedrock ledges and portions of the local debris flow. The majority of the surface runoff occurring at this site does not drain directly into the river.

PREVIOUS WORK: This site was initially recorded in October 1990 and has been monitored yearly since 1992.

STATUS AND RECOMMENDATIONS: The site is fairly stable although sand is being removed and not being replaced. It is recommended that the site be monitored biennially.

C:05:037

C:05:037 consists of two partially exposed fire features, several flakes and a few sherds. The sherds indicate Puebloan and Southern Paiute affiliation. The site is situated on a dune covered talus slope and debris flow. Drainages occurring do not drain directly into the river.

PREVIOUS WORK: This site was initially recorded in October 1990. It has been monitored yearly since 1992.

STATUS AND RECOMMENDATIONS: C:05:037 is located near a popular river camp. Although the ephemeral nature of the site does not necessarily attract visitation, it is a nice walk from camp so a trail is present and trash is often found in minor amounts. Feature 1 exhibits increased deflation and gullying across the site. Fire-cracked rock and artifacts are moving downslope at Feature 2. It is recommended that this site be monitored every three years.

C:06:002

C:06:002 consists of an inscription documenting the time and place of the death of Frank Brown. Mr. Brown drowned during the private railroad survey expedition of 1890. The inscription was completed by boatman, Peter Hansbrough, who ironically also drowned several days later. The inscription was placed on the water worn surface of the Coconino Sandstone five meters above the 28,000 cfs level.

PREVIOUS WORK: This site was initially recorded as a historic property by Robert Euler in 1972 Paint from boats docking at this location during the high water of the early 1980s can be seen on the rock face.

STATUS AND RECOMMENDATIONS: The site is presently stable. Visitation is high and will remain so. Threats to the site include high water flows in excess of 70,000 cfs and vandalism. It is recommended that the site be monitored on a five year interval. Casual observation of the site can take place on a trip to trip basis due to its location.

C:06:003

C:06:003 consists of a sherd and lithic scatter with two probable wall alignments. The artifacts indicate a PII Puebloan occupation. The site is situated on a reworked dune covered terrace dominated by limestone boulders from a debris flow. Surface waters draining do not discharge directly into the river.

PREVIOUS WORK: This site was originally recorded by Robert Euler in 1976 and has subsequently been monitored by the Park Archaeologist. The site was rerecorded in greater detail in September 1990. It was monitored for the first time since the survey in 1994. The site was mapped in detail this year.

STATUS AND RECOMMENDATIONS: Presently, human trailing is the major impact at C:06:003. There is also increased gullying at Locus A. Obliteration of the current trail and the appropriate retrailing is recommended. Due to heavy visitation, Locus A should be monitored every other year. A check dam may be helpful to control erosion at Locus A. Retrailing will occur in FY96.

C:06:005

C:06:005 consists of three petroglyph elements. Placement is on a Supai Sandstone ledge adjacent to the river, four meters above 28,000 cfs level.

PREVIOUS WORK: This site was initially recorded in September 1990. The site was monitored for the first time in 1994. The Southern Paiute Consortium trip stopped here in September 1994 and also the Hopi and Zuni trip in 1995. The site, and thus the immediate area, has cultural significance to these people.

STATUS AND RECOMMENDATIONS: The site is presently stable. Impacts include the slow process of natural exfoliation and human visitation. The site is heavily visited due to the sites proximity to the popular Brown inscription (C:06:002). Because the panel is situated on the ground surface (bedrock ledge), inadvertent foot traffic treading on the actual site is now a problem. Over time, there may be erosional impacts. Monitor annually.

C:06:010

C:06:010 is a shallow overhang with the remnants of an ephemeral rock enclosure. Maximum wall height is 30 cm. No artifacts were observed and cultural affiliation is unknown.

PREVIOUS WORK: This site was initially recorded in September 1990 and was monitored for the first time during this year.

STATUS AND RECOMMENDATIONS: Some rock movement has occurred since the survey and it is apparently a visitor-related impact. Otherwise the site is very stable. Recommend monitoring in five years and reevaluating the schedule.

C:09:004

C:09:004 consists of three partial structures, a granary and a sparse artifact scatter located on a bedrock ledge against a cliff base. Tusayan Gray Ware observed on the surface indicates a PII affinity.

PREVIOUS WORK: This site was initially recorded by Robert Euler in 1963 and rerecorded in greater detail in October 1990. The site was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: The site has remained unchanged since the survey. It is recommended that C:09:004 be removed from the River Corridor Monitoring Project schedule and be reverted to a non-Glen Canyon Dam monitoring program.

C:09:031

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.

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 rerecorded in 1990. The site was monitored for the first time during FY 95.

STATUS AND RECOMMENDATIONS: The grave is protected by a dense growth of vegetation and exhibits no change since 1990. Retrailing will take place in FY96 to reduce the multiple trails originating at the river to a single trail leading to the grave. It is further recommended that the site be monitored on a five year schedule.

C:09:034

C:09:034 consists solely of the partial remains of Bert Loper's boat. Mr. Loper known as the "Grand Old Man of the Colorado River" drowned in 1949 when his boat capsized. The boat floated on downstream where it was recovered by boatman Don Harris and pulled onto the shore.

PREVIOUS WORK: The boat and commemorative plaque that accompanies it were recorded by Euler in 1972 and rerecorded in 1990. The site has been monitored annually by GRCA since 1982 and, for the first time as part of this project in FY95.

STATUS AND RECOMMENDATIONS: Very little of the original craft remains. Reclamation photographs from the 1950s show an intact boat but in the years since then treasure seekers desiring a historical relic from the river corridor have carted off most of it, one fragment at a time. All that remains is a dismal portion of the bow that is chained and anchored to a rock in the mesquite line. It is recommended that the site be monitored biennially to track the incremental disappearance of Bert's boat.

C:09:050

C:09:050 originally consisted of a group of complete vessels eroding from a cutbank at the mouth of a large side canyon. The vessels are representative of PI-II Puebloan culture.

PREVIOUS WORK: This site was discovered and initially recorded in September 1990. Due to the sites 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 has been monitored annually since 1992.

STATUS AND RECOMMENDATIONS: After seasonal flooding in the local drainage during September 1990, the site location has remained stable. It is recommended that C:09:050 be monitored on a semiannual basis in case more cultural materials are revealed in the cutbank.

C:09:051

C:09:051 is an extensive open site consisting of a roomblock, activity areas, midden, artifact concentrations, and fire-cracked rock. The site is located on stabilized reworked dunes at the mouth of a major side canyon. The site has PII Puebloan affiliation.

PREVIOUS WORK: This site was initially recorded by Janet Balsom, Park Archaeologist, in November 1989 and originally included three loci. In September 1990 NPS survey personnel added a fourth loci and further documented the site. C:09:051 has been monitored at least annually since 1992. This site is also the location of a surface analysis unit.

STATUS AND RECOMMENDATIONS: Retrailing in 1991 has had a positive effect on the general area. Feature 3 continues to slowly erode into the local drainage as it has been doing for most of this century. This spring a major flood re-channelled the side canyon thus, removing some of Feature 3. The rest of the site is stable. Game trails continue to criss-cross this portion of the delta. Recommend monitoring every year. It is further suggested that a check dam be considered at Feature 3. At some point, more trail work will be warranted as old foot trails reestablish themselves.

C:09:052

C:09:052 consists of an extensive PII Puebloan occupation including structural outlines and a dense artifact scatter dominated by sherd and groundstone. The site is located in the upper mesquite zone within reworked riverside dunes.

PREVIOUS WORK: This site was initially recorded by Park Archaeologist, Janet Balsom, in November 1989. NPS survey personnel photographed and mapped the site in greater detail in September 1990. The site has been monitored at least annually since 1992. C:09:052 was partially mapped utilizing a total station, this work will be completed in FY96. A surface analysis unit is also present.

STATUS AND RECOMMENDATIONS: The trail obliteration project of 1991 has had a very positive effect on C:09:052. Prior to retrailing, heavy foot traffic from backpackers and boat trips was evident from trailing and the numerous collectors piles present on the surface. Trailing to a limited extent is evolving once again and needs to be checked before fully developed. Recommend annual monitoring and more map work.

C:09:053

C:09:053 consists of three distinct artifact concentrations and a single rock alignment situated on riverside dunes. Sherds indicate a PII Puebloan affiliation. No chipped stone or groundstone tools were observed. Sherd density is fairly high with 200-300 present on the surface.

PREVIOUS WORK: This site was originally recorded by Robert Euler in 1976 as C:09:001. The site was changed to C:09:053 by the office of the Park Archaeologist in November 1989 and mapped in greater detail in September 1990. Subsequent to the survey, some retrailing and trail maintenance was carried out to curtail the impacts of hikers across the surface. It was monitored in FY93 and FY95.

STATUS AND RECOMMENDATIONS: The trail work has had a positive affect. Presently, only deer are trailing through the site and that is something that has been going on since the site was abandoned. Wind deflation is also ongoing and is only a problem now because the dam does not allow for the natural accumulation of sand available for refurbishment once surface sands are removed. It is recommended that C:09:053 be monitored yearly.

C:09:080

C:09:080 consists of two shallow adjacent overhangs and an associated PII sherd scatter. The site is located at the base of the Bright Angel Shale Formation.

PREVIOUS WORK: This site was located and recorded in October 1990. It was monitored for the first time this year.

STATUS AND RECOMMENDATIONS: This site is technically out of the project area but it belongs to the "N" control group and will be monitored annually.

C:09:082

C:09:082 consists of two distinct activity areas dominated by fire-cracked rock, sherds and groundstone. Feature 1 contains groundstone, Tsegi Orange Ware and lithic debris. Feature 2, a concentration of fire-cracked rock, contains PII Puebloan ceramics and a single Southern Paiute sherd. The site is located in reworked dunes within the lower mesquite zone.

PREVIOUS WORK: This site was initially recorded in October 1990. It has been monitored at least annually since 1992. A surface analysis unit was placed here in 1994.

STATUS AND RECOMMENDATIONS: It is recommended that C:09:082 be monitored on an annual basis and be included on the more detailed map on this delta.

C:09:088

C:09:088 consists of the Bureau of Reclamations Marble Canyon Dam test site. Present on both sides of the river are adits (tunnels), abandoned barges, painted markers, gauges, cable, and industrial trash. The abandoned barges subsequently filled with sediment during the 120,000+ cfs floods of the

1950s and have developed a mature cryptogamic surface.

PREVIOUS WORK: The bulk of the engineering work represented at river level took place between 1950 and 1951. The archeological recording of the site was done in December 1990. The site has been monitored yearly since the survey.

STATUS AND RECOMMENDATIONS: The site is currently stable. Although the location is representative of an important phase of modern history in the American west, it remains to varying degrees an eyesore to many people traveling down the river corridor. It is recommended that C:09:088 be monitored on a three to five year schedule and that test adit three be photographed biennially. It is further suggested that the trail to test adit 1 be obliterated.

C:13:005

C:13:005 is an extensive site consisting of at least nine features with associated artifacts. The features include a small rock shelter and numerous roasting/hearth features. Sherds indicate a PII Puebloan affiliation with a later Hopi presence. The site is situated on riverside dunes and an adjacent structural bench.

PREVIOUS WORK: This site was initially recorded by Robert Euler in 1962 with updates in 1976 and 1989. The site was mapped in greater detail in March 1991. Due to the nearly constant backpacker traffic at this location and daily use by the river running community as a camp and scouting location, impacts are unavoidably heavy. Some of this pressure has been alleviated through stabilization and retrailing but it has not been enough. The site was monitored many times by GRCA Park programs. This monitoring project monitored this site for the first time during FY95.

STATUS AND RECOMMENDATIONS: Because of the impacts mentioned above the site is not in very good shape. Due to the sites location on a large dune, stability is an on going problem. An out of control toilet paper fire on the morning of May 3, 1995 further impacted Features 7, 8, and 9 while completely compromising an adjacent historical property. Revegetation and trail obliteration will be completed in FY96 and monitoring will commence on an annual basis.

C:13:006

C:13:006 consists of a PII Puebloan habitation with a rich assemblage of artifacts including; ceramics, lithic debris, shaped stone, ashy soil, and intact groundstone. The site is eroding out of a reworked dune at the mouth of a major side canyon.

PREVIOUS WORK: This site has had comparatively a lot of attention paid to it: Schwartz in the early 1960s, Euler and Taylor in 1965, Balsom and Fairley in 1984, and again in 1990. Euler collected some complete manos in 1965. The site has been described as "badly eroded". A surface analysis unit was placed on this site. The stationary camera removed from C:13:359 was relocated to C:13:006 this spring.

STATUS AND RECOMMENDATIONS: Although the site has been "badly eroded", much of the

intact, buried material may remain. Outlines of room blocks are still clearly discernable on the lip of the slope. The entire surface portion site is continuing to move downslope into the local drainage. The site should be monitored annually. Total station mapping of the site will take place in FY96, as will an assessment for implementing site stabilization.

C:13:007

C:13:007 consists of several questionable structural outlines with associated artifacts indicating a Puebloan occupation. The site is located on a bench bordering an active side canyon drainage just above where it enters the river. Runoff from this site is directed into the Colorado River via the adjacent side canyon.

PREVIOUS WORK: This site was noticed by Schwartz in the early 1960s (1965: 286) and recorded by Euler and Taylor in 1965. Some "Lino-like" (BM III) sherds were also observed in the local drainage. This site was recorded in greater detail in September 1990. By 1990 so much camping had taken place on site that artifacts on the surface were rare and structural outlines were moved to accommodate camping spots. In 1992, NPS trail crew placed jute matting across the site and built a wall to stabilize the erosional trend at Feature 5. The wall was blown out by localized rain in 1993 and has since been repaired (November 1994).

STATUS AND RECOMMENDATIONS: C:13:007 is presently stable. This is mostly due to the effective work conducted by the NPS trail crew. Feature 5 will always be at some risk because of it's location. Recommend monitoring in alternate years.

C:13:008

C:13:008 is an extensive open small structure site with a minimum of 12 features manifested on the surface. Numerous artifacts are present and the assemblage is dominated by groundstone tools indicating a high level of processing . Sherds indicate a PII Puebloan occupation.

PREVIOUS WORK: This site was initially recorded by Euler and Taylor in 1965 and was visited numerous times thereafter. The site was mapped in greater detail in 1990. This site has been monitored by a non-Glen Canyon Dam related monitoring program.

STATUS AND RECOMMENDATIONS: The site is heavily impacted by annual erosional processes in the form of a local arroyo and a network of expanding gullies. This drainage network is too mature to alter now. A major hiking trail passes through the site causing impacts to features 1, 2, 9, and 12. Retrailing is suggested. It is recommended that this site be monitored in FY96 and subsequently monitored by a non-Glen Canyon Dam monitoring program.

C:13:010

C:13:010 is the large complex habitation site known as Furnace Flats. The site which was initially recorded in 1965 by Euler and Taylor has seen a lot of work done over the years including minor excavation in 1984. The site is closed to the public due to its fragile character and archaeological

significance.

PREVIOUS WORK: Extensive work has been done at this location by Jones, Balsom and others in 1984. See Jones Excavation Report (1986).

STATUS AND RECOMMENDATIONS: As mentioned above, access to the site is strictly limited and even archaeological work done must be well considered before any action takes place. A detailed map of the site will be finalized in FY96 incorporating the excavation work done in 1984 and the recent USGS work done by R. Hereford. The site will be monitored yearly.

C:13:069

C:13:069 is a large open habitation site with numerous features and a sparse artifact assemblage indicating a PII occupation. The site is located on an old sand-covered river terrace equivalent to the upper mesquite zone.

PREVIOUS WORK: This site was mapped in detail in September 1990 and monitored in FY93 and FY95.

STATUS AND RECOMMENDATIONS: This site is at particular risk due to the adjacent river camp which is highly used especially during the May to October season. The area is also used by backpackers throughout the year and a major trail cuts directly through the site. Retrailing and revegetation work carried out in 1992 has had a positive affect on the site. Locally active gullying still poses an ongoing threat to Features 1 and 2. Annual monitoring is recommended.

C:13:070

C:13:070 consists of artifact concentrations and possibly a buried structure indicating a Puebloan occupation. The site is situated on a highly dissected structural terrace. Near the edge of the terrace, two complete rectangular manos reside side by side stuck vertically into the surface. They are 90% exposed and remain tenuously upright in the position they were placed by the last person to use them. These two artifacts represent a true moment frozen in time. A single visitor or local rain could cause them to fall. Runoff does not drain directly into the river.

PREVIOUS WORK: This site was initially recorded by Robert Euler and Walter Taylor in 1973. It was described as a "masonry pueblo and sherd area." No photographs were taken and there is no mention of the upright manos or complete metate. This site has been monitored at least once since 1992. A surface analysis unit was also placed at the site to observe artifact movement.

STATUS AND RECOMMENDATIONS: There has been increased surface erosion due to deflation and bank slumpage, and increased gullying at Locus D. A lack of free sand available in the system to protect this site is noticeable. Total station mapping was completed at C:13:070 in May 1995. It is recommended that this site be monitored in the spring and the fall and a plan for stabilization be contemplated with the possibility of planting native vegetation.

C:13:092

C:13:092 is a turn of the century historic camp belonging to the prospector/trapper, Felix Lantier. Structural outlines and artifacts are still present on the surface. A sparse scatter of prehistoric ceramics and lithic debris in the immediate vicinity also indicate a PII Puebloan presence.

PREVIOUS WORK: This site was initially recorded by Robert Euler in 1976. NPS survey personnel recorded the property in greater detail in September 1990. GRCA staff have monitored this site many times in the past. The site has been monitored by this project in FY92, FY94, and FY95.

STATUS AND RECOMMENDATIONS: The site is currently stable. There is evidence of occasional visits by tourists from the river camp located 70 meters upstream. Recommend annual monitoring.

C:13:098

C:13:098 is an early 19th century historic habitation and mine. Referred to as the M^c^Cormick Mine, the site is well known and highly visited.

PREVIOUS WORK: This site was initially recorded by Euler and Jones in 1978. NPS survey personnel recorded the site in greater detail in September 1990. This site has been monitored at least once since 1992.

STATUS AND RECOMMENDATIONS: Two separate erosional channels have headcut to within one meter of the cabin. Recommend inclusion in the stabilization work that will take place in September 1995 to check further erosion. Monitor twice a year.

C:13:099

C:13:099 consists of two loci of collapsed masonry structures and numerous artifacts including: ceramics, lithics, groundstone, and charcoal. The site is a PII Puebloan habitation located within the historic high water zone. Channeled runoff flows directly into the Colorado River.

PREVIOUS WORK: This site was initially recorded by Euler and Jones in 1978 and was described at that time as "highly eroded". The site was recorded in greater detail in September of 1990. The site has been monitored at least once since 1992. Total station mapping began in April 1994 and was completed in FY95.

STATUS AND RECOMMENDATIONS: C:13:099 remains "highly eroded" today. Active erosion and the ongoing transport of cultural materials towards and into the river remains a problem. Included in this at risk group are Features 1, 2, 3, 4, 6, and 7. Feature 5 is presently stable. This site

also gets a lot of foot traffic from the local camp. Recommend trail obliteration and inclusion in the stabilization work to be carried out in September 1995. Monitor twice a year.

C:13:100

C:13:100 is a PII Puebloan habitation with features and a rich artifact assemblage including: ceramics, lithics, hammerstone, manos, metates, and charcoal. The site is located on a highly eroded dune covered terrace only five meters above 28,000 cfs.

PREVIOUS WORK: This site was initially recorded by Euler and Jones in 1978. The site was recorded in greater detail in September 1990. The site has been monitored in FY92, FY93, and FY94. C:13:100 is part of the detailed mapping program that is currently taking place.

STATUS AND RECOMMENDATIONS: Ongoing erosion at C:13:100 is presently effecting the site in the form of two localized gullys and minor trailing from the adjacent river camp. Recommend trail obliteration and twice annual monitoring. Stabilization of erosional channels where feasible will occur in September 1995.

C:13:101

C:13:101 is a PII Puebloan habitation including a structural outline, numerous features and artifacts. The site is located in the predam high water zone.

PREVIOUS WORK: This site was initially recorded by Euler and Jones in 1978 and recorded in greater detail in 1990. The site was monitored in FY93 FY94 and FY95. It was noted in 1978 that a hiker had used slabs from a cist for a modern fire pit.

STATUS AND RECOMMENDATIONS: The NPS trail crew obliterated the hiking trail that passed through the site in 1993. This has had a very positive effect. General erosion across the surface of the site will continue as long as the dam causes a lack of free sand in the system. Sand which protected sites prior to the dam is currently not replaced when it gets removed. Recommend monitoring every five years.

C:13:131

C:13:131 is the old tourist camp of Grand Canyon character, prospector and entrepreneur "Captain" John Hance. The site was occupied during the late 1890s and the materials that remain on the surface are indicative of the period.

PREVIOUS WORK: This site was initially recorded by Robert Euler in 1978 and was rerecorded and mapped in greater detail in April 1991. Ironically, the monitoring project monitored near this location the afternoon of May 3, 1995 when what was left of the site was destroyed by an out of control toilet paper fire. C:13:005 was also impacted by this fire.

STATUS AND RECOMMENDATIONS: This site has been highly impacted by visitor use for decades. Due to its distance from the river, the impacted surface and the destruction caused by the fire in May 1995, it is recommended that C:13:131 be monitored by a non-Glen Canyon Dam monitoring program.

C:13:272

C:13:272 is a multicomponent site consisting of structures, features, and artifact concentrations. Ceramics indicate a PII Puebloan occupation and two of the features appear to be protohistoric in origin. The site is located in riverside dunes partially held together by a mesquite thicket. Runoff at this location does not drain directly into the river.

PREVIOUS WORK: This site was originally documented by Balsom and Fairley in 1984 and recorded in greater detail in 1990. The site was monitored in FY92, FY93, FY94 and FY95. Detailed mapping will be completed in the spring of 1996.

STATUS AND RECOMMENDATIONS: Although the site is slowly but continuously eroding due to lack of available wind blown sand, there are presently no immediate threats to the site. Because this property is located on a delta that gets a lot of visitation and is proximal to the river, it is recommended that C:13:272 be monitored on an annual basis. C:13:272 is included in the sites to be stabilized through erosion control methods in September 1995.

C:13:273

C:13:273 is a Puebloan special use area consisting of five fire and storage features and two artifact concentrations. The sherds on the surface indicate a PII occupation. The site is situated on a set of stabilized dunes 65 meters from the river.

PREVIOUS WORK: This site was initially recorded in September 1990 and was monitored for the first time in FY95. Retrailing was completed in February 1995. Prior to the trail work archaeological testing was carried out by project staff in November 1994.

STATUS AND RECOMMENDATIONS: Several boulders were brought down into the arroyo since 1990. Feature 4 is eroding faster relative to the rest of the site and will be assessed for stabilization in FY96. C:13:273 should be monitored annually.

C:13:274

C:13:274 is an enigmatic (questionable) series of rock alignments with an associated flake scatter and a single fire feature located over 200 meters from the Colorado River. No sherds were seen on the surface and cultural affiliation is unknown.

PREVIOUS WORK: This site was initially recorded in September 1990 and was monitored for the first time during this FY.

STATUS AND RECOMMENDATIONS: Feature 2 is being undercut by an established gully which was present when the site was recorded in 1990. This site was inappropriately designated as an N group site and will be replaced by a site showing no impacts.

C:13:291

C:13:291 consists of several exposed walls and features of PII Puebloan affinity with associated

C:13:291

C:13:291 consists of several exposed walls and features of PII Puebloan affinity with associated artifacts. The site is located on a highly dissected alluvial terrace at the base of Dox Sandstone cliffs. Water eroding the surface drains directly into the Colorado River.

PREVIOUS WORK: This site was initially recorded in 1988. It was recorded again in greater detail and mapped in October 1990. The site has been monitored annually since the survey.

STATUS AND RECOMMENDATIONS: C:13:291 is presently eroding across the entire site with particular emphasis on the gullys at Features 1 and 4. A standing structural post at Feature 4 could yield a good date. The site will be assessed for possible erosion control in FY96. C:13:291 should be monitored annually with a crew of one or two to keep impacts to a minimum. Monitoring should take place after the rainy season.

C:13:321

C:13:321 consists of five fire features and an enigmatic pile of Dox Sandstone slabs. These slabs were probably put here by Felix Lantier, a prospector that lived adjacent to this site at the turn of the century. The site is situated in a stabilized dune at the mouth of a major drainage. Surface runoff does not drain directly into the Colorado River.

PREVIOUS WORK: This site was initially recorded in September 1990. It was monitored in FY93 FY94 and FY95.

STATUS AND RECOMMENDATIONS: The site is in stable condition. However wind is constantly rearranging the loose sand on the dune. Not much sand is gained or lost from the inner swales of the dune complex. A river camp is located on the adjacent beach and there appears to be some artifact movement aided by the human hand. Near Feature 4, people have made a little stone circle. Artifacts and rocks in the surface analysis unit have been unevenly and uncharacteristically displaced indicating that a person probably picked them up and set them back down. It is recommended that C:13:321 be monitored on an annual basis.

C:13:329

C:13:329 is a small rock shelter with an associated circular rock feature and midden. Minimal artifacts occur on the surface. A single Tusayan White Ware sherd suggests a probable PII occupation. The site is situated on a small dune and adjacent rock outcrop in the upper end of the mesquite zone.

PREVIOUS WORK: This site was initially recorded in September 1990. The site was monitored in FY92, FY93 and FY95.

STATUS AND RECOMMENDATIONS: The majority of the site is stable, however a terrace-based gully located in Feature 2 expanded by 6 centimeters in width since the last visit in 1993. New

artifacts have also surfaced at this feature. It is recommended that C:13:329 be monitored every other year and that the gully be watched.

C:13:333

C:13:333 is a probable field camp consisting of a single fire feature, scattered fire-cracked rock, lithic debris, several hand tools, charcoal and some slivers of bone. A single Tusayan White Ware sherd suggests a PII affiliation. The site is located in an elongated sandy slot between two steep sloped parallel dunes. These dunes are only 50 meters from the river.

PREVIOUS WORK: This site was initially recorded in September of 1990. The site was monitored in FY92 and FY95.

STATUS AND RECOMMENDATIONS: The site is relatively stable but is subject to minor episodes of runoff from locally occurring rains. The sandy surface absorbs most of the precipitation however, the site does occasionally experience water flowing in the small channel which it occupies. Due to a lack of sand refurbishment in the system the erosion will ultimately cause expansion of the drainages. It is recommended that C:13:333 be monitored on a three year schedule.

C:13:334

C:13:334 is an open habitation site with a fire feature, a rock outline, a circular cist and a lithic/sherd scatter. The sherds indicate a Cohonina affiliation. The site is located on a low sandy terrace.

PREVIOUS WORK: This site was initially recorded in September 1990, and was monitored in FY93 and FY95.

STATUS AND RECOMMENDATIONS: There has been some minor rock movement at Feature 4 and some of the artifacts have changed positions probably due to people picking them up and setting them down. Overall the site is in stable condition. It is recommended that C:13:334 be monitored every three years.

C:13:335

C:13:335 is a small open site consisting of some scattered fire-cracked rock and several fragments of burned animal bone. The site is situated in a blowout on the top of a mesquite covered dune 40 meters from the river. Cultural affiliation is not known.

PREVIOUS WORK: This site was initially recorded in September 1990 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: The site is protected by its location and is subject to eolian movement of sand grains from place to place locally. Rodents are using the bones to gnaw on and have made the subsurface of the site their home. Monitor every three years.

C:13:339

C:13:339 consists of a PII habitation buried in an alluvial terrace comprised of at least six features appearing on the surface and an associated artifact scatter. Two later (historic) hearths are also present.

PREVIOUS WORK: This site was initially recorded in September 1990. It was monitored in FY93 and FY95.

STATUS AND RECOMMENDATIONS: The site is situated on a steep and actively eroding terrace. Several features are exposed in gullys or steep sided bank cuts which pose permanent and ongoing impacts to the site. Some retrailing work was conducted near Feature 7 in February 1995 to lessen the impact from hikers. It is recommended that the site be monitored annually.

C:13:342

C:13:342 is a historic site dating to the turn of the century and consists of the structural remnants of a canvas tent platform and an associated assemblage of domestic and functional materials. The site lies just above the impressive drift lines left by the larger of the predam floods of the late 19th and early 20th centuries.

PREVIOUS WORK: This site was initially recorded in September 1991. It has been monitored in FY92 and FY93.

STATUS AND RECOMMENDATIONS: The site is currently stable with minor wind deflation and animal burrowing present. An incipient runoff channel developed and entrenched on the west side of the site in the last few years but is not causing any impact yet. Some movement of artifacts was noticed at each visit, but nothing has been removed. It is recommended that C:13:342 be monitored biennially.

C:13:343

C:13:343 is a PII Puebloan open site consisting of three slab lined features, a rock alignment and an artifact scatter.

PREVIOUS WORK: This site was initially recorded in September 1990. The site was monitored in FY92, FY93, and FY95.

STATUS AND RECOMMENDATIONS: Feature 1 is eroding because of its location on the slope. More charcoal is eroding out of the cutbank and the artifacts are being impacted by the arroyo that cuts the edge of the site. Monitor in alternate years.

C:13:347

C:13:347 consists of a partial masonry wall exposed in a steep arroyo cut within 17 meters of the river and a mere 5 ft above the 28,000 cfs level. During October 1995, a large newly exposed Black

Mesa Black-on-white sherd was found in the cutbank above the stacked rock wall. A beautiful ground, polished and incised serpentine pipe bowl fragment was also found proximal to the sherd.

PREVIOUS WORK: This site was initially recorded in September 1990. It has been monitored in FY92 and FY93. Total station mapping will continue in FY96.

STATUS AND RECOMMENDATIONS: The arroyo in which the site is located has gotten deeper since 1993 and the potential for a real gully washer is high. The drainage is too mature to be altered or stabilized in any practical way. Due to the close proximity of the site to the river and the discovery of the pipe fragment last October it is recommended that C:13:347 be monitored twice a year.

C:13:349

C:13:349 is a multicomponent site consisting of a historic habitation and an artifact assemblage indicating a PI-II Puebloan presence. The site is located in mesquite anchored dunes 100 meters from the river. Surface runoff does not drain directly into the Colorado River.

PREVIOUS WORK: This site was initially recorded in September of 1990. This site was monitored in FY92, FY94, and FY95.

STATUS AND RECOMMENDATIONS: Features 2, 3, 4, and 5 are currently eroding downslope due to slump and deflation. A complete metate between Features 1 and 2 recently disappeared under the collapsed bank of an arroyo. Erosion is ongoing and pervasive and too advanced to correct. Recommend continued monitoring annually and mapping as a form of data recovery. New artifacts can be expected to erode out of the main arroyo.

C:13:359

C:13:359 is PII Puebloan habitation with structural outlines and associated artifacts. The site is located on a dune covered terrace abutting a local cliff face. Surface runoff drains into the Colorado River.

PREVIOUS WORK: This site was initially recorded in March 1991. It has been monitored in FY92, FY93, FY94 and FY95. A stationary camera placed here in 1992 was removed and relocated to C:13:006 this spring. The photographs were not showing any changes and it was determined that the camera could be used more effectively on another site.

STATUS AND RECOMMENDATIONS: The site is experiencing minor erosion across the entire surface and minor downslope movement is ongoing at Feature 3. The gully passing Feature 2 is unchanged since early 1994. However, a single storm could change that dramatically. It is recommended that C:13:359 be monitored every three years. It is further suggested that the gully at feature 2 be considered for stabilization.

C:13:365

C:13:365 consists of two highly eroded fire features situated in a dune and a problematic wall. A few lithics are present in the debris fan and represent the only artifacts. Cultural affiliation is not determined. Runoff does not flow directly into the Colorado River.

PREVIOUS WORK: This site was initially recorded in October 1990 and has been monitored annually since 1992. This site was mapped in detail in FY94.

STATUS AND RECOMMENDATIONS: The site is stable. A small drainage rill developed in Feature 2, located on the dune surface probably as a result of trailing created during the recording of the site. Recommend monitoring only after flows in excess of 50,000 cfs.

C:13:367

C:13:367 is a small rock shelter with a stacked rock wall and a few Redwall chert flakes. No cultural affiliation has been assigned.

PREVIOUS WORK: This site was initially recorded in October 1990 and was monitored for the first time during FY95.

STATUS AND RECOMMENDATIONS: The site is well protected by a large boulder and is very stable. C:13:367 is assigned to the "N" control group and as such will be monitored annually.

C:13:368

C:13:368 is a small rock shelter with a sparse lithic scatter consisting of less than 15 flakes. The site is located in a travertine deposit and laminar alluvial sediments are present on the surface indicating the presence of very high water in the shelter at some point prehistorically. Cultural affiliation is unknown.

PREVIOUS WORK: This site was initially recorded in October of 1990. It has been monitored in FY92, FY93, and FY95.

STATUS AND RECOMMENDATIONS: C:13:368 is most directly impacted at this time by runoff coming over the lip of the travertine shelter from above. The runoff has created a small channel which bisects the site and is removing the sediment. This impact is independent of the dam or the modern river. Monitor every five years.

C:13:371

C:13:371 is an extensive PII Puebloan habitation with at least seven features currently exposed and eroding including: walls, storage, fire-cracked rock and structural outlines. The artifact assemblage is dominated by ceramics, but lithic debris, a projectile point, and complete groundstone are also present. The site is located at the mouth of an unnamed drainage on older colluvial debris and a dissected alluvial terrace.

PREVIOUS WORK: This site was initially recorded in October of 1990 less than a month after the flood that altered the site. A stationary camera was placed here in March 1992. The site was mapped in detail using a total station.

STATUS AND RECOMMENDATIONS: A side canyon flood during September 1990 did extensive damage to this site while exposing previously buried materials. Surface runoff does drain directly into the Colorado River. Ongoing erosion is present across the site with particular emphasis at Features 2 and 4 and, less evident impacts at Features 1, 3, 5, 6 and 7. Increased animal trailing is also evident. The site should by monitored semiannually and considered for a stabilization project.

C:13:385

C:13:385 is a 12th century Puebloan habitation site consisting of two slab-lined features and associated artifacts dominated by Kayenta ceramics with chipped stone, hand tools, groundstone, and shaped slabs. The site is located on an alluvially cut structural terrace with an eolian component. Surface runoff from this site dies out in a boulder field before reaching the current channel of the Colorado River.

PREVIOUS WORK: This site was initially recorded in April 1991 and has been monitored in FY93, FY94, and FY95. The site was total station mapped in FY94.

STATUS AND RECOMMENDATIONS: Continued incremental erosion is occurring at C:13:385. Although the two features are presently stable, artifacts are currently moving downslope, and the local drainage network across the entire terrace is expanding and downcutting to include other sites (C:13:386 and C:13:070). Recommend monitoring every other year and after any heavy rains occurring in this Reach.

G:02:001

G:02:001 is an open site consisting of two grinding slabs and a light scatter of artifacts located on a series of parallel benches incised into a basalt flow adjacent to the river. Aquarius Brown sherds indicate a Pai affiliation.

PREVIOUS WORK: This site was initially recorded by Robert Euler and was mapped and recorded in greater detail by NPS survey personnel accompanied by members of the Hualapai Tribe in February of 1992. The site was monitored for the first time this year.

STATUS AND RECOMMENDATIONS: The site is very discreet and very stable. The threat from futre impacts is remote, recommend discontinue monitoring.

G:02:009

G:02:009 is a historic structure consisting of two stone rooms and a fire hearth with no indication of a site date. The rooms are incorporated into a natural rock outcrop.

PREVIOUS WORK: This site was initially recorded by Euler and Jones in 1978. The site was mapped in greater detail in March 1992 by NPS survey personnel accompanied by members of the Hualapai Tribe. The site was monitored for the first time in FY95.

STATUS AND RECOMMENDATIONS: The walls at G:02:009 are in stable condition. The support beams in room 2 however are precariously perched. Monitor annually.

G:02:032

G:02:032 is an open roaster site with minimal artifacts. The sherds indicate a Pai affiliation. This site was recorded in 1992 by NPS survey personnel accompanied by members of the Hualapai Tribe. Although this site was scheduled to be monitored, it is nearly inaccessible due to the thick vegetation choking the drainage in which it is located. The site is also located over 700 meters from the river. Because this site is beyond the potential impact zone, it is recommended that G:02:032 be removed from the monitoring program.

G:02:100

G:02:100 is a historic site known as "Bridge Canyon City". It was established by Reclamation engineers in the 1930s as a base of operations for the proposed Bridge Canyon dam. The location is remote and rugged but a permanent spring made the place viable for habitation of a small town. The "city" exhibits a lot of work taken place on the surface; clearing living spaces, constructing roomblocks from the local granite, laying pipelines, pouring cement, and designing a trail system. Between 1939 and 1960 Bridge Canyon City was at various times a very busy place in the wilderness. All this effort went for naught however because the dam was never built and now G:02:100 remains as a modern ghost town in the west end of Grand Canyon.

PREVIOUS WORK: This site was recorded in April 1991 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: The site is in stable condition at the present time. A few minor changes were observed during the visit in May; the water heater fell over since 1991, and some rock came down from the walls. G:02:100 was also mapped in detail using a total station this past May. Further detailed mapping is needed to complete the map. This may be accomplished in FY96. Recommend monitoring every three years.

G:02:101

G:02:101 is the well crafted powder house for the operations at "Bridge Canyon City". The feature is constructed of wood planks utilizing a natural vug in the rock near river level.

PREVIOUS WORK: This site was recorded in April 1991 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: G:02:101 is in very stable condition. It is recommended that the site be monitored every five years.

G:02:102

G:02:102 is a small historic camp dating to the early era of engineering work in the west end of Grand Canyon (1922-1939). It may belong to the City of Los Angeles Water Commission project when that city was trying to establish a physical presence on the Colorado River in order to lay better claim to the water. Materials present include; wire nails, tobacco tins, scrap metal, wire, charcoal, broken glass, food cans, and rock walls.

PREVIOUS WORK: This site was initially recorded in April 1991 and was monitored for the first time during this FY.

STATUS AND RECOMMENDATIONS: The site is in stable condition. It is located on steep slopes above the 300,000 cfs level. Recommend removal from the monitoring program.

G:02:103

G:02:103 consists solely of the commemorative plaque located at Separation Canyon that pays tribute to the location and solemn event of the parting of the ways of three men from Major Powell's first expedition down the river in 1869. The three men were killed days later on the north rim by either a local Paiute band or hostile Mormon militia.

PREVIOUS WORK: This popular site known officially as the CENOTAPH was recorded as a historic site in April 1991.

STATUS AND RECOMMENDATIONS: The plaque is securely bolted into the face of a granite cliff and is in very stable circumstances. The only threat to its integrity is if someone were to remove it. Several trails have formed in order to visit the cenotaph, therefore, it is recommended that one trail leading to the plaque be well-defined. The remaining trails should be obliterated. Recommend monitoring be discontinued.

G:02:105

G:02:105 is another historic site pertaining to engineering projects in the west end of Grand Canyon. It consists of three rock walls defining three cleared areas probably used as tent platforms. A pile of trash including food cans, tobacco tins, broken glass, a metal buckle, and parts of a leather boot indicate a short term habitation in the 1920s or 1930s.

PREVIOUS WORK: This site was recorded in April 1991 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: The site is in stable condition. It is recommended, due to its location, outside the zone of potential impact, that G:02:105 be removed from the monitoring schedule.

G:02:106

G:02:106 is another engineering site associated with the Bridge Canyon Dam project (1923-1960). The site consists of a series of rock walls, cleared platforms, trails, broken glass, a few broken tools, cans, and tins.

PREVIOUS WORK: This site was initially recorded in April 1991 and monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: The site is in stable condition at the present time. The greatest immediate threats are location of the site on steep talus slopes and visitation from monitors. It is recommended for the safety of project personnel and the good of the site that monitoring be discontinued.

G:02:107

G:02:107 is a very subtle site consisting of a cleared area adjacent to a large boulder and a small cairn. No artifacts were observed on the surface. The location overlooks the mouth of Lost Canyon and could be a hunting blind common to Hualapai traditional use.

PREVIOUS WORK: This site was initially recorded in March 1992 by NPS survey personnel accompanied by members of the Hualapai Tribe. The site was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: Because the site consists essentially of a large rock and a flat spot it is very stable. Access is difficult due to the drowned mouth of the canyon which is a morass of vegetation and quick sand. Recommend discontinue monitoring.

G:02:108

G:02:108 is another engineering site associated with the Bridge Canyon Dam project. It is located on a series of narrow benches adjacent to the river in a very constricted section of the canyon. The site consists typically of a series of built up platforms connected by trails running parallel to the river. Artifacts present on the surface include; cut lumber, a large homemade grappling hook, intact glass jars, cans, tobacco tins, wire, cable, industrial sized bolts and parts of broken tools. The assemblage indicates a 1939 to 1960 occupation.

PREVIOUS WORK: This site was initially recorded by NPS survey personnel accompanied by members of the Hualapai Tribe in March 1992 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: The platforms are stable at the present time. No previous photographs were available for comparison so a set was taken this year. This site is susceptible to extreme high water and should be monitored every five years.

G:03:002

G:03:002 is a large roaster complex consisting of not less than ten fire features with associated artifacts including: desert side-notched points, groundstone, Hualapai and Paiute pottery, purple glass, and metal. The site is located on low stabilized dunes covering an alluvial terrace. Surface runoff does not flow directly into the Colorado River.

PREVIOUS WORK: This site was initially recorded by R. Euler in 1962. His site card notes "I had only 15 minutes at Granite Park. Thorough investigation would probably reveal additional evidence of occupation." This was definitely the case, and in 1972 Dr. Euler "spent two hours walking over the entire 'park' area." The site was re-recorded in January 1991. G:03:002 was monitored in FY93, FY94, and FY95.

STATUS AND RECOMMENDATIONS: The site is presently stable regarding physical impacts. However, visitor-related impacts from trailing are extensive and need to be curbed across the entire Granite Park area. Recommend monitoring on a biennial basis.

G:03:003

G:03:003 is a multicomponent rock shelter with an extensive midden and a group of roasting features stretching out below it. The artifact assemblage includes: chipped stone tools, broken groundstone, lithic debris, hand tools, carbon and sherds belonging to the Puebloan, Hualapai, Cohonina and Southern Paiute groups. The site is located in the Bright Angel Shale and the sand dunes adjacent to the shelter. Some of the surface runoff does flow into the Colorado River. Other areas retain the water on the surface within the dune.

PREVIOUS WORK: This site was initially recorded in a minimal fashion by Euler and Gumerman in 1969. Sherds were collected and an analysis was conducted. Field notes state that the condition of the site was "undisturbed" and the potential for a rewarding excavation was "excellent". The site was visited again in 1981 by Euler and Jones. More sherds were collected and a simple sketch map was made. G:03:003 was recorded in detail in January 1991. The site has been monitored annually since the survey.

STATUS AND RECOMMENDATIONS: The bulk of the site is presently stable. However, visitation has increased dramatically over the last several years. This has caused a trail which passes through the midden directly to the rock shelter. This trail/runoff channel has several nickpoints which down cut during each episode of rain. The headcut of this channel is presently working its way toward the midden. In March 1995 a flood down the local side canyon widened the channel and truncated the base of the trail causing concern. The site should be monitored twice in FY96 and then reassessed. No action will be taken at this location without the direct participation of the Hualapai Tribe.

G:03:004

G:03:004 is an extensive multicomponent rock shelter with an associated group of roasting features. The artifact assemblage indicates a presence dominated by Virgin Branch Puebloan, Southern Paiute and Hualapai with Kayenta Branch and Hopi wares also on site. Numerous sherds, chipped stone and hand tools, rock art and historic materials are present. The configuration of this site is very similar to G:03:003, which is in the same reach but on the opposite side of the river. Some runoff drains into the local side canyon which flows directly into the Colorado River while other areas retain the surface waters within the dune.

PREVIOUS WORK: This site was initially recorded by Euler in 1972. Sherds were collected and analyzed and a few notes were taken. The site was revisited several more times in the 1970s. No further descriptive work or mapping was completed, but on each occasion more sherds were collected and typed. The site was recorded and hand mapped in detail in March 1991. The site was monitored in FY93, FY94, and FY95. The site was mapped using a total station in FY94.

STATUS AND RECOMMENDATIONS: The site is currently stable and not being adversely affected by physical impacts. However, the potential exists if a localized rainstorm hits the area. Presently, a trail caused by visitation on the north side of Features 2 and 7 leading to the midden and rock shelter (Feature 1) is entrenching and will at some point be too deep to control. This trail will be obliterated in FY96 and possibly rerouted up the main drainage. It is recommended that G:03:004 be monitored annually for the next two years and then reevaluated.

G:03:019

G:03:019 is a multicomponent site consisting of a rock shelter, a midden, several activity areas, a roasting feature and associated artifacts. Sherds on the surface indicate PII, Pai and Paiute affiliations and a trade connection to Hopi as is evidenced by the presence of Jeddito Wares.

PREVIOUS WORK: This site was recorded in April 1991 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: The site is in stable condition. A trail exists that was used by the survey team and is probably occasionally used by hikers on river trips. This trail was possibly here prehistorically and has been kept up to a degree by game. It is recommended that this site be monitored on a three to five year schedule.

G:03:020

G:03:020 is a multiple (seven) feature habitation site containing structural outlines, chipped stone and hand tools as well as groundstone and carbon. No sherds were observed. The site is situated on stabilized dunes on both sides of a major side canyon drainage. The bulk of surface runoff disappears into the dune sands before reaching the Colorado River.

PREVIOUS WORK: This site was initially recorded by R. Euler in 1978. Three features and chert flakes were noted at that time. Euler reported seeing no ceramics. The site was mapped and recorded in greater detail in February of 1991. The site has been monitored since FY92.

STATUS AND RECOMMENDATIONS: Gullying at Feature 2 increased since 1993; Features 5 and 6 are suffering from wind deflation with no replacement. Feature 7 is eroding out of a cutbank and exhibits the most change since 1993. Recommend discontinue monitoring of Locus A but continue monitoring of Locus B annually. A newly discovered fire feature will be added to the map.

G:03:024

G:03:024 is a roasting feature complex with associated ceramic, lithic, and groundstone artifacts indicating a PII Puebloan and a later Hualapai occupation. The site is located above the mesquite zone on stabilized dunes.

PREVIOUS WORK: This site was initially recorded in January 1991. The site was monitored in FY93, FY94, and FY95.

STATUS AND RECOMMENDATIONS: The bulk of the site is presently stable. The gullies at Features 3 and 5 are active and show growth and headward movement since 1993. Recommend monitoring every other year due to the ongoing erosion at Feature 3.

G:03:025

G:03:025 is a large roasting complex consisting of eight surface roasters, Pai/Paiute ceramics, lithic debris, a biface, complete groundstone, and historic artifacts from the late 19th century. The site is located on a dune covered terrace above the mesquite zone. Surface runoff is not channeled directly into the Colorado River.

PREVIOUS WORK: This site was initially recorded in January 1991 and was monitored in FY93. FY94, and FY95.

STATUS AND RECOMMENDATIONS: The site is presently stable and the past three winters have been wet enough to allow for a lush cover of spring vegetation which acts as an anchor and a blanket for the archaeological features. Ephemeral trailing is evident due to the local Bighorn sheep population. Recommend biennial monitoring due to the potential for visitor-related impacts.

G:03:026

G:03:026 is a roaster complex consisting of eight surface features and artifacts including chipped stone tools, groundstone, Pai, Cohonina, and Virgin Branch ceramics as well as historic artifacts from a late 19th century Hualapai use. The site is located on a dune covered alluvial terrace bordering a major side canyon drainage. The bulk of surface runoff is channeled into the local side canyon arroyo which flows directly into the Colorado.

PREVIOUS WORK: This site was initially recorded in January of 1991 and has subsequently been monitored in FY92, FY93, FY94, and FY95.

STATUS AND RECOMMENDATIONS: Incipient gullying is present across the site but only encroaches on cultural materials on the west side of Feature 3. Trailing from tourists and researchers is evident everywhere, and the problem is compounded by Bighorn sheep living in the area. The features are presently stable. It is suggested that a rerouting of trails from the river camp to the main drainage take place and monitoring occur annually for the next two years.

G:03:027

G:03:027 consists of an isolated bedrock mortar ground into the surface of a rectangular limestone boulder 50 meters from the river and 12 ft above the 28,000 cfs level.

PREVIOUS WORK: This site was recorded in February 1991. It has been monitored in FY92, FY93, and FY95.

STATUS AND RECOMMENDATIONS: The boulder and mortar are in a very stable condition. A day hiking trail passes directly by the boulder and causes no site impact. It is recommended that this site be monitored subsequent to flows in excess of 60,000 cfs; otherwise discontinue monitoring.

G:03:028

G:03:028 is a large open site with six separate loci of features and activity areas. These consist of groups of roasters, cleared areas, concentrations of artifacts and partially buried slabs. Sherds indicate a PII presence and later Prehistoric through late 19th century Hualapai use. This is the location of a large Ghost Dance ceremony which swept the region in the 1890s.

PREVIOUS WORK: Although the site was known about for decades (actually centuries) it was not recorded until February 1991. It has been monitored in FY93, FY94, and FY95.

STATUS AND RECOMMENDATIONS: The site is currently stable and is recovering from heavy foot traffic from research carried out in the immediate vicinity. Extensive trailing was obliterated. Vegetation is profuse giving added protection. A local group of Bighorn sheep also use the area so there will always be trails developing and disappearing across the surface. It is recommended that G:03:028 be monitored in alternate years.

G:03:029

G:03:029 consists of two overlapping roasting features, several flakes and a single Cerbat Brown Ware sherd. The site is located on dune covered Tapeats Sandstone ledges and is protected by vegetation.

PREVIOUS WORK: This site was located and recorded in February 1991 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: Although the roasting features are located in a modern runoff channel within the dunes, it appears to be stable at the present time. There is no threat from visitor-related impacts or Glen Canyon dam flows. It is recommended that G:03:029 be deleted from the monitoring program.

G:03:032

G:03:032 is a roaster complex with minimal artifacts. Several flakes, two groundstone tools, an old metal button, and a small wire cotter pin were noted. The remains of at least four roasting features are scattered on the surface. The site is probably a late historic period Hualapai occupation.

PREVIOUS WORK: This site was initially recorded in February of 1991 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: The site's surface is currently stable, but arroyos and a network of gullys are present. Due to the potential for erosion, it is recommended that G:03:032 be monitored every three years.

G:03:034

G:03:034 is a roaster complex with Virgin Branch affinity. Artifacts include Virgin ceramics, bifacial and hand tools, groundstone and charcoal. The site is located on a dune covered alluvial terrace bisected by a minor side canyon drainage. The majority of surface runoff does not flow directly into the Colorado River, but is absorbed by the dunes.

PREVIOUS WORK: This site was initially recorded in February 1991. The site was monitored in May 1994 at which time a possible burial was located on the river side of Feature 6. The site was also monitored during FY95.

STATUS AND RECOMMENDATIONS: The site is presently stable at the general level although minor surface rearrangement and localized deflation is occurring. Recommend biennial monitoring to check on potential burial.

G:03:040

G:03:040 is a roasting complex divided into two separate loci and consisting of several at least seven features. Artifacts include bifacial and hand tools, groundstone, charcoal, and lithic debris. The site is located on a flat terrace feature bounded by two arroyos.

PREVIOUS WORK: This site was initially recorded in March 1991 and was monitored for the first time in FY94.

STATUS AND RECOMMENDATIONS: The site is fairly stable. However, general surface erosion and wind deflation is present. The potential for major physical impacts due to localized rain or side canyon flooding is high. Surface runoff is channeled into the Colorado River. Recommend monitoring in FY96 and then reevaluating status.

G:03:044

G:03:044 is a habitation and roaster site divided into two separate and distinct loci; Locus A is a series of five cleared and modified rock shelters located in bedrock ledges over 35 meters above river level. Locus B consists of two roasting features eroding into an arroyo. Chipped stone tools and some gray ware pottery was found. During 1994, an unfired .44 caliber (19th century) cartridge was found amongst the boulders on the sandy bench at Locus B.

PREVIOUS WORK: This site was initially recorded in March 1991 and has been monitored annually since.

STATUS AND RECOMMENDATIONS: Locus A is presently stable. Some of the surface runoff at this site is channeled directly into the Colorado. Locus B is in a state of permanent erosion which may be due in part to fluctuating flows in the main river channel, base level lowering and a lack of free sand in the modern post dam system. Recommend annual monitoring of Locus B only.

G:03:046

G:03:046 consists of 15-20 fragments of fire-cracked rock, two flakes and a single Southern Paiute gray ware sherd. The site takes up less than a 2x3 meter area on the surface of a riverside dune.

PREVIOUS WORK: This site was initially recorded in March 1991 and was monitored for the first time in FY94.

STATUS AND RECOMMENDATIONS: Presently, the site is impacted by surface runoff and wind deflation. Due to the sites proximal location to the river, it is recommended that G:03:046 be monitored after flows in excess of 50,000 cfs by a single archeologist to reduce impact.

G:03:048

G:03:048 is a shallow rock shelter located on Tapeats Sandstone ledges surrounded by steep rocky talus slopes. Artifacts are common on the surface and include; flakes, numerous groundstone items (fragmented and complete), two Desert side-notched points, charcoal and at least two Southern Paiute utility gray ware sherds. The artifacts indicate a Paiute occupation.

PREVIOUS WORK: This site was located and recorded in March of 1991 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: Artifacts are located on a steep slope and are subject to natural and constant downslope movement. Spalling is a threat to the sheltered area although no recent evidence of this can be seen. It is recommended that G:03:048 be monitored every three years.

G:03:060

G:03:060 is a roaster complex consisting of 13 features and very few artifacts. Artifacts include hand tools, groundstone, flakes, and five Moapa sherds indicating a Virgin Branch presence. The site is located on a river terrace covered by partially stabilized dunes. Runoff from this surface that reaches

localized channels does flow directly into the Colorado River.

PREVIOUS WORK: This site was initially recorded in April 1991 and monitored for the first time in FY94.

STATUS AND RECOMMENDATIONS: Minor surface erosion and deflation is presently occurring across the site. Because of the large area (80x200 meters) encompassing the site and its location at the base of an active talus slope, major erosional impacts are inevitable. Recommend monitoring of selected features most at risk. Monitor every three to five years.

G:03:061

G:03:061 is a Tapeats Sandstone rock shelter with a hearth, 20-30 flakes, burned bone fragments, and four quids. These quids are evidence of agave gathering and use indicating a Southern Paiute and/or Hualapai occupation. Surface runoff is not channeled directly into the Colorado River.

PREVIOUS WORK: This site was initially recorded in March 1991 and has been monitored annually since the survey.

STATUS AND RECOMMENDATIONS: The site is presently stable and will probably remain so. Impacts are mainly physical due to animal use; large cat and coyote scat as well as owl pellets are present. Recommend monitoring on a five year schedule. Suggest obtaining a C-14 sample in FY96.

G:03:063

G:03:063 consists solely of the remnants of a highly eroded firepit/roasting feature. No artifacts have been observed on the surface. The site is located on a highly eroded dune covered terrace over 17 meters (55 ft) above the current 28,000 cfs level. Runoff does not flow directly into the Colorado River.

PREVIOUS WORK: This site was initially recorded in March of 1991 and was monitored for the first time in 1994.

STATUS AND RECOMMENDATIONS: Erosion is ongoing; gullying, arroyo encroachment, deflation, and gravity creep are all taking part. Due to the ephemeral nature of the site, little potential for data recovery exist. Recommend discontinue monitoring.

G:03:064

The site is a roaster complex situated on an alluvial terrace directly above the mesquite line adjacent to the river. The sediment comprising the terrace is poorly consolidated and easily eroded. Over thirteen archaeological features are present and are dominated by the distinct mounds of fire-cracked rock indicating roasters. The entire terrace system has been eroding since at least 1965 and is currently expanding at an undetermined rate. Due to the protective caps of fire-cracked rock, erosion is occurring differentially, cutting channels around the roasters creating peninsulas as the drainages carve out the loose and unprotected sediments. Ultimately the archaeological features will be

isolated, pedestaled and brought down to base level with the rest of the terrace. Near feature 8, a large metate is eroding from the cutbank at a depth of 2.9 meters below the modern surface. This indicates an earlier and probably extensive occupation of this site in addition to the Hualapai presence on the surface.

PREVIOUS WORK: The USGS is particularly interested in this location as a recent phenomenon of unique quality to the river corridor and has been studying the arroyo system in detail since 1992. C-14 samples were taken from buried cutbank deposits by the NPS in 1993 revealing a suite of dates ranging from 1880 +/- 70 BP to 2870 +/- 60 BP.

STATUS AND RECOMMENDATIONS: This office is currently in consultation with the Hualapai Tribe on the condition and future of this property. It is recommended that G:03:064 be monitored twice a year (spring and fall). It is further recommended that monitoring be done by two archaeologists and that visitation to this site be strictly limited due to its fragile nature. The site was mapped with a total station this year.

G:03:067

G:03:067 is a roaster complex consisting of five features and minimal artifacts including two bifaces and several chert flakes. A single Moapa sherd indicates a Virgin Branch presence. The site is located on low stabilized dunes covering a debris fan on a major side canyon delta.

PREVIOUS WORK: This site was initially recorded in March 1991 and has been monitored annually since 1992.

STATUS AND RECOMMENDATIONS: The site is relatively stable with the main impact being from visitor-related trailing due to the proximity of two highly used camping beaches. Trail obliteration and rerouting will occur in FY96 and biennial monitoring will continue.

G:03:069

G:03:069 is a rock shelter with several associated rock alignments and an assemblage of artifacts including; sherds, handtools, a complete projectile point and several phragmites reeds construed to be arrow shafts. The sherds indicate a multiple occupation of Cohonina, Southern Paiute, and Hualapai. The site is located over 300 meters from the river.

PREVIOUS WORK: This site was initially recorded in April 1991 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: The site is essentially stable and can be seen from the river. It is outside the zone of potential impact.

G:03:072

G:03:072 is a large roaster complex situated on a sand covered river terrace in the upper mesquite zone. Artifacts include; sherds, lithics, and groundstone. The sherds indicate a multiple occupation of the Virgin Branch and protohistoric to late historic Pai/Paiute.

PREVIOUS WORK: This site was recorded in April 1991. It was monitored in FY93 and FY95.

STATUS AND RECOMMENDATIONS: In general the site is stable. Cryptogamic soil began to develop on the minor trailing created during recording in 1991. Feature 14 is subject to erosion from two small gullies and Features 11 and 12 could be impacted by eolian deflation. Recommend monitoring these three features only on an annual basis. It is further suggested that the small gullys be considered for stabilization.

G:03:077

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. The Hualapai Tribe has indicated that this is a Traditional Cultural Place.

PREVIOUS WORK: This site was recorded in April 1991 and was monitored for the first time during the current FY.

STATUS AND RECOMMENDATIONS: The site is in very stable condition. This site is a highly visited location, due to its proximity to a permanent water source, popularity as a commercial river trip stop, and importance to the Hualapai Tribe. It is recommended that G:03:077 be retained in the monitoring program on a three to five year schedule.

G:03:080

G:03:080 is a large habitation site located at the mouth of a major side canyon and consists of several features and associated artifacts. An extensive rock art panel is located in a long narrow rock shelter on the upstream side of the site. Sherds indicate a prehistoric Pai occupation and the pictographs have a dual affinity belonging to Pai and Southern Paiute cultures.

PREVIOUS WORK: This site was initially recorded in April 1991. It was monitored in FY92 and FY95. G:03:080 has also been visited and documented by the Southern Paiute Consortium as an important site to their people.

STATUS AND RECOMMENDATIONS: The site is in good and stable condition. Some wall fall occurred at the rock art panel and a new feature was discovered in March of this year. Due to increased visitation it is recommended that G:03:080 be monitored annually.

G:03:082

G:03:082 is the sparse remnants of three small rock shelters with expedient rock alignments and minimal artifacts. Sherds indicate the presence of Virgin Branch culture and a later Pai/Paiute occupation. The site is situated on narrow Tapeats Sandstone ledges adjacent to the river.

PREVIOUS WORK: This site was recorded in April of 1991. It has been monitored in FY92, FY93, and FY95.

STATUS AND RECOMMENDATIONS: Remains of this site are found laying on the barren rock surface with no continuity or deposition to warrant further work. Recommend monitoring at this location be discontinued.

G:03:085

G:03:085 is a small open site consisting of a few flakes and a Cerbat Brown Ware potbust. The site is situated on a dissected alluvial terrace with an overlay of alluvial sand.

PREVIOUS WORK: This site was recorded in April 1991. It has been monitored in FY92, FY93, and FY95.

STATUS AND RECOMMENDATIONS: The site is currently stable and no further cultural materials were observed this year. Recommend monitoring be continued once every three to five years.

V. Management Summary

The management summary includes site-specific measures to reduce impacts and measures to protect site integrity. Also included is a work plan for FY96, and an assessment of the monitoring program.

A. Measures to Reduce Site Impact

During FY95, 40 sites were recommended for certain remedial actions to reduce site impact. Retrailing (seven sites) and obliterating trails (11 sites) are the most commonly recommended methods of reducing site impact. Multiple trails often form by commercial and private boaters hiking up the canyons. A latent problem with these trails is that they have the potential to become entrenched. Entrenchment can lead to the formation of shallow to deep gullies that may connect with river- or terrace-based drainages.

Options for reducing site impact through stabilization include planting vegetation, installing check dams, and stabilizing. The term "stabilizing" is used to include practices of site preservation other than planting vegetation or installing check dams. Planting vegetation is recommended for eight sites, one site is recommended for installing check dams, and six sites are recommended for stabilizing.

The final suggestion to reduce site impact is closing the site to visitors. Although closure recommended for site C:13:070, A:16:159, C:13:006, and G:03:003 GRCA staff determined closure of these sites unnecessary given that the information accumulated does not justify closure. Monitoring these four sites will continue on the designated schedules, being particularly cognizant of visitor-related impacts.

Table 7 summarizes where, and what recommendations were made in FY95 to reduce site impact. In Section C, the recommendations are prioritized based on the severity of the impacts.

Table 7. Recommended Measures to Reduce Site Impact.

Site Number	Re-Trail	Oblit. Trail	Plant Veg.	Check Dam	Stabilize	Close Site	Total
A:15:005		X					1
B:09:317		X					1
B:10:121		X					1
B:15:091		X					1
B:15:126					X		1
C:02:097	X						1
C:02:098			X				1
C:09:031	X	X					2
C:09:034	X	X	X				3
C:09:051				X			1
C:13:005		X	X				2
C:13:008	X						1
C:13:070		X			X	X	3
C:13:098			X				1
C:13:099			X				1
C:13:100			X				1
C:13:131	X	X					2
C:13:272		X	X				2
C:13:273					X		1
C:13:291					X		1
C:13:321					X		1
C:13:359					X		1
C:13:371			X				1
G:02:009		X					1
G:02:103	X						1
G:03:004	X						1
Total	**7**	**11**	**8**	**1**	**6**	**1**	

B. Measures to Protect Site Integrity

Methods to protect site integrity are recommended when disturbances have the potential to strip a site of cultural information. The four measures suggested to mitigate potential loss of site integrity are: mapping, subsurface testing, surface collection of the entire site, and excavation.

In FY95, ten sites are recommended for mapping with a total station. Ideally, mapping is the first step to obtaining archaeological data in conjunction with erosional processes. However, testing seems to be the most effective and efficient option for learning about sites along the river corridor

before they disappear. Appropriate methods would be conducted in consultation with all participants of the PA. It is understood that actual implementation of testing would not occur until all PA signatory representatives are cognizant of the testing procedures.

Many sites recommended for testing have exposed, datable material and/or features that could offer information about subsistence and chronology. Currently, soil samples collected from fire features along the corridor lack information on how the features functioned. Much of the recent information on function is based on ethnographic data and speculation.

Seventeen sites were recommended for testing in FY95. Although many sites recommended for testing are not immediately threatened, some sites were recommended for testing based upon the information potential, i.e. chronology or subsistence. These sites will be prioritized using previous monitoring data and photos. Before any testing, the sites will be reevaluated in the field and discussed in further detail with the participants of the PA. In Section C, several sites recommended for testing have a priority rank of "0"-- no action, because they are not immediately threatened.

Unless a catastrophic event occurs at a site, it is not foreseeable that either option would be implemented. Section C shows these recommendations prioritized depending on the degree of deterioration-- severe, moderate, or minor.

Table 8. Recommended Measures to Protect Site Integrity.

Site Number	Map	Test	Total
A:15:031		X	1
B:10:262		X	1
B:11:271		X	1
B:13:002		X	1
B:15:143		X	1
C:02:092	X		1
C:02:098		X	1
C:09:051	X		1
C:09:082	X		1
C:13:006	X		1
C:13:008		X	1
C:13:010	X		1
C:13:070		X	1
C:13:321	X	X	2
C:13:333		X	1
C:13:335		X	1
C:13:339		X	1
C:13:343		X	1
C:13:347	X		1
C:13:368		X	1
G:02:100	X		1
G:03:026	X		1
G:03:034		X	1
G:03:046	X		1
G:03:064		X	1
G:03:072		X	1
Total	**10**	**17**	

C. FY96 Monitoring Work Plan

The long-term monitoring program was established to implement management assessments and recommendations suggested by field personnel. As illustrated in table 8, several recommendations to protect and preserve site information were made. Yet, due to field logistics, funding, and various site conditions, it is crucial to prioritize the needs of each site dependent on the degree of impact. Four priority ranks were developed to categorize the extent of the impact(s): extensive, moderate, minor, and no action.

A priority rank of one is recommended when there are extensive impacts, and remedial actions should be completed within the following fiscal year due to immediate threats. Moderate impacts are given a priority rank of two. These sites are not endangered by any immediate impact therefore remedial actions should be implemented within the following two years. A priority rank of three is recommended when very minor impacts are evident. For this rank, remedial action should occur within the following three years. A priority rank of zero is suggested when no remedial action will occur until enough evidence is provided to justify the action.

Appendix C contains the proposed work schedules for FY96. This includes: trip dates, sites to monitor and map, and schedules for various remedial actions. The majority of the sites recommended for remedial action received a priority rank of "1" in FY95, as seen in Table 9 but some sites are carried over from the past three monitoring years because they received ranks of "2" or "3".

Prior to any remedial action, excluding trail work, preliminary assessments will be made by an archaeologist and resource specialist. If actions are warranted, a proposal will be written describing the remedial actions and will be sent to the members of the Programmatic Agreement with the allotted 30 days for a response. The only time a proposal is substituted with a memorandum is when retrailing and trail obliteration are involved.

Table 9 summarizes FY95 sites that received remedial action recommendations, the types of impacts observed, and priority rank. In some cases, more than one priority rank was given for multiple recommendations.

Table 9. Recommendations and Priority Ranks for FY95 Sites.

Site Number	Schedule	Impacts	Recommendations	Rank
A:15:005	Annual	Trailing	Obliterate trail	1
A:15:031	Discontinue		Test	0
B:10:121	Annual (N group)	Trailing	Obliterate trail	2
B:10:262	Discontinue	—	Test	1
B:11:271	3-5 years	Erosion	Test	3
B:13:002	Biennial	Gully, Erosion	Test	0
B:15:091	Biennial	Trailing	Obliterate trail	1
B:15:126	Annual (N group)	Animal	Stabilize	2
B:15:143	Annual (N group)	—	Test	0
C:02:092	3-5 years	Visitation	Map	3
C:02:097	Annual	Trailing	Retrail	1
C:02:098	Annual	Erosion	Plant vegetation, Test	2, 3
C:09:031	3-5 years	Trailing	Retrail, Oblit. trail	1
C:09:034	Biennial	Trailing	Retrail, Oblit., Plant	2
C:09:051	Annual	Erosion	Map, Check dam	1
C:09:082	Annual	Erosion/Dep.	Map	1
C:13:005	Annual	Trailing	Oblit. trail, Plant Veg.	1
C:13:006	Annual	Erosion	Map	1
C:13:008	Discontinue	Erosion/Gully	Retrail, Test	2, 3
C:13:010	Annual	Erosion	Map	1
C:13:070	Semiannual	Erosion Trailing	Obliterate trail, Stabilize, Close, Test	3, 2, 0, 0
C:13:098	Semiannual	Erosion	Plant vegetation	0
C:13:099	Semiannual	Erosion	Plant vegetation	0
C:13:100	Semiannual	Erosion	Plant vegetation	0
C:13:272	Annual	Trailing	Oblit. trail, Plant veg.	0
C:13:273	Annual	Erosion	Stabilize	1
C:13:291	Annual	Erosion	Stabilize	1
C:13:321	Annual	Erosion	Stabilize, Map, Test	3, 3, 0
C:13:333	3-5 years	Erosion	Test	0
C:13:335	3-5 years	Erosion/Dep.	Test	0
C:13:339	Annual	Erosion	Test	0
C:13:343	Biennial	Erosion	Test	3
C:13:347	Semiannual	Erosion	Map	1
C:13:359	3-5 years	Erosion	Stabilize	1
C:13:368	3-5 years	Erosion	Test	3
C:13:371	Semiannual	Erosion	Plant vegetation	1
G:02:009	Annual	Trailing	Obliterate trail	2
G:02:100	3-5 years	—	Map	0
G:02:103	Discontinue	Trailing	Retrail	2
G:03:004	Annual	Trailing	Retrail	1
G:03:026	Annual	Erosion	Map	3
G:03:034	Biennial	Erosion	Test	3
G:03:046	Discontinue	Gullies/Dep.	Map	3
G:03:064	Annual	Erosion	Test	0
G:03:072	Annual	Erosion	Test	1

D. Monitoring Program Assessment

Remedial Actions Implemented in FY95
FY94 began the first official implementation of suggested remedial actions. Assessments were made in November, 1994 with work completed in February, 1995. Much of the required actions involved some form of stabilization. The preservation methods were accomplished by the lead GRCA Resource Specialist, Kim Crumbo during winter and fall rehabilitation trips.

Sites monitored in FY94 with a priority rank of "1" were selected for remedial action in FY95. Table 10 reflects the actions implemented. Where assessments were made, implementation is scheduled for the FY95-6 trip or sometime in FY96.

Table 10. Management Actions Completed in FY95.

Retrail	Obliterate trail	River Mile	Actual Work
A:15:042	A:15:042	204.3R	Completed
B:11:272		131.6R	Completed
C:06:003	C:06:003	011.1R	Assessed
C:13:098	C:13:098	065.5R	Assessed
C:13:099	C:13:099	065.5R	Assessed
C:13:100	C:13:100	065.5R	Assessed
C:13:273		067.7L	Completed
C:13:339			Completed
G:03:003	G:03:003	209.0L	Consult w/ Hualapai
G:03:004		206.6R	Assessed
	G:03:024	208.6L	Consult w/ Hualapai
	G:03:026	208.9L	Consult w/ Hualapai
	G:03:028	208.7L	Consult w/ Hualapai
	G:03:067	219.7R	Assessed

Stabilization at Palisades
It was determined at the Stabilization Workshop held in Marble Canyon in May, 1995, to proceed with an initial effort to curb the erosive action of several incised drainages in the vicinity of Palisades Delta. These drainages are currently impacting four archaeological properties; C:13:098, C:13:099, C:13:100, and C:13:272.

This project is a joint effort led by NPS trails personnel, project staff, and the Zuni Conservation team. Various methods will be utilized in order to mitigate the rapid downcutting of the drainages and the subsequent erosion of cultural features. The actual procedures and techniques implemented will be put into application while on site. All representatives of the PA that are present will be consulted on the appropriate and effective measures.

The actual labor will include obliterating trails and installing check dams at key locations within the two stream types. Thework will be coordinated by GRCA Resource Specialist Kim Crumbo with assistance from the GRCA trail crew and other PA representatives. Photographs and maps will be generated from the beginning of the project to the end, and a report of the events will be sent to all members of the PA after the project is completed.

Summary and Conclusions

FY95 marked the first official year that the long-term monitoring and remedial action plan was implemented. The actions accomplished were very successful in preserving each site. A total of 165 monitoring episodes was completed. Approximately 700 photographs were taken. This includes regular 3 x 5 black-and-white photographs, color slides, medium format black-and-whites, and videotape. Thirteen sites were mapped with a total station, and surface analysis units were observed for the second time at nine sites. A stabilization workshop was held at Marble Canyon, Arizona to initiate the remedial actions to be completed at Palisades this September.

FY96 will show improvements in the database. Beginning in the summer of 1995, a remedial action file will be created to insure all sites are treated appropriately and not neglected or over-shadowed by active sites.

The IMACS site forms acquired during the survey will be incorporated into Grand Canyon National Park's GIS system. This will enable the program to expand in several directions. Closer to home, the site maps will be computerized, allowing us to illustrate, on individual site maps, when and where changes occurred, i.e., showing new tributaries to a gully/arroyo, or the development of new trails. These maps will be generated for all the sites, while total station mapping will be completed on only selected sites.

In FY96 the use of 8 mm video cassette and/or medium format cameras will continue at selected sites to supplement 35 mm black-and-white prints. Video documentation can be used in the lab as a tool for impact analysis and education. Video also provides several different visual angles and voice recorded descriptions. A medium format camera produces photographic clarity sometimes lacking in 35mm cameras. The sites selected for medium format photography are C:13:006, C:13:010, C:13:099, C:13:100, C:13:291, C:13:339A, C:13:347, C:13:349 and G:03:004. Other sites may be added later if they are experiencing active erosion.

FY96 will mark the third recording of the surface analysis units. The three observations should generate sufficient data to assess the effectiveness of this method. If the data do not reveal information unique from that gathered during routine monitoring activities, new methods of quantifying the data will most likely be investigated.

The project will continue to advance standards and procedures enhancing the protection and preservation of each site. Members of the project feel they have begun to make significant advances towards understanding impacts affecting cultural resources along the river corridor. Several impacts, (visitation, spalling, mature arroyos) cannot be completely stopped. However, long-term site

monitoring is the most efficient way to recognize impacts occurring through time and is currently the most effective way of managing cultural resources into the future.

VI. References Cited

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VII. APPENDICES

A. Sample Monitoring Form

10/94

Grand Canyon National Park

RIVER CORRIDOR ARCHAEOLOGICAL SITE MONITORING FORM

MANAGEMENT

1. Site Number AZ: _____ 2. Monitor Session _____

3. River Mile _____ Bank (L/R/B): _____ 4. Date _____

5. Monitor (s) _____

6. Site Type _____

NATURAL IMPACTS

0 = Absent; 1 = Present; 2 = Increase; 3 = Decrease; 4 = NA (for items 7 - 14)

		Structures / Storage	Artifacts	Roasters/ Hearths	Perishables/ Midden	Rock Art	Other
7.	Surface Erosion (0-10cm)						
8.	Gullying (10-100cm)						
9.	Arroyo Cutting (>1m)						
10.	Bank Slumpage						
11.	Eolian/Alluvial Erosion/Deposition						
12.	Side Canyon Erosion						
13.	Animal-Caused Erosion (trailing,burrowing)						
14.	Other Natural Impacts (spalling, roots)						

15. If arroyos or gullies are present, do they drain to the river? (Note: Some drainages die out in dune fields or on terraces before reaching the river.) 0 = no; 1 = yes; 2 = NA

_____

16. Do any of the above impacts appear to have occurred since the last monitoring episode? 0=no; 1=yes
If yes, explain in 17.

_____

17. Comments:

HUMAN IMPACTS

Site Number :
Monitor Session :

0 = Absent; 1 = Present; 2 = Increase; 3 = Decrease; 4 = NA (for items 18 - 24)

18.

	Structures / Storage	Artifacts	Roasters/ Hearths	Perishables/ Midden	Rock Art	Other
Visitor Impacts						

19. Collection Piles: If present, explain in 26. _____
20. Trails: If present, explain in 26. _____
21. On-site Camping: If present, explain in 26. _____
22. Criminal vandalism/ARPA violations: If present, explain in 26. _____
23. Other: If present, explain in 26. _____
24. Human impacts since last monitoring: _____
25. Are any human impacts directly related to river fluctuations and/or dam operations? 0 = no; 1 =yes
If yes, explain in 26 (i.e., development of new trails to avoid high water, availability of new beaches in proximity of site). _____
26. Comments:

MANAGEMENT ASSESSMENT AND RECOMMENDATION

27. Monitor Schedule: 1) discontinue 2) semiannually 3) annually 4) every-other-year 5) every three to five years _____
28. Monitor with a stationary camera: 0 = no; 1 = yes _____
29. Recommended measures to reduce site impacts: 0 = no; 1 = yes

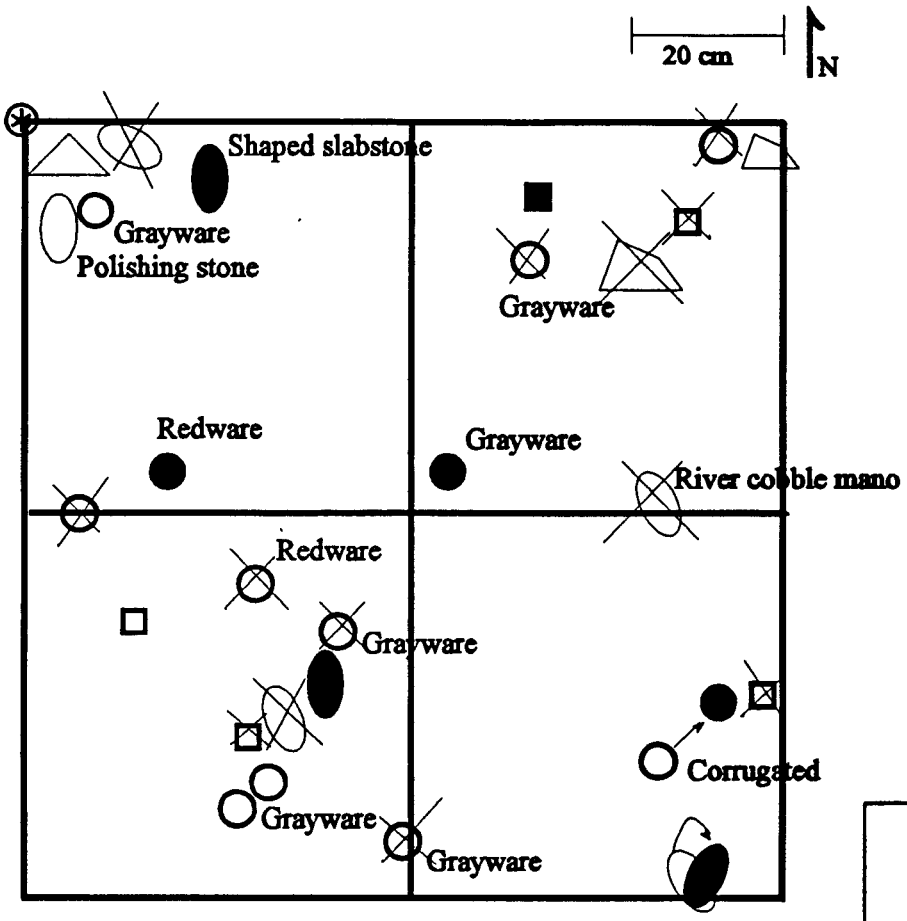
Retrail _____ Plant vegetation _____ Stabilize _____
Obliterate trail(s) _____ Install check dams _____ Close site to visitors _____

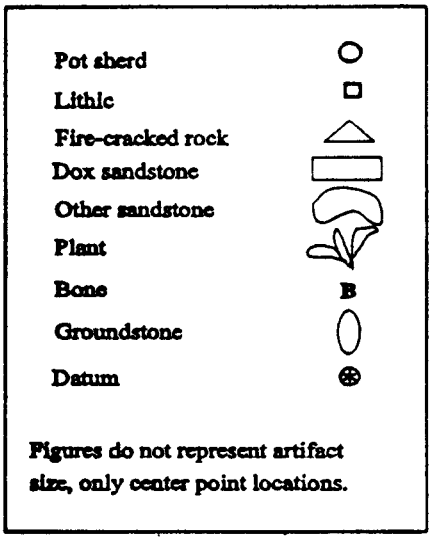
30. Recommended measures to protect the site's integrity: 0 = no; 1 = yes

Surface collect entire site _____ Test for depth of subsurface cultural deposits_____
Map as a form of data recovery _____ Excavate entire site _____

31. Comments: (i.e., surface sample unit)

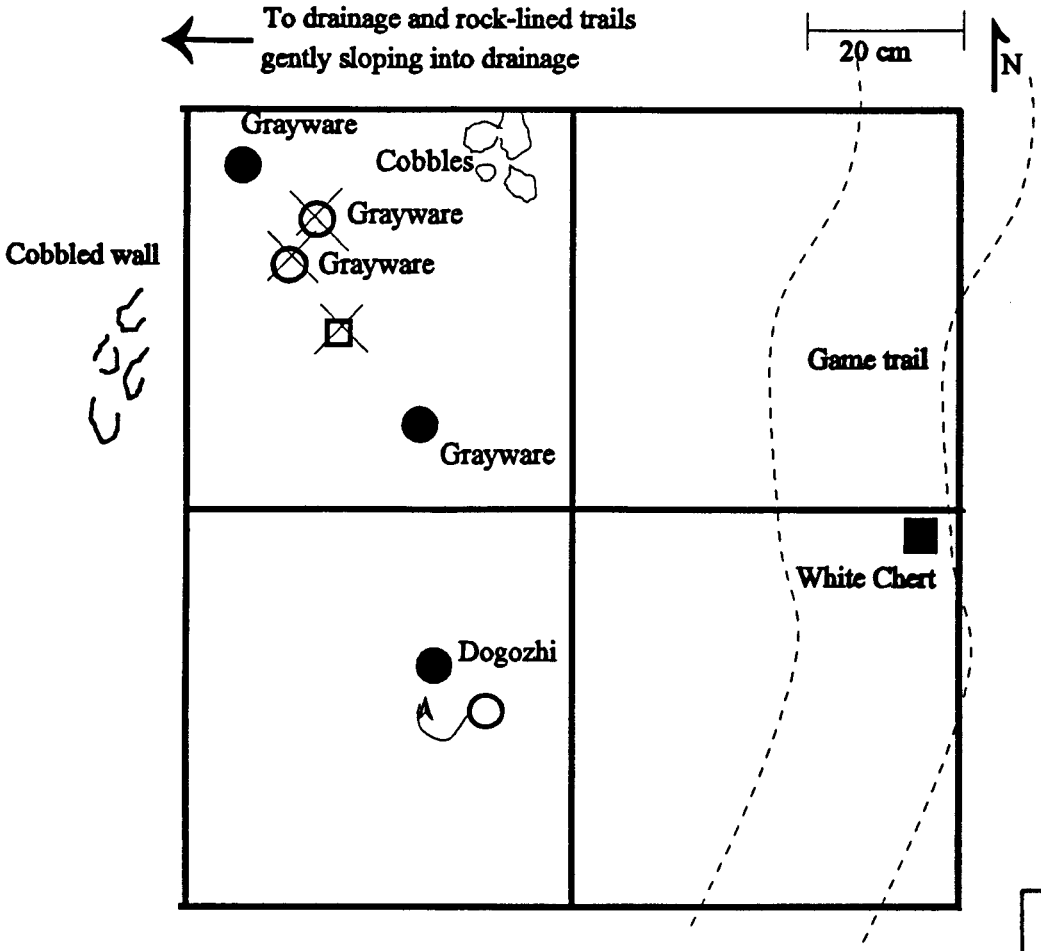
B. Artifact Tracking Unit Maps and Summary Statistics

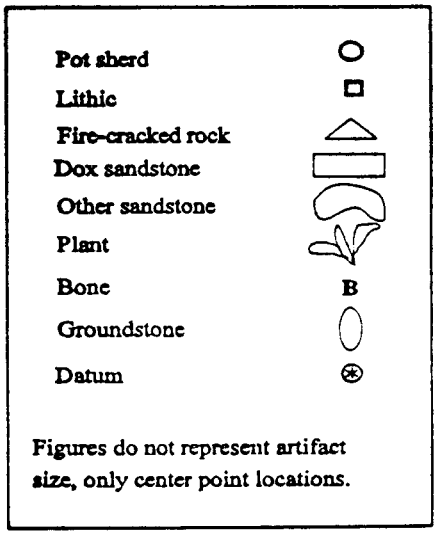




C:09:051A	Time 1 Artifacts Observed	Time 2 Artifacts Observed	Percent Change in Artifact Density
	20	13	35% Decrease

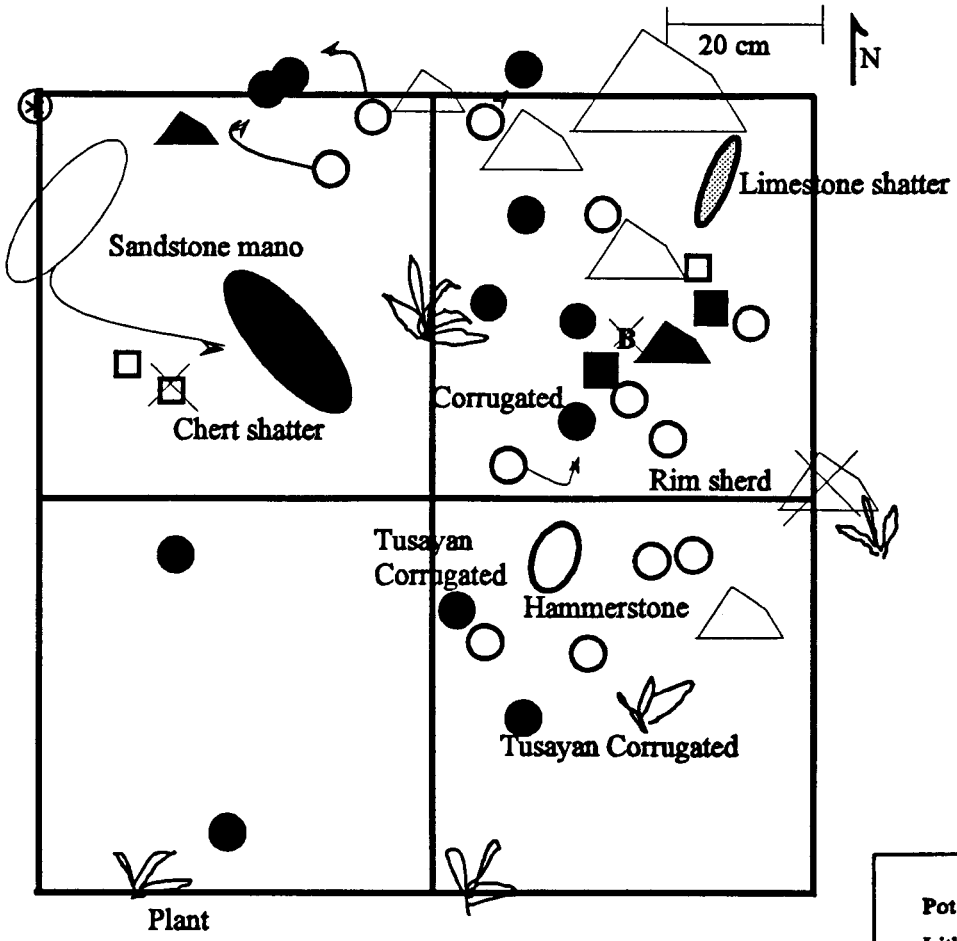
C:09:051A Surface Analysis Unit at Feature 1. Initiated 94-3 (LMO/JSC 2-30-94), analyzed 95-4 (LML/LAW 3-28-95). Solid black items indicate 95-4 observations. X = not identified during second observation.

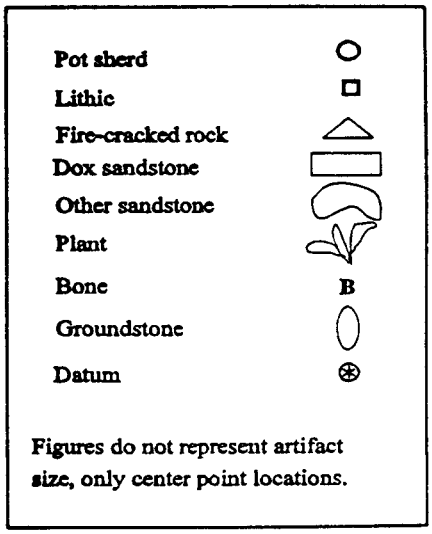




C:09:051B	Time 1 Artifacts Observed	Time 2 Artifacts Observed	Percent Change in Artifact Density
	4	4	0%

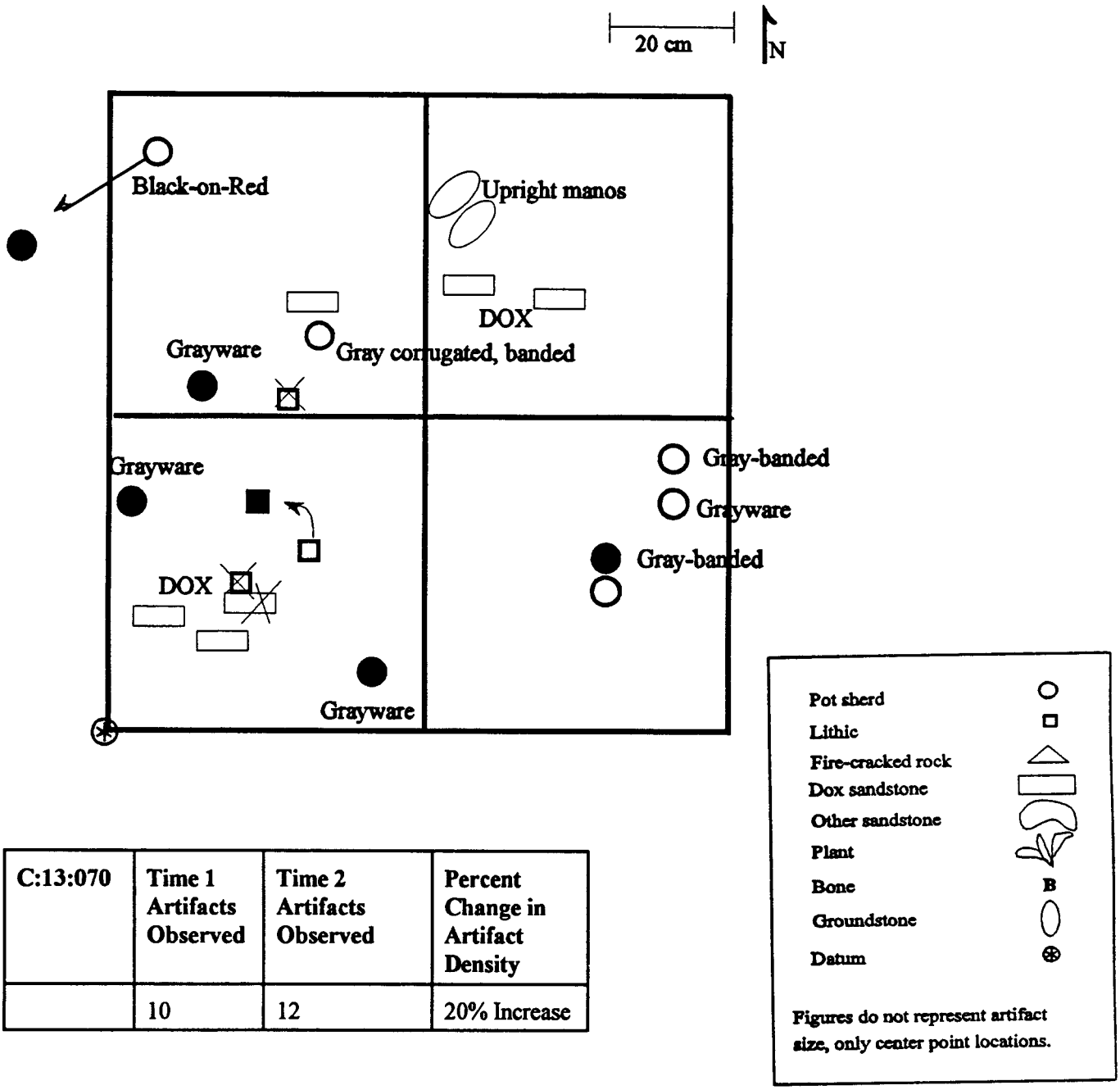
C:09:051B Surface Analysis Unit at Feature 3. Initiated 94-3 (LMO/JSC 2-30-94), analyzed 95-5 (LML/LAW 5-2-95). Solid black items indicate 95-4 observations. X = not identified during second observation. No datum nail was found at this unit.





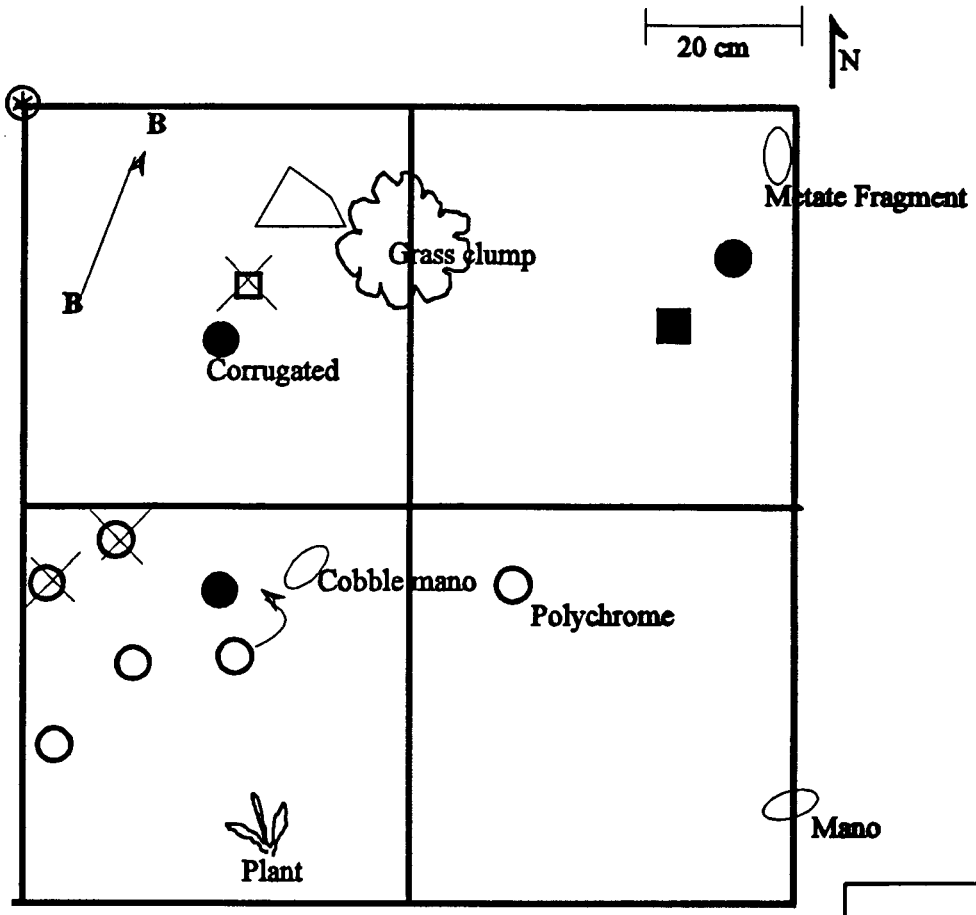
	Artifacts Observed	Time 2 Artifacts Observed	Percent Change in Artifact Density
	19	23	21% Increase

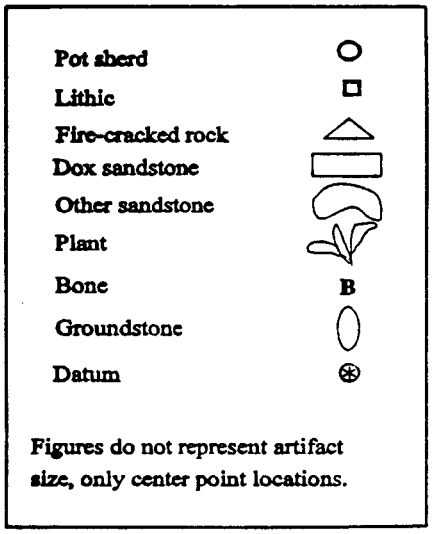
C:09:052 Surface Analysis Unit. Initiated 94-3 (CMC/LKM 2-26-94), analyzed 95-4 (LML/LAW 3-28-95). Solid black items indicate 95-4 observations. **B** = Exposed bone. X = not identified during second observation.



C:13:070	Time 1 Artifacts Observed	Time 2 Artifacts Observed	Percent Change in Artifact Density
	10	12	20% Increase

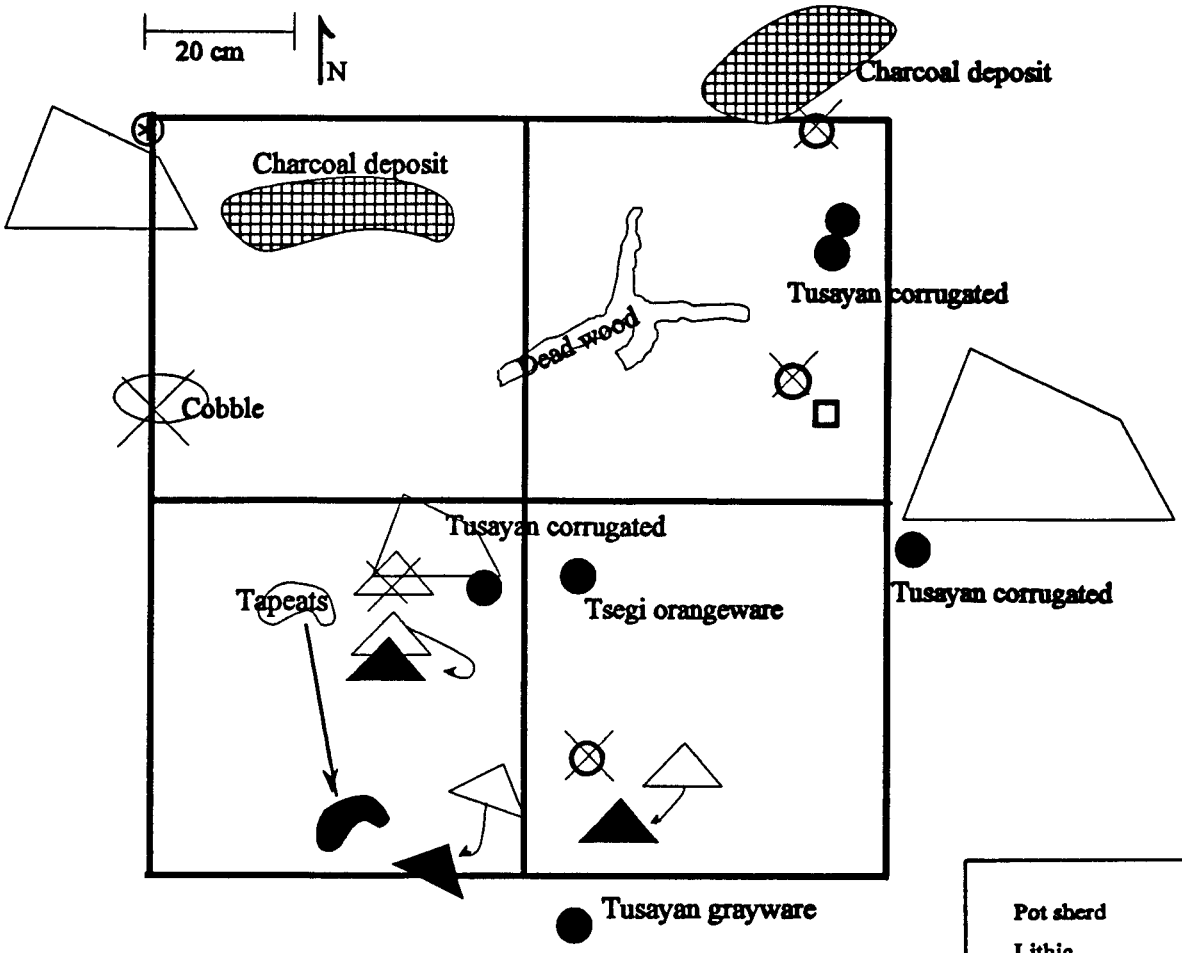
C:13:070 Surface Analysis Unit. Initiated 94-3 (MJ 3-1-94), completed 95-5 (LML/LAW 5-2-95). Solid black items indicate 95-5 observations. X = not identified during second observation.

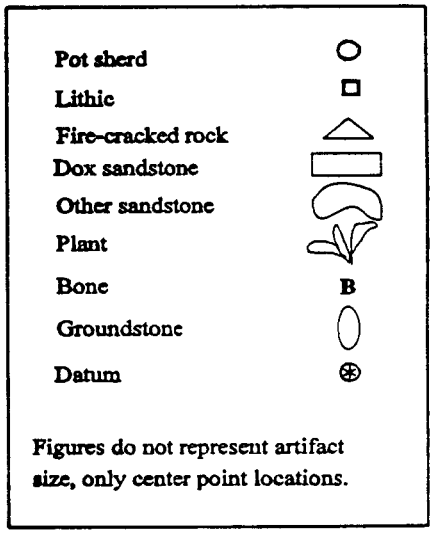




C:09:082	Time 1 Artifacts Observed	Time 2 Artifacts Observed	Percent Change in Artifact Density
	11	11	0%

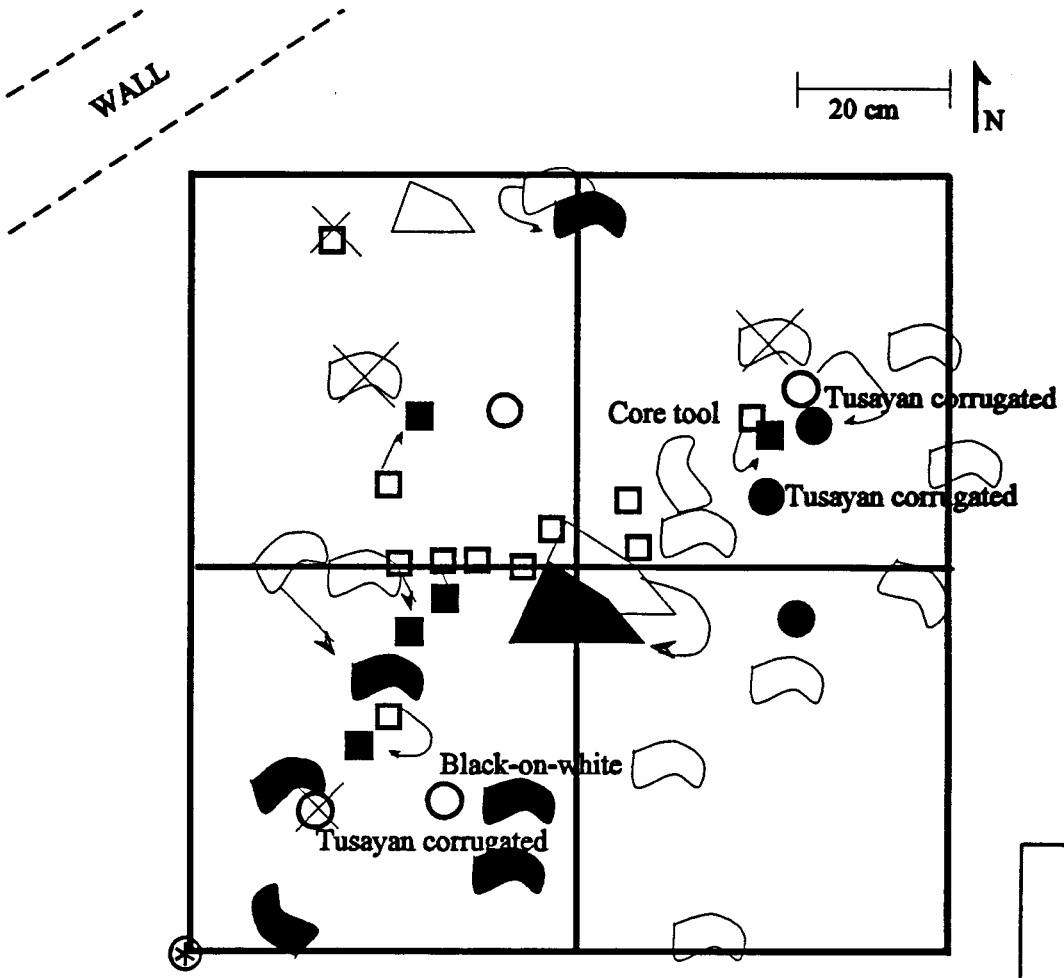
C:09:082 Surface Analysis Unit. Initiated 94-3 (CMC/LKM 2-26-94), analyzed 95-4, (LML/LAW 3-29-95). Solid black items indicate 95-4 observations. **B** = Burned bird bone fragments < 1cm long. X = not identified during second observation. Sparse grasses cover this unit.

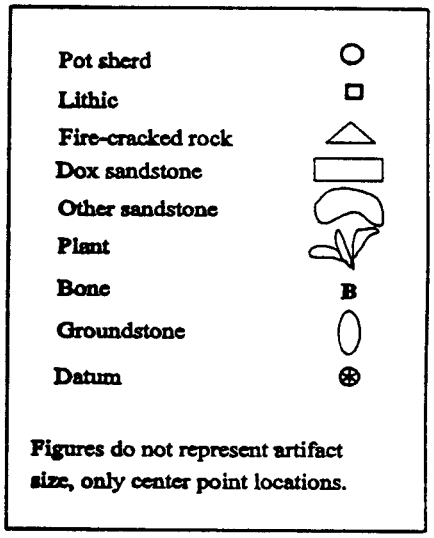




C:13:006	Time 1 Artifacts Observed	Time 2 Artifacts Observed	Percent Change in Artifact Density
	11	12	9% Increase

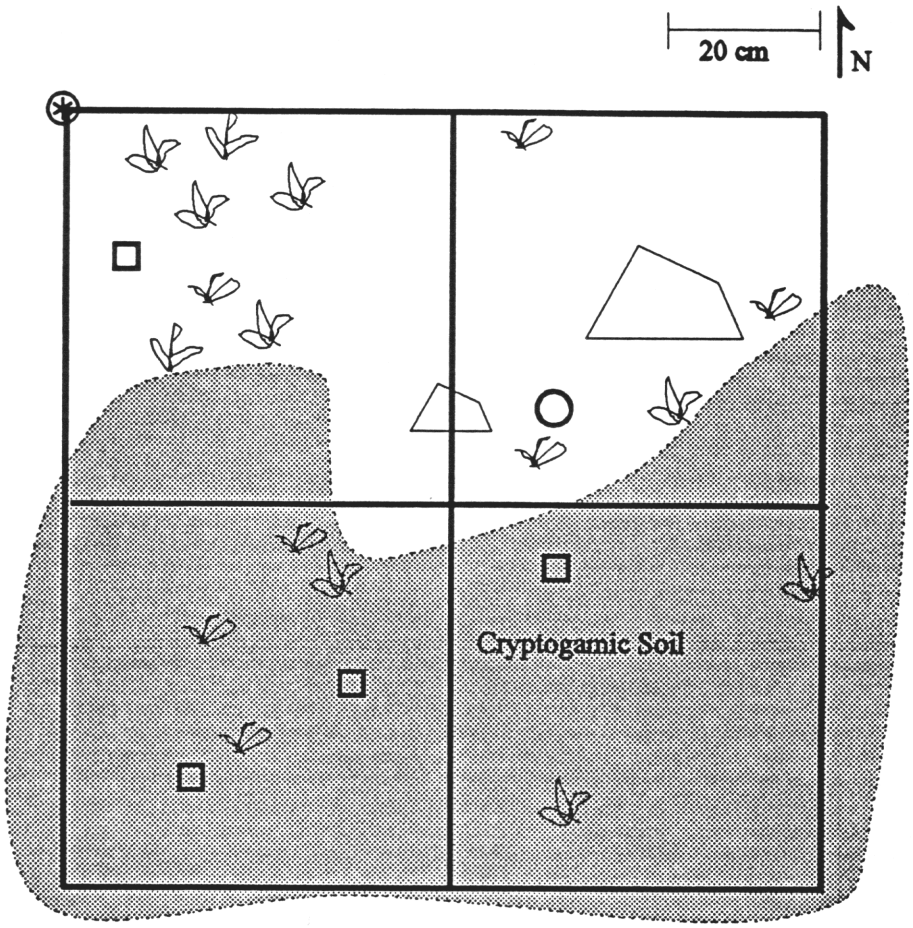
C:13:006 Surface Analysis Unit. Initiated 94-3 (LKM/JSC 3-31-94), analyzed 95-5 (LML/LAW 5-2-95). Solid black items indicate 95-5 observations. X = not identified during second observation.

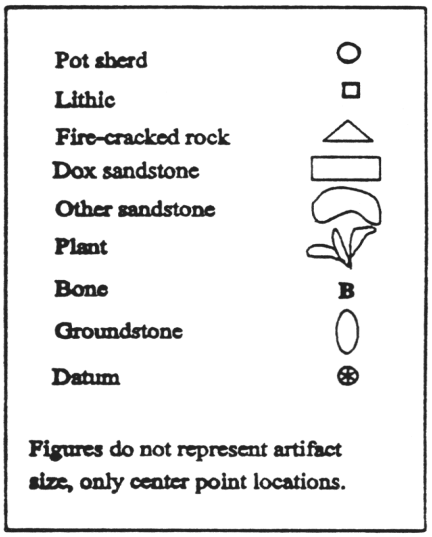




C:13:100	Time 1 Artifacts Observed	Time 2 Artifacts Observed	Percent Change in Artifact Density
	15	15	0%

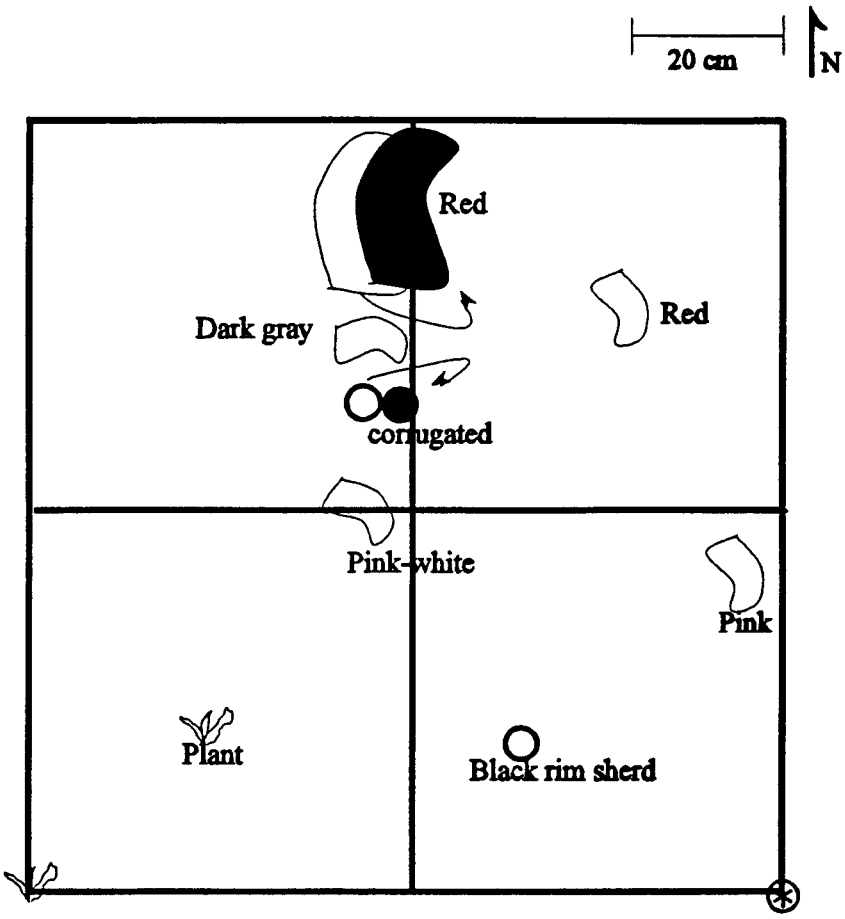
C:13:100 Surface Analysis Unit. Initiated 94-3 (MJ 2-27-94), analyzed 95-4 (LML/LAW 3-30-95). Solid black items indicate 95-4 observations. X = not identified during second observation.

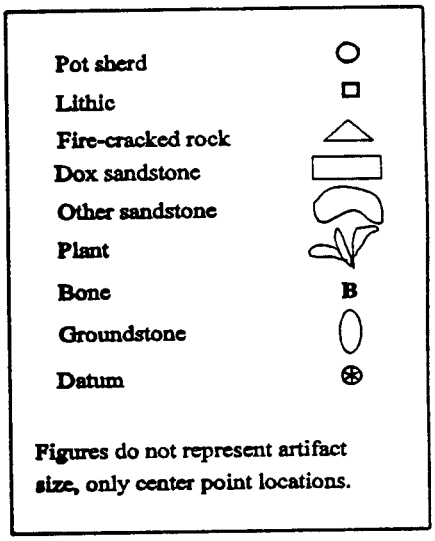




C:13:101	Time 1 Artifacts Observed	Time 2 Artifacts Observed	Percent Change in Artifact Density
	5	N/A	N/A

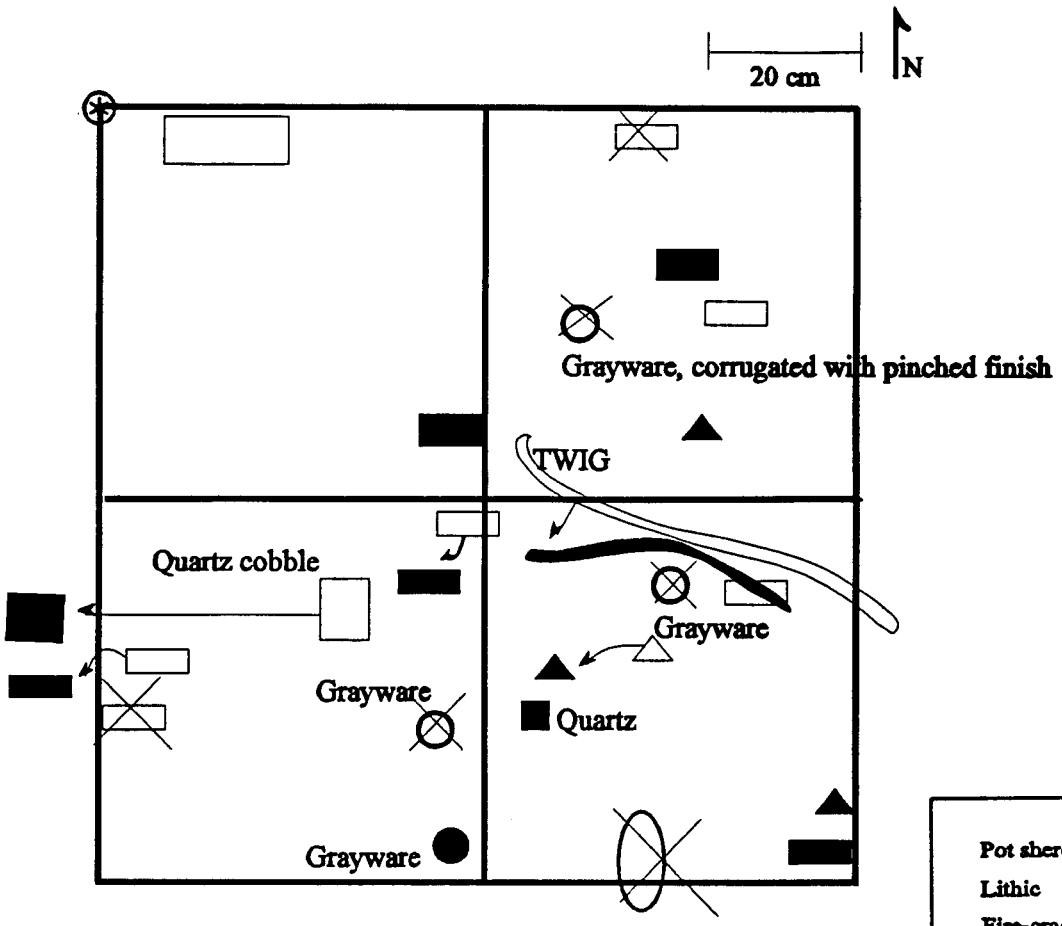
C:13:101 Surface Analysis Unit. Initiated 94-3 (LMO/LKM/JSC 3-31-94). This unit could not be located in FY 95 and will be omitted from the sample.

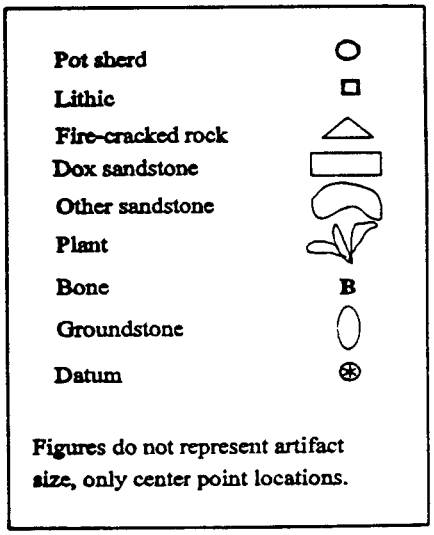




C:13:272	Time 1 Artifacts Observed	Time 2 Artifacts Observed	Percent Change in Artifact Density
	2	2	0%

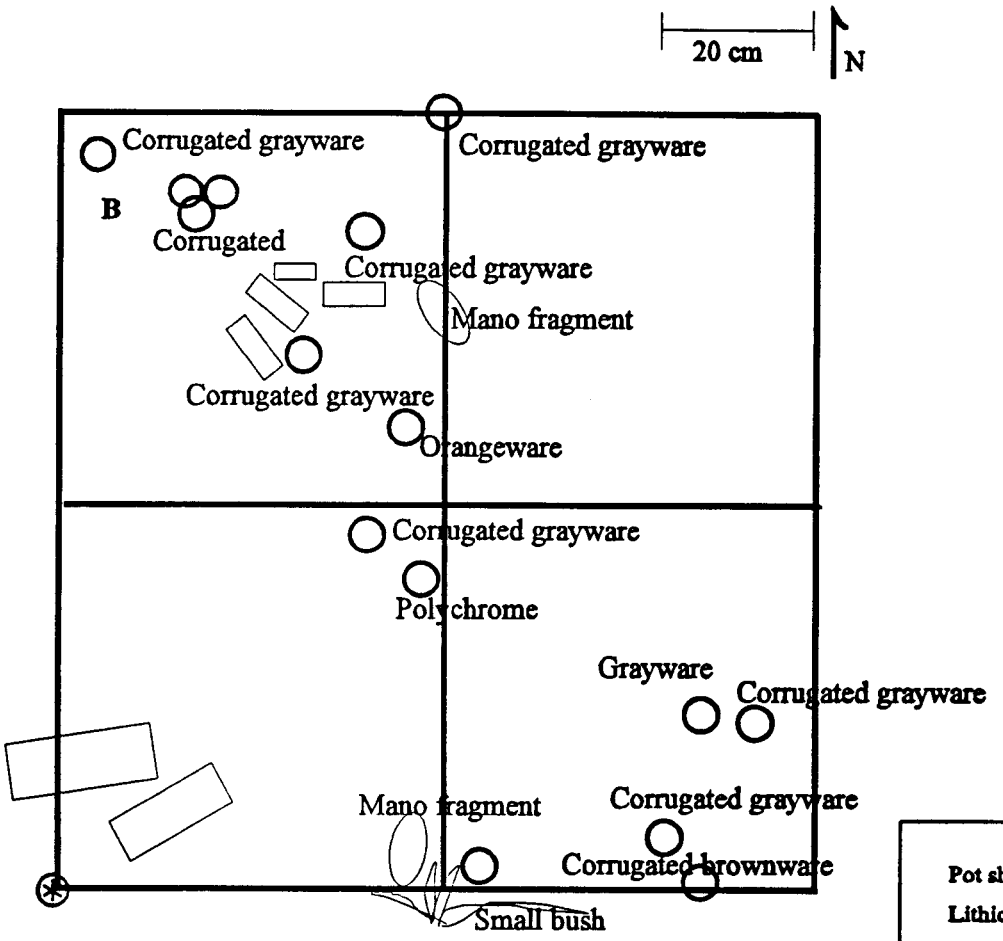
C:13:272 Surface Analysis Unit. Initiated 94-3 (MJ 2-27-94), analyzed 95-4 (LML/LAW 3-30-95). Solid black items indicate 95-4 observations. X = not identified during second observation. Small pebbles and sandstone ranging in size from 1 cm to 5-10 cm can be found throughout this unit.

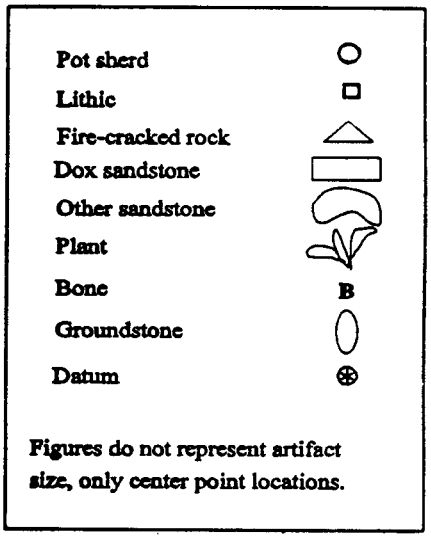




C:13:321	Time 1 Artifacts Observed	Time 2 Artifacts Observed	Percent Change in Artifact Density
	5	5	0%

C:13:321 Surface Analysis Unit at Feature 5. Initiated 94-3 (MJ 2-28-94), analyzed 95-5 (LML/LAW 5-3-95). Solid black items indicate 95-5 observations. X = not identified during second observation.





C:13:385	Time 1 Artifacts Observed	Time 2 Artifacts Observed	Percent Change in Artifact Density
	18	N/A	N/A

C:13:385 Surface Analysis Unit near Feature 2. Initiated 94-3 (MJ 3-1-94).
B = metatarsal Small pieces of sandstone are covering the surface area.
Due to time constraints on the 95-5 trip, this unit will be analyzed on the September 95-6 river trip.

C. FY96 Monitoring Work Plan

Tentative Trip Dates With A Maximum of 18 Days:

Resource Trip -- September 30 - October 15, 1995
Monitor Trip -- February 16 - March 4, 1996
Monitor, Map Trip -- March 20 - April 6, 1996
Monitor, Map Trip -- May 1 - 18, 1996
Remedial Action Trip -- September 11 - 28, 1996

List of Sites to Monitor in FY96

TOTAL SITES = 146
TOTAL MONITORING EPISODES = 154

"N" Group--13

Site Number	River Mile/Bank	Site Type
C:09:080	052.1R	Ephemeral Structure
C:13:367	057.5R	Small Structure
C:13:274	067.6L	Water/Soil Control
B:15:132	108.8L	Camp
B:15:121	114.2R	Camp
B:15:126	117.7L	Small Structure
B:15:143	117.7L	Camp
B:10:236	124.5R	Camp
B:10:121	140.0L	Small Structure
B:10:230	152.2R	Camp
A:16:156	186.1L	Ephemeral Structure
A:15:017	195.9R	Camp
G:03:019	214.0R	Small Structure

SEMIANNUAL--8

Site Number	River Mile/Bank	Site Type
C:09:050	051.8R	Isolated Pot
C:13:371	062.5R	Small Structure
C:13:100	065.5L	Pueblo
C:13:099	065.5L	Small Structure
C:13:098	065.5L	Historic Structure
C:13:347	070.7L	Small Structure
C:13:070	073.1L	Small Structure
G:03:003	209.0L	Roaster Complex

ANNUAL -- 33

Site Number	River Mile/Bank	Site Type
C:02:097	001.3R	Ephemeral Structure
C:02:098	001.3R	Camp
C:02:096	002.0L	Ephemeral Structure
C:06:003	011.1R	Camp
C:06:005	011.8L	Rock Art
C:09:052	052.3R	Small Structure
C:09:082	052.3R	Camp
C:09:051	052.3R	Pueblo
C:13:006	059.8R	Small Structure
C:13:272	065.5L	Small Structure
C:13:273	067.7L	Roaster Complex
C:13:339	067.9L	Small Structure
C:13:092	069.6R	Historic Structure
C:13:321	069.6R	Roaster Complex
C:13:349	070.2L	Historic Structure
C:13:069	071.1L	Small Structure
C:13:010	071.5R	Pueblo
C:13:291	072.2R	Small Structure
C:13:005	076.6L	Roaster Complex
B:14:107	122.0R	Ephemeral Structure
B:11:272	131.6R	Thermal Feature
B:09:317	166.4L	Camp
A:16:159	187.9L	Camp
A:15:005	201.8R	Small Structure
G:03:004	206.6R	Roaster Complex
G:03:040	207.7L	Roaster Complex
G:03:064	207.8L	Roaster Complex
G:03:026	208.9L	Roaster Complex
G:03:044	211.2L	Roaster Complex
G:03:020	211.6R	Roaster Complex
G:03:080	221.8R	Roaster Complex
G:03:072	223.3R	Roaster Complex
G:02:009	259.4R	Historic Structure

BIENNIAL SCHEDULE-- EVEN YEARS--24

Site Number	River Mile/Bank	Site Type
C:06:008	012.7R	Small Structure
C:13:374	061.5L	Camp
C:13:101	065.6L	Small Structure
C:13:336	065.6L	Camp
C:13:132	068.3R	Rock Art
C:13:009	069.4R	Pueblo
C:13:322	071.1R	Rock Art
C:13:379	073.0R	Small Structure
C:13:386	073.2L	Small Structure
C:13:381	074.9L	Camp
C:13:359	074.9R	Small Structure
B:15:131	120.3L	Thermal Feature
B:15:135	121.6L	Small Structure
B:14:105	122.0R	Ephemeral Structure
B:10:261	123.4L	Roaster Complex
B:10:111	123.8L	Roaster Complex
A:16:167	183.0L	Roaster Complex
A:16:174	184.7R	Roaster Complex
A:16:148	186.1L	Roaster Complex
A:16:004	189.7L	Camp
A:15:003	198.4R	Roaster Complex
G:03:066	214.9L	Camp
G:03:061	216.6R	Camp
G:03:058	221.2R	Camp

10% Sample from "I" Category -- New Sites -- 6

Site Number	River Mile/Bank	Site Type
B:10:248	141.8R	Ephemeral Structure
B:09:320	156.8L	Bedrock Mortar
B:09:319	164.2R	Ephemeral Structure
B:09:315	164.2R	Ephemeral Structure
A:16:179	179.5L	Rock Art
A:15:018	197.7R	Camp

Sites Remaining from "SI" Category -- New Sites -- 62
(The "SI" group should be completed this year.)

Site Number	River Mile/Bank	Site Type
C:09:058	051.1L	Ephemeral Structure
C:09:062	052.1R	Enigmatic Feature
C:09:061	052.3R	Ephemeral Structure
C:09:059	052.3R	Water/Soil Control
C:09:071	052.7R	Small Structure
C:09:073	052.8R	Small Structure
C:09:054	052.9R	Small Structure
C:09:067	056.0R	Small Structure
C:09:084	056.9L	Sherd Scatter
C:13:370	057.2L	Ephemeral Structure
C:13:372	057.3L	Camp
C:13:353	060.7R	Small Structure
C:13:033	065.3L	Small Structure
C:13:324	068.6L	Camp
C:13:338	069.3L	Roaster Complex
C:13:327	069.3L	Camp
C:13:340	069.3L	Camp
C:13:344	069.9L	Camp
C:13:346	070.0L	Storage
C:13:348	070.0L	Small Structure
C:13:352	070.1L	Camp
C:13:351	070.2L	Artifact Scatter
C:13:345	070.3L	Small Structure
C:13:358	070.9L	Camp
C:13:362	072.4R	Small Structure
C:13:377	072.6R	Artifact Scatter
C:13:387	073.5L	Small Structure
C:13:389	075.4L	Ephemeral Structure
C:13:393	076.6L	Artifact Scatter
C:13:392	076.6L	Camp
B:11:278	130.6L	Small Structure
B:10:231	136.8R	Roaster Complex
B:10:237	139.0R	Roaster Complex
A:16:149	174.8R	Roaster Complex
A:16:153	175.5R	Small Structure
A:16:150	176.3R	Thermal Feature
A:16:154	176.9R	Camp
A:16:172	179.5R	Rock Art
A:16:157	180.7L	Roaster Complex

Sites Remaining from "SI" Category

Site	River Mile/Bank	Site Type
A:16:180	182.8R	Roaster Complex
A:16:161	185.4R	Small Structure
A:16:184	189.1R	Camp
A:15:022	194.5L	Roaster Complex
A:15:028	199.9L	Roaster Complex
A:15:036	201.3L	Camp
A:15:029	202.3R	Thermal Feature
A:15:033	202.5R	Roaster Complex
A:15:037	203.9R	Roaster Complex
A:15:043	204.2L	Camp
A:15:038	204.6R	Camp
A:15:047	204.7L	Camp
G:03:038	206.2R	Roaster Complex
G:03:041	207.9L	Roaster Complex
G:03:055	209.4R	Roaster Complex
G:03:076	210.8R	Camp
G:03:030	212.8R	Roaster Complex
G:03:073	214.0R	Roaster Complex
G:03:052	214.2R	Roaster Complex
G:03:033	219.8R	Enigmatic Feature
G:03:062	221.4R	Historic Scatter
G:03:054	222.4R	Camp
G:03:001	225.7L	Camp

FY96-1 October Monitoring List
33 Sites

Site Number	River Mile/Bank	Site Type
C:09:050	051.8R	Isolated Pot
C:09:062	052.1R	Enigmatic Feature
C:09:080	052.1R	Ephemeral Structure
C:13:367	057.5R	Small Structure
C:13:371	062.5R	Small Structure
C:13:033	065.3L	Small Structure
C:13:098	065.5L	Historic Structure
C:13:099	065.5L	Small Structure
C:13:272	065.5L	Small Structure
C:13:100	065.5L	Pueblo
C:13:101	065.6L	Small Structure
C:13:336	065.6L	Camp
C:13:274	067.6L	Water/Soil Control
C:13:273	067.7L	Roaster Complex
C:13:339	067.9L	Small Structure
C:13:347	070.7L	Small Structure
C:13:070	073.1L	Small Structure
C:13:386	073.2L	Small Structure
C:13:387	073.5L	Small Structure
B:15:132	108.8L	Camp
B:15:121	114.2R	Camp
B:15:126	117.7L	Small Structure
B:15:143	117.7L	Camp
B:10:236	124.5R	Camp
B:10:121	140.0L	Small Structure
B:10:248	141.8R	Ephemeral Structure
B:10:230	152.2R	Camp
A:16:156	186.1L	Ephemeral Structure
A:16:148	186.1L	Roaster Complex
A:15:017	195.9R	Camp
G:03:026	208.9L	Roaster Complex
G:03:003	209.0L	Roaster Complex
G:03:073	214.0R	Roaster Complex
G:03:019	214.0R	Small Structure

FY96-2 February Monitoring Trip
39 Sites

Site Number	River Mile/Bank	Site Type
C:06:008	012.7R	Small Structure
C:09:073	052.8R	Small Structure
C:09:054	052.9R	Small Structure
C:13:370	057.2L	Ephemeral Structure
C:13:372	057.3L	Camp
C:13:353	060.7R	Small Structure
C:13:374	061.5L	Camp
C:13:132	068.3R	Rock Art
C:13:324	068.6L	Camp
C:13:327	069.3L	Camp
C:13:340	069.3L	Camp
C:13:338	069.3L	Roaster Complex
C:13:009	069.4R	Pueblo
C:13:379	073.0R	Small Structure
C:13:381	074.9L	Camp
C:13:359	074.9R	Small Structure
B:15:135	121.6L	Small Structure
B:10:261	123.4L	Roaster Complex
B:10:111	123.8L	Roaster Complex
B:10:231	136.8R	Roaster Complex
B:10:237	139.0R	Roaster Complex
A:16:150	176.3R	Thermal Feature
A:16:154	176.9R	Camp
A:16:167	183.0L	Roaster Complex
A:16:174	184.7R	Roaster Complex
A:16:184	189.1R	Camp
A:16:004	189.7L	Camp
A:15:022	194.5L	Roaster Complex
A:15:003	198.4R	Roaster Complex
A:15:028	199.9L	Roaster Complex
A:15:029	202.3R	Thermal Feature
A:15:033	202.5R	Roaster Complex
G:03:055	209.4R	Roaster Complex
G:03:076	210.8R	Camp
G:03:052	214.2R	Roaster Complex
G:03:066	214.9L	Camp
G:03:061	216.6R	Camp
G:03:033	219.8R	Enigmatic Feature
G:03:058	221.2R	Camp

FY96-3 March Monitoring Trip
49 Sites

Site Number	River Mile/Bank	Site Type
C:02:097	001.3R	Ephemeral Structure
C:02:098	001.3R	Camp
C:02:096	002.0L	Ephemeral Structure
C:06:003	011.1R	Camp
C:06:005	011.8L	Rock Art
C:09:052	052.3R	Small Structure
C:09:059	052.3R	Water/Soil Control
C:09:061	052.3R	Ephemeral Structure
C:09:051	052.3R	Pueblo
C:09:082	052.3R	Camp
C:13:006	059.8R	Small Structure
C:13:092	069.6R	Historic Structure
C:13:321	069.6R	Roaster Complex
C:13:352	070.1L	Camp
C:13:349	070.2L	Historic Structure
C:13:351	070.2L	Artifact Scatter
C:13:345	070.3L	Small Structure
C:13:069	071.1L	Small Structure
C:13:322	071.1R	Rock Art
C:13:010	071.5R	Pueblo
C:13:291	072.2R	Small Structure
C:13:362	072.4R	Small Structure
C:13:377	072.6R	Artifact Scatter
C:13:005	076.6L	Roaster Complex
C:13:392	076.6L	Camp
C:13:393	076.6L	Artifact Scatter
B:15:131	120.3L	Thermal Feature
B:14:107	122.0R	Ephemeral Structure
B:14:105	122.0R	Ephemeral Structure
B:11:272	131.6R	Thermal Feature
B:09:320	156.8L	Bedrock Mortar
B:09:315	164.2R	Ephemeral Structure
B:09:319	164.2R	Ephemeral Structure
B:09:317	166.4L	Camp
A:16:179	179.5L	Rock Art
A:16:172	179.5R	Rock Art
A:16:159	187.9L	Camp
A:15:018	197.7R	Camp
A:15:005	201.8R	Small Structure
G:03:038	206.2R	Roaster Complex

FY96-3 March Monitor Trip

Site Number	River Mile/Bank	Site type
G:03:004	206.6R	Roaster Complex
G:03:040	207.7L	Roaster Complex
G:03:064	207.8L	Roaster Complex
G:03:041	207.9L	Roaster Complex
G:03:044	211.2L	Roaster Complex
G:03:020	211.6R	Roaster Complex
G:03:062	221.4R	Historic Scatter
G:03:080	221.8R	Roaster Complex
G:03:072	223.3R	Roaster Complex

FY96-4 May Monitoring Trip
33 Sites

Site Number	River Mile/Bank	Site Type
C:09:058	051.1L	Ephemeral Structure
C:09:050	051.8R	Isolated Pot
C:09:071	052.7R	Small Structure
C:09:067	056.0R	Small Structure
C:09:084	056.9L	Sherd Scatter
C:13:371	062.5R	Small Structure
C:13:099	065.5L	Small Structure
C:13:098	065.5L	Historic Structure
C:13:100	065.5L	Pueblo
C:13:344	069.9L	Camp
C:13:348	070.0L	Small Structure
C:13:346	070.0L	Storage
C:13:347	070.7L	Small Structure
C:13:358	070.9L	Camp
C:13:070	073.1L	Small Structure
C:13:389	075.4L	Ephemeral Structure
B:11:278	130.6L	Small Structure
A:16:149	174.8R	Roaster Complex
A:16:153	175.5R	Small Structure
A:16:157	180.7L	Roaster Complex
A:16:180	182.8R	Roaster Complex
A:16:161	185.4R	Small Structure
A:15:036	201.3L	Camp
A:15:037	203.9R	Roaster Complex
A:15:043	204.2L	Camp
A:15:038	204.6R	Camp
A:15:047	204.7L	Camp
G:03:003	209.0L	Roaster Complex
G:03:030	212.8R	Roaster Complex
G:03:054	222.4R	Camp
G:03:001*	225.7L	Camp
G:02:009*	259.4R	Historic Structure

* = BELOW DIAMOND

Proposed Remedial Actions

Site Number	River Mile and Bank	Site Type	Current Mapping Status
C:02:092+	1.4L	Camp	New
C:06:003+	11.1R	Camp	New
C:09:051*	52.3R	Pueblo	Incomplete
C:09:082*	52.3R	Camp	Incomplete
C:13:006*	59.8R	Small Structure	New
C:13:010*	71.5R	Pueblo	New
C:13:098-	65.5L	Historic Structure	Incomplete
C:13:272-	65.5L	Small Structure	Incomplete
C:13:291-	72.2R	Small Structure	Incomplete
C:13:321+	69.6R	Roaster Complex	New
C:13:347*	70.7L	Small Structure	Incomplete
C:13:349*	70.2L	Historic Structure	New
C:13:359*	74.9R	Small Structure	New
C:13:385-	73.2L	Small Structure	Incomplete
C:13:386-	73.2L	Small Structure	Incomplete
C:13:387-	73.5L	Small Structure	Incomplete
G:03:026+	208.9L	Roaster Complex	New
G:03:046+	207.1R	Camp	New
G:03:065*	217.0R	Lithic Scatter	New

Sites to Map for FY96.
* = Number 1 priority.
- = Number 2 priority.
+ = Number 3 priority.

Sites assessed in FY95 receiving stabilization and trail work on the FY95-6 river trip.

Site Number	River Mile/Bank	Site Type
C:13:098	065.5/L	Historic Structure
C:13:099	065.5/L	Small Structure
C:13:100	065.5/L	Pueblo
C:13:272	065.5/L	Small Structure

Sites assessed in FY95. Trail work will be implemented in FY96.

Site Number	River Mile/Bank	Site Type
C:06:003	011.1/R	Camp
G:03:004	206.6/R	Roaster Complex
G:03:067	219.7/R	Roaster Complex

Sites located in the Granite Park area that require retrailing and trail obliteration. Consult with Hualapai tribe in FY95 for work in FY96.

Site Number	River Mile/Bank	Site Type
G:03:024	208.6/L	Roaster Complex
G:03:028	208.7/L	Roaster Complex
G:03:026	208.9/L	Roaster Complex
G:03:003	208.9/L	Roaster Complex

Sites to assess for testing during the scheduled monitoring trips.

Site Number	River Mile/Bank	Site Type
C:13:374	061.5/L	Camp
C:13:371	062.5/R	Small Structure
C:13:384	065.4/R	Other
C:13:349	070.2/L	Historic Structure
C:13:364	071.4/R	Small Structure
B:15:143	117.7/L	Camp
B:10:262	137.2/L	Ephemeral Structure
A:15:030	199.0/R	Thermal Feature
A:15:021	199.5/R	Camp
A:15:039	203.0/L	Roaster Complex
G:03:072	223.3/R	Roaster Complex

Sites recommended for trail obliteration and retrailing in FY96. Assessments will be made this September and November with probable implementation in November or February.

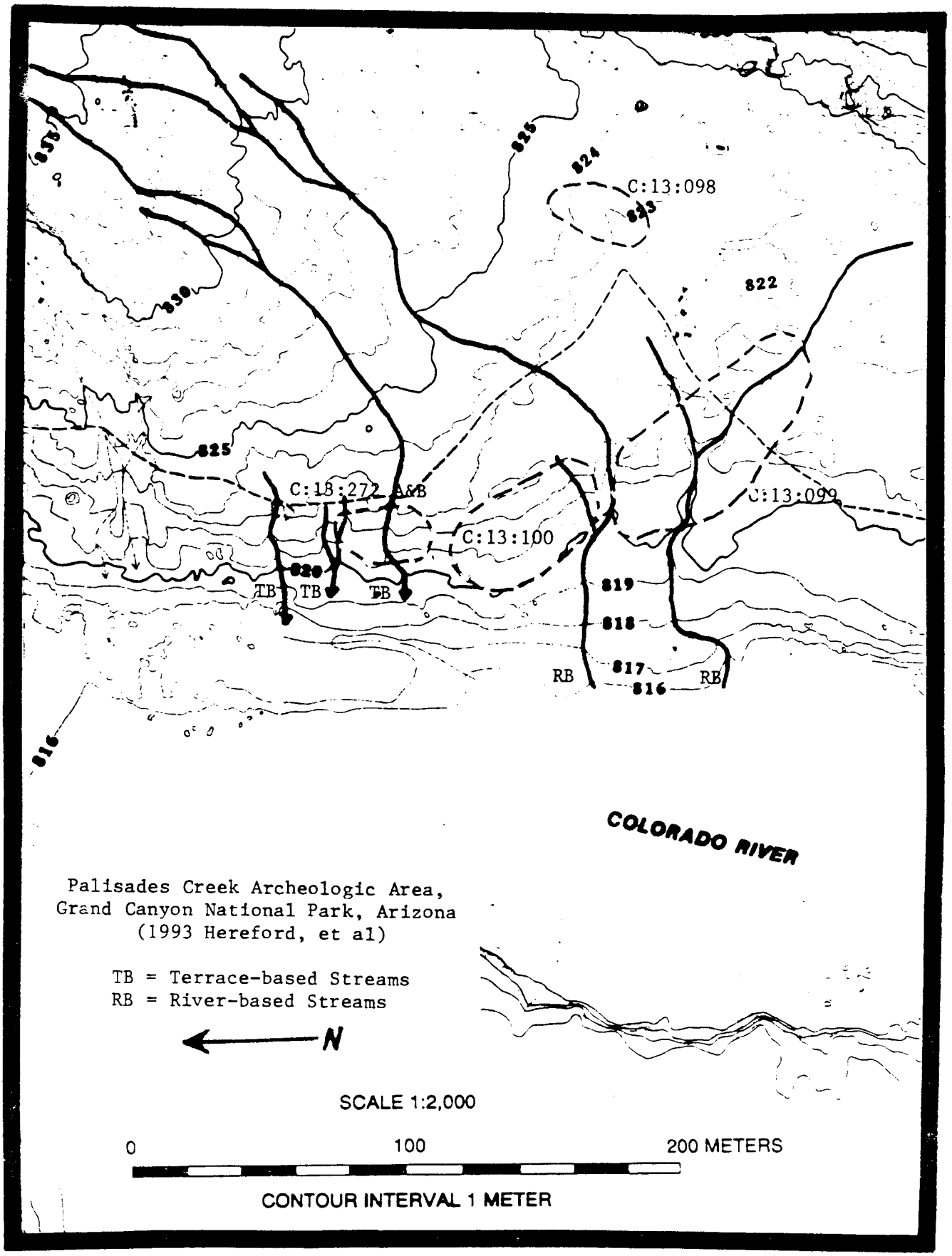
Trail Obliteration. * = also retrail

Site Number	River Mile/Bank	Site Type
C:02:097	001.3/R	Ephemeral Structure
C:09:031*	044.8/L	Burial
C:13:323	068.6/L	Camp
C:13:359	074.9/R	Small Structure
C:13:005	076.6/L	Roaster Complex
B:15:091	109.5/R	Small Structure
B:09:317	166.4/L	Camp
A:16:160	174.3/R	Roaster Complex
A:16:151	177.2/L	Camp
A:15:005	201.8/R	Small Structure

Sites recommended for stabilization. Assessments will be made in September and November with possible implementation in February.

Site Number	River Mile/Bank	Site Type	Recommendation
C:02:101	009.9/R	Thermal Feature	Check dam
C:13:006	059.8/R	Small Structure	Stabilize
C:13:273	067.7/L	Roaster Complex	Stabilize
C:13:349	070.2/L	Historic Structure	Stabilize
C:13:291	072.2/R	Small Structure	Stabilize
G:03:064	207.8/L	Roaster Complex	Check dams, plant vegetation

D. Stabilization at Palisades Delta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C:18:272 A&B
C:13:100
C:13:099
TB
TB
TB
RB
RB
COLORADO RIVER
Palisades Creek Archeologic Area,
Grand Canyon National Park, Arizona
(1993 Hereford, et al)
TB = Terrace-based Streams
RB = River-based Streams
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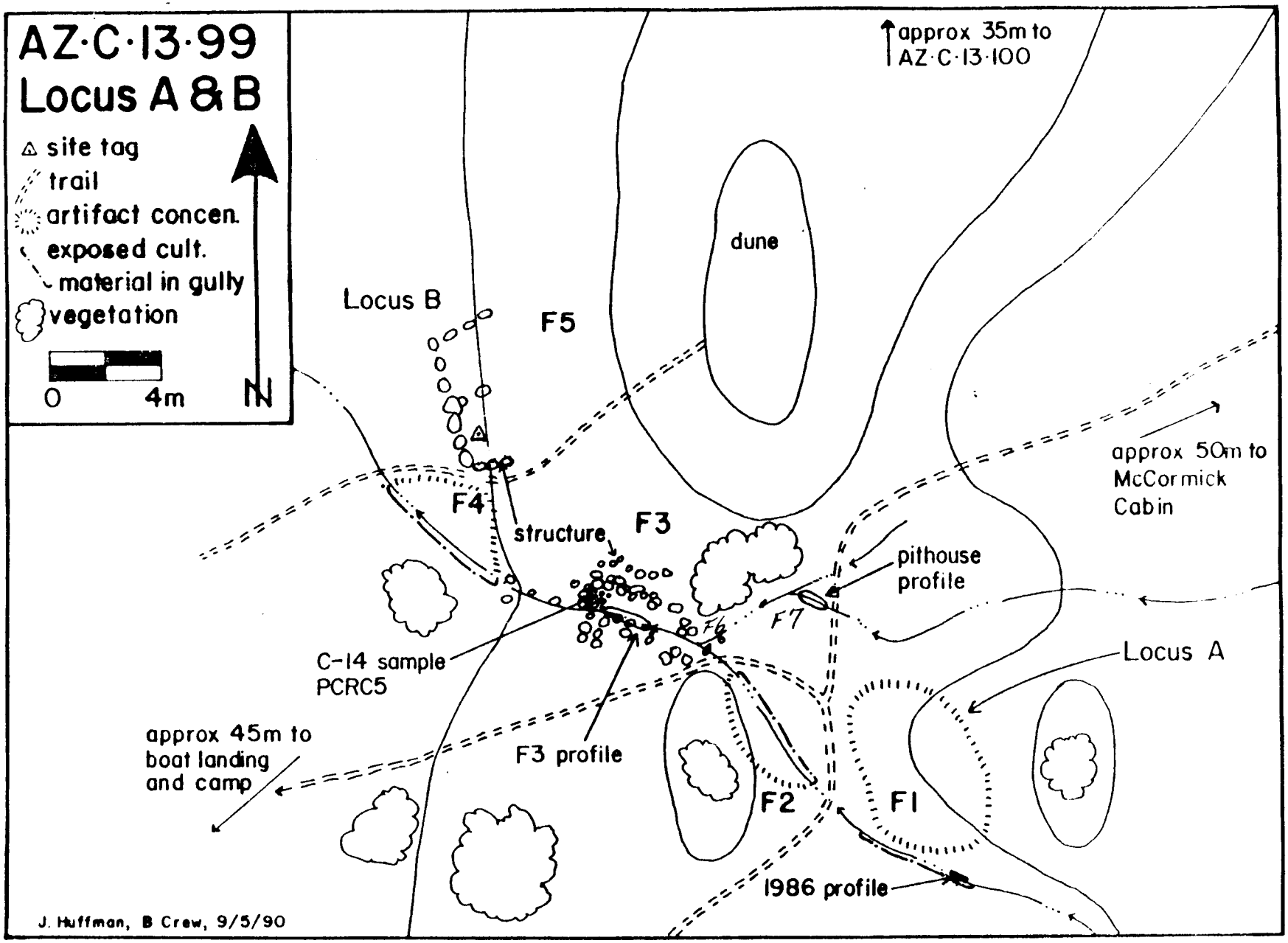
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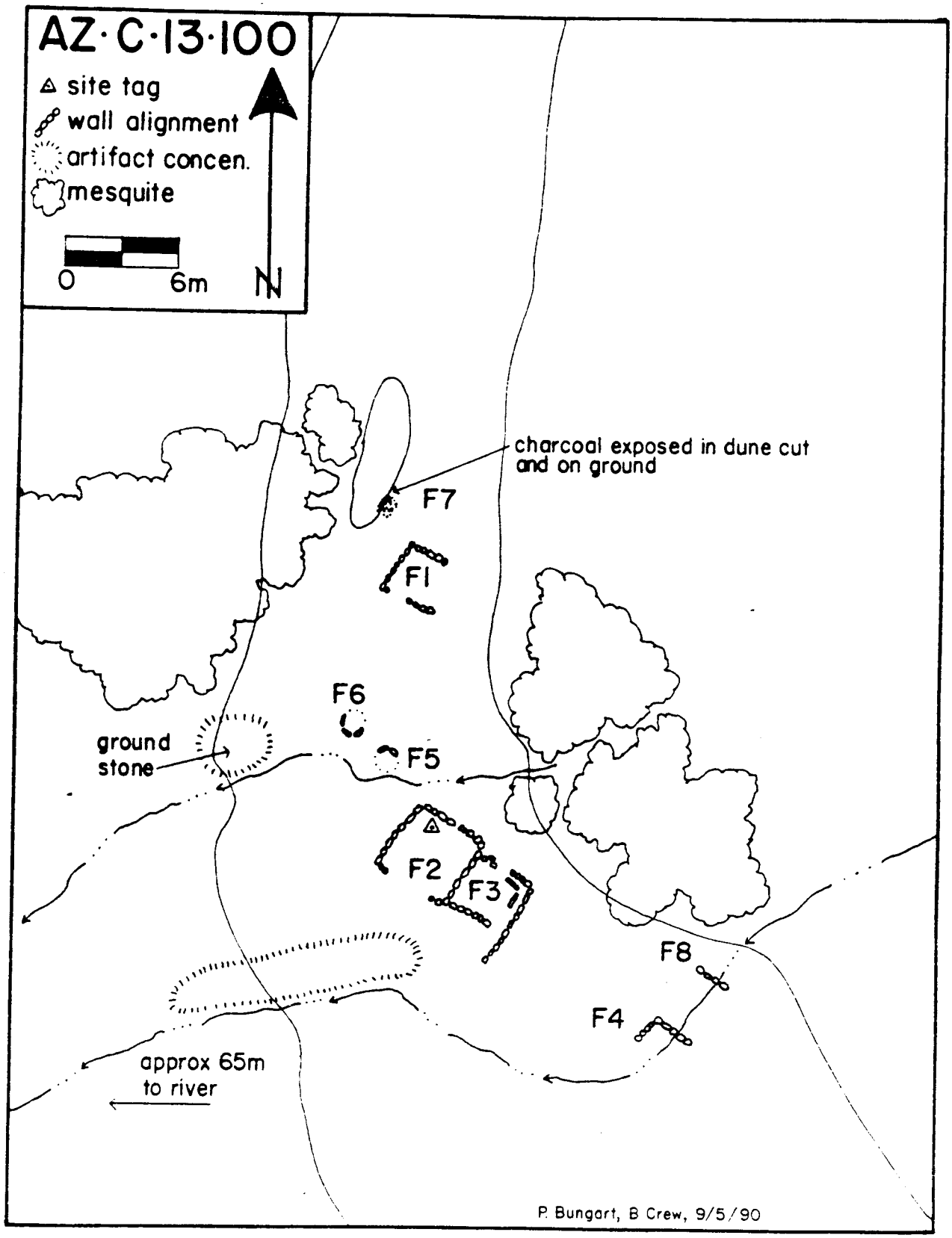
J. Huffman, B Crew, 9/5/90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ground stone
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F4
approx 65m to river
P. Bungart, B Crew, 9/5/90