NEVADA Archaeologist

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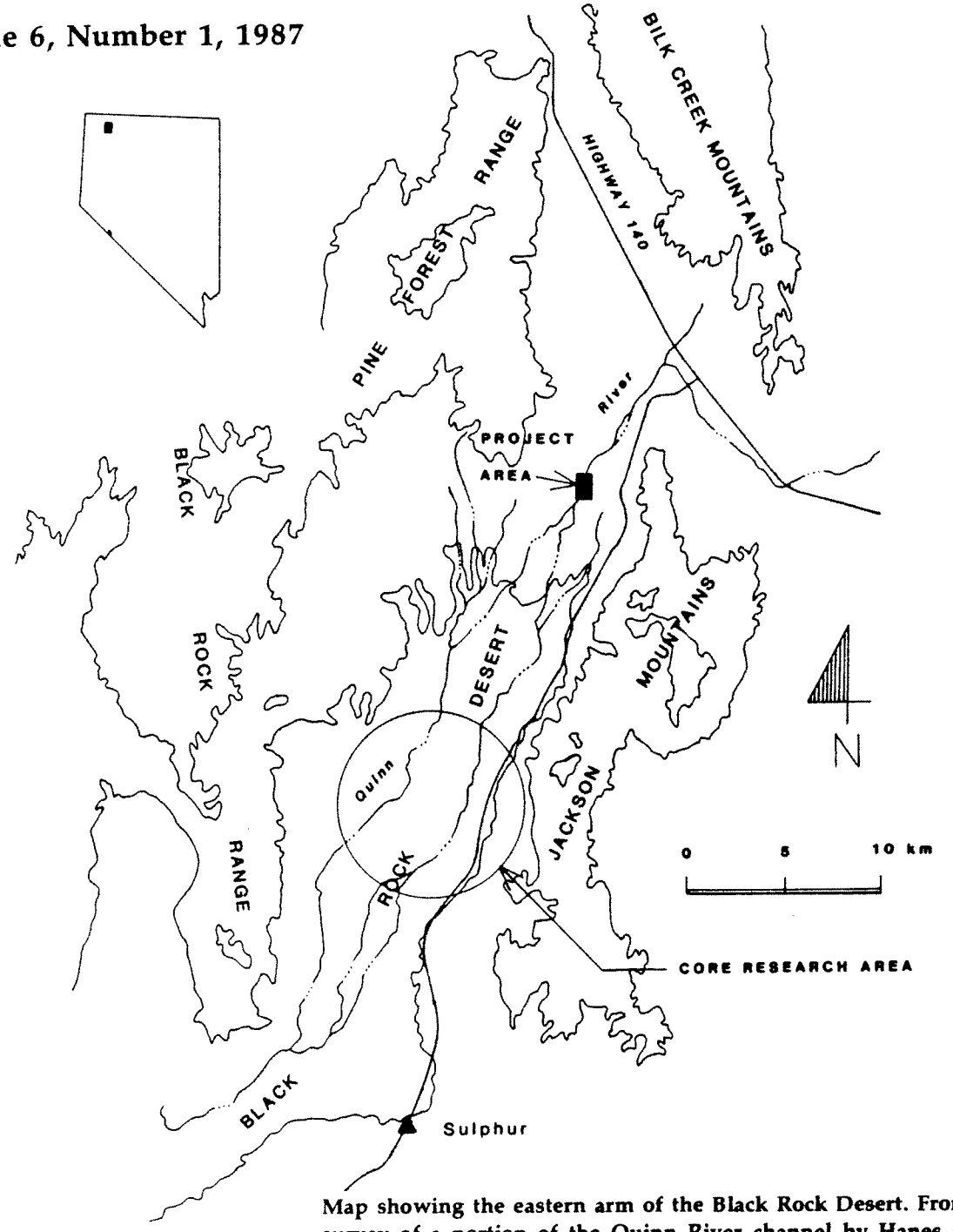

Map showing the eastern arm of the Black Rock Desert. From a survey of a portion of the Quinn River channel by Hanes and McGukian, this volume.

Nevada Archaeological Association

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The design for the NAA logo was taken from a Garfield Flat petroglyph by Robert Elston.

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Manuscripts submitted to the *Nevada Archaeologist* should follow the style guide of the January, 1979 issue of *American Antiquity*. Manuscripts should be typed and double spaced throughout, including notes and bibliography, and illustrations should be camera-ready with a caption typed on a separate sheet of paper, also double-spaced. Something less than these standards will be accepted reluctantly if what you have to say is more important than the format expressed above.

More manuscripts relating to Nevada archaeology and anthropolgy, in general, are solicited.

NEVADA Archaeologist

Volume 6, Number 1 1987

IT'S TIME FOR A CHANGE

It has been 15 years since the initial publication of this journal in 1972. The first three years it was guided by Mrs. Jean Myles who served as editor and publisher. After seven years, I was appointed editor, and I called for a "Phoenix Issue" to revivify the journal for the members. I have edited this journal for seven issues in the past seven years, and now it is time for a change. Already this year, Dr. Robert Elston has put out two issues of the *Newsletter* to further communications between us. The Fall issue, Volume 6, Number 2, will be edited by Dr. Gary Haynes of the Department of Anthropology of the University of Nevada, Reno. If I have any suggestion to make, it would be to solicit manuscripts from the amateur members and keep their interest level up and participation current. Good luck, Gary.

DRT

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AN ELEPHANT BY ANY OTHER NAME: REPLY TO MAWBY

Richard Ryan

According to Mawby, my article in Nevada Archaeologist Vol. 5, No. 1 contained "quite a batch of errors." I quote directly from his letter in Vol. 5, No. 2. "He (Ryan 1985:10) seems to imply that the Rancholabrean megafauna of the Great Basin included Castoroides (which he misspells) and tapirs." Before answering this charge, I must bring to Mawby's attention the fact that he has failed to underline the Latin word Castoroides. But not wishing to start a running feud, and in fairness to both of us, I suggest that my misspelling, and his failure to underline, were both simple typographic errors.

As to the assertion that I implied the presence of extinct animals in the Great Basin for which there is no record, I have several comments. First, in the article I made no reference to Rancholabrean megafauna of the Great Basin, but rather, to "Rancholabrean megafauna of the Ice Age." There is a clear difference. It is important that this be clarified for the reader. Specific to the Great Basin, I have written on extinct megafauna (animals with body weight exceeding 100 pounds) in Appendix A, Desert Research Institute Technical Report No. 42, 1984. It is a brief piece that would be of interest to your readers.

When he indicates that my use of Mylodon is erroneous, Mawby is guilty of taxonomic hair-splitting. A word of clarification for the reader is also in order here. In the literature, one will encounter the terms Mylodon harlani, Paramylodon harlani and Glossotherium harlani, all three of which refer to the same animal -- the giant ground sloth. This very unusual herbivore is not well known in the Great Basin. Mawby is correct that Glossotherium is commonly accepted today, although there is still some quarreling (Jim I. Mead, personal communication).

Lastly, as for "the mastodon is not an elephant," Mawby is also correct. The mastodon has a trunk, two fine tusks, and most of the right equipment, but by any other name, it still only qualifies as an "elephant-like" animal. However, archaeologists bend the rules of zoological nomenclature for the mastodon; I refer to your article "Nevada's Fossil Elephants" in the last issue.

I trust that I have clarified the "erroneous information, etc." that was attributed to my article. The remarkable menagerie of extinct creatures that existed with early Paleoindians is truly a fascinating subject. I urge the readers of Nevada Archaeologist to pursue it.

ARCHAEOLOGICAL SURVEY ALONG THE QUINN RIVER BLACK ROCK DESERT, NEVADA

Richard C. Hanes
Bureau of Land Management
Portland, Oregon

Peggy McGuckian
Bureau of Land Management
Winnemucca, Nevada

The Black Rock Desert in northwest Nevada has long been noted for its unique natural history values as well as a region rich in archaeological remains. Because of these factors, the Bureau of Land Management undertook development of a management plan focusing on the eastern arm of the Black Rock Desert north of Sulphur (Pedrick 1984). During the course of developing the plan, data addressing many of the area's characteristics was to be gathered and synthesized into the document providing the basis for making future use allocations and implementing protective measures. As part of the archaeological role in contributing to the document, a survey of the upper reaches of the Quinn River

away from the main playa area was desired to provide information supplementary to the ongoing work performed the past two decades by Clewlow (1968, 1983). A systematic sample survey was performed by BLM personnel in August, 1985. The results are provided below.

BACKGROUND

Clewlow's regional studies have generally considered a broad area including playa and surrounding higher terrain. However, the focus of the effort, where much of the spectacular early cultural materials and fossil big game remains have been found, is in the immediate "sink or pool of the Quinn River, which flows in from ... the northeast and dissipates itself in a number of dampish sloughs and channels" (Clewlow 1968:3). Within this study core zone (Figure 1) several expansive sites have been recorded (Hu-17, Hu-22, Hu-55, and Hu-65), each actually consisting of a number of more localized concentrations of cultural materials. Between the dispersed concentrations of lithic materials were found diffuse scatters of lithics. The key characteristics of these localities is the apparent broad time range represented by the temporally sensitive lithic forms (pre-Archaic to late Archaic) and the presence of numerous late Pleistocene fossil vertebrate localities, containing mammoth, camelid, and bison remains (Clewlow 1968, 1983). The earlier cultural remains are represented by Clovis, Great Basin Stemmed, and Black Rock Concave Base point styles, crescentic shaped bifaces, and distinctive beaked stone tools.

Common early Archaic cultural manifestations found in the playa area are Northern Side-notched, Pinto, Elko series, and Humboldt series projectile point styles. The less common late Archaic tools observed include Rosegate series, Desert series, and Gunther Barbed projectile points. Material type for the points and debitage is predominantly obsidian, with chert for the crescents.

A more restrictive range of prehistoric time markers have been discovered away from the playa core study zone. Two locations (Hu-21 and Hu-23) were identified by the earlier surveys north of the core zone nearer the present project area. One site was situated among stabilized dunes on the valley floor, the other on greasewood flats toward the western slopes of the Jackson Mountains. At both sites were found large amounts of obsidian debitage and the early Archaic point styles of Northern Side-notched, Elko series, and Humboldt series forms. A few later Rosegate series points were also found at one of the locations. Elko series point forms have a somewhat broader distribution in the immediate Black Rock Desert area, appearing with house floors at the Trego Site (Seck 1980), located southwest of Sulphur, and with Rosegate series forms at Barrel Springs (Cowan 1972).

In the High Rock country to the west, a similar suite of point styles constituted Layton's (1970:317) Silent Snake Phase (Humboldt series, Pinto series, and Northern Side-notched) with an assigned time range of 6000-3500 B.P., and early Smokey Creek Phase (Elko series) with a 3500 to 1500 B.P. estimated range. Apparently, it was during these periods that the Desert Culture became established and reached its zenith in the area. A more recent survey in the Black Rock Range (Elston and Davis 1979:121) provides further evidence of extensive exploitation of all environments during the same time period, with a narrower environmental range being utilized subsequently.

In sum, the early Archaic dart points have been found in all settings, from the playa floor (Clewlow 1968; Hester 1977) to the flanking slopes (e.g., Buckbrush Springs), and throughout the Black Rock Range (Elston and Davis 1979), including the high elevation spring site at Summit Twin Springs (Clewlow 1981). Though still later Archaic point styles (Rosegate, Desert,

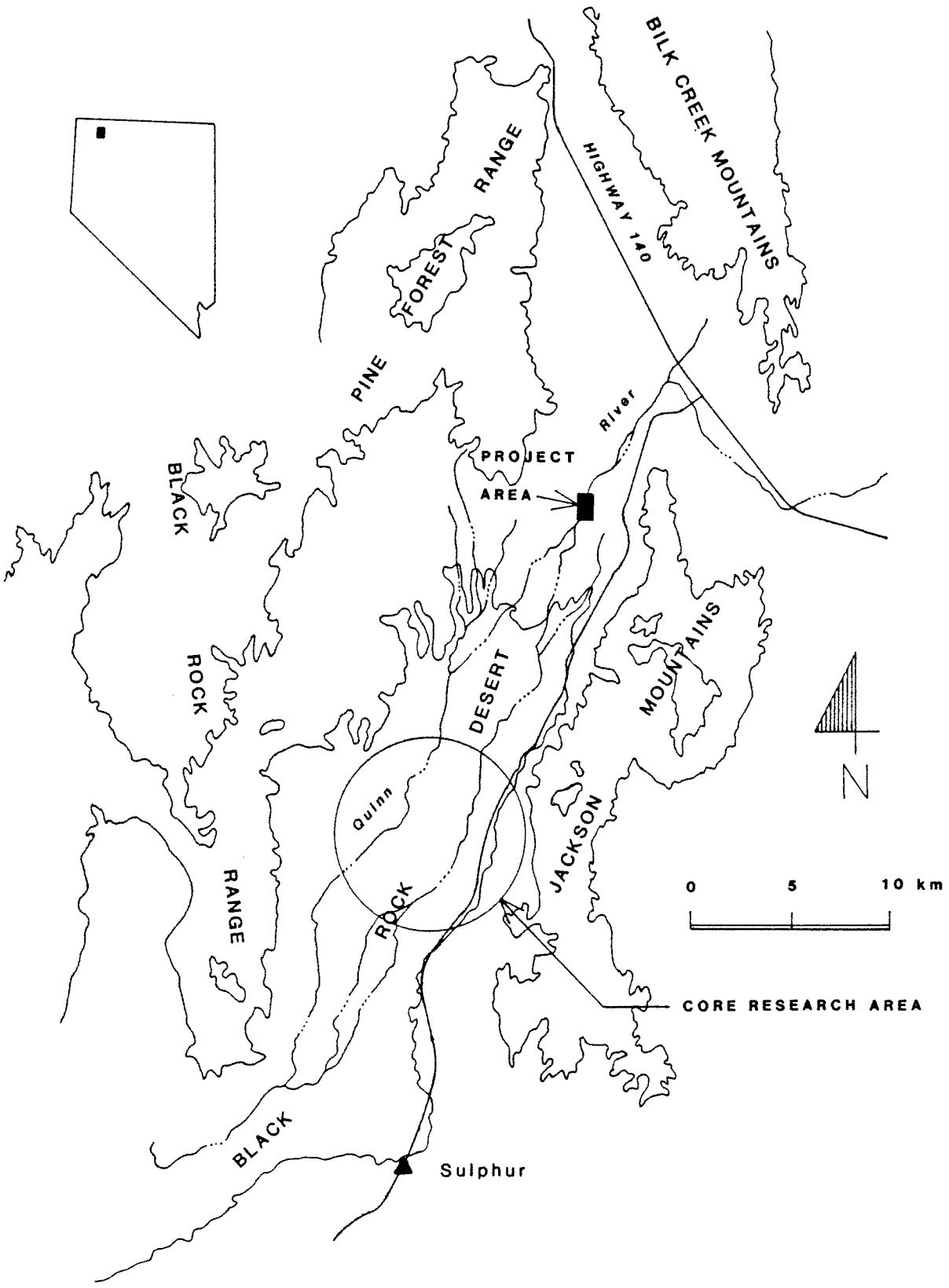

Figure 1. Map of the Eastern Arm of the Black Rock Desert showing the project area.

and Gunther series) were found on and immediately around the playa area, a greater relative incidence of late materials were discovered in association with nearby springs, such as Double Hot, McFarlan Bath, and Barrel Springs (Clewlow 1968; Cowan 1972).

Clewlow (1968:50) early on perceived such a marked distribution pattern of projectile point forms based on admittedly unsystematic but broad regional familiarity with the area. The occurrence of later point styles is associated predominantly with foothill spring sources, the early pre-Archaic styles with the more immediate playa pool area, and the early Archaic materials scattered throughout the area, but more common in the lower elevations.

Given the above temporal and distributional framework to work from, our goal was to determine if utilization of the immediate Quinn River area conformed to this very coarse-grained "model." If findings in the proposed survey area do conform, then we would expect to find early Archaic campsites with little manifestations of Paleo-Indian and late Archaic time periods.

Figure 2. Map of the project area showing artifact discovery localities A-E.

SETTING

With the apparent focus of research occurring in the southern portion of the proposed BLM special management area, at the pool area of the Quinn River, the need for more data from the northern portion, along the Quinn River channel was identified. A 960 acre parcel along a two mile stretch of the Quinn River channel, a short distance south of the Leonard Creek Ranch road, was selected for survey. The project area is located approximately 30 kilometers north of the core research area which yielded numerous Paleo-Indian and extinct megafauna discoveries (Figure 2).

The majority of the project area surveyed lies along the banks and within the floodplain of the Quinn River, an ephemeral stream which entrenched itself in this lakebed of prehistoric Lake Lahontan following the dessication of the lake. Originating in the Santa Rosa Range southeast of McDermitt, the Quinn meanders southwest to its terminus in the Black Rock Desert. Fed by storm runoff and snow melt, the river flows from November through July, peaking in March and April. Maximum flow is approximately 1000 cubic feet per second (Tol, personal communication, 1987). Throughout most of the summer the river is a dry channel. During the winter the river spreads out into the playa immediately to the south of the project area, forming a long narrow shallow lake, which early European travelers referred to as "Mud Lake" (Lohse 1980:9). During the spring, the Quinn in the Black Rock Desert area provides habitat for migrating waterfowl (shore birds and puddle ducks).

The local climate is arid, characterized by cold winters, hot summers and frequent droughts. Average annual precipitation is 13 centimeters. The vege-

tation of the project area is primarily greasewood with some shadscale. Along the river banks Great Basin wild rye, squirreltail and saltgrass also grow. Some sagebrush and rabbitbrush occur in the surrounding area.

Soils are composed of silt and clay and are fairly saline and alkaline in character. Shrubs have stabilized the loosely consolidated soils and collected windblown soils around their bases creating hummocks which arise out of the otherwise level plain of the dry lakebed. Both the main channel and overflow channels of the Quinn River cut through this portion of the Black Rock Desert.

SURVEY METHODS

The area selected for survey, though basically following the main Quinn River channel, was established in conformance with the established cadastral grid system. Hence, due to the extremely irregular meander of the stream channel, parts of the survey parcels were as far as 1.2 kilometers away from the stream course. Therefore, not only would a particular stretch of the immediate stream banks be systematically inspected, but also artifact distribution patterning away from the channel could be assessed. A four person crew walked parallel transects at 100 meter spacings, noting artifact occurrences on their respective transects as they were discovered. The individual discoveries were later plotted on a map and "sites" defined for subsequent formal recording and analysis. No artifact collections were made; all worked items were sketched in the field.

FINDINGS

As unattractive for habitation as the immediate vicinity of the survey area appears today, a significant quantity of prehistoric cultural debris was observed. Additionally, time diagnostic lithic tools are well represented in the field observations. Given the history of artifact collecting in the region, no complete specimens were found and the larger fragments discovered were away from the highly visible debitage concentrations. Artifacts, including debitage, were predominantly of black obsidian with a small quantity of chert, and rare items of basalt. Though the discoveries were not exclusively associated within a certain definable distance from the immediate stream channel, there does appear to be a greater density of materials nearer the stream banks. Five separate localities of surface materials can be delineated and are identified as areas A-E in Figure 2.

Area A: A very dense concentration of mostly obsidian debris was identified in a marked bed of the river channel. The large quantity of chipped stone materials in a confined area and the presence of some ground stone implements makes this locale very distinctive for the survey area. The site is primarily on the east bank of the channel. Diagnostics include a possible Black Rock Concave Base form (Figure 3s) and two Northern Side-notched fragments (Figure 3q,r) with another isolated Northern Side-notched form found about 400 meters to the west (Figure 3g).

Area B: An area distant from the immediate river channel contains small clusters of obsidian and chert debitage and two Elko series point forms (Figure 3i,k). The series of clusters and inter-spaced isolates appear to be associated with the overflow channels of the Quinn.

Area C: A large, very dispersed scatter of lithic items includes a light concentration on the east bank of the river channel in the middle of the larger area. Time diagnostics include two Northern Side-notched forms (Figure 3a,h) and an Elko series form (Figure 3j).

Area D: A very dispersed scattering of only a few flakes and biface fragments was found on the flat valley floor away from the river channel. No time diagnostics were observed.

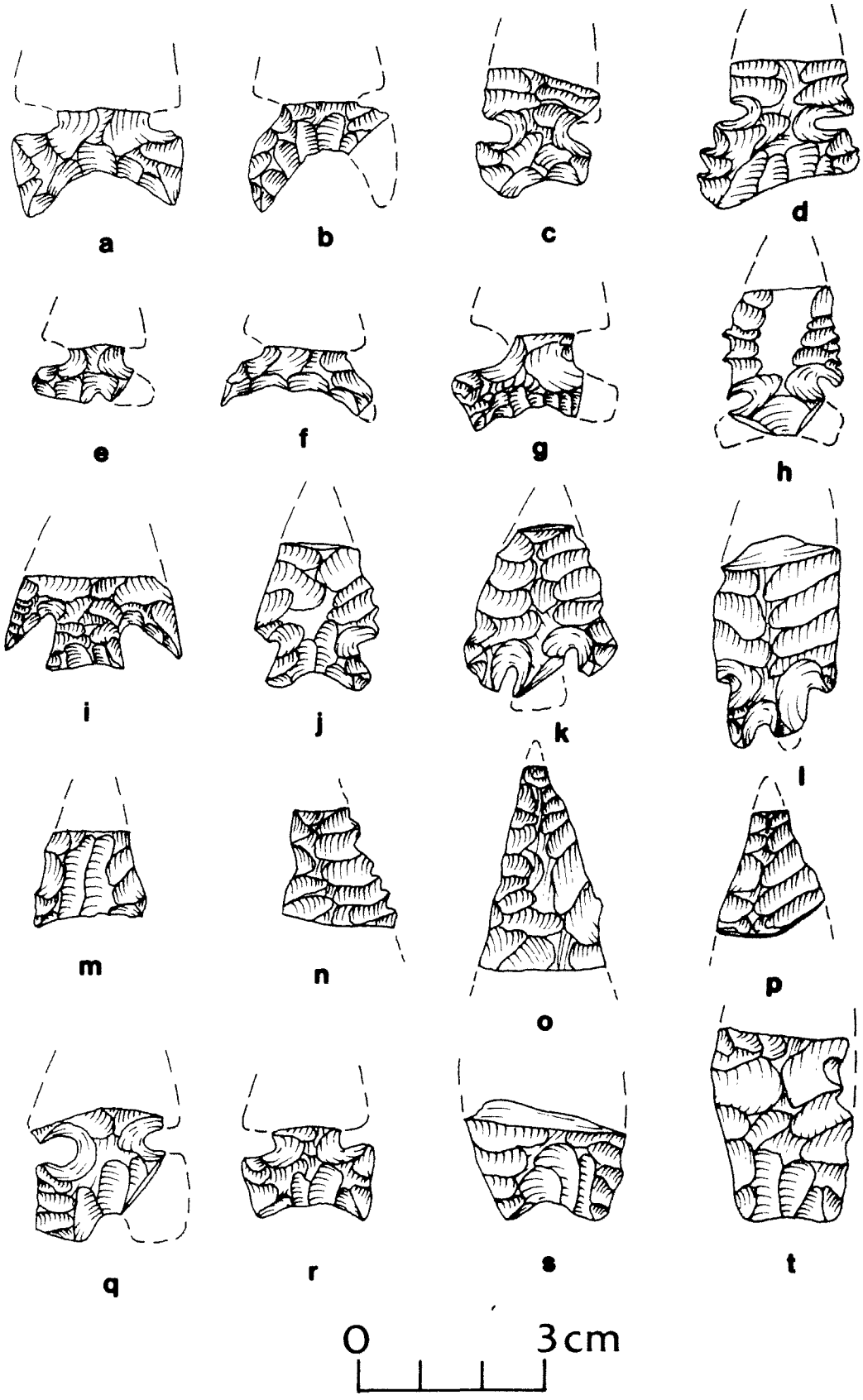

Figure 3. Projectile points and biface fragments observed in project area.

Area E: A large scattering of lithic debris exhibits a greater density nearer the river channel and to the west. Time diagnostics include four Northern Side-notched forms (Figure 3b-d,f) and two Pinto forms.

A small number of isolated artifacts were also found between the localities briefly described above (Figure 3m).

All time diagnostic materials can be attributed to the early Archaic Silent Snake Springs and Smokey Creek occupational phases of the High Rock country, except for a single base of a Black Rock Concave Base point (Figure 3s). The most frequent point type observed was the large side-notched form with marked concave basal edge (Figure 3a-h,q,r). Other point forms include Elko (Figure 3i-k) and Pinto (Figure 3l) series. Point blade fragments were typically of the dart size range (Figure 3n-p). Biface fragments noted at the campsite location (Area A) also include the base of a large lanceolate specimen, probably a preform (Figure 3t).

When viewed in total, the surveyed area seems to contain a single intensively occupied campsite, with less intense but persistent use radiating out, primarily along the stream course. The homogeneity of material types and forms throughout the study area, and among areas A, C, and E in particular, is striking when viewed in the field. If use was confined to a narrow, early time span, it would not be difficult to envision based on the debris observed.

CONCLUSION

Time indicators observed during the survey suggest almost exclusive use of the main Quinn River channel north of the playa area during early Archaic periods. This finding would suggest that the Quinn River flow would have still been suitable to attract campsites for a certain "lag" period after ultimate desiccation of the post pluvial lake. Once a certain threshold in climatic deterioration was attained, later occupation of the valley floor in the eastern arm of the Black Rock Desert became unattractive, despite possible pool recurrences of the lake.

The prevalence of large side-notched forms, found throughout the Black Rock Desert region including the Quinn River sites, provide an interesting facet to the archaeological record of the area. Uncommon in most of the Great Basin in Nevada (Elston 1982:194), they constitute the most common style in some northwest Nevada assemblages. Similarly, Northern Side-notched points are a marker of the Menlo Phase in Surprise Valley, considered a period of relatively greater sedentarism in the 6000 to 5000 B.P. time range (O'Connell 1975:28). Being an apparent oddity to the usual mixture of Humboldt, Pinto, and Elko series styles marking early Desert Archaic occupations, they have been suggested as a marker for intrusive early populations from northeast of the Great Basin (McGonagle 1979:64). Evidence for Dirty Shame Rockshelter (Hanes 1987), located in the far southeastern corner of Oregon, documents the introduction of the Northern Side-notched point form into the northern Great Basin region approximately 8000 years ago, replacing an earlier array of large lanceolate point forms. The importance of this northwest Nevada phenomena would pose and interesting future study topic.

These recent survey results provide further support to the earlier findings, that the earliest occupations of the region were oriented toward the shallow waters and marshes of the now seasonally dry playa area. The playa area was subsequently used less intensively, with the late occupations largely focused at springs at elevations above the playa. Additionally, as Hester (1973:5) surmised, use of the Black Rock Desert region as a whole also decreased in intensity with degeneration of the regional environment. On a final note, the distribution of archaeological mat-

erials on the Black Rock Desert valley floor documents not only the fact that utilization of the region was tethered to water sources (Lohse 1980:210), but also attests to the apparent stability of the Quinn River channel itself over possibly the past 6000 years. Hopefully, future work in the region can further substantiate the spatial patterning identified, and establish a more refined chronological framework.

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ARCHAEOLOGICAL SURVEY OF THE SUSIE CREEK AREA ELKO COUNTY, NEVADA

Lynda Armentrout and Richard C. Hanes
Bureau of Land Management

INTRODUCTION

An extensive archaeological survey of 9000 acres was conducted in 1979 in the Susie Creek drainage area north of the townsite of Carlin, Nevada (Figure 1). The survey also included an additional 2000 acre parcel toward the town of Elko near the north bank of the Humboldt River at the confluence with South Fork. A survey revealed a markedly varying degree in density of finds and distinct patterns in the character of the archaeological record.

The survey was conducted in response to plans to mechanically seed portions of a large burn area which resulted from a series of three lightning caused fires which burned in July, 1979. Burning intensity varied with the terrain and wind conditions, leaving unburned fingers and islands of vegetation throughout the area. A total of nearly 48,000 acres burned, of which 21,500 were public lands. Mechanical seeding and chaining was proposed for about half of the public land area leading to the survey.

Due to the urgency of the survey, it was performed by BLM archaeologists Hugh Ball, Robert Crabtree, Richard Hanes, Roberta McGonagle, and Patrick Welch under the direction of Lynda Armentrout. Twenty-two other Bureau employees assisted in the effort. The survey strategy adopted involved the surveyors walking parallel transects, usually in an east-west fashion, using topographic features, such as valley basins, as investigative units. The spacing between surveyors varied according to the terrain, but averaged 15 meters. Non-burned islands of vegetation were included in the survey. Isolated artifacts and small artifact scatters were recorded and collected. Larger sites were mapped, recorded, and flagged for avoidance by the drilling and chaining machinery.

ENVIRONMENTAL SETTING

One major perennial stream flows through the survey area, Susie Creek, and two others are nearby, the Humboldt River to the southeast, and Maggie Creek to the west. A number of intermittent streams are also located within the survey area including Dry Susie Creek and Dry Gulch, the latter a tributary to Susie Creek. Though a few springs occur nearby, including Hot Springs to the south, none are actually within the surveyed areas.

The survey area is characterized by the low rolling hills to the west and

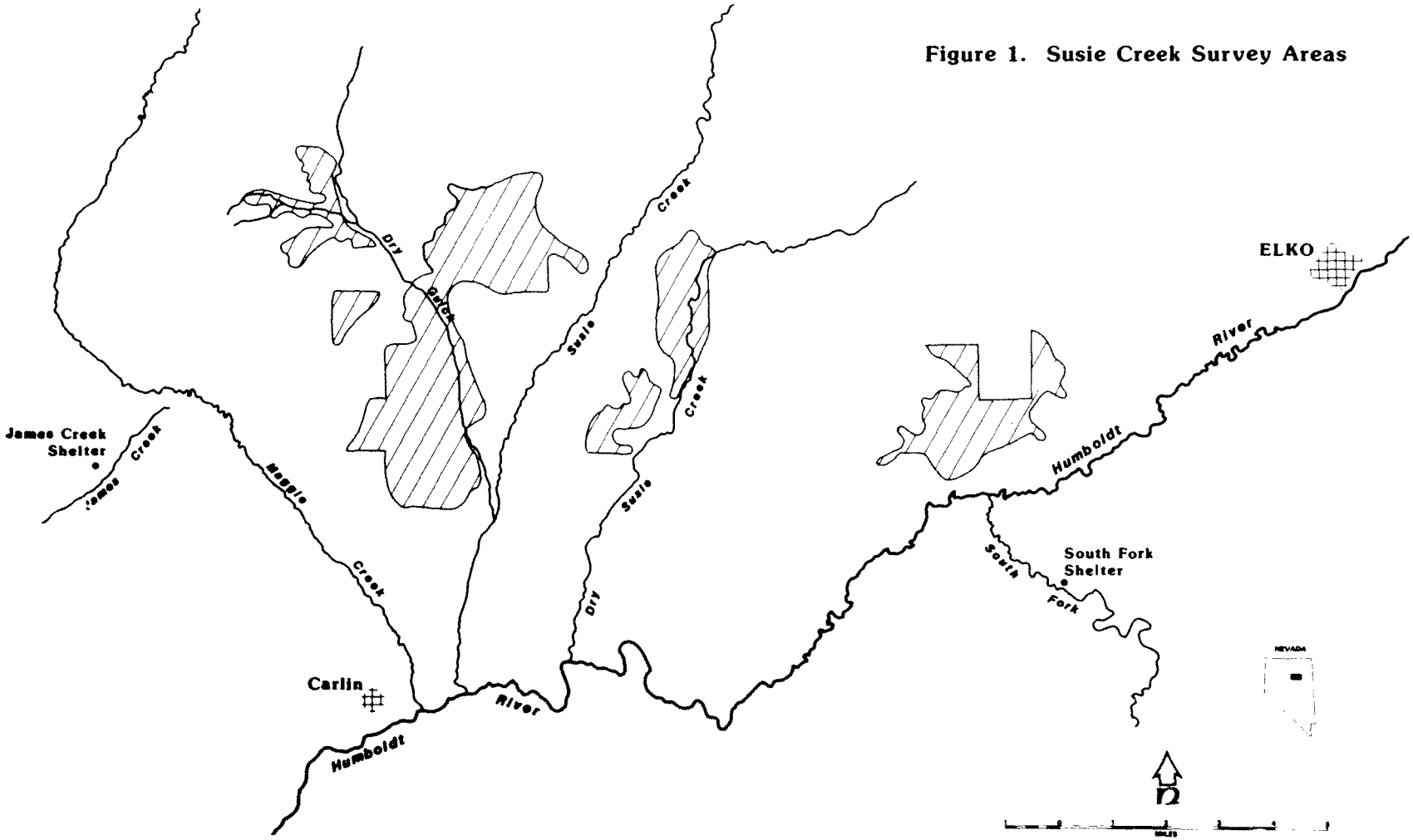

Figure 1. Susie Creek Survey Areas

the southern flank of the Adobe Range to the east. Elevations in the area vary from 5000 feet in lower Susie Creek and along the Humboldt River to 6000 feet in the Adobe Range. Slopes generally have a southern exposure. Soils are primarily moderately deep and well drained with some shallow, gravelly textured soils in some areas. Kuchler (1964) places the survey area into the Great Basin Sagebrush Association. This association is dominated by sagebrush species (Artemisia) with an understory of Bluebunch wheatgrass (Agropyron spicatum), Idaho fescue (Festuca idahoensis), squirreltail (Sistanion hystrix), Indian ricegrass (Oryzopsis hymenoides), Great Basin wildrye (Elymus cinereus), and cheatgrass (Bromus tectorum). Principle forbs include Phlox spp., Eriogonum spp., Lomatiums spp., and Lupine spp. Other vegetation types include antelope bitterbrush (Purshia tridentata), rabbitbrush (Chrysothamnus spp.), prickly pear (Opuntia spp.), spiny hopsage (Grayia spinosa), quaking aspen (Populus tremuloides), and Utah juniper(Juniperus osteosperma). The upper Susie Creek area is a migration route for mule deer and much of the survey area provides winter range for the deer. Other forms of wildlife includes black-tailed jack rabbits, badgers, yellow-bellied marmots, chukar, sage grouse, and the more common smaller rodents, reptiles, and avifauna.

ARCHAEOLOGICAL AND ETHNOLOGICAL BACKGROUND

Chronological information for the immediate area is provided by two rockshelters which have been excavated at each end of the survey area, James Creek Shelter (Budy and Elston 1986) to the west across Maggie Creek, and South Fork Shelter to the east, near the mouth of the South Fork (Heizer et al. 1968; Spencer et al. 1986). A series of four open sites consisting of large lithic scatters with some groundstone, rockclusters, firepits and ash lenses were also excavated immediately south, on the north side of the Humboldt River between Maggie and Susie creeks (Rusco et al. 1979). James Creek Shelter and South Fork Shelter provide information dating back over 7000 years, but mostly in the past 3000 years when occupation intensified and organic materials and occupational features are preserved. All three projects record the occurrence of Humboldt series, Pinto, Elko series, Rosegate series, and Desert series projectile point forms and Shoshone ceramics in the area.

An archaeological survey in the James Creek area also revealed a similar array of time sensitive artifacts and indicated use of the area through brief visits for hunting and tool manufacture (Clerico 1983). Additionally, a large site was recorded in lower Susie Creek at Hot Springs (Stanley Jaynes, personal communication 1986). The site contains Humboldt, Rosegate and Desert series point types, groundstone, Shoshone ware, and basalt use.

Steward (1938:155) noted the occurrence of at least two villages on the Humboldt River in the vicinity of the survey. "People lived along the Humboldt River from Susie Creek to South Fork and somewhat on both tributaries, and near Hot Springs. Although camps were scattered, perhaps 1 or 2 miles apart, the preferred site was a village at the mouth of South Fork." Steward (1938:157,159) further noted the abundance of seeds on Susie Creek and the presence of a fish dam a short way up the creek from its mouth. A root food was found at Hot Springs.

SURVEY RESULTS

A total of 229 locations of cultural finds was recorded, including 24 larger sites which were field recorded and not collected. Of the larger sites, 16 are campsite/workshop locations most of which are small and contain primarily debitage with some biface fragments and hammerstones. The largest camp-

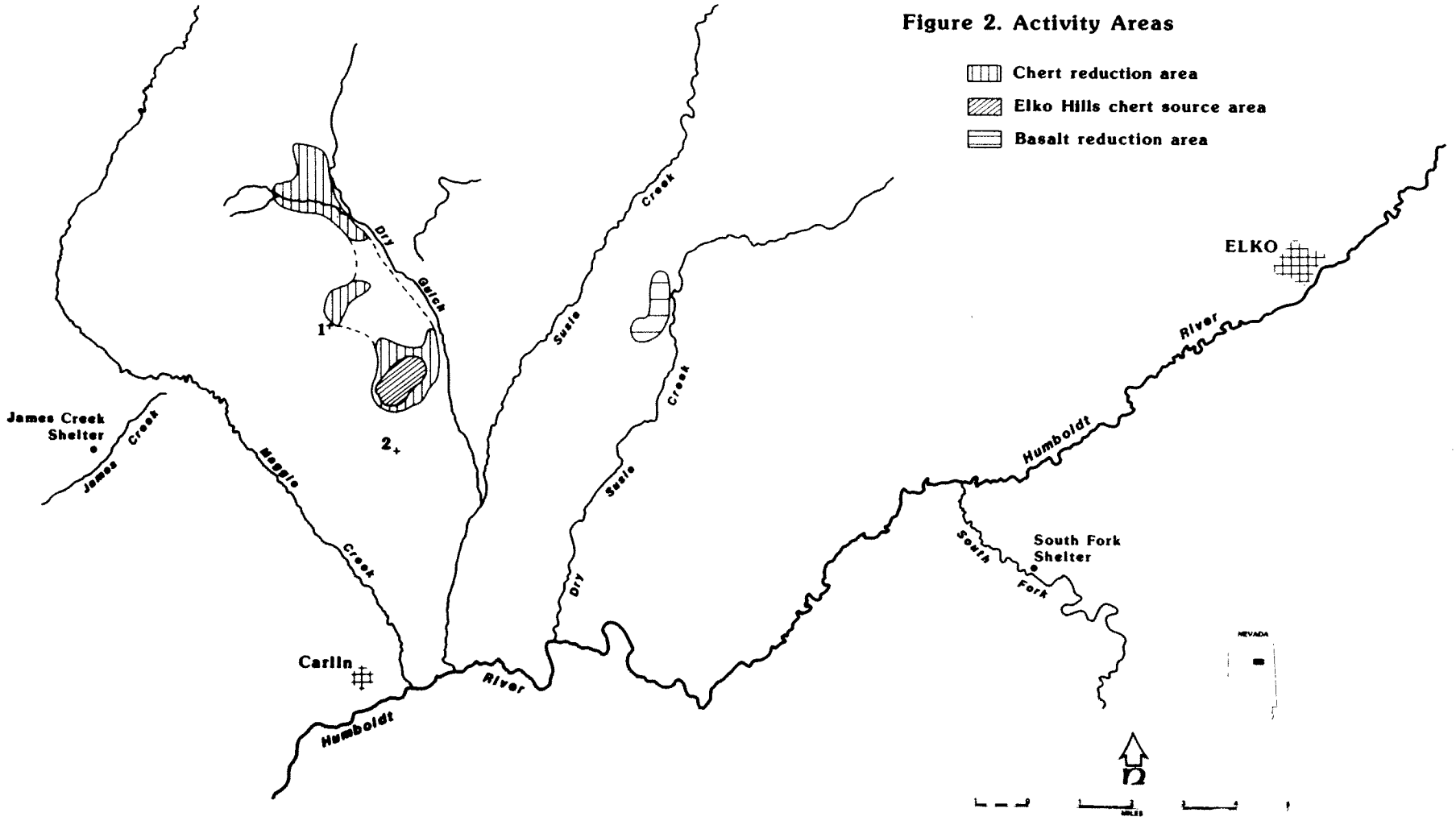

Figure 2. Activity Areas

site/workshop site is over 100 acres in size and located in proximity to the quarry areas described below. The site is a very large lithic scatter with a number of artifact concentrations of primary and secondary flakes, casual cores, exhausted cores, biface fragments, and only one completed projectile point (Humboldt series). The remaining eight larger sites are quarry locations where cobbles of natural chert toolstone may be found. These materials were found eroding out of alluvial terraces and hillsides in gently undulating terrain. Prehistoric utilization of these locations is testified by the presence of flakes, shatter and cores at each of the eight sites.

Artifacts found at the other 205 locations were collected and are described in the following sections. For final recordation purposes, the 229 discovery locations were combined into 12 "sites" based on geographic proximity and assigned Smithsonian numbers 26Ek2951-26Ek2962.

ARTIFACTS COLLECTED

A total of 518 stone artifacts was collected during the survey, including: 358 flakes and flake fragments; 62 angular pieces of chipped stone; 96 cores, bifaces and unifaces; and, two groundstone items. A small scatter of pottery was also collected. All occurrences were in the form of isolates and small confined scatters of debris as described above. The chipped stone are described by raw material type since obvious distinctions are recognizable. All flakes, flake fragments and angular pieces were size graded and cortex presence noted.

LOCAL MATERIALS

Highly Translucent White Chalcedony

The predominate material type discovered in the survey is a translucent white chalcedony which varies to gray and brown tints and to almost a clear opalite form. Seven quarry locations and two campsite/workshop locations were recorded in the hills between Maggie Creek and Dry Gulch. There are no quartz-like inclusions like the Tosawihi materials to the west, and the Dry Gulch material is much more translucent. Elston (1986) considers this material part of the Elko Hills variant of cryptocrystalline materials available in the upper Humboldt River basin. Obviously, the natural occurrence of this material in the Dry Gulch area was a major attraction for people using the area in prehistoric times. In addition to the campsites and quarries recorded in the field, a total of 158 flakes and flake fragments was collected. This number constituted over half (51%) of the flakes collected in the entire survey. Fifty-eight (37%) of the flakes still had some degree of cortex remaining. The vast majority of flakes are hard hammer percussion forms ranging up to 80 mm in length. In addition, 16 angular chunks were recovered, six of which had cortex, and nine large cores (up to 90 mm in diameter) having multifaceted surfaces. A striking feature of the survey assemblage is the paucity of worked items of this material. Only one finished point may be firmly attributed to this material, an Elko series form (Figure 3r), in addition to a point fragment and two biface fragments.

Basalt

Dark colored, coarse-grained volcanic rocks were also procured locally, but as yet the precise source location is unidentified. Apparently the source is on Dry Susie Creek. In a highly confined area large flakes were produced and utilized. Eleven flakes, mostly quite large (up to 144 mm in length) and having some remnants of cortex, were collected and a small campsite/workshop containing basalt in addition to chert materials was recorded.

Opaque, Highly Vitreous White Chert

Another form of siliceous stone naturally occurring in the same Dry Gulch location as the Elko Hills material is a very distinct opaque, very vitreous white chert. Relatively few flakes of this material were collected (16), almost half of which had some cortex (7). However, a high proportion of angular chunks were collected (18), primarily of a size much smaller (18-25 mm) than the average Elko Hills size (44 mm). Only one core of this material was found and no projectile points or other bifaces. Apparently, the material occurs in a small pebble form, thus limiting its utility.

Other Local Cherts

Various types of opaque, fine-grained chert materials were obviously collected locally, probably from stream cobbles or other low density occurrences. These may be distinguished by color: gray, gold, brown and red. A total of 38 gray flakes and chunks, two large cores (79 and 112 mm on long axis), a Humboldt series point (Figure 3a) and Eastgate point (Figure 4d), and a lanceolate blank (Figure 5c) was recovered. A total of 20 gold chert flakes was recovered, primarily in the lower Susie Creek area, but no worked items were collected except for a translucent probable Humboldt series form made of a highly translucent variant (Figure 3e). Brown chert was represented by 23 flakes (five with cortex) and three moderately sized cores. One worked item is a pink and brown mottled Eastgate point (Figure 4c). Red chert is represented by only three flakes (one quite large with cortex), a large utilized cobble, and a small Humboldt series point form (Figure 3b).

EXOTIC MATERIALS

Tosawihi Chert

The most commonly used exotic lithic raw material was an opaque to semi-translucent white to cream colored chert. Purple colored imperfections and macroscopic quartz crystals are also common distinctive attributes. Most notable of the Tosawihi collection are the numerous projectile points made of the material (Figure 3h,i,k,l,m,n,o,p,q; Figure 4a,b,h,i; Figure 5a), also blanks (Figure 4k,l,m,n,o; Figure 5d,e,f), and an eccentric bifacial tool (Figure 5b). Clearly, Tosawihi chert was the preferred tool making material in the Susie Creek area over a long time span. This being so despite the local occurrences of what appears to be an equally high grade of tool stone. In addition to the above illustrated collected items were seven point and biface fragments, a large core (79 mm long), an assayed cobble (104 mm), 76 flakes (only one with cortex), and 21 angular chunks (only five with cortex). Though some of the flakes and chunks could be variants of the local Elko Hills chert misidentified, their attributes and the marked absence of cortex suggest that they represent a collection of imported materials. The angular chunks of Tosawihi materials also have a markedly lower size range than the corresponding Elko Hills materials.

Volcanic Glass Materials

A few items of obsidian and ignimbrite were recovered from the area. Predictably, these materials are represented in the debitage collected by only one small utilized flake fragment of ignimbrite. The worked items include an obsidian triangular biface (Figure 3c), a probable Humboldt series point made of ignimbrite (Figure 3d), and Eastgate blade fragment of ignimbrite (Figure 4e), and a Rosegate series point fragment of obsidian (Figure 4f).

Other Materials

An assortment of other chert materials were collected which do not resemble the above material types and cannot be determined to be local or not. Five angular chunks (none with cortex) and 13 flakes (none with cortex), six biface

Figure 3. Projectile points collected.

a. **Humboldt series:** opaque, very fine-grained light gray CCS.

b. **Humboldt series:** opaque red jasper CCS with impact damage.

c. Triangular banded obsidian preform on markedly curved flake.

d. Probable **Humboldt series:** black ignimbrite, fine diagonal parallel flaking pattern.

e. Probable **Humboldt series:** trunslucent glassy light gold CCS.

f. **Humboldt series:** opaque red and gold CCS.

g. **Pinto:** semi-translucent white CCS.

h. **Pinto:** translucent glassy white CCS, serrated blade edges.

i. **Pinto:** semi-translucent white CCS.

j. **Pinto:** opaque black CCS, made on a curved flake.

k. Large triangular dart point: made on a thin curved flake of translucent white CCS, impact fractured, stem reworked.

l. Dart point mid-section: white translucent CCS with quartz inclusions.

m. **Elko series:** white translucent CCS, impact fractured.

n. **Elko series:** white translucent CCS with some inclusions, very finely flaked.

o. **Elko series:** semi-translucent heat-treated white CCS flake with quartz inclusions.

p. **Elko series:** translucent white CCS.

q. **Elko series:** opaque white CCS, reworked on one edge.

r. **Elko series:** highly translucent opalite, probably local material.

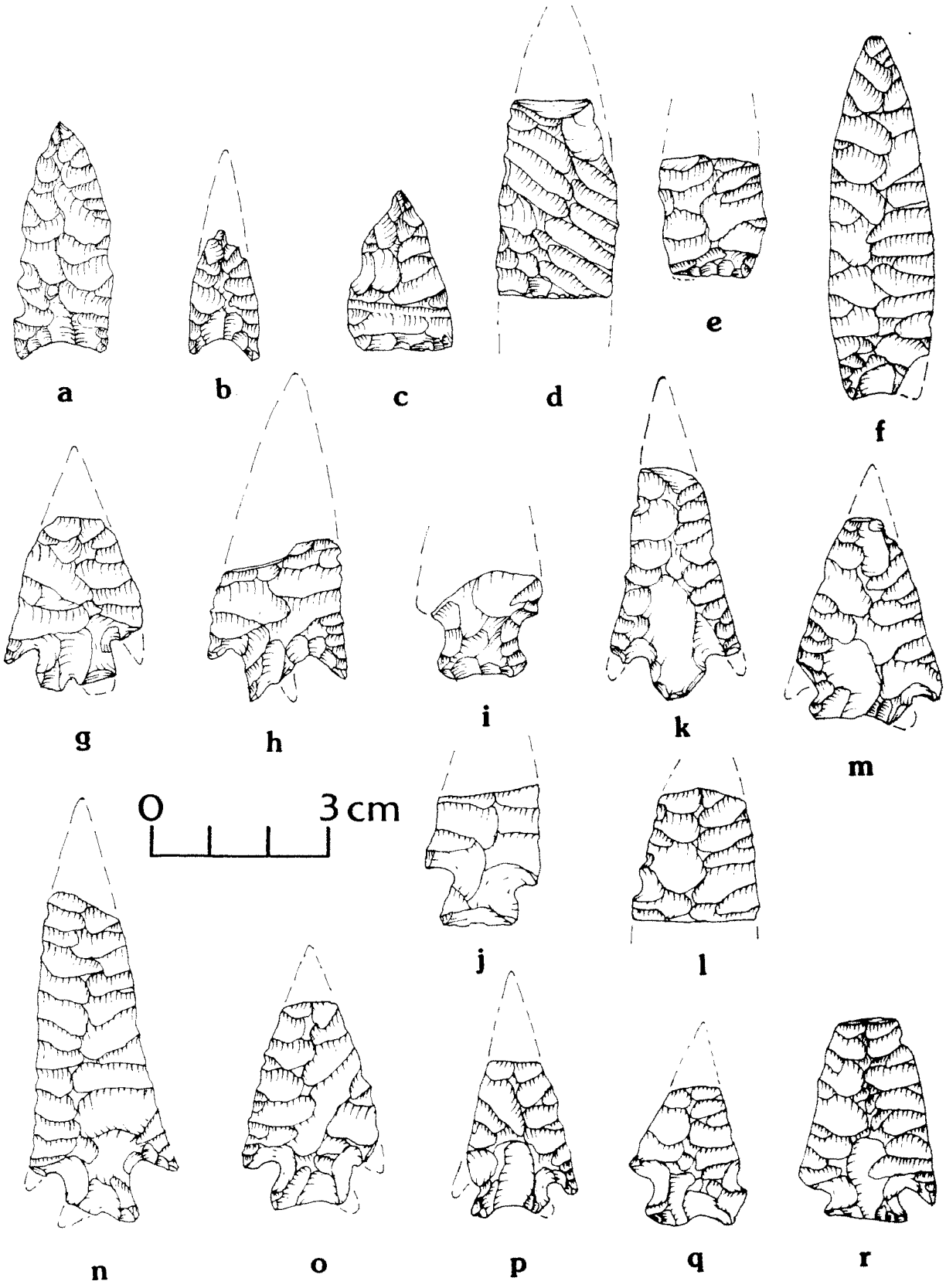

Figure 3

Figure 4. Projectile points and other bifaces collected.

a. **Eastgate series:** white translucent CCS, impact fractured.

b. **Eastgate series:** white translucent CCS, finely flaked with narrow notches.

c. **Eastgate series:** opaque fine-grained pink and brown mottled CCS.

d. **Eastgate series:** semi-translucent light gray CCS, heat damaged.

e. **Eastgate series:** blade fragment of black ignimbrite.

f. **Rosegate series:** banded obsidian.

g. **Rosegate series:** semi-translucent dark red CCS.

h. **Rose Spring corner-notched:** white translucent CCS, finely worked on a thin curved flake.

i. **Rosegate series:** white semi-translucent CCS, unifacial retouch on a thick flake, plano-convex cross-section.

j. **Rosegate series:** translucent ivory-colored CCS, made on a heat-treated flake, found with several flakes of the same material.

k. **Sub-triangular blank:** white translucent CCS, made on a heat-treated flake.

l. **Blank:** white and red mottled translucent CCS.

m. **Blank tip:** semi-translucent white CCS with quartz inclusions.

n. **Blank tip:** semi-translucent white CCS, possibly heat-treated due to observed sheen.

o. **Small triangular blank:** white semi-translucent CCS, marked heat treatment characteristics with pre-heated surface exhibiting a pinkish color and subsequent flake scars a glassy white, crudely irregular section, perhaps utilized as a cutting instrument.

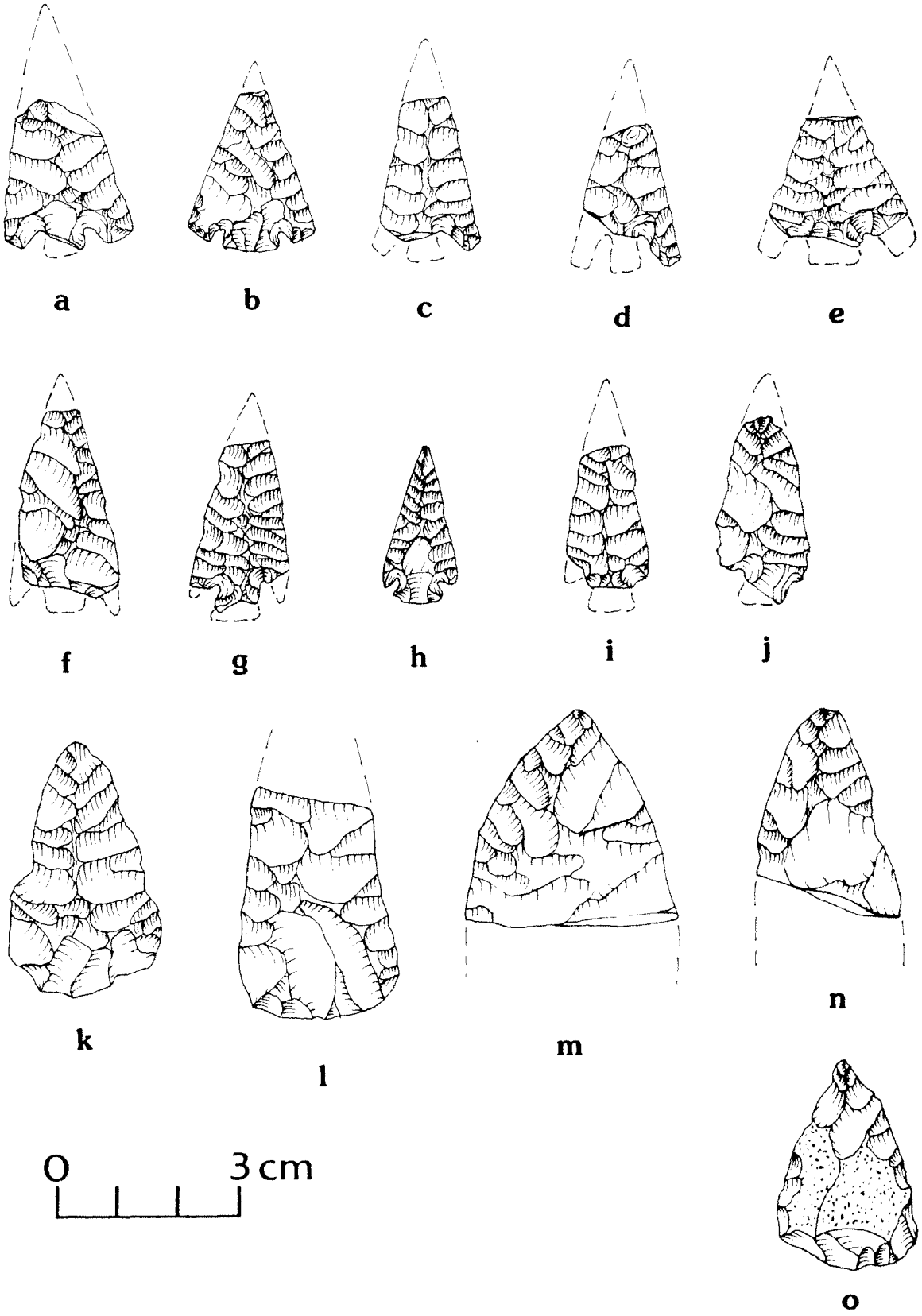

Figure 4

Figure 5. Projectile point, other bifaces and a uniface collected.

a. **Great Basin Stemmed point:** white and black mottled semi-translucent CCS, characteristic stem edge grinding and burin stem tip, the lower blade edge on one side has steep unifacial beveling.

b. **Bifacial tool:** opaque white and maroon colored CCS, bifacially refined edge, has one unifacially damaged edge and one highly polished edge.

c. **Lanceolate blank:** very coarse-grained opaque, brown and gray mottled CCS.

d. **Blank tip:** fine-grained white translucent CCS, edges finely retouched, perhaps heat-treated.

e. **Lanceolate blank:** semi-translucent white CCS with opaque white inclusions, very regular biconvex in section, thin.

f. **Unifacial tool:** white translucent CCS with quartz inclusions, one edge unifacially beveled on a large thick flake, has unifacial hinge fracturing along the edge, found with several utilized flakes of the same material.

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fragments, and two projectile points were collected. Most notable is a Pinto point (Figure 3j) and small flake of black opaque chert, a Rosegate series point made on a flake of translucent ivory-colored chert (Figure 4j) found with several flakes of the same material, and, at most, six flakes of material which may be the Maggie Creek type reported in the area by Rusco et al. (1979) and Elston (1986).

ACTIVITY AREAS

Based on the types of materials found and their distribution, three activity areas may be defined for the Susie Creek area (Figure 2). These include:

1. An Elko Hills chert source area located in the low rolling hills between Dry Gulch and Maggie Creek;

2. A chert reduction area on the west side of Dry Gulch where primarily Elko Hills chert, among a small quantity of other materials, was worked from the nodules procured in the above area. The dashed lines in Figure 2 indicate the probable continuation of materials between the survey areas;

3. A basalt reduction area where locally procured volcanic stones were worked into large flake tools.

Outside these activity areas, the recovered and observed materials were far less abundant and much more heterogenous in attributes. Most notable in this regard are the areas west of lower Dry Gulch, between Dry Gulch and Susie Creek, much of the Dry Susie Creek area, and all of the area immediately north of the Humboldt River, at the confluence with South Fork.

When the Susie Creek materials are considered in a regional context, two factors are quite striking: (1) the restricted use of Maggie Creek chert, Dry Susie Creek basalt, and Elko Hills chert not far away from their sources; and, (2) the preference of the most distant Tosawihi chert for the more refined tool forms. This distribution closely corresponds with Elston's (1986) discussion of raw material characteristics as applied to this region. Elko Hills materials at James Creek Shelter are not well represented, with the major occurrence being the presence of an assayed cobble and four cores in hori-

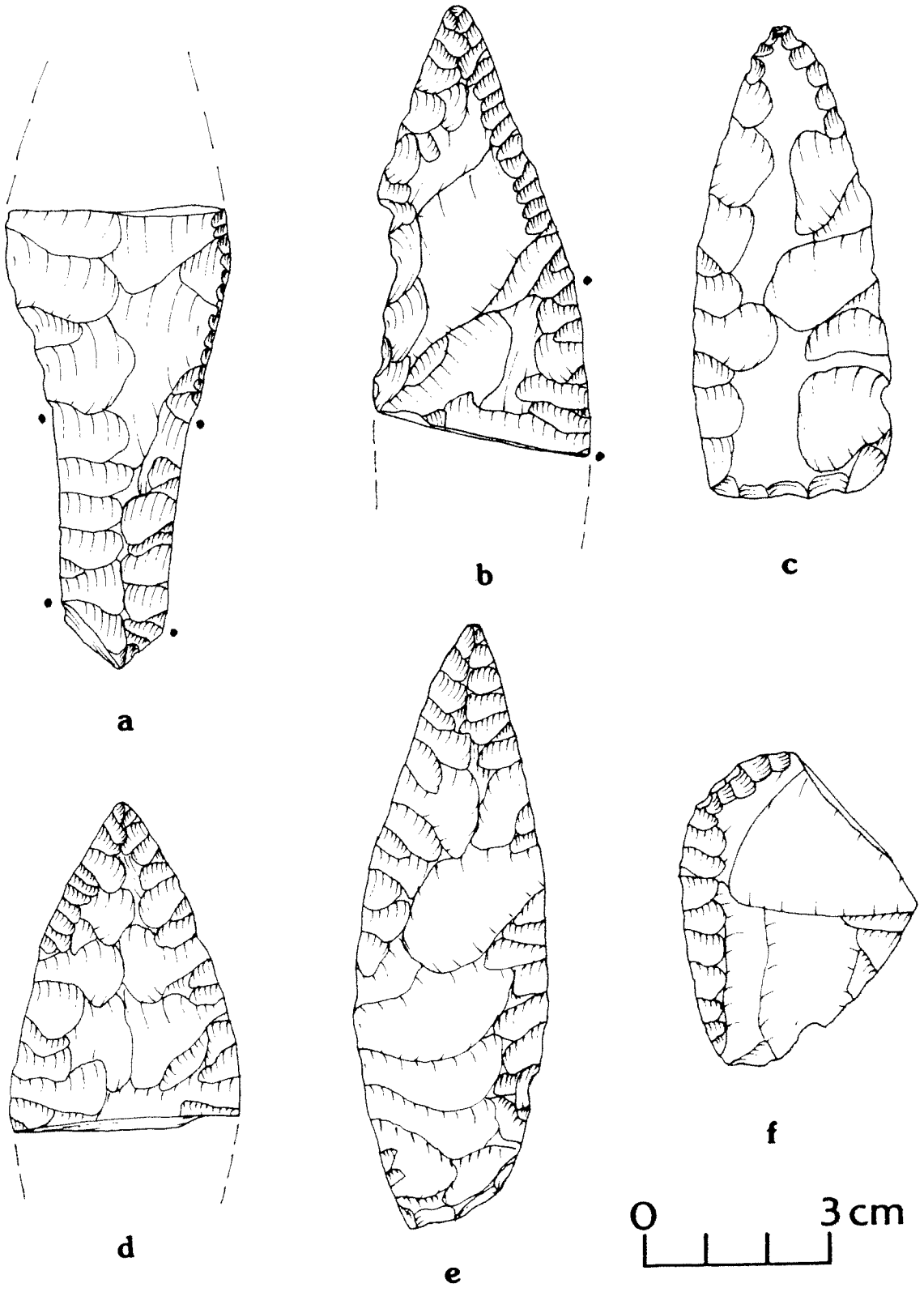

Figure 5

zons III and IV of the James Creek component (2850 to 1300 B.P.) associated with Elko series projectile points. Like Susie Creek, few points are made of Elko Hills material. As Elston (1986) points out, the material apparently has a deceivingly low utility factor, perhaps due to a high degree of hardness making it tough to flake without hinged flake terminations, though it does improve with heat treatment.

CHRONOLOGICAL CONSIDERATIONS

The geographic distribution of the 27 typologically distinctive projectile points also poses an interesting spatial pattern. A broad range of styles were collected in the surveyed areas, including Great Basin Stemmed, Humboldt series, Pinto, Elko series, and Rosegate series. No side-notched items of either the Desert series or Northern forms were observed. The discovery of one Desert Side-notched form was reported by a survey crew member from the Dry Gulch vicinity, but was lost in the field. Also, a small fragment, possibly of a side-notched form, was collected, but it is too fragmentary to be conclusive. The Great Basin Stemmed point was found near a tributary to Dry Gulch, near the ridgetop dividing the Susie Creek and Maggie Creek drainages at 5360 feet elevation (Location 1 in Figure 2). A stemmed eccentric form was collected further up the Dry Gulch drainage near the same elevation (Figure 5b). All Humboldt and Pinto points found in the survey were located between the Maggie Creek and Susie Creek/Dry Gulch drainages. On the other hand, Elko and Rosegate series forms were scattered throughout the surveyed area, but were found exclusive of the other types east of the Susie Creek/Dry Gulch drainage. This distribution of various point styles corresponds with the site density noted above, which is generally much less for surveyed areas between Dry Gulch and Susie Creek, east of Susie Creek, and just north of the Humboldt River near Elko.

A ceramics scatter was discovered near the southern end of the surveyed area, nearest the Humboldt River on the low ridge between Maggie Creek and Susie Creek (Location 2 in Figure 2). This location is near the lower Susie Creek sites excavated by Rusco et al. (1979) where Shoshone ceramics were also found.

It is apparent that, though the Elko Hills chert and other naturally occurring material types are relatively low in utility, they still constituted a major attraction to the low hills between Susie Creek and Maggie Creek for a lengthy period of time. A number of exposures of a fine-grained milky white translucent silica material is present and many of the artifact localities discovered in the survey consist of large decortication flakes and worked cobbles of the same material. However, during later times, people using Elko and Rosegate series projectile point styles made a much broader use of the land, apparently primarily hunting as witnessed by the diffuse scatter of materials and the high incidence of projectile points and bifaces recovered. Late in prehistoric times, use became considerably reduced with the few items attributable to late occupation occurring nearer the Humboldt River course.

The broader distribution of Elko and Rosegate series point styles in the Susie Creek area corresponds well with the findings at James Creek Shelter, the South Fork Shelter locality, and numerous other locations in the northern Great Basin. Occupational intensity increases dramatically at those sites after 3000 B.P., marked by the predominance of Elko series point forms, peaking somewhat later, corresponding with the prevalent use of Rosegate series forms. Living surfaces from this time period are more detectable and brush shelters were often constructed. Correspondingly, intensity of habitation appears to decline markedly in late prehistoric times at these sites, witnessed by the dearth of Desert series materials in the Susie Creek survey.

CONCLUSIONS

The area extending from near the townsite of Elko westward to near Maggie Creek north of the town of Carlin exhibits some obvious patterns of use. Prehistoric inhabitants utilizing Elko and Rosegate series projectile points utilized the entire area, however, typologically earlier point styles (Great Basin Stemmed, Humboldt and Pinto) only appear in the area between Dry Gulch and Maggie Creek. Available lithic raw materials is a major factor attracting people into this area away from the Humboldt River.

In sum, the Susie Creek survey provides yet another occurrence of a Great Basin Stemmed find away from a lacustrine setting, it has provided further evidence of the lithological richness of the upper Humboldt River basin, and provides a spatial confirmation of findings at nearby rockshelters indicating a patterned variation in habitational intensity of the region over the past 10 millenia.

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SOME THOUGHTS ON THE POSSIBLE FUNCTION OF SOME CAIRN COMPLEXES IN THE SOUTHWESTERN GREAT BASIN

Mark Q. Sutton

ABSTRACT

Rock cairn phenomena in the southwestern Great Basin have been the subject of considerable research and interest during the last 50 years. Functional interpretations have been ascribed to several types of cairn complexes (e.g., shrines, burial cairns, etc.), while others have defied interpretation. As a result of recent investigations at cairn complexes in several portions of the southwestern Great Basin, an interpretive model of several cairn complex types was developed. It is suggested that certain of these may reflect the construction of game diversion barriers and/or artificial habitats designed to attract and harbor small animals. Both techniques may have been used to facilitate game capture.

INTRODUCTION

The presence of large numbers of rock cairns in the California desert, in groupings of various sizes (one to many hundred), and sometimes in association with other sites, have attracted the attention of researchers since the 1930s. Malcolm Rogers (1939, 1966) recorded and described many such complexes in both the Mojave and Colorado deserts of southern California. Others have been reported in various locations in Nevada (cf. Dansie 1981; Tuohy 1981), in the Colorado Desert (Begole 1981 and references therein), and in the Mojave Desert (Wlodarski and McIntyre 1979; Taylor et al. 1985).

Wallace, Hunt, and Redwine (1959) and Hunt (1960) investigated a number of cairns in Death Valley, California, some of which contained burials. These cairns were not closely clustered in groups, were generally quite large, and were constructed of large boulders. The burial cairns in the Death Valley area are believed to date from ca. 5000 B.P. to historic times, although there is some contention that this pattern is considerably older (Bischoff et al. 1976; but also see Payen et al. 1978). The data on cairn burials have been summarized by Wilke (1978).

Cairns and cairn complexes appear to have served other purposes as well. At least some cairns in the Great Basin appear to have been constructed to serve as food caches or granary foundations (Steward 1938). Similar functions for cairns are also known for other areas (cf. Binford 1978). Some cairns, associated with trails, have been interpreted as trail shrines (Rogers 1966:76: Begole 1981:1), and others have been interpreted as water control devices (cf. Irwin-Williams et al. 1986; Taylor et al. 1985; Dansie 1981).

Cairn groupings appear to fall into several general "types": (1) single or small groups of cairns with no other associated cultural material; (2) single or small groups of cairns in association with some cultural materials (e.g., artifacts, trails, rock rings, etc.); and (3) large groups of cairns with no other associated cultural material. These large groups of cairns appear to fall into two basic morphological categories, here called linear and globular.

There has been little speculation regarding the functional differences between linear and globular groupings of cairns. Some of the former definitely appear to be associated with game-drive systems. Benedict and Olsen (1978) reported several drive systems in the Rocky Mountains of Colorado which included "a dry-laid stone wall and 187 cairns arranged in lines and diffuse zones" (1978:10). These linear cairn groups were interpreted as game channeling features. The drive complex was dated to about 5500 B.P.

RECENT INVESTIGATIONS

Results of excavations and mapping of several rock cairn sites in the central Mojave Desert were recently reported by Taylor et al. (1985). Excavations were conducted at two sites, CA-SBr-221 and CA-SBr-3186. The CA-SBr-221 site is located south of Soda Lake (Figure 1) and consists of more than 89 cairns located on a large gravel bar, roughly aligned in three rows on the apex of the bar (Taylor et al. 1985:7).

Excavation of six cairns at the CA-SBr-221 site revealed that they were constructed directly on the gravel bar surface. Although no chronometric data were obtained, Taylor et al. (1985:14) argued (from geomorphological data) that the cairns probably did not date to within the last several thousand years. Except a few "amorphous flakes of problematic origin" (Taylor et al. 1985:12), no artifacts were recovered in association with the cairns.

The CA-SBr-3186 site consists of 174 cairns located on a broad alluvial fan originating on the north side of the Soda Mountains (Figure 1) (Taylor et al. 1985). The cairns are small, averaging 1 meter in diameter and 12 centimeters in height, and were constructed of fairly small rocks (Taylor et al. 1985:10).

Ten of the cairns were excavated but no artifacts were recovered in the excavations although some debitage was noted on the surface of the site. No material suitable for chronometric dating was recovered but the site was dated to the late prehistoric based on the absence of "caliche, ground patina, desert varnish, wind abrasion or other factors suggestive of great age" (Taylor, et al. 1985:15). Also, their general setting on an active fan suggests that the cairns are of recent age.

Taylor et al. (1985) proposed that the above two cairn complexes may have served as water control devices, either for horticulture or for the enhancement of native plants. They pointed out several similarities between the two sites and others in the Great Basin (and in the Negeve in Israel), including general paucity of artifacts, absence of other functional interpretations, general association with sites or artifacts of presumed early cultural materials (e.g., Lake Mojave Period, 8000-10,000 B.P.), and their occurrence on pluvial landforms (1985:24-25).

A large complex of cairns (CA-Riv-2823 in the northern Coachella Valley (Figure 1) was recently investigated (Wilke 1984; Sutton and Wilke 1985). The site consists of two cairn fields which run for several hundred meters along either side of a steep ridge and generally converge on low ground at its toe (Figure 2). The northern group consists of 84 cairns and the southern group of 340 cairns. The size and condition of the individual cairns varied but they were generally .5 to 1 meter in diameter, constructed from large rocks, and most appear to have fallen down.

It was proposed (Sutton and Wilke 1985) that the cairns once served as base supports for superstructures of poles and brush. Assuming synchronic use of the cairns, the resulting array of brush, although not necessarily physically connected, would have formed a solid visual barrier. This barrier might not have been crossed by some animals since they may have been uncomfortable in entering an area where they could not see clearly. The two cairn groups were arranged so that as one moved down the ridge, they converged. This could have served to funnel animals (presumably mountain sheep) toward a small opening at the foot of the ridge.

It was hypothesized (Wilke 1984) that if the cairns served as bases for game barriers, there should be some kind of hunting blinds at or near the convergence of the two cairn groups and that broken projectile points should also be found there. Unfortunatley, no such structures or artifacts were located during the fieldwork. However, since the neck of the "funnel" is located in

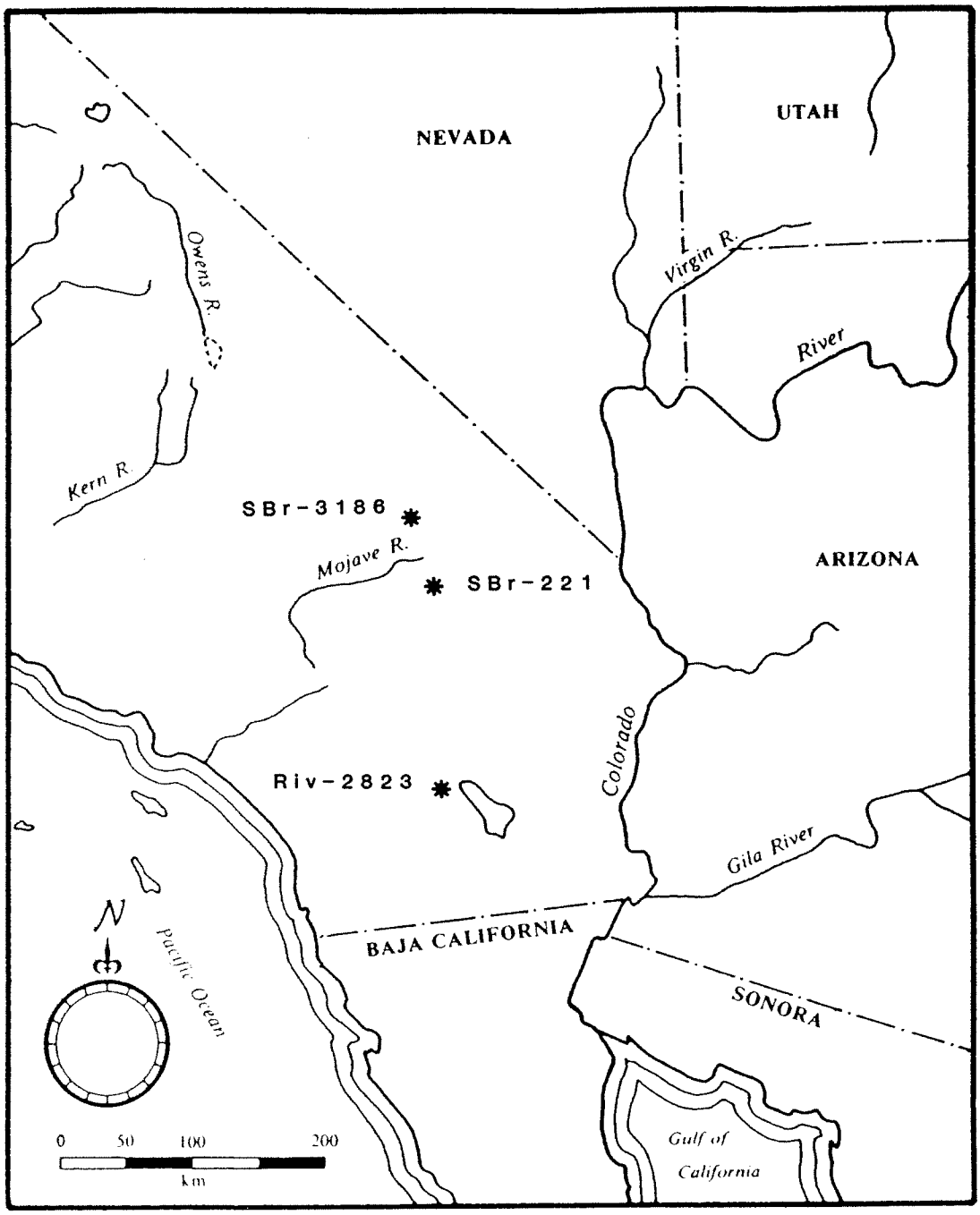

Figure 1. Location of the sites discussed in the text.

the vicinity of a fairly active wash, it remains possible that such evidence was removed by erosion.

No chronometric data are available whereby to accurately place the CA-Riv-2823 cairn fields in time. However, most of the rocks used in their construction were patinated, indicating some antiquity. A large camp (CA-Riv-1179), located about 600 meters to the north, dates to within the last 500 years. Mountain sheep (Ovis canadensis) remains were recovered during excavations (Sutton and Wilke, report in preparation) at CA-Riv-1179. While there is no direct association, the geographical proximity of the two sites may suggest some relationship.

A SPECULATIVE MODEL

At least two general types of cairn groups, linear and globular, have heretofore defied interpretation. Suggestions for the possible interpretation of these two types are presented below. It must be recognized that these interpretations are quite speculative in nature.

LINEAR CAIRN GROUPINGS

Large linear cairn groupings are often located on ridges, or, as in the case of the CA-Riv-2823 example, skirting a ridge. The interpretation of the CA-Riv-2823 site suggests a hunting function, that barriers were established which animals were unwilling to cross and that those barriers served to direct game in a particular direction to facilitate their capture. Given this as a reasonable interpretation, the explanation could be applied to other cairn groups as well.

It is proposed that at least some linear cairn groupings in the southwestern Great Basin, and perhaps elsewhere, may have anchored brush walls which could have been built to present a "solid" visual barrier that certain game animals would not cross. Their movement would then have been directed in such a manner as to facilitate their capture (cf. Benedict and Olsen 1978, Pendleton and Thomas 1983).

The constructions may have had to have been several tiers in depth so as to present a solid visual barrier, a task that single line "fence" type construction might not have fulfilled. Construction time may have been reduced with this type of arrangement since individual rocks would not have had to have been moved as far as with a set row pattern. This may be a reasonable interpretation of the function of the CA-SBr-221 site and of many of the cairn groups that Rogers called "relief structures of the alignment type" (1939:10). However, Thomas Taylor (personal communication 1985) felt that such structures would have been necessary on gravel terraces, that the presumed poor footing of the gravel itself may have discouraged certain animals from crossing a ridge.

The presence of game trails in the vicinity of linear cairn groupings may be an important aspect. I suspect, however, that many of the cairns date to more mesic periods when large animals would have been more plentiful, and that such ancient game trails would not have survived to the present.

Other features have been recorded in the Great Basin which have been interpreted in a similar manner. While not a cairn complex, the Fort Sage Drift Fence, in west-central Nevada (Pendleton and Thomas 1983), was interpreted as a diversion fence designed to channel animals to specific breaks in the fence where they would have been captured. The Mount Albion complex, in Colorado (Benedict and Olsen 1978), may also be an example of this type of construction. At the Happy Whistler site, cairns may have formed one side of a diversion feature used to guide "the animals from grazing areas to predetermined kill sites" (Benedict and Olsen 1978:5). The function herein proposed for some linear cairn complexes is quite similar.

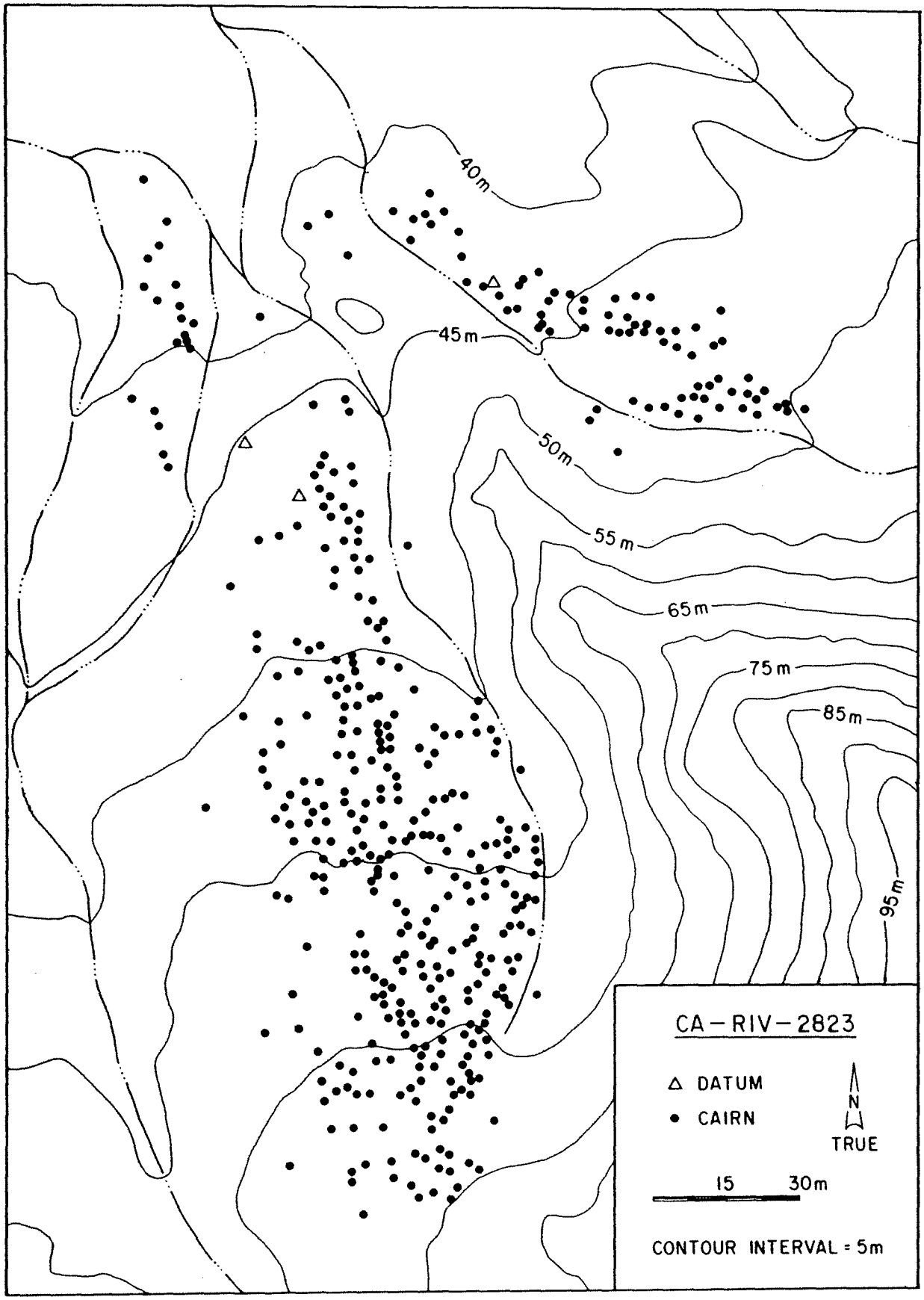

Figure 2. Map of the cairn complex at CA-Riv-2823.

Examples of perishable drift fence constructions are known from the Great Basin (cf. Steward 1938:34-35). These features often have no supporting basal structures (e.g., rock cairns) and may have required less labor investment. Other hunting structures, such as blinds (cf. Brook 1980 and references therein), are also commonly known.

GLOBULAR CAIRN GROUPINGS

It is proposed that some globular groupings of cairns may have been built to support intentionally piled brush creating, in effect, artificial habitats in which small game animals, such as pocket mice (Perognathus spp.), who like such habitats, (cf. Rosenzweig and Winakur 1969:558), and possibly rabbits (cf. Lepus californicus) could have taken refuge. This would have served both to concentrate the animals and to facilitate their capture. The CA-SBr-3186 site and other large globular cairn groupings found in the Colorado desert (e.g., Begole 1981:12, Figure 19) may have served this function.

Environmental manipulation such as is suggested here is certainly not unknown nor even uncommon in the Great Basin and California. For example, burning as a method of enhancing plant production has been well described (cf. Lewis 1973; Timbrook, Johnson, and Earle 1982). Proto-agricultural plant and water manipulation has been described for the Owens Valley (Lawton et al. 1976) and portions of the Colorado desert (Lawton and Bean 1968).

While attempts to control the environment to encourage plant productivity are reasonably well known, such, is not the case for animals. In his examination of environmental manipulation in the Great Basin, Downs (1966:49) stated that:

> There would appear to be relatively little which societies possessed of such simple technology could do to encourage the growth of animals, insure their appearance, or prolong the period of availability.

This assessment appears to be somewhat pessimistic, since at least several techniques of animal manipulation are known. For example, fire was used by some California groups during rabbit drives (Lewis 1973) and to collect some insects (Essig 1934:184). Of even greater interest is the use of fire to improve forage for some game animals which would then be hunted (Lewis 1973). This general concept is quite similar to that proposed here for globular cairn groupings. The construction of shelter for small animals may have encouraged their presence, as burning to improve forage apparently did, and could have provided a more stable food supply.

CONCLUSION

It is not my intent to rigidly defend the above functional interpretations, but the proposals do seem to contain interesting ideas that merit further exploration. Even then, the model certainly would have limited application. The purpose here is to stimulate thought on the matter in the hope that a better understanding of the rock features will result.

ACKNOWLEDGEMENTS

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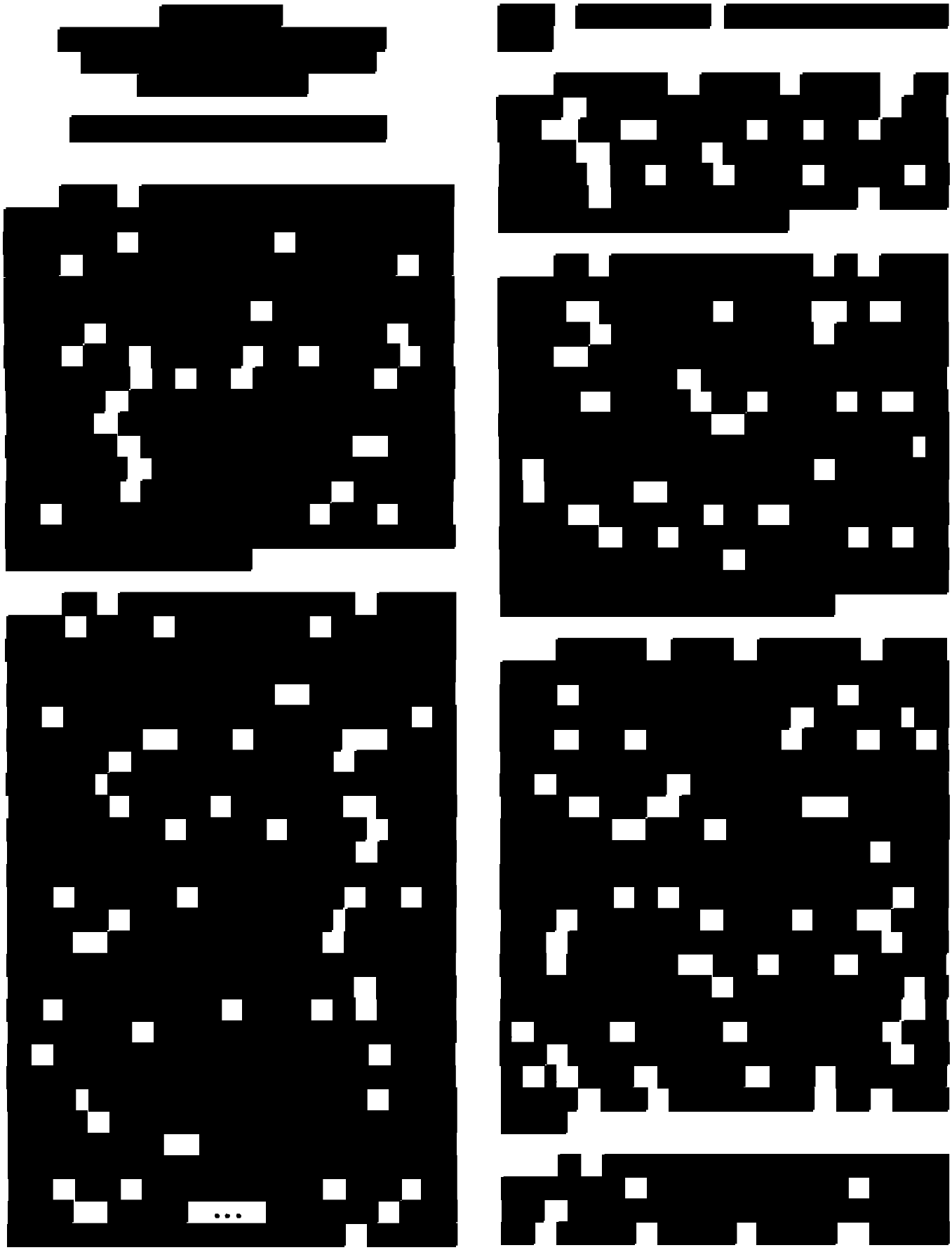

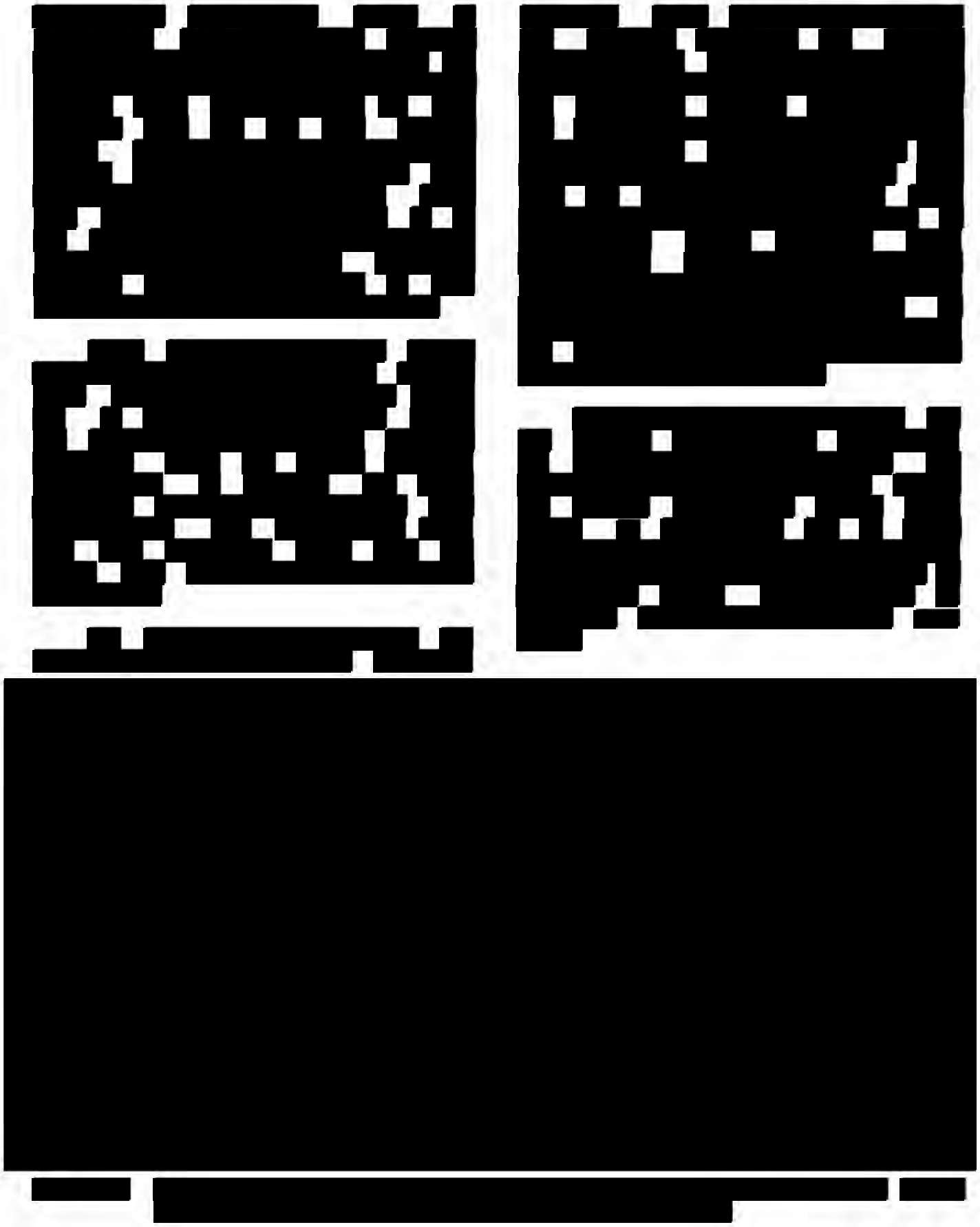

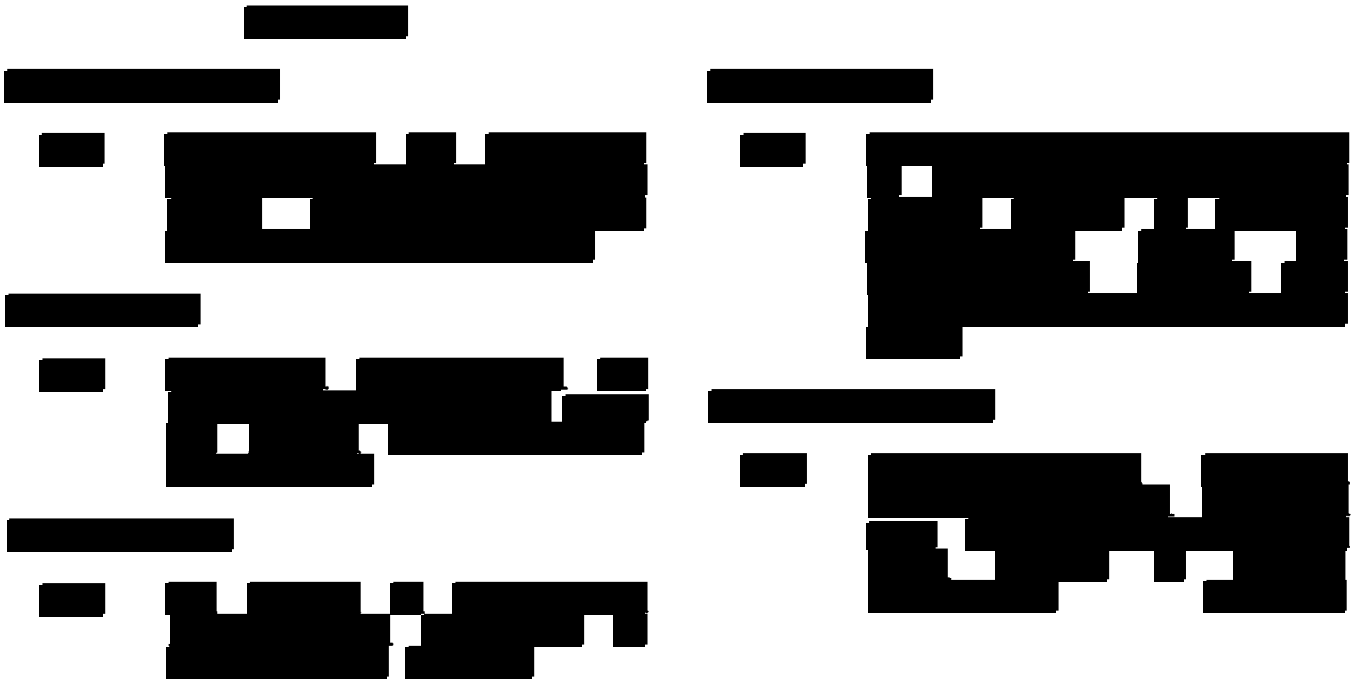

PALEOENVIRONMENTAL AND ARCHAEOLOGICAL IMPLICATIONS OF EARLY HOLOCENE - LATE PLEISTOCENE CAVE DEPOSITS FROM WINNEMUCCA LAKE, NEVADA (1)

Robert S. Thompson (2)
Eugene M. Hattori (3)
and Donald R. Tuohy (4)

ABSTRACT

Dated packrat middens, artifacts, and fossil bones from archaeological sites on the eastern and northwestern shores of former Winnemucca Lake, Washoe and Pershing counties, Nevada, reveal minimum ages for the final demise of pluvial Lake Lahontan (12,070 B.P.) and potential ages for early occupation of lakeside sites. Remains from packrat nests indicate that the plant community surrounding the caves contained elements reflecting a more mesic environment at that time. A purported association of a horse mandible fragment and a dated juniper bark mat (11,200 B.P.) has been questioned by a recently obtained radiocarbon date on the horse bone (12,800 B.P.).

INTRODUCTION

The Nevada Division of Historic Preservation and Archaeology has provided us matching funds for radiocarbon dating packrat middens and archaeological materials from the Winnemucca Lake Basin, western Nevada. Unfortunately, few of the anticipated dates have been obtained so far, but preliminary findings and the potential for information gain will be presented today.

The study sites are the Falcon Hill sites which include Empire and Kramer caves and the Shinners Sites (A, B, D, F, G, H, I, J, K), all of which are on the northwestern end of the lake basin. We also studied the East Shore sites including Fishbone, Guano, Cowbone, Chimney and Crypt caves located in the northeastern sector of the lake basin. Archaeologists have uncovered well-preserved textiles and other non-perishable and perishable artifacts at these localities dating back to 9540 B.P. (Orr 1952, 1956, 1974; Roust 1958; Rozaire 1969, 1974; Hattori 1982). These caves have also been the study sites for paleoenvironmental research involving changing lake levels (Broecker and Orr 1958; Shutler 1961; Broecker and Kaufman 1965) and the analysis of fossil pollen from cave sediments (Sears and Roosma 1961). Extinct Pleistocene animals have been found in the lowest levels of several of the caves (Orr 1952, 1956; Hattori 1982; Grayson 1982), and the Holocene levels of these sites contain the remains of mammals, reptiles and fish that no longer live in the Winnemucca Lake Basin (Hattori 1982). Finally, Fishbone Cave is one of the first sites where packrat (Neotoma) middens were brought to the attention of the scientific community (Orr 1956).

SETTING

The Winnemucca Lake caves are wave-cut, tufa encrusted Pleistocene age features formed by Lake Lahontan and its predecessors. As Lake Lahontan receded, the caves were uncovered and available for habitation by animals, including humans. After the Pleistocene lake desiccated, Winnemucca and Pyramid lakes were fed by water from the Lake Tahoe-Truckee River system.

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(1) Paper presented at 1984 Great Basin Anthropological Conference, Boise, Idaho.

(2) Department of Geological Science, Brown University, Providence, Rhode Island 02912.

(3) Desert Research Institute, University of Nevada System, Reno, Nevada.

(4) Department of Anthropology, Nevada State Museum, Capitol Complex, Carson City, Nevada 89710.

The Falcon Hill Sites are located between 1238 meters (4060 feet) and 1296 meters (4250 feet) elevation. The modern vegetation of Falcon Hill is dominated by xerophytic desert scrub species including Atriplex confertifolia, Artemisia spinescens, Tetradymia axillaris, and Sarcobatus vermiculatus. The East Shore sites are located between 1235 meters (4050 feet) and 1250 meters (4100 feet) along a terrace of an embayment. The setting of the lower Eastern Shore caves is even drier than Falcon Hill. The vegetation in this area is dominated by Kochia americana and Atriplex confertifolia.

PACKRAT MIDDENS

Modern packrats reflect these modern plant associations in the construction of their nests which are basically detailed inventories of plants and animals (in addition to packrats) living near the collection sites. The ancient packrat middens likewise reflect the environment when they were constructed. Individual packrats build these assemblages in association with their living areas, and constantly add twigs, leaves, bones, and other debris, including artifacts from their surroundings. On the basis of modern behavioral studies it is believed that packrat middens reflect the vegetation withn no more than 50 to 100 meters of the shelter entrance (Stones and Hayward 1968; Bleich and Schwartz 1975). These collections then become impregnated with urine and trampled into rock-hard masses. The solidifying urine also serves as a fossil pollen trap. In dry daves and rockshelters, these middens are commonly preserved for thousands or tens-of-thousands of years.

We were initially attracted to the caves by the spectacular archaeology and because it had already been demonstrated that ancient packrat middens existed there (Orr 1956; Broecker and Kaufman 1965; Shutler n.d.). Unfortunately these previously dated middens could not be located for study, and we visited the caves to make new collections. In 1978 and 1980 we collected 10 middens from Kramer Cave and Shinners Site B on Falcon Hill. Several of these middens contained Artemisia tridentata and a Juniperus sp., both of which are plants that no longer grow on the hill but grow within the Winnemucca Lake Basin. From the presence of these more mesic species, we thought these middens could be late Pleistocene or early Holocene in age and certainly worthy of further study.

In 1983 and 1984 we visited the caves of the eastern shore and collected a series of 25 packrat midden assemblages from Fishbone, Guano, and Crypt caves to study the past vegetation of that area. Twelve of these units are dominated by Juniperus cf. occidentalis Artemisia tridentata, Prunus andersonii and Opuntia sp. The latter three plants are generally confined to a much higher (and more mesic) elevational setting within the Winnemucca Lake Basin today, and the juniper is a Sierran species found many miles to the west and several hundred feet higher in elevation. These middens were also believed to presumably be late Pleistocene or early Holocene age. During the collection of two middens from Guano Cave (GC Middens 7A and 7B) we observed cordage in association with the midden assemblages. The remaining 13 middens contain vegetational remains that resemble the modern plant cover. One of these middens from Fishbone Cave (FB Midden 1) contains two pieces of Catlow twined basketry, and several middens contain Phragmites stems (culms), which were probably brought into the cave by humans.

PREHISTORY

Our ultimate objective in studying Winnemucca Lake Basin packrat middens is to provide paleoenvironmental background for the interpretation of the archaeological record. The modern aridity of the basin and the sparseness of the vegetation around the lake basin, due largely to the diversion of the Truckee River,

make this an inhospitable setting for human habitation today. We also believe that climatically induced changes may have resulted in similar settings in the past (Hattori 1982). Conversely, there were times when lakes grew and marshes developed within the confines of the lake basin. Most of these changes in lake levels were caused by climatic change here and elsewhere and may have resulted in local and regional population shifts.

One of the more intriguing archaeological aspects of this study is dating and analyzing early evidence for human occupation of the area and verifying a presumed human-extinct fauna association. As previously mentioned, the area is quite arid and so perishable artifacts are well preserved. These conditions have been effect for over 12,000 years. There are pitfalls, however, in this situation. Shutler (n.d.; Rozaire 1969) and Tuohy realized mixing of deposits was a potential problem in the Falcon Hill caves and so they dated artifacts rather than "associated" organics from the surrounding cave deposits. Another problem encountered with the dry caves is the probable collection and curation of older materials by later occupants of the sites. Thus, Pleistocene shrub ox (Euceratherium sp.) mandibles were bracketed by 1900 and 4000 B.P. radiocarbon dates on textiles at Falcon Hill (Shinners Site C; Hattori 1982).

In Fishbone Cave, Phil Orr (1956, 1974) reported a horse mandible above a juniper bark "mat" in Level 4, the lowest occupational level. There is, however, some question as to the identification of the bark and if, in fact, it is a woven material. The dates on the juniper "matting" are 10,900 ± 300 (L-245 A?) and 11,250 ± 250 B.P. (L-245 B?) (Orr 1974). Additionally, a horse splint bone awl with connective tissue on the articulating end was also recovered from Level 4.

RADIOCARBON DATING

In our study, only six packrat middens have been dated thus far. Juniper leaves and twigs from one midden (Shinners B) have been dated by the University of Arizona's Tandem Accelerator/Mass Spectrometer and five other juniper middens were dated at the same institution with a conventional CO_2 counter. These Winnemucca Lake Basin packrat middens yielded ages between 11,580 ± 290 (A-3699) and 12,070 ± 210 B.P. (A-3697).

Shrub ox mandibles and horse metapodials from Falcon Hill, and also the horse mandible associated with the juniper bark mat, miscellaneous Level 4 bones, and the horse splint bone awl from Fishbone Cave were submitted to Thomas Stafford (presently with Carnegie Institute of Washington, D.C.) at the Radiocarbon Laboratory, University of Arizona for dating. The shrub ox mandible was rejected because of a preservative coat applied to the bone. The horse metapodials and miscellaneous bones were also found to be inadequate for dating.

The horse mandible and the ligaments from the horse bone awl, however, were believed to be acceptable for dating. Bone from the mandible was dissolved and non-carbonate organic fractions separated for dating. Cartilage from the awl was removed and cleaned. Both materials were processes by the Tandem Accelerator/Mass Spectrometer method. The cartilage was found to be too small a sample to date. The horse bone, however, yielded a date of 12,280 ± 520 B.P. (no lab number at this time).

CONCLUSIONS

Our preliminary findings from the midden dates shed light upon the potential for site occupation and past lake levels. Because packrat middens are highly soluble in water, it is doubtful that the water ever rose above the

entrances of the sites after the middens we collected were formed. Their ages, therefore, provide limiting dates for the recession of Lake Lahontan's last maximum of 1330 meters (Benson 1978, 1981). The Falcon Hill midden was from a site (Shinners B) at an elevation of 1296 meters, the minimum date at this elevation is 12,020 ± 210 B.P. (A-3697) for a Guano Cave midden, at an elevation 1230 meters, reflects a similar minimum lake recession age for this elevation. So, at present, it appears that the sites were available for human occupation by at least 12,070 radiocarbon years ago in a vastly different vegetational and hydrologic setting. This date is some 730 radiocarbon years after horse was in the area and some 2430 radiocarbon years after the earliest dated basketry from Falcon Hill was manufactured at 9540± (Rozaire 1969).

The horse mandible dated to 12,280 B.P. predates the mat found below it by some 1000 years (barely within two standard deviations). It is probable that if, indeed, the juniper bark mat is cultural, it is not contemporaneous with the older horse mandible found stratigraphically above it. Additionally, the origin of the horse mandible is now in question. Was it found by humans elsewhere in the cave or was it brought in from another area or site and curated for a period of time?

We still have about 25 more middens to process. The data from these middens will shed light on the nature of vegetation change at the Pleistocene/Holocene boundary and also the chronology and nature of Holocene vegetational changes. Artifacts from dated middens and previously dated artifacts from these sites will then be analyzed to assess the relationships between the changing archaeological cultures and the different environmental settings through time.

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The Nevada Archaeological Association was organized in 1972 to provide a bond of communication between professionals in the field of archaeology and its allied sciences, members of various amateur organizations, and the people of Nevada towards the furtherance of public education and involvement in responsible preservation of Nevada's finite archaeological and historical resources.

The need for recording these cultural resources of the past for the enlightenment of future generations grows more pressing with each day of development and progress. The goals of the Nevada Archaeological Association are: to provide a focal point for general information and study of non-renewable cultural resources; to provide a central point for recording artifact collections from Nevada and the Great Basin and the verbal knowledge of provenience and associations accompanying these collections; to correlate this knowledge with that information already professionally recorded for the mutual benefit of the amateurs and professionals with research interests; to provide assistance with education towards responsible public participation in archaeology; to assist in the preservation of sites by the establishment and maintenance of a registry of available, capable, and technically skilled amateurs in Nevada who would be able to work with professionals in accordance with the Code of Ethics and Standards of Research Performance as advocated by the Society of Professional Archaeologists, particularly in the immediacy of salvage archaeology; and to provide a bond of communication between professionals, amateurs, and the general public by publishing a journal, *Nevada Archaeologist.*

To these ends the Nevada Archaeological Association was incorporated in 1972, in the State of Nevada, with its organizational and editorial offices as listed on the inside cover, and with designated conference and meeting center located in Tonopah, Nevada. Membership is open to all those interested in the archaeology, ethnology, and history of the human inhabitants and their natural habitats in Nevada, the Great Basin, and adjacent environs.

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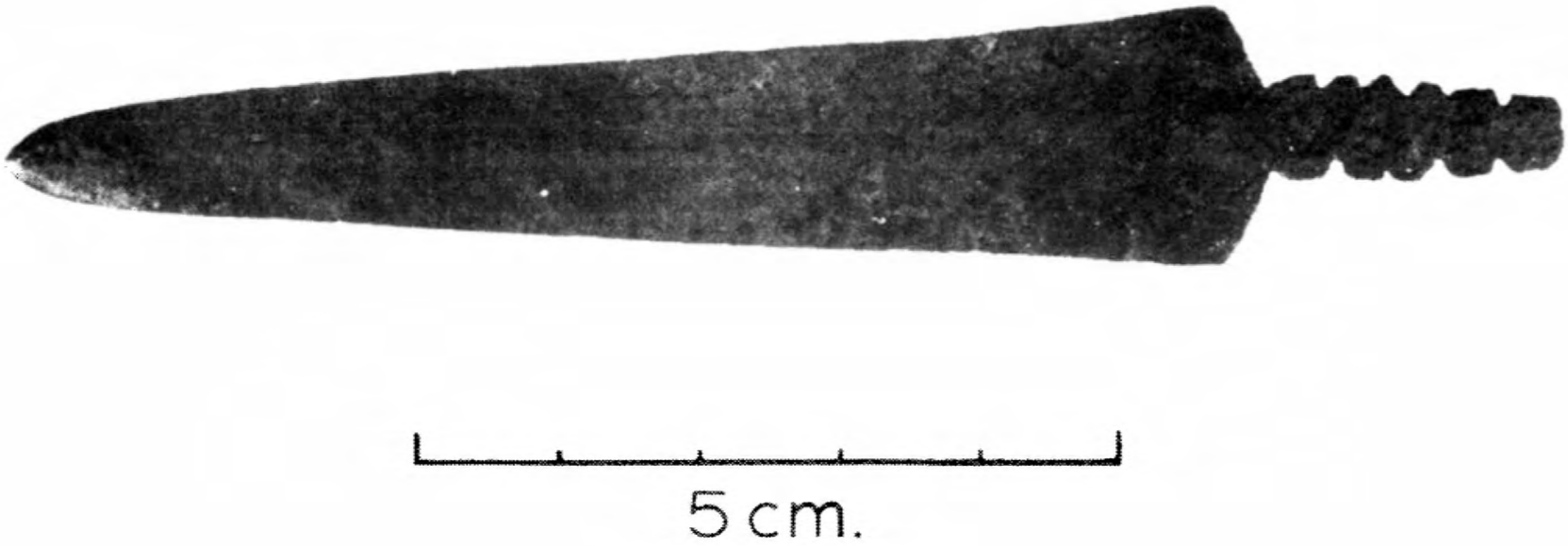
Residents of all other Nevada communities are asked to join the Nevada Archaeological Association until such time as there are sufficient numbers of people willing to form local chapters of the above organization. Information on the Constitutions and By-laws of the above organizations may be obtained at cost from the secretaries of the above organizations.



Metal arrowpoint made out of a barrel hoop. Found near an emigrant trail in Churchill County, Nevada.