

ARCHEOLOGICAL RESEARCH IN GLEN CANYON, 1977

by

Alan R. Schroedl

VOL. I

National Park Service
Midwest Archeological Center
Lincoln, Nebraska

June 1981

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With sections by

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And Appendices by

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ACKNOWLEDGEMENTS

During the 1950s when pre-inundation archeological salvage work was being carried out in Glen Canyon, providing adequate logistical support for the crews was time consuming and difficult. In the intervening 20 years, the integrity of the Glen Canyon system has been maintained; in few other places in the West is access more difficult, the terrain more rugged, and civilization further away than in Glen Canyon. When logistics are so difficult, countless people must be thanked for helping bring a project to completion.

During the field work our best friends and greatest aids were personnel from the National Park Service Glen Canyon National Recreation Area. At Page, Arizona, Superintendent Temple Reynolds and Assistant Superintendent Joe Kennedy helped us in every way; while Bill Supernaugh, Cultural Resource Specialist, kept a watchful eye over the progress of the project. Ron Martin and Marion Clark solved many of our transportation problems.

During the field work, which took us to every ranger district in the recreation area, we were courteously received and offered every assistance. At Rainbow Marina, Rangers Eldon Kohlman and Wayne Landrum helped us during bad weather. At Bullfrog Marina, District Ranger Mac Shaver looked after us, and at Hite, the northernmost outpost, Ranger Bruce Freet kept track of us in Gypsum Canyon and showed us the Jomac Mine and the location of the proposed Hite restaurant complex. At Halls Crossing, Ranger Duane Alire not only acted as our mailman and contact with the outside world, but, along with his wife, Cindy, always welcomed us with hot showers, cold beer, and good food.

The Del E. Webb Corporation, particularly Alex Ross from Wahweap Lodge and Marina and Lou Mallory of Bullfrog Marina, must be thanked for letting us hitch rides up and down Lake Powell on their regularly scheduled tours. They graciously made room on their boats for both us and our equipment.

At Halls Crossing Marina, General Manager Jerry Dyer and other marina employees made our stay more comfortable by treating us as local residents rather than passing tourists. In Gypsum Canyon, Carol Nieuwenhuis from the University of California at Berkeley, brightened our stay and explained the alluvial geology to us; she also contributed one of the appendices to this report.

The mainstay of any field project is the crew members who actually do the work. I supervised all of the field work, while Peggy Barnett, from the University of Utah, acted as crew chief. She also made the plant collections in the field and had a hand in writing several sections of this report. Other crew members were John Carpenter and Karl Reinhard, both from the University of Arizona, and Kaytee Umbreit from Temple University. Reinhard made all of the pottery field identifications and Umbreit did most of the field mapping and drawing. Brad Lewis, from the University of Utah, was the chief cook, bottle washer, and comic relief for the summer; Nancy Coulam, from Arizona State University, was a crew member for the final week during an interagency reconnaissance trip.

A number of people offered support and assistance once the field portion of the project was completed and the analysis had begun. Jesse D. Jennings from the University of Utah, provided all of the records generated during the Upper Colorado River Basin Archeological Salvage Project (UCRBASP), better known as the "Glen Canyon Project." At the University of Utah, Frank Hull, Sharon Arnold, and David Crompton all contributed in various ways to this project. Beverly Albee of the Garret Herbarium identified numerous plant specimens collected during the 1977 project.

The artifact analysis reported here was done by a number of people. At the University of Utah, Nancy Coulam analyzed the ground stone and functioned as a laboratory assistant, Nancy Hewitt identified the organic artifacts, Craig

Hylton analyzed the human skeletal remains from Gypsum Canyon, Peggy Barnett did flotation analysis, Bill Lucius aided in both pottery and faunal identifications, Lynne Sebastian studied the rock art from Moqui Canyon, Dennis Weder analyzed all of the chipped stone remains from the 1977 season, and Anne Worthington analyzed all of the pottery.

Mark Stiger from the Midwest Archeological Center completed the analysis of the coprolites recovered during 1977 and wrote an appendix for the report. Robert Bye, from the University of Colorado, analyzed all of the corn, beans and squash remains that were recovered. He also contributed an appendice to this report.

Most of the rock art field illustrations were redrawn in final form by Nancy Coulam. The final drafting was done by Melodie Tune, and Wayne Nelson did the photography for this report. The drafts were typed and retyped by Claudia Shaffer and Sharon Rezac.

Special thanks are due to Cal Calabrese, Chief of the Midwest Archeological Center, for his support and interest in the 1977 project, and to Adrienne Anderson, now National Park Service Rocky Mountain Regional Archeologist, who conceived of the project and oversaw its completion.

Alan R. Schroedl
January 1978

INTRODUCTION

The 1977 archeological field program undertaken by the National Park Service in Glen Canyon National Recreation Area (Fig. 1) was an outgrowth of a 1976 intensive inventory of Lake and Moqui Canyons by an archeological crew from the University of Utah (Schroedl 1976a). Four discrete projects were undertaken by the field crew in 1977, the primary purpose of each being inventory and evaluation of cultural resources as directed by the National Environmental Policy Act of 1969, Executive Order 11593, and the National Historic Preservation Act of 1965. These projects were also viewed as the beginnings of a longer term study of the area's prehistory based on the Upper Colorado River Basin Archaeological Salvage Project data collected in the 1950s and 1960s. This study is expected to provide adequate base data for management, interpretation, and increasing professional understanding of regional prehistory.

The major project of the 1977 season was a critical evaluation of the significance of select sites in Lake and Moqui Canyons to determine their potential eligibility for the National Register of Historic Places. Lake Canyon and Moqui Canyon had been surveyed in the 1950s by members of the Upper Colorado River Basin Archeological Salvage Project (UCRBASP). Excavation was subsequently undertaken at selected sites that were assumed to be representative of the prehistoric occupation. Two full seasons of excavation indicated that these canyons draining the Red Rock Plateau had sizable prehistoric populations and were among the most heavily utilized canyons in the area during prehistoric times (Jennings 1966:34).

Because the National Historic Preservation Act of 1966, which created the National Register of Historic Places, and the National Environmental Policy Act of 1969 were passed after completion of the UCRBASP (the Glen Canyon Project as it was called); the University of Utah crews had no established procedures or

criteria for formal recognition of significant archeological sites or districts. In 1974 during construction-related archeological evaluation, Kay (1974) pointed out that both of these canyons contained numerous sites, some of them perhaps significant in terms of the National Register, and that neither canyon had been under professional scrutiny since the University of Utah crews left them in the early 1960s. Kay noted that planned developments at Halls Crossing Marina would undoubtedly increase the number of visitors to both of these canyons and suggested that the sites be resurveyed and evaluated against National Register Criteria of Significance (36 CFR 800).

In 1976, state Highway U-95 was officially completed. This all-weather paved road connecting Hanksville with Blanding, Utah, crossing the Colorado River at the Hite Bridge was designated a Bicentennial Highway. Official opening of the highway was expected to significantly increase visitation to the San Juan Triangle. This is the area between the Colorado and the San Juan Rivers (Fig. 1); the apex of the triangle is the confluence of these two drainages. Lake and Moqui canyons are located in the middle of this area. Also in 1976, the last 17 km. of U-263, a spur road from U-95 to Halls Crossing Marina, were paved. The increase in visitation to the Halls Crossing area as a result of these highway improvements prompted the National Park Service to obligate funds for evaluation of the archeological resources and the extent of visitor impact on the resources in these two canyons adjacent to Halls Crossing.

The Department of Anthropology at the University of Utah contracted with the National Park Service to resurvey these canyons in 1976. The goals of the 1976 work were "to thoroughly and systematically inventory the prehistoric cultural resources in all areas of Lake and Moqui Canyons and their mainstem tributaries..." and "to recommend for each site recorded whether or not further evaluation against National Register criteria should be undertaken"

(Schroedl 1976a:1). The result of the 1976 survey was an updated summary of known archeological sites in the canyons with specific recommendations concerning further site evaluation for the National Register of Historic Places (Schroedl 1976a). These recommendations were the basis for the 1977 work, which consisted of site evaluation and salvage excavation of sites that were heavily disturbed and in danger of being completely destroyed by vandals.

It should be noted that the 1976 crew evaluated sites on lands administered by both the National Park Service and the Bureau of Land Management. The boundary between these two agencies in Lake and Moqui Canyon is not based on geographical or topographic features; it is arbitrary in relation to the prehistoric occupations of the region. The 1977 crew restricted their activities (evaluation, testing, and excavation) to lands administered by the National Park Service.

The second project of the season, of lesser scope, was a program of extensive surface collecting and testing on a sparsely covered bench above Dangling Rope Canyon. Dangling Rope Canyon, a right bank drainage about 13 km. downstream from Forbidden Canyon, is the site for the relocation of Rainbow Marina. This Dangling Rope benchland was surveyed as part of the 1976 Glen Canyon project in advance of pending marina relocation (Schroedl 1976b). It was suggested that several of the lithic concentrations be tested for subsurface features and evaluated for inclusion on the National Register of Historic Places. In 1977, these tests were completed, and an intensive surface collection was obtained from the area where future development would directly impact archeological resources.

The third project of the 1977 season was evaluation of a recently discovered archeological site at the mouth of Gypsum Canyon 50 km. upstream from Hite. In 1976, charcoal and human skeletal remains were discovered eroding out of an alluvial cut bank by geologist Carol Nieuwenhuis. The 1977

crew visited the site to determine its stability and to evaluate it against the National Register Criteria of Significance.

The fourth project of the field season consisted of two small pre-construction surveys. The first was an intensive survey of a bluff overlooking the Hite Bridge. That is the location of a proposed restaurant complex at the Hite Marina. The second survey covered the Jomac Uranium Mine area on Browns Rim a few kilometers to the southeast of the Hite Bridge. At both of these locations recent disturbances had obliterated much of the original ground surface. No discernible prehistoric activity loci were observed. The report of these project has been completed (Schroedl 1978).

In summary, the goals of the 1977 field season in Glen Canyon National Recreation Area consisted of archeological evaluation at sites in Gypsum, Dangling Rope, Lake, and Moqui Canyons in order to assess their significance in terms of the National Register of Historic Places, and evaluate them for management needs.

Standard testing procedures were used during the 1977 field season. Arbitrary horizontal and vertical datums were established; features were excavated as discrete units and plotted on scale maps. All artifacts were collected and bulk soil samples from cultural features such as cists and firepits were collected for flotation analysis. The results of the flotation procedures are presented in the chapter entitled "Organic Artifacts". Possible dendrochronological samples were recovered only at Carols House in Gypsum Canyon, unfortunately these samples were cottonwood and could not be dated. The lack of sufficient charcoal at any of the sites precluded radiocarbon dating.

Throughout this report all references to the level of Lake Powell are at the 1977 level of 1114 m., 14 m. below the maximum flood pool elevation of 1128 m. which is expected to be reached in 1980.

Each site including architectural features and stratigraphy (when present) is discussed separately. Artifacts are discussed by classes in the section entitled "ARTIFACTS." This format was used for two reasons, first, it gives due credit to the individuals who analyzed the artifact classes, and second, it places all this information in one location of the report for ease of reference. The distribution of artifacts from sites is highly variable, some sites yielded virtually no artifacts, while other sites yielded hundreds. The unevenness of the distribution of artifacts makes it more convenient to discuss all of them in one section of the report.

The final portion of the report is entitled, "Conclusions and Recommendations." In this section, there is a general discussion of prehistoric cultural resources in Glen Canyon National Recreation Area along with a discussion of the limited archeological conclusions that can be drawn from the 1977 field work. Finally, recommendations are advanced for archeological sites in all four of the canyons, both for future preservation and for inclusion on the National Register of Historic Places. Sites in Gypsum Canyon and Dangling Rope are not considered to be of National Register quality. On the basis of the 1976 work in Lake and Moqui Canyons, in conjunction with the more extensive 1977 fieldwork, it is recommended that both of these canyon systems be nominated as archeological districts to the National Register of Historic Places.

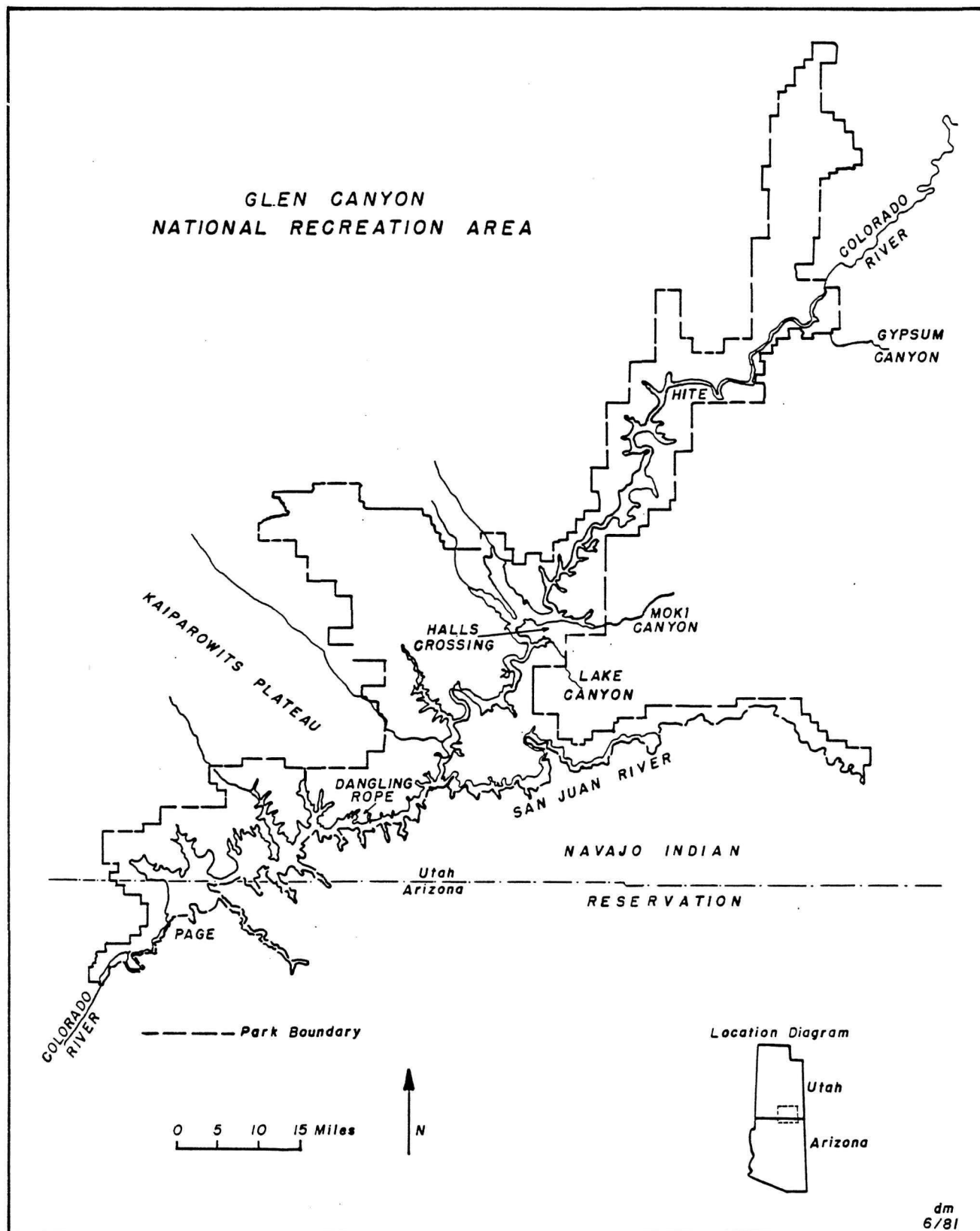


Figure 1. Map of Southern Utah/Northern Arizona

General Setting of Glen Canyon

Glen Canyon, which is over 225 river km. long, extends from about the mouth of the Dirty Devil River near Hite, Utah, to Marble Canyon just above Lees Ferry in Arizona (Fig. 1). The winding Colorado River has cut a narrow gorge through Triassic and Lower Jurassic formations to form sheer cliff walls that tower more than 400 m. above the original river bed. Table 1 presents the stratigraphic section of the geological formations in the Glen Canyon area.

Today, Glen Canyon is almost completely inundated by the waters of Lake Powell formed by the Glen Canyon Dam 24 km. above Lees Ferry. The lake is over 150 m. deep near the dam and is presently about 14 m. below the maximum flood pool elevation of 1128 m. When the lake is full there will be more than 3100 km. of shoreline, a length which exceeds the total U.S. shoreline on the Pacific coast.

The desert climate of the Glen Canyon Region is characterized by aridity with hot summers and cold winters. Average annual precipitation is about 18 cm. per year in the area (Flowers 1959:29), with the effective moisture being reduced well below this amount due to loss through seepage and high evapotranspiration rates. The number of frost-free days varies with the elevation, but ranges between 160 and 200 days. Average annual temperature is about 15° C. at elevations between 975 and 1060 m. and between 11° C. and 13° C. at higher elevations on the perimeter of Glen Canyon area (Flowers 1959:29); for the Lake Powell region, the average temperature is about 15° C. (Table 2). A low of -18° C. and temperatures as high as 51° C. (air temperature) and 60° C. (ground temperature) have been recorded in the area (Fowler 1959:481).

Although the vegetation of the Glen Canyon area can be classified as belonging to the Upper Sonoran zone, the canyons in this region constitute unique biotic microenvironments with distinctive floral communities contingent upon

Table 1. Geologic Section of the Glen Canyon - Southern Utah - Northern Arizona Area (modified from Hintze 1973)

Age	Formation	Thickness in Meters
Quaternary	Various local formations	
Tertiary	Cedar Breaks Formation	0 - 60
Upper Cretaceous	Kaiparowits Formation	820
Upper Cretaceous	Wahweap Sandstone	380
Upper Cretaceous	Straight Cliffs Formation	335
Upper Cretaceous	Tropic Shale	185 - 195
Upper Cretaceous	Dakota Sandstone	10 - 30
Upper Jurassic	Morrison Formation	0 - 110
Upper Jurassic	Cow Springs (?) Sandstone	0 - 45
Upper Jurassic	Entrada Sandstone	180 - 230
Middle Jurassic	Carmel Formation	60 - 120
	Glen Canyon Group	520
Lower Jurassic and Late Triassic	Navajo Sandstone	
Late Triassic	Kayenta Formation	
Late Triassic	Wingate Sandstone	
Late Triassic	Chinle Formation	150 - 380

[...pages 9 and 10 missing...]

the amount of available moisture (Flowers 1959). Four floral communities, the Streamside, the Terrace, the Hillside, and the Springs and Seeps Communities have been noted within the canyon microenvironments (Fig. 2).

The Streamside Community, dominated by phreatophytic flora, is found along stream and river channels where sufficient water is available. Plants in this community often occur in dense masses and usually include tall shrubs and small trees. The Terrace Community generally occurs on older terraces which are now above the flood plain. Plants from this community which are predominately low shrubs and herbs derive moisture from subsurface water through capillary action. The Hillside Community consists primarily of low widely-spaced xerophytic shrubs since available moisture for plants in this community is derived solely from infrequent precipitation. Local variations in plant cover for this community are a result of topography, exposure, latitude, and local edaphic conditions.

The last community, the Springs and Seeps, is the most localized plant community in the canyons. Along the plane of stratification between the Navajo Sandstone, which is an aquifer, and the Kayenta Sandstone, numerous seeps and springs occur. These outlets occur at any level in the canyon from high up in the cliff faces and talus slopes to the floors of the canyons. These locations can vary from a damp seam in an overhang to freeflowing springs in large alcoves. The types of plants found in this community are dependent on the amount of water produced at the seep or spring which is often seasonally variable.

Flowers (1959) lists various plant species that were found in these communities during the UCRBASP in the 1950s. During 1977 plant collections were made in the vicinity of a number of different archeological sites. The identified communities and associated flora are listed with the appropriate site.

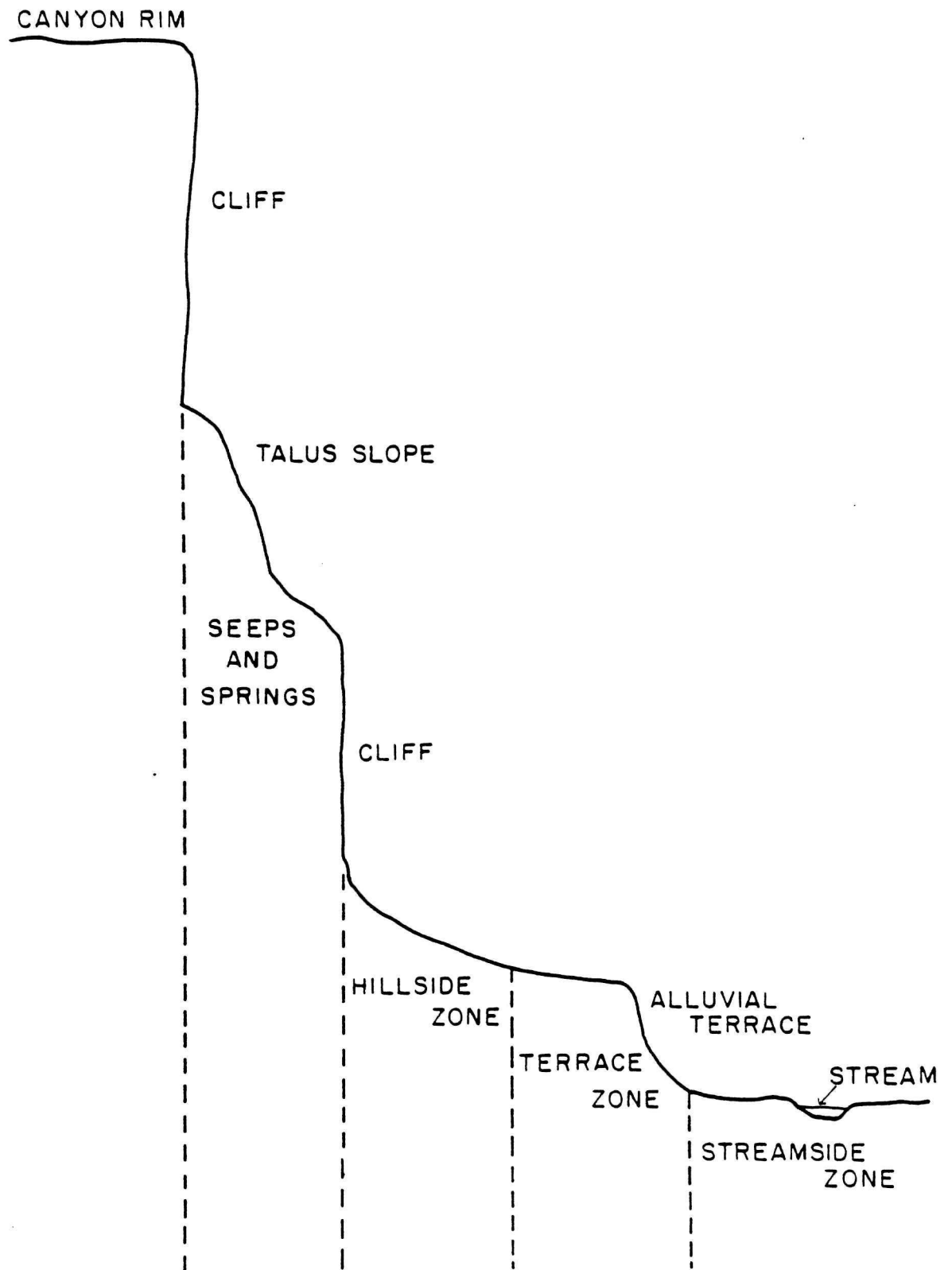


Figure 2. Generalized section of canyons in Lake Powell area

A wide variety of insects, reptiles, amphibians, and avifauna have been reported for the Glen Canyon region (Woodbury et al. 1959). Of the mammalian fauna recorded (Durrant and Dean 1959), bats and rodents were probably the numerically dominant orders prior to the filling of Lake Powell. Of the artiodactyls, mule deer (Odocoileus hemionus) was the commonest of the ungulates in Glen Canyon. Although bighorn sheep (Ovis canadensis) are common in Gypsum Canyon and immediate areas, they are apparently rare in Glen Canyon. Surprisingly, at almost every archeological site in Glen Canyon in which faunal remains were recovered, bighorn sheep was the predominate prey (Jennings 1966:22). Whether this is a result of the prehistoric cultural preference or indicative of a different faunal assemblage in the area in prehistoric times is not yet determined.

GYPSUM CANYON

Introduction

In the summer of 1976, Carol Nieuwenhuis discovered human skeletal remains eroding out of a cut bank near the mouth of Gypsum Canyon while she was doing a geological analysis of the alluvium in the area. The data on the site and its location were forwarded to the Midwest Archeological Center and it was decided that the site should be visited in 1977 by the National Park Service crew to determine the extent and cultural affiliation of the site and to evaluate it for possible inclusion on the National Register.

In the summer of 1977, the National Park Service archeological crew visited the site (42SA5379, Carols House) and determined that all that remained of the site was a portion of a single semi-subterranean structure; most of the alluvial point on which the site was located had already eroded away due to previous high water levels of Lake Powell. Since the remainder of the structure was in danger of eroding into Lake Powell, the crew excavated the remaining portion of the structure and salvaged the information still remained.

During the excavation of Carols House (42SA5379), the mouth of Gypsum Canyon was surveyed and mapped (Fig. 3). Two other sites were recorded—a petroglyph panel on a boulder and a circular ring of rocks.

Previous investigation

Prior to the visit of the crew to Gypsum Canyon in 1977, no other professional archeology was carried out near the mouth of Gypsum Canyon. The UCRBASP did not send crews up this far in Cataract Canyon. A number of other archeological sites are known in the surrounding area and have been visited by

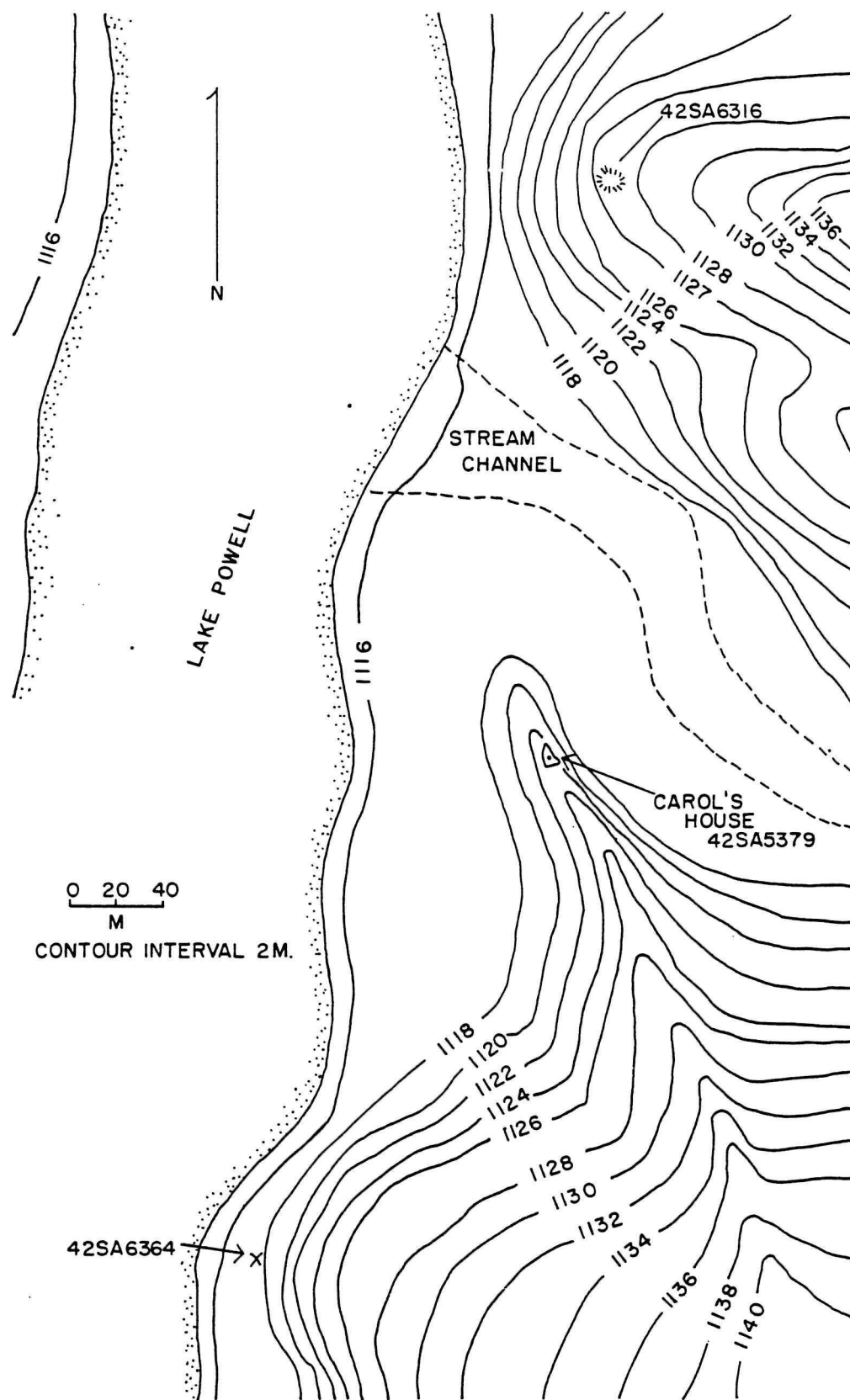


Figure 3. Topographic map of mouth of Gypsum Canyon showing archeological site locations

previous archeological expeditions (The Claflin-Emerson Expedition and the Carnegie Expeditions; Gunnerson 1969; Sharrock and Keane 1962), but none of these previous expeditions recorded sites at the mouth of Gypsum Canyon.

Setting

Gypsum Canyon is a left bank tributary of the Colorado River in Cataract Canyon about 270 km. upstream from the Glen Canyon Dam (Fig. 4). Cataract Canyon is very narrow in the vicinity of Gypsum Canyon, usually less than 200 m. across. Gypsum Canyon was first named by John Wesley Powell on July 26, 1869 (Powell 1961); Powell's camp was almost lost to a flash flood at the mouth of this canyon.

Although Lake Powell stretches another 6 km. upstream past the mouth of Gypsum Canyon, it is more like a river than lake in this area with an extremely strong downstream current. Gypsum Canyon is one of the first major left bank tributaries in Glen Canyon Recreation Area going downstream, but one of the farthest from the dam. The vegetation is generally sparse in the canyon (Table 3) and wildlife is not abundant although bighorn sheep are seen from time to time.

Carols House (42SA5379)

This site is a single habitation structure located on the left bank of Gypsum Canyon at an elevation of 1120 m. on an alluvial point. In 1977 Lake Powell was at an elevation of about 1114 m., but in previous years it reached almost to the level of the site and severe erosion resulted on the northwest side of the point. Much of the structure had eroded into the lake.

The dry-laid, semi-subterranean, masonry structure was probably rectangular, but since much of it was eroded away (Fig. 5, 6) its shape cannot be fully

Figure 4. The mouth of Gypsum Canyon in Cataract Canyon.

Figure 5. Carols House (42SA5379) on alluvial terrace.

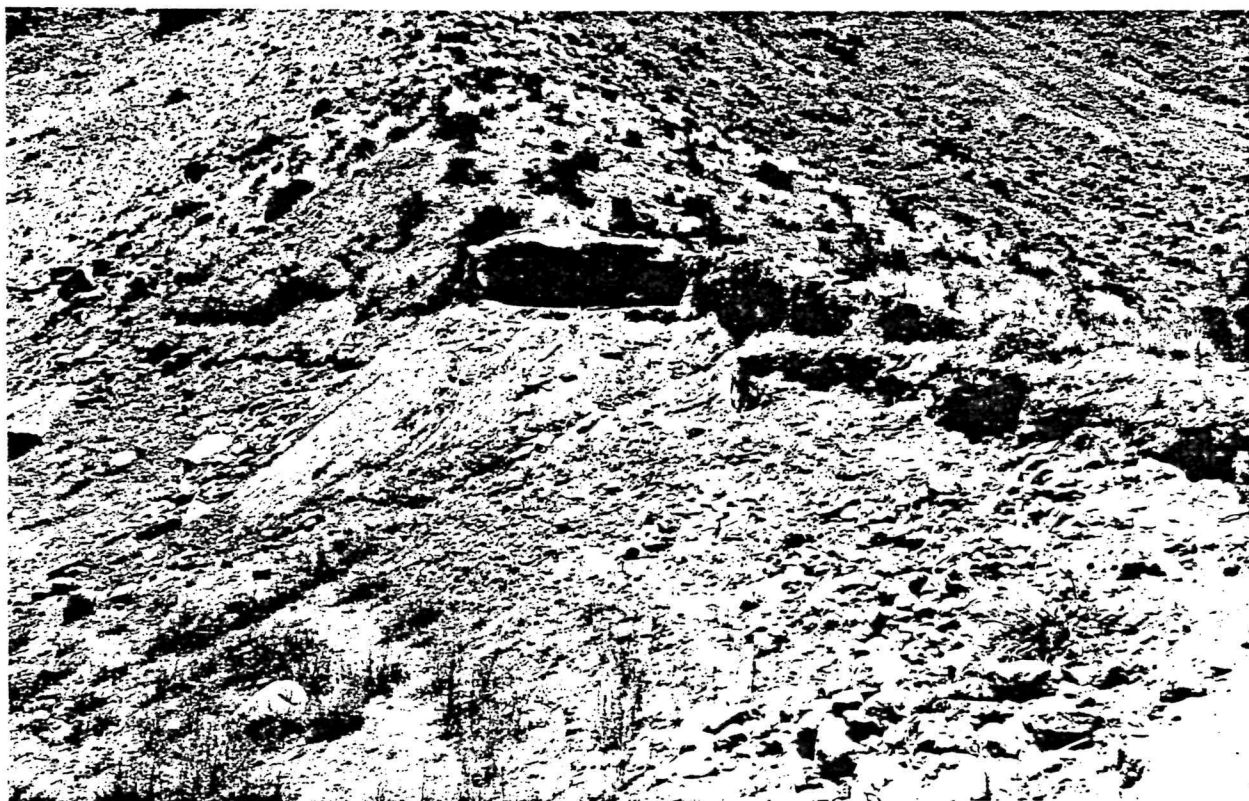
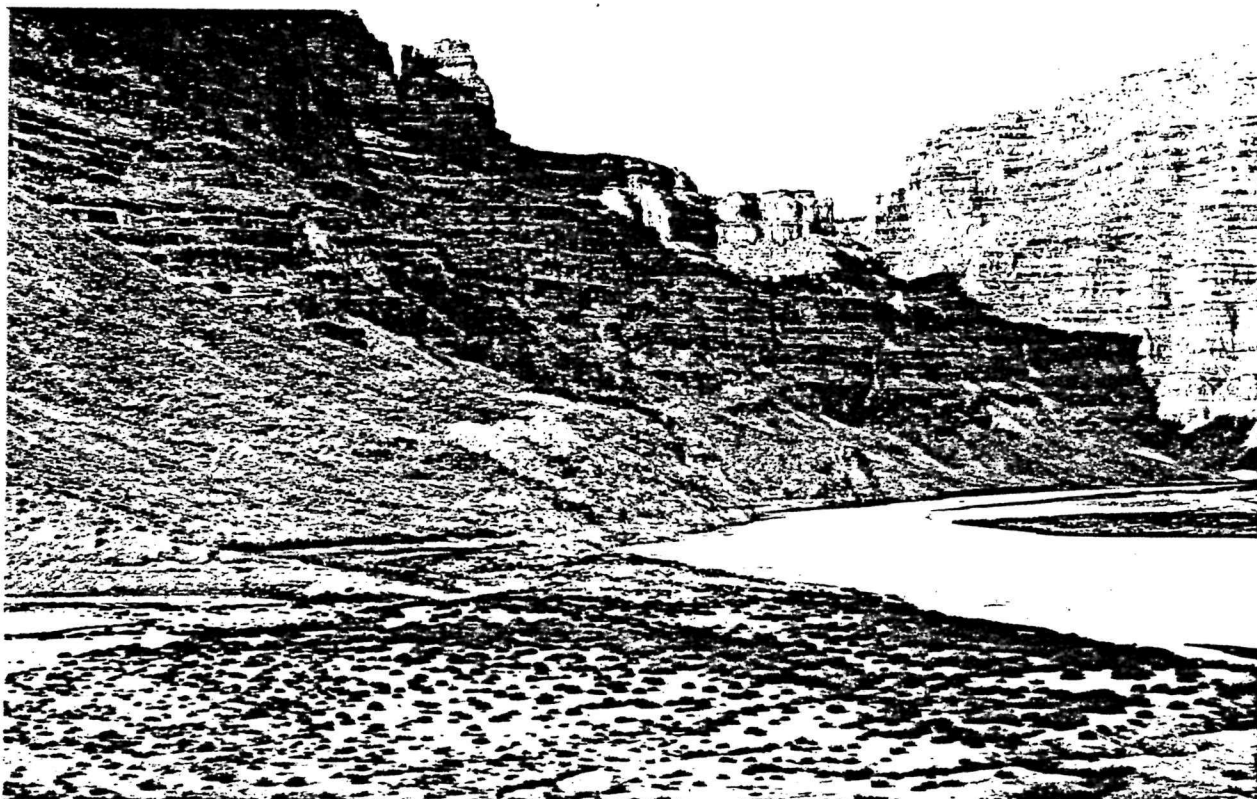


Figure 6. Carols House (42SA5379), view of structure eroding.



Table 3. List of Plant Communities in the Vicinity of Carols House (42SA5379)

<u>Streamside Species</u>
CHENOPODIACEAE (goosefoot family)
<u>Chenopodium</u> cf. <u>album</u> L. (lambsquarter)
COMPOSITAE (sunflower family)
<u>Grindelia aphanactis</u> Rydb. (gumweed)
GRAMINEAE (grass family)
<u>Muhlenbergia</u> sp. (muhly)
<u>Polypogon monspeliensis</u> [L.] Desf. (rabbitfoot grass)
SCROPHULARIACEAE (figwort family)
<u>Veronica Anagallis-aquatica</u> L. (speedwell)
TAMARICACEAE (tamarisk family)
* <u>Tamarix</u> cf. <u>ramoisissima</u> (tamarisk) ¹
<u>Terrace Species</u>
CACTACEAE (cactus family)
<u>Opuntia polycantha</u> Haw. (plains prickly pear)
CHENOPODIACEAE
<u>Chenopodium</u> cf. <u>album</u> L. (lambsquarter)
COMPOSITAE (sunflower family)
* <u>Chrysothamnus nauseosus</u> [Pall.] Britton (rubber rabbitbrush)
<u>Grindelia aphanactis</u> Rydb. (gumweed)
<u>Gutierrezia microcephala</u> [D.C.] A. Gray Xanthocephalum l. (threadleaf snakeweed)
<u>Haplopappus nuttallii</u> Torr. & Gray (nuttail goldenweed)
<u>Macheranthera tanacetifolia</u> H.B.K. Nees (aster)

Table 3 — Continued

CRUCIFERAE (mustard family)

Stanleya pinnata [Pursh] Britton (desert princes plume)

GRAMINEAE (grass family)

Festuca octoflora Walt. (sixweeks fescue)

Hilaria jamesii [Torr.] Benth. (galleta grass)

Muhlen bergia sp. (muhly)

Oryzopsis hymenoides [Roem & Schult.] Ricker (Indian ricegrass)

Sporobolus cryptandrus [Torr.] A Gray (sand dropseed)

Stipa sp. (needle grass)

MALVACEAE (mallow family)

Sphaeralcea cf. parvifolia A. Nels. (globemallow)

POLYGONACEAE (buckwheat family)

Eriogonum inflatum Torr. & Frem. (desert trumpet)

Rumex cf. crispus L. (curley dock)

Hillside Species

CACTACEAE (cactus family)

Opuntia basilaris Engelm. & Bigel. (beavertail prickly pear)

CHENOPODIACEAE (goosefoot family)

*Salsola kali L. (Russian thistle)

COMPOSITAE (sunflower family)

Grindelia aphanactis Rydb. (gumweed)

Gutierrezia microcephala [D.C.] A. Gray xanthocephalum l.

(threadleaf snakeweed)

Macheranthera tanacetifolia [H.B.K.] Nees (aster)

Table 3 — Continued

EPHEDRACEAE (ephedra family)

*Ephedra torreyana S. Watts. (Torrey mormontea)

GRAMINEAE (grass family)

Festuca octoflora Walt. (sixweeks fescue)

Muhlenbergia sp. (muhly)

Oryzopsis hymenoides [Roem & Schult.] Ricker (Indian ricegrass)

Sporobolus cryptandrus [Torr.] A. Gray (sand dropseed)

Stipa sp. (needlegrass)

MALVACEAE (mallow family)

Sphaeralcea cf. parviflora A. Nels. (glove mallow)

POLYGONACEAE

Erigonum inflatum Torr. & Fram. (desert trumpet)

*Dominant species

¹ Introduced during historic times

determined. Only the south and east walls and their juncture are still intact. From NW-SE the maximum distance is 9 m. across the structure. The walls are constructed of sandstone slabs set vertically on the floor abutting the interior of the structure. Above these vertical stones, 2-4 courses of dry-laid masonry remain (Fig. 7). The single walls are 30-50 cm. thick with heights ranging from appx. 75 cm. on the south wall to appx. 1 m. on the east. A ventilator shaft located in the south wall is appx. 52 cm. high and 44 cm. wide with vertical slabs facing the sides and horizontal slabs overlying the shaft and paving the bottom.

A vertical sandstone slab deflector is embedded appx. 75 cm. north of the ventilator shaft in the use-packed floor. The slab measures appx. 60 cm. in length, 6 cm. in thickness, and extends 21 cm. above the floor surface.

A rectangular hearth is located appx. 24 cm. north of the deflector with six vertical sandstone slabs lining the perimeter of the hearth; it has no basal paving slab. It measures 67 cm. E-W, 58 cm. N-S and is 16-22 cm. deep (Fig. 8). The fill of the hearth was dark gray ash and yellow sand containing scattered bits of charcoal; no floral remains were recovered from the flotation sample..

No other floor features such as post holes or storage pits were found; however, portions of burned roof beams (?) were found on the floor surface in the southwest portion of the structure; no pattern was evident. Two samples were submitted for dendrochronology, but could not be dated since the samples were cottonwood. One of the charcoal fragments was radiocarbon dated at A.D. 1310 $\pm$ 200 radiocarbon years (W-3758) (See Appendix II).

The structure was a maximum of 75 cm. below the modern surface. The fill of the structure consisted of mixed colluvial gravel and sand that washed in from the higher portion of the alluvial point to the south of the site (Fig. 9).

Figure 7. Firepit, deflector and ventilator shaft in Carols House (42SA5379).



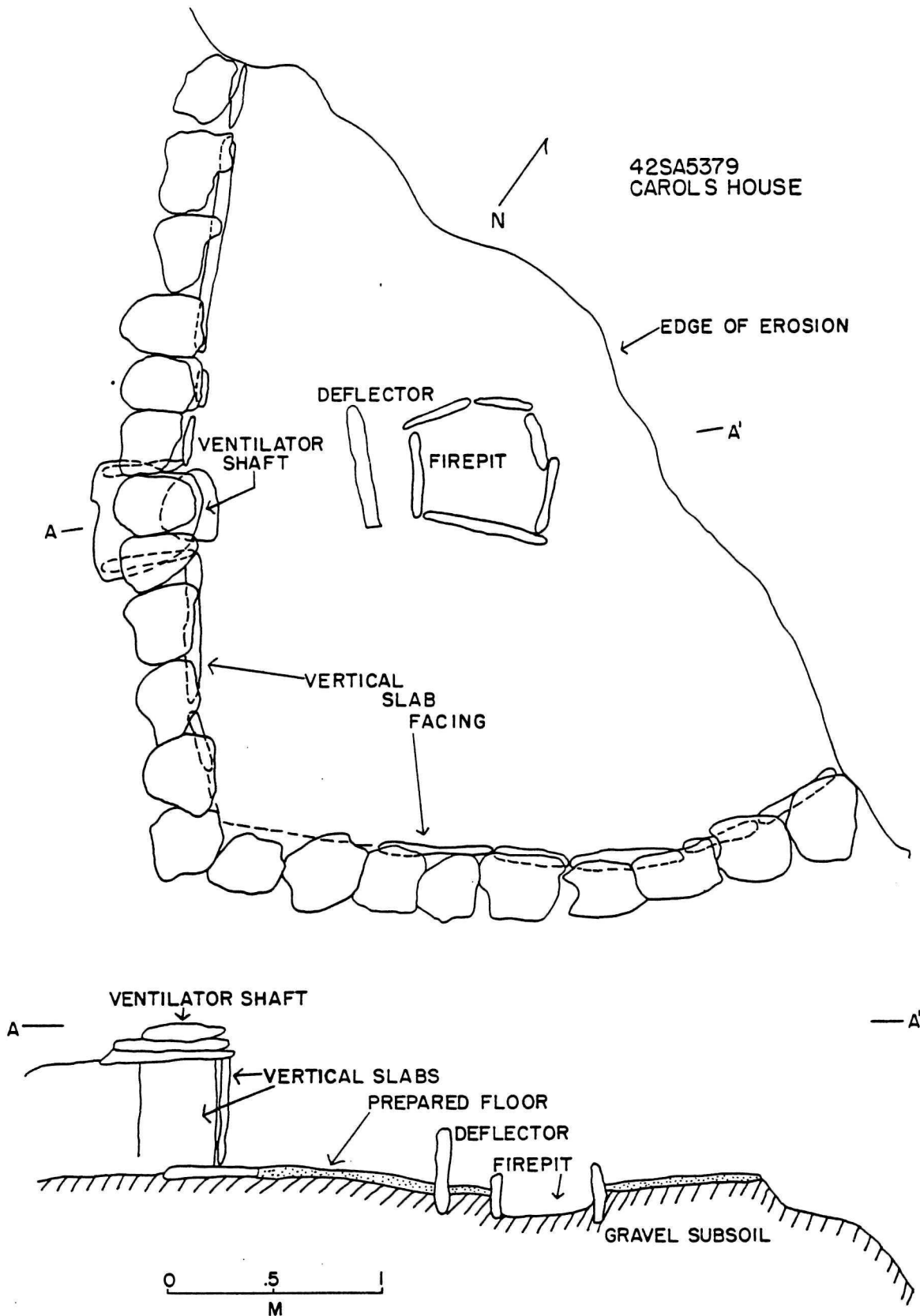
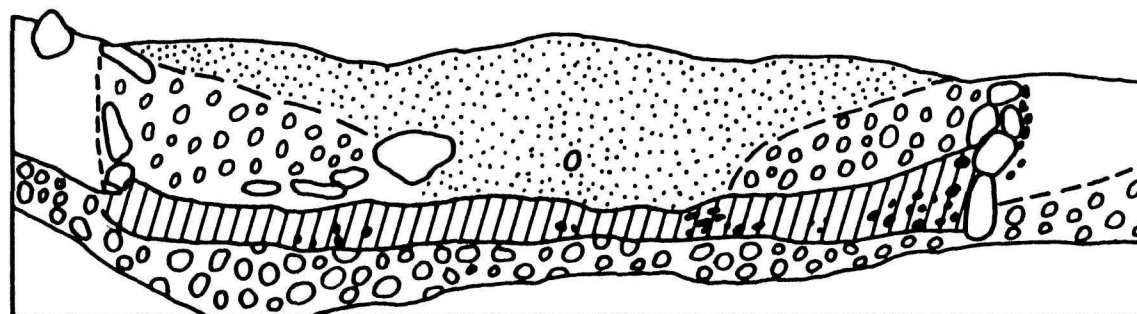


Figure 8. Planimetric map and cross section of Carols House (42SA5379)



SCALE
0 ——— 1
M

42SA5379

-  STERILE FILL
-  CULTURAL FILL
-  CHARCOAL
-  GRAVEL DEPOSIT

Figure 9. Stratigraphic profile of Carols House (42SA5379)

Artifacts were sparse at the site, only 14 sherds were found. The partial remains of an adult and a child were recovered from floor contact within the structure. Only the adult phalanges were found in situ to the southeast of the firepit. About 30 cm. northwest of the deflector slab, the charred, broken skeletal remains of a child were uncovered. The orientation of the body could not be determined for either of these individuals. It appears that both individuals were inside the structure when it burned.

The single radiocarbon date and the limited pottery collection at this site suggest a Pueblo III occupation between A.D. 1000 and A.D. 1300. Cultural affiliation is uncertain since both Kayenta and Mesa Verde sherds were recovered. The lack of artifactual material on the structure floor and the burned human remains indicate that the structure was cleaned out and the human bones, probably disarticulated, were placed inside, then the structure was burned.

HUMAN SKELETAL REMAINS

The adult remains consisted of a complete right lower limb and a few partially charred pieces of unidentifiable long bones. Only the phalanges were recovered in situ during the 1977 excavation. All of the other bones were recovered by Carol Nieuwenhuis in 1976. She extracted all of them, with the exception of the femur, from the exposed profile which was only 1-2 m. above the level of Lake Powell. She found the femur lying on the opposite side of the point below the structure. Apparently it had been removed from the profile and thrown over the bank at some previous time since it showed a high degree of weathering.

The femur, lacking a head, is broken at the neck and cracked almost the full length of the shaft. The medial condyle at the distal end is also missing. The tibia is also extensively damaged. The medial condyle at the proximal end

has broken away; only the lateral portion of the intercondylar eminence is intact. The damage on the anterior portion of the bone extends almost to the level of the nutrient foramen. Indices for measures of the femur and the tibia (Table 4) show a high degree of anteroposterior flattening. The femur can be classed as hyperplatymetric (range: $x - 74.9$) and the tibia as platycnemic (range: $55.0 - 62.9$).

Both the fibula and the patella are complete. Of the foot bones, only some of the phalanges are missing. The only damage to the foot bones is on the posterior end of the calcaneus and the head of the first metatarsal.

The lengths of the lower limb bones are comparable to those found in an adult male skeleton recovered from a Pueblo III site, Ivy Shelter, in Moqui Canyon--tibia 38.6 and fibula 38.9 cm. (Reed 1963). Based on Trotter and Gleser (1958) estimates, for mongoloid and Mexican males, the adult probably ranged from 171.9 to 174.4 cm. in stature.

Although complete, the patella was damaged premortem; a piece was broken out of the upper lateral portion, possibly as the result of a fall. There is considerable lipping on the upper anterior face of the patella, some of which overlaps the broken region which had entirely healed.

The age of the adult is difficult to determine on the basis of these scant remains. It is probable that this was a fully mature, even elderly, individual, since there is evidence of some bone resorption at the points of muscle attachment on these bones.

The bones of the child were extensively damaged; the only whole bones were several metacarpals (no measurements are given). The recovered remains include portions of the skull (some of which are charred), vertebrae, ribs, sternum, scapula, some innominates, portions of long bones, and six teeth.

Table 4. Measurements of Adult Skeletal Material from Carols House (42SA5379)

Bone	Measurement	
Femur	ant. - post. diam. (mid-shaft)	2.84 cm.
	med. - lat. diam. (mid-shaft)	2.80 cm.
	circumference (mid-shaft)	9.9 cm.
	subtrochanteric diam. ant. - post.	2.21 cm.
	subtrochanteric diam. med. - lat.	3.53 cm.
	trochanteric length	42.40 cm.

	platymeric index	6.26
	pilastric index	101.4

Tibia	maximum length	38.90 cm.
	maximum length (minus spine)	28.75 cm.
	ant. - post. diam. (at nutrient foramen)	3.85 cm.
	med. - lat. diam. (at nutrient foramen)	2.32 cm.

	platyonemic index	60.3

Fibula	maximum length	38.60 cm.

The age of the child is estimated at 5-6 years, on the basis of epiphyseal development and the eruption of the teeth. The only identifiable portion of the mandible is a fragment of the ascending ramus.

All teeth are free of the bone matrix and appear to be from the lower left quadrant. An adult first incisor which may have begun to erupt premortem has a shovel shape. The second incisor, canine, and premolars are unerupted adult teeth, all showing little or no development of root. The first molar is deciduous and shows no wear although there is a carie on the buccal surface. The roots of the molar have been broken away.

In summary, given the condition of the bones and the incompleteness of the skeletal remains, no conclusions can be drawn about the prehistoric occupants of Carols House.

42SA6316

This site is a singular dry-laid circular masonry structure measuring 5 m. N-S and 4.5 m. E-W. It is on the right bank of Gypsum Canyon almost directly north of Carols House (Fig. 10, 11). Testing of the structure in the SE quadrant produced no artifacts, however a 3-5 cm. plastered clay floor was noted 10 cm. below the modern surface within the structure. No floor features or artifacts were observed.

42SA6364

This petroglyph panel is well-known among river runners, but had never been formally identified or incorporated into the site files for the State of Utah until the 1977 National Park Service field crew recorded the site.

Figure 10. Rock Ring, 42SA6316.



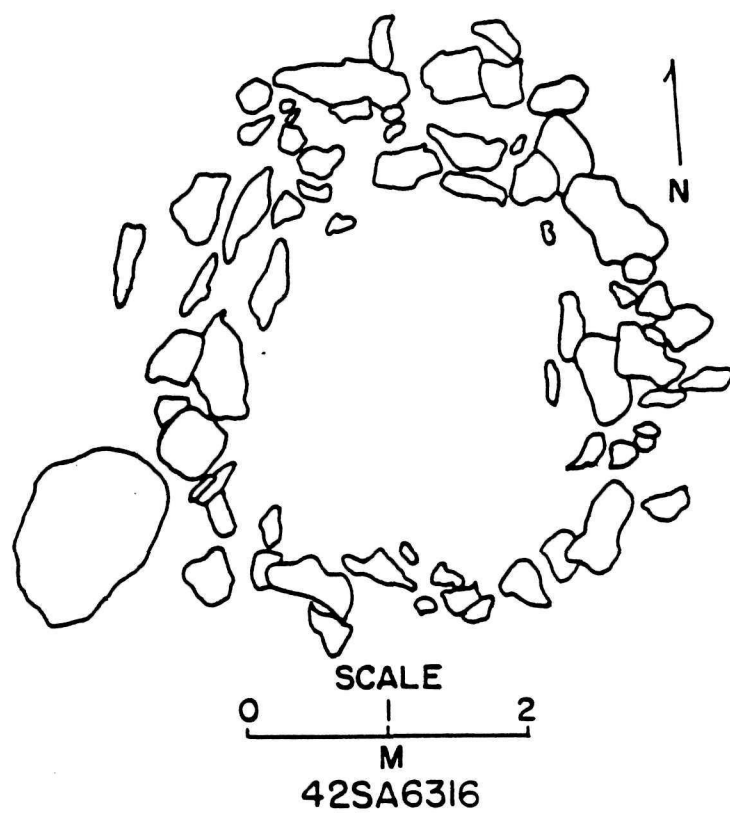


Figure 11. Planimetric map of 42SA6316

Figure 12. High water mark on petroglyph panel at 42SA6364.



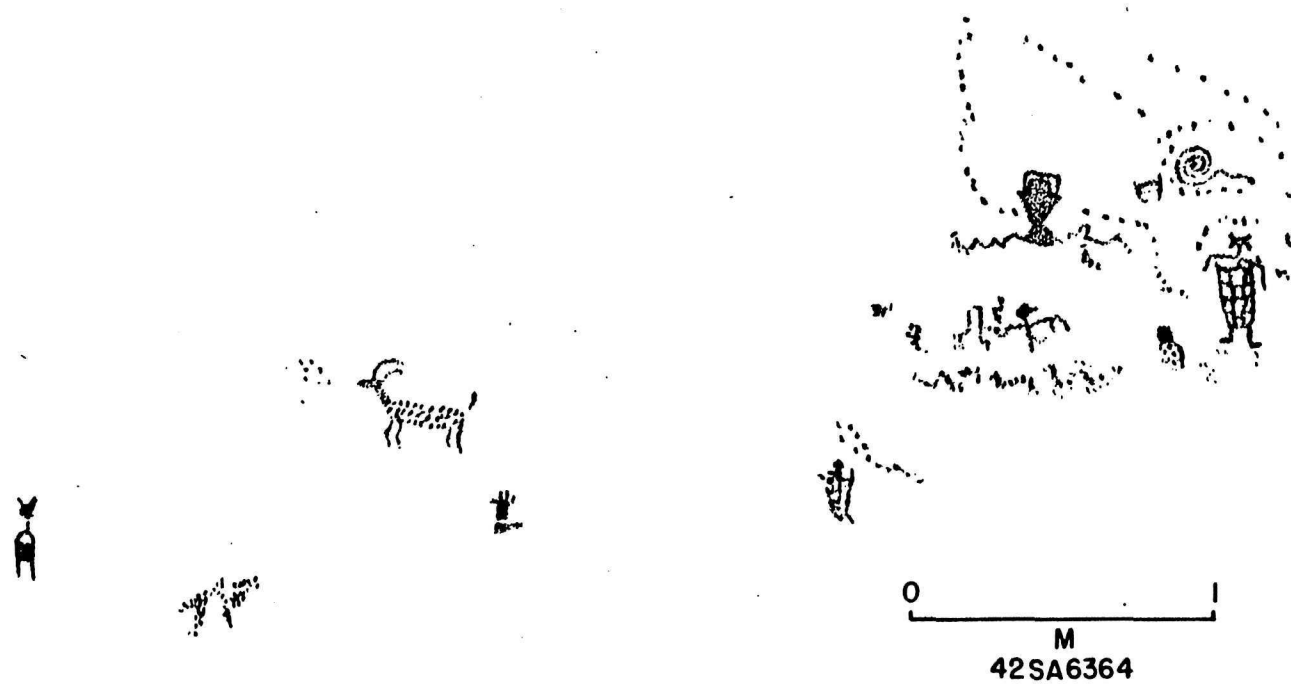


Figure 13. Petroglyph panel at 42SA6364

The panel is pecked into a large boulder at the base of a talus slope about 135 meters downstream from Carols House on the left bank. A recent high water mark of Lake Powell (1117 m.) is evident on the face of the boulder (Fig. 12); the bottom portion of the panel was encrusted with a thin, hardened layer of mud that had to be washed off before the panel could be drawn.

This petroglyph panel (Fig. 13) contains two zoomorphs; a mountain sheep whose body consists of a series of dots, and what appears to be a front view of a sheep, deer, or other quadruped, two anthropomorphs, a spiral, many lines of dots and zigzag patterns, and an abstract of undetermined nature. The anthropomorphs have generally rectangular torsos, slightly broader at the shoulders, that are filled with a grid pattern. The smaller anthropomorph has only rudimentary arms and a single leg; the larger has short arms extending downward from the shoulders and short legs with feet depicted. The latter figure has two upward projections from the top of the head and two downward projections that probably represent earbobs. On the basis of the rectangular bodied anthropomorphs with interior cross-hatching, the panel can be assigned to Turner's Style 5 which is tentatively dated to pre- A.D. 1050 (Turner 1963:1).

DANGLING ROPE CANYON

Introduction

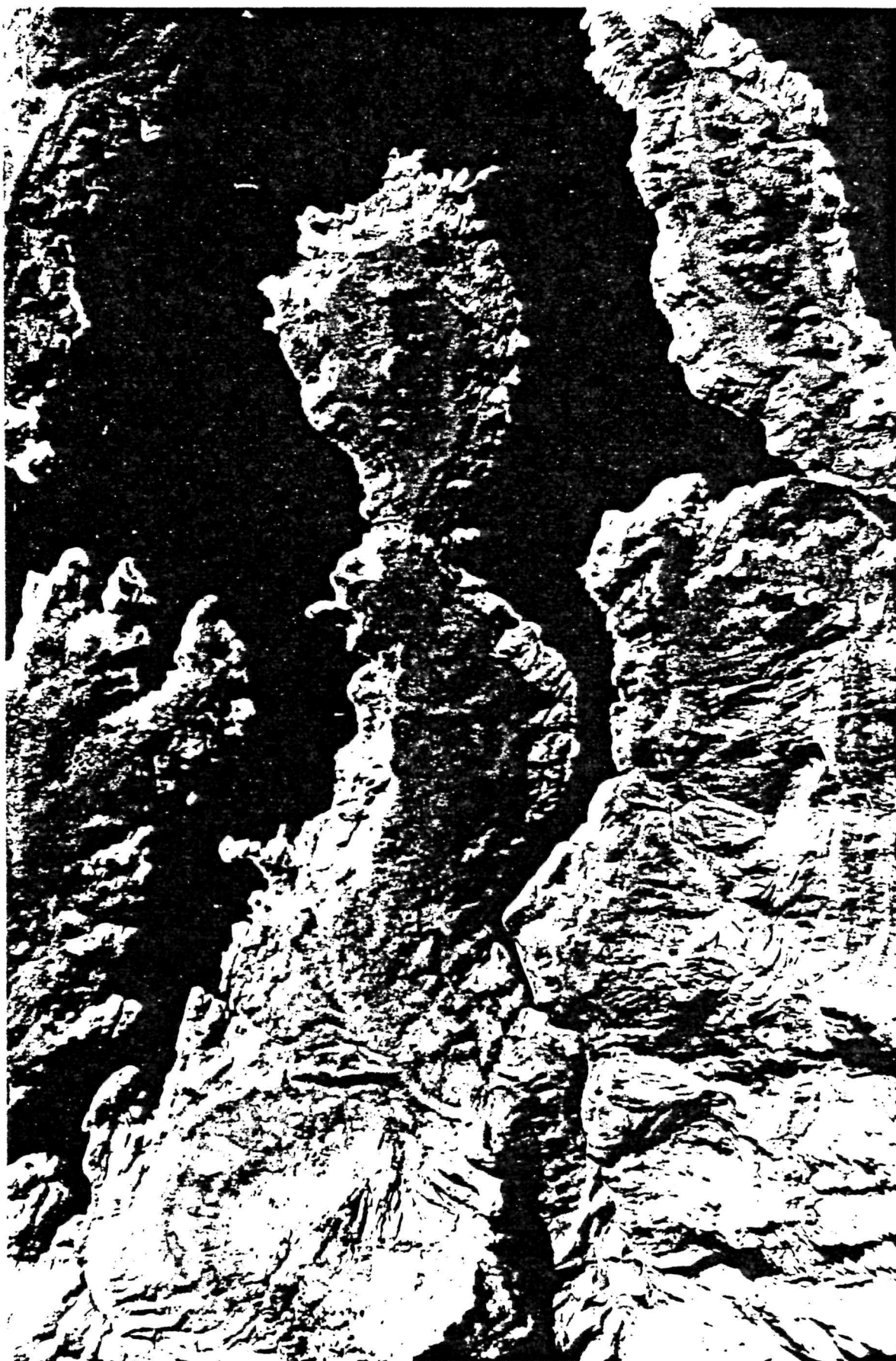
In 1976 a benchland in Dangling Rope Canyon where facilities for Rainbow Marina are planned was intensively surveyed for prehistoric archeological sites (Fig. 14). During the survey six concentrations of lithic artifacts were recognized and assigned site numbers according to the Smithsonian trinomial designation used in Utah. The entire benchland itself, however, did appear to have an extensive, if sparse, scatter of artifacts.

The survey report tentatively assigned these sites to the Archaic stage of occupation, which dates between 6000 B.C. and A.D. 200 in this area (Schroedl 1976c). The survey report also recommended that several of these concentrations be tested "to ascertain the extent and depth of the cultural deposits and to determine more precisely their cultural affiliations" (Schroedl 1976b:7). It was also recommended that the sites be evaluated for possible inclusion on the National Register and that surface collections be undertaken where anticipated construction might be expected to encroach upon the sites.

In 1977 the National Park Service crew of archeologists returned to Dangling Rope Canyon to carry out these recommendations. Tests were made at two sites, 42SA1706 and 42SA1708; no subsurface evidence of occupation was noted. The testing indicated that these scatters of artifacts were not of sufficient importance to be included on the National Register. In addition, several isolated features, firepits and a cist, were excavated. No information on cultural affiliation was obtained from the tests.

The second aspect of work in the canyon consisted of an intensive surface collection of the benchland where development is expected. This would not only provide information on cultural affiliations of the lithic scatters, but would also preserve the artifacts for archeological analysis.

Figure 14. Aerial view of Dangling Rope Bench.



The specific procedures of artifact collection on the benchland were successful. This unique procedure of making a large surface collection aided in the proper identification of the cultural affiliation of the lithic scatters, and also provided enough data to discuss in detail the types of prehistoric cultural activities that took place on the benchland (see "ARTIFACTS").

Previous Investigations

Prior to the 1976 survey (Schroedl 1976b) no professional archeological work, either survey or excavation, appears to have been done on the benchland. The Kaiparowits Plateau, more than 1000 m. above the Dangling Rope bench, was surveyed during the first phase of the UCRBASP as was the mainstem of the Colorado River around the mouth of Dangling Rope Canyon (Fowler et al. 1959). The intermediate benchlands between the high plateaus and the canyon bottoms were apparently not surveyed.

One site, Benchmark Cave (42SA433), containing more than 4 m. of stratified deposits, is located .5 km. upstream from the mouth of Dangling Rope Canyon on the Colorado River. This site was excavated twice, once in 1958 (Lipe 1960), and again in 1962 (Sharrock 1964). The final conclusion derived by Sharrock from this site (1964:18) is that it represents a short term aceramic Pueblo occupation of less than 100 years. In light of the preceramic Archaic material recovered from the Dangling Rope benchland 1.5 km. up the canyon and about 100 m. higher, the aceramic occupation at Benchmark Cave may be Archaic rather than Pueblo.

Setting

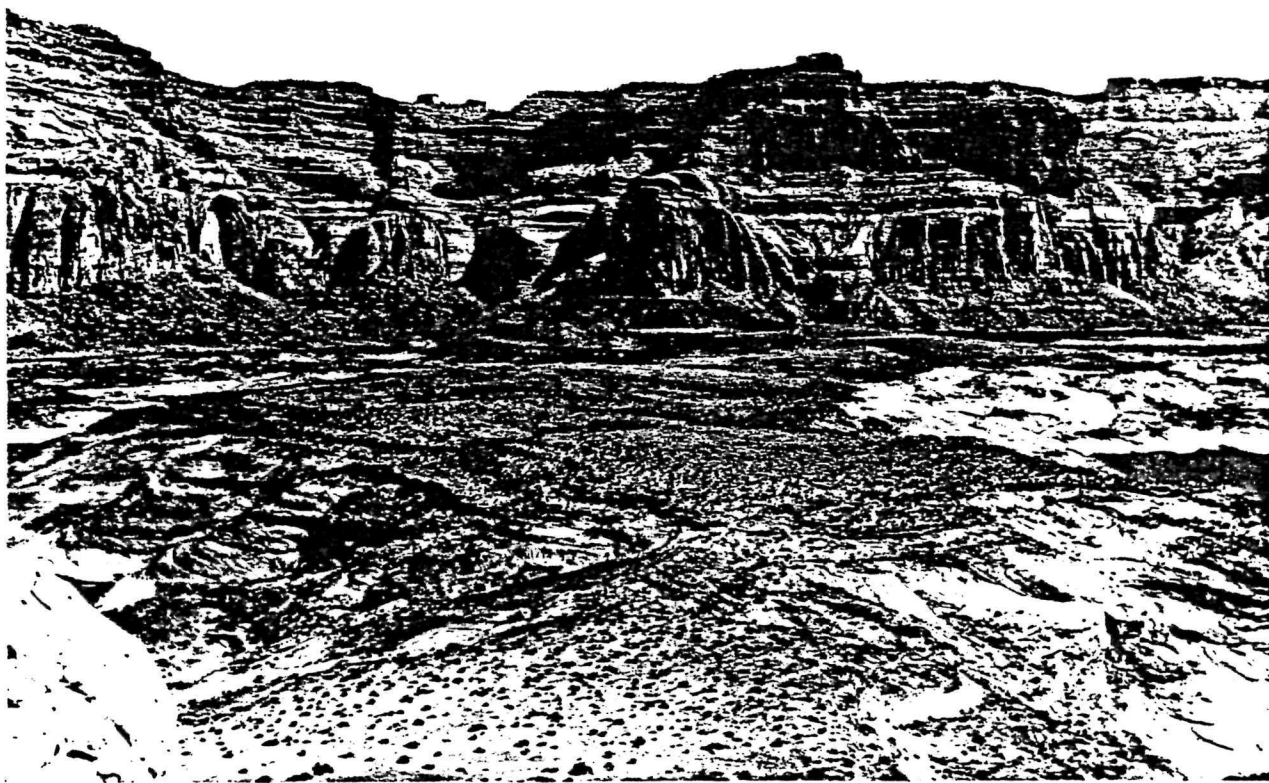
Dangling Rope Canyon is a short right bank canyon of Glen Canyon about 63 lake km. upstream from the Glen Canyon Dam. The mainstem of the canyon

risers on the Kaiparowits Plateau to the NW of Navajo Point and trends in a NE/SW direction for 12 km. to the mouth of the canyon. Presently an arm of Lake Powell extends into the mainstem for about 2.4 km. Steep Navajo sandstone cliffs circumscribe the canyon which has an extensive bench at an elevation of about 1150 m.; today this bench is about 40 m. above Lake Powell. The bench is dissected by several narrow tributaries, each of which is now an arm of Lake Powell.

The bench on which the proposed marina facilities are to be constructed is about 2 km. upstream from the mouth of the canyon on the right bank. The bench is about 1.1 km. long and averages about 250 m. in width (Figs. 15, 16). At the south end the bench constricts to a narrow neck and flares out again to form an oval-shaped peninsula with a readily visible 60 m. high sandstone spire (Fig. 17). The sandstone bench itself is covered by aeolian sand dunes, partially stabilized by sparse vegetation. Several areas of high artifact concentrations occur in blowouts associated with the shifting dunes.

Fifteen different plant species were collected on Dangling Rope benchland from May 17-23, 1977 (Table 5). Most of these plant species can be found in either the Hillside Community or Terrace Community or grading from one to another. The Terrace Community is defined as land areas on which plants receive water by capillary action from subterranean water sources supplied by rivers, tributary streams, springs, or aquifers. The Hillside Community has precipitation as its main water source with low, widely-spaced shrubs dominating. Variation in the general uniformity of the plant cover is completely dependent on local factors (Flowers 1959). The Dangling Rope bench varies between 1120 and 1170 m. in elevation which is the optimum growing altitude for most of the plants collected in the area. Since the general uniformity of plants is variable and completely dependent on highly localized factors, plant

Figure 15. Overview of Dangling Rope benchland, looking north.



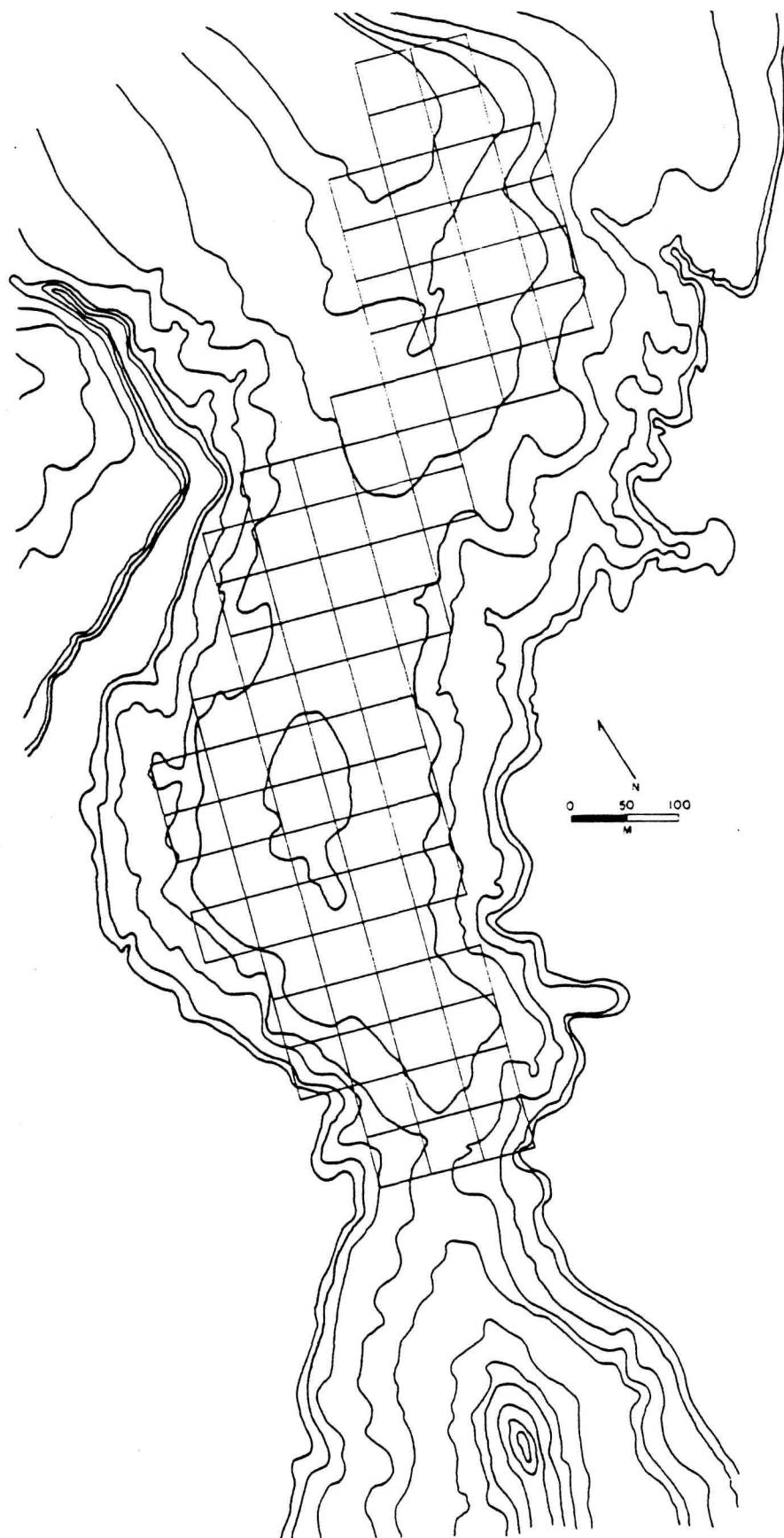
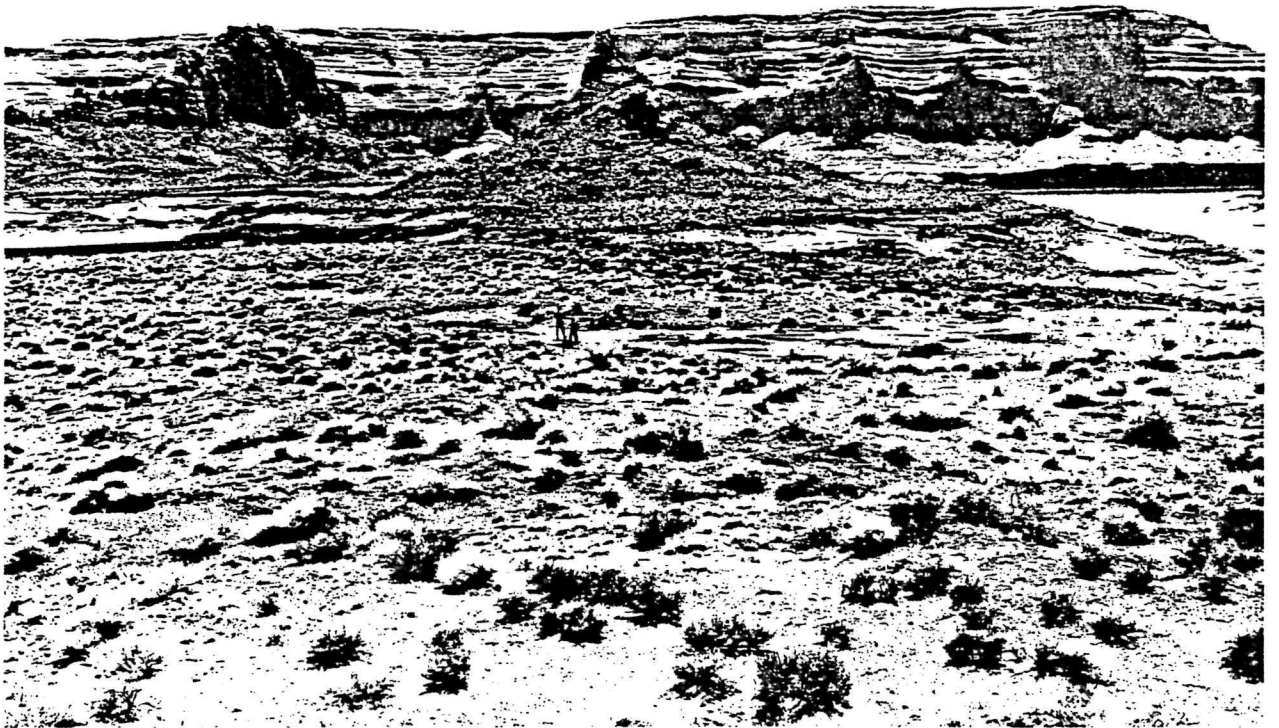


Figure 16. Topographic map of the Dangling Rope Bench, with grid system.

Figure 17. Sandstone spire at end of Dangling Rope peninsula.



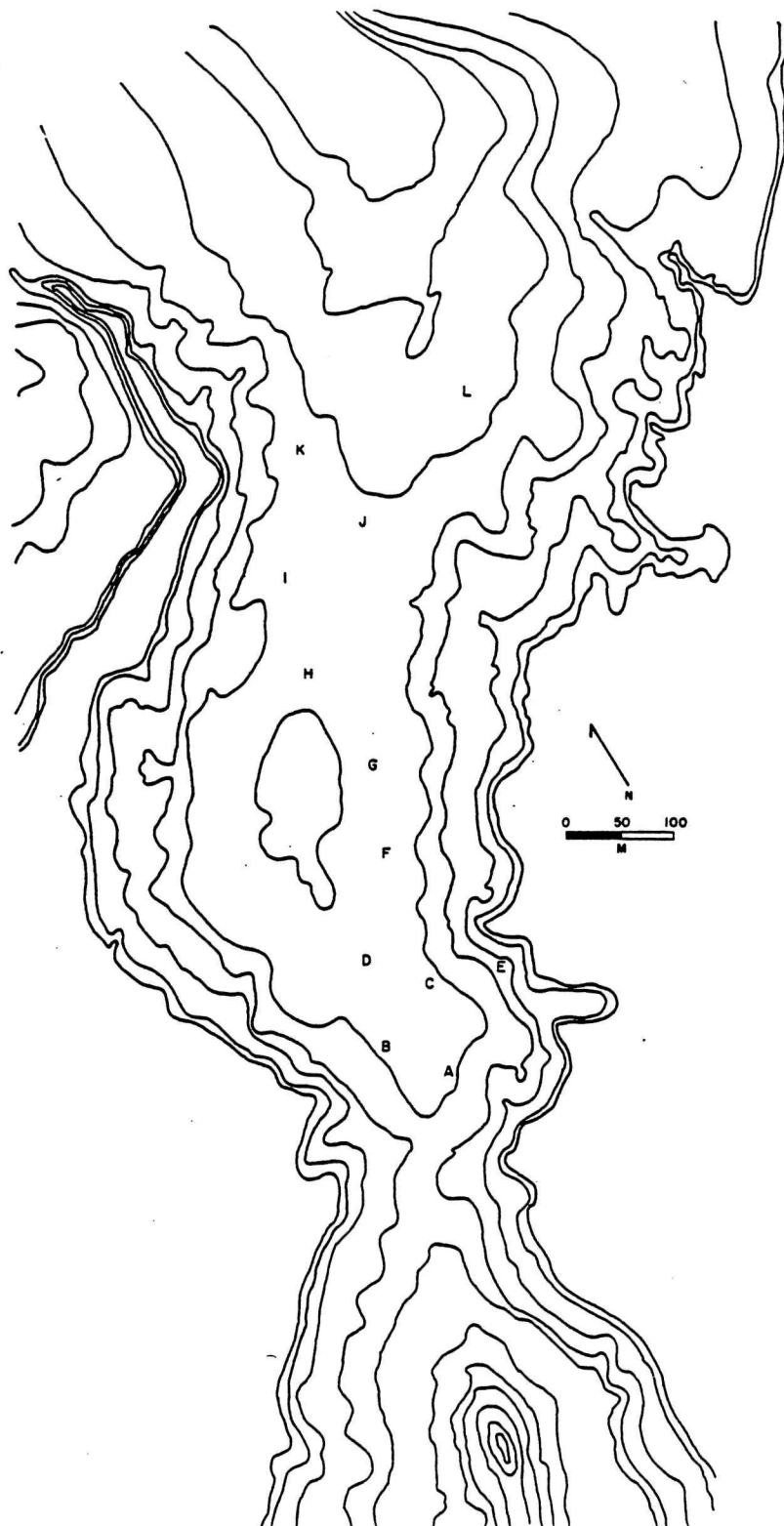


Figure 18. Location of plant collections on the Dangling Rope bench

Table 5. List of Plants from the Dangling Rope Benchland

BORAGINACEAE (borage family)

Cryptantha sp. (Cryptantha)

CACTACEAE (cactus family)

Mamillaria sp. (mamillaria)

Opuntia sp. (prickly pear)

CHENOPODIACEAE (goosefoot family)

*Atriplex canescens (Pursh) Nutt. (fourwing saltbush)

COMPOSITAE (sunflower family)

Dyssodia sp. (dogweed)

Leucelene ericoides (Torr.) Green

EPHEDRACEAE (ephedra family)

Ephedra torreyana S. Wats. (Torrey mormontea)

GRAMINEAE (grass family)

Oryzopsis hymenoides Roem & Schult. Ricker (Indian ricegrass)

Sporobolus cryptandrus (Torr.) A. Gray (sand dropseed)

*S. giganteus Nash (giant dropseed)

LEGUMINOSAE (pea family)

Dalea fremontii Torr. (Fremont indigobush)

LOASACEAE (blazing star family)

Mentzelia sp. (blazing star)

POLEMONIACEAE (phlox family)

Gilia cf. sinuata Dougl. (rosey gilia)

POLYGONACEAE (buckwheat family)

Eriogonum inflatum Torr. & Frem. (desert trumpet)

LILIACEAE (lily family)

Yucca sp. (soapweed)

*Dominant species

collections were made at several different areas in the survey area. The following descriptions are keyed to Fig. 18.

(A) Moderate low shrub cover with interspersed cactus and short grasses. Dominant plant is Dalea fremontii with Ephedra torreyana, Opuntia sp.; both Sporobolus cryptandrus and S. giganteus secondary.

(B) Blow out area SW of eroding dune. Vegetation is extremely sparse. Major plant is Eriogonum inflatum with Atriplex canescens, Gilia sinuata and Dalea fremontii widely scattered.

(C) Flat sandy area with very sparse vegetation. The dominant plant is Atriplex canescens with the scattered appearance of Oryzopsis hymenoides, Mamillaria sp., Ephedra torreyana, Sporobolus cryptandrus, S. giganteus, Leucelene ericoides, Eriogonum inflatum and Opuntia sp.

(D) Rocky sandstone slope. The major plants are Dalea fremontii and Ephedra torreyana with an occasional Oryzopsis hymenoides and Mentzelia sp.

(E) Steep rocky slopes grading down to the Lake. Dominant plants are Ephedra torreyana and Leucelene ericoides with an occasional Sporobolus cryptandrus. Yucca sp. appears in crevices as single plants.

(F) Low sandy slopes facing west. The plants are low growing grasses and shrubs. Sporobolus cryptandrus, S. giganteus, Ephedra torreyana, Eriogonum inflatum and several stands of Opuntia sp.

(G) Vegetation on this flat sandy area is more dense. Opuntia sp. increases in number with Sporobolus cryptandrus and S. giganteus dominant. In lesser amounts are Ephedra torreyana, Eriogonum inflatum, Oryzopsis hymenoides, Dyssodia sp. and Mentzelia sp.

(H) Gently sloping hillside. Oryzopsis hymenoides is the dominant plant with great amounts of Sporobolus cryptandrus interspersed. Also occurring, in

lesser amounts, are Eriogonum inflatum, Opuntia sp., Dalea fremontii, Ephedra torreyana, Dyssodia sp., and Cryptantha sp.

(I) Sparse vegetation occurring on rocky slopes. The dominant plants are Dalea fremontii and Leucelene ericoides with an occasional COMPOSITAE.

(J) Southwest facing gentle slope with Sporobolus cryptandrus and S. giganteus as the major cover plants. Also occurring are Dalea fremontii, Leucelene ericoides, and Ephedra torreyana. Sparsely scattered are Opuntia sp., Eriogonum inflatum and Oryzopsis hymenoides.

(K) An open sandy blow-out with sparse vegetation. Dalea fremontii, Sporobolus cryptandrus, S. giganteus and Eriogonum inflatum are major plants.

(L) Vegetation is much denser here with Ephedra torreyana and Dalea fremontii dominant on the gentle slopes and Oryzopsis hymenoides secondary in dominance. COMPOSITAE, Opuntia sp. and Leucelene ericoides are very dense between the major plants.

Methodology

The benchland in Dangling Rope Canyon covers about 261,750 m.². About 180,850 m.² of that area was gridded off by grid squares 50 m. on a side. Within this larger grid system, a smaller grid system was aligned with 5 m. grid squares in order to test sites 42KA1706 and 42KA1708. At these two sites several test trenches were dug to ascertain the depth of the deposits. No subsurface evidence of occupation was found.

The larger grid system, which controlled the surface collecting procedure, consisted of 81 50 m. grid squares. The meridian was aligned on magnetic North and the system was completely laid out with compass and measuring tape. Corners of the grid squares were flagged with surveyors tape tied on low shrubs. corners of grid squares were fairly visible since there was not much relief on the

benchland and vegetation was never more than 60 cm. high. At the close of the field work, the grid was mapped with a plane table and alidade on a topographic map of the bench supplied by the National Park Service (Fig. 16).

Within each of the 81 grid squares an intensive surface collecting procedure was instituted. Several crew members walking 3-4 m. apart would systematically cross back and forth over each grid unit and collect every artifact. All the artifacts were collected and bagged separately for each unit.

The collection of all the artifacts in such a large area was a manageable task for three reasons. First, the raw frequency of artifacts per grid unit was not large, appx. 140 artifacts per grid unit (2500 m.²). Second, the only identifiable artifacts were ground and chipped stone artifacts. Although a single sherd of an unidentified Tusayan White ware was recovered on the slickrock near the lake, no other pottery, bone artifacts, or organic artifacts were recovered on the benchland. Third, the identification of the lithic artifacts was simplified by the fact that there are no lag gravels on the bench and thus there is no naturally occurring silaceous material in the collection area. Hence, every piece of silaceous material (i.e., chert, quartzite, etc.) was an artifact brought there by some prehistoric inhabitant of the bench.

There are obviously some biases in this collection procedure. There is a variability in the diligence of the individual crew member in stooping over and picking up every minute flake, even pressure retouch flakes. Since pressure retouch flakes are represented in the total lithic assemblages, this factor probably was negligible in its effect, although pressure retouch flakes are probably underrepresented.

A more subtle bias seems to have operated on the collection procedure. From observation of the crew members during the collecting it seems likely that the more clustered the artifacts (i.e., the more localized the concentrations of

lithic material) the more likely that all the artifacts would be collected. On the other hand if the artifacts were scattered relatively evenly over the grid square (i.e., no distinct concentrations) the crew member was more likely to accidentally miss artifacts. On the basis of one square that was recollected after several days, it can be estimated that squares with less than a total of 25 artifacts may be erroneously underrepresented (i.e., undercollected) by as much as 100% due to collection error rather than shifting dunes. This should not be alarming since the absolute changes in the raw frequencies are very small considering the total distribution of artifacts. Even adjusting the squares with very low frequencies upwards alter the spatial relations among the major areas of concentration.

Sites on Dangling Rope Benchland

The 1976 survey located six concentrations of lithic scatters, 42KA1705-42KA1710 (Fig. 19). Designation of these concentrations of artifacts as "sites" was done on an intuitive basis; the archeologists perceived local clusterings of lithic artifacts and assigned site numbers to these intuitive clusters even though artifacts were found over the whole bench. What is surprising is that there is a reasonable correspondence between the intuited site locations and the grid squares that have more than 250 artifacts in them (compare Fig. 19 with Fig. 106). Of the six sites, only 42KA1707 has less than 250 artifacts in the grid square (42KA1709 was so large that it occupied two adjacent squares as does 42KA1708); on the other hand there are only two squares that have more than 250 artifacts that were not assigned a site number.

Although the sites are discussed here separately and artifacts are reported as coming from one of three sites (see "ARTIFACTS"), the distribution of artifacts clearly shows that the whole bench was a prehistoric activity location

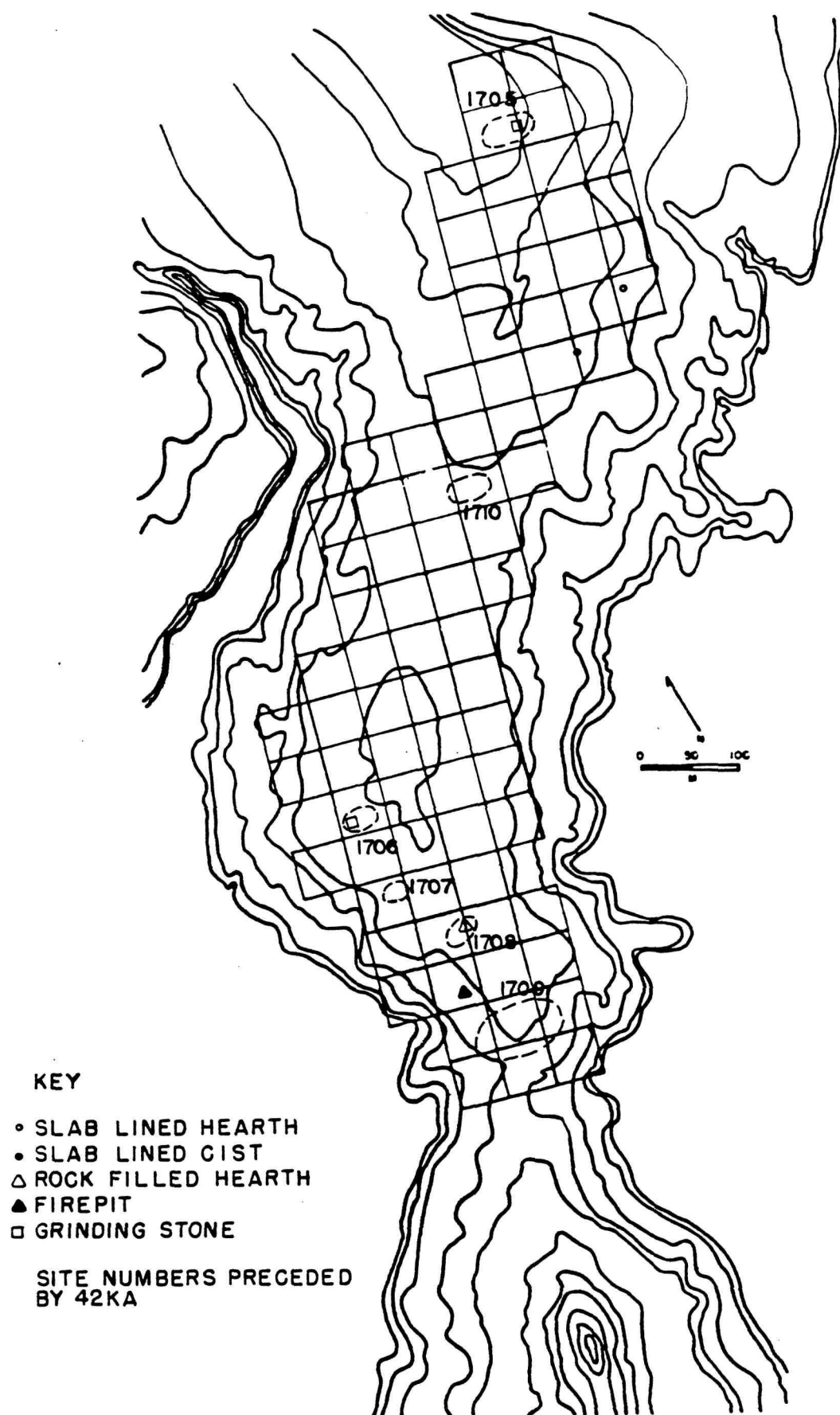


Figure 19. Location of sites and cultural features on the Dangling Rope bench.

and that the concentrations of lithic artifacts do not represent distinct sites in the sense of culturally discrete, temporally bounded entities. What the analysis has shown is that the concentrations simply represent areas of differential intensity of utilization.

The lithic artifacts reported in the "ARTIFACTS" section are discussed under three site locations or clusters, 42KA1706, 42KA1708, and 42KA1709. The first two sites were tested and collected separately; sites 42KA1706, 42KA1707, and 42KA1710 were incorporated into 42KA1709 during the analysis. Again, it must be emphasized that the bench itself constitutes the activity locus or "site" and not the individual clusters, therefore the incorporation of data from one "site" to another has no effect on the final interpretation and conclusions drawn concerning the original prehistoric occupants of the benchland.

Sites 42KA1707 and 42KA1710 consisted solely of lithic artifacts and no cultural features were observed; they are not described below.

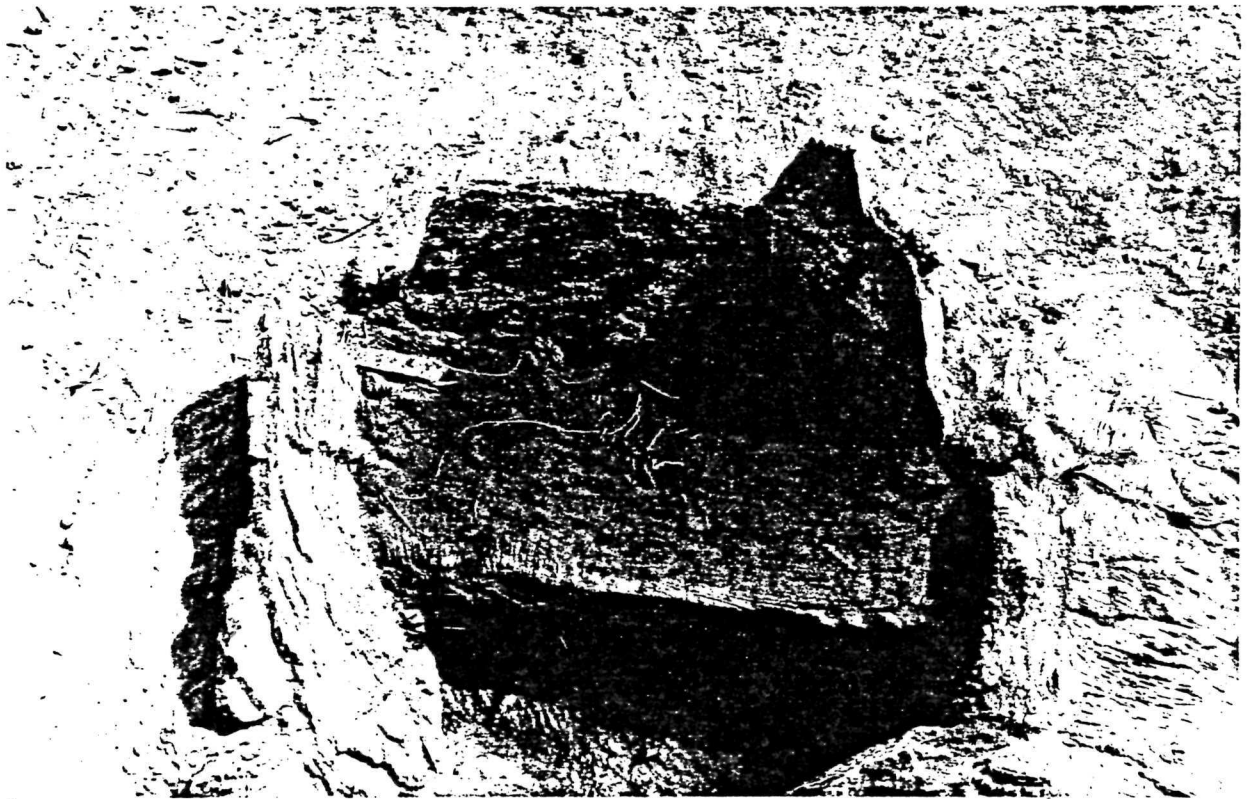
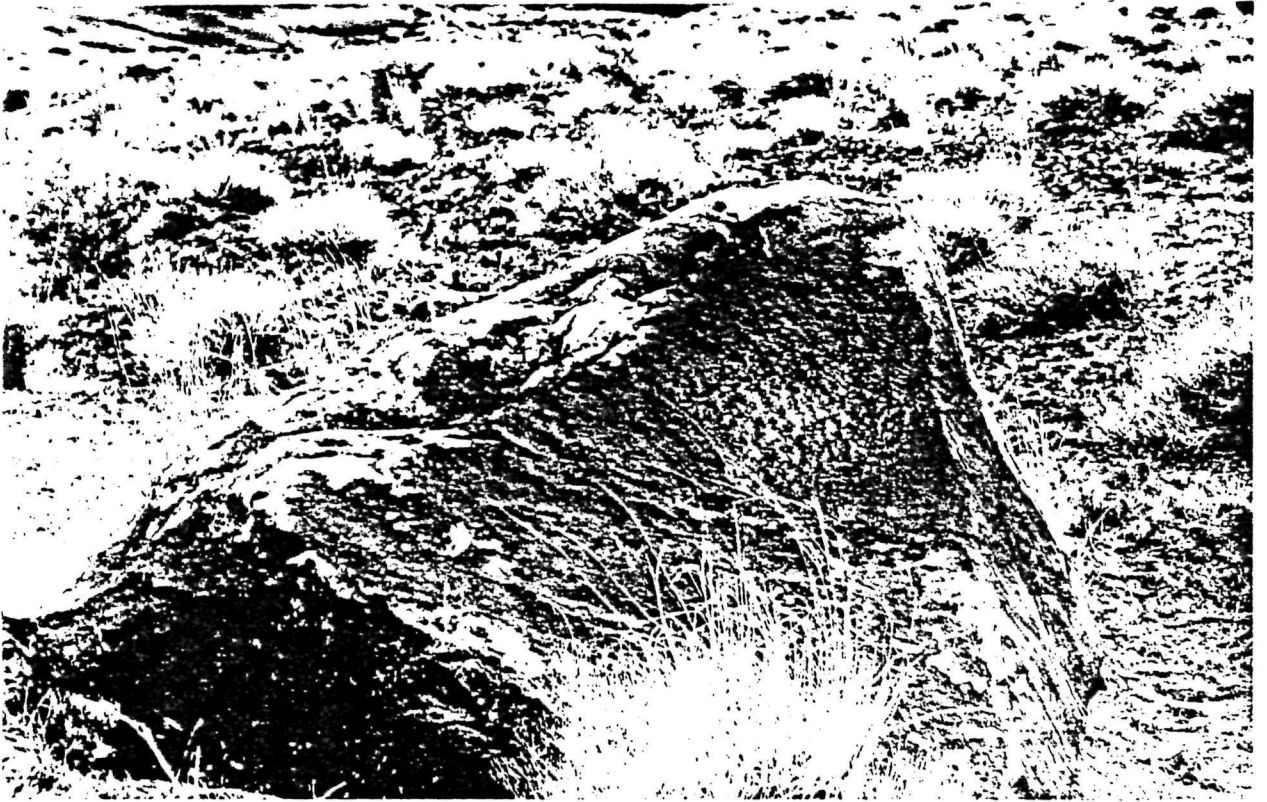
42KA1705

This lithic concentration was located near the north end of the bench. To the northeast of the main concentration of lithic artifacts was a large, weathered, sandstone boulder about 1.75 m. long and 1 m. high. A patinated face on the southwestern side of the boulder shows evidence of use as a grinding surface (Fig. 20). There was no extensive artifact scatter around the boulder and no other ground stone artifacts were found near it.

About 240 m. to the southeast of the boulder a vertical slab-lined firepit was excavated (Fig. 21, 22). The hearth was oval in plan view 57 cm. by 53 cm. Eight to 10 cm. of the sandstone slabs extended above the modern ground surface. Five large slabs, each averaging about 2.5 cm. in thickness, surrounded the perimeter of the firepit and no basal floor slab was found. The fill of the

Figure 20. Grinding stone at 42SA1705.

Figure 21. Slab-lined firepit on the Dangling Rope bench.



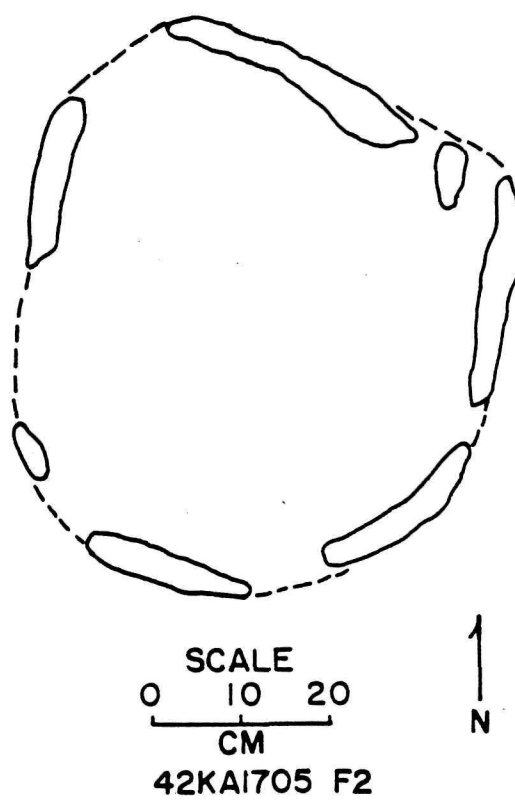


Figure 22. Planimetric view of slab-lined firepit (42KA1705)

firepit consisted of grayish-black, ashy fill with minute pieces of charcoal which had a maximum depth of 17 cm. A single chert flake was recovered from the fill of the firepit.

About 65 m. to the southwest of the slab-lined firepit, an oval slab-lined cist about one meter in diameter was excavated (Fig. 23, 24). Five large sandstone slabs surround the perimeter of the pit with two large flat slabs forming the floor of the feature. The cist has a maximum depth of 35 cm. below the present ground surface. The fill of the feature was primarily blow sand and a few sandstone slabs, flotation produced no cultural material. The slabs in the fill of the cist suggest that it may have been covered at one time. There were no concentration of artifacts around either the cist or the firepit.

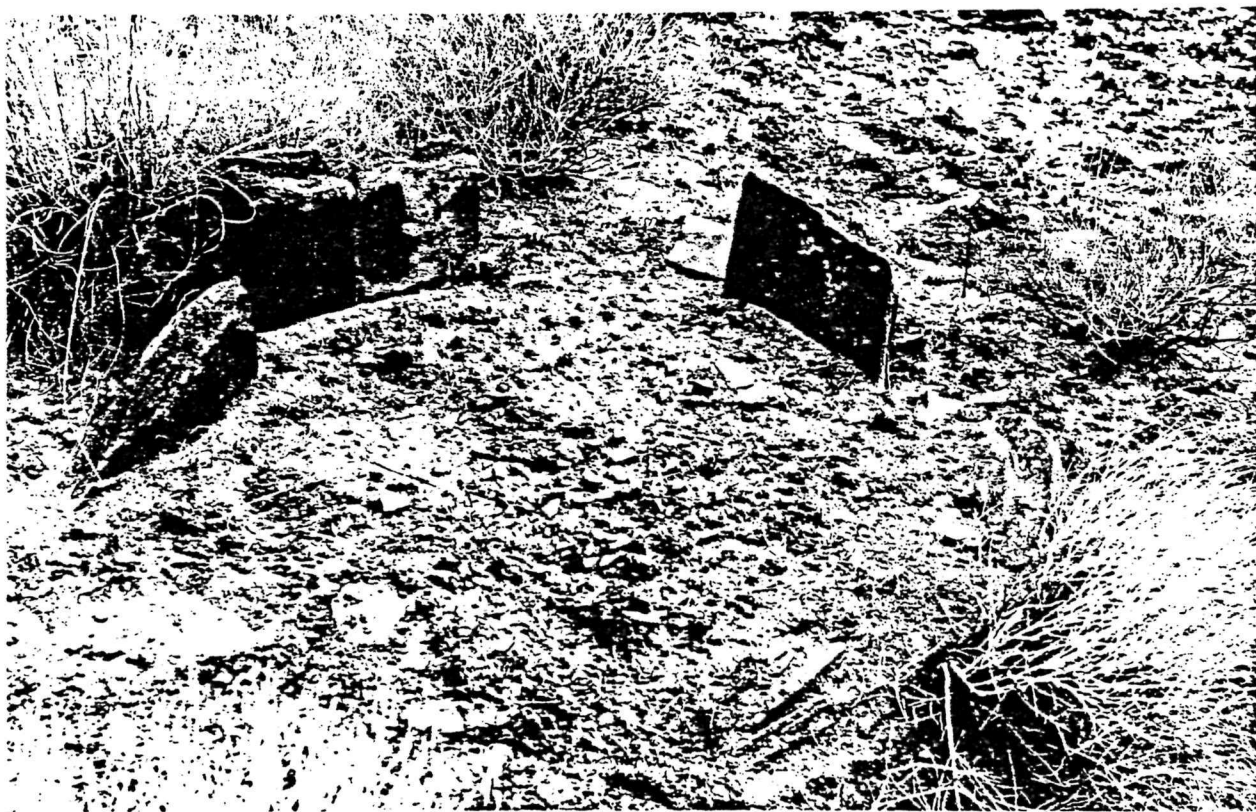
42KA1706

A dense concentration of lithic material on the southwestern portion of the bench, just below a little rise, appeared to have potential as a stratified site (Fig. 25). A projectile point, a complete metate (Fig. 26) and several fragments, two manos and three ground stone gaming pieces (Fig. 27), one of which was recovered during the 1976 survey, were noted on the surface in this area. Two test trenches were dug in the area, but they failed to produce any evidence of subsurface occupation. Of all the concentrations of artifacts on the benchland, only this one approaches what could be called a habitation site on the basis of the artifact assemblage (See "ARTIFACTS" section).

42KA1708

This large lithic scatter occurs in a blowout depression about 150 m. to the southeast of 42KA1706. This deflated area is about 45 m. long and 30 m. across, trending in a SW-NE direction. The eastern portion of the depression contained most of the artifacts. A test trench was dug into the dune on the NE edge of the

Figure 23. Cist at 42KA1705.



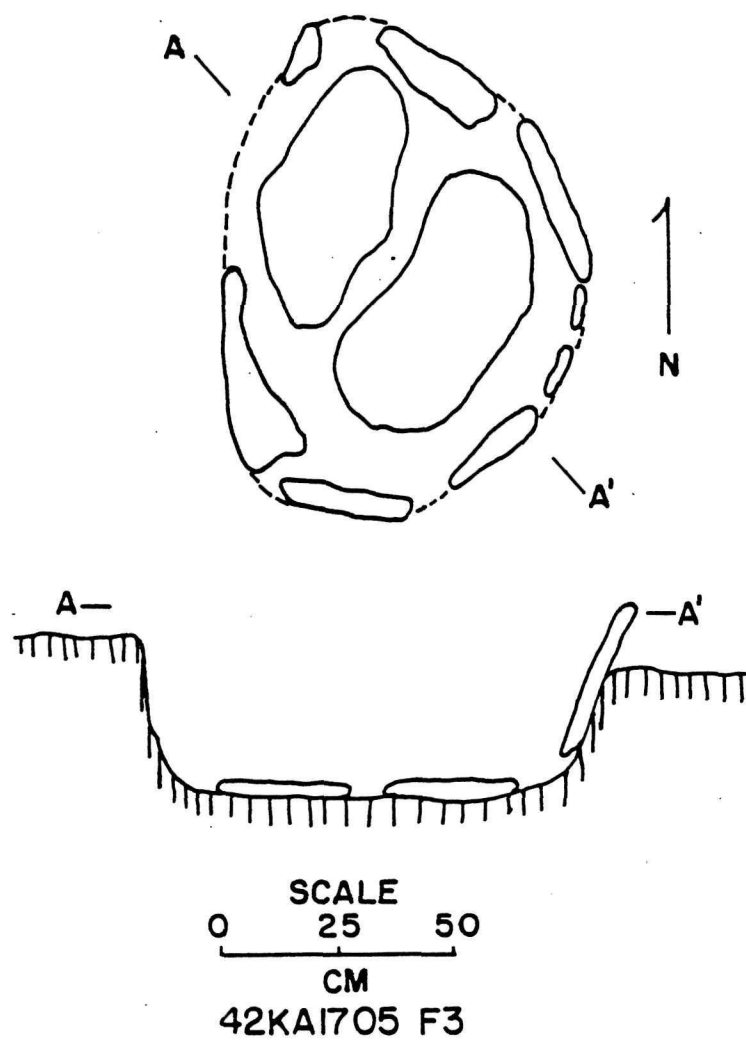


Figure 24. Planimetric and cross section of cist at 42KA1705

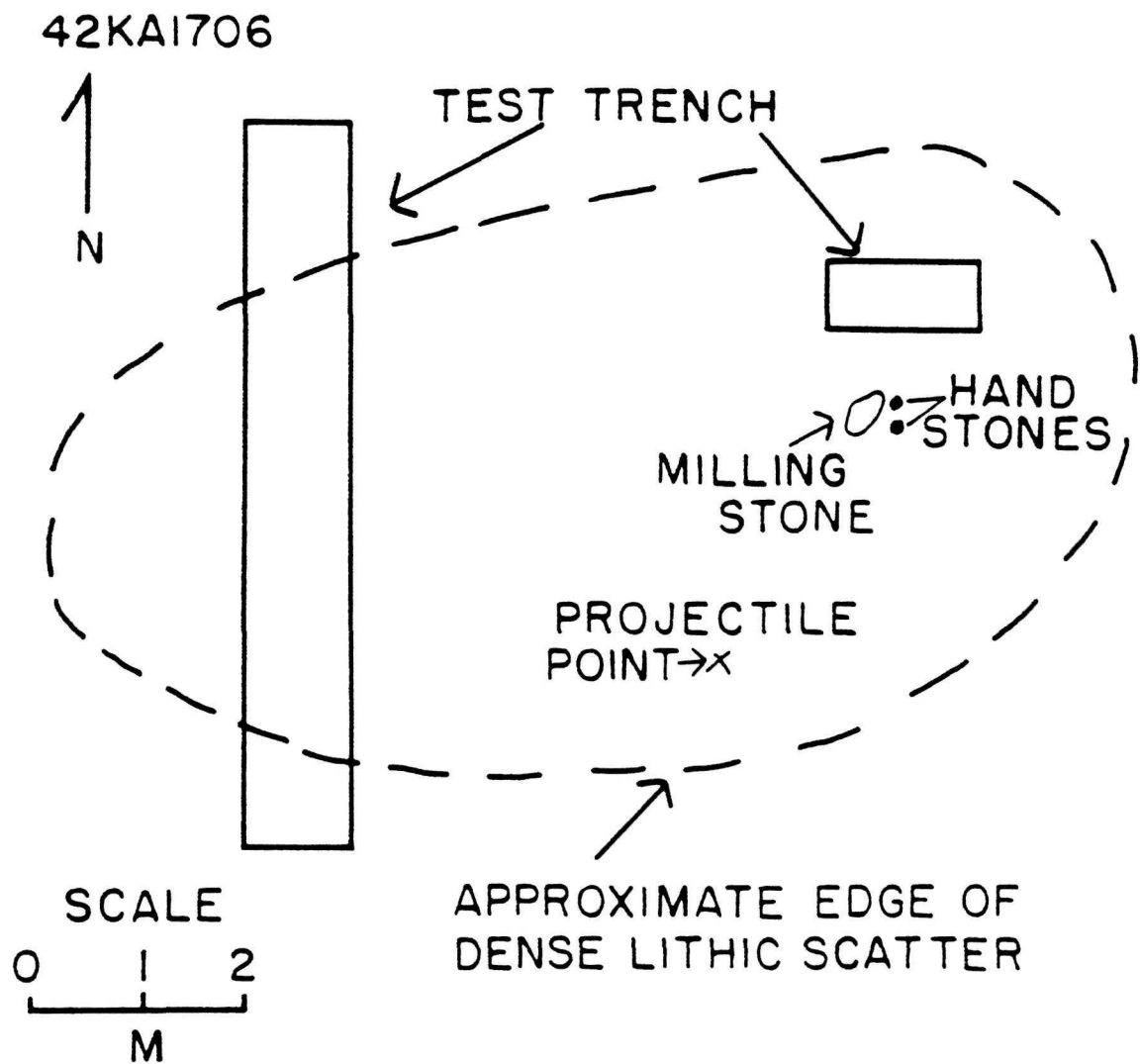


Figure 25. Planimetric map of 42KA1706

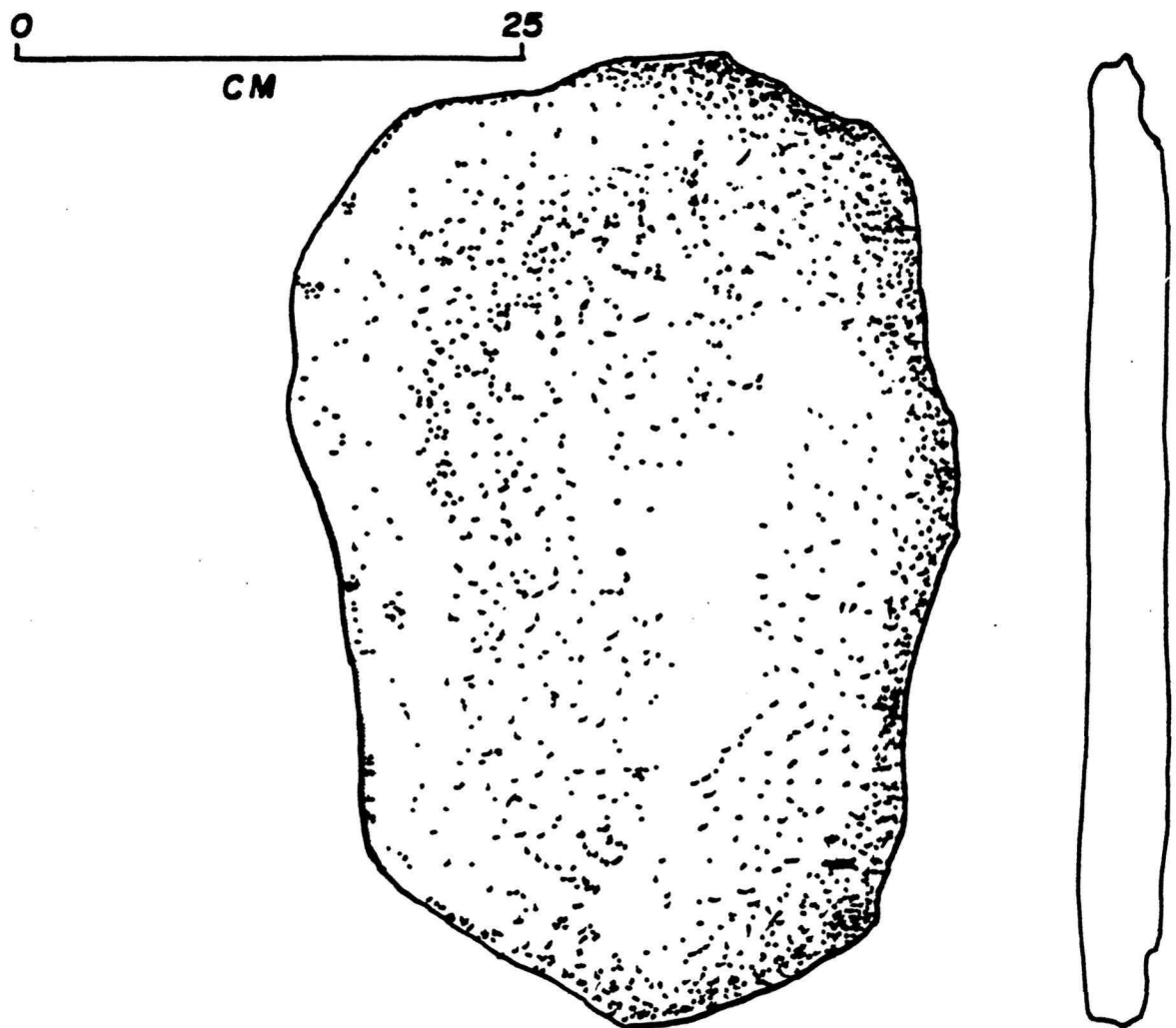


Figure 26. Line drawing of metate from 42KA1706

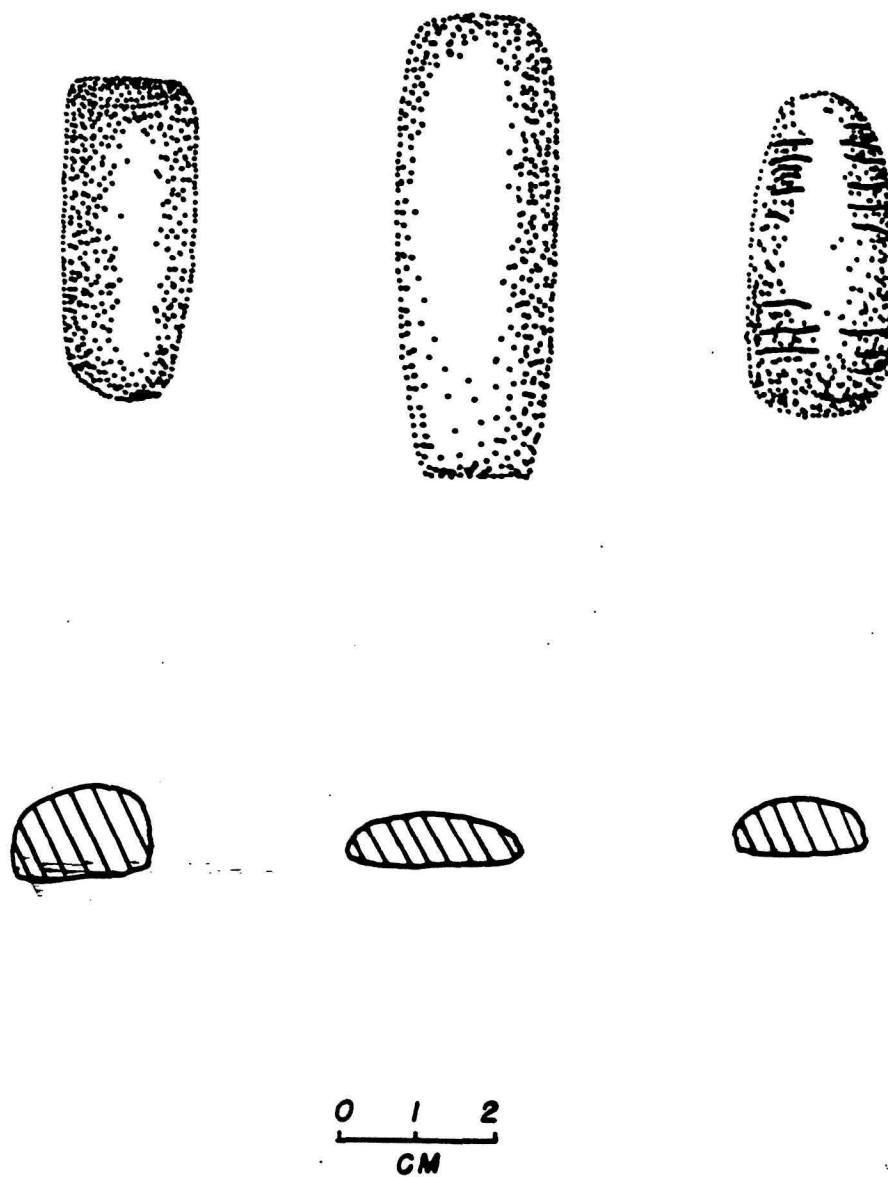


Figure 27. Gaming pieces from 42KA1709

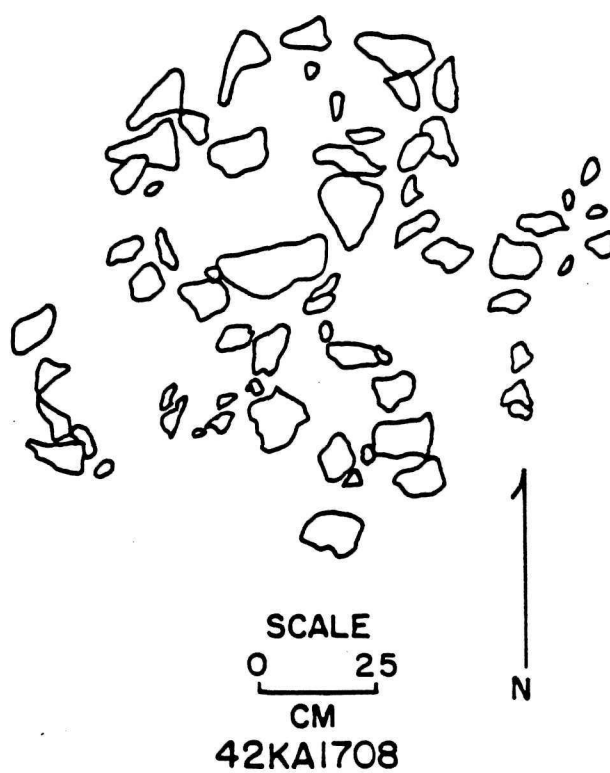


Figure 28. Hearth at 42KA1708

scatter, but again no subsurface evidence of occupation was encountered. A hearth was excavated just off the eastern edge of the site. This hearth (Fig. 28) was about one meter in diameter and consisted of numerous small chunks of sandstone, some of which were fire blackened. There was no identifiable pit, although the soil under the rocks was a grayish color to a depth of 10 cm. No other artifacts were found in or around the hearth.

42KA1709

This site number was assigned to a large concentration of lithic artifacts at the south end of the benchland near the "neck" or constriction that leads to the spire on the point of the Dangling Rope bench. As work on the bench proceeded it was decided that it would be convenient to use site number 42KA1709 to control all of the artifactual material collected on the benchland (except 42KA1706 and 42KA1708). 42KA1709 can be thought of as not just a lithic scatter at the end of the bench, but rather as the whole bench itself.

A single cultural feature was found near the south end of the bench about 60 m. south of 42KA1708. This feature was a single small circular firepit about 35 cm. in diameter. It was a shallow pit, 5-7 cm. deep; the fill consisted of very loose, gray, ashy material discolored by small bits of charcoal. Although several small flakes were found in the fill of the firepit, there was no increase in the amount of lithic material around the feature.

Summary

Although the testing of the sites and the surface collection of the artifacts indicates that the bench is not eligible for the National Register, the data recovery program was successful. On the basis of the artifact analysis (see Chipped Stone) it is possible to develop a picture of prehistoric utilization of the benchlands in Dangling Rope Canyon.

LAKE CANYON

Introduction

One of the main goals of the 1977 season was to evaluate all the sites in Lake and Moqui Canyons for possible inclusion in the National Register. Some of the sites in both canyons had been listed as not being of National Register quality as individual sites (Schroedl 1976a) . Other sites were listed that needed to be evaluated further through testing and more extensive scrutiny than was undertaken in 1976.

Schroedl (1976a:Table 18) lists ten sites in Lake Canyon that deserved further consideration. Only three of those ten are within the boundaries of the Glen Canyon Recreation Area and the remainder are on Bureau of Land Management land. The 1977 crew restricted their activities solely to lands within the recreation area boundaries. Of the three sites listed, only 42SA697 is historic, probably a Navajo or Paiute structure of weathered logs. From 1976 to 1977, numerous changes in the structure were apparent. It appears that visitors to Lake Canyon have been using logs from this structure as a convenient source of firewood--a scarce resource in heavily visited canyons. No more work was done on this site; the sad conclusion is that there is probably no worthwhile scientific or historic information remaining at this site.

The second of the three sites, 42SA628, was not visited. Time restrictions on our work made it necessary to be highly selective about which sites were visited. It was felt that the drop in the water level of Lake Powell made this small site less accessible and thus it would be more protected from over visitation than some other sites, especially those in Moqui Canyon.

The third site, Angry Ridge (42SA5485), was visited and it was immediately clear that it should be excavated to save the remaining archeological

information (Schroedl 1976a). One of the two rooms had been completely cleaned out by vandals. The site is reported below. Also while working on the canyon rim site, 42SA551 was revisited, mapped and photographed in order to derive more information on these enigmatic "fortress" type structures on the canyon rim in Lake Canyon.

Previous Investigation

Under the Upper Colorado River Basin Archeological Salvage Project (UCRBASP), a survey of the upper reaches of Lake Canyon was finished in 1960. At the end of that survey, the canyon and its major tributary, the East Fork, had been completely surveyed (Fowler 1961). As part of the report on this survey, Fowler summarized the previous work in the canyon. It is the best available summary of all archeological work in the canyon prior to 1960, and for that reason it is quoted extensively (Fowler 1961:287, 288).

Archeological sites were noted in Lake Canyon as early as 1880. Platte D. Lyman, a member of the Mormon Hole-in-the-Rock party, noted in his journal, ". . . an old stone fortification, built probably several hundred years ago, on a point of rock jutting into the lake" (Miller 1959:167). This was probably University of Utah site 42SA549.

It is probable that one of the Wetherill parties, led by Clayton Wetherill, passed through Lake Canyon in 1897 on the way to Moqui Canyon in search of Basketmaker remains (McNitt 1957:160), although there is no extant record to indicate that the party was in Lake Canyon.

The first published mention of an archeological site in the canyon was in 1909. Albert R. Lyman, who had been in the area for several years as a cowboy, described in a popular magazine Lake Pagahrit (Lyman 1909) and a "castle" built on a point overlooking the lake (University of Utah site 42SA549). He also noted that the general area had been a hideout for renegade Utes in the late 19th century. In a conversation with the present writer in the summer of 1960 Mr. Lyman further mentioned having encountered a group of Paiutes in Lake Canyon "around 1905." However, no clear traces of such Ute or Paiute occupation were noted by the survey.

In 1923 Neil M. Judd and a small party, guided by John Wetherill, passed through Lake Canyon on the way to Moqui Canyon. In the two brief reports on this expedition (Judd 1924a, 1924b), however, no sites are mentioned in Lake Canyon.

In 1929 the Charles L. Bernheimer party, including Earl H. Morris and John Wetherill, stopped briefly in the canyon. Bernheimer noted in his diary the existence of caves and mentions digging in several of them but finding little (Bernheimer 1929). Morris' notes from this expedition contain a sketch map of a "rectangular fortification" (University of Utah site 42SA316). He also noted many "buried caves," and a few, "slightly higher than the rest . . . [that contained] ashes and characterless Pueblo sherds" (Morris 1929). In the course of his geological researches in the San Juan triangle Gregory (1938:27) noted "well made buildings" in Lake Canyon and the several other canyons of the area.

A popular magazine account of river running on the Colorado River, published in 1958, described ruins in Moqui, Lake and Wilson canyons including Wasp House (University of Utah site 42SA373) (De Ross 1958:17). Between 1952 and 1958 Gene Foster, of the Museum of Northern Arizona, conducted several survey trips into the Glen Canyon area and in the course of these investigations recorded a dozen sites in the lower part of the Lake Canyon (Foster et al., n.d.).

In 1958 Jesse D. Jennings, director of the University of Utah Glen Canyon Project, recorded three sites (42SA373, 374, and 375) (Fowler 1959) near the mouth of Lake Canyon during a brief reconnaissance in Glen Canyon. Also in 1958, the Triangle survey party of the Glen Canyon Project, under the direction of Thomas Mathews, recorded site 42SA316 on the rim of East Fork (Weller, 1959). In 1959 Fowler (1959) recorded 24 sites (20 sites) in the lower half of the canyon (see Adams [1960] for a detailed listing of archeological activities in the Glen Canyon Basin area).

The remainder of the canyon was surveyed in 1960 and 53 more sites were recorded. At the same time the survey was being completed, sites were either tested or excavated in Lake Canyon (Sharrock et al. 1961). The 1976 survey crew assigned four new site numbers in Lake Canyon bringing the total number of site designations assigned in Lake Canyon to 81. The 1977 crew excavated Angry Ridge (42SA5485) and revisited 42SA551.

Setting

Lake Canyon is a left bank tributary of Glen Canyon about 18 km. long and 158 km. upstream from the Glen Canyon Dam (Fig. 1). At a maximum elevation of 1128 m., Lake Powell will extend almost 8 km. into the canyon; the lake is just a little over 100 m. deep at the mouth of the canyon.

Rising on the eastern flanks of the Nokai Dome, Lake Canyon is a narrow canyon incised into Navajo Sandstone, trending in a crescentric pattern, first northwest along the edge of the Nokai Dome for about 12 km., and then westward about 6 km. to Glen Canyon proper. Lake Canyon has three major right bank tributaries and only the one farthest upstream, East Fork, is named. There is one unnamed major left bank canyon located about 2.5 km. from the mouth of the canyon with a number of smaller side canyons existing farther upstream on the west side of the canyon.

The canyon is narrow, averaging around 350 m. across and more than 100 m. deep in some places. Remnants of alluvial terraces are found above the 1117 m. elevation of the lake (see Appendix II). These highly dissected terraces are found along the sides of the canyon and are sometimes several hundred meters long and as high as 15 to 30 m. The alluvium is found only in the lower 14 km. of the canyon. A perennial stream, fed by numerous springs, now runs over bedrock in the canyon floor through a channel cut through the alluvium.

The canyon was named after Lake Pagahrit, a shallow lake, that formed behind a falling dune dam just above the juncture of the East Fork with the mainstem of the canyon. Around 1915 the lake broke through the dam and cut away much of the alluvium. The observed dissection is a result of relatively recent arroyo cutting.

Vegetation in the canyon itself conforms to the communities identified by Flowers (1959), the Streamside, the Terrace, and the Hillside. During the

excavation of Angry Ridge, a plant collection was made on the canyon rim in the vicinity of the site and the surrounding sandstone knolls. The plants which were collected on June 21, 1977, occur in either the Hillside or the Terrace communities or both. The identified plants are listed in Table 6.

Angry Ridge (42SA5485)

Angry Ridge is located on the right bank rim of Lake Canyon about 11 km. upstream from the mouth of the canyon. The site consists of two contiguous habitation structures situated in a slight depression between low sandstone knolls. It was discovered during the survey of the canyon in 1976 (Schroedl 1976a). Vandalism at the site was extensive; one structure (Structure 2) was almost completely dug out to the bedrock floor of the structure (Fig. 29). In 1977, an assessment of the damage prompted the excavation of the site to preserve the remaining archeological data.

The site is about 200 m. upstream from Lyman Flat and the Penthouse (42SA623, 42SA624, Sharrock et al. 1961) and about 40 m. higher on the canyon rim. The two semi-subterranean structures are about 50 m. from the canyon rim. These two habitation structures represent the best examples of dry-laid masonry in Lake Canyon. It is surprising that the site was not recorded earlier. The floor of both structures was pecked into the underlying sandstone up to a depth of 50 cm. Around the perimeter of these pecked depressions, dry-laid masonry walls were carefully constructed from tabular slabs of dark brown sandstone (Fig. 30). The particular sandstone chosen for wall construction fractured naturally into tabular slabs--no dressing was required. The nearest outcrop of this material is between 30-40 m. to the southeast of the site.

Figure 29. Angry Ridge (42SA5485) prior to excavation.



Figure 30. Wall constructed around perimeter of pit pecked out of bedrock, Angry Ridge (42SA5485).



Table 6. Plants of the Canyon Rim (Lake Canyon)

(T)	BERBERIDACEAE (barberry family)
	<u>Berberis fremontii</u> Torr. (Fremont barberry)
(T)	CACTACEAE (cactus family)
	<u>Opuntia</u> cf. <u>compressa</u> (prickly pear)
(T)	CHENOPODIACEAE (goosefoot family)
	* <u>Atriplex canescens</u> !Pursh1 Nutt. (fourwing saltbush)
	COMPOSITAE (sunflower family)
(T)	<u>Artemisia filifolia</u> Torr. (sand sagewort)
(T,H)	<u>Gutierrezia microcephala</u> !DC1 A. Gray (Xanthocephalum)1
	(thread leaf snakeweed)
(H)	EPHEDRACEAE (ephedra family)
	* <u>Ephedra nevadensis</u> S. Wats. (Nevada mormon tea)
(T)	GRAMINEAE (grass family)
	<u>Hilaria jamesii</u> !Torr.1 Benth. (galleta grass)
(T)	LILIACEAE (lily family)
	<u>Yucca</u> sp. (soapweed)
(T)	OLEACEAE (olive or ash family)
	<u>Fraxinus anomala</u> Torr. (single leaf ash)
(T,H)	POLYGONACEAE (buckwheat family)
	<u>Eriogonum inflatum</u> Torr. & Frem. (desert trumpet)

- * Dominant species
- T Terrace community
- H Hillside community

STRUCTURE 1

Structure 1 is a rounded, rectangular, double-wall enclosure measuring 4.3 m. by 3.8 . (Fig. 31, 32, 33). The floor is pecked into the sandstone bedrock to a maximum depth of 20 cm. Around the rim of the depression a double wall of masonry has been laid; the wall varies between 60 and 100 cm. in thickness. The maximum height of the wall is 1.75 m. on the west, where appx. 30 courses of masonry are still intact. The minimum height is 50 cm. on the south wall by an entrance way. The lip of the sandstone bedrock depression forms a doorsill for an entryway in the middle of the south wall. Since walls around this entryway have collapsed, the original height of the entrance cannot be determined. The width is 50 cm.

About 75 cm. north of the door along a center line through the structure is a circular firepit (50 cm. in diameter) pecked into the bedrock floor to a depth of 10 cm. (Fig. 34). The fill of the firepit consisted of a light-gray ash and red sand containing a few flecks of charcoal. About midway between the firepit and the entryway are two small postholes pecked into the bedrock. They are 50 cm. apart and both are 8 cm. in diameter. The westernmost one is 5 cm. deep and the other is 2 cm. deep. It is likely that these postholes were the supports for some kind of deflector for the firepit.

Four other small circular depressions pecked into the bedrock sandstone were found in a NW-SE axis to the east of the firepit running parallel to the long axis of the enclosure. They were 30-40 cm. apart and varied in diameters from 10-15 cm. and in depths from 4.5-7 cm. Nothing was found in these holes; they may have been used as postholes for roof support or they could have been loom anchors which are known to conform to this configuration.

Against the edge of the structure in the NW corner another floor feature was observed—a rectangular hole 6.5 cm. deep and measuring 21 by 19 cm. Nothing was found in it and its function is not known.

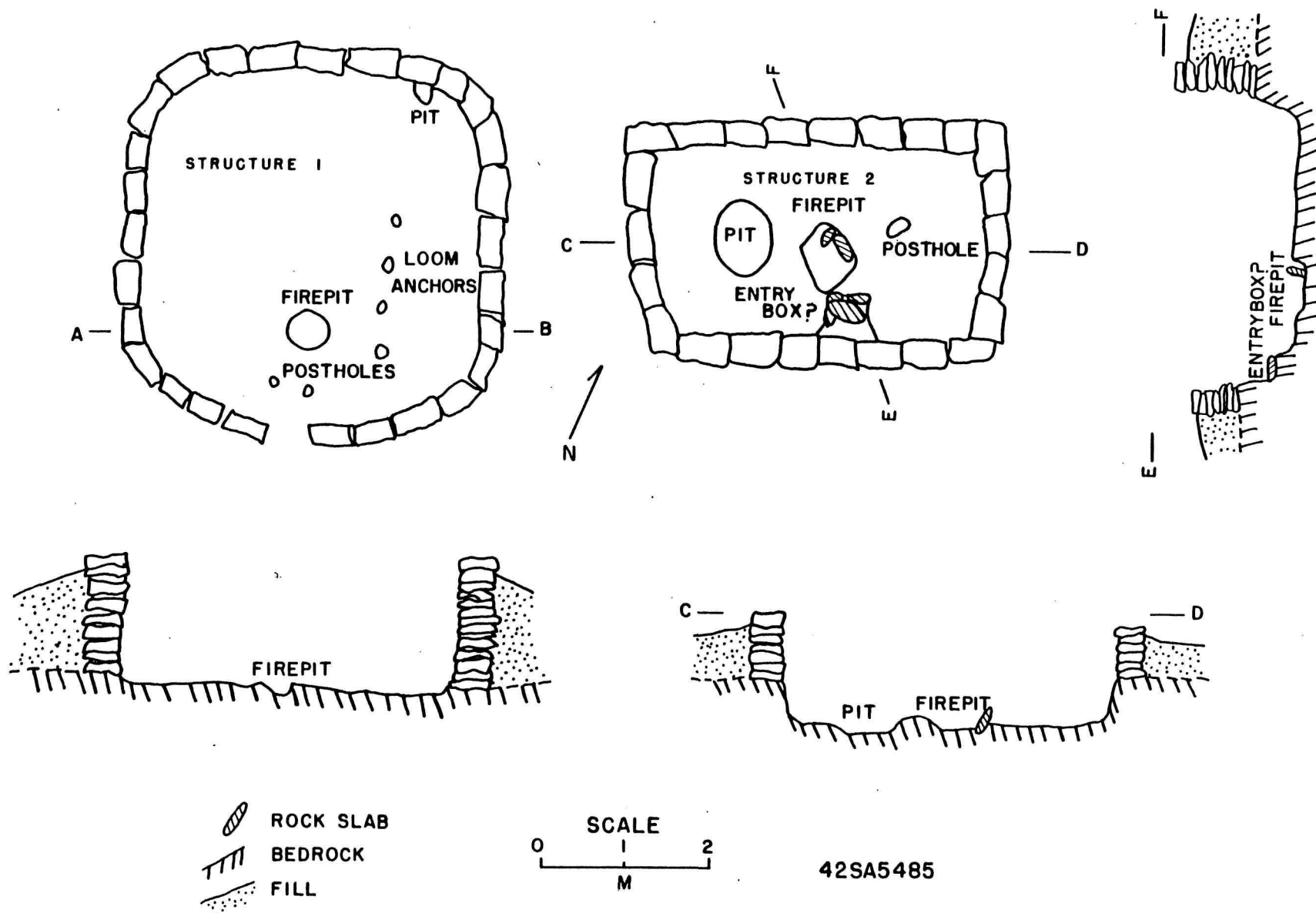


Figure 31. Planimetric view and cross section of Angry Ridge (42SA5485)

Figure 32. Structure 1, Angry Ridge (42SA5485).

Figure 33. Pecked bedrock firepit in Structure 1, Angry Ridge.

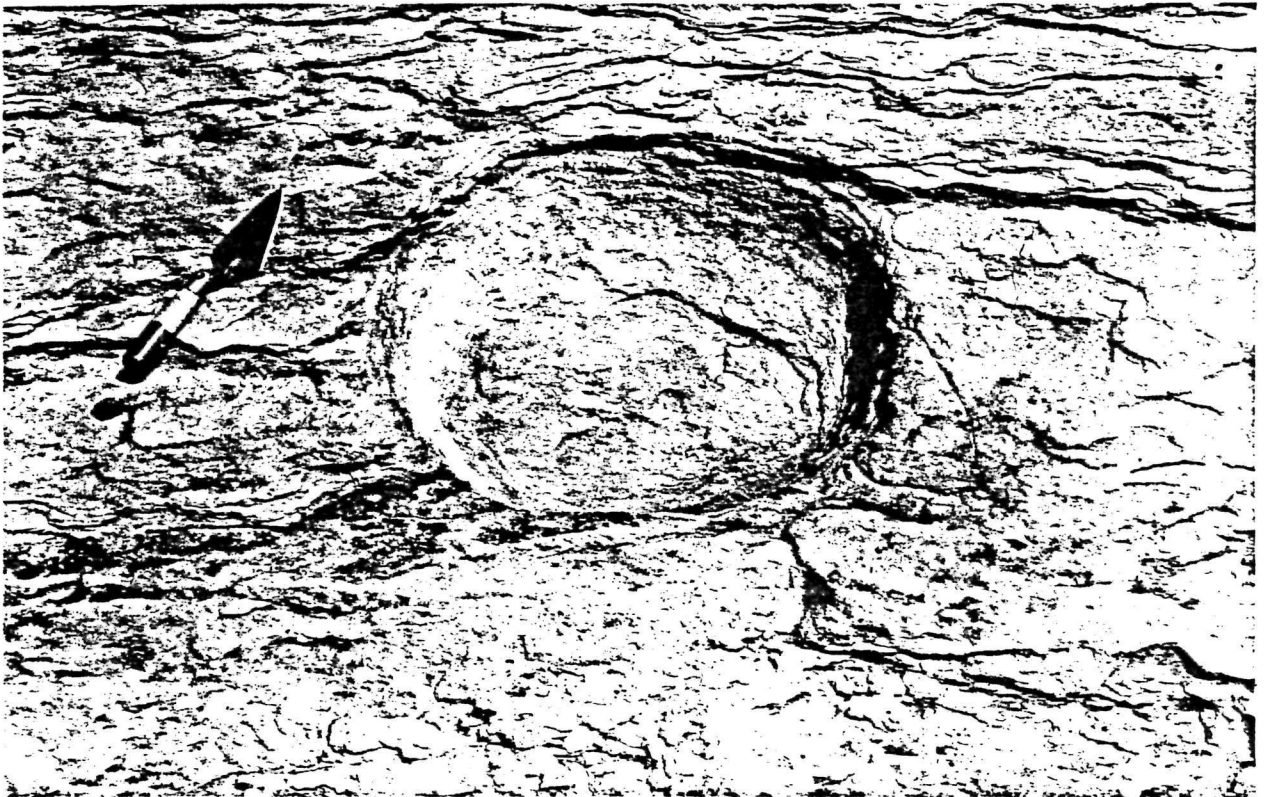
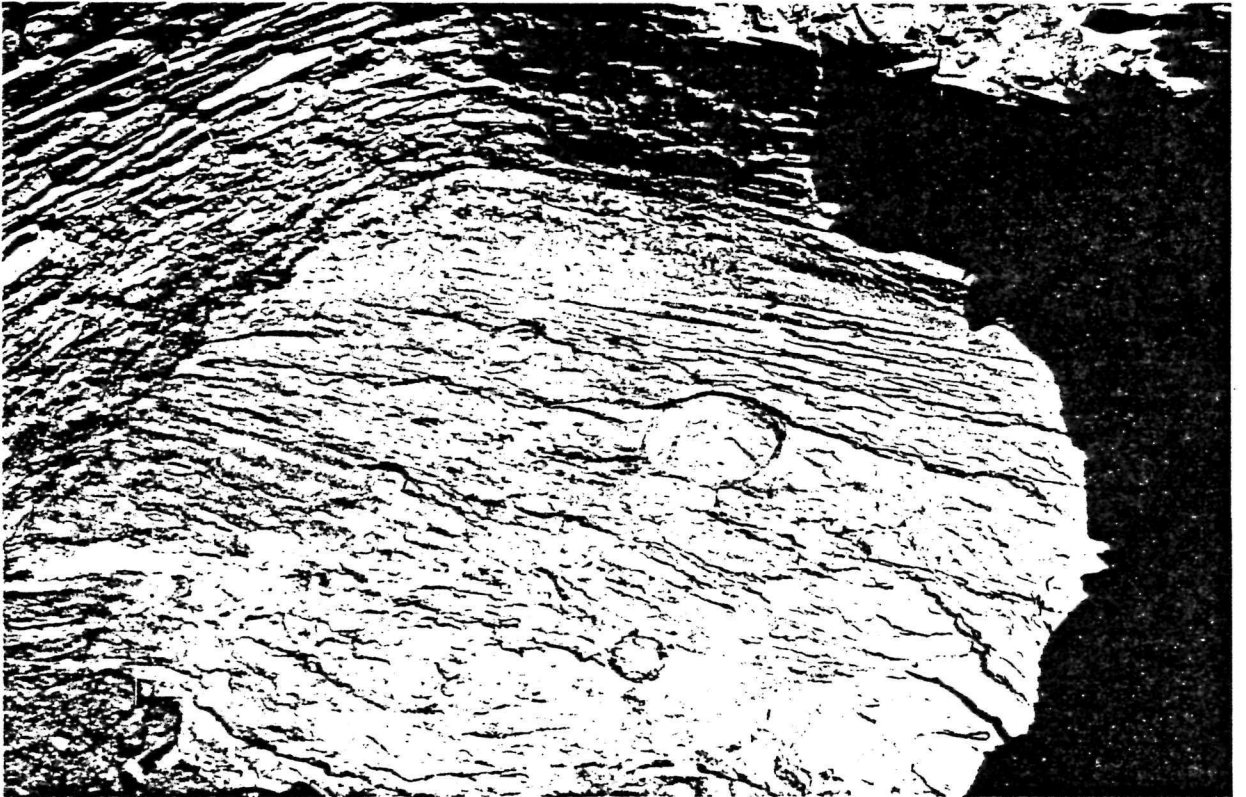
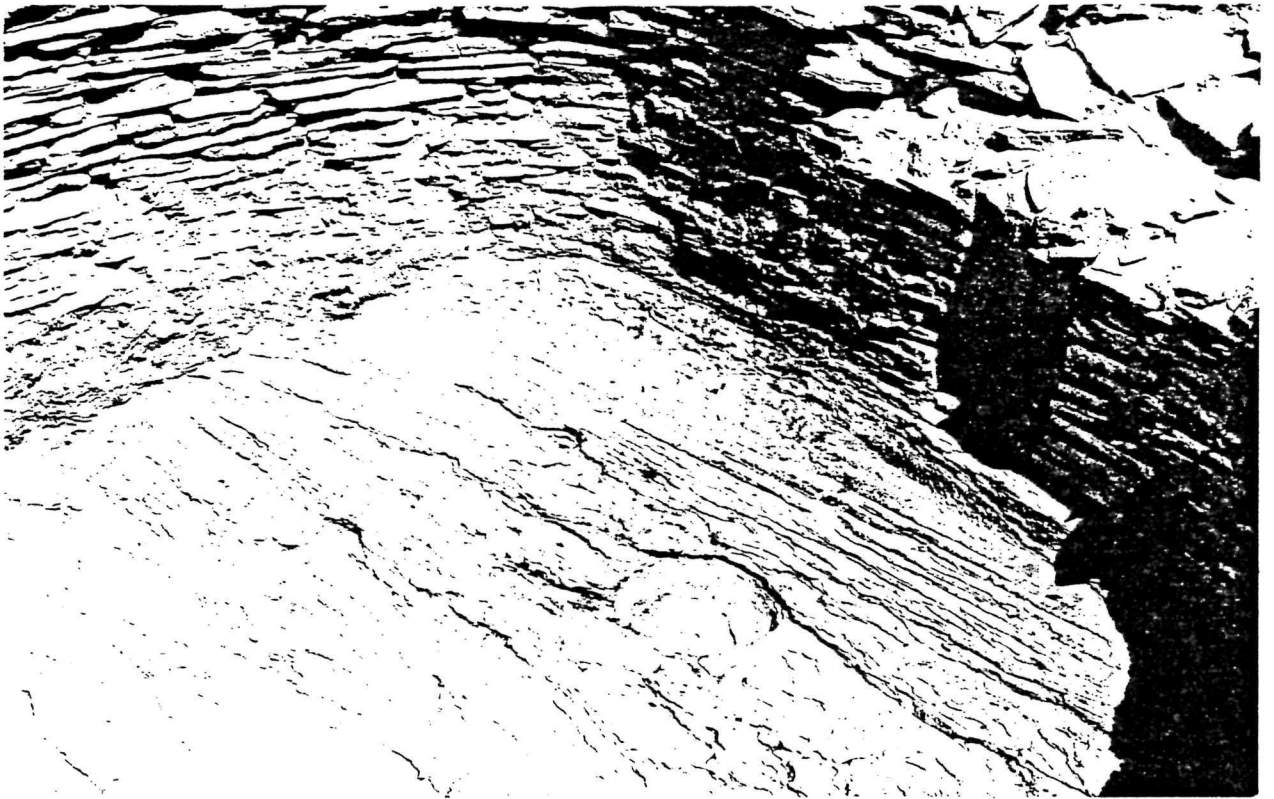


Figure 34. Floor features and entryway, Angry Ridge (42SA5485).



The fill of the structure was more than a meter of sterile aeolian sand, in the upper portion of which numerous sandstone slabs had collapsed from the walls. It is estimated that the maximum height of the walls may have been more than 2 meters. Artifacts were scarce in this structure. Most of the pottery was found within the last 10 cm. of sand above the floor surface.

STRUCTURE 2

Structure 2 is an elongated, rectangular, semi-subterranean room with interior dimensions of 2.2 by 4.0 m. (Fig. 31, 35, 36). It lies one meter east of Structure 1 and they have no common wall. While the area between the two structures was not excavated, it is believed that there were no significant cultural features between the two structures.

A rectangular depression was pecked 50 cm. into the sandstone bedrock before the walls were constructed. This structure had only a single wall of dry-laid masonry consisting of 20 or more courses of slabs which outlined the perimeter of the depression. The wall itself varied from 75 cm. to 1 m. in height and 25 to 65 cm. thick.

A rectangular firepit that had two upright vertical slabs was centrally located. The firepit, pecked into the sandstone, varied in depth between 10 and 20 cm. The vertical slabs of sandstone were set on the north and west sides of the pit which measures 60 cm. N-S and 80 cm. E-W. Red, sandy, ashy fill was found within the firepit. On the east edge of the firepit there is a shallow circular depression that may have been a posthole.

There is another small pecked oval depression about 75 cm. east of the firepit which is possibly a posthole; it measures 15 cm. N-S, 30 cm. E-W and is 9 cm. deep. In the western portion of the structure there is a large pecked oval depression. It is 12 cm. deep, 76 cm. E-W and 1 m. N-S. Nothing was found in it.

Figure 35. Interior of Structure 2, Angry Ridge (42SA5485).



Figure 36. Slab-lined firepit, Structure 2, Angry Ridge (42SA5485).



Directly opposite the firepit abutting the south wall is a small stack of three sandstone slabs embedded in a mud mortar matrix. The height of this feature is about 25 cm. above the sandstone floor, with a maximum width and length of 50 cm. The exact function of this feature is uncertain. It is too small to be a bench and, since there is no evidence of an entryway in the wall, it is not an entry box/deflector that was found in other sites in the area. Since there was no evidence of an entryway, the entrance is postulated to have been through the roof.

The large mound of backdirt on the edge of the structure from vandalism accounts for the minimal amount of aeolian sand (less than 20 cm.) found within Structure 2 (Fig. 29). It is likely that the looter dug completely to the floor of the structure, especially since only five sherds were recovered in the fill. The paucity of artifacts the looter must have found in this structure probably discouraged him from digging out Structure 1.

42SA551

Site 42SA551 is a single, long, rectangular, dry-laid masonry structure (Fig. 37) located on a small eminence on the right bank of Lake Canyon, 13 kilometers upstream from the mouth of the canyon and 2 kilometers south of Angry Ridge. The single structure measured 2.25 m. N-S and 12 m. E-W. The remaining intact courses of dry-laid masonry (1 to 3) were about 25 cm. high. Wall fall around the perimeter of the structure suggests that it may have been no more than a meter high.

Several sites in Lake Canyon such as the Fortress site (42SA316) and 42SA655 have been noted as possible defensive sites or at least sites that have some specialized function. The location and size of 42SA551 suggests that it falls into this class of sites. The site was revisited in 1977 in order to map and

Figure 37. Overview of 42SA551.



photograph it and make an intensive surface collection in order to identify its cultural affiliation and to place it in the prehistoric chronology of the canyon. Thirty sherds of Navajo utility ware were collected about 20 m. to the northeast of the site. The sherds are probably all from one vessel and are probably not associated with the occupation or construction of the structure. In addition to a number of flakes that were collected, several Pueblo sherds were also collected. The surface collection of artifacts was too small and no definite conclusion can be drawn about the temporal span or the cultural affiliation of the site.

MOQUI CANYON

by

Peggy Barnett and Alan R. Schroedl

Introduction

The National Park Service crew of archeologists spent the major portion of the 1977 field season in Moqui Canyon. There were several reasons for this. First, the canyon has one of the highest concentrations of archeological sites of any of the left bank tributaries of Glen Canyon; over 100 sites have been recorded in Moqui Canyon. Many of these sites are located within the boundaries of the recreation area and are not inundated by Lake Powell. The opposite situation occurs in Lake Canyon, many of the sites are outside the boundary of the recreation area and, of those that are within the recreation area, more than half are submerged by Lake Powell.

The second reason that the crew spent so much time in Moqui Canyon is that three more unknown sites were recorded and evaluated. One of these previously unrecorded sites, the Over Site (42SA6214), was about an hour's walk from the lake. It was a three room structure that was being damaged by looters. The already tight work schedule was rearranged to salvage the remaining archeological data at this site. Also, during the 1976 survey, site 42SA533 was under water. The lake level dropped more than two meters from 1976 to 1977, and in 1977 42SA533 was just barely out of the water. Although this site was extensively damaged by looters prior to its inundation, it was decided to salvage the remaining archeological data at this site reported here as "Steury Ledge." The data that were salvaged at these sites consist of architectural details most

of the portable artifacts, such as lithics and pottery, have long since been removed by visitors.

Third, there were a number of rock art sites in the canyon that had not been adequately recorded during the UCRBASP. Thus, one of the major aims of the 1977 field project was to record as many of these rock art sites as possible. This new information, along with previous field notes, drawings, and photographs of the UCRBASP, provided the data for the section on "Rock Art in Moqui Canyon" by Lynne Sebastian.

Although this is the first and only compilation of rock art in Moqui Canyon, it can in no sense be thought of as a complete record or inventory of the rock art. Due to the tight work schedule, less than half of the rock art sites in the canyon were visited by the crew in 1977 and drawn or redrawn. The other panels that Sebastian discusses were drawn from previous field notes which did not always contain the relevant data concerning techniques of construction, degree of patination, etc. Also, there are several other sites in Moqui Canyon outside the boundary of the recreation area, including 42SA772, which have rock art panels that have never been drawn.

From the 1976 to 1977 field season, an alarming number of differences were noted at several sites in Moqui Canyon. The large numbers of visitors to this canyon is having a tremendous and visible effect on the archeological resources in the canyon. In contrast to Lake Canyon, many sites in Moqui Canyon are at or near the present level of Lake Powell. Therefore, access to these sites is relatively easy. In Lake Canyon there are fewer sites that are accessible from the lake. Also, since the canyon bottom above the lake in Lake Canyon is choked with vegetation, upstream passage is difficult and archeological sites are harder to reach in this canyon. In this respect, archeological resources in Lake Canyon are better "protected" from over visitation.

However, in Moqui Canyon the bottom is relatively flat and passable making upstream travel very easy. The ease of access to sites in Moqui Canyon has made them targets for visitor "vandalism" (Schroedl 1976a:45-48). Most of the recognizable archeological sites in the lower portion of Moqui Canyon are being damaged at an alarming rate. The fourth reason for spending a major amount of time in Moqui Canyon was to reexamine as many of the previously recorded sites as possible, making appropriate up-dates in the notes, detailed plan maps, and drawings when necessary.

It must be noted that until 1976, many of these sites had only been visited once by professional archeologists--the survey crews of the UCRBASP. The survey crews did not describe or record these sites in any great detail. The primary purpose of the survey was to locate sites that were worthy of further testing and possible excavation (Jennings 1959:685). It was not the task or the duty of these survey crews to generate detailed information such as plan maps and scale drawings, etc. for every site; their job was to locate sites in a broad range of ecological areas in order to provide a balanced view of archeology in the Glen Canyon area.

Thus many of the sites in Moqui Canyon, especially the more common, smaller sites, are represented by no more than a two sentence description and a location on a map. With the tremendous rate of destruction of sites in the canyon, it was decided that as much archeological information should be gained from these sites as possible. It was hoped that through accurate recordation and description some archeological data could be salvaged from these sites that are rapidly being damaged by visitors. Unfortunately, a number of sites have been so disturbed that much of the archeological data recorded in 1976 and 1977 is highly suspect, and is probably not valid (see sites 42SA684 and 42SA5489 below).

Presently, there are 41 sites above the present Lake Powell level and within the recreation area boundary in Moqui Canyon. There are also two "isolated finds" (Schroedl 1976a). Table 7 lists each of these sites with a description of the work that was carried out there by the 1976 or 1977 crews. Six of them were excavated and four others were cleaned out in 1961 by the University of Utah. Of the 41 sites, ten of them (all of those with site numbers in the thousands) were first located and recorded either in 1976 or 1977. Although this canyon was intensively surveyed by the UCRBASP, the number of sites that were missed during this early survey is almost 10% of the total, a fairly high rate of error. As noted by Schroedl (1976a), it is possible that several of the recently "discovered" sites may be a result of wall and structure construction by modern visitors to the canyon. There is no way to check this possibility.

Not every site that is listed in Table 7 is discussed below (see Appendix I). Sites that were excavated or cleaned out by the University of Utah are not discussed and the reader is referred to the published site reports. Likewise, the sites that exhibited no significant changes from either natural or human activity since they were recorded are not discussed--these are described in Appendix I. The remainder of the sites where work was carried out in 1977 are described below in the same sequence as Table 7; in downstream to upstream fashion, from the canyon mouth to the boundary of the recreation area.

Table 7. List of sites in Moqui Canyon within the Recreation Area Boundary and above the water level of Lake Powell with a discussion of recent field work at each site (downstream to upstream orientation).

Site	Discussion of Recent Field Work
42SA5487	Rock art panel originally part of 42SA533, drawn in 1977 (see "Rock Art in Moqui Canyon," This report)
42SA533	Submerged in 1976, excavated in 1977, (see "Steury Ledge," this report)
42SA5510	Recorded in 1976, visited in 1977, damaged by looters
42SA5488	Recorded in 1976
42SA604	Visited in 1976, still intact
42SA606	Could not be relocated, probably submerged
42SA733	Cleared to floor in 1961 (Day 1963), mapped in 1977
42SA734	Structure cleared to floor in 1961 (Day 1963)
42SA5486	Recorded in 1976, mapped and tested in 1977
42SA732	Visited in 1976
42SA684	Cleared to floor, mapped and rock art drawn in 1977 (see "Rock Art in Moqui Canyon," this report)
42SA682	Mapped in 1977
42SA5489	Recorded in 1976, revisited and mapped in 1977
42SA5490	Inaccessible, recorded 1976, modern graffiti below site recorded 1977
42SA683	Recorded in 1961 as inaccessible, first visited by archeologists in 1976, excavated, 1977, as "Rappel Ruin," this report
42SA6317	Recorded and mapped in 1977
42SA727	Visited in 1976, mapped in 1977
42SA678	Excavated 1961, "Copter Ledge" (Sharrock et al. 1963)
42SA726	"Isolated find," not visited

Table 7 — Continued

Site	Discussion of Recent Field Work
42SA685	Visited in 1976, rock art drawn in 1977 (see "Rock Art in Moqui Canyon," this report)
42SA720	Recorded in 1961, inaccessible
42SA6215	Recorded, mapped and testing in 1977
42SA6214	Recorded and excavated in 1977, the "Over Site," this report
42SA677	Mapped in 1977
42SA737	Visited in 1976
42SA676	Rock art redrawn in 1977 (see "Rock Art in Moqui Canyon," this report)
42SA739	"Isolated find," not visited
42SA738	Excavated in 1961, "Ivy Shelter" (Sharrock et <u>al.</u> 1963)
42SA740	Mapped and completely surface collected in 1977
42SA741	Visited in 1976
42SA742	Visited in 1976
42SA679	Excavated in 1961, "Hiboy House" (Sharrock et <u>al.</u> 1963)
42SA723	Recorded in 1961, visited in 1976, inaccessible
42SA680	Visited in 1976, still intact in 1977
42SA731	Recorded in 1961, visited in 1976, inaccessible
42SA729	Excavated in 1961, "Flatrock House" (Sharrock et. <u>al.</u> 1963)
42SA743	Visited in 1976, still intact
42SA675	Excavated in 1961, "Red Ant Kiva" (Sharrock et <u>al.</u> 1963)
42SA728	Could not be relocated
42SA744	Visited in 1976, still intact

Table 7 — Continued

Site	Discussion of Recent Field Work
42SA681	Excavated 1961, "Rehab Center" (Sharrock et <u>al.</u> 1963)
42SA721	Partially excavated in 1961 (Day 1963)
42SA722	Cleared to floor 1961 (Day 1963)

Previous Investigations

The first known archeological expedition into Moqui Canyon was led by Clayton Wetherill in 1897 who was searching for Basketmaker remains (McNitt 1957:160). By this time several of the sites had already been disturbed, most likely by cowboys or prospectors who were known to have been in the area during the preceding two decades (Crampton 1959).

In 1923, under the sponsorship of the National Geographic Society, Neil M. Judd of the Smithsonian Institution, guided by John Wetherill, led a party into the mouth of Moqui Canyon in search of archeological sites (Judd 1924a, 1924b). Judd did not describe in any detail any of the sites he noted. However, pictures in one of the reports (Judd 1924a) of "Moki Roost" correspond to site 42SA371; two other sites, 42SA533 and 42SA662, are also pictured. Two years later, in 1925, Gregory (1938:27) noted several prehistoric structures in Moqui Canyon during his geological researches in the area.

In 1929 the seventh Charles L. Bernheimer expedition, accompanied by John Wetherill and Earl H. Morris, entered Moqui Canyon via one of the falling dunes (Bernheimer 1929; Morris 1929). During the three days they spent in the canyon, they noted "the ruins of a miserable cliff house" and dug in two caves for Basketmaker material. They recovered numerous artifacts and six burials from "Cave I" and "Cave II" (Moki III), these two sites are now numbered 42SA736 (Bernheimer Alcove) and 42SA772 respectively.

No further archeological activities were carried out in the canyon until the 1950s. Between 1952 and 1958, Gene Foster surveyed much of the Glen Canyon area for the Museum of Northern Arizona and identified nine sites in Moqui Canyon.

In 1956 negotiations for salvage archeology in the Glen Canyon area were begun in anticipation of the effects of Lake Powell and the construction of the

Glen Canyon Dam. By 1957 full scale emergency archeological activities were underway in the region by the two contracting agencies, the University of Utah and the Museum of Northern Arizona. The archeological activities in the upper reaches of Glen Canyon and its tributaries, including Moqui Canyon, were under the jurisdiction of the Department of Anthropology, University of Utah, under the program entitled the Upper Colorado River Basin Archeology Salvage Program (UCRBASP).

The first priority of the UCRBASP was an intensive archeological survey of the area to determine the extent of the prehistoric cultural resources. These surveys are reported in depth in Fowler, et al. (1959). The first two sites visited in Moqui Canyon under this program were 42SA370 and 42SA371 during a 1958 survey of the mainstem of the Glen Canyon (Fowler 1959). The following year, 1959, the canyon was surveyed from its mouth to about 2 km. upstream on the North Gulch tributary and 18 sites were noted. Three of the 20 sites known, Shady Alcove (42SA576), Echo Cave (42SA583), and Doll Ruin (42SA585) were excavated in 1959 by University of Utah crews (Lipe, et al. 1960:42-69).

In 1960, the survey of Moqui Canyon continued with 12 sites being recorded in the survey area between the mouth of North Gulch and the mouth of a short box canyon called Burnt Spring. In 1961 an excavation program was mounted in Moqui Canyon and the University of Utah tested or excavated 17 sites. Concurrent with the excavation, the North Gulch tributary and the main canyon and tributaries from North Gulch to its headwaters in the Clay Hills area were surveyed. Sixty-seven more sites were added to the then known 32 sites in the canyon. However, several of these sites are duplications of previously recorded sites or were not sites at all (i.e., they exhibit no evidence of cultural occupation), hence the actual number of new archeological sites recorded during this portion of the survey is less than 67.

By the end of the 1961 field season, Moqui Canyon and its tributaries had been completely surveyed from mouth to headwaters. No further professional archeological work was done in Moqui Canyon until the return of the crew from the University of Utah in 1976. Seven new sites were recorded during their resurvey of the canyon (Schroedl 1976a). During 1977, three more sites were located and recorded bringing the total number of known archeological sites in Moqui Canyon to 102.

Setting

Moqui Canyon is a left bank tributary of Glen Canyon about 19 km. upstream from Lake Canyon and 177 km. upstream from the Glen Canyon Dam (Fig. 38). Lake Powell is about 90 m. deep at the mouth of the Moqui Canyon and presently extends more than 6 km. into the mainstem of the canyon.

Moqui Canyon is about 48 km. long and rises in the Clay Hills region to the east at an elevation of about 1890 m. and drains about 650 sq. km. of Mancos Mesa. The mainstem of the narrow canyon is entrenched up to almost 200 m. into Triassic and Jurassic deposits. Upstream from the canyon mouth to North Gulch, the canyon is incised into Navajo Sandstone. Further up the canyon the Kayenta Formation, Wingate Sandstone, and the Chinle Formation are the respective components of the canyon walls.

Moqui Canyon has over a dozen right bank tributaries and side canyons, three of which are named. The major right bank tributary, North Gulch, enters the mainstem of the canyon at appx. 5.5 km. upstream from the canyon mouth. The next two right bank side canyons upstream are Dry Canyon and Blocked Draw, respectively. There are at least eight major left bank tributaries, four of which are named: Camp Canyon, Red Tanks, Burnt Spring, and Lost Shoe Canyon.

Figure 38. Typical canyon setting, Moqui Canyon.



Remnants of alluvial terraces also occur in Moqui Canyon. These terraces are similar to those found in Lake Canyon and are described in detail by Lance (1963). The terraces reached their maximum thickness of about 25 m. at the mouth of the canyon prior to the inundation of Lake Powell. The alluvium gradually thins out further upstream and is non-existent beyond Blocked Draw about 21 km. upstream where the Chinle Formation begins to appear in the streambed.

Numerous springs and seeps occur at the geologic boundary between the Navajo Sandstone and the Kayenta Formation and feed the intermittent stream that flows in the middle reaches of the canyon through the deeply dissected alluvium. Plant growth is abundant around the springs and along the stream channel where there are sufficient amounts of water.

Unique to Moqui Canyon are a number of falling dunes on the south face of the canyon, the left bank. These falling dunes have provided means of egress and access to the canyon for a number of different archeological expeditions to the area, including the crew from the University of Utah during the UCRBASP.

Steury Ledge (42SA533)

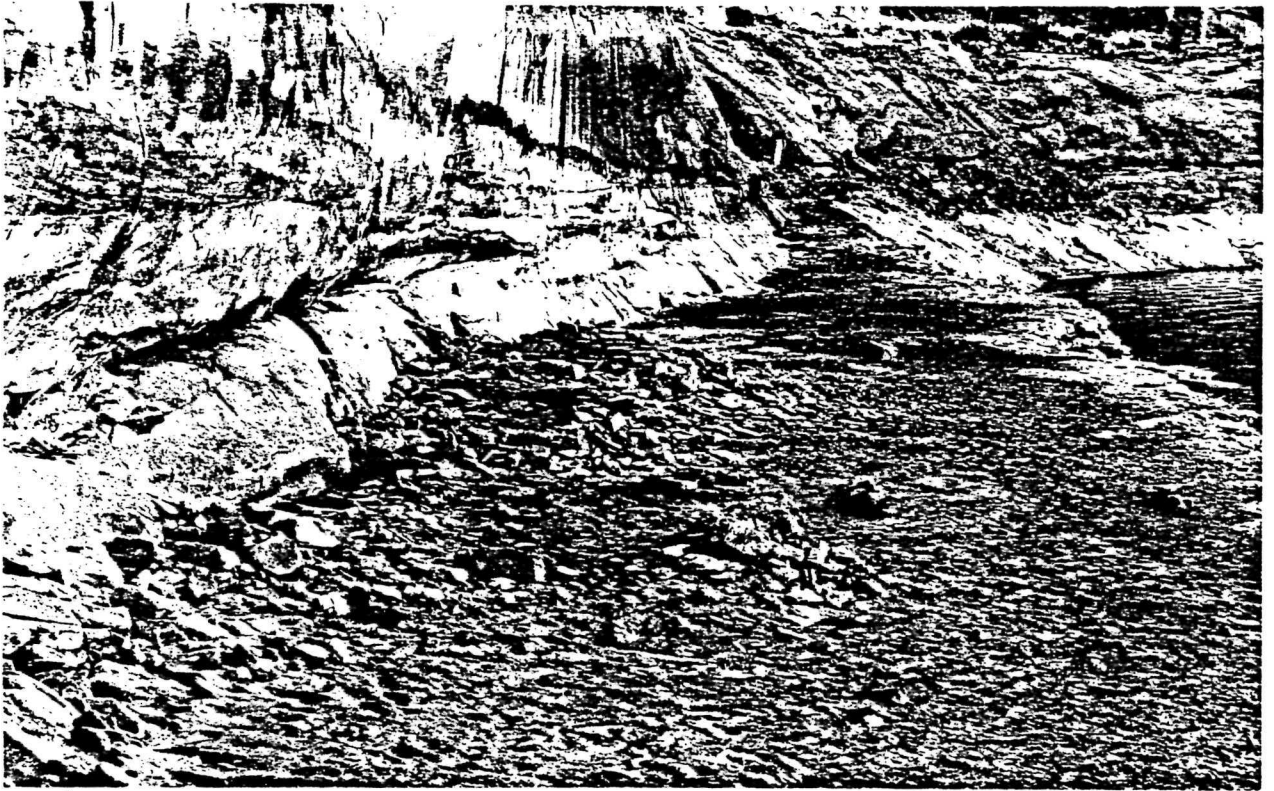
This site once consisted of four, dry-laid masonry structures (Fig. 39, 40). It is located on the right (north) bank of Moqui Canyon about 1.5 km. upstream from the mouth of the canyon. The two major structures, both rectangular surface structures, are situated on a flat south-facing sandstone ledge that is more than 30 m. long and about 14 m. wide. The cliff face forms the rear wall for both of the major structures.

The site was first apparently visited by Neil Judd in the 1920s. When it was officially recorded by the UCRBASP in the 1950s, the site also included the petroglyph panels to the west which are now known as 42SA5487. At that time

Figure 39. View of Steury Ledge (42SA533) in 1959.



Figure 40. View of Steury Ledge (42SA533) in 1977.



the ledge on which the site was located was over 70 m. above the streambed and the site could only be reached by a difficult climb up a steep talus slope. The survey crew felt that although "excavation would be rewarding," the lack of access and the difficulties associated with bringing excavation equipment to the site precluded excavation of the site at that time.

At the time of recordation (August 7, 1959) by the UCRBASP crew, the site was littered with artifacts, some of which were collected. The walls on the two rectangular structures were preserved at or near their original height (Fig. 41); roof beams were noted in place. Two small, semi-circular rooms, probably granaries, shared a common wall and were several meters to the west of the two main structures.

This site was under water during the 1976 survey. In 1977 the lake level had dropped sufficiently to expose the original structures. A decision was made to excavate the remaining portion of the site at that time. The reason for excavation was to salvage the paucity of archeological information that had not been destroyed by the lake and previous visitors to the site.

The 1977 crew found no surface scatter of artifacts. The survey crew collected a "representative" sample of pottery in 1959 which amounted to about 50 sherds (Fowler et al. 1959). The 1977 work, which included complete excavation of the two main structures, produced a total of three sherds. The structures had obviously been dug out previously by passing boaters. At some time in the past eight years the water level was sufficiently high in the canyon to make the site easily accessible to visitors who cleaned out the structures.

Much of the looters' backdirt within the structures remained in suspension when the waters of Lake Powell covered the site. As the waters receded in 1977 the suspended fill settled back into the structure. Because of the effects of Lake Powell in 1977, the fill of the structures appeared to have been

Figure 41. Height of walls in 1959 at Steury Ledge (42SA533).



undisturbed. The only clues to the fact that it was dug out previously was the lack of artifactual material at floor contact and the presence of a corroding Roosevelt dime, dated 1969, in one of the firepits.

The walls were not nearly as high as when they were previously recorded 18 years earlier and no roof beams were found. The sad conclusion is that visitors probably knocked over portions of the walls and used the beams for firewood in a canyon where firewood is at a premium. The evidence for this interpretation comes from a modern, very recent, rock-lined firepit several meters from the major structures. Also, the two granaries (Structure 3 below) were barely discernible. Without the previous site records, the granaries would probably have not been recognized in 1977 due to their dispersed nature. Although some of the destruction noted in 1977 may have resulted from inundation, it is clear that much of the damage and the loss of portable artifacts at this site is due to the heavy visitor traffic.

STRUCTURE 1

Structure 1, a rectangular room measuring 3 m. N-S and 3.5 m. E-W, lies 1 m. west of Structure 2, (Fig. 42). It is partially constructed of sandstone slabs set vertically on the floor, facing the interior of the structure. Above these vertical stone slabs 8-10 courses of horizontal masonry remain. The walls are appx. 75 cm. thick, and heights range from appx. 78 cm. on the west to 1 m. on the south. A door in the south wall, measuring appx. 50 cm. wide, has vertical slab sides. Two horizontal slabs form the doorsill (Fig. 43). A circular firepit is located appx. 23 cm. northwest of the door. The firepit, rimmed with hard-packed, fire-reddened clay, is 88 cm. N-S, 86 cm. E-W, and 12 cm. deep. The fill was dark gray ash and red sand containing a few pieces of charcoal. No other floor features, such as post holes or storage pits, were found in the red sandstone bedrock floor of the structure.

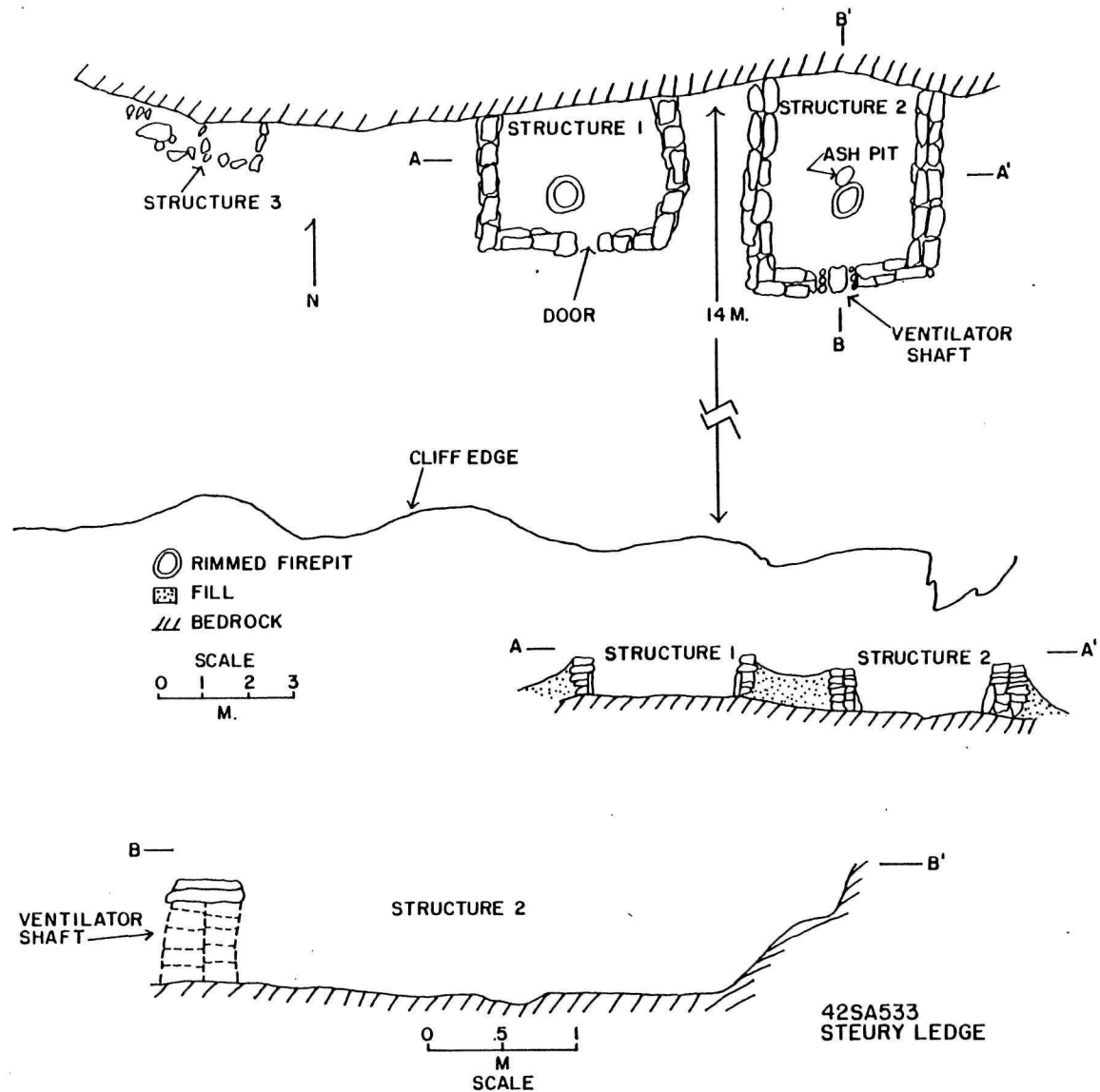
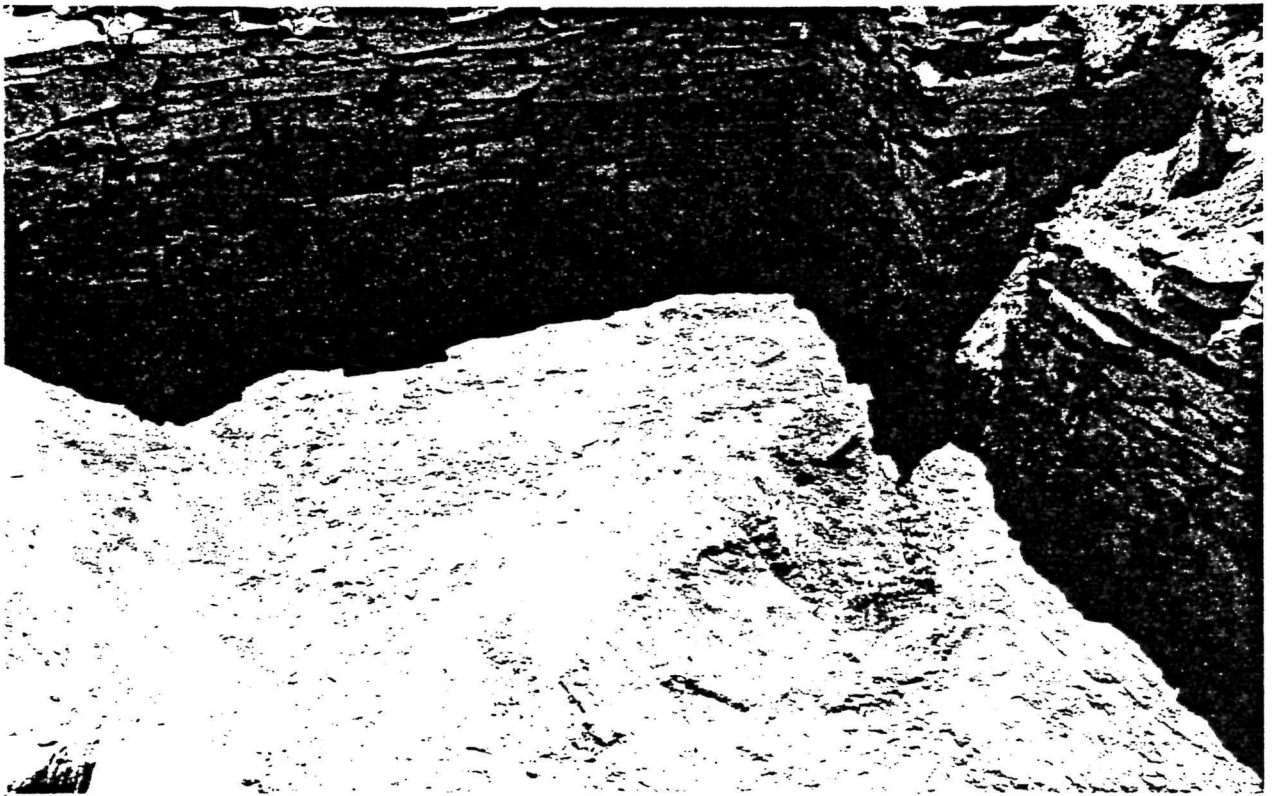


Figure 42. Planimetric map and cross section of Steury Ledge (42SA533)

Figure 43. Interior view of Structure 1 at Steury Ledge (42SA533).



STRUCTURE 2

Structure 2 is 4.3 m. N-S and 3 m. E-W (Fig. 44). The double sandstone slab walls are appx. 1 m. thick, vary from 5-10 courses, and have heights from 1.5 m. on the east to 2.25 m. on the south. A ventilator shaft located in the south wall is 56 cm. high and 42 cm. wide, faced on each side with small horizontal stone slabs and covered with large tabular slabs (Fig. 45).

The floor of Structure 2 is also bedrock. A centrally located circular firepit, appx. 90 cm. to the north of the ventilator shaft, is rimmed with blocks of sandstone averaging 20 cm. in length and 10 cm. in thickness. Around the blocks a sandy clay material was used to form a collar. The firepit measures 75 cm. N-S and 69 cm. E-W and is appx. 11 cm. deep. Dark gray ash and red sand with small pieces of charcoal constitute the fill. Immediately north of the firepit is a depression filled with gray ash, measuring appx. 50 cm. N-S by 40 cm. E-W. As in Structure 1, no additional features, such as post holes or storage pits, were discovered in the floor.

STRUCTURE 3

Structure 3, consisting of the possible remnants of two small circular rooms, is appx. 2.4 m. west of Structure 1. All that remains of these rooms is a line of sandstone slabs with similar slabs scattered to the east, west, and south of the rooms. The easternmost room is appx. 1.5 m. N-S and 1 m. E-W; the western room is appx. 1 m. N-S by 1.3 m. E-W. These rooms were not excavated and no artifacts were observed on the surface around them.

Figure 44. Interior view of Structure 2 at Steury Ledge (42SA533).

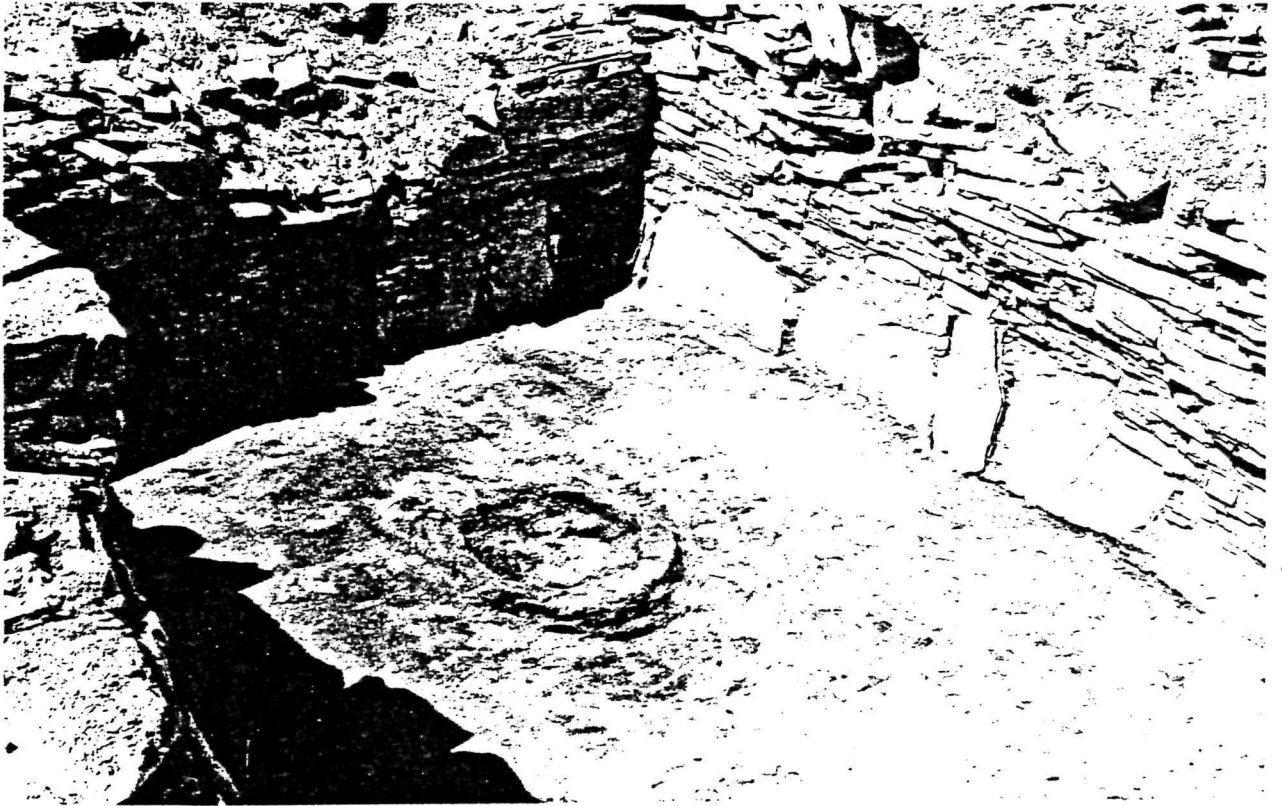


Figure 45. Ventilator shaft and firepit in Structure 2
at Steury Ledge (42SA533).



42SA5486

Site 42SA5486 consists of two masonry structures (Fig. 46) and two sandstone, slab-lined, grinding bins. The site is located on the north bank of North Gulch ca. 2 km. from the confluence with Moqui Canyon. The structures occupy a southwest facing sandstone ledge just below site 42SA733 and west of 42SA734. The walls of both structures are dry-laid sandstone block masonry with basal courses intact. Test trenches were dug in both structures.

STRUCTURE 1

Structure 1, a rectangular structure, has interior dimensions of 3 m. N-S and 5.8 m. E-W. The walls are intact in the SW corner where seven courses of masonry measuring appx. 1 m. in height remain and the NE corner where five courses remain to a height of 80 cm. The test trench in the SW quadrant of the structure revealed shallow floor pecked 10 cm. into the bedrock.

STRUCTURE 2

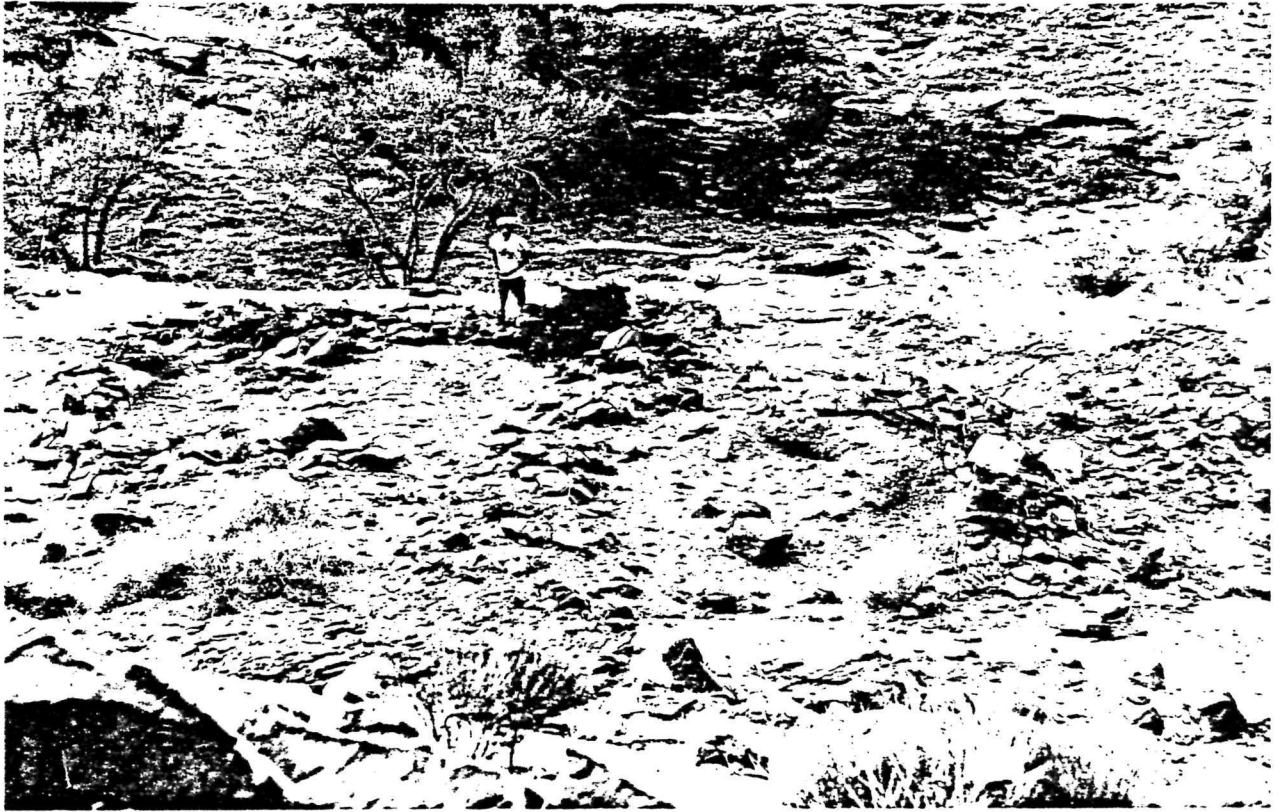
Structure 2 is a circular structure with a diameter of appx. 3.3 m. with appx. eight courses of masonry remaining, measuring 1.1 m. in height. The test trench was dug into the eastern quadrant of the structure. This structure is semi-subterranean, although this is not apparent from the present topography. The bedrock floor is pecked to a depth of more than 40 cm. in the sandstone ledge. Thus, what appears as a low surface structure on a ledge actually has some depth (see also Angry Ridge in Lake Canyon). No floor features or artifacts were found in either structure during the testing.

MEALING BINS

Two rectangular slab-lined mealings bins were located about 6 m. east of the two structures in a small shaded alcove (Fig. 47). The two adjacent bins share a common center wall and are slightly dug into the surrounding soil. The

Figure 46. Site 42SA5486.

Figure 47. Mealing bins in alcove, 42SA5486.



eastern bin lacks an upright slab near the foot of the bin; both bins measure about 82 cm. long and about 50 cm. wide. The interior of each bin is packed with clay sloped at an angle of about 45 degrees toward the foot of the bin. Set in this clay in both bins is a chunk of sandstone apparently used as a rest for the metate; in neither bin was the metate recovered. In the bottom of both of the bins at the foot of the box is an embedded flat slab, used to catch the ground meal. A fragment of a metate and one two-handed mano were recovered from these grinding bins.

42SA684

This site consists of three (?) slab masonry rooms situated on a narrow, south-facing, sandstone ledge on the right bank of Moqui Canyon about 500 m. upstream from North Gulch (Fig. 48). This ledge is about 9 m. long and 3 m. wide, and during prehistoric times was about 6 m. above the alluvium. Access to the structure is by means of hand and toe holds up the cliff face near the middle of the ledge.

The ledge appears to have formed a bedrock floor for the structures, while the cliff face formed the rear wall of the rooms. The fill of the rooms consisted of several cm. of blow sand; no floor features were found in any of the rooms. The abundance of "modern" trash in the fill and the paucity of artifacts indicate that it was probably dug out by looters. The few artifacts that were recovered from this site were found in a narrow crack about 10 cm. wide, 8-10 cm. deep, that ran along the rear wall. The small amount of fill in this crack did not appear to have been directly disturbed.

The only intact room was a small trapezoidal wet-laid structure on the east end of the ledge (Fig. 49). It was 1.6 m. long with a maximum width of 1.4 m. The southern wall has a maximum height of 1.1 m. with a 20 cm. thick wall of unshaped, sandstone masonry with a reddish-brown, mud mortar. The southern

Figure 49. Wetlaid structure at 42SA684.

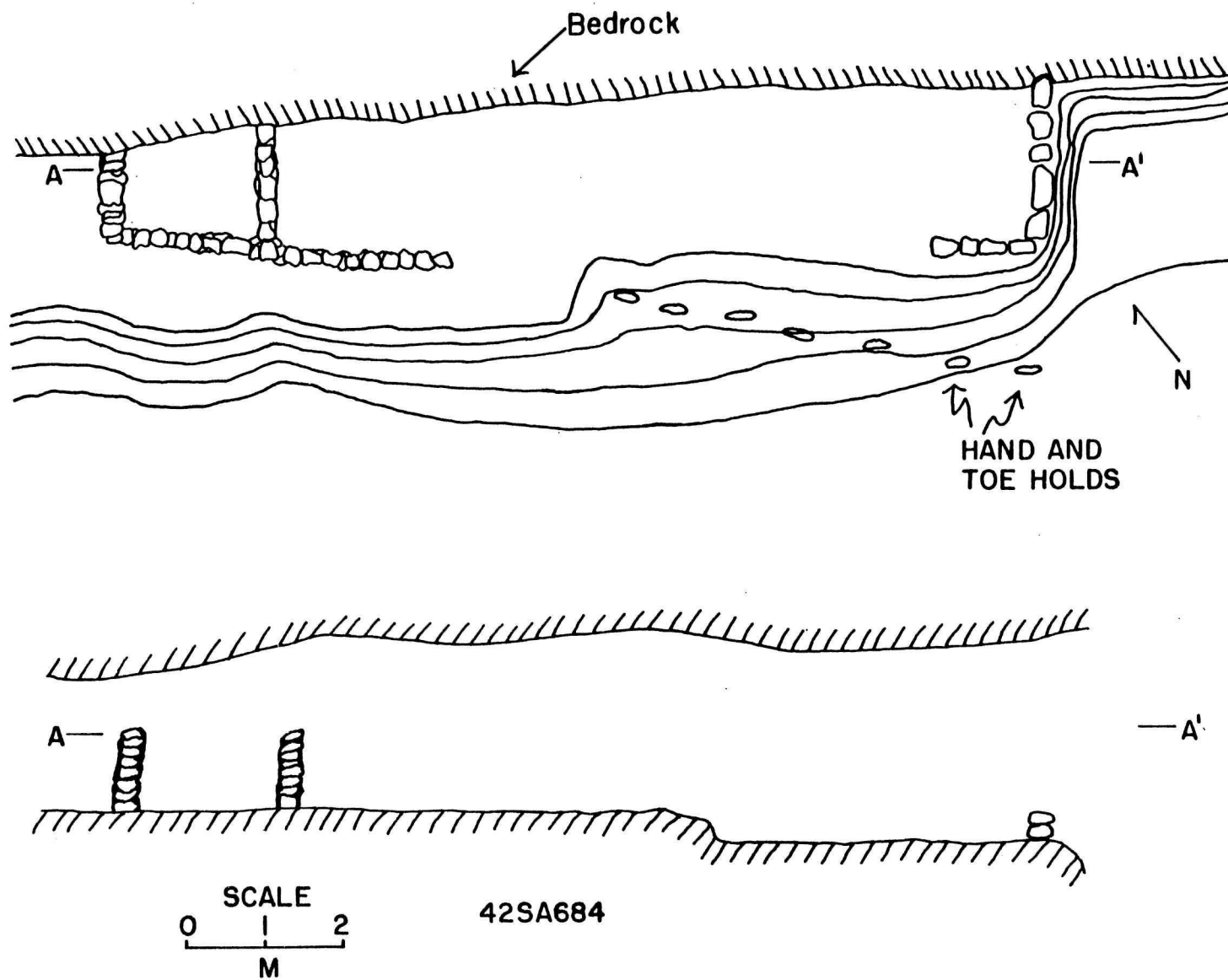


Figure 48. Planimetric view and cross section of 42SA684

