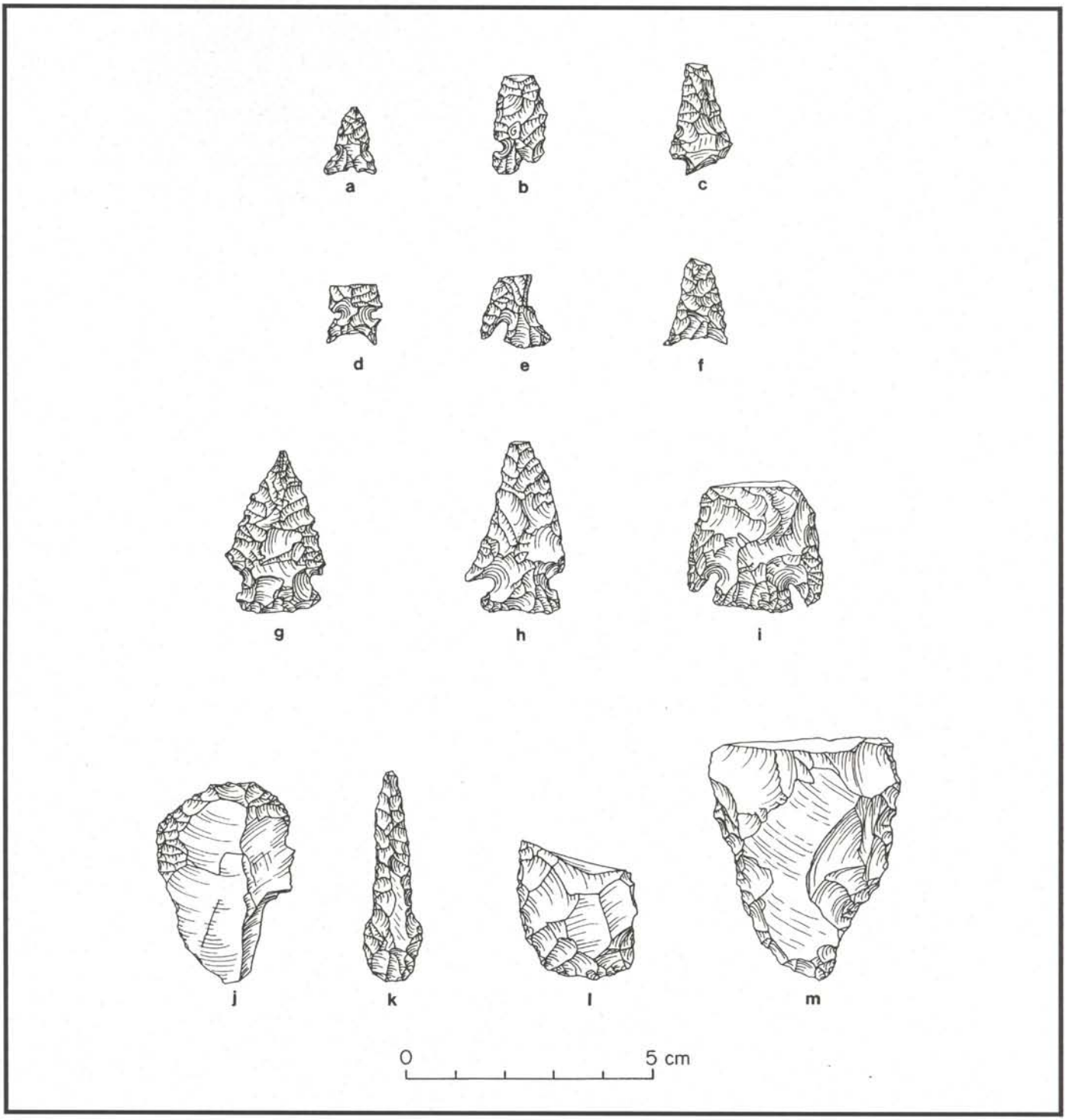
IDAHO ARCHAEOLOGIST

ISSN 0893-2271



Volume 22, Number 1

Volume 22, Number 1
Spring 1999

IDAHO ARCHAEOLOGIST

Editor, Mark G. Plew
Associate Editor, Darlene Burke
Associate Editor, Glenn Smith

EDITORIAL ADVISORY BOARD

J. Perry Silver, Jr. and Audrey Hedley, Idaho Archaeological Society, Glenda King, Idaho State Historical Society, Roderick Sprague, University of Idaho, E. S. Lohse, Idaho State University, and Max G. Pavesic, Boise State University.

The ***IDAHO ARCHAEOLOGIST*** is published semi-annually by the Idaho Archaeological Society in cooperation with the College of Social Science and Public Affairs, Boise State University. The ***IDAHO ARCHAEOLOGIST*** is the journal of the Idaho Archaeological Society, a non-profit association of professional and amateur archaeologists, organized under the laws of the State of Idaho. Subscriptions are $12.00 per year and may be obtained by writing the ***IDAHO ARCHAEOLOGIST***, Department of Anthropology, Boise State University, 1910 University Drive, Boise, Idaho 83725.

NOTICE TO AUTHORS: Manuscripts should conform to the style sheet for *American Antiquity*. Manuscripts should be typed double-spaced, with 1 1/2 inch margins, and submitted, if possible on 3.5 inch diskette written in Wordperfect or MS Word. A single hard copy should be submitted. The ***IDAHO ARCHAEOLOGIST*** publishes peer reviewed articles and shorter contributions concerning the archaeology of Idaho and those areas of adjacent states and provinces including the Columbia drainage and the Great Basin. Technical and theoretical papers having a wider audience will be considered. Manuscripts should be addressed to:

Mark G. Plew, Editor
IDAHO ARCHAEOLOGIST
Department of Anthropology
Boise State University
1910 University Drive
Boise, Idaho 83725

© 1999 Idaho Archaeological Society

CONTENTS

ARTICLES AND REPORTS

ARTICLES AND REPORTS

A SUMMARY OF ARCHAEOLOGICAL TEST EXCAVATIONS AT 10-CN-1, SOUTHWESTERN IDAHO[1]

Camille Sayer, Mark G. Plew and Sharon Plager

INTRODUCTION

Archaeological excavations at 10-CN-1 conducted by the 1996 Boise State University Archaeological Field School were facilitated through a cooperative agreement between the Boise State University Department of Anthropology and the Boise District Office of the Bureau of Land Management. The cooperative program is centered on the Birds of Prey National Conservation Area, within which BLM is responsible for the stewardship of all cultural resources. It is designed to enhance our understanding of the rich cultural resources located within the Birds of Prey National Conservation Area and to provide assistance to the BLM in the management of these resources. The cooperative program also provides training, practical experience and research opportunities to BSU students and faculty. The program was initiated in 1993 and encompasses previous as well as concurrent research efforts similarly aimed at improving the understanding and management of the archaeological properties within the area.

The 1996 archaeological test excavations were conducted at site 10-CN-1 under the terms of the cooperative agreement. The project area located along the Snake River was chosen in response to the heavy vandal impact it has received over the past few decades. Recent vandalism documented in March, 1994 prompted a Bureau of Land Management investigation in which Cascade Resource Archaeologist Dean Shaw conducted an inspection of the site area and prepared a preliminary damage assessment report. A recommendation of this report proposed additional damage evaluation as a basis for further archaeological investigation and site restoration. In early March, 1996 Dean Shaw and Mark Plew representing Boise State University (BSU) agreed that BSU would conduct its archaeological field school at the location between May 31 and July 5, 1996. In late March the site was visited by Dean Shaw and Dan Hutchison, BLM State Archaeologist, accompanied by Environmental Coordinators Ted Howard and Terry Gibson of the Shoshone-Paiute tribe. The visit resulted in an agreement by the tribe that the proposed investigation was appropriate.

A series of baseline questions outlined for the greater Birds of Prey National Conservation Area provided the context for determining evaluation and excavation methods employed (see Plew 1994). In particular, our objectives were to define the depositional and post-depositional history of the site and to identify its temporal range and functional context. In this regard we sought to determine the maximum extent of disturbance and to assess the potential for additional archaeological excavations. We further sought to establish the degree to which diet breadth measures, technological organization, and technological diversity might inform us as to settlement and subsistence patterns and mobility, particularly as it relates to recent investigations in the Birds of Prey National Conservation Area (see Plew and Sayer 1994, Sayer, Plager and Plew 1996).

ENVIRONMENTAL SETTING

The excavated sites are situated approximately 30 miles southwest of Boise, Idaho at the western-most edge of the Birds of Prey National Conservation Area which covers 485,832 acres in southwestern Idaho and includes much of the western Snake River Canyon (see Figure 1). The site, 10-CN-1, is located some four miles south of Melba, Idaho, approximately 1/4 mile west of the old Guffey Railroad Bridge which is listed on the National Register of Historic Places.

Physiographically the area falls within the Columbia Intermontane Province and is defined as the Snake River

1. **Note:** Detailed data tabulations for artifacts and faunal remains are found in archaeological test excavations at 10-CN-1, Southwestern Idaho, by Camille Sayer, Mark G. Plew and Sharon Plager, *Technical Reports No. 5*, Snake River Birds of Prey National Conservation Area Archaeological Project, Boise State University.

Plain which constitutes a section of the High Lava Plain Subprovince (Freeman, et. al. 1945). The Snake River Plain is composed of Late Tertiary and Quaternary age basalts which encompass approximately 14,000 acres extending in an arc across southern Idaho. The lava plateau was uplifted during the late Pliocene and Pleistocene epochs and subsequently cut by the Snake River to form the present canyon. Of particular importance to the canyon formation and depositional features was the catastrophic flood of Lake Bonneville ca.14,000 years ago (Malde 1968). While much of the Plain is characterized by shallow rocky soil cover, many of the terraces along the canyon floor, including those in the project area, exhibit considerable sediment accumulation. These sediments are derived from several sources including alluvial silt and sand deposits, 7,000-10,000 year old loess deposits from the Owyhees, basalt colluvium from the canyon walls, and gravels and boulders deposited by the Bonneville flood. The soil matrices in the excavated terrace sites themselves are all very deep and are dominated by calcareous silty loams. In some instances, these grade into very fine sandy loams at increased depth. The parent materials consist of eolian and silty alluvium.

Topographically the project area is located in a relatively open section of a deeply incised gorge with columnar basalt walls that stretch for approximately 20 miles from Big Foot Bar in the east to roughly Guffey Butte in the west, and extend nearly 800 ft. down from the rim in some places. The river generally flows in a westerly direction through the study area. Beyond the canyon on both sides the topography is largely flat with scattered hills, buttes and basalt outcrops. The river terraces on the north bank within the project area are relatively narrow, never exceeding 200 meters across. All of the excavated sites, as well as the majority of those known to exist in the area, are located on terraces directly adjacent to the river. The elevation of 10-CN-1 and other sites is roughly 2,300 ft. This portion of the canyon is further characterized by a lack of perennial drainages feeding into the canyon from the north side. In fact, no permanent tributaries feed into the canyon within or near the project area for several miles in both directions along the river. Site 10-CN-1 lies on a north side terrace opposite the western-most end of an island situated in the middle of the Snake River. The site is due north of Guffey Butte, a prominent topographic feature located on the south side of the river. At present a roadway extends east-west from Guffey Bridge to the Marsing Highway. This road intersects the southern portion of the site.

Figure 1. General Location Map Showing Project Area

Like most of southern Idaho, the area climate is marked by hot, dry summers and relatively moist, cool winters. The average annual precipitation is between 8 and 10 inches (Idaho Department of Water Resources 1978) with the greatest amount occurring in the winter months. Average daily temperatures range from 93.4 degrees F. in July to 18 degrees F. in January (ibid.).

The vegetation in the project/site area is typical of riverine settings within semi-desert contexts. The dominant vegetation cover is upland grass and shrub, with a narrow riparian zone along the edges of the river. Outside the canyon to the north there is a high percentage of irrigated fields. Of the wide variety of species represented in the area big sagebrush, black greasewood, saltbush, and cheat grass dominate. Other common species include rabbit brush, shadscale, basin wild rye, Indian ricegrass, bluegrass, Russian olive, coyote willow, and poison ivy along the riverbank. A number of species noted in the area are exotics in-

troduced to the region and spread as a result of various Euroamerican activities, including grazing and agriculture (see USDI, BLM 1995).

Prior to the introduction of cattle the area was probably characterized by much higher densities of understory grasses (Yenson 1982). The local paleoenvironmental context explored by Henry (1984) at nearby Murphy Rockshelter provides a vegetative chronology spanning more than 10,000 years. Henry argues that the sequence begins with the appearance of a "grass-like" vegetation approximately 10,350 years ago. This would have supported the megafauna believed to be commonly distributed throughout the area. A second period from 9,900 B.P. to 6,250 B.P. marks the emergence of the shadscale steppe community which suggests a somewhat warmer and drier climate. A third rather brief episode occurs between 6,350 B.P. and 5,900 B.P. and is characterized by a turn to relatively cooler, moister conditions. Between 5,900 B.P. and 3,500 B.P. sagebrush became an important element of the vegetative community and a greater diversity of species is exhibited in general. After 3,000 B.P. the shadscale community is predominate. These episodic changes, which were no doubt affected by varied microenvironmental conditions, suggest patterns which would have been variously utilized by native populations.

A variety of animal species inhabit the study area and reflect a range of highly diverse microenvironmental settings. Mammals found within the area are part of the Northern Great Basin Biotic Complex and include mule deer, jackrabbits, coyotes, badgers, Townsend's ground squirrels, kangaroo rats and mice (Davis 1939: 32-34).

Avifauna reside in the area on a seasonal basis. A wide variety of species are found including waterfowl, game birds, and raptors. Common birds include owls, hawks, eagles, falcons, ducks, geese, pelicans, quail, pheasants and snipes.

Aquatic resources are also abundant within the region. Common species include fresh water mollusks, with varieties of trout, white fish, squawfish, catfish, bass and sturgeon. It is important to note that, similar to many plant species, several animal species which inhabited this region in the past are no longer present today. Of relevance to human subsistence strategies were anadromous fish, salmon and steelhead trout in particular, which formed by historic accounts a critical component of the native diet (Steward 1938). These species were prevalent prior to the construction of numerous dams along the Columbia and Snake Rivers. Other species which likely inhabited the canyon in the past include deer, elk, mountain sheep and bison (Tobias 1976).

In general, the area is characterized by considerable ecological diversity and would have provided a plentiful resource base for the native inhabitants of the canyon. A number of the plant and animal species noted above are known ethnographically to have contributed significantly to the aboriginal diet (Steward 1938). Among these are deer, rabbits, ground squirrels and anadromous fishes, all of which are available in varying abundances across multiple seasons. Among the plant communities, Steward documented the use of Great Basin wildrye, shadscale, Indian ricegrass, and various berries for subsistence and willow for utilitarian purposes (1938; for a listing of Basin resources see King 1996).

BACKGROUND

Previous Research

Previous investigations include numerous surveys and small-scale excavations in the greater Birds of Prey Area and surrounding region. These investigations have established the general temporal and functional range of cultural occupations in both the riverine and upland contexts.

The earliest systematic archaeological investigation in the area is Louis Schellbach's 1929 excavation of "Schellbach Cave" (Schellbach 1967). Though the earliest formal archaeological excavation in Idaho, the investigation is best known for its recovery of a cache of fishing gear including netsinkers, a fishhook and line, and 13 fish remains—ten of which have been identified as Chinook salmon and three to the family *Salmonidae* (Pavesic, Follett and Statham 1987).

Beginning in the early 1960's a series of small excavations established the general time depth and nature of subsistence along the Snake River between Marsing and Grandview, Idaho. These include excavations of a small rockshelter (10-AA-15) along the Snake River opposite Schellbach Cave (Tuohy and Swanson 1960). The site appears to have been a mussel-collecting station though deer and rabbit remains are represented. The site contained Rosegate series projectiles and Shoshone Ware sherds suggesting a Late Archaic age of post-A.D. 1,000. Two functionally comparable localities include sites 10-OE-128 and 10-OE-129 excavated near Marsing, Idaho by Gruhn (1964). The sites are dated to the Early and Middle Archaic by the presence of Humboldt points and somewhat more recent large corner and side-notched Middle Archaic projectiles. Both sites appear to have been important in seasonally based mussel procurement strategies as large quantities of *Gonidea angulata* were distributed throughout the occupational units. Additional evidence of mussel collecting and use is documented by Huntley (1988) at the Cromwell site near Marsing, Idaho at Big Foot Bar (Plew 1980) and Givens Hot Springs (Green 1982) where house features dating between 4,000-5,000 and 1,000 B.P. are associated. Deer remains are also commonly associated with these contexts as is demonstrated by excavations at 10-EL-392 near Grandview, Idaho (Plew and Sayer 1994).

Recent investigations within the western-most reach of the study area include testing by Willig in 1988 at a small site approximately 1/2 mile west of Grandview, Idaho. Willig documented a shallow deposit with some evidence of mussel procurement. As with many of the sites along the Snake River the deposits appear relatively homogeneous, consisting of alluvium and sandy silts in-

terspersed with carbonates. Test excavations at 10-EL-387 and 10-EL-388 produced comparable assemblages containing small amounts of lithic and shell debris to a depth of one meter (Plew, Guisto and Mitchell 1992). To the east, archaeological test excavations at sites 10-AA-12, 10-AA-14, and 10-AA-189 near Swan Falls Dam provide little evidence of significant occupations. These sites are characterized by very low densities of lithic, bone and mussel and at best appear to represent short term uses associated with highly mobile foragers. The sites provide no supporting documentation for a pattern of riverine fishing (Sayer, Plager and Plew 1996). Test excavations of 10-AA-188, a rockshelter located just west of 10-AA-189, provided ample evidence of an extensive use of deer, rabbits and mussels spanning the period of Early to Late Archaic. West of Swan Falls, Sammons and Myler (1993) describes a limited range of Late Archaic material culture associated with deer and rabbit remains at site 10-AA-306. Hauer and Hughes (n.d.) describe the results of the 1960's test excavations at site 10-CN-6 which provide evidence of Middle to Late Archaic occupations.

Surveys within the area further attest to the temporal range and functional variability of archaeological sites in Southwest Idaho. Keeler and Koko conducted a survey of the Guffey-Swan Falls area in 1971, focusing on the canyon section of what is now the Birds of Prey National Conservation Area (1971). Their survey identified a number of habitation areas. Subsequently, a cultural resource inventory of the Bureau of Land Management Boise District identified archaeological sites within the Birds of Prey National Conservation Area (Young 1984). Based on random samples, Young proposed that the Kuna Desert area, which includes the Idaho Army National Guard's Orchard Training Area (OTA), was characterized by low site densities.

The most intensive investigation of the OTA was the 1984 Class III inventory completed by Addington (1984). The survey was based on 200 m pedestrian transects in the general Maneuver Area with much less intensive coverage within the Impact Area. The inventory documented a total of 70 archaeological sites classified as a variety of prehistoric and historic types and served as the basis for the development of subsequent monitoring activities. Monitoring of the 28 sites deemed significant in the Orchard Training Area was conducted by Jenks from 1989 to 1992, with seven sites monitored by Chavarria in 1993 (1994). Under a 1994 cooperative agreement between Boise State University, the Idaho Army National Guard and Bureau of Land Management, Sayer supervised monitoring efforts of 28 sites during the 1994, 1995 and 1996 field seasons (see Plager 1996).

Though not reflecting the range or level of activity found in the adjacent riverine context, the OTA includes several important cave sites including Higby, Tank and Cathedral Caves. These sites were the focus of test excavations conducted by Delisio between 1973 and 1978. Though not fully reported, the occupations appear to date from the Early Archaic into historic times. Elko Series points dating to the Middle Archaic were found as well as modern bison remains (Delisio 1980:4-5).

More recently, Willig conducted test excavations at site 10-AA-256. Her findings, though unpublished, appear to suggest a varied, if highly temporary, use of the location (see Sayer and Plew 1995 for discussion). Comparing the typological characteristics evident on the small number of projectile points collected, the site appears to represent a Late Archaic occupation. In 1994, further field investigation was conducted at 10-AA-256 as part of Boise State University's summer Archaeological Field School. The excavation provided the opportunity to conduct data recovery as a means to further assess the site's significance. Based on the lithic materials and bone recovered, Sayer and Plew (1995:17) concluded that the site represented a series of short term uses associated with highly mobile foragers.

The range of material cultures documented by limited excavations (e.g. Gruhn 1964; Tuohy and Swanson 1960) and surveys (Keeler and Koko 1971, Murphey 1977) have suggested extensive use of the riverine context. More recent work, however, indicates that the intensity of use may be somewhat less than believed (see Sayer and Plew 1994; Sayer, Plager and Plew 1996). Temporal control of these occupations is limited to radiometric dates from Givens Hot Springs (Green 1982, 1993) which indicate occupations between 6,000 and 600 B.P and typological dates from most other locations. In general, the time frame documented at Givens Hot Springs and elsewhere typologically correlate temporally with Bachman Cave (Metzler 1977) near Marsing and Nahas Cave in the Owyhee Uplands (Plew 1981). Though a degree of semi-permanence not uncommon to hunter-gatherers is represented by these investigations, the more common pattern appears to be one of relatively mobile foragers using resources as encountered, an argument offered by Gould and Plew (1996a, 1996b) on the basis of homogeneity in chipped stone tool assemblages.

PROJECT OBJECTIVES

Our two primary objectives included the delineation of diet breadth and the examination of attributes of lithic technologies that address the nature of local settlement-subsistence patterns. First, we sought to correlate the faunal record with contemporary species, distributions, and inferences drawn from historical and ethnographic accounts of aboriginal resource acquisition which have traditionally emphasized abundance as a primary determinate of use. In this regard we sought to determine whether utilization of fauna had changed over time and whether environmental/social constraints may have provided selective advantages to local populations. We used optimal foraging models to assess diet breadth, incorporating a set of predetermined parameters, such as the relative utility of the selection of one species over another. Optimality models which simply and mechani-

cally operationalize the relationships between variables or conditions make it possible to reassess the perceived or historically documented importance of specific resources by weighing the variables that influence economic decisions. In such an equation, aboriginal populations may be understood to make choices about resource use on the basis of encounter rate, pursuit and handling time relative to return. Hence, while some resources may be abundant, decisions not to use them may be related to the cost of handling time which renders them less important (see Plew 1990). While it is obvious that biological, environmental and seasonal factors may effect decision making by altering the nature of choices, it is clear that optimal decision making relates to social organization among hunters and gatherers with specific regard to mobility or degrees of sedentism. To address this linkage we examined variability in the attributes of lithic technologies as a means by which we can assess intensity of occupation relative to mobility (c.f. Binford 1980). On the assumption that material types, sources, and technological attributes reflect variable activities in time and space we should be able to determine the extent, nature and relative duration of occupations and thereby hypothetically address levels of settlement organization. Controlling these two factors of diet breadth and technological variability provide a solid basis upon which to identify and explore other attributes and factors influencing variable decision making during the past several thousand years.

SITE DESCRIPTION AND STRATIGRAPHIC CONTEXT

Site 10-CN-1 is located approximately 1/4 mile west of the historic Guffey Bridge near Celebration Park and about eight miles south of Melba, Idaho. The site is situated on a small terrace opposite the western-most end of a small island in the Snake River. A county roadway extending west from the Guffey Bridge to Walter's Ferry some 3 1/2 miles downstream forms the southern periphery of the site (see Figure 2). A large unimproved turn out area is situated near the southeastern edge of the site. The northern boundary of the site area is formed by basalt talus and Bonneville flood rounded boulders. On its eastern-most edge the site extends slightly up an adjacent hill cut by a roadway. The western-most portion of the site is overgrown with heavy greasewood cover and, by our estimates, was vandalized by relic hunters several decades ago.

The investigation of site 10-CN-1 was driven by three major objectives. The first objective was to investigate and establish the vertical and horizontal extent of the site. The second objective was to examine the stratigraphic context as it might inform us about depositional, functional and temporal contexts. The third objective was to determine the extent of damage to the site based on volume estimates from assessment of areas of direct vandal impact.

Our preliminary efforts focused on mapping the site boundary, features, and disturbed areas. A survey determined the site dimensions to be 80 X 40 meters. A

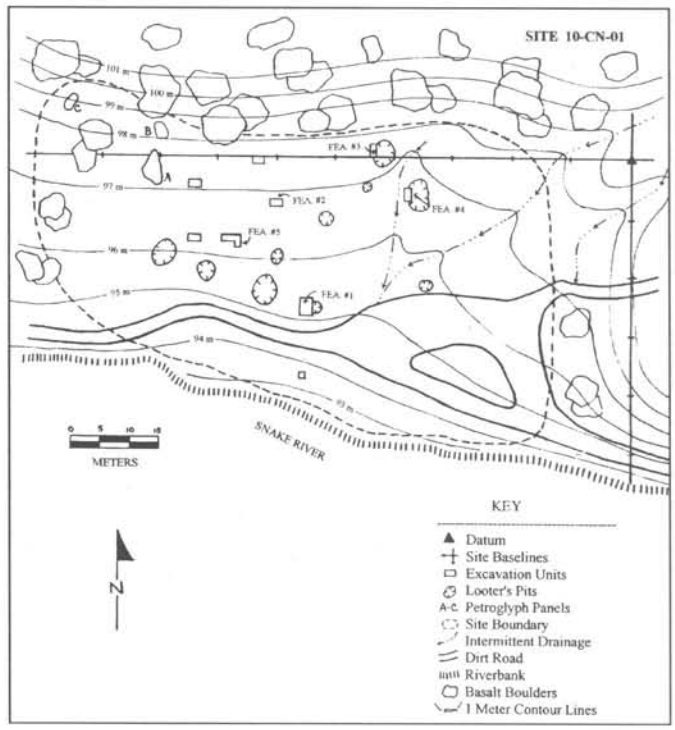


Figure 2. Plan Map of Site 10-CN-1

datum was established on the western slope of the hillock on the eastern margin of the site. For purposes of reading elevations the datum was placed c. 15 meters east of the site boundary. An east-west baseline was extended to 80 meters beyond the datum near the western-most edge of the site. An intersecting north-south baseline was established at a point 55 meters west of the datum and extended 40 meters to the southern periphery of the site. Along the north-south baseline there was considerable evidence of cultural activity and a significant charcoal feature exposed by vandalism. Our initial effort involved mapping the entire site and locating and mapping the remnants of earlier "pot-hunting" activities as a preliminary step to assessing volume and nature of sediments and exposed stratigraphy visible in vandal pits.

Excavation methods employed excavation of arbitrary 10 cm levels from pit datums, with all removed sediments passed through an 1/8 inch hardware mesh. Provenience was referenced from the individual pit datums located on the corner of the highest point in the grid system. All recovered materials were field sorted into morphological/descriptive types including lithic artifacts and debitage, ceramic sherds, bone, shell, seeds, historic materials and recent debris (post 1950). Thermally altered rock was counted by level but not bagged. All materials were bagged by level and provenience. No shell fragments smaller than 2 cm were collected unless associated with a feature. Flotation samples were taken routinely from all excavation units by level and by feature. Multiple samples were taken as appropriate. Sediments samples were collected from columns at the pit datum in all units. These were pro-

cessed and size sorted using nested screens. Coordinates for sediments and flotation samples were carefully recorded. Photographs of floor levels, features and *in situ* artifacts were routinely taken while plan maps and profiles were drawn for all units and features. Detailed field notes were kept by the field director and crew chiefs as well as all of the participating student excavators. These materials supplemented an extensive array of level, feature, stratigraphy and catalog forms.

Sediments and Stratigraphy

Four 1 x 2 meter, one 1 x 3 meter, and one 1 x 1 meter units were excavated to variable depths because the site, which slopes southward toward the river, is undulating. Our initial test excavation examined areas which we believed would provide useful insights regarding the nature of the stratigraphy. Test units 0-1S, 62-64W and 7-8S, 59-61W establish the northern-most boundary of the site. Sediments from the units consisted of rather homogeneous eolian sediment with inclusions of small angular exfoliated basaltic rock from the adjacent boulders. Larger rocks measuring 20-30 cm were encountered in some levels. Stratigraphy is limited to three recognizable horizons. The upper c. 50 cm of the sediment consists of a light brown/grey sand (10 YR 6-2) containing a few small charcoal flecks that appear to represent carbonized rootlets found throughout the deposit but little in the way of material culture. Only a few small tertiary lithic flakes were recovered. A second stratum extends to as much as 80 cm below surface and consists of a very pale brown sand (10 YR 7-3) which is loosely compacted. Below 80 cm the deposits are extremely loose brown sands (10 YR 5-3) which appear to be water deposited and totally lacking cultural materials. The latter is characteristic of all units across the site though varying somewhat due to the degree of undulation of sediments associated with a 15 degree slope toward the river. Hence the upper deposits of the site are typically deeper nearer the river. This was well exemplified by excavation unit 13-14S, 66-68W (see Figure 3). This unit, which is located within the core of the cultural deposit at 10-CN-1, contained almost two meters of cultural bearing sediments. Unfortunately, the sediments have been terribly disturbed by virtue of having been redeposited several times by vandal activities as indicated by sediments processed at the Geophysics Laboratory, Boise State University. These analyses suggest considerable uniformity of sediments with regard to particle size. Most samples exhibited ranges between <.250 and <.075 indicating a high percentage of sand/silt having been modified by both water and wind actions. The distribution, however, is quite varied, indicating disturbances.

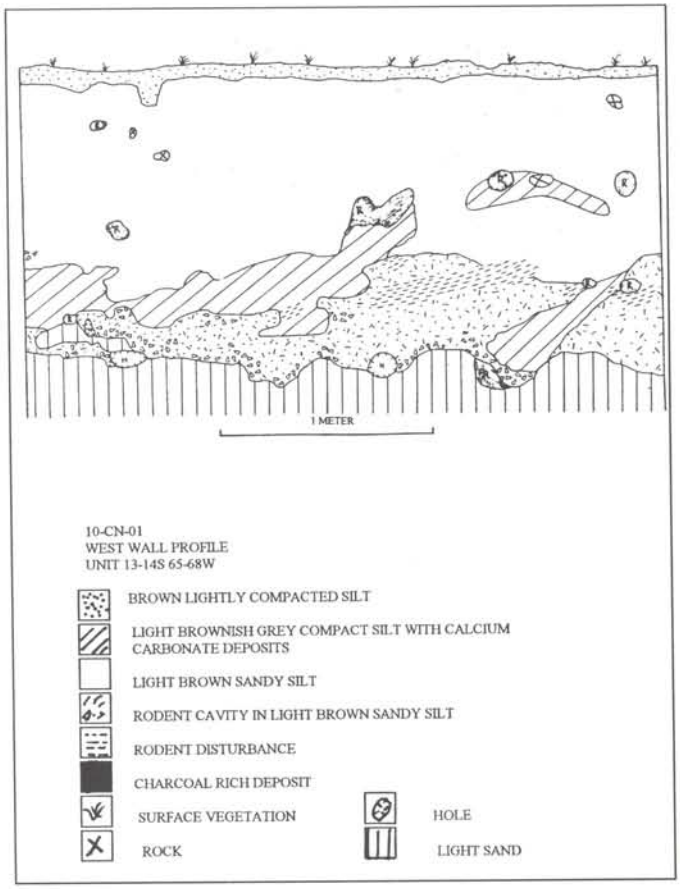


Figure 3. Site 10-CN-1, West Wall Profile, Unit 13-14S, 65-68W

The upper-most stratum (c. 0-10 cm) consisted of a loosely compacted pale brown silt (10 YR 6-3) containing numerous organic remains. Underlying the upper 10 cm, stratum 2 was an extensive deposit of some 80 cm. This is a very loosely compacted greyish brown (10 YR-5-2) silt which has been churned repeatedly by vandals. Not unexpectedly, the deposit contains much evidence of rodent activity. Below stratum 2 lies a 20-30 cm thick lens of mottled dark brown/brown (10 YR 4-3) sandy silt. Stratum 3 was loosely compacted and extends from c. 1 meter to 1.5 meters below surface. Stratum 4 is a very dark brown (10 YR 2-2) moist sandy silt with a high charcoal and clay content. This stratum, which extends between 1.5 and 1.8 meters in depth, was slightly more compacted than the preceding strata. Stratum 4 appears to be somewhat less disturbed than the upper levels of the deposit. The lowest stratum, Stratum 5, is a yellowish brown (10 YR 5-6) fine sand which is loosely compacted and very homogeneous. The deposit does contain some small gravels. Stratum 5 is equivalent to the sandy deposits encountered elsewhere on the site at variable depths between 80 and 180 cm below surface. This relationship is also observed in the lowest levels of unit 7-8S, 60-61W where the culture bearing stratum is encountered at c. 1 meter below the surface and underlain by sterile sands (see Figure 4).

The cultural deposit appears limited to an area of 5-30S, 55-80W. Its greatest depth was approximately 1.8 meters within unit 13-14S, 66-68W and 50-80 cm on the northern and southern peripheries of the site area.

Evaluation of Vandalism

The majority of the "pot hunter" excavations have been long abandoned and have generally filled in with

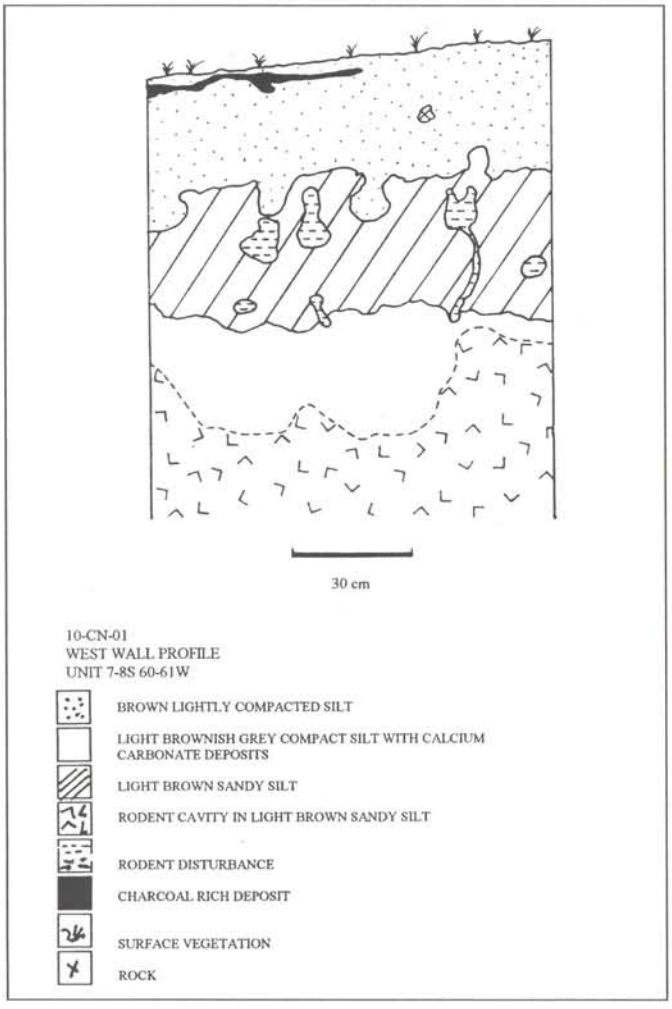


Figure 4. Site 10-CN-1, West Wall Profile, Unit 7-8S, 60-61W

sediment and are heavily covered by vegetation. These areas, while mapped, were not explored by subsurface investigation. The two most obvious and recent vandal pits noted in 1994 were cross-cut for purposes of defining the stratigraphic nature of the deposits, identifying the depth of excavation and the extent of cultural materials removed. The two units examined were in the northwestern corner of the site area at 0-2S, 43-44W and 7-8S, 37-38W. The west wall of each depression was cleared by excavating a fifty cm trench north-south. All sediment was passed through an 1/8 inch hardware mesh and bagged as lots as no provenience was obtainable. Stratigraphically the units are very similar to those on the northern periphery of the site. The upper sediments contain some cultural material and are underlain by sterile sands at approximately 1 meter. Materials recovered from the vandalized areas consist largely of shell, bone and lithic debris. It appears from the absence of artifacts and the size of material that the areas were screened using mesh no smaller than 1/4 inch. This situation differs from the more centrally located cultural deposits which appear to have been disturbed two or perhaps three decades ago where a great deal of material of large and small categories as well as tools remain. We believe this reflects the absence of screening. Local informants indicate that people began to "dig" at the location over 40 years ago, a time during which screening was somewhat less common. We estimate, by calculating depths of deposits based upon the overall stratigraphy of the site, that a total of 69 cubic meters have been removed by virtue of vandalism. This constitutes approximately c. 1/4 of the most intensively utilized portion of the site area. Based upon debris and artifact counts from the site, we estimate that as many as 20,000 individual cultural or culturally related items have been removed or displaced. Sampling and recovery doesn't allow us to estimate the number of artifacts lost or to determine whether the loss varies by type or category of artifacts. As noted, we believe that the quantity of cultural material varies more by recovery technique than looter choice or density of material remains.

The assessment of disturbance is based upon sediments analysis (particle size distributions), size sorting of material categories throughout levels, level of compaction and rodent activity, and the absence of discernable stratification. The presence of recent materials including .22 caliber slugs and broken beer bottles were found at depths ranging to 120 cm below pit datum.

Archaeological Features

Excavations at 10-CN-1 identified five (N=5) features of variable integrity. Feature 1, which was the most prominent and important of the recorded features, is located at 25-26S, 54-55W (see Figure 5). The feature was visibly exposed by vandalism just north of the roadway running east-west across the site. It appeared in the pit wall as a dark charcoal-bearing deposit. Horizontal excavation revealed the feature to measure approximately 1 x 1 meters and extend to a depth of about 40 cm below pit datum. The boundaries of the probable hearth were highly irregular, lacking clearly defined properties and only a semblance of a basin shaped cross-section. The deposit, which consists generally of dark brown silt (10 YR 6-3), contains dark charcoal stains and intermixed ashy deposits. Considerable rodent activity combined with recent intrusions of late 20th century materials characterize the fill. The feature does not appear to have been purposely excavated, though removal of the hearth fill may have created its roughly basin-shaped configuration. While the deposit is relatively loosely compacted, the sediments underlying the feature are noticeably more compact and consist of largely sterile sands. Small amounts of bone, shell, lithic debris and thermally altered rock were found throughout the deposit as were substantial quantities of recent glass and metal fragments indicating considerable disturbance.

Feature 2 was an area of discolored/light white mottled sediment located in the southeast corner of unit 7-8S, 59-60W at a depth of 115 cm below pit datum. Charcoal staining and a light density of lithic, bone and shell fragments are associated. The feature may be a naturally occurring phenomenon which is only indirectly

associated with what is largely a non-stratified unit. The feature rests at the interface between the culture bearing stratum and the sterile sandy deposits which underlie the entire area. The context does not permit an interpretation of the function of the feature.

Feature 3 was located in unit 0-2N, 43-44W between 30-70 cm below pit datum. The unit is one of the vandalized depressions cross-cut for stratigraphic and sampling purposes. The west wall contains evidence of ashy concentrations within a matrix of greyish silty sand (10 YR 5-2) that were associated with very few (N=8) cultural items. The context suggests that the feature reflects the remnants of a fire hearth, though this cannot be directly inferred from the stratigraphic context.

Feature 4 was associated with unit 5-7S, 37-38W. The unit was within one of the vandalized depressions and was described with respect to the stratigraphic profile. It consists of relatively compacted greyish brown silty sand (10 YR 5-2) located from the surface to approximately 70 cm below pit datum. It contained shell, bone, thermally altered rock, lithic debris, a core fragment and a hammerstone as well as some evidence of charcoal staining, which provided the basis upon which the context was recorded as a feature.

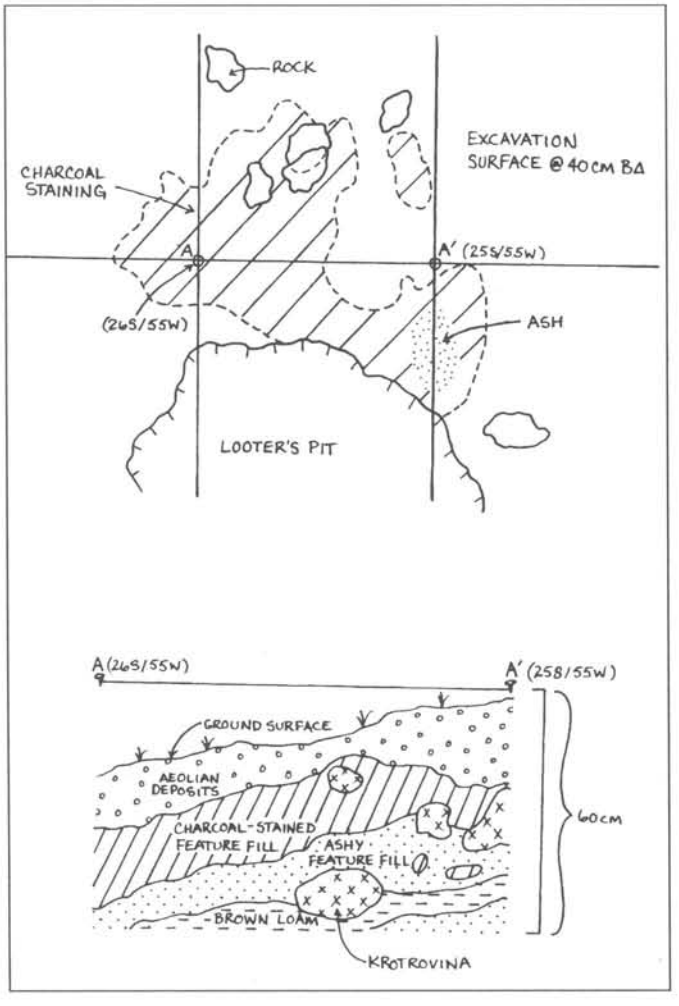


Figure 5. Plan View and Cross Section of Feature 1, Site 10-CN-1

Feature 5 was a extensive, dense charcoal stain approximately 20 cm in thickness found near the base of the cultural deposit in unit 13-14S, 66-68W. The feature, which exhibits considerable mottling, appears as a natural stratum but contains very extensive amounts of lithic debris, charred bone, seeds and shell fragments as well as thermally altered rocks. The extensively disturbed nature of this unit suggests that the feature reflects redeposited hearth fill.

In sum, the archaeological features were generally rather nondescript and in some instances may not be directly associated with cultural activities. Features 1 and 5, however, appear to reflect the occupation/use of the location. Unfortunately, the disturbed nature of the deposit prohibits an adequate assessment of the intensity of its use over time though the two meter depth of deposit, extensive charcoal concentrations and relative density of material remains suggests a rather important and long term periodic use.

MATERIAL CULTURE REMAINS

Artifact Analysis

The artifacts analyzed include implements manufactured and utilized by the site occupants as well as by-products of other activities. The analysis and classification of the chipped stone, bone, shell and ceramic artifacts focuses on the general morphological and technological attributes. Following an initial sorting of materials into general material categories and morphological types both qualitative and quantitative attributes were measured for each.

The analysis of diagnostic projectile points is particularly important as it assists in placing the occupations at the site in a cultural and chronological sequence. Where possible points have been placed in time sensitive typological categories. In the case of nondiagnostic items general technological categories have been identified. Size ranges, where appropriate, refer to length, width and thickness measurements respectively. Provenience is given as the square meter grid unit and depth in centimeters below the pit datum. Raw material, particularly with regard to the lithic items, was examined as it is important to issues of mobility and technology.

Lithic debitage, in addition to the formal tool categories, is an important means by which technological organization and related issues can be addressed. Patterning in the various attributes measured is outlined and explored subsequent to the discussion of the formal tool categories which follows.

Lithic Artifacts

The lithic items were measured for length along the longitudinal axis where orientation could be identified and on the longest axis in all other cases. Width was determined at the widest point perpendicular to the length, and thickness refers to the maximum thickness. Where any additional measurements were taken the specific parameters are given. All measurements are given in mil-

limeters. The descriptive term 'irregular' refers to non-patterned flake scars, particularly along the margins.

A. Projectiles Points

Projectiles with at least the basal element and a portion of the mid-section intact were classified according to specific type. Within the ranges, length is based on complete specimens only. Projectile point fragments not typologically identifiable are summarized according to morphological elements following the descriptions of represented types.

1. **Desert Side-Notched Series** (see Figure 6, a-b, d)
   Number of Specimens: 4
   Artifact Numbers: 69, 120, 137, 138
   Form: Isoseles triangular blade outline. Points are side-notched and sometimes basally notched. Basal element is equal to greatest width of blade element and is frequently concave. Points are typically plano-convex in cross section. Only one of the specimens is complete (A120). Three of the points exhibit a basal notch consistent with the Sierran subtype. The fourth has a concave base.
   Technique: Pressure flaking.
   Size Range: 13.2 mm x 6.9-12.6mm x 2.3-2.7 mm
   Material: 2 obsidian, 2 cryptocrystalline

2. **Cottonwood Triangular** (see Figure 6, f)
   Number of Specimens: 4
   Artifact Numbers: 87, 88, 142, 153
   Form: Small triangular projectile points which are commonly made from thin slightly plano-concave flakes. Retouched on all margins. Bases are straight to slightly concave. Three of the specimens are missing their tips and the only complete item is small, given the range generally represented within the type.
   Technique: Pressure flaking
   Size Range: 15-23.9 mm x 12-14.5 mm x 2.5-3.1 mm
   Material: 2 obsidian, 1 cryptocrystalline, 1 vitrophyre

3. **Rose Spring Side-Notched** (see Figure 6, c)
   Number of Specimens: 1
   Artifact Number: 132
   Form: Small points with triangular blade outlines and shallow side notches that slope into a small stem. All are plano-convex. Some have slightly expanding stems. The specimen is incomplete.
   Technique: Pressure flaking.
   Size Range: 21.4 mm x 12.9 mm x 3.3 mm
   Material: 1 cryptocrystalline

4. **Rose Spring Corner-Notched** (see Figure 6, e)
   Number of Specimens: 3
   Artifact Numbers: 71, 105, 122
   Form: Small points with triangular blade outlines with shallow corner notches and small slightly expanding stems. Plano-convex in cross-section. All three specimens are fragmentary.
   Technique: Pressure flaking
   Size Range: Given the angles of the existing lateral margins the points appear to range from approximately 24 to 28 mm in length. Width ranges from 11.6 to 14.2 mm and thickness from 2.3 to 3.3 mm.
   Material: Obsidian

5. **Elko Corner-Notched** (see Figure 6, g-i)
   Number of Specimens: 4
   Artifact Numbers: 32, 77, 170, 172
   Form: Large points with a triangular outline with straight to slightly convex lateral edges. Deep corner notches with extended blade elements often extending to the full length of the base. Bases are straight to slightly concave and often expand. Of the four specimens one is complete and one is missing only the extreme distal end. Three points have straight bases while the other is slightly concave.
   Technique: Pressure flaking
   Size Range: 33.2-37 mm x 14.4-27.3 mm x 4.8-6.5 mm
   Material: 2 obsidian, 1 basalt, 1 vitrophyre

6. **Small Side-Notched Points**
   Number of Specimens: 2
   Artifact Numbers: 27, 136
   Form: Small side-notched projectile points which do not fit standard types. Both are small obsidian side-notched points with slightly convex lateral edges. Specimen A136 has a slightly expanding straight base. Specimen A27 also has a straight base. Both points exhibit an irregular flaking pattern and are bi-convex and comparatively thick in cross section.
   Technique: Pressure flaking
   Size Range: A27: 19.8 mm x 13.9 mm x 4.6 mm; A136: 25.1 mm x 17.2 mm x 5 mm
   Material: Obsidian

B. Projectile Point Fragments

1. **Tips**
   Number of Specimens: 14
   Artifact Numbers: 3, 21, 38, 48, 60, 65, 72, 75, 91, 128, 139, 150, 151, 156
   Form: All specimens appear to be from triangular blades with the majority represented by the extreme distal portions of the points.
   Technique: Pressure Flaking
   Size Range: Highly variable. 5-21.2 mm x 4-18 mm x 1-4.2 mm
   Material: 10 obsidian, 4 cryptocrystalline

2. **Midsections or Other Indistinguishable Elements**
   Number of Specimens: 16
   Artifact Numbers: 5, 8, 10, 16, 18, 20, 22, 46, 90, 94, 96, 106, 109, 123, 146, 147
   Form: Only one is clearly the mid-section of a projectile point. The remainder are generally small, thin,

undeterminable portions of the margins of points or bifaces.
Technique: Pressure/Percussion
Size Range: Highly variable. 6 x 4 x 2 mm to 18.2 x 17.1 x 5.2 mm
Material: 13 obsidian, 3 cryptocrystalline

3. Projectile Point Bases
Number of Specimens: 15
Artifact Numbers: 6, 15, 23, 29, 39, 70, 76, 101, 131, 144, 145, 149, 158, 160, 168
Form: The majority appear to be the basal elements of small side-notched points with dimensions falling

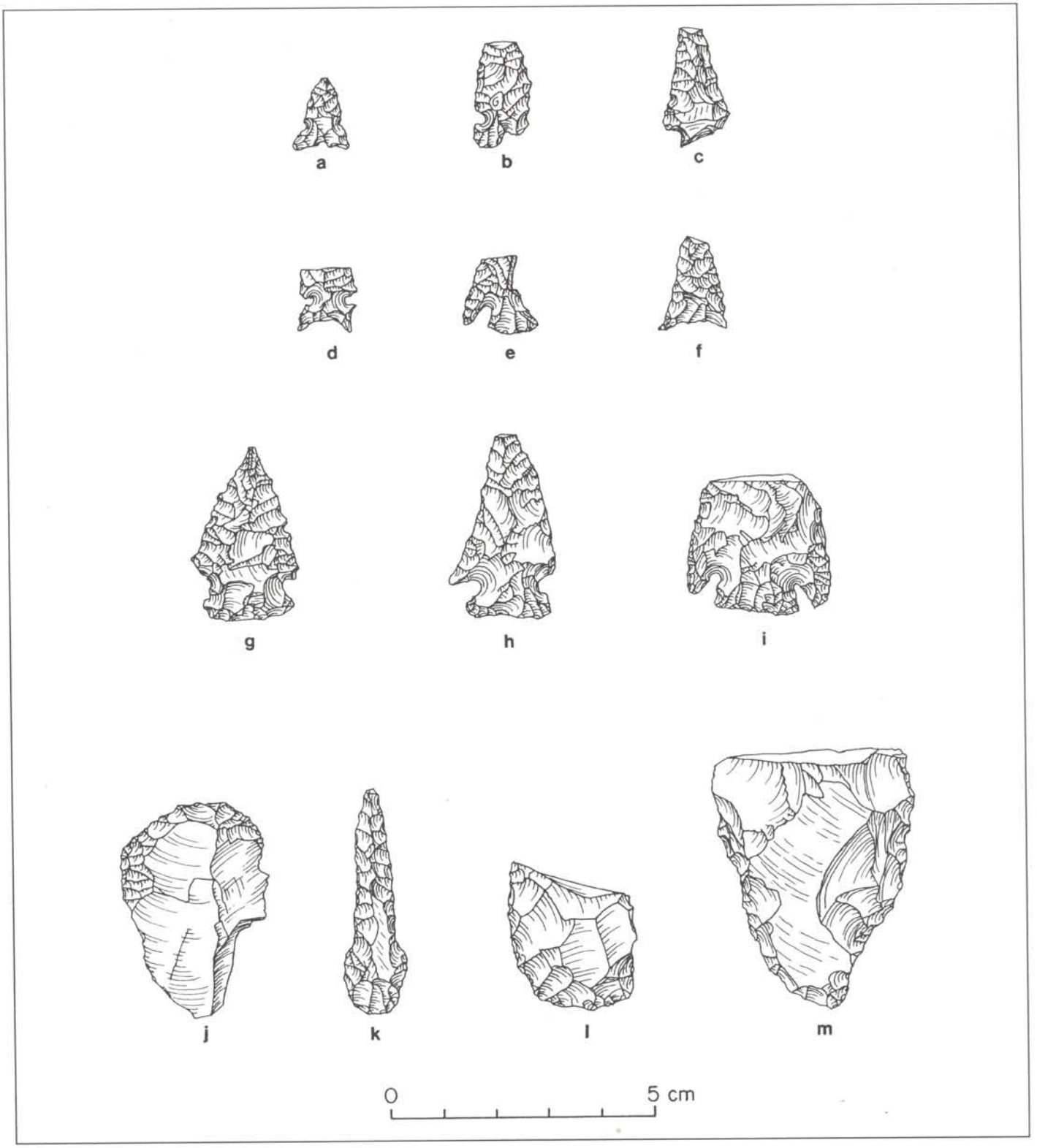


Figure 6. Desert Side-Notched: a-b, d: Rose Spring Side-Notched, c; Rose Spring Corner-Notched, e; Cottonwood Triangular, f; Elko Corner-Notched, g-i; Scraper, j; Perforator, k; Knives, l-m.

within the Rose Spring type parameters. Many have snapped at the point of the notch. One specimen is larger and may be part of a dart point.
Technique: Pressure
Size Range: Highly variable depending on percentage of elements represented. 6-17.1 mm x 6-20 mm x 2-5.5 mm.
Material: 13 obsidian, 2 cryptocrystalline

C. Cores
Number of Specimens: 16
Artifact Numbers: 9, 40, 62, 74, 78, 81, 82, 83, 97, 111, 118, 121, 125, 126, 163, 166
Form: The majority of cores consist of conical ovate to round forms exhibiting largely undirectional primary and secondary flake scars. Many of them are fragmentary and, given their small size, exhausted. Several of the specimens exhibit a few large multidirectional flake scars removed in an irregular fashion from an unshaped core cobble or large flake.
Technique: Percussion
Size Range: 22.1 x 11.8 x 10.2 mm to 60.5 x 60.3 mm
Material: 2 obsidian, 4 cryptocrystalline, 7 basalt, 3 quartzite

D. Drill/Perforators (see Figure 6; k)
Number of Specimens: 4
Artifact Numbers: 43, 64, 95, 169
Form: Drills made on large flakes with proximal portions retouched to give an ovate appearance. Three of the specimens are represented by only the distal portion of the drill bit element. All of the specimens exhibit irregular flaking with secondary retouch on the distal end. The proximal end of the complete specimen has been worked into a disc-shaped form. Two of the distal end specimens are comparable to the complete one in regards to size and their lenticular shape in cross-section. The other item is longer, narrower and round in cross-section.
Technique: Percussion/Pressure
Size Range: 43 x 12.5 x 5 mm (complete specimen)
Material: 3 chert, 1 chalcedony

E. Scrapers (see Figure 6, j)

1. End Scrapers
Number of Specimens: 1
Artifact Number: 7
Form: Modification on either distal or proximal end of artifact creating an edge angle typically greater than 30%. Specimen is plano-convex in cross-section.
Technique: Percussion with some retouch
Size Range: 41 x 27.8 x7.3 mm
Material: cryptocrystalline

2. Side Scrapers
Number of Specimens: 2
Artifact Numbers: 33, 49
Form: Modification on margins lateral to either the distal or proximal end of artifacts, creating an edge angle typically greater than 30%. Specimens are plano-convex in cross-section.
Technique: Percussion with some retouch
Size Range: A33: 38 x 26.8 x 12.2 mm; A49: 34.5 x 26 x 8.3 mm
Material: 1 obsidian, 1 cryptocrystalline

3. Combination End and Side Scraper
Number of Specimens: 1
Artifact Number: 154
Form: Modification on at least one lateral margin as well as the distal or proximal end of artifact. The retouch results in an edge angle typically greater than 30%. Specimens are plano-convex in cross-section.
Technique: Percussion with some retouch
Size Range: 36.2 x 21 x 9.9 mm
Material: cryptocrystalline

F. Knives (see Figure 6, l-m)
Number of Specimens: 5
Artifact Numbers: 17, 42, 130, 148, 157
Form: Two of the specimens are elongated ovate-shaped bifaces exhibiting irregular flake scars with some retouch along the margins. Both are biconvex in cross-section. One specimen is the midsection of a siltstone seam knife which is unifacially worked on the margins only. It is flat, thin and rectangular in outline. A third variety is a thick, lanceolate-shaped biface slightly bi-convex in cross-section and rather crudely finished. None of the items are complete.
Technique: Percussion with some retouch
Size Range: 22.4-49.2 mm x 23.8-38.8 mm x 7-10 mm
Material: 2 basalt, 3 cryptocrystalline

G. Bifaces
Number of Specimens: 6
Artifact Numbers: 19, 80, 93, 152, 162, 164
Form: Bifacially flaked objects consisting of a broad range of specific forms. Some of the more irregularly shaped specimens may be core remnants. Four of the items may be the proximal or distal ends of knives as they compare favorably with those clearly identified in the assemblage. All of the items are fragmentary.
Technique: Percussion
Size Range: 16-30 mm x 14.7-25.2 mm x 5-10.3 mm
Material: 3 obsidian, 3 cryptocrystalline

H. Modified Flakes
Number of Specimens: 12
Artifact Numbers: 1, 41, 79, 98, 113, 115, 117, 124, 161, 165, 173, 174
Form: Flakes exhibiting minor retouch along well defined edges of angular shatter and thinning flakes.
Technique: Percussion/Pressure

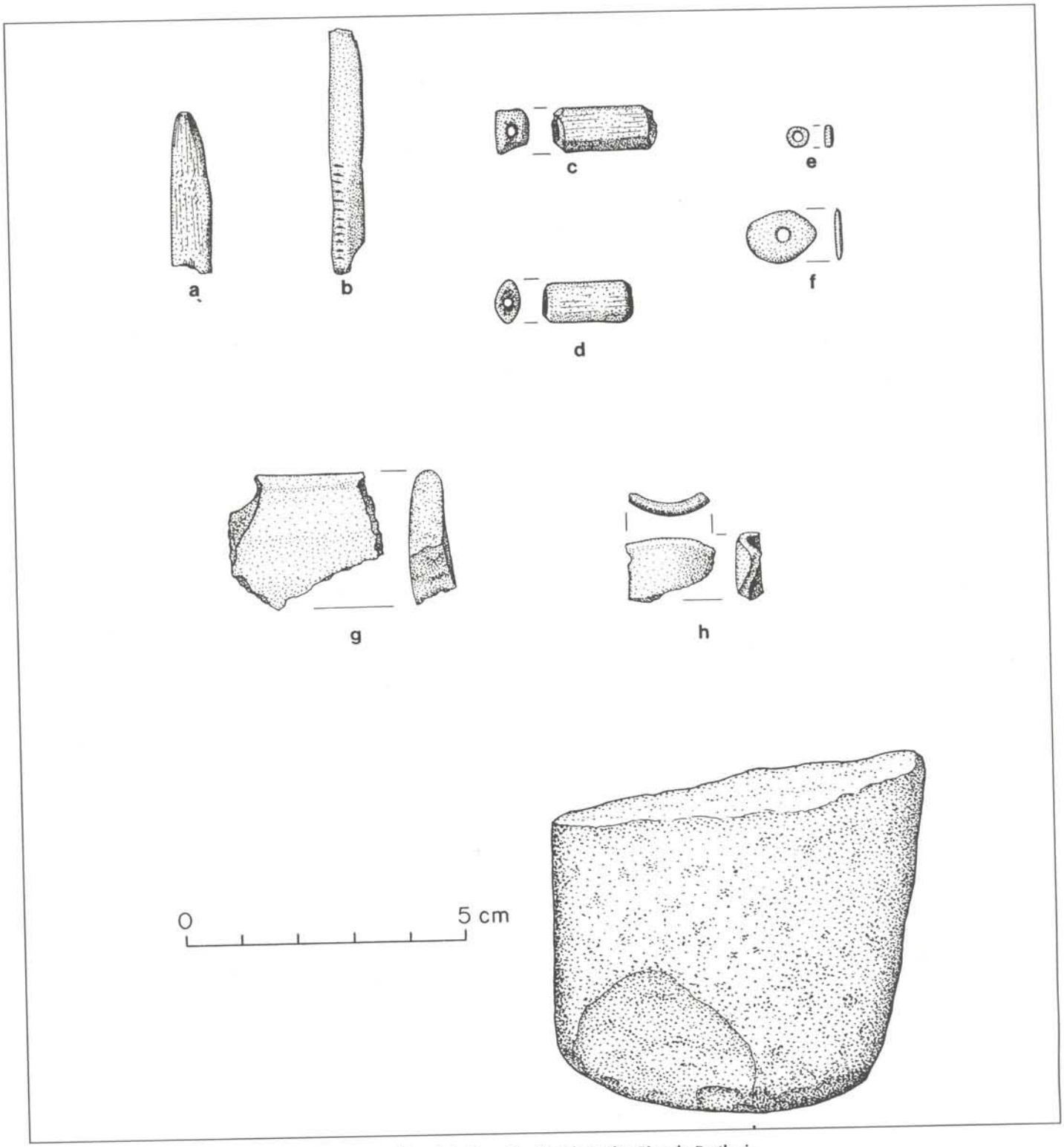


Figure 7. Bone Awls, a-b; Bone Beads, c-d; Stone Beads, e-f; Pottery Rim Sherd, g; Clay Pipe, h; Pestle, i

Size Range: 21-71.2 mm x 17-49.4 mm x 3.4-12.5 mm
Material: 5 obsidian, 6 cryptocrystalline, 1 basalt

I. Groundstone

1. Cylindrical Pestle (see Figure 7, i)
Number of Specimens: 1
Artifact Number: 68

Form: Cylindrical pestle which tapers toward the pounding or grinding surface. The specimen is the larger end of a cylindrical shaped pestle smoothed on all sides and oval in cross-section. The surface of the distal end has been flattened and is oriented perpendicular to the sides. A single large flake has been detached from the distal end. A portion of the pestle surface has been charred.

Technique: Pecked
Size Range: 63.4 mm long and 62 mm in maximum diameter. The diameter of the distal end is 52 mm.
Material: granite

J. Hammerstones
Number of Specimens: 1
Artifact Number: 36
Form: Large elongated basalt fragment which exhibits evidence of pecking and battering on what appears to be the end of the specimen. The specimen is oval to rectangular in cross-section.
Technique: Unmodified except by use.
Size Range: 66.7 mm x 41 mm x 39 mm
Material: basalt

K. Stone Beads (see Figure 7, e-f)
Number of Specimens: 2
Artifact Numbers: 92, 159
Form: Small, highly polished disc-shaped beads. One specimen is rounded and perfectly circular in outline while the other is flat and ovoid in outline.
Technique: Pecking and polishing
Size Range: A92 measures 12 x 8.8 x 1.2 mm, while specimen A159 is 4 mm in diameter and 1.85 mm thick.
Material: quartzite ?

Ceramic Artifacts:

The length of ceramic items was measured on the longest axis with the width derived from the longest point on the axes perpendicular to length. The thickness refers to maximum thickness. The assemblage was too small and fragmentary to estimate vessel dimensions. Color was determined with the use of a Munsell color chart and surface treatment and temper was examined with the aid of a binocular microscope at 10X.

A. Shoshoni Plain Ware (see Figure 7, g)
Number of Specimens: 16
Artifact Numbers: 11, 12, 13, 61, 63, 66, 67, 73, 99, 102, 103, 107, 129, 133, 134, 141
Form: Sherds are thick and rather crudely made and appear to belong to the type of flat-bottomed vessels referred to as Shoshoni Ware. Undulating surfaces with striations are often evident. The exterior surfaces are often charred while the interior surface occasionally exhibits charring and residue build up. Besides a single rim and base sherd all of the specimens are body fragments.
Decoration: None
Temper: Coarse quartzite sand and ground basalt
Technique: Coiling and scraping
Size Range: Sherds are small, ranging from 11 x 15 mm in area to 23 x 37 mm. The wall measurements range from 7.1 to 8.5 mm thick.
Color: Dull brown to dark brown or dark grey

B. Clay Pipe Fragment (see Figure 7, h)
Number of Specimens: 1
Artifact Number: 155
Form: A small ceramic rim sherd which, given the rim curvature, bowl-like shape and vessel thickness constitutes a portion of a pipe. The exterior is well smoothed and burnished.
Decoration: None
Temper: Fine-grained sand or mica
Technique: Unknown
Size Range: 15.4 mm x 11.4 mm x 2.5 mm
Color: Brown to dark reddish brown

Bone Artifacts:

Bone items were measured along the axes of maximum width, length and thickness. Diameters are provided in the case of the beads. Observations were also made as to whether or not the bone has been burned or charred or alternatively if it is green. Given the small and often fragmentary nature of the items only general observations and identifications regarding actual bone elements and contributing species were possible.

A. Bone Beads (see Figure 7, c-d)
Number of Specimens: 5
Artifact Numbers: 28, 30, 44, 59, 127
Form: Two forms can be isolated across the specimens but all have highly polished surfaces and perforations which extend lengthwise through the bead. Four are cylindrical with a somewhat rectangular outline and trapezoidal to oval shape in cross-section. All of these were formed from cut long bones from a small to mid-size mammal. The ends on two have been beveled and the bone of one is charred. One specimen is much smaller and disc-shaped.
Technique: cutting and polishing
Size Range: The long bone beads are from 13 to 18 mm long, 6 to 9 mm wide and 4 to 6 mm thick. The small disc bead is 4.3 mm in diameter and 16 mm thick.
Material: Small long bone, one charred specimen.

B. Bone Awls (see Figure 7, a-b)
Number of Specimens: 1
Artifact Number: 100
Form: Elongated bone fragment which has been modified to a point at one end. Round in cross-section. The bone has been charred.
Technique: Grinding and wear
Size Range: 28.8 mm x 7.2 mm x 5.3 mm

C. Cut/Modified Bone
Number of Specimens: 3
Artifact Numbers: 85, 86, 140
Form: Small fragmented long bones exhibiting incising, hatching or cut marks along the exterior surface. A small groove runs widthwise across an extremely small green fragment. Another larger green splinter

shows evidence of thin, decorative hatching along a portion of a single lateral margin. The surface is highly polished and the specimen may have been part of a bead. The third item exhibits a single cut mark on one margin of a flat, undeterminate fragment of charred bone. All of the specimens are fragmentary.

Technique: Cutting and polishing

Size Ranges: Highly variable

Miscellaneous Artifacts:

A. Modified Shell

Number of Specimens: 1

Artifact Number: 119

Form: A fresh water mussel shell fragment exhibiting a single drilled hole.

Technique: Grinding

Size Range: 50.4 mm x 25.8 mm x 1.5 mm

B. Glass Trade Bead

Number of Specimens: 1

Artifact Number: 104

Form: A small round disc-shaped glass bead. Powder blue in color. Sometimes referred to as "pony beads" which date to the first half of the 19th century.

Size Range: 4.9 mm in diameter and 3.4 mm thick

A total of 143 formal artifacts were recovered from 10-CN-01. The cultural remains are dominated by projectile points, bifaces and modified flakes. Although small, the assemblage exhibits a range of utilitarian implements including scrapers, drills, knives and a single pestle fragment. Cores comprise a fairly large class and include a wide range of raw material types. Interestingly, only one hammerstone was recovered. Ceramic artifacts constitute a small percentage of the assemblage (N=16) and other than a single clay pipe fragment, could easily have derived from a single vessel. A total of six bone and stone beads and several worked or modified bone specimens were recovered. Many of these items represent a non-utilitarian or decorative component which is notable given the meager size of the assemblage and their relative paucity in the region. Figure 8 provides an overall breakdown of the artifact assemblage according to type.

The distribution of temporally diagnostic projectile points at 10-CN-01 provides a relative time frame within which the site was occupied. The predominance of Desert Side-Notch and Rose Spring points suggests a Late Archaic occupation, while larger Elko dart points indicate an earlier Middle Archaic period of use. Desert Side-Notch points in the western Great Basin date to within the last 1,000 years and Rose Spring appear after 300 A.D. The Elko points overlap considerably with the later styles, but date to as early as 6,000 B.P. in many contexts (Holmer 1986). A single Pony Bead dating from the early 19th century was recovered. The bead is a

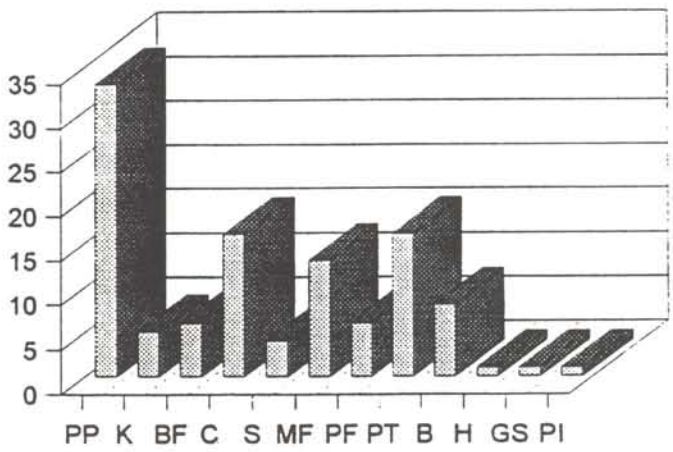


Figure 8. Distribution of Artifact Types, 10-CN-1. PP=Projectile Points; K=Knives; BF=Biface Fragments; C=Cores; S=Scrapers; MF=Modified Flakes; PF=Perforators; PT=Pottery; B=Beads; H=Hammerstone; GS=Groundstone; PI=Pipe

common trade item indicating a relatively late aboriginal occupation.

The cultural materials classified according to the morphology and technological attributes above can be grouped into broader functional categories for the purpose of demonstrating site type or use. As with any classification, these functional classes are a simplification which allows for comparisons both within and between sites in the area. We have adopted the categories defined in Winter's (1969) scheme which include weapons, general purpose tools, domestic tools, fabricating tools, recreational objects and ceremonial objects. Weapons refer to lithic projectile points, bone points, net weights and other implements used to procure food or engage enemies. General purpose tools include an extremely wide array of tools difficult to assign to a more definitive category such as knives, scrapers, modified flakes, bifaces, hammerstones, and cobble tools. Domestic tools include needles, mortars and pestles, milling stones, and utilitarian ceramics. Fabricating tools refer to cores, drills, awls, flintnapping equipment and abraders, among other things. The recreational/ceremonial category covers virtually all non-utilitarian items including decorative apparel such as beads, gaming implements and pipes. Distribution of artifacts among these classes is shown in Figure 9 and is used to measure the relative evenness and richness of the assemblage.

According to Winter's categories, the majority of the artifacts are general purpose tools followed closely by weapons. The relatively even representation of implements in these two categories and the presence of domestic and fabricating tools suggests that the site was the focus of a variety of activities including hunting, some stone tool manufacturing and a variety of processing activities.

It is difficult to infer any specific behavior from the largely decorative items comprising the recreational/cer-

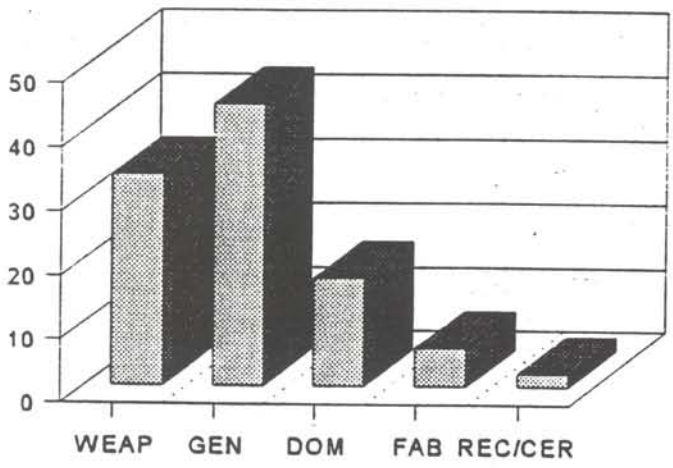


Figure 9. Functional Categories after Winter's (1969)

emonial category other than to suggest that their introduction into the record is likely the result of breakage and/or loss. The assemblage documents a slight preference for obsidian over cryptocrystalline in the manufacture of projectile points with basalt constituting a very small percentage. This pattern is somewhat atypical, as the majority of the sites located within the canyon context demonstrate a preference for obsidian. Within the general purpose tools category the distribution across a broader array of material types is similar. Overall the materials outlined in the classification suggests use of the site for short term uses as well as a wide variety of subsistence, processing and maintenance activities.

Lithic Debitage

In conjunction with the formal tools, the lithic remains recovered during the excavation provide potentially valuable insights into past human activities that have occurred at the site. These materials, as well as the ecofactual remains and contextual relationships are essential in the determination of site function and age. A total of 10,161 lithic debitage specimens were recovered from 10-CN-01. Comparable to the formal lithic artifacts, the distribution of the debitage across the three material types shows a slight preference for obsidian over cryptocrystalline and a clear predominance of these types over basalt (see Figure 10).

The debitage was initially examined and sorted according to material type, general size classification and morphological traits which allowed for the determination of flake completeness. These characteristics included the presence of an identifiable striking platform or bulb of percussion. Approximately 75 percent of the assemblage was determined to be fragmentary. Further analysis on a variety of attributes including size, thickness, presence of cortex, platform type and number of dorsal flake scars was then conducted on the essentially complete debitage specimens. Five general size classes were defined and are given in Figure 11. The assigning of the debitage to the size classes resulted in almost half (47%) falling into the second smallest class of .26 to 1sq. cm. in area, followed by 29% falling into the 1.01 to 2.25 sq. cm. range. Only 2% fell in the largest size category of greater than 6.26 sq. cm. (see Figure 11).

The distribution of the complete specimens across material type was 56% obsidian, 33% cryptocrystalline and 11% basalt. The overwhelming majority (93%) of these flakes exhibited no cortex on the dorsal surface and the remaining 6% exhibiting under 50% (see Figure 11). The results of the analysis of the numbers of dorsal flake scars is illustrated in Figure 11 and shows the vast majority (80%) to have evidence of one or two with a small percentage (18%) exhibiting three to five. Virtually none of the specimens were found to have completely cortical dorsal surfaces or greater than five flake scars.

Based on the relative preponderance of small flakes in conjunction with virtually no cortex and multiple flake scars evidenced on the dorsal surfaces, it appears that technologically much of the site represents the use of largely late stage reduction and retouch techniques on material already reduced outside the site. However, the presence of several cores and a considerable number of flakes falling into moderate size ranges suggest that some tool manufacturing or at least secondary stage reduction was being carried out as well.

FAUNAL AND BOTANICAL REMAINS

Bone, shell and seed were recovered during excavation of site 10-CN-01. All excavated units contained bone and shell though only 14 produced evidence of botanical remains (seeds). Bone constitutes the largest category of non-artifactual materials, comprising 87% of the total. Shell accounts for 12% of the non-artifactual assemblage while seeds represent less than 1%.

The bone assemblage was initially sorted into identifiable and unidentifiable specimens. The identifiable were further sorted into vertebrate and fish remains. A total of 17,398 bone/fragments weighing 7,099 g were collected. Most of the bone was highly fragmented and unidentifiable. Of the 869 identifiable bones and bone fragments, 168 were classified as fish. Fish remains were

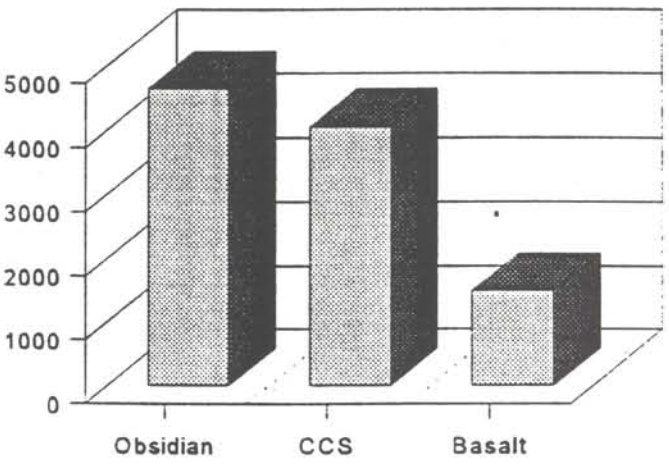


Figure 10. Distribution of All Items by Material Type

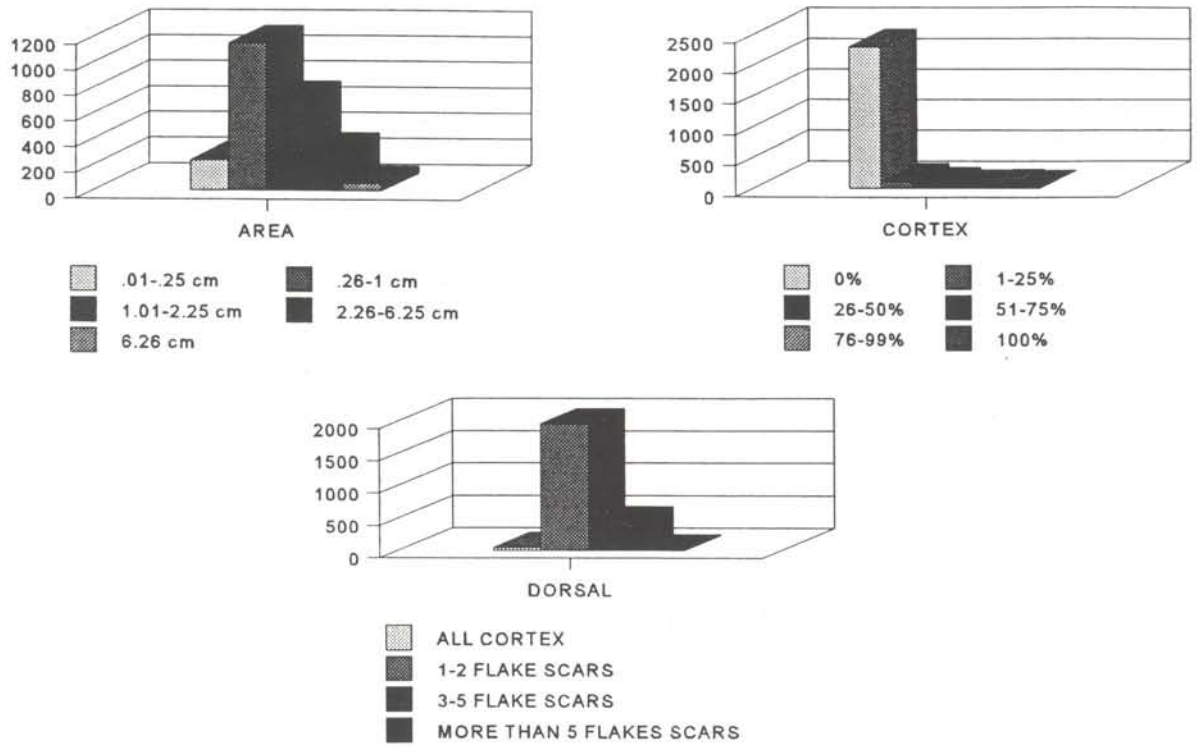


Figure 11. Distributions of Flake Area, Cortex and Dorsal Scars

present at all but three of the units: unit 14-15S 65-66W contained 33% of the fish bone recovered. Most of the bone was found in three contiguous units 13-14S 65-66W, 14-15S 65-66W and 13-14S 66-68W (N=10,635; 61%). Notably, 77% of the animal remains and 13% of the shell fragments are charred suggesting cultural associations and the probable use of these species for food.

Identifiable faunal remains were examined by Susanne Miller (1997). Her analysis suggests a range of species with emphasis in utilization of only a few. The major species represented in the assemblage include artiodactyla (33%), fish (22%), rabbits (1%) and small animals (15%). The latter category includes a large number of small unidentified rodents, amphibians and small birds (see Figure 12). The small animal remains category includes both small and microfaunal elements. Notable among the remains are elements belonging to *Thomomys sp.* Only a few remains are identified as belonging to medium sized mammals. These appear to represent canids and mustelids. The presence of small to microfaunal remains are likely not associated with the cultural activities at the site. *Odocoileus sp.* and *Antilocapra sp.* are represented within the artiodactyla remains. Fish include Salmonids, cyprinids and a range of unidentified small fishes. Importantly, the family Salmonidae includes a variety of fishes, the majority not salmon. The size ranges of the fish represented in the family Salmonidae suggest the likelihood that many are trout or perhaps whitefish. Few of the diagnostic vertebrae are large enough to represent the remains of a salmon taken during the major spring and fall fish runs documented in the 19th and early 20th centuries. The remains consist largely of vertebrae, ribs and otoliths.

While the presence of artiodactyla, especially deer and fish, are expected, the relative absence of rabbits is of interest as it varies substantially from the pattern of many Middle Snake River sites where deer and rabbits dominate the assemblages (Gould and Plew 1996). The percentage of charred identifiable remains mirrors the distribution of the unidentifiable assemblage.

The presence of mussel shell at 10-CN-1 is not well represented relative to other faunal categories. The collection includes only those specimens two centimeters

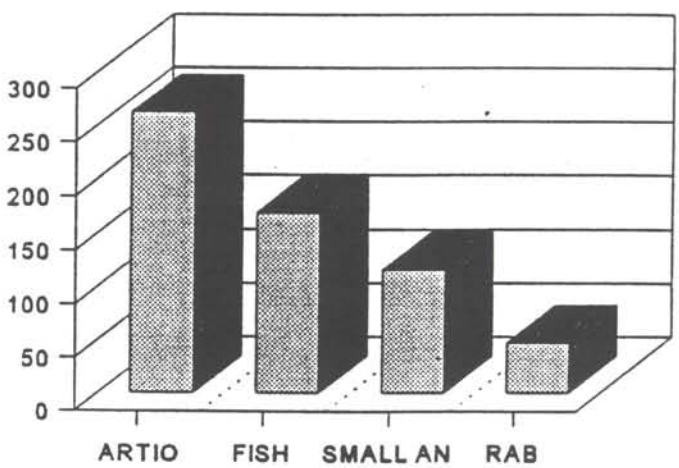


Figure 12. Distribution of Identified Faunal Remains, 10-CN-1.

in diameter or greater with potentially diagnostic attributes. Of the 2,454 shell fragments examined, the majority were fresh water mussel, though 25 small gastropods were identified. The shell is broadly distributed throughout the deposits and is largely uncharred. This suggests that shell is either naturally occurring in the deposit or that mussels were consumed without preparation. We cannot, however, discount the possibility that mussels were steamed or boiled, in which case they would not exhibit charring unless disposed by dumping in firepits.

The botanical collection constitutes the smallest assemblage recovered from 10-CN-1. A total of 68 individual seeds were collected. The majority appear to represent hackberry, which is presently found along the river. Though known as a food source we cannot distinguish natural versus cultural use. Notably, however, Unit 4-5S 74-75W yielded 28% of the total seeds recovered. Though seeds were recovered from lower levels, the disturbed nature of the deposits prevents us from arguing for an aboriginal use of seeds.

X-RAY FLUORESCENCE AND OBSIDIAN HYDRATION ANALYSIS OF ARTIFACT OBSIDIAN FROM SITE 10-CN-01

Analyses were conducted by Thomas Jackson, Pacific Legacy using a Spectrace 440 energy dispersive X-ray fluorescence spectrometer. The spectrometer is equipped with an Rh X-ray tube powered by a 50 kV X-ray generator. The X-ray tube is operated at 30kV, .20 mA, using a 0.127mm Rh filter under vacuum. Specimens are scanned for 250 seconds live-time for the elements Ti, Mn, Fe, Ni, Cu, Zn, Ga, Pb, Rb, Sr, Y, Zr, and Nb. The EDXRF system employs a Tracor X-ray TX 6100 X-ray analyzer and Tracor reduction software run on an IBM PC based microprocessor. Trace and minor element intensities are converted to concentration estimates using a least squares calibration line developed by analysis of international rock standards.

Element concentration data in the attached table are reported as parts-per-million (ppm) by weight. Samples were analyzed as unmodified artifact samples (not powder). Values for Ni, Cu, and Ga are not reported because these are not recognized as useful in distinguishing among geological sources of obsidian. Ti, Mn, and Fe values are semi-quantitative. The U.S.G.S. RGM-1 standard was included during analysis of unknowns to check machine calibration (see Figure 13).

Analytical data for trace and minor element analyses are provided in the attached tables. Analysis of these data suggest that as many as three chemically distinguishable obsidian types may be present in the artifact collection. These provisional chemical groups are indicated on the data tables by the letters A, B, and C. Because of the large number of obsidian sources in the vicinity of the project area and the lack of thorough chemical descriptions of most of these sources, it is not possible to assign specific original geological source assignments to all artifacts submitted for analysis. The provisional source group "A" most closely compares in chemical composition with the source at "Oreana South" that has been described by NAA by Dr. Michael Glascock at the University of Missouri (personal communication). Unfortunately, he does not have good location data for that source. Otherwise, given the close chemical similarities between so many of the sources in the region, we are not inclined to attempt definite assignments of artifacts to primary geological source(s).

Examination of the artifacts submitted clearly indicates that some of the obsidian raw material is pebble-size pieces derived from secondary sources, probably stream or alluvial gravels (e.g., specimens 306, 448, 470). It is possible that re-deposited pebble sources are the origin of the obsidian raw material rather than primary geological sources. The fact that three different chemical groups are represented by samples with erosion or weathering

SAMPLE	TI/R1		MN/R1		FE/R1		PB/R1		TH/R1		RB/R1		SR/R1		Y/R1		ZR/R1		NB/R1		SOURCE
LABEL	PPM	ERROR	PPM	ERROR	PPM	ERROR	PPM	ERROR	PPM	ERROR	PPM	ERROR	PPM	ERROR	PPM	ERROR	PPM	ERROR	PPM	ERROR	ASSIGNMENT
RGM1	1483.2	180.9	250.5	22.9	13346.2	298.6	25.2	4.2	16.9	6.5	146.0	2.6	105.4	4.8	26.7	2.4	218.0	5.1	7.9	5.3	
284	763.6	185.0	143.8	23.9	10262.6	299.8	31.9	4.3	32.6	6.4	228.8	2.9	30.3	4.8	25.4	2.6	115.6	5.2	9.2	5.4	A
306	893.6	185.5	156.4	24.4	10495.4	300.6	29.3	4.3	32.4	6.5	232.9	3.0	32.9	4.8	26.1	2.7	120.9	5.2	16.2	5.4	A
330	830.4	183.8	181.5	23.2	10481.1	299.4	30.1	4.3	25.0	6.5	234.5	2.9	31.1	4.8	29.5	2.6	119.4	5.1	7.5	5.4	A
357	729.7	190.0	139.5	24.8	9231.4	301.6	27.7	4.4	32.9	6.6	204.3	3.1	25.8	4.8	21.4	2.8	104.7	5.2	13.3	5.5	A
379	801.9	188.6	171.9	24.7	10736.9	302.6	36.4	4.5	32.9	6.8	236.9	3.2	33.5	4.9	27.2	2.8	107.2	5.3	8.5	5.6	A
396	842.4	183.6	187.3	23.9	11010.3	300.3	29.0	4.3	30.1	6.5	243.5	3.0	31.1	4.8	27.7	2.7	108.4	5.2	11.9	5.4	A
423	939.3	195.9	196.0	26.9	11176.9	306.5	36.4	4.7	31.1	7.3	227.9	3.5	37.4	5.0	26.2	3.1	118.0	5.4	4.4	6.1	A
435	696.1	219.3	173.6	29.3	11669.7	311.3	36.9	5.1	23.6	8.6	230.2	4.0	35.8	5.1	25.9	3.4	98.4	5.7	8.9	6.1	A
448	850.5	183.0	251.1	23.8	9892.6	299.3	44.5	4.4	22.2	6.6	155.2	2.7	30.3	4.8	21.9	2.5	99.2	5.1	6.6	5.4	B
470	531.7	183.0	640.5	24.6	6997.0	297.4	31.5	4.2	14.5	6.9	180.3	2.7	15.0	4.8	41.8	2.4	57.9	5.1	34.3	5.3	C
481	748.8	188.9	188.7	23.7	11068.3	300.3	30.9	4.3	35.1	6.3	229.4	3.0	48.1	4.8	27.3	2.6	142.9	5.2	11.4	5.4	A?
488	1031.9	201.2	119.6	28.2	8925.7	309.3	33.9	4.8	23.4	8.1	180.3	3.7	29.8	5.1	20.7	3.4	113.4	5.6	5.7	6.2	A?
498	993.6	187.7	161.0	25.1	10929.0	302.7	28.9	4.5	35.3	6.7	230.0	3.2	36.1	4.9	29.7	2.8	115.4	5.3	9.5	5.6	A
531	1003.2	189.5	282.2	25.1	13290.3	303.7	40.7	4.5	40.3	6.7	264.5	3.3	28.5	4.9	24.4	2.9	112.9	5.3	10.4	5.6	A
629	745.3	185.4	225.2	23.9	10712.6	299.7	36.1	4.3	29.0	6.4	211.7	2.9	23.9	4.8	26.2	2.6	97.1	5.1	12.6	5.4	A
665	1063.0	199.3	145.6	27.9	8929.1	309.6	29.1	4.9	32.9	7.8	187.1	3.8	23.7	5.1	22.3	3.5	87.1	5.7	3.9	6.6	A
667	882.5	185.5	158.4	23.8	10722.9	300.1	29.9	4.3	25.7	6.5	216.3	2.9	45.9	4.8	27.2	2.6	131.2	5.2	9.1	5.4	A?
F223	594.1	192.5	144.1	24.0	9468.3	300.6	28.3	4.4	26.0	6.7	211.0	3.0	24.0	4.8	32.0	2.7	103.1	5.2	8.0	5.5	A
F232	671.1	197.4	195.2	25.4	11151.5	303.6	36.0	4.5	29.6	7.0	243.2	3.4	36.3	4.9	25.8	2.9	117.7	5.3	13.1	5.6	A
266	660.2	192.0	151.6	24.7	9678.4	302.0	29.6	4.4	23.1	7.0	212.2	3.2	27.3	4.9	26.1	2.8	98.7	5.3	10.4	5.5	A

Source Assignments:
A= Unknown A
B= Unknown B
C= Unknown C
RGM1= USGS Reference Standard

Figure 13. EDXRF Analysis of Materials from 10-CN-1

cortex may indicate that all of the obsidian, regardless of chemical group, is derived from re-deposited material.

CONCLUSIONS

Excavations suggest relatively uniform deposits consisting of both alluvial and eolian materials which are distributed unevenly from north to south across the site. On the northern periphery sediments are rather homogeneous and largely eolian with inclusions of small angular basaltic rock exfoliated from adjacent boulders. Deposits are somewhat deeper within the central portions of the site area and relatively more shallow toward the Snake River. Near the northern periphery of the site three major stratigraphic horizons are noted. The upper 50 cm consist of light brown/grey sediments which contain a few small charcoal flecks resulting from carbonized rootlets. A second stratum extends to as much as 80 cm below datum and consists of a loosely compacted very pale brown sand. The upper two strata contain very limited cultural remains consisting of a few lithic flakes and small and highly fragmented mussel remains. A third stratum extended below 80 cm and consists exclusively of loosely compacted brown sands which are culturally sterile.

The central portion of 10-CN-1 consists of cultural bearing deposits extending to nearly two meters below surface. Five major strata were described. The upper most stratum, a loosely compacted pale brown silt, is underlain by a loosely compacted greyish brown silt extending to nearly 80 cm. below surface. Stratum 3 is a shallow lens (20-30 cm thick) of highly mottled dark brown sandy/silt extending to approximately one meter below the surface. Stratum 4, which consists of a moist sandy silt containing extensive charcoal and clay, extends between 1.5 and 1.8 m below Stratum 3 and is highly compacted. The lowest level, Stratum 5, is a yellowish brown fine sand which is very loosely compacted and extremely homogeneous.

The excavations produced minimal evidence of archaeological features which might inform us regarding site functions. Four of the features represent rather nondescript concentrations of charcoal with variable densities of lithics, bone, shell and thermally altered rock over areas of 40-50 centimeters in diameter and having variable configurations. The exception is Feature 1 located in unit 25-26S, 54-55W which was exposed on the surface at the time of excavation by earlier vandalism. Its initial appearance was as a small circular fit pit containing extensive charcoal. Horizontal excavation revealed the feature to measure approximately one meter in diameter and extend to a maximum depth of 40 cm. The deposit, consisting of a dark brown silt, was extensively stained and interspersed with ash. Small amounts of lithic debris, mussel and thermally altered rocks were recovered. Extensive rodent activity has introduced late 20th century material into the matrix. It is not clear whether the feature was cleared of deposits aboriginally or whether it was damaged by extensive "pot hunter" activity.

The test excavations produced data which enable us to identify the temporal use of the location and to minimally address the nature of some of its occupations. The recovery of Desert Side-Notched, Cottonwood Triangular and Rose Spring projectile points (N=11) indicates a Late Archaic (post 1,000 B.P.) use of the area. The recovery of four Elko projectiles, three from Stratum 5, Unit 13-14S, 65-66W extends the use of the location to Middle Archaic times (5,000-1,000 B.P.). Notable also is the recovery of a pastel blue glass trade bead ("pony bead") dating to the first half of the 19th century and suggesting a rather recent use of the location. The artifactual assemblage reflects a rather even distribution of artifact types. Though projectiles dominate the collection, pottery, cores and modified flakes constitute the most common types. The richness of the assemblage is greater than other recently excavated sites in the area (see e.g. Sayer, Plager and Plew 1996). While cores are well represented in the collection, only a single hammerstone was recovered. Additionally interesting is the recovery of a single groundstone specimen which traditionally has indicated plant processing activity. The earlier disturbance to the location may have resulted in the collection of these items and hence skewed their representation in the assemblage. However, this is not the case with projectiles which are normally removed by vandalism. Winter's functional categorization identifies weapons and general purpose tools as primary tool categories. The absence of groundstone and the probability that the 16 pottery sherds are from one or two vessels no doubt accounts for the distribution of domestic tools in the assemblage. It is, however, noteworthy that virtually no groundstone was recovered. This may suggest a specific seasonal occupation of the site. Notably also are fabricating tools (awls) and recreational/ceremonial items (beads, pipe). These may represent lost or discarded items, as they occur in such small quantities. In turn, the preponderance of evidence may indicate hunting and related processing activities as primary functions at 10-CN-1 and thereby suggest somewhat more extensive uses than those documented at other locations along the river toward Swan Falls (see Sayer, Plager and Plew 1996).

Analysis of lithic debris indicates a preference for the use of obsidian, followed closely by cryptocrystallines (CCS) and basalt. This correlates with the preponderance of tool categories represented in the assemblage. Projectile points exhibit a relatively even distribution in production between obsidian and CCS which fits nicely with EDXRF analysis suggesting use of local materials. The presence of cores implicitly suggests manufacturing activity. Forty-six percent (46%) of the flakes analyzed have area dimensions between .26 and 1 cm. An additional 28% range between 1.01 and 2.25 cm. Ninety-three percent (93%) of flakes exhibit no cortex though 79% exhibit 1-2 dorsal flake scars. Overall, this suggests

a range of manufacturing and retooling activities were performed at 10-CN-1. It is not possible to determine whether these activities were constant or variable over what are almost certainly multiple uses of the location.

We are perhaps most informed regarding site activities by analysis of faunal remains. The total bone assemblage consists of nearly 18,000 bones/fragments. Osteological analysis indicates a range of species including large and small mammals, rodents, fish, amphibians and small birds. Major food species represented in the assemblage include artiodactyla (33%), fish (22%), small animals (15%) and rabbits (1%). Few medium sized mammals are represented and mainly include remains of canids and mustelids. Within the largest class represented, artiodactyla, are individuals of *Antilocapra sp.* and *Odocoileus sp.* Cultural utilization of deer is indicated by a selection for specific elements, the presence of cut marks, striae, discreet impact and battering zones and fracture patterns of long bones as well as conservation of bone for tool manufacture. The artiodactyl MNIs conservatively indicate no more than five individuals.

Fishes include individuals belonging to Salmonidae, Cyprinadae and a number of small unidentified fishes. The size ranges of fishes identified to the family Salmonidae are quite small and are most likely trout or whitefish. Conservatively, the MNI estimate of salmonid individuals is 18. The majority of the remains appear to be unaltered by heat or burning. The absence of many skeletal elements may be accounted for by nonpreservation or discard relating to butchering/processing, cooking or ingestion (see Miller 1997). One of the most interesting aspects of our analysis is the relative absence of rabbits in the faunal assemblage. This is notable as deer and rabbits generally dominate Middle Snake River assemblages (see Gould and Plew 1996; Sayer, Plager and Plew 1996). The limited presence may reflect season of use which may also be suggested by the greater representation of fish at the location. Seventy-seven percent (77%) of all bone/fragments exhibit evidence of charring, indicating probable cultural association. In contrast, some c. 2500 mussel shells/fragments were recovered. Of these only 13% are charred.

Excavations at 10-CN-1 indicate that prior to the site having been badly vandalized it was a multicomponent site spanning the Middle to Late Archaic and perhaps more recently into the earlier 19th century as suggested by the recovery of a glass trade bead. The rather extensive cultural deposit suggests many repeated occupations or uses during the past 5,000 years. The material culture assemblage characterized by relative richness and evenness may indicate lengthier stays than those documented in other reaches of the Birds of Prey Area and the Snake River Canyon. Functional tool categories suggest hunting and processing activities, particularly those associated with general purpose tools. In this regard faunal remains indicate the use of a range of species with an emphasis on deer, antelope, fish and small animals. Compared with bone, the mussel assemblage is quite small and does not appear to have constituted a major portion of the diet, though an important supplement. MNI estimates, however, suggest but a few individuals of these species. Hence, 10-CN-1 may well represent very short but repeated occupations. The presence of fire hearths suggest extended use of the location though it was not generally possible to associate specific activities or temporal episodes with individual features. Notable, however, is the recovery of c. 33% of all fish remains from a single excavation unit which may indicate the seasonal and/or episodic use of the location for variable activities. The site also indicates that the manufacturing and retooling of chipped stone artifacts occurred periodically. The presence of cores, flake sizes and numbers of dorsal flake scars indicate that some manufacturing and retouch or retooling occurred at the site. Manufacturing versus retooling would have varied by the specific tasks conducted at the site. The size and range of cores recovered suggests the use of local materials and the probable production of some expedient tools. The EDXRF analysis of materials supports the hypothesis by indicating that the volcanic glasses represented in the assemblage are of local origin.

Our original objectives are met, though not conclusively, as it relates to our ability to generalize about subsistence. Our interest in addressing diet breadth variability in Middle Snake River contexts is enhanced by excavations at 10-CN-1. Our investigation has increased the range of species documented within the area while reiterating the relative importance of artiodactyla in local prehistoric contexts. Notable, however, is the absence of rabbits (*Leporidae*) at 10-CN-1 which stands apart from findings in other contexts (see Gould and Plew 1996). Additionally, the greater abundance of fishes represented in the context differs from a number of other sites along the Middle Snake River where fish are not commonly found to constitute significant portions of the diet. Thinking optimally, we may assert that artiodactyla provided consistently over time an important and optimal resource. Calculated in terms of simple cost benefit returns the consistency represented across the assemblage would seem to suggest that fish and small animals, while important, were most likely supplementary in the diet. Were the fish within the family Salmonidae relatively larger, we might surmise them to reflect a more significant resource such as salmon depicted in ethnohistoric/historic records. This, however, is not indicated. Further, if we assume that a number of the species represented in the small animal category are not food sources but naturally accumulated within the deposits, artiodactyla appear to dominate the choices made by the prehistoric occupants of the site.

The activities and resource use decisions made by occupants of 10-CN-1 relate not only to optimal choices regarding prey but also to degrees of mobility. Evidence indicates manufacturing from local material sources as the presence of cores and lithic attributes reflecting manufacturing are documented at the location. Further, the

richness of the assemblages indicates a range of activities indicative of some degree of extended use. These evidences suggest groups that may be occupying the same locations for extended periods and logistically organizing extraction forays away from base camps. Though we cannot determine whether the degree of "semi-permanence" suggested by findings at 10-CN-1 indicate "collectors" of the sort hypothesized by Binford (1980), it is clear that the location is markedly different than sites such as 10-AA-14, where a much more ephemeral pattern is exemplified.

Our findings suggest that developing composites of variables will prove useful in identifying the range of variation in local and regional patterns that may eventually lead to a more refined understanding of the relationships between mobility strategies and optimal economic decision making, as well as how and why such strategies have changed over time.

ACKNOWLEDGMENTS

We appreciate the assistance of Dean Shaw and Dan Hutchison in arranging and administering the 10-CN-1 project. We would like to thank our field school participants for their hard work in the field and laboratory: Stacia Acker, Adam Berg, Jennifer McDaid, Gretchen Kennedy, Wendy Christensen, William Hoek, Karin Murdock and Shoko Tokoro. Special thanks are due Craig Hauer who served as crew chief and Stacia Acker for serving as camp cook. We owe a debt of gratitude to Tom Bicek, Celebration Park, for making available the Park's facilities and for a myriad of lesser favors. We are indebted to Thomas Jackson and Susanne Miller for their prompt and insightful analyses of the lithic and faunal remains. Sarah Moore prepared the artifact illustrations and Faith Brigham assisted with the final preparations of tables, illustrations and organization of the manuscript.

REFERENCES CITED

Addington, Steven J.
1987 Project Report: Idaho National Guard Training Area Cultural Resource Inventory. Bureau of Land Management, Boise District, Boise.

Binford, Lewis R.
1980 Willow Smoke and Dog's Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. **American Antiquity** 45:4-20.

Chavarria, Juan C.
1994 Results of the Evaluations of Seven Sites at the National Guard Training Area, 1993. Bureau of Land Management, Idaho State Office, Boise.

Davis, William B.
1939 **The Recent Mammals of Idaho**. Caxton Printers, Ltd.

Delisio, Mario P.
1980 Report on the Archaeology of Cathedral-Tank-Higby Caves, 10-AA-160, 10-AA-159, 10-AA-40, Southwestern Idaho. Report on file, Bureau of Land Management, Boise District Office.

Ebert, James I. and Timothy Kohler
1988 The Theoretical Basis of Archaeological Predictive Modeling and a Consideration of Appropriate Data Collection Methods. In **Quantifying the Present and Predicting the Past**, edited by W.J. Judge and L. Sebastian, pp. 97-171. U.S. Department of the Interior, Washington.

Freeman, Otis W., J.D. Forrester and R. L. Lupher
1945 Physiographic Divisions of the Columbia Intermontane Province. **Association of American Geographers Annuals** 35(2): 53-75.

Gould, Russell T. and Mark G. Plew
1996a Prehistoric Salmon Fishing in the Northern Great Basin: Ecological Dynamics, Trade-Offs, and Foraging Strategies. In **Prehistoric Hunter-Gatherer Fishing Strategies**, edited by Mark G. Plew, pp. 64-83, Boise State University.

1996b Site Structure at Three Island Crossing (10-EL-294), Southwestern Idaho. Paper Presented at the 25th Great Basin Anthropological Conference, Kings Beach, California.

Green, Thomas J.
1982 House Form and Variability at Givens Hot Springs, Southwest Idaho. **Idaho Archaeologist** 6(1-2): 33-43.

1993 Aboriginal Residential Structures in Southern Idaho. **Journal of California and Great Basin Anthropology** 15(1): 58-72.

Gruhn, Ruth
1964 Test Excavations at Sites 10-OE-128 and 10-OE-129 Southwest Idaho. **Tebiwa** 7(2): 28-36.

Hauer, Craig A., and Lisa Hughes
n.d. Description and Analysis of Material Culture of Site 10-CN-6, Middle Snake River, Southwestern Idaho. Manuscript under review, **Idaho Archaeologist**.

Henry, Craig
1984 Holocene Paleoecology of the Western Snake River Plain, Idaho. Master of Science Thesis, University of Michigan.

Holmer, Richard N.
1986 Common Projectile Points of the Intermountain West. In Anthropology of the Desert West: Essays in Honor of Jesse D. Jennings, pp. 91-115, edited by Carol Condie and Don D. Fowler, **University of Utah Anthropological Papers Number 110**.

Huntley, James L.
1979 **Ferry Boats of Idaho**. Caxton Printers, Caldwell.

Idaho Department of Water Resources
1978 Gooding County, Idaho, Water-Related Land Use—1975. Idaho Department of Water Resources in Cooperation with the Pacific Northwest Region Commission. Boise.

Keeler, Robert W. and David G. Koko
1971 An Archaeological Survey of the Proposed Guffy-Swan Falls Reservoirs, Southwestern Idaho. Report on file, Idaho Water Resources Board. Boise.

Kelly, Robert S.
1983 Hunter-Gatherer Mobility Strategies. **Journal of Anthropological Research** 39: 277-306.

King, Glenda L.
1996 Great Basin Ethnobotany: A Computerized Database. Masters Thesis, Graduate College, University of Oklahoma.

Leonard, Robert D. and George T. Jones (editors)
1989 **Quantifying Diversity in Archaeology**. Cambridge University Press, Cambridge.

Malde, Harold
1965 Snake River Plain. **In Quaternary of the United States**, H. E. Wring, Jr. and David G. Frey (eds.). Pp. 255-263. Princeton: Princeton University Press.

Metzler, Sharon
The Brown Creek Archaeological Survey, Owyhee County, Idaho. Report on file, Boise District Office, Bureau of Land Management.

Miller, Susanne J.
Faunal Remains from 10-CN-1, Southwestern Idaho. In Archaeological Test Excavations At 10-CN-1, Southwestern Idaho by Camille Sayer, Mark G. Plew and Sharon Plager, pp. 60-126, **Technical Reports No. 5**, Snake River Birds of Prey National Conservation Area Archaeological Project, Boise State University.

Pavesic, Max G., W. I. Follett, and William P. Statham
1987 Anadromous Fish Remains from Schellbach Cave. No. 1, Southwestern Idaho. **Idaho Archaeologist** 10(2): 41-42.

Pavesic, Max G. and Daniel S. Meatte
1980 Archaeological Test Excavations at the National Fish Hatchery Locality, Hagerman Valley, Idaho. **Archaeological Reports No. 8**. Boise State University, Boise.

Pianka, E. R.
1974 **Evolutionary Ecology**. Harper, New York.

Plager, Sharon
1996 Summary Report of Monitoring Archaeological Sites in the Orchard Training Area-1995. **Technical Reports No. 3**, Birds of Prey National Conservation Area Archaeological Project, Boise State University.

Plew, Mark G.
1980 Archaeological Excavations on Big Foot Bar, Snake River Birds of Prey Natural Area, Idaho. **Project Reports No. 3**, Idaho Archaeological Consultants, Boise.

1981 A Preliminary Report on Archaeological Excavations at Nahas Cave. **Idaho Archaeologist**. 4(3):1-7.

1990 Modeling Alternative Subsistence Strategies for the Middle Snake River. **North American Archaeologist** 11(1): 1-15.

1992 An Archaeological Assessment of the Proposed Horseshoe Bend Hydroelectric Project, Boise County, Idaho. **Cultural Resource Reports 1992-1**, Boise State University.

1994 **A Preliminary Research Design for Archaeological Investigations in the Birds of Prey Natural Area**. Boise State University, Boise.

Plew, Mark G., and Bret T. Guisto and Jennifer S. Mitchell
1992 **A Report on the Archaeological Survey and Test Excavations of the Smith Land Exchange**. Report submitted to Bureau of Land Management. Boise. (September 1992).

Plew, Mark G. and Max G. Pavesic and Mary Anne Davis
1987 Archaeological Investigations at Baker Caves I and III: A Late Archaic Component on the Eastern Snake River Plain. **Archaeological Reports No. 15**.

Plew, Mark G. and Camille Sayer
1995 Archaeological Excavations at 10-EL-392, Southwest Idaho. **Technical Reports No. 2**. Birds of Prey National Conservation Area Archaeological Project. Boise State University.

Sammons, D., and Terrie L. Myler
1994 Archaeological Investigations at 10-AA-306: The Midden Site. **Reports of Investigation 94-1**. Center for Ecological and Environmental Anthropology, Idaho State University.

Sayer, Camille
1995 Summary of Monitoring in the Orchard Training Area, Fall 1994. Report on file, Bureau of Land Management, Boise District Office, Boise.

Sayer, Camille and Mark G. Plew
1995 Archaeological Excavations at 10-AA-256, Orchard Training Area, Birds of Prey National Conservation Area, Idaho. **Technical Reports No. 1**, Birds of Prey National Conservation Area Archaeological Project. Boise State University.

Shott, Michael
1986 Technological Organization and Settlement Mobility: An Ethnographic Examination. **Journal of Anthropological Research** 42(1): 15-51.

Schellbach, Louis
1967 The Excavation of Cave No. 1, Southwestern Idaho. 1929. **Tebiwa** 10(2): 63-72.

Smith, Eric Alden and Bruce Winterhalder (editors)
1992 **Evolutionary Ecology and Human Behavior**. Aldine de Gruyter, Chicago.

Stevens, David W. and John R. Krebs
1986 **Foraging Theory**. Princeton University Press, Princeton.

Steward, Julian H.
1938 Basin-Plateau Socio-Political Groups. **Bureau of American Ethnology Bulletin** No. 120, Washington, D.C.

Tobias, Nelle
1976 Swan Falls (Wees Bar) Petroglyph Field. Report on file, Idaho State Historical Society, Boise.

Tuohy, Donald R. and Earl H. Swanson, Jr.
1960 Excavation at Rockshelter 10-AA-15, Southwest Idaho. **Tebiwa** 3(1&2): 20-24. Pocatello.

United States Department of the Interior, Bureau of Land Management
1995 Snake River Birds of Prey National Conservation Area Management Plan. Lower Snake River District Office, Bureau of Land Management, Boise.

Willig, Judy
1988 Unpublished Report. On file, Boise District Office, Bureau of Land Management. Boise.

Winter, Howard D.
1969 **The Riverton Culture: A Second Millennium Occupation in the Central Wabash Valley**. Illinois Archaeological Survey Monograph No. 1. Illinois State Museum Reports of Investigations No. 13. Springfield.

Yenson, Dana
1982 A Grazing History of Southwestern Idaho with Emphasis on the Birds of Prey Study Area. Report on file, Bureau of Land Management, Boise.

Young, Jack
1984 Class II Cultural Resources Inventory of the Owyhee, Bruneau and Jarbidge Resource Areas. Bureau of Land Management, Boise District Office.

Boise State University
Department of Anthropology
College of Social Sciences
and Public Affairs
1910 University Drive
Boise, Idaho 83725

Account 00281010

Non-Profit Organ.
U.S. POSTAGE
PAID
Boise, Idaho
Permit No. 170