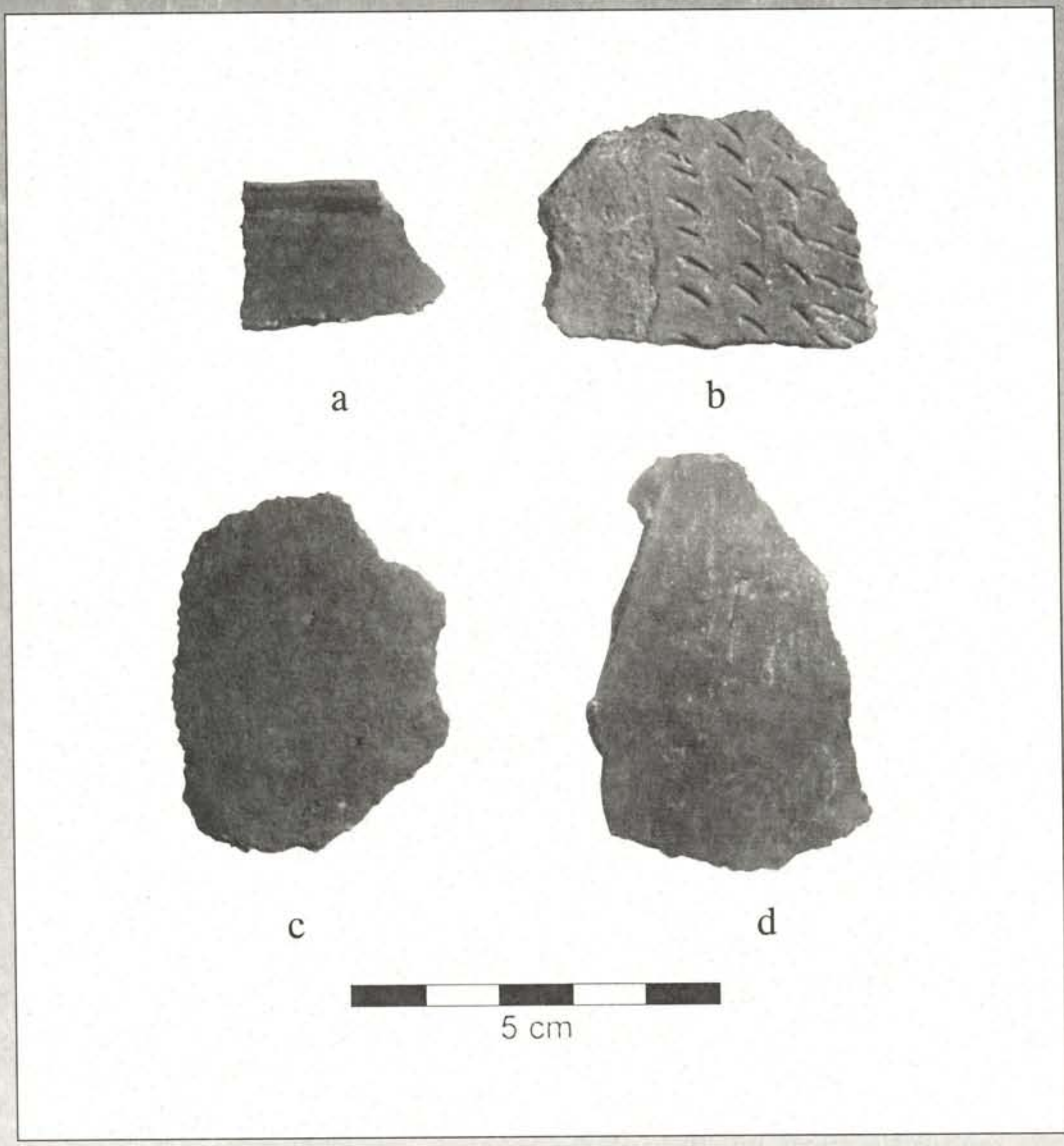
ISSN 0893-2271

Idaho ARCHAEOLOGIST



Volume 30, Number 1

Volume 30, Number 1
Spring 2007

Idaho ARCHAEOLOGIST

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 83725-1950.

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Cover Photo: Swenson site (10-EL-1417) ceramic sherds.

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ARTICLES AND REPORTS

ARCHAEOLOGICAL TEST EXCAVATIONS AT THE SWENSON SITE (10-EL-1417) NEAR KING HILL, IDAHO

Mark G. Plew and Christopher A. Willson

INTRODUCTION

During June of 2002, Boise State University conducted its Archaeological Field School at the Swenson site (10-EL-1417) near King Hill, Idaho. The opportunity to work at the site was made possible by Harry Knox and Pamela Swenson, owners of River Ranch on which the site is located, approximately 1/4 mile west of King Hill. Situated on the north side terrace overlooking the Snake River, the site is located approximately one mile west of Clover Creek. Its location near Clover Creek and the Bell Mare basalt quarry (Plew and Chavarria 1995) provided an opportunity to further explore the range of occupations within the middle Snake River corridor.

Site 10-EL-1417 is situated at the east edge of the property above the Snake River in what is presently extensive pasture. The Union Pacific Railroad lies just 2-4 meters north of the site area. It is one of three sites recorded on the River Ranch property. Two seasons of excavation were earlier undertaken at site 10-EL-1577 (Huter, Plew and Benedict 2002) and a single season of investigation focused on site 10-EL-110 near King Hill Creek (Willson and Plew 2007). Test excavations sought to answer a number of research questions relating to the depositional and post-depositional history of the site, its relative age, whether the site represented a single occupation use or multiple occupations, its diet breadth and function. The most general questions addressed by our excavations relate to issues of mobility and resource use. We broached these questions by evaluating diversity in technological and subsistence assemblages. Did technological organization of the assemblage suggest site occupations/uses reflecting variable activities over time that would suggest high or low residential mobility. Would this confirm the arguments made by Gould and Plew (1996) and seemingly that most Middle Snake River sites represent forager sites; an argument seemingly confirmed by work at 10-EL-1577 and 10-EL-110. Would debitage analysis suggest varied strategies of toolstone acquisition and tool manufacture and would volcanic glass sources corroborate the linear pattern of distribution along the Snake River described by Holmer (1997). We sought to determine if ceramics would reflect the type of manufacture described by Simms et. al. (1997) for mobile foragers or the mineralogical selection described by Dean and Horting (2000) for southeastern Idaho. We sought as well to evaluate the energy returns of resources represented in the assemblage and to assess the relative optimality of those resources using a simple diet breadth reconstruction.

PREVIOUS ARCHAEOLOGICAL RESEARCH

During the past three decades, considerable effort has focused on Middle Snake River archaeology, including both reconnaissance and excavation. Major surveys include those by Keeler and Koko (1970) and Murphey (1981) in the Birds of Prey National Conservation Area and Ostrogorsky and Plew (1979) and Butler and Murphey (1982a) in the Wiley and Dike Hydroelectric project areas near Bliss, Idaho. Butler and Murphey (1982b) also conducted a survey of the Kanaka Rapids locality (see also Gould and Plew 1991), while Carley and Sappington (1982) examined the area along the river between Clear Lakes and the mouth of Rock Creek. These efforts to locate and record sites were performed to comply with federal antiquities legislation passed during the late 1960s and 1970s (Meatte 1990:29). A notable exception to this is Bentley's (1983) survey of the Snake River Canyon between Shoshone Falls and C. J. Strike Reservoir. The purpose of his study was to derive an inductive site location model, making this effort one of the few problem-oriented surveys conducted along the river.

Important excavations have been conducted at various locations along the Middle Snake River in Idaho, producing evidence of varied level and type of use (Plew 1988). Near Marsing, the Givens Hot Springs locality has produced evidence of pit structures which date to the transition between the Middle and Late Archaic periods (Green 1982, 1988). Feature 1 at 10-OE-60, a steep-walled, circular structure measures between 5.9 and 7.2 m in diameter with an interior hearth (Green 1982:41, 1988:Table 1). This feature evidenced central supports, burned posts, and thatch. Rose Spring, Eastgate, and Elko series projectile points and mortars were found within Feature 1, which has been associated with C-14 ages of 1190 ± 70 and 1100 ± 60 years B.P. (Green 1988: Table 1; Meatte 1990:59). Another pit structure, Feature 3, measuring between 4.5 and 5.5, was found at

10-OE-60. No internal features were found in this partially excavated feature, but Rosegate series projectiles were associated with the structure (Green 1982:41). A C-14 age of 1270 ± 80 years B.P. has been given for this structure (Green 1988:Table 1; Meatte 1990:59). Plew (1995) has questioned whether all the structures at Givens represent residential structures and has raised issues relating to the criteria for defining "houses."

East of Givens, near Swan Falls (10-AA-17), Ames (1983:27-29) uncovered the burned remains of an oval wickiup-like structure. Measuring approximately 3 m in diameter, this saucer-shaped pit feature contained no interior features but did yield Elko and Rose Spring projectiles as well as pottery sherds. The age of the structure is estimated between 600 and 800 years B.P.

A few kilometers downstream from Swan Falls, Schellbach (1967) and Tuohy and Swanson (1960) have documented Late Archaic occupations. Schellbach Cave No. 1 has produced the only evidence of fishing equipment along the Middle Snake River. The equipment recovered consists of harpoon points, possible net sinkers, a length of line, and a fishhook (Schellbach 1967). Pavesic, et. al., (1987:23) report on the 42 faunal remains recovered at the site, most of which were Chinook. Cave No. 1 has been interpreted as an equipment caching location (Pavesic et. al. 1987; Schellbach 1967). On the north side of the Snake opposite the cave, 10-AA-15 produced projectiles of Late Archaic age in association with pottery and mussel remains (Swanson and Tuohy 1960). In the near vicinity, Sammons and Myler (1993) describe a limited range of Late Archaic materials associated with deer and rabbit remains at 10-AA-306.

Downstream, near Swan Falls dam, Sayer, Plager and Plew (1996) conducted test excavations at 10-AA-12, 10-AA-14, and 10-AA-189. These sites produced low densities of material remains with no artifacts or evidence of fishing activity. Test excavations at 10-AA-188, a small rockshelter west of Swan Falls, produced considerable evidence of Early to Late Archaic use of deer and mussels (Sayer, Plager and Plew 1996). Excavations at 10-CN-1 provide evidence of a Middle and Late Archaic use of artiodactyls, fish, and small mammals. A range of materials including historic glass beads was recovered as was evidence of retooling activity. At Celebration Park near Melba, Hauer and Hughes (1997) have recently reported on the 1960s excavations at 10-CN-6 documenting Middle and Late Archaic occupations. Yohe and Neitzel (1998) report on test excavations at Bonus Cove which document a Late Archaic mussel collecting station associated with limited salmon remains and Bliss points.

Upstream from Swan Falls at Big Foot Bar (10-AA-166), test excavations revealed evidence of an oval structure ca. 3 x 4 m in size (Plew 1980a:20-26). This 30-cm deep, saucer-shaped feature contained Cottonwood projectiles with what appear as small postholes found around the perimeter. Extensive mussel remains were found in association with the structure, estimated to date after 800 B.P.

Over 50 kilometers to the east of Big Foot Bar, a number of excavations between the towns of Hammett and Hagerman have produced considerable evidence of Late Archaic activity. Near Grand View, Idaho, test excavations at 10-EL-387 and 10-EL-388 produced small amounts of lithic and shell debris (Plew, Guisto and Mitchell 1992). Just west of Grand View along the Snake River at site 10-EL-392, Plew and Sayer (1994) recovered pottery, deer remains, and a few fish vertebrae at what appears as a short-term encampment. Slightly further upstream, Plew and Willson (2006) have described a Late Archaic component at the Medbury site near Hammett that resembles in range of material culture the Grand View location.

To the east, at Glenns Ferry, the site of Three Island Crossing has provided important insights regarding Middle Snake River activities (Gould and Plew 2001). Excavations over two field seasons provided archaeological evidence of three and perhaps four occupations dating over a period of 300 years between 580 and 970 B.P. Present at the site is an oval wickiup type structure with central firepit and what appear as postmolds around the perimeter of the structure and two connected shallow-basin storage pits. The artifact assemblage includes over 1400 lithic, bone, and ceramic artifacts. The preponderance of the tools reflects Winter's (1969) general tool category. The faunal assemblage is notable as it contains the remains of some twenty deer and 19,000+ fish remains. Though the fish remains probably account for no more than 300 or 400 fish, the assemblage reflects a repeated use of the site for fishing activity. Notably, the site does not contain evidence of long-term storage facilities.

In the vicinity of King Hill, Idaho, just east of Glenns Ferry three sites of Late Archaic age have been investigated. The Clover Creek (10-EL-22) site located near the mouth of Clover Creek and the Snake River is a lithic reduction station producing evidence of extensive reduction of basalt (Plew and Gould 1990). The source of this material is likely the Bell Mare site, a basalt quarrying area located some five miles north of Clover Creek (Plew and Chavarria 1992). Just west of King Hill, Idaho is the Knox site, producing evidence of lithic reduction and animal processing associated with the presence of extensive faunal remains and a large fire hearth (see Plew, Huter and Benedict 2002). A range of medium to small mammals is present. Recent investigation at the King Hill Creek Site (Willson and Plew 2007) suggests a similar pattern, one that fits within Kelley's classification of forager sites.

Upstream at Bancroft Springs, Butler and Murphey (1982a) excavated a possible house pit associated with materials of Late Archaic age at 10-EL-216. Additional investigations of several sites at Kanaka Rapids upstream from Bancroft Springs led to the discovery of a house structure at 10-GG-273, defined by the presence of a rectangular stone foundation with postholes (Butler and Murphey 1983). The Kanaka sites contained predominately domestic and general purpose tools (Butler and Murphey 1983; Plew 1988). Fish remains as well as mussel shells were recovered from some of the Kanaka sites, though rabbits appear to have been the primary prey target.

Near Bliss, site 10-GG-1 dates between 900 and 250 years B.P. (Plew 1981). Located atop a large terrace on the north side of the Snake, 10-GG-1 contains four separate cultural components and a varied assemblage, including many weapons and domestic items, as well as extensive faunal remains which include salmon. Analysis of the faunal assemblage suggests a spring use of the location (Plew 1981:154-155). More recent excavations at Area B, an 18th century component (Gould and Plew 2001), have documented large stone-lined roasting pits containing the remains of deer, fish, and large canids. Analysis of the tool assemblage indicates a weighting of tool types favoring general purpose tools (Gould and Plew 2001). Lithic debitage analysis indicates that re-sharpening or retooling was undertaken at the site.

At the Hagerman National Fish Hatchery (10-GG-176), Pavesic and Meatte (1980) describe occupational surfaces and saucer-shaped lenses they consider to be house features dating between 500 and 1,000 years B.P. Though the site is a limited test excavation, the authors interpret it as being a prehistoric manifestation of the historic fishing village pattern (Pavesic and Meatte 1980:23, 75-76). More recent excavations at the site (Landis and Lothson 1983; Lothson and Virga 1981) do not corroborate this idea. The Pavesic and Meatte speculations concerning the economic pattern at the hatchery site become problematic in that the "structures" in question were noted only in backhoe profiles and were never defined in horizontal plan (Pavesic and Meatte 1980:39-40). Furthermore, the faunal assemblage contained no evidence of fish, and the rather sparse tool assemblage contained no fishing equipment.

Murphey and Crutchfield (1985) conducted excavations at the Crutchfield site (10-GG-191) on Billingsley Creek just north of Hagerman. Crutchfield contained evidence of a Late Archaic occupation dating between 600-700 B.P. A variety of material items were recovered, including bone and stone tools, fish remains, and shell fragments from a rock-lined cache pit from which a C-14 age of 620 ± 80 years B.P. was obtained (Murphey and Crutchfield 1985:76). Two oval saucer-shaped house structures, one containing a hearth and the other having external posts, were noted in association with the tool and faunal assemblages.

ENVIRONMENTAL SETTING

King Hill is located within the Western Snake River Plain and the greater Columbia Intermontane Province. The Snake River Plain constitutes a section of the High Lava Plain Subprovince of the Intermontane Province as defined by Freeman, Forrester and Lupher (1945) and may be defined as an arc curving 560 kilometers east-west and 8-110 kilometers north-south across southern Idaho (Malde 1965:255). In total, the area encompasses approximately 14,000 square miles (Freeman, Forrester and Lupher 1945:71). Ninety percent of the Snake River Plain section is covered with Quaternary basalts (Thornbury 1965) which are structurally distinct from those of the Columbia Plateau (Malde 1965:255). Malde

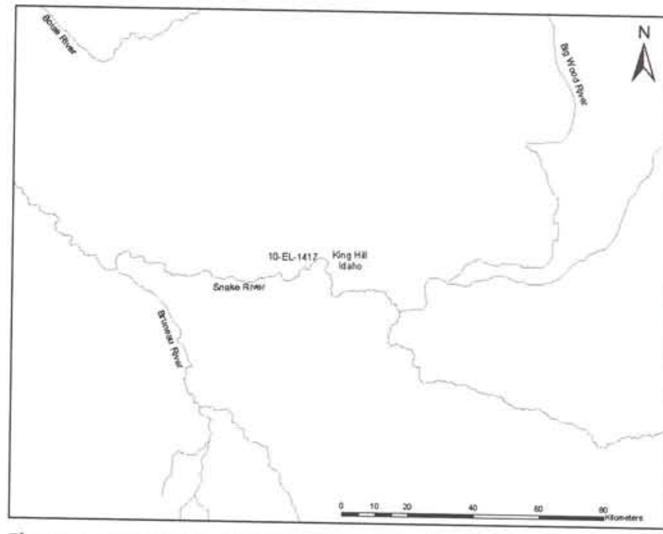

Figure 1. Map illustrating the general location of the Swenson Site (10-EL-1417).

(1965:255) contends that the "Quaternary features of the Snake River Plain express the latest stages of tectonic and depositional events that began in late Tertiary times" and that mark structural differences between the eastern and western Snake River Plain. Owing to the recent nature of the Snake River basalts (Russell 1902), many areas are characterized by minimal soil cover (Thornbury 1965:459).

The Middle Snake River area is characterized by five major geological episodes, including the Glenns Ferry Formation, Tuana Gravels, Bruneau Formation, Eastern Snake River Plain lava flows, and Melon Gravels (Malde 1960, 1965:258-261). The Glenns Ferry Formation contains extensive but poorly consolidated detrital material in minor basalt flows, little precipitated material, and few ash beds (Malde 1965:258). The Tuana Gravels document some canyon cutting and are associated with pebble and cobble gravel interbedded with sand and silt, whereas the Bruneau Formation is associated with broad valley erosion and consists of clays, diatomites, and beach gravels interbedded with basalts. The youngest of these basalts is dated at 1.4 million years (see Malde 1965:260). Additionally, the Block Mesa Gravels comprise a piedmont deposit of locally derived sand and gravels approximately 8 meters thick (Malde 1965:259). This formation is associated with partial canyon entrenchment and is capped with a hard caliche (Malde ibid:260). A series of minor episodes involving pebble/gravel outwash and basalt flows associated with canyon/terrace cutting also characterize the late Pleistocene. Notable among these is the Thousand Springs Basalt. More recently, melon gravels or rounded boulders and cobbles of local basalts were deposited by the outflow of Pleistocene Lake Bonneville (see e.g., Malde 1965).

FIELD STRATEGY AND METHODS

A site datum was established on the eastern edge of the terrace some 40 meters from the Snake River and positioned to surrounding landmarks. An E-W baseline was

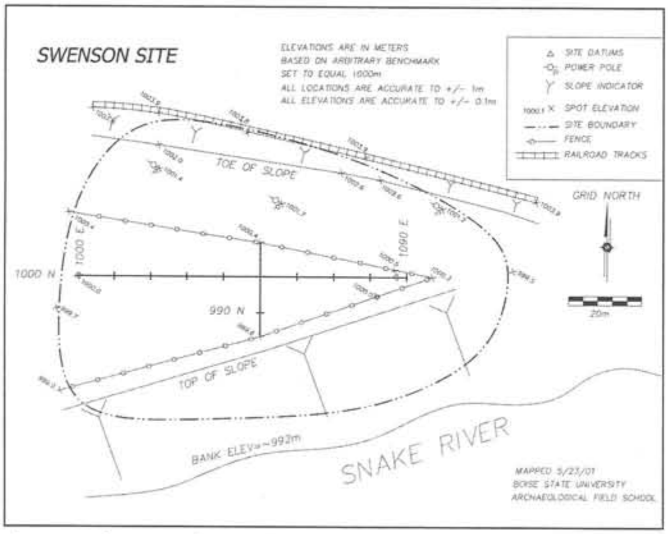

Figure 2. Plan map showing location of excavation units.

laid out in ten-meter units with 1 X 2 and 1 X 1 units staked along and north-south of the baseline, which extended some 100 meters across the terrace. Elevational readings were taken at ten-meter intervals within the grid system through use of a topographic map prepared prior to excavation. The units were excavated in arbitrary 10 cm levels. All sediments were screened through 1/8-inch hardware mesh with artifacts and ecofactual remains collected and bagged by material type per unit level.

EXCAVATION UNITS AND STRATIGRAPHY

Four test units were excavated to sterile sediments. In general, sediments are silty-sands that distinguished stratigraphically by minor color differences. Four strata were described. Within Test Unit 1, a 1 x 2 meter unit, seven arbitrary levels were excavated. The upper three levels were characterized by very dark-gray brown sandy-silt. These sediments became more compacted at levels below 50 cm. Sediments were highly mottled, suggesting post-depositional impacts, particularly by rodents. Sediments become increasingly clayey and lighter

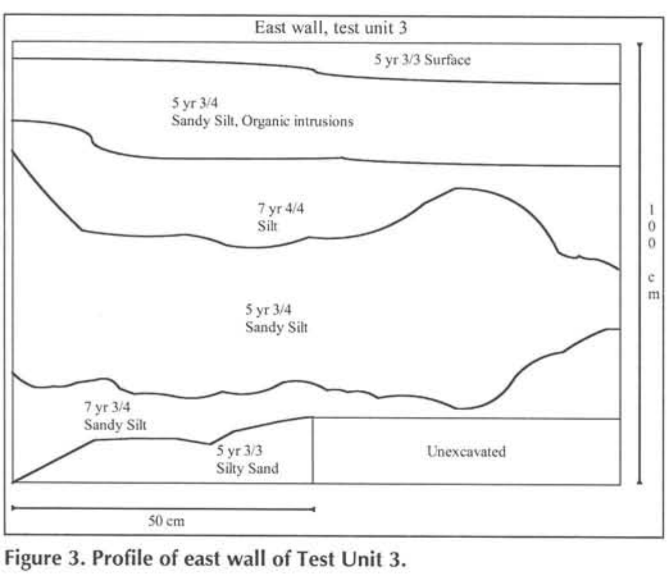

Figure 3. Profile of east wall of Test Unit 3.

in color above a hardened caliche at 70 cm below the surface. Test Unit 2, a 1 x 2 meter unit, was excavated to 90 cm below pit datum. The sedimentary sequence is similar to Unit 1 except that sediments are not as dark. Sediment color ranges from brown to yellowish-brown (10YR4/4). Within the unit were several areas of very dark grayish-brown (2.5YR3/2) stain that appear to reflect possible hearth areas. Sediments generally reflect a significant degree of post-depositional faunal turbation.

Test Unit 3, a 1 x 2 meter unit, was excavated to 160 cm below pit datum (bpd). Unlike Units 1 and 2, where evidence of cultural activity declines sharply after 60 cm bpd., cultural remains are extensive between 50 and 120 cm bpd. Sediments are dark-brown (5YR3/4). Unlike Unit 1 where a compacted level of caliche is encountered at 50 cm bpd., sediments in Unit 3 become sandy and lighter in color at greater depths. The varied depths at which cultural remains were encountered suggest that the original surfaces were not uniform. Unit 4, a 1 x 1 meter unit, was excavated to 60 cm below pit datum. Sediments consist of silty-sands that are dark-greyish-brown in color (10YR4/2) within which are several small (10-20 cm) areas of organic concentrations. Though cultural remains were recovered throughout the deposits, no formal archaeological features were noted. Some of the concentrations of ecofactual remains and organic staining may reflect remnants of hearth areas disturbed by rodents.

MATERIAL CULTURE

Cultural materials were typed and functionally classified using Winter's (1969) classification scheme. Units include weapons (projectile points), domestic tools (ceramics and bone needles), fabricating (cores) and general utility tools (knives, bifaces, worked flakes, hammerstones, and pestles), and decorative items (beads and pipe fragments). Size ranges are given in centimeters by length, width, and thickness respectively. When only one specimen is represented in the collection, artifacts are measured individually and represent actual sizes.

Desert Side-Notched

No. of Specimens: 3 (A30, A79, A89)
Form: Small triangular bladed and side-notched points. Base typically extends slightly beyond blade element. Specimens are plano-convex.
Material: Obsidian
Size Range: 2.0-1.4 x 1.4-1.1 x 0.3
Flake Patterns: Irregularly flaked with retouch along lateral margins.

Rose Spring Side-Notched

No. of Specimens: 1 (A29)
Form: Small triangular bladed and side-notched projectiles having a straight base. Specimen is plano-convex.
Material: Cryptocrystalline
Size Range: 2.0 x 1.0 x 0.3
Flake Pattern: Lithic scarring with minor retouch on blade margins.

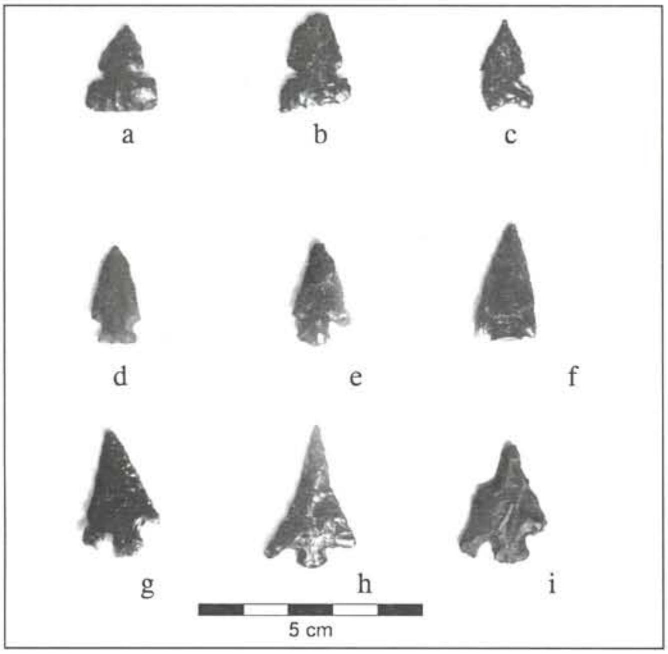

Figure 4. a-c, Desert Side-Notched; d, Rose Spring Side-Notched; e-f, Rose Spring Corner-Notched; g-i, East Gate Expanding Stem.

Rose Spring Corner-Notched

No. of Specimens: 2 (A11, A70)
Form: Small triangular bladed specimens with slightly excurvate base and corner notches. One specimen is bi-convex.
Material: Obsidian

Eastgate Expanding Stem

No. of Specimens: 3 (A31, A69, A5)
Form: Slightly incurvate triangular bladed projectile points having deep corner notches and expanding bases. Both are plano-convex in cross-section.
Material: 2 Obsidian, 1 Cryptocrystalline
Size: 2.9-2.1 x 1.9-1.5 x 0.4-0.3
Technique: Irregular flake scar patterns.

Bliss Point

No. of Specimens: 1 (A62)
Form: Type II Bliss point. Specimen is somewhat shouldered with straight base.
Material: Cryptocrystalline
Size: 2.3 x 0.9 x 0.3
Technique: Retouch on margin only.

Small Corner-Notched

No. of Specimens: 2 (A4, A32)
Form: Small, triangular bladed and corner-notched points. Points do not conform to any common point type. One specimen (A4) has a slightly expanding blades element.
Material: Obsidian
Size Range: 1.8-1.5 x 1.3-0.9 x 0.3
Technique: Irregular flake scarring with margin retouch. One specimen (A4) is worked on the dorsal side only.

Corner-Notched Projectiles

No. of Specimens: 8 (A75, A19, A17, A32, A14, A48, A33, A47)
Form: Corner-notched points characterized by broad triangular blades and deep corner-notches have slightly expanding bases. These forms, though in the size range of Elko points, are typologically distinct. Artifacts are generally biconvex in cross-section. Blade width is greater than length.
Material: 4 Obsidian, 3 Basalt, 1 Vitrephyre
Size Range: 2.3 x 2.9-1.7 x 1.3-0.7
Technique: Irregular percussion flaking.

Large Corner-Notched

No. of Specimens: 1 (A28)
Form: Large triangular bladed corner-notched point with straight base. Biconvex in cross-section. Upper third of artifact is broken.
Material: Obsidian
Size: 3.2 x 3.4 x 0.7.
Technique: Irregularly struck percussion scars.

Large Corner-Notched Expanding Base

No. of Specimens: 1 (A7)
Form: Large triangular bladed specimen with shallow corner notches and expanding base. Blade margins are slightly encurving.
Material: Basalt
Size: 4.3 x 2.3 x 0.6
Technique: Percussion. Edges exhibit crushing.

Lanceolate-Humboldt-like Point

No. of Specimens: 1 (A72)
Form: Narrow lanceolate having a slightly expanding or excurvate margin and concave base. The specimen is biconvex in cross-section.
Material: Obsidian

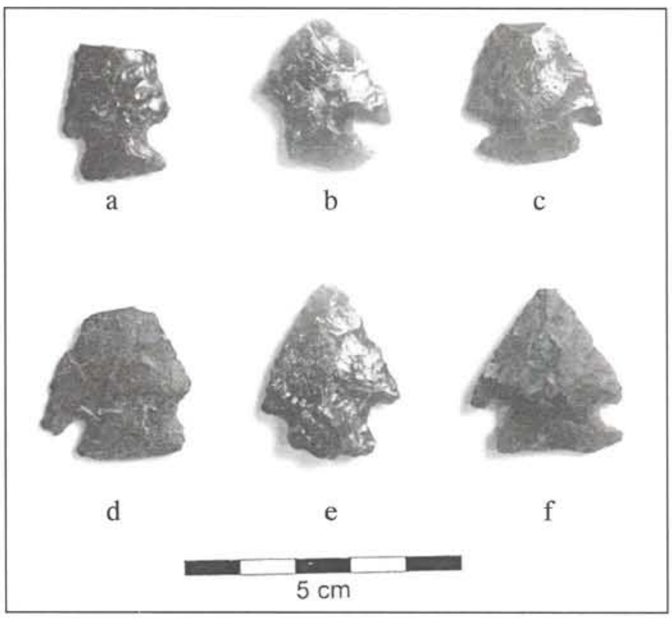

Figure 5. a-f, Large Corner-Notched and Large Corner-Notched Expanding Base.

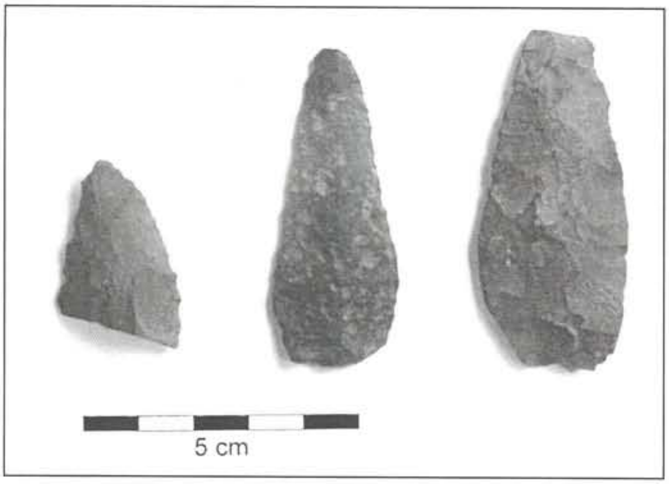

Figure 6. a-b, Knives and knife tips.

Size: 4.3 x 1.9 x 0.6
Technique: Retouched margins.

Large Side-Notched Points
No. of Specimens: 2 (A26, A51)
Form: Large irregularly shaped side-notched and straight-based points not conforming to local topologies. Specimens are biconvex in cross-section.
Material: Obsidian
Size Range: 3.1-2.1 x 1.5-1.7 x 1.2-0.5 cm
Technique: Large primary flake scars.

Projectile Point Fragments
No. of Specimens: 8 (A16, A24, A25, A52, A68, A46, A81, A82)
Form: Fragmentary point bases. Bases are straight to slightly expanding.
Material: 1 Cryptocrystalline, 7 Obsidian
Size Range: Greatest width: 2.4-1.0

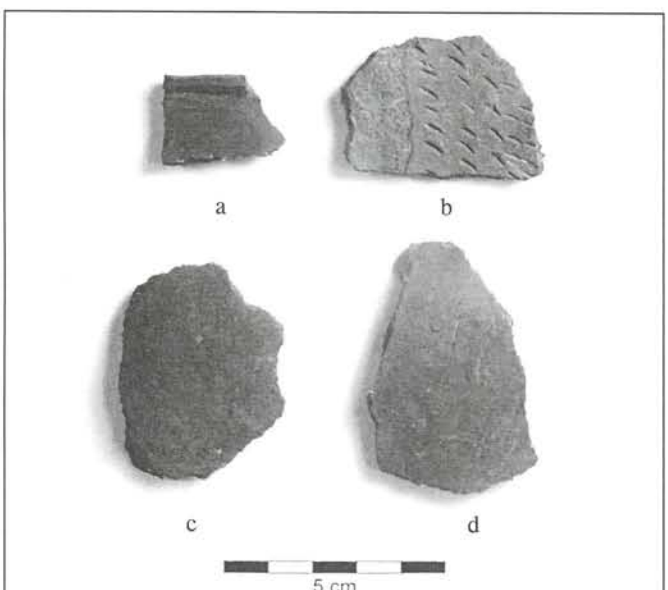

Figure 7. Ceramics; a, rim sherd; b, incised body sherd; c-d, body sherd.

Projectile Point Tips
No. of Specimens: 7 (A9, A18, A15, A25, A34, A76, A80)
Form: Tips from triangular bladed points
Material: Obsidian
Size Range: Length: 1.9-1.1

Knives
No. of Specimens: 13 (A1, A35, A44, A37, A49, A43, A85, A59, A83, A41, A86, A56)
Form: Knives are fragmentary but appear to consist of two types of bifacial and generally biconvex specimens. The first type is a relatively narrow elongated form while a second is broader and has a rounded base.
Material: 4 Cryptocrystalline, 8 Basalt
Size Range: 5.2-2.0 x 3.9-1.5 x 0.9-0.4 (fragments)

Perforator
No. of Specimens: 1 (A66)
Form: Small perforator having a broad expanding base. The specimen is plano-convex.
Material: Cryptocrystalline
Size: 7.3 x 1.1 x 0.3
Technique: Vertical surface is modified.

Scrapers
No. of Specimens: 2
Form: Distal end scrapers. One specimen has been manufactured from ? of a small vitrephyre nodule and exhibits relatively fine retouch.
Material: 1 Vitrephyre, 1 Basalt
Size Range: 5.5-4.7 x 4.0-3.3 x 1.6-1.2
Technique: Percussion.

Worked Flakes
No. of Specimens: 4 (A52, A64, A94)
Form: Irregularly shaped flakes exhibiting retouch on lateral margins.
Material: 3 Basalt
Size: 5.1-3.2 x 3.3-2.1 x 1.2-0.5

Biface Fragments
No. of Specimens: 11 (A8, A10, A12, A36, A38, A50, A90, A34, A91, A42, A34)
Form: Fragmentary bifacially-worked specimens.
Material: 1 Cryptocrystalline, 10 Obsidian
Size Range: 4.9-1.1 x 2.9-1.3 x 0.5-0.3
Technique: Percussion.

Cores
No. of Specimens: 8 (A2, A13, A20, A22, A53, A45, A71, A74)
Form: One conical/ovate and seven irregular cores.
Material: Basalt
Size Range: Width only equals 7.0-2.3 cm
Technique: Percussion

Ceramics
No. of Specimens: 104 (A6, A65, A67, A73, A78, A80)

Figure 8. a-d, Polished bone.

Form: Five body sherds and one small rim fragment which is slightly excurvate and with a flattened rim. Reddish-brown to grey-brown interior and exterior surfaces. One grey sherd is decorated with four lines of fingernail incisions (N=27). Surfaces are well smoothed. Temper includes crushed calcite and mica.
Size Range: Body Sherds: 5.1-1.1 x 3.3-0.9 x 0.6-0.4
Rim Sherd: 1.9 x 1.7 x 0.7

Polished Bone

No. of Specimens: 4 (A39, A54, A55, A56, A60)
Form: Four specimens of polished bone. One specimen (A60) is a bird bone. The additional specimens appear to have been manufactured from long bone fragments that were flattened and polished. One specimen (A39) appears to have been drilled.
Material: Bone
Size Range: 2.9-2.5 x 1.7-0.7 x 0.4-0.3

FUNCTIONAL DISTRIBUTION OF ARTIFACTS

Analysis of the 10-EL-1417 site assemblage suggests some degree of richness in artifact types but little evenness between categories. Of the 85 artifacts included in the analysis, 47% are weapons (n=40). The general utility category (n=31) constitutes 36% of the total assemblage and is comprised of bifaces (n=11), unifacially worked flakes (n=4), perforators (n=1), scrapers (n=2) and knives (n=13). The domestic category constitutes 0.7% of the total assemblage and includes 6 ceramic sherds. Some fabricating of chipped stone tools occurred at the site as evidenced by cores (n=8) that comprise 0.9% of the total. In addition, four pieces of polished bone are included in Winter's decorative category and constitute the remaining 0.4% of the assemblage.

Raw material distributions for projectile points indicate a high frequency of use of obsidian in the manufacture of projectile points (n=30). However, the absence of cores and the lack of primary and secondary flakes indicate that obsidian tools were probably not being manufactured on-site, but rather curated to the location or possibly retooled or fashioned from locally available small nodules. Basalt cores are most frequent (n=8) and are very probably from the Bell Mare source approximately five miles northeast of the site (Plew and Chavarria 1995). Basalt accounts for 38% of all toolstone sources.

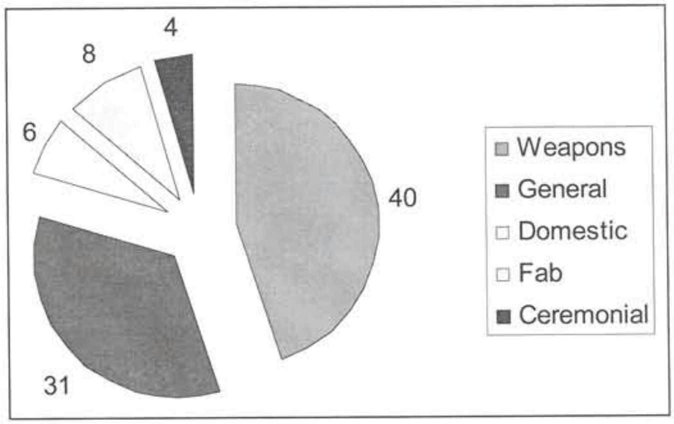

Figure 9. Functional distribution based on Winter's 1969 Categories Scheme.

LITHIC DEBITAGE ANALYSIS

Analysis of the chipped stone assemblages shows evidence of a core reduction strategy for basalt materials and retooling/manufacture for cryptocrystalline and obsidian materials. This is primarily evidenced by variability in the debitage size ranges and the predominate presence of basalt cores. Of a total of 6,709 flakes recovered, 5,039 (75%) are basalt flakes recovered during the excavation and exhibited fairly even dispersal of flake sizes (Figure 10). In addition to debitage, 8 basalt cores and several formal basalt tools were recovered. This suggests that materials were obtained, reduced, and utilized on-site. In contrast, only 1,067 (18%) obsidian flakes and 599 (10%) cryptocrystalline (CCS) flakes were recovered indicating a clear preference for basalt. The distribution of obsidian and CCS flakes are concentrated in specific units and levels suggesting that the use of these materials may represent specific events of uses of the location.

Lithic debitage analysis indicates few early stage reduction flakes of obsidian (Figure 11). This however,

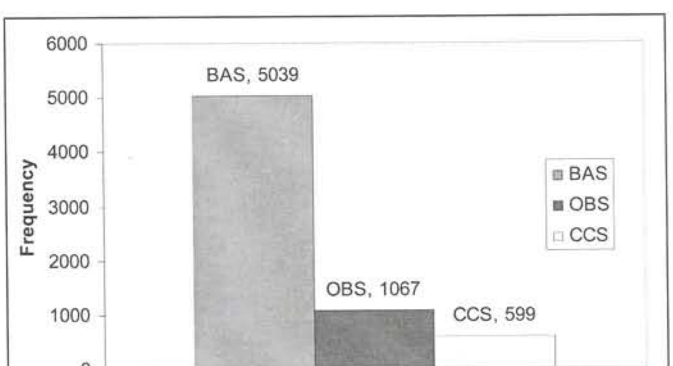

Figure 10. Lithic distribution by material type.

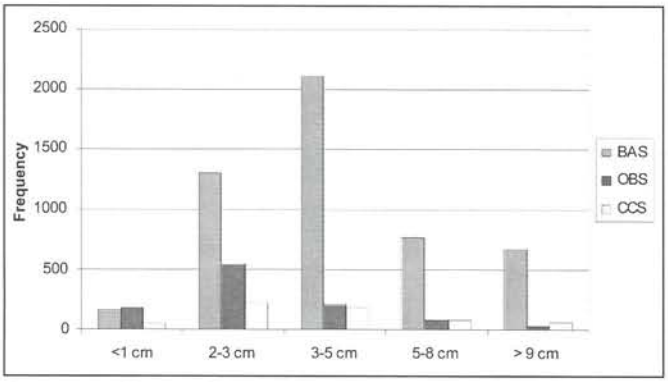

Figure 11. Lithic size distributions by material type.

may reflect materials simply being retooled at the site or small locally derived nodules reflecting flake sizes normally associated with late stage reduction. In contrast, 96% of basalt flakes are either middle or early stage flakes, suggesting a core reduction strategy.

The proportion of formal obsidian tools (42) to late stage flakes (n=726) most probably reflects a strategy of curation. The tertiary (< 1mm – 3 mm) obsidian flakes are thought to be primarily associated with retooling. CCS exhibits a similar pattern.

GEOCHEMICAL CHARACTERIZATIONS

Obsidian projectile points were submitted for X-Ray Fluorescence (XRF) analysis. The assessments indicate that volcanic glass was acquired regionally from known sources in southwest Idaho (Table 1). These include Brown's Bench (57%) located on the border of Idaho and Nevada, the South Hills near Twin Falls, Idaho, and the Cannonball Mountain source (43%) located to the northeast. Although no patterns can be described regarding the mechanisms by which these materials were acquired or transported (see Willson 2005, 2007), the obsidian sources identified are located fewer than 90 kilometers from the site location and are well within expectations for distance of the 150 km as described by Holmer (1997) and Plager (2001).

There are 30 known sources for volcanic glass identified for the region. Generally, the obsidian materials found in archaeological sites located in Idaho come from five main sources—Timber Butte, Malad, Owyhee, Brown's Bench, and Big Southern Butte (Willson 2007). These five sources occur collectively 1,707 times, comprise 85.1% of the entire collection, and have been deemed statistically as well as culturally significant.

In Willson's (2007) study, secondary source materials, including the unknown category, are deemed to be outliers, typically representing less than .002% of the 2,033 specimens analyzed. These 25 sources occur frequently but collectively only represent 14.9% of analyzed obsidian specimens and include sources in Oregon, Nevada, Idaho, and Wyoming.

In southwestern Idaho, 140 samples were analyzed through the XRF process. There are 15 sources represented in this study and of these, the Owyhee (30%), Brown's Bench (17%), Cannonball Mountain (13%), and Timber Butte (10%) sources occur most frequently with Bear Gulch, Coyote Wells (Owyhee area), and Hudson Ridge (Brown's Bench area) comprising 12% of the analyzed specimens for this area. The remaining sources are evenly dispersed between seven secondary sources (collectively .057%) and one major source (Big Southern Butte .014%).

The archaeological sites located on the Middle Snake River near Glenns Ferry, including 10-EL-1417, exhibit a marked increase in Brown's Bench and Cannonball Mountain sources. These sites also exhibit an increase in the frequencies of outliers such as American Falls, Bear Gulch, Malad, and Big Southern Butte resources but the frequency is less than 1% of the total distribution. Also notable is a marked decline in the presence of Timber Butte and various Oregon source materials. In sites near Glenns Ferry located southeast along the Snake River, the frequency of Brown's Bench and Cannonball Mountain sources increases greatly. Twenty-two of the 50 samples analyzed were sourced to the Brown's Bench area and eight were from Cannonball Mountain. Interesting is that these sites also reflect the greatest number of sources at distances greater than Holmer's (1997) expected distance decay.

TABLE 1. XRF SOURCE DISTRIBUTIONS FOR 10-EL-1417

Lab #	Cat #	Description	Geochemical Source
52	A11	Point	Cannonball Mountain
53	A30	Point	Brown's Bench
54	A31	Point	Cannonball Mountain
55	A69	Point	Brown's Bench
56	A70	Point	Cannonball Mountain
57	A79	Point	Brown's Bench
58	A89	Point	Brown's Bench

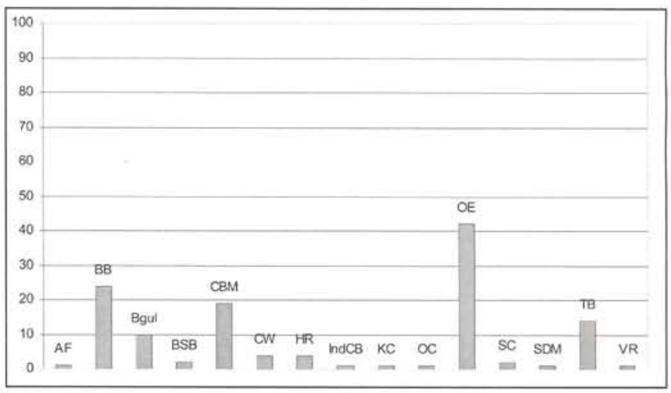

Figure 12. Frequencies of source materials in southwestern Idaho (Willson 2007).

THERMALLY ALTERED ROCK

A total of 31 thermally altered rocks were recorded but not collected. Of these, the majority ranged between 4-6 cm in diameter with the remaining specimens < 3 cm in diameter. All were quartzite.

FAUNAL REMAINS

A total of 4,039 faunal remains were recovered from the Swenson site excavations. These include 337 (1%) identifiable remains from which there are 48 NISP. There are 3,702 highly fragmented unidentifiable specimens (92%). Fifty-six percent of the unidentifiable remains are green bone (n=2,062) whereas 44% are charred (n=1,640). The latter most probably reflects discard of remains into firepits. Analysis of the faunal remains reveals that mammalian species occur 68% of the time with fish remains comprising 32%.

Of the 337 identifiable remains, 48 were identified at the family level. The most common taxon is Mule Deer (*Odocoileus hemionus*) (32%), followed by Cottontail (*Sylvilagus nutalli*) (28%), with Townsend's pocket gopher (*Thomomys towndsendii*) (18%), Wood Rat Marmot (*Marmota flaviventris*) (8%), (*Neotoma lepida*) (6%), Coyote (*Canis latrans*) comprising the remaining (4%) (Figure 13).

This portion of the faunal collection was divided into small, medium, and large animals; the small species category constituted 36% of the collection and includes rodents and other small burrowing animals. The medium category includes rabbit, marmot, badger, and coyotes. These remains represent 32% of the total collection. The large category includes deer and antelope constituting the remaining 32% of the assemblage.

It appears that the diet breadth represented by the Swenson assemblage was fairly diverse and within the range documented at the Knox site (10-EL-1577) and King Hill Creek (10-EL-110). A reliance on species common to the area, including deer, rabbit, birds, and fish was commonly exploited. The remains of shellfish (n=81) are present but do not suggest this resource contributed significantly to the diet.

FISH REMAINS

A total of 23 fish remains were recovered from excavations at 10-EL-1417. These consist of 23 caudal vertebrae and two otoliths. Calculation of MNI suggests that the assemblage represents about 2-3 fish. The caudal vertebrae range between 1.2 and 1.4 cm. All vertebral remains are salmonid as are the otoliths. The relatively large size of the vertebrae suggests salmon, either Chinook salmon (*Onchorynchus tshawytscha*) or large steelhead trout (*Salmo gairdnerii*). Though age and size estimates are not possible the remains appear to be from mature fish. None of the remains have been exposed to fire.

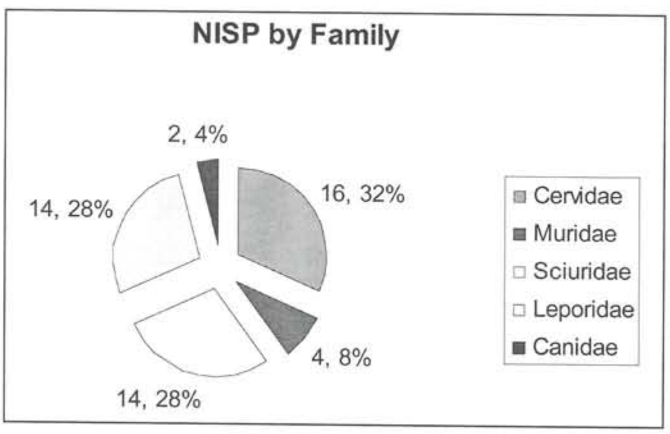

Figure 13. Frequency by family.

SUMMARY OF SIGNIFICANT FINDINGS AND IMPLICATIONS

Investigations of the Swenson site (10-EL-1417) provide the basis for addressing the majority of questions posed by our research design. As with other sites in the area and at sites 10-EL-1577 and 10-EL-110, sediments, largely silty-sands, appear to have accumulated by a series of events following the deposition of Bonneville gravels. It appears likely that sediments were redeposited periodically as conditions emerged 2000-3000 years ago (see Bentley 1983). Regardless, sediments appear to have accumulated on what were undulating surfaces. Due to the high level of faunal turbation, intact features were noted, though concentrations of organic materials and ecofacts were variously configured within the deposit, suggesting the possibility that features existed that have been disturbed.

The technological organization of the assemblage is varied. Of the 85 artifacts included in the analysis, 47% are weapons (n=40). The general utility category (n=31) constitutes 36% of the total assemblage and is comprised of bifaces (n=11), unifacially worked flakes (n=4), perforators (n=1), scrapers (n=2), and knives (n=13). The domestic category constitutes 0.7% of the total assemblage and includes 6 ceramic sherds. Some fabricating of chipped stone tools occurred at the site as evidenced by cores (n=8) that comprise 0.9% of the total. In addition, four pieces of polished bone are included in Winter's decorative category and constitute the remaining 0.4% of the assemblage. The assemblage suggests a range of activities that include hunting, processing, and the manufacture of bone and stone tools and is similar to those described by Gould and Plew (1996) in which variability is most often noted in general tool categories; a pattern characteristic of Bliss (Plew 1981; Gould and Plew 2002), Clover Creek (Plew and Gould 1990), Knox (Plew, Huter and Benedict 2002), and Three Island Crossing sites (Gould and Plew 2002).

A total of 5,039 (75%) basalt flakes were recovered during the excavation and exhibited fairly even dispersal of flake sizes. In addition to debitage, 8 basalt cores and several formal basalt tools were recovered. This suggests that materials were obtained, reduced, and utilized on-site. In contrast, only 1,067 (18%) obsidian flakes and 599 (10%) cryptocrystalline (CCS) flakes were recovered indicating a clear preference for basalt. The distribution of obsidian and CCS flakes are concentrated in specific units and levels suggesting that the use of these materials may represent specific events of uses of the location.

This presumably reflects the availability of basalts from Bell Mare quarry (see Plew and Chavarria 1995) and at other area localities and is the pattern at Clover Creek (Plew and Gould 1990) and Knox (Plew, Huter, and Benedict 2002). Raw material distributions for projectile points indicate a high frequency in the use of obsidian. However, the absence of cores and the lack of primary and secondary flakes suggest that obsidian tools were not being manufactured on site. Late stage obsidian flakes suggest retooling or the occasional fashioning of tools from small nodules acquired locally. Local cryptocrystalline materials were being utilized but constitute the least preferred raw material or the least available toolstone. Geochemical characterizations of volcanic glasses from 10-EL-1417 include Brown's Bench (57%) located on the border of Idaho and Nevada, the Cannonball Mountain (43%) to the northeast. In general, these sources have been found in other sites. Notably absent is the Malad source, commonly found in many Middle Snake River sites. Most of these obsidian sources are within a 90 km radius of the site and reflect the distributional range described by Holmer (1997) and Plager (2001). However, as discussed by Willson (2005, 2007) we are unable to specifically address the cultural mechanisms by which these materials reached the Swenson site.

One question outlined in our research design was whether pottery would address the arguments made by Simms, Bright and Ugan (1997) regarding time investments in ceramic manufacture associated with mobility or the argument of Dean and Horting (2000) that ceramic variability reflects purposeful decisions regarding the selection of specific minerals as tempering agents. Our analysis of 6 pottery sherds indicates a ware that is neither poorly made nor refined. However, the sample is too small to really address the question. It is worth noting that the pottery is sand and basalt-tempered, reflecting as is commonly the case on the Snake River Plain use of local tempering agents (see Butler (1987). We believe that too many factors influence both time investments (see Eerkens 2003) and selection of particular constituents for either to be particularly useful in considerations of mobility.

As stated, a focus of the investigation was assessing residential mobility. In this study we used Kelley's (2001) analysis of lithic assemblages to assess the degree of residential mobility reflected by the 10-EL-1417 assemblages (see Table 2). Examination of the lithic assemblages indicates a relatively high residential mobility. Indeed there is a nearly perfect correlation with 10 of 14 criteria reflecting high residential mobility are noted. The pattern generally reflects the argument offered by Gould and Plew (1996) that the Late Archaic settlement of the Middle Snake River is characterized by generalized assemblages of the type associated with mobile foragers.

Faunal analysis indicates subsistence based upon hunting of medium and small mammals and the use of fish. A total of 337 identifiable mammalian specimens and 23 fish vertebrae were recovered. Fauna represented in the assemblage are deer, rabbits, rodents, some avifauna, and fish. Fish remains belong to the family *Salmonidae*. Although size ranges for caudal vertebrae suggest salmon. Calculation of MNI suggests about 2-3 fish. That the remains are Chinook salmon would indicate a fall use of the location. The distribution of deer and rabbits reflects the pattern described by Gould and Plew (1996) for Late Archaic sites of the Middle Snake River. The emphasis upon deer (17,971-31,450 kcal/per hour) and rabbits (8,983-10,780 kcal/per hour) reflects the more optimal return rates that these species would have provided within the riverine catchment. The faunal assemblage exhibited no evidence of butchering though 34% of the faunal remains were charred. This is likely reflective of the remains having been discarded in firepits; a pattern common at Bliss (Plew 1981, Gould

Table 2. Kelley's (2001) Lithic Assemblages Associated with Different Mobility Strategies Compared with Site 10-EL-1417

	High Residential Mobility	Low Residential Mobility	Swenson
Lithic Raw Material	CCS/Volcanic Glass	Siltstone, Tuff, Rhyolite	CCS/Volcanic, basalt
Bifaces as Cores	Common	Rare	Medium
Bifaces as Bi-Products	Rare	Common	Medium
Bipolar Knapping/Scavenging	Rare	Medium to Common	Rare
Flake Tools	Rare to Medium	Common	Rare
Fire-Cracked Rock	Rare	Common	Rare
Site Size/Density	Small/Low	Large/High	Small/Low
Tool/Debitage Ratio	High	Low	High
Biface/Flake Tool Ratio	High	Low	Medium
Complete Flakes	Rare	Common	Rare
Proximal Flake Fragments	Common	Rare	Common
Distal Flake Fragments	Common	Rare	Common
Angular Debris	Rare	Common	Rare
Assemblage Size / Diversity	Low Slope	High Slope	Low Slope

and Plew 2002) and at the Knox site (Plew, Huter and Benedict 2002). The inclusion of invertebrates in the diet is evidenced by the presence of freshwater mollusks that occur throughout the deposits. No macrobotanical remains or groundstone tools were recovered though the riparian context would have provided a significant contribution to the diet. The diet breadth documented at Swenson indicates a range of species and the optimal use of these species appears relatively specific. The breadth is similar to that documented at the Knox site (Huter, Plew and Bendict 2002) and at King Hill Creek (Willson and Plew 2007).

In conclusion, it appears that Swenson was most likely visited on several occasions by foraging groups during the Late Archaic period and engaged in hunting, fishing, and exploiting invertebrates and most likely locally available plant foods. A primary focus of the site's activities over time is extensive basalt core reduction and tool manufacture.

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BOOK REVIEW

BIOARCHAEOLOGY: THE CONTEXTUAL ANALYSIS OF HUMAN REMAINS

Edited by Jane E. Buikstra and Lane A. Beck. Amsterdam: Academic Press, 2006.
ISBN 0-12-369541-4, 606 pp., hardcover, $74.95, acknowledgements, illustrations, glossary of acronyms, bibliographical references, index.

Reviewed by Margaret Streeter
Boise State University

Bioarchaeology is a relatively new multidisciplinary field that integrates skeletal analysis with archaeological investigation to reconstruct past lives. Jane Buikstra and Lane Beck have produced an edited volume that is a very thorough and well-researched description of the evolution of bioarchaeology in North America. Contributions by many prominent practitioners present scholarly accounts of the people and intellectual foundations that have led to the integration of archaeological context and osteological analysis.

The book is divided into three parts. Section 1 "People and Projects: Early Landmarks in American Bioarchaeology", includes chapters 1 through 7. These chapters give the reader the historical background to bioarchaeology, beginning with the typological mindset of 18th and 19th century anatomists such as Blumenback, Broca, and Keith. This section also includes balanced and insightful biographies of later key figures such as Hrdlika and Hooten underscoring their contributions to the development of methods of analysis and to the importance of assembling large archaeological skeletal samples for comparative study. Particularly noteworthy are the biographical sketches of the often unacknowledged women such as Bartlett, Dillenius, Ericksen, Knight, and Trotter and the contributions that they made at a time when skeletal analysis was dominated by males.

The second section, "Emerging Specialties" chapters 8 through 12 is a comprehensive assessment of the development and current state of a broad range of bioarchaeological topics. Specifically problem-oriented methods including ritual and mortuary theories, dental anthropology, and the advances in sexing and aging skeletal material that have increased our understanding of paleodemography.

The third and final section of this book "On to the 21st century" includes chapters 13 through 16 and provides a view of the future direction and applications of bioarchaeology. Topics discussed in this section include the impact of NAGPRA legislation, skeletal biologists are urged to take a more proactive role in developing collaborative projects with Native American communities. The changing role of bioarchaeology is considered particularly as it relates to mortuary studies. New sophisticated analytical tools for the analysis of biomechanical histories, stable isotopes, biodistance and DNA are also reviewed.

The final chapter considers the distinct developmental path of bioarchaeology in Britain acknowledging the wide-ranging contributions of Wells and Brothwell. From an early emphasis on case studies British bioarchaeology has increased its focus on problem-oriented research. New trends in training and standardization of methods stand in contrast to the lack of published data bases that hamper comparative research. The chapter ends with an optimistic view to the future of British bioarchaeology emphasizing contextualization and an integrated approach.

CONCLUSION

This is a well-written and informative book covering a broad range of topics in this truly interdisciplinary field. The biographies offer many little-known details of the people and the intellectual influences that shaped and continue to shape the growing field of bioarchaeology. A particularly valuable feature is the extensive bibliography (over160 pages) which serves as a valuable reference with particular appeal to anyone interested in the development of current methods, the history or future of bioarchaeology. It is also well suited as an excellent text in a graduate level course on the history of physical anthropology.

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