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ARTICLE

Archaeological Recording and Assessment of Rock Art at Celebration Park, Southwestern Idaho

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Abstract

The rock art of Celebration Park, though well-known, has received little formal attention in the past two decades. To better document and assess the condition of the rock art panels, the College of Western Idaho mapped and recorded all of the rock art-bearing boulders during the 2014-2015 field seasons. The distribution of elements within Celebration Park appear to have similar characteristics to the southcentral Owyhee petroglyphs commonly characterized by the Great Basin Pecked style, and a common occurrence of Rectilinear Abstract elements. The occurrence of Great Basin Rectilinear Abstract (GBRA) elements at Celebration Park include a dot design (n=39) as the most common element within the substyle. Common elements within the Great Basin Curvilinear Abstract (GBCA) substyle include the semi-circles (n=17) which constitutes 26% of the style. Also common are circles (n=12), tailed circles (n=10), and chained circles (n=10). The rock art at Celebration Park is notably distinct from that at Wees Bar.

KEYWORDS: rock art, Celebration Park, petroglyph frequencies

Introduction

Celebration Park and its noted rock art are located on the north side of the Snake River south of the city of Melba, Idaho (Figure 1). Though the first systematic archaeological survey of the area was conducted in 1958 by Donald Tuohy, the area was first visited and reported by Richard Erwin (1930:70-79) who described the rock art of Swan Falls—what is now known as Map Rock—as well as what appears to be rock art at Celebration Park. Both locations were also recorded in some detail by Terry Pike (1969). It is important to note that the petroglyphs of Celebration Park do not exist in an isolated context. There are several sites that have been surveyed within Southwestern Idaho (Figure 4) and near the park. Upstream from

Celebration Park are the Wees Bar petroglyphs, noted by Erwin (1930) and described in detail by Nelle Tobias (1981). Tobias illustrated much of the unique rock art found along that portion of the Snake River and provided a detailed description on the frequency of elements (Tobias 1981:6).

Though the rock art of the park is well known, it has received little formal attention in the past two decades. To better document and assess the condition of the rock art panels, faculty and students from the College of Western Idaho mapped and recorded all of the rock art-bearing boulders during the 2014-2015 field sessions. Documentation of the west side of the boulder field occurred during spring 2014 in which time 45 panels were recorded. The east side was documented during spring and fall of 2015 with a total of 41 panels recorded and mapped.

Figure 1. Celebration Park in Southwestern Idaho.

Geology of the Snake River Canyon Boulder Field at Celebration

The Snake River Canyon and adjacent areas were shaped by shield volcanoes and field basalts (Greeley 1982). Exposed columnar basalts reveal a multitude of volcanic flows that occurred over an extended period of time. Intermixed in some instances are lacustrine sediments from Tertiary and Quaternary time periods (Maley 1987). More recently, melon gravels or rounded boulders and cobbles of local basalts were deposited by the outflow of Pleistocene Lake Bonneville approximately 14,500 years ago (Malde 1965). Sediments suggest a succession of fluvial and aeolian events characterized by silts and sands intermixed with small gravels that are underlain by larger and more extensive gravel deposits. The geology of the project area is associated with these events and includes such landforms as low stream terraces, floodplains, sand dunes, alluvial fans, and islands. Shallow aeolian deposits cover much of the area including those areas above the canyon rimrocks. Colluvial deposits are found along talus slopes while alluvial fans have formed at the mouths of side canyons (Malde 1968). The Snake River flows through a deep canyon that was shaped by the Bonneville Flood (Curry and Oviatt 1985). The estimated 1,140 cubic miles of water discharged during this geologically brief event abraded large chunks of the basalt walls and deposited the rounded boulders on flood terraces (Jarret and Malde 1987).

Owing to the Bonneville Flood event, Celebration Park is located on a flood terrace and densely covered with boulders ranging in size from to 2-3 meters in diameter (Figure 2). Exposed basalt columns frame the park's northeast border while the Snake River forms its southern border. The western location of the documented petroglyphs are approximately 50 meters north of the Visitor's Center. The eastern boundary is located 650 meters east of the Visitor's Center and slopes approximately 30 degrees from the basalt columns to the Snake River.

Figure 2. The boulder field of Celebration Park behind the Visitor's Center, facing southeast.

Figure 3. Petroglyph panel in the eastern boulder field. Elements include dots, rakes, sheep horns, and connected circles.

Ethnography of Southwest Idaho

The historic inhabitants of southern Idaho included the Northern Shoshone and Northern Paiute, which are distinguished primarily on the basis of language (Murphy and Murphy 1986:284). Economic lifeways and socio-political organization were similar for the Shoshone (which included the Boise, Bruneau, and Weiser subgroups) and the Northern Paiute, who both occupied southwestern Idaho at the time of historic contact (Murphy and Murphy 1960, 1986; Steward 1938). The Northern Paiute comprised the Payette, Weiser, and Bannock subgroups, with the latter defining a group of mounted hunters who moved eastward to the Fort Hall area during the eighteenth century (Liljeblad 1957:81). The primary ethnographic sources for the Middle Snake River area and southwestern Idaho are Murphy and Murphy (1960), Steward (1938, 1941), and Steward and Wheeler-Voegelin (1974). The primary ethnographic sources for the Eastern Snake River Plain include Lowie (1924) and Liljeblad (1957). Walker (1978:139-157) provides a broad synthesis of ethnography of the plain and specifically addresses Lemhi Shoshone-Bannock use of anadromous and other fishes. The above works describe both economic and social lifeways and enumerate the material cultures of the Northern Shoshone and Paiute Peoples of the plain.

Murphy and Murphy (1960) provide a relatively detailed but cautionary view of the socio-political organization and economy of Middle Snake River groups. Following Steward (1938, 1941), they suggest that the Snake River Shoshone resemble the Western Shoshone of Nevada in social, political, and economic characteristics. They observe that these groups had fewer horses, engaged in no bison hunting activities and virtually no warfare (Murphy and Murphy 1960:321). Further, they lacked band chiefs, and winter villages lacked headmen. Generally, the socio-cultural pattern was a loose organization in which individuals occasionally were chosen to coordinate specific tasks, such as being “fishing directors” (Steward 1938:168-169). In the predominant settlement pattern, small aggregates of nuclear families or family clusters camped together and performed subsistence-related activities. The composition of a cluster was highly fluid in that allegiances shifted as families moved to pursue different resources (Steward 1970:129-130). A somewhat larger but less common multi-cluster aggregate was characterized by “temporary allegiances for a few corporate activities, such as hunting, or other associations where local resources could support unusual numbers of people” (Steward 1970:130). Though such corporate organizations were known, they were the exception. The Shoshone of Nevada and those living along the Snake River were characterized by households which were nearly self-sufficient economic units and independent social and political units (Steward 1938:239).

The dominant settlement pattern of the Middle Snake River was highly dispersed with small winter residences (Murphy and Murphy 1960:322). The area was occupied during the winter because of a perceived good supply of both wood and shelter. Steward (1938) reports winter villages being moved several times during the winter period. Bishop and Plew (2016) have argued that this may be related to fuel exploitation. The splitting of residence groups into much smaller winter camps of two or three lodges is important in that the same people did not camp together at the same sites each winter (Liljeblad 1957:36; Murphy and Murphy 1960:322). This corroborates with Steward’s (1938:169) observation that the “true political unit was the village, a small and probably unstable group.” In this context the term “villages” as it is now used in relation to rank societies, implies some greater socio-political complexity than was, in fact, the case among Snake River groups (Liljeblad 1957:35-36). As such, many describe the archaeological presence of villages, which implies a greater level of complexity than is appropriate (e.g., Meatte 1990:71; Pavesic and Meatte 1980). This is especially evident in how production for storage has been employed in archaeological conjectures about the winter pattern (e.g., Meatte 1990:66-67, 69, 71; Pavesic and Meatte 1981:21-23).

The major subsistence pursuits of Middle Snake River groups were fishing and camas collecting. Three major anadromous fish runs during the spring, summer, and fall provided an important food source; two of these were Chinook salmon (*Oncorhynchus tschawytshca*) runs, while one was comprised of steelhead trout (*Salmo gairdnerii*). Areas such as Glenns Ferry were considered better fishing sites since waters were shallow enough for weirs to be used (Murphy and Murphy 1960:322) though the use of weirs along the Snake was not widespread. Steward (1941:226) notes that "(d)ams and weirs could be used in few places in the Snake River which is too wide and deep…" Above Hagerman, salmon were speared, while basketry traps, sometimes used in conjunction with weirs, were employed in small streams. Steward (1938:43) notes seasonal fishing for species other than steelhead or salmon, including the three-tooth lamprey, Colombia River sturgeon, cutthroat trout, and Rocky Mountain whitefish. He also notes that some species were taken during the winter (Steward 1938:168).

Camas was of economic importance, and each summer groups from the Snake River traveled north of the river to Camas Prairie so they could harvest the economically important root (Murphy and Murphy 1960:322; Steward 1938:166-167). At this time camas was prepared for storage, and social interactions occurred among many different groups. In addition, deer were taken throughout the year. Deer, elk, and mountain sheep were taken in the fall in the mountains north of Hailey. Steward (1938:167) also reports that deer were taken south of the river. In addition, other plants and berries were incorporated in the diet (Steward 1938:167-168). This traditional anthropological view of Middle Snake River ethnographic groups presents a picture of a mixed-mode foraging strategy marked by a subsistence emphasis on anadromous fish and camas with groups establishing residential bases along the river (Gould and Plew 2001; Plew and Guinn 2016).

The Archaeology of the Celebration Park Area

In addition to the extensive rock art of Celebration Park, a number of archaeological investigations have been conducted within its boundaries as well as in the vicinity of the park. These site excavations and surveys provide a context for assessing the prehistoric petroglyphs of the area.

Touhy's (1958) survey reported two sites characterized by mussel shell and lithic debris, resulting in his interpretation of the location as a campsite. Further surveys were conducted by Keeler and Koko in 1971, who revisited the location as part of the Guffey Falls dam project. Keeler and Koko reported shell, lithics, and what they incorrectly recorded as metates, along with evidence of looting. Murphey's 1977 Bureau of Land Management survey listed sites 10-CN-5 and 10-CN-6 on the same form, continuing the thought that the two sites were extensions of one another. Murphey labeled the area as a habitation site and again noted looting in the area, as well as shells, two hand stones, and fire-cracked rock.

In 1968, T. Virginia Cox and students of Boise State College conducted test excavations at site 10-CN-6 in Celebration Park, then known as the Warick Site. Cox conducted limited testing which resulted in the recovery of Elko and Desert Side-Notched projectile points, Shoshoni Ware pottery sherds, knives, groundstone, bifaces, and scrapers—the basis for the conclusion that Middle and Late Archaic occupations occurred at 10-CN-6 (Hauer 1996). As with other sites in the area, site 10-CN-6 appears to have served as "a short-term habitation site" (Hauer 1996).

Mary Anne Davis of the Idaho State Historical Society supervised the 1990 excavation of site 10-CN-4 as a mitigation action of Section 106 compliance prior to paving the existing parking lot of Celebration Park. Additional excavation within the park was conducted by Willig (1988) and Sammons and Myler (1994) at the so-called Midden site.

Beginning in 2000, Boise State University began an extensive re-investigation of sites 10-CN-5 and 10-CN-6 and other sites in the area (Huter 2000; Plew 2006). Recent excavations further document the primarily Late Archaic use of the location as determined by a radiocarbon date of 640+/-40 B.P. In addition to the excavations of a number of hearth features, a faunal assemblage documenting the common use of deer and rabbits was recovered. No evidence of the use of fish is noted. It appears that the site was utilized repeatedly over a period of time (Plew 2006).

Rock Art of Southwest Idaho

In the Bruneau-Jarbidge area of Southwestern Idaho, Kelley Murphey (1994) reports on 25 different rock art sites. Elements are estimated to span the Middle Archaic into Historic times (Murphey 1994:20) and include dots, circles, undulating lines, Katchina figures, shield warriors, and anthropomorphs, and are found on boulders, caves, and canyon walls. Also documented are the presence of "pits" on boulders at the Upper Salmon Falls site (Murphey 1997:29). The pits are shallow and exhibit a light re-patination by which Murphey (1997:29) indicates their manufacture during a time frame approaching the Historic Period, but not after.

In the South Central Owyhee Uplands, Plew (1996) describes rock art from Pole Creek, Camas Creek, and Big Spring Creek, three tributaries to the Owyhee River northeast of the Duck Valley Indian Reservation. Plew (1996:7) notes that rock art frequencies increase where associated with habitation sites. The range of elements at Camas Creek is a larger amount than appears at Pole and Big Spring Creek, and also has higher visible evidence of habitation.

The elements of the Owyhee Uplands are consistent with the Great Basin Pecked Style, with both Abstract and Representational present (Plew 1996:6). Of the Abstract, rectilinear motifs are more abundant. This is notable as the Great Basin Abstract Curvilinear elements are more common in California and Nevada (Plew 1996:6). Zoomorphic and anthropomorphic elements are present in the Owyhee Upland sites (Plew 1996:8). Plew indicates a notable difference between the Owyhee Upland elements and those Murphey

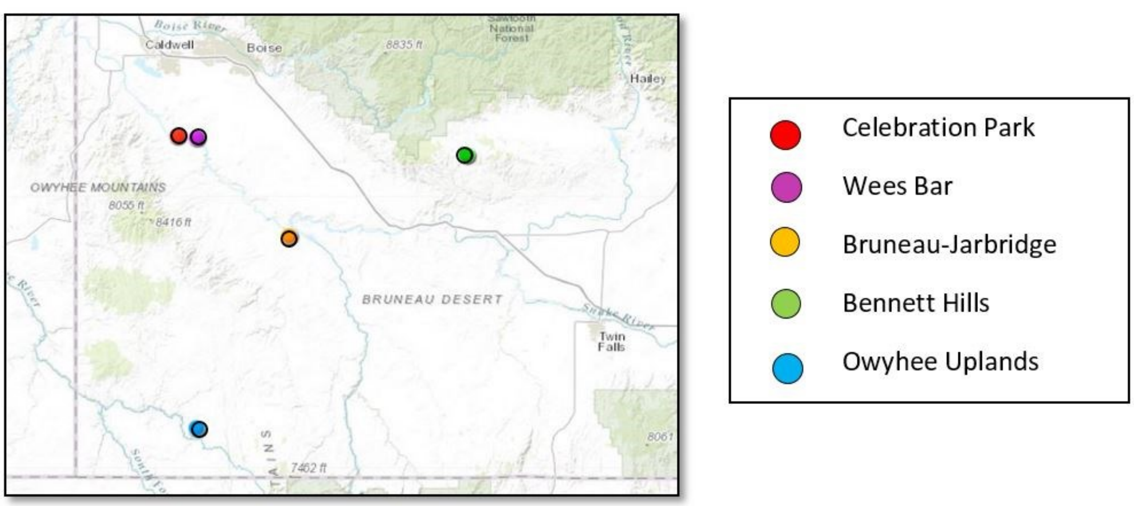

Figure 4. Location of rock art sites in Southwestern Idaho.

Figure 5. Feature with rectilinear and curvilinear sub-styles. Elements include dots, rake, zigzag lines, tailed circle, and arches.

surveyed in 1994 at the Bruneau-Jarbidge sites (Plew 1996:8); the Owyhee Upland rock art does not seem to have the same degree of Fremont influence. The petroglyphs are most likely Late Archaic to Historic (Plew 1996:8).

Northeast of the Snake River in the Bennett Hills, Merrell and Johnson (2011) describe a site location having extensive shield and bear claw figures (2011:8), motifs noted by Plew (1979, 1996) in Owyhee County. Merrell and Johnson (2011:11) argue that the rock art of the Bennett Hills appears to reflect the Great Plains Tradition with the Fremont element of the shield bearer. This style interprets the art as a narrative, a means to translate magico-religious ceremonies or biographical events. Similar motifs are found at the Danskin Rockshelter on the south fork of the Boise River (Erwin 1930; Merrell 2004). The manner of pecking at the Bennett Hills is noticeably different from the Great Basin Style, as it is shallow and less accurate (Merrell 2011:9). Merrill states this technique is oftentimes a signature for a more recent manufacture date, and using this observation, as well as the elemental motifs, estimates the petroglyphs date to the 1600-1700s.

Field Methods

The boulder field at Celebration Park was surveyed for petroglyph sites during the 2014 and 2015 field seasons. Rock surfaces with a single petroglyph were identified as a feature, as were rocks with multiple petroglyphs. For the purpose of recording the rock art, an identification number was assigned to each boulder containing petroglyphs. Each identification number was consecutive, with a west-to-east increase in the denominations. Occasionally, extensive quantities of petroglyphs on a single surface necessitated separating the rock art into separate panels. The boulder would therefore have a single identification number, but each panel would have a letter value attached, such as a, b, c, and so on.

Sketches/drawings were produced by superimposing a 10 x 10 cm grid over each panel. Field staff recorded the images in compliance with ARARA standards, disregarding vandalism unless it was intertwined with the rock art, in which case it was labeled as graffiti. Photos were taken of the petroglyphs with and without the gridding. The Snake River served as the constant geographical feature, and a photo of the site's orientation to the Snake River was included.

The geographical coordinates were recorded for each petroglyph feature using handheld GPS systems. A compass was used to measure the slope of the rock surface containing the petroglyph, and to record the direction the petroglyph faced. In addition, the girth and height of each boulder was documented, as was the height of the topmost petroglyph and bottommost petroglyph from the soil line. Heizer and Baumhoff's *The Prehistoric Rock Art of Nevada and Eastern California* (1962) was used as the basis for identifying rock art elements.

Analysis

At each site, the elements of Celebration Park were assigned to Heizer and Baumhoff's descriptive list of Great Basin (GB) stylistic elements (Heizer and Baumhoff 1962). Heizer and Baumhoff (1962:198) divide the GB elements into Representational and Abstract substyles. Representational elements include Katchina and human figures, hands, and quadrupeds (Heizer and Baumhoff 1962:199). The Abstract style is further delineated into Curvilinear and Rectilinear styles (Heizer 1962:198). The Curvilinear style is typified by circles, sun disks, stars, and snakes, whereas the Rectilinear elements include rectangular grids, intersecting lines, rakes, and dots (Heizer and Baumhoff 1962:200).

By these measures, few of the Great Basin Representational (GBR) style are found in Celebration Park. Of the 223 total element motifs documented in Celebration Park, only 15 are GBR. The Great Basin Abstract styles are found to be more common in Celebration Park. The Great Basin Curvilinear Abstract (GBCA) substyle includes 64 of the 223 motifs, while the Great Basin Rectilinear Abstract accounts for 144 (Figure 6).

Of note is the fact that Curvilinear, Rectilinear, and Representational substyles appear to cluster near the western end of the boulder field (Figure 7). Representational elements, though clustering with Curvilinear and Rectilinear elements, are fewer in number and relatively absent from the remainder of the field area to the east where Curvilinear and Rectilinear elements share a common distribution. The average distance to the Snake River for petroglyph features on the west end of the field is approximately 142 meters while the features along the east side are approximately 56 meters from the river. The most common cardinal orientation is to the southeast, facing the river, while a few face southwest—none appear to face north, east, or west.

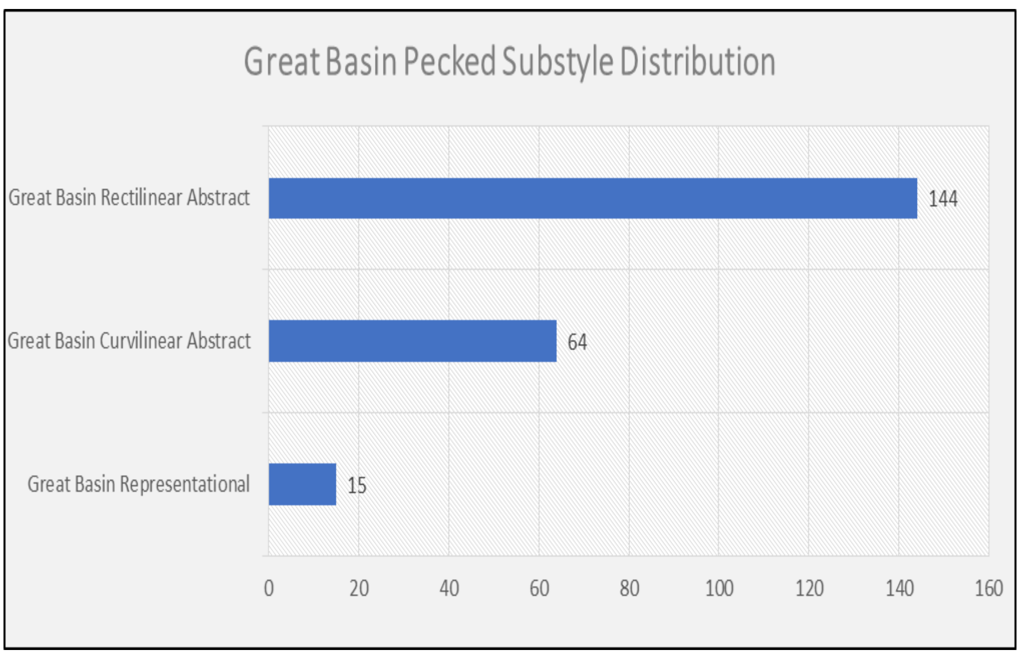

Figure 6. The Great Basin elements of Celebration Park by substyle.

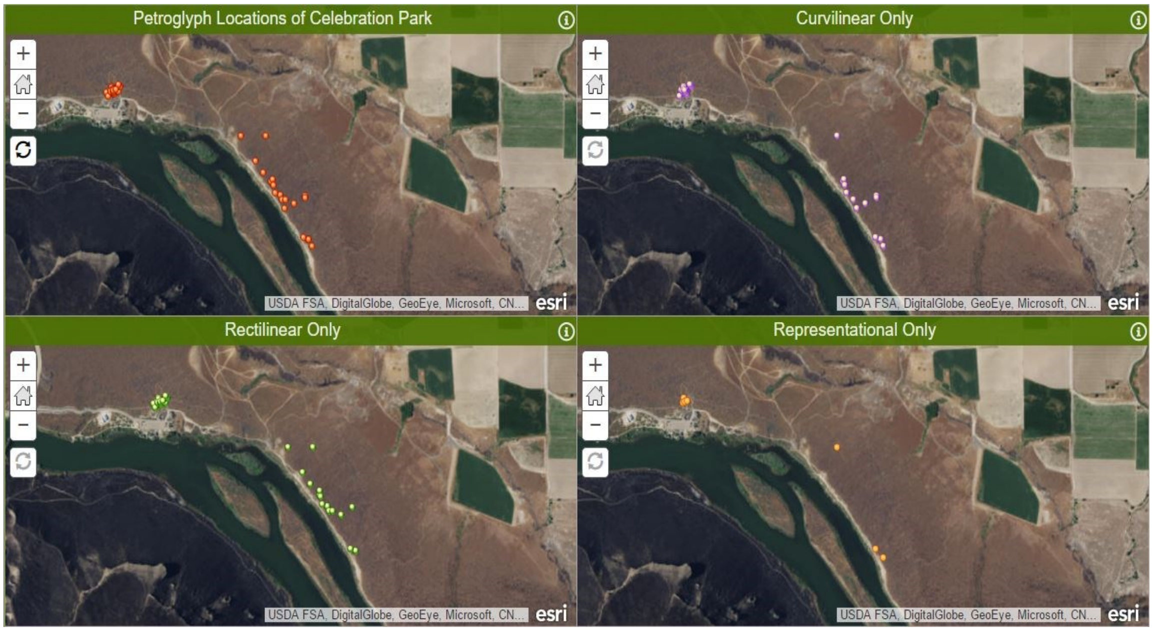

Figure 7. Top left: locations of all recorded petroglyph boulders. Top right: locations with Curvilinear elements. Bottom left: locations with Rectilinear elements. Bottom right: locations with Representational elements.

Discussion

The distribution of elements within Celebration Park appear to have similar characteristics to the southcentral Owyhee petroglyphs documented by Plew (1996). Plew observed the rock art of the Owyhee Uplands as largely characterized by the Great Basin Pecked style, with a more common occurrence of the Rectilinear Abstract elements (Plew 1996:6). Of the Owyhee Upland Rectilinear elements, the most common were dots (n=66), rectilinear designs (n=40), straight lines (n=27), and bird tracks (n=24) (Plew 1996:6). This is comparable to the common Rectilinear elements distribution of Celebration Park where the dot, or dot design (n=39) was the most common element within the Great Basin Rectilinear Abstract (GBRA) substyle. Singular dots, dots pecked in seemingly random alignment, and dots with an orderly or design appearance were tallied under the same heading. Also of interest were straight lines that did not appear to be part of radiating dashes nor tally mark designs (n=25). Other common GBRA motifs within the park were rectilinear designs (n=13), parallel lines (n=13), and rakes (n=12) (Figure 8). The frequent elements within the Curvilinear substyle of the Owyhee Uplands are the Curvilinear meander (n=91) and circles (n=46) (Plew 1996:6), whereas the most common Curvilinear element of Celebration Park is the semi-circle (n=17), constituting 26% of the GBCA. Also common are circles (n=12) with 19%, tailed circles (n=10), and chained circles (n=10) (Figure 9) both figuring 16% of the GBCA.

Compared to Celebration Park, Representational elements are documented in greater frequency in the Owyhee Uplands, where Plew (1996:7) notes 12 different motifs—several with common occurrences. Interestingly, the human figure is noted on 26 sites in the Owyhee Uplands (Plew 1996:7), but found only once in Celebration Park. Shield figures and mounted riders are also recorded in the Uplands (Plew 1996:7), but are absent from Celebration Park. Within Celebration Park, the most common motifs for the GBR style are plant forms (n=3),

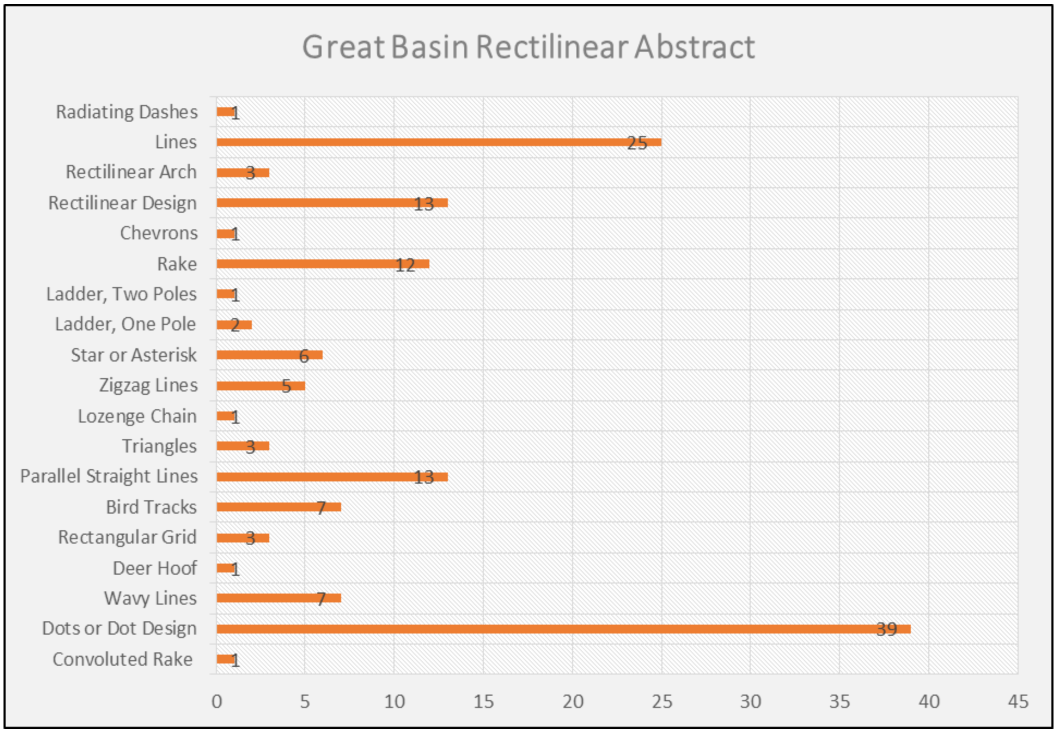

Figure 8. Rectilinear elements and their count.

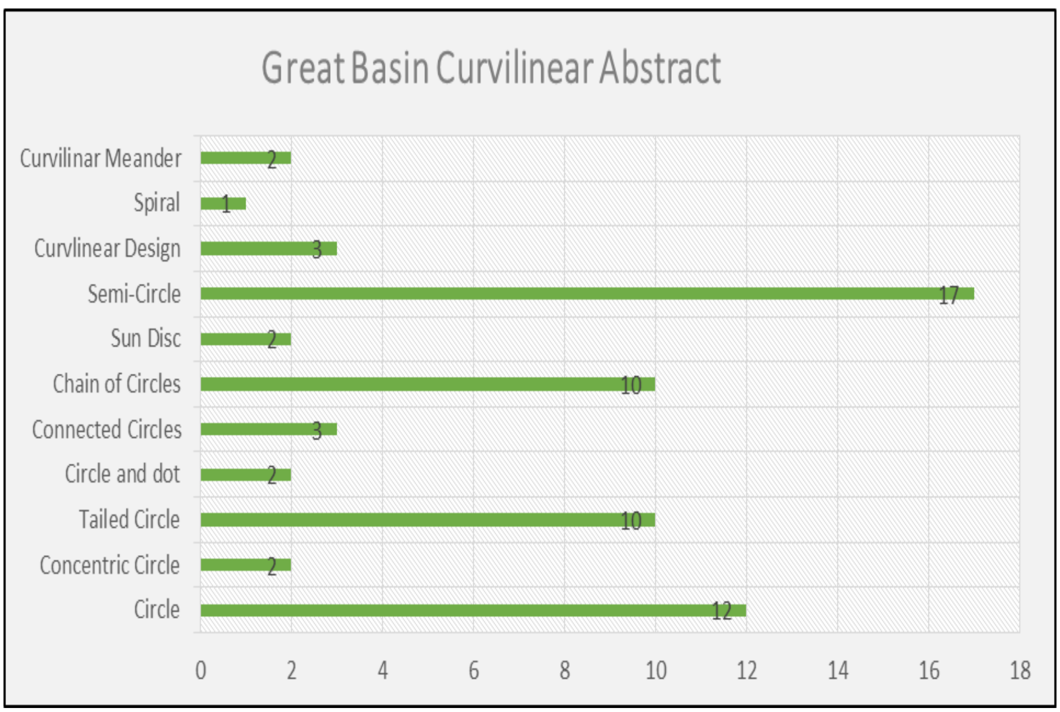

Figure 9. Curvilinear elements and their count.

sheep horns (n=3), and paws (n=3).

The rock art of Bennett Hills is considered to be characteristic of the Great Plains tradition by Merrell (2011:11). Prominent elements of the Bennett Hills location are shield figures and bear claws (Merrell 2011), whereas within Celebration Park shield figures are absent and only three paws were documented. The extensive documentation of the Bruneau-Jarbidge and Middle Snake River Petroglyphs by Murphey (1994) are described as having Fremont influence. Murphey (1994:25) describes a variety of figures not found within Celebration Park, such as Katchina figures, anthropomorphs, and shield figures.

Figure 10. Photo showing common elements that include dots, connected circles, rectilinear designs, and zigzag lines.

Upstream from Celebration Park and on the south side of the Snake River, the Wees Bar petroglyphs are relatively distinctive compared to Celebration Park. Although there are a few general similarities between the two sites, such as the presence of dots, rakes, circles, and chained circles (Tobias 1981:13), there are several elements present at the Wees Bar site that are absent from Celebration Park. Arrows, incised triangles, “M” and “W” variants, and hollow figures are a few of the elements described by Tobias (1981) that are not found within the documented rock art of Celebration Park. Also notable is the presence of 22 anthropomorphs at the Wees Bar site, in contrast to the documentation of one at Celebration Park.

While it is not possible to say with any degree of certainty what function the Celebration Park rock art served, it is clear that the site was repeatedly visited over an extended period of time; that the rock art was produced during intervals when the terraces were inhabited is consistent with findings at other Southwestern Idaho petroglyph sites previously mentioned. Notably, the rock art of the park falls within the range of the late Holocene or Archaic Period of the Great Basin. The excavated sites at and near Celebration Park date to this later time frame (post-900 B.P.). On this basis it may be assumed that some of the rock art dates to this period. During this time the importance of the site(s) may well have changed. In this regard, the varied interpretations of the functions of rock art may be assumed to be represented at the park. Regardless, the findings of the present study indicate that the rock art of Celebration Park is in many ways unique among rock art sites in the region.

Recommendations

The College of Western Idaho Petroglyph Recording Project has been successful in establishing a comprehensive body of baseline data that can be used to observe changes to the petroglyphs over time. It is our recommendation that Canyon County Parks, Recreation, and Waterways develop a plan for general monitoring in select areas so that instances of vandalism and the impact of erosion might be recorded. In the future, the application of DStretch (decorrelation stretch) technology could be used to illuminate instances of superimposition as well as any pigments that may have originally been applied to the petroglyphs.

Acknowledgments

The Anthropology Club of the College of Western Idaho conducted their Petroglyph Recording Project at Celebration Park 2014-2015. This project was facilitated by the generous assistance of many participants and agencies including a generous grant bequeathed by the Canyon County Historic Preservation Committee that enabled CWI students to put forth their best efforts in documenting the rock art of Southwestern Idaho. The project would not have been possible without Canyon County Parks, Recreation, and Waterways Director Tom Bicak, Co-Director Kathy Kershner and Recreational Planner Nichole Schwend. Their assistance and institutional support contributed to the success of the project including use of the facilities and camp sites at Celebration Park. The report itself benefitted from an editorial review panel led by Dr. Mark Plew, Boise State University. Dr. Plew's guidance and mentorship was critical to the success of this report. The panel also included Nikki Gorrell, College of Western Idaho, Assistant Professor of Anthropology and Anthropology Club Adviser as well as Nichole Schwend with Canyon County Parks. Lastly, a special acknowledgement to Linda Murray, the fall 2015 Project Coordinator, who has contributed many hours post-graduation collecting and collating hundreds of descriptive forms, sketches, and photographs to ensure Canyon County received a complete database.

Faculty and students of the College of Western Idaho conducted a range of tasks over four field sessions in two academic years. Nikki Gorrell served as the Project Director for the Petroglyph Recording Project. During the spring of 2014, she was assisted by CWI Geology faculty Ander Sundell. During the fall of 2014, spring of 2015, and fall of 2015 CWI Geography faculty Bryan Krouse assisted with the Geographic Informational Systems (GIS) aspect of the project. CWI staff Kathy Guthrie served as the Director's Assistant and Van Driver. CWI student and professional photographer April Mantha contributed the majority of photos for the 2014 seasons. Both Kathy and April were instrumental to the success of the project.

The 2014 spring session had Jessica Mylan as Project Coordinator. The students included Lantz Brown, Kailie Leggett, Scott May, Abram Grisham, Sylvia Perritte, Davis McDonald, Laurel Hitchborn, Audrey Chapman, Linda Murray, Tanis Partee, April Mantha, Sue Roberts, and Jeannie Reinhardt.

The 2014 fall session had Audrey Chapman as the Project Coordinator. The students included Leah Acevez, Lantz Brown, Laurel Hitchborn, Jadie King, Linda Murray, Katt Mitchell, Mia Mick, Nick Parry, Thomas Beckman, Kyle Rios, Tanis Partee, April Mantha, and Sue Roberts.

The 2015 spring session had Audrey Chapman as the Project Coordinator and Laurel Hitchborn as Project Manager. The students included Allie Goeckner, Sue Roberts, Kelsey Wilber, Linda Murray, Leah Acevez, Jessica Mylan, April Mantha, Dunia Rossi, Joseph Rossi, Mia Mick, Ollie Shannon, Marie Fowler, Katt Mitchell, Veronica Gutierrez, Shauna England, Thomas Beckman, and Joshua Danes. Boise State University Students were Vicki Hall Stark, Lantz Brown, Sue Roberts, and Shane Tabor. Community member and University of Alaska anthropology undergraduate anthropologist Liz Nevills also contributed.

The 2015 fall session had Linda Murray as the Project Coordinator and Laurel Hitchborn as the Project Manager. The students included Allie Goeckner, Leah Acevez, Kelsey Wilber, Veronica Gutierrez, Melissa Downs, Chris Vertrees, Maribel Carrillo, Mia Mick, Ollie Shannon, Dave Draper, Marie Fowler, Carol Metsker, Kaylene McArthur, Shauna England, and Tanis Partee. BSU student Sue Roberts and Liz Nevills also contributed.

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ARTICLE

Archaeological Test Excavations at the Medbury Site (10-EL-1367)

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Abstract

The Medbury site, a Late Archaic site near Hammett, Idaho was initially tested in 1995. Subsequent testing was conducted in 2014 and 2015. The results of these excavations recovered an assemblage dominated by domestic gear. Lithics which exhibit a marked preference for obsidian suggest retooling activities as opposed to manufacturing of tools. XRF analysis of ceramics indicate that two distinct pottery types found at Medbury were produced from the same source materials. The diet breadth reflects a pattern common along the Western Snake River—one where deer and rabbits are predominate.

KEYWORDS: Medbury, Hammett, ceramics, XRF analysis

Introduction

The Medbury site (10-EL-1367) is located approximately one and one-half miles southeast of the town of Hammett, Idaho, and to the northeast of the old Medbury Ferry crossing. The site was originally brought to the attention of the Department of Anthropology by Elton Bentley and Dorian Duffin, the land owner, and was first visited in July 1995 to assess its potential as a possible field site for Boise State University's summer Archaeological Field School. The site which has been known for a number years to local collectors was at the time of the initial visit impacted by several years of plowing and cultivation of alfalfa and by extensive rodent activity. In October 1995 students from Boise State University excavated four 1 x 2 meter test units to a depth of one meter below the surface. The purpose of the excavation was to assess the stratigraphic context of the site and establish the range of materials present and the probable age of the deposit.

The site area is situated approximately 40 meters north of the river's edge and covers an area of 70 x 30 meters. At the time of the test excavation the field was covered by stubble from the last alfalfa cutting. The surrounding area is covered by scattered stands of sagebrush with riparian vegetation including willows along the river's edge. The site is defined by a medium (5-10 flakes per meter) scattering of lithic flakes, ceramic sherds and thermally altered rock, mussel shell, and "green" and charred bone which is not uniform across the site area.

The test excavations recovered a Late Archaic assemblage that included Desert Side-Notched (n=4) and Rose Spring points (n=4) and pottery (n=12). The assemblage was characterized by weapons (35%), utility items (22%), and domestic items (29%). A total of 2560 lithic flakes were recovered with 88% measuring in a range of .26-1.0 cm flake size analysis suggesting retooling activity. Fifty-five percent of the toolstone is obsidian with basalt (24%) and cryptocrystalline (21%) materials occurring in relative frequencies. Obsidian source material is from Brown's Bench, Owyhee, and Cannonball Mountain sources. A total of 1405 faunal remains were recovered. Of these, 49% were charred suggesting their discard into fire hearths. Though no formal hearths were excavated, charcoal stained areas associated with thermally altered rock (n=330) were common. Deer, rabbits, and salmon (n=22 nisps) were present.

During the summers of 2014 and 2015, additional testing was conducted at Medbury. This followed GPR assessment of the area by John Bradford, Department of Geosciences at Boise State University. This analysis failed to identify any significant anomalies within the area of the previous test excavations.

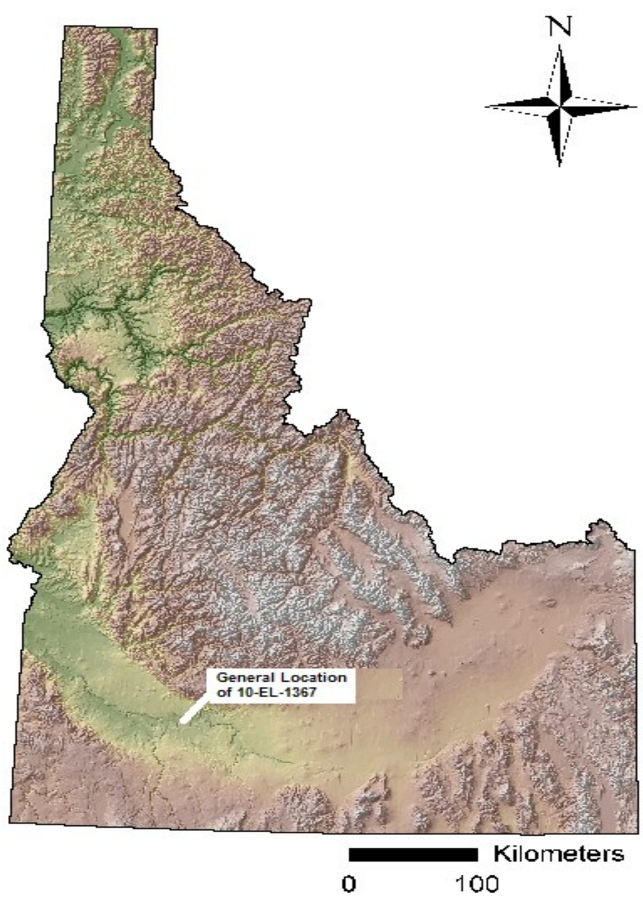

Figure 1. General location of site 10-EL-1367.

Previous Archaeological Research

During the past three decades a number of excavations have been conducted between the towns of Hammett and King Hill. These sometimes minor excavations have produced considerable evidence of Late Holocene/Late Archaic activity. Sites include 10-EL-438 (Plew and Willson 2010), Indian Cove (Young 1986), Three Island Crossing (Gould and Plew 2001; Eastman 2011), King Hill Creek (Willson and Plew 2007), Knox (Plew, Huter and Benedict 2002), Swenson (Plew and Willson 2007), Clover Creek (Plew and Gould 1990), 10-El-215 (Plew and Willson 2013), and 10-El-216 (Plew and Willson 2010).

On the south bank of the Snake River near Indian Cove and 1.5 miles south of Hammett, Idaho, Young (1986) excavated a shallow, round, saucer-shaped structure measuring 15 cm at its greatest depth. A central fire pit was associated with a radiocarbon date of 4170+/-80 B.P. A range of artifacts including Humboldt points were earlier collected from the site. The majority of the lithic flake assemblage consists of thinning and late stage flakes (78%).

Three Island Crossing located near Glenns Ferry, Idaho, is characterized by a diverse artifact assemblage (n=1413) and a significant faunal collection consisting of deer, rabbits, and fish (NISP= 19,000+) remains. The site, based upon radiocarbon dates between 580+/-180 B.P. and 970+/-60 B.P., suggests a minimum of three occupations. A single structure with interior fire pit and two one meter-wide storage pits were recorded (Gould and Plew 2001). More recent excavations at the western end of the Three Island terrace report similar findings. Though there is no evidence of an isolated event, fish appear more important than deer in the diet breadth (Eastman 2011).

Located approximately one and one-half miles west of King Hill and located on the east side of King Hill Creek is site 10-EL-110 or the King Hill Creek site. The site is a Late Holocene/Late Archaic site documenting a diet breadth that includes mammals, fish, some waterfowl, and mussels. Seventy percent of the artifactual assemblage consists of weapons (30%) and domestic items (40%). Late stage flakes of obsidian suggest some re-tooling activity. Source materials are from Brown's Bench (30%), Cannonball Mountain (20%) and Big Southern Butte (20%). A primary activity at King Hill Creek was basalt core reductions and tool manufacture. The lithic tool assemblage is suggestive of a high level of residential mobility.

At the Knox site just west of King Hill, Idaho, evidence of processing and manufacturing activities was noted (Plew, Huter and Benedict 2002). Though the earliest use of the site dates to Middle Archaic times, the majority of the occupations are of Late Archaic age. Early stage reduction of basalt was a primary activity and is thought to be associated with the Bell Mare basalt quarry some five miles to the east (Plew and Chavarria 1992). In addition, a small storage pit and large cooking pit measuring more than a meter in diameter were present. Using Kelly's (2001) chipped stone mobility index, Knox is suggested to represent the only site assemblage in this reach of the river exhibiting low residential mobility.

Approximately one-half mile east of Knox is the Middle to Late Holocene/Archaic Swenson site (Plew and Willson 2007). The assemblage is primarily characterized by weapons (47%) and general utility tools (36%). The chipped stone assemblage suggests a high level of mobility (cf. Kelly 2001). Seventy-five percent of the lithic material from Swenson is basalt. Flake size commonly in the range of 3-5 cm suggests early stage reduction. Obsidian recovered from the Swenson tests are largely from Brown's Bench (57%) and Cannonball Mountain (43%). Faunal remains (n=4039) document deer (32%) and rabbits (28%) as the most important items in the diet breadth. Forty-four percent of the remains are charred.

The Clover Creek site (10-EL-22) is located just east of King Hill across Clover Creek and along an east-side terrace of the Snake River. Initial testing of the location is purported to have identified evidence of houses in association with pottery and fish remains (Butler 1982). More recent excavations (Plew and Gould 1990) suggest that the primary activity was early stage lithic reduction associated with a nearby basalt quarry at Bell Mare (Chavarria and Plew 1992). Hydration dates establish the age of the site between ca. 900 and 1000 years B.P. (see also Gould and Plew 1996). No structures or other cultural features were noted in two field seasons of excavation.

Upstream at Bancroft Springs, Butler and Murphey (1983) excavated a possible house pit associated with materials of Late Archaic age at site 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.

Located approximately four miles upstream from Clover Creek site 10-EL-215 is a Late Archaic site that contains some Early to Middle Archaic items (Plew and Wilson 2010). Desert Side-Notched and Eastgate Corner-Notched points along with Humboldt and Humboldt-like points were recovered. The assemblage consisting of 237 artifacts exhibits some degree of richness and includes bifaces, knives, cores, perforators, groundstone, and pottery. Within the chipped stone assemblage weapons accounted for 30% of the total, and general utility tools accounted for 27%. Use wear was identified on only 2% of 208 specimens examined. Obsidian accounted for 71% of the toolstone used in manufacturing projectile points. In contrast, 48% of the 51,624 flakes recovered are cryptocrystalline. Sixty-four percent of all flakes are <1 cm in diameter. Volcanic glass is from Brown's Bench (n=9) and Cannonball Mountain (n=3). A highly fragmented faunal assemblage (n=8161) suggests a diet breadth containing mussels, deer, and rabbits.

Analysis of the technological organization of the 10-EL-216 site assemblage just east of 10-EL-215 shows little richness or evenness in artifact types. Test excavations identified several areas of lightly scattered lithic debris and 25 lithic artifacts that include nine Late Archaic projectile point fragments (n=9), one drill tip (n=1), one scraper (n=1), one battered cobble (n=1), ten biface fragments (n=10), and three cores (n=3).

Analysis of the 10-EL-216 site assemblage indicates little richness in artifact types. Of the 25 artifacts included in the analysis, 32% are weapons (n=9). The general utility category constitutes 43% of the total assemblage and is comprised of hammerstones (n=1), biface fragments (n=10), and perforators (n=1). Fabricating tools include three cores (n=3). All artifacts were inspected for evidence of use wear. Five artifacts exhibited minor lateral margin edge damage. These included four bifaces (A5, A14, A18, A24) and the perforator/ drill tip (A17). The observed wear cannot be associated with any specific activity (Plew and Willson 2010).

A total of 6237 lithic flakes were recovered from testing. The predominant raw material is basalt, constituting 45% of the total (n=2805). The frequency of cryptocrystalline (n=1712) and obsidian (n=1720) is equal at 27.5% of the total. The frequencies of basalt and cryptocrystalline represent utilization of local material—especially basalts which may be transported from the nearby Bell Mare basalt quarry (Plew and Chavarria 1992). Flake size range analysis indicates that 4383 flakes in the assemblage are <1 cm in diameter, with an additional 1101 flakes measuring <2 cm in diameter—indicating that 88% of the assemblage are early stage flakes. This suggests that retooling and re-sharpening are primary activities at 10-EL-216. Geochemical analysis of volcanic glasses indicates materials from American Falls, Brown's Bench, Owyhee, Bear Gulch, and Big Southern Butte—Brown's Bench being the primary source (75%). Notably, Brown's Bench materials are more frequent at 10-EL-216 than at other sites in the area.

Four hundred (n=400) unidentifiable small mammal remains (largely rodent remains—most representing natural mortalities) were recovered as were ten identifiable remains consisting of rabbit and deer. The majority of remains are "green" and none modified. There are no evidences of cut marks or other breaks or abrasions of bone. Ninety-four small botanical remains were recovered as were 440 mussel fragments. Both appear to be largely naturally occurring. In addition, two pieces of thermally altered rock (TAR) and six historic artifacts were recovered. No formal features were encountered. The absence of formal features coupled with the presence of few processing tools and few faunal remains indicate that little processing activity occurred at 10-EL-216. Typologically the assemblage appears to be of Late Archaic age—a pattern characterizing many of the sites along this section of the Snake River (Plew 2008).

A primary focus of the 10-EL-216 investigation was assessing residential mobility. In this study we used Kelly's (2001) analysis of lithic assemblages to assess the degree of residential mobility reflected by the 10-EL-216 assemblage. Examination of the 10-EL-216 lithic assemblages indicates a high residential mobility. Indeed, there is a nearly perfect correlation with 13 of 14 criteria reflecting high residential mobility. Finally, re-evaluation of the depression excavated by Murphey and reported by Butler in 1983 as a "Fremont" house structure appears to be a historic feature (Plew and Willson 2010).

Excavations at site 10-EL-438 which is located along the north side of the Snake River near C.J. Strike reservoir produced radiocarbon dates of 410+/-40 B.P. (Beta-2861-2) and 1220+/-40 B.P. (Beta-286101). Typologically, the assemblage contains materials of both Late and Middle Archaic age. A total of 97 artifacts were recovered. Of these 24% are weapons (n=23). The general utility category constitutes 16% of the total assemblage while fabricating tools include seven cores or 7% of the assemblage. The material culture is dominated by domestic tools (49%) and weapons (23%), though the percentage of domestic items is skewed by the number of pottery sherds recovered (n=47). Activities include processing of large-to-medium-sized and smaller game, fish, and mollusks (Plew and Willson 2011).

Test excavations produced a total of 2000 lithic flakes. The predominant raw material is obsidian, constituting 53% of the total (n=1057). The frequency of cryptocrystalline (n=543) and basalt (n=400) represent 27% and 20% respectively. Flake size analysis indicates that 1451 of flakes are <1 cm in diameter (the diameter being the width of the flake), with an additional 138 flakes measuring <2 cm in diameter. A total of 411 flakes measures >3 cm (21%). As 73% of the flakes may be thought to generally indicate later stage reduction and retooling, some evidence of primary reduction is evident. Geochemical analysis of volcanic glasses indicates materials from Brown's Bench (50%) and Owyhee (50%) sources.

A total of 3298 mammal remains (largely rodent remains) were recovered. These most probably represent natural mortalities. Though the majority of remains are unidentifiable, 39 mammal remains were identified to species and as noted include deer, antelope, rabbit, badger, fox, raccoon, and woodrat. In addition, 918 fish remains were recovered. These include 10 otoliths, 43 head parts, and 864 ribs/rib fragments. The remains appear to be salmonid. Based upon the number of otoliths a minimum of five fish are present though it seems likely that the number is greater (Plew and Willson 2011).

Analysis of the 10-EL-438 lithic assemblages suggests a high residential mobility, as reflected in the correlation of 13 out of 14 high mobility criteria (Kelly 2001) This is of interest as the correlations for Swenson, King Hill Creek, and 10-EL-216 are quite similar.

Field Strategy and Methods

A site datum was established based upon surface concentrations of mussel and lithic debris in the vicinity of the previous testing. The datum was located north of the Snake River and positioned due south of a telephone pole on Snake River Road. An N-S baseline was laid out in 10-meter units with four 1 x 1 units staked along east-west of the baseline which extended some 50 meters across the terrace with GPS reading taken of all points of reference Elevational readings were taken at 10 meter intervals within the grid system with a topographic map prepared throughout the 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.

Units were considered sterile after three levels were excavated without the recovery of any cultural materials. The decision of where to focus excavation was based upon concentrations in cultural materials as units increased in depth. During the final weeks of excavation a 1 x 3 meter trench was established along the western edge of the site area to establish stratigraphic context.

Figure 2. Overview of main excavation area.

Unit and Feature Descriptions

The area excavated in 2014 was near the location of previous test excavation and test units and were chosen due to surface concentrations of mussel fragments and lithic debitage. The investigation included excavation of a 13 x 13 meter area some 30 meters south of Snake River Road and 100 meters north of the Snake River. The extent of excavation was to one meter below surface. Sediment profiles were extremely uniform consisting of fine grained, sandy loam. Munsell readings were taken throughout the excavation with an average

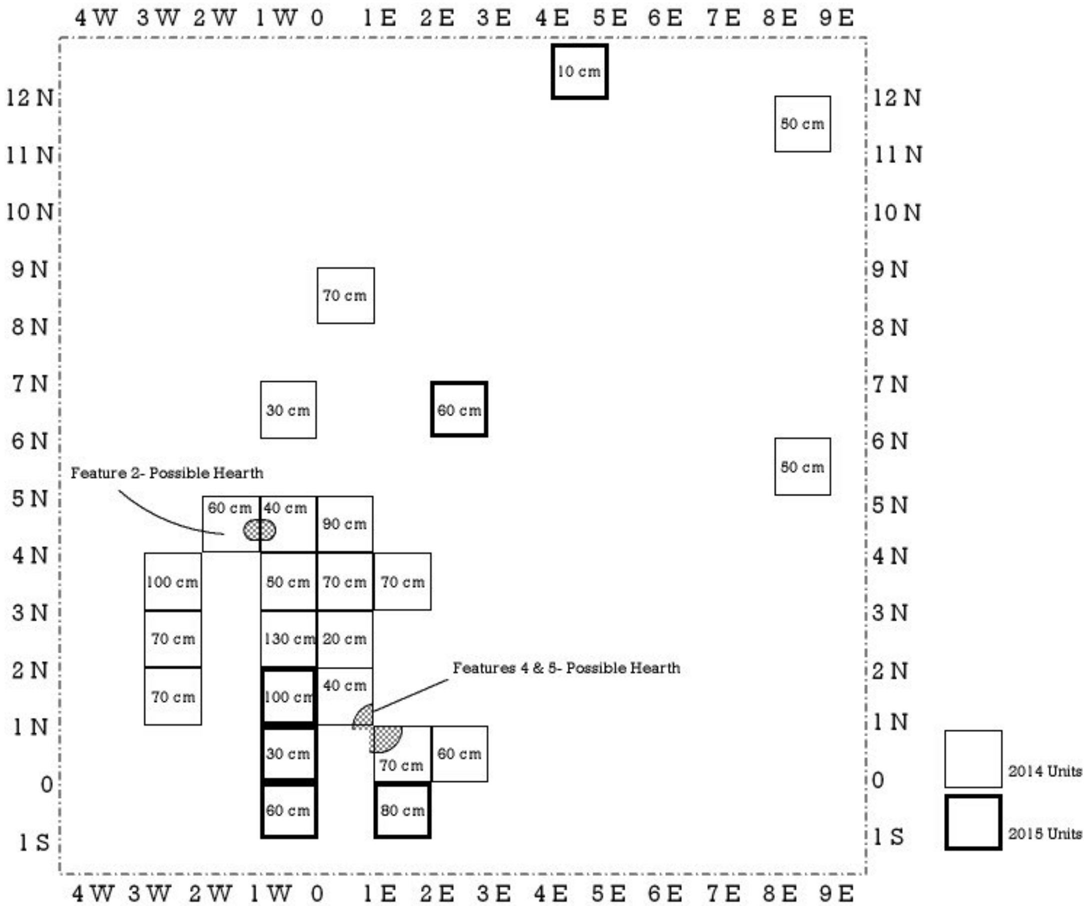

Figure 3. Plan map from excavation conducted during the 2014 field season.

Figure 4. Detail showing generally uniform stratigraphy. Red line indicates the only apparent stratigraphy in the main block excavation.

coloration of 10 YR 4/3, brown.

Twenty units were excavated and ranged in depth from 30 to 130 cm bpd. A total of 12.5 cubic meters were excavated. Only two formal cultural features were documented. Features 2 and 4/5 appear as possible fire hearths identified by dark staining and traces of ash mixed into the sediment. Feature(s) 4/5 was associated with a concentration of cultural items including pottery, projectile points, and a drill.

In the summer of 2015 six units were excavated adjacent and south of the previously excavated units that produced pottery and hearth features. These units were excavated to a maximum depth of 100 cm below surface. Cultural material was most concentrated between 10 and 50 cm. No additional features were documented during the investigation. Sediment type and Munsell readings were consistent with the 2014 excavation.

Radiocarbon Dates

A single radiocarbon date was returned on charcoal-stained sediment from the 60-70 cm level. The sample returned a date of 920+/-30 B.P. (Beta-405467). The calibrated 2-sigma assessment is in the range of 925-760 B.P. or A.D. 1025-1190—the occupation generally within the range of Late Archaic period sites in the area.

Material Culture

Following Winter (1969) and Thomas (1983) we functionally categorize weapons as projectile points, domestic tools as including ceramics and groundstone, fabricating tools as including awls, cores, and hammerstones, and general utility tools as including bifaces/biface fragments, knives, scrapers, and drills. Size ranges include only complete artifacts and are given in centimeters by length, width, and thickness respectively.

A. Projectile Points

1. Desert Side-Notched (Figure 5, e-g)
Number of Specimens: 8
Artifact Number: A25, A33, A48, A54, A70, A99, A133, A134
Form and Description: Blades are triangular in shape with bases being blade width or greater. Specimens are generally characterized by straight lateral margins. One specimen (A48) is missing the tip.
Size Range: 2.6-1.6 x 2.0-1.2 x 0.3
Material Type: Obsidian, CCS
Provenience: 8-9N, 0-1E–50-60 cm (A25); 3-4N, 2-3W–60-70 cm (A33); 4-5N, 1-2W–40-50 cm (A48); 3-4N, 0-1W–0-10 cm (A54); 1-2N, 0-1W–50-60 cm (A70); 0-1N, 1-2E–30-40 cm (A99) 1-2N, 0-1W–20-30 cm (A118); 0-1S, 0-1W–40-50 cm (A133)

2. Rose Spring Corner-Notched
Number of Specimens: 4
Artifact Number: A34, A39, A91, A109
Form and Description: Blades are slender and triangular in outline with convex lateral margins. Items have narrow, expanding bases.
Size Range: 2.4-1.9 x 1.1-0.8 x 0.3-0.2

Material Type: Obsidian, CCS
Provenience: 3-4N, 1-2E–0-10 cm (A34); 1-2N, 2-3W–0-40 cm (A39); 0-1W, 2-3E–20-30 cm (A91); 13-14N, 4-5E–20-30 cm (A109)

3. Rose Spring Side-Notched (Figure 5, a)
Number of Specimens: 5
Artifact Number: A26, A62, A72, A95, A97
Form and Description: Blades are triangular in form with straight to convex lateral margins. The base widths vary with some nearly as wide as blades.
Size Range: 2.6-1.9 x 1.9-1.2 x 0.4-0.3
Material Type: Obsidian
Provenience: 2-3N, 0-1W–40-50 cm (A18); 3-4N, 1-2E–0-10 cm (A26); 2-3N, 2-3W–10-20 cm (A62); 1-2N, 0-1W–50-60 cm (A72); 0-1N, 1-2E–60-70 cm (A95); 0-1S, 1-2E–30-40 cm (A97); 0-1S, 0-1W–40-50 cm (A134)

4. Rose Spring Corner Notched-Large (Figure 5, j)
Number of Specimens: 2
Artifact Number: A30, A100b
Form and Description: Specimen has a large triangular blade with convex lateral margins. Item has a plano-convex surface. A fan-shaped base is convex.
Size Range: 3.9-3.2 x 1.7 x 0.5
Material Type: Obsidian
Provenience: 3-4N, 1-2E–10-20 cm (A30); 13-14N, 4-5E–Surface (A100b)

5. Eastgate
Number of Specimens: 1
Artifact Number: A8
Form and Description: This specimen is very triangular in shape. Item is convex with an irregular-shaped surface.
Size Range: 2.2 x 2.3 x 0.6
Material Type: Obsidian
Provenience: 8-9N, 0-1E–20-30 cm

6. Elko
Number of Specimens: 2
Artifact Number: A102, A128
Form and Description: Blade is triangular in shape and has straight lateral margins. Artifact is missing one shoulder barb and the base.
Size Range: 3.9 x 2.0-1.5 x 0.6-0.5
Material Type: Obsidian, CCS
Provenience: 0-1S, 1-2E–0-10 cm (A102); 1-2N, 0-1W–50-60 cm (A128)

7. Small Corner-Notched (Figure 5, b-d)
Number of Specimens: 4
Artifact Number: A66, A75, A121, A135
Form and Description: Blades are triangular in shape and have somewhat straight lateral margins. The bases are narrower than the blade elements.
Size Range: 2.0–1.6 x 1.5–1.1 x 0.4-0.2
Material Type: Obsidian

Provenience: 2-3N, 2-3W–10-20 cm (A66); 2-3N, 2-3W–20-30 cm (A75); 0-1S, 1-2E–50-60 cm (A121); 0-1N, 0-1W–20-30 (A135)

8. Small Side-Notched Point

Number of Specimens: 5
Artifact Number: A51, A52, A85, A100a, A129
Form and Description: Triangular outline with bases wider than the blade on three of the four artifacts. The tip is missing on a single artifact—A100a. Specimens are bi-convex in profile with straight lateral margins.
Size Range: 1.9-1.5 x 1.9-1.0 x 0.3
Material Type: Obsidian
Provenience: 1-2N, 0-1E–30-40 cm (A51, A52); 0-1N, 2-3E–0-10 cm (A85); 2-3N, 2-3W–0-10 cm (A100a); 1-2N, 0-1W–60-70 cm (A129)

9. Stemmed Point

Number of Specimens: 3
Artifact Number: A32, A10, A79
Form and Description: Artifacts are stemmed with triangular blades. The bases are bifurcated, with a corner missing on A10. A base is absent from A79.
Size Range: 2.6 x 1.9 x 0.6
Material Type: Obsidian
Provenience: 3-4N, 1-2E–20-30 cm (A32); 2-3N, 0-1W–30-40 cm (A10); 1-2N, 0-1W–60-70 cm (A79)

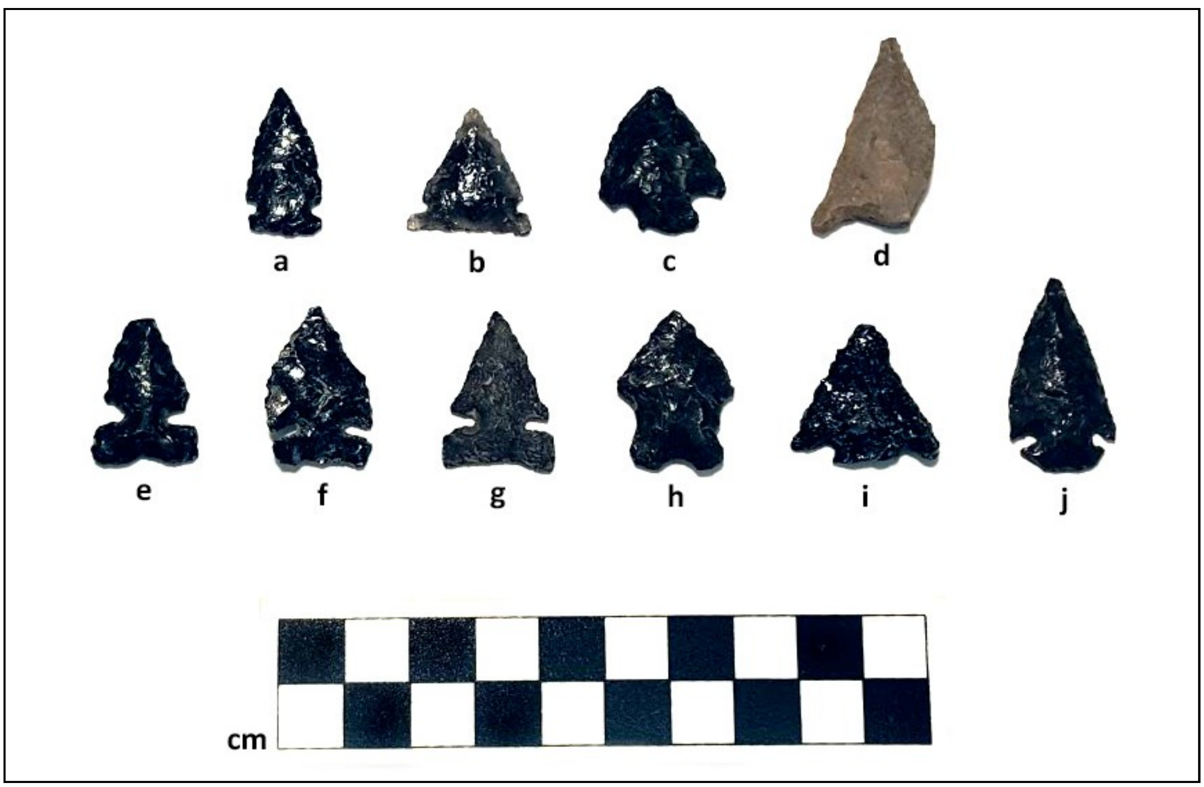

Figure 5. a, Rose Spring Side-Notched; b, Small Side-Notched; c-d, Small Corner-Notched; e-g, Desert Side-Notched; h, Small Side and Basal-Notched; i, Eastgate; j, Rose Spring Corner-Notched.

10. Projectile Point Tips
Number of Specimens: 5
Artifact Number: A6, A20, A90, A96, A98
Form and Description: Specimens are long and triangular in outline. Break points vary from <1 cm tip portions to mid-point breaks. One specimen, A96 has a more flat, triangular shape than the others.
Size Range: 2.3-1.0 x 1.4-0.6 x 0.4
Material Type: Obsidian
Provenience: 2-3N, 0-1W–20-30 cm (A6, A20); 0-1S, 1-2E–10-20 cm (A90); 0-1S, 1-2E–30-40 cm (A96); 0-1N, 1-2E–60-70 cm (A98)

11. Projectile Point Base
Number of Specimens: 2
Artifact Number: A49, A114
Form and Description: These specimens are bifurcated. One is broken low on the stem, the other high.
Size Range: 1.1-1.0 x 1.5-1.3 x 0.6-0.3
Material Type: Obsidian
Provenience: 1-2N, 0-1E–20-30 cm (A49); 0-1S, 1-2E–30-40 cm (A114)

12. Ceramics (Figure 6, c-e)
Number of Specimens: 52
Artifact Number: A7, A9, A12, A14, A16, A17, A22, A27, A29, A31, A35, A36, A41, A43, A46, A50, A53, A58, A60, A63, A64, A73, A74, A76-A78, A80-A84, A87, A89, A92, A94, A101, A105-A108, A110, A111, A113, A115-A117, A119, A120, A122, A125, A127, A130
Form and Description: Sherds are non-decorative intermountain gray ware and Southern Idaho Plain or what has by some writers been described as "Fremont" or Great Salt Lake Fremont pottery. The pottery is tempered with a course sand. XRF analysis of four sherds

Figure 6. a, Bone awl; b, Bone bead; c, Intermountain sherd; d-e, Southern Idaho Plain.

(10-EL-1367-22, 50, 73,77) were conducted by the University of Idaho using a Horiba-XGT-7200 instrument to assess constituent content of the sherds. We sought to determine if the two pottery types were manufactured from distinct material sources. The analysis documented no appreciable differences in the two types. We interpret this to mean that the two forms which have been seen as representing two "ethnically" distinct groups appear to have been manufactured from the same source materials in context. Sixteen sherds are blackened—some with dark residue. Reddish-orange pigmentation is visible on some interior walls. Items A46, A64, A80, and A84 are all rim pieces with varying thickness and curvature.
Size Range: L/W 5.7-1.4 x 4.2-0.6
Material Type: Clay/Sand

13. Bone Awl (Figure 6, a)
Number of Specimens: 1
Artifact Number: A71
Form and Description: Specimen is triangular with a smooth surface and pointed tip.
Size Range: 5.9 x 1.8 x 0.8
Material Type: Bone
Provenience: 0-1N, 1-2E–30-40 cm

14. Hammerstones (Figure 7d)
Number of Specimens: 6
Artifact Number: A13, A40, A42, A47, A103, A131
Form and Description: Items A40, A47, and A103 are both relatively slim and elongated in shape. Both A40 and A131 show wear at the proximal end, with A40 exhibiting a break. A13 is flat and severely fragmented. A42 is the largest and is round with flat surfaces.
Size Range: 7.7-4.9 x 6.7-3.0 x 3.9-1.8
Material Type: Quartzite
Provenience: 4-5N, 0-1E–30-40 cm (A13); 3-4N, 0-1E–20-30 cm (A40); 2-3N, 0-1W–60-70 cm (A42); 1-2N, 0-1E–20-30 cm (A47); 5-6N, 2-3E–10-20 cm (103), 0-1N, 0-1W–10-20 cm (A131)

15. Cores (7, e-f)
Number of Specimens: 13
Artifact Number: A2, A4, A11, A15, A19, A23, A37, A44, A67, A88, A93, A123, A126
Form and Description: The majority of specimens exhibit minimal cortex and appear to be nearly exhausted. Item A88 is the exception with approximately ¾ of the surface being cortex. Having no uniformity, irregular percussion flaking is visible on the exterior of all cores.
Size Range: 5.5 x 2.4
Material Type: Obsidian, Basalt, CCS
Provenience: 4-5N, 0-1E–0-10 cm (A2); 4-5N, 0-1E–10-20 cm (A4); 4-5N, 0-1E–30-40 cm (A11); 4-5N, 0-1E–40-50 cm (A15); 2-3N, 0-1W–50-60 cm (A19); 5-6N, 8-9E–40-50 cm (A23); 4-5N, 0-1W–20-30 cm (A37); 1-2N, 0-1E–10-20 cm (A44); 0-1N, 1-2E–30-40 cm (A67); 0-1N, 1-2E–40-50 cm (A88); 2-3N, 2-3W–40-50 cm (A93); 0-1S, 0-1W–0-10 cm (A123); 0-1N, 1-W–0-10 cm (A126)

16. Biface Tips
Number of Specimens: 2

Artifact Number: A1, A5
Form and Description: Triangular in shape with minimal flaking visible. A1 has somewhat flat surfaces on all sides. Appear to have been broken mid-to-high from the original biface.
Size Range: 2-1.7 x 1.9-1.5 x 0.5-0.8
Material Type: Basalt
Provenience: 6-7N, 0-1W–0-10 cm (A1); 2-3N, 0-1W–10-20 cm (A5)

17. Bifaces (Figure 7b-c)
Number of Specimens: 4
Artifact Number: A38, A68, A104, A124
Form and Description: A68 and A124 are elongated and slightly curved in form. Flaking is visible in all specimens. A38 is a biface fragment. All specimens are basalt apart from A104, which is obsidian.
Size Range: 7.8-2.2 x 2.8-1.4 x 1.2-0.5
Material Type: Basalt, Obsidian
Provenience: 3-4N, 0-1E–10-20 cm (A38); 1-2N, 0-1W–40-50 cm (A68); 5-6M, 2-3E–20-30 cm (A104); 1-2N, 0-1W–40-50 cm (A124)

18. Drill Tip
Number of Specimens: 1
Artifact Number: A86
Form and Description: Item exhibits fine pressure flake marks and four-sided cross section. Drill tip appears to be heat treated.
Size Range: 1.4 x 0.4 x 0.3
Material Type: Chip Stone
Provenience: 0-1S, 1-2E–0-10 cm

19. Knives (Large)
Number of Specimens: 2
Artifact Number: A56, A57
Form and Description: Flaking is visible on lateral margins, and both are broken in the mid-section. Items exhibit straight to convex lateral margins. Specimens are biconvex.
Size Range: 3.6-4.0 x 3.5-3.3 x 1.2-1.0
Material Type: Basalt, CCS
Provenience: 3-4N, 1-2E–40-50 cm

20. Knives (Small) (Figure 7a)
Number of Specimens: 3
Artifact Number: A24, A65, A112
Form and Description: Specimens appear to be broken at the mid-section, and have visible flaking. Margins are convex.
Size Range: 4.0-2.8 x 1.9-1.6 x 0.6-0.5
Material Type: Basalt
Provenience: 2-3N, 0-1W–70-80 cm (A24); 2-3N, 2-3W-10-20 cm (A65); 0-1S, 1-2E–20-30 cm (A112)

21. Scrapers
Number of Specimens: 3
Artifact Number: A21, A45, A59

Figure 7. a, Knife fragment; b-c, Bifaces; d, Pestle fragment; e-f, Obsidian cores.

Form and Description: Specimens are plano-convex and exhibit unifacial retouch on the lateral margin. A21 appears to be heat treated.
Size Range: 4.0-2.8 x 3.2-2.3 x 1.2-0.6
Material Type: Basalt, CCS
Provenience: 5-6N, 8-9E–40-50 cm (A21); 4-5N, 1-2W–40-50 cm (A45); 3-4N, 1-2E–40-50 cm (A59)

22. Polished Stone
Number of Specimens: 1
Artifact Number: A69
Form and Description: A69 consists of two broken pieces. The exterior surfaces are smooth and flat.
Size Range: 1.7-1.2 x 1-0.9 x 0.7
Material Type: Stone
Provenience: 1-2N, 0-1W–40-50 cm

23. Polished Bone (Figure 6,b)
Number of Specimens: 1
Artifact Number: A132
Form and Description: A132 is flat and very thin. The specimen is smooth on one side with bone texture visible on the other.
Size Range: 1.6 x 0.9 x 0.1
Material Type: Bone
Provenience: 0-1N, 0-1W–10-20 cm

24. Historic Artifacts
Number of Specimens: 3
Artifact Number: A3, A28, A61
Form and Description: Items A3 and A61 are brass .22 shell casings. A61 is partially flattened. A28 is a thin, flat metal rod with a deteriorating rust exterior.
Material Type: Brass, Iron
Provenience: 2-3N, 0-1W-0-10 cm (A3); 1-2N, 2-3W-0-10 cm (A28); 1-2N, 0-1W-20-30 cm (A61).

Functional Analysis

A total of 135 artifacts were recovered from the test excavation. Analysis indicates that 32% of the assemblage are weapons (n=43). Equally represented are ceramic sherds (n=52) that constitute an additional 39% of the total inventory. The fabricating tools category is comprised of an awl, cores (n=13), and hammerstones (n=6) which represent 15% of the total. General utility tools (n=15) constitute 11% of the assemblage. A piece of polished bone and a single polished stone were recovered, as were historic materials which included .22 shell casings and a flattened metal rod. Ninety-one percent of the weapons were produced from obsidian while the majority of fabricating and general utility tools were produced from basalt and cryptocrystalline materials (see Figure 8).

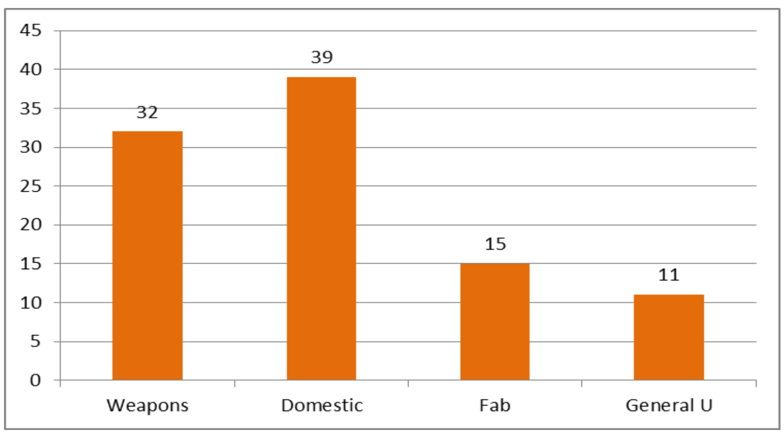

Figure 8. Percentage frequency of artifacts by category.

Lithic Debitage

Test excavations recovered a total of 7983 lithic flakes. Analysis of the lithic debitage consisted of sorting the materials by size and raw material type. Flake size ranges included 6148 (78%) items measuring within a range of less than 1.0 cm in square area. Over one thousand items (n=1228) fell within a range of 1.0-2.0 cm and 456 within a range of 2.0-3.0 cm square. One-hundred and thirty two items were recovered measuring 5.0 cm or greater in diameter (Figure 9).

Though 13 cores were recovered, suggesting some manufacturing activity at the site, the overall flake-to-tool ratios indicate re-sharpening and retooling as reflecting the most common activities in lithic reduction. Sorting debitage by raw material type indicates that

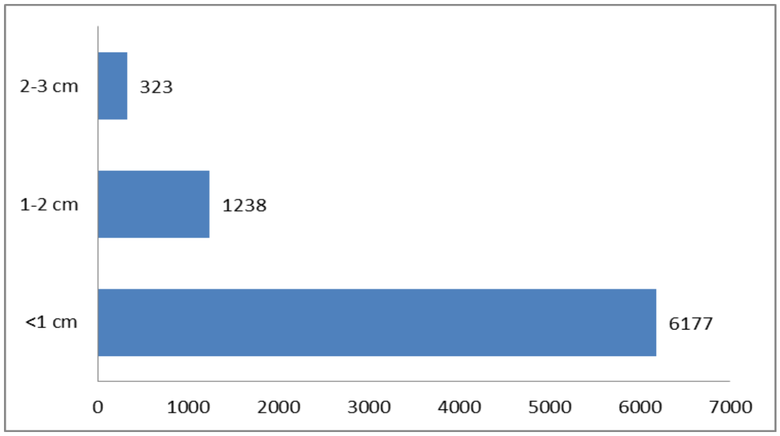

Figure 9. Frequency of flakes by size range.

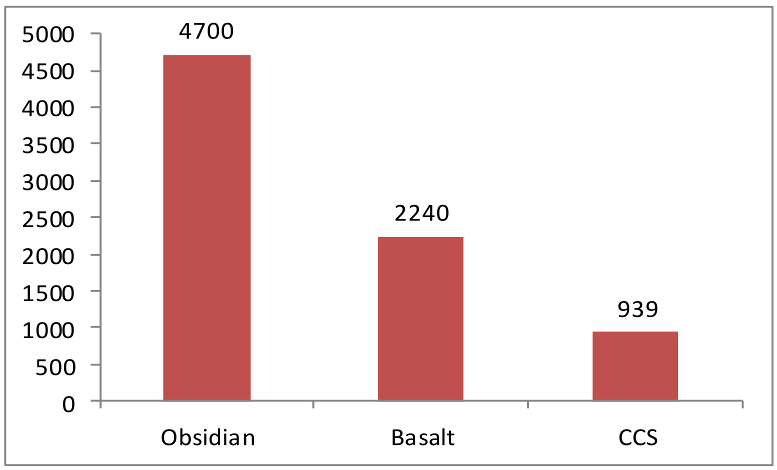

Figure 10. Frequency distribution of raw material types.

60% of the total number of flakes are obsidian, while 28% are basalt, and 12% cryptocrystalline (see Figure 10).

Geochemical Sources

Geochemical analysis identified nine (n=9) specimens from the Brown's Bench locality and one (n=1) from Timber Butte. Obsidian materials that have been sourced in the region have generally come from Timber Butte, Owyhee, and Brown's Bench. Willson's (2005) study of Archaic sites along the Snake River in western Idaho found that these sources occur over 70% of the time. The Medbury materials conform to this pattern.

Faunal and Botanical Remains

Faunal remains which were highly fragmented were separated into vertebrate and invertebrate remains and sorted according to categories of identifiable, unidentifiable, green, and charred. The majority of the unidentifiable bone is rather evenly divided between green (n=1546, 29%) and charred (n=3725, 71%) indicating discard into hearth/fire pit areas. This pattern was observed during the initial investigation of Medbury. Osteological analysis documents the presence of rabbit and deer bones but does not allow an estimate of the minimum number of individuals. Invertebrate remains consist of 846 specimens of *Margaratifera falcata.* The majority of specimens are highly fragmented.

Conclusions

Archaeological evidence from the Medbury site indicates occupation of the location around 920+/-30 B.P., though probably visited by Late Archaic groups on more than one occasion. It appears that occupations representing temporary encampments were of short-term duration. This assumption is based on the rather meager cultural and ecofactual assemblage recovered and the general absence of clearly defined features. The 2014 season identified two formal features consisting of dark charcoal stains having traces of ash. That many faunal remains are charred suggests the presence of fire hearths; however, these appear to be open/surface fires as no evidence of formal (constructed) features were noted.

Fishing, mussel collecting, and hunting are reflected in the presence of very limited numbers (NISPs) of rabbit, deer, and fish remains. Functionally, the assemblages consist of weapons (32%), domestic items (39% and exclusively pottery), fabricating tools (15%), and general utility items (11%). The numbers of fabricating and general utility tools are greater than those excavated in the 1995 test. Of special interest was the recovery of pottery defined typologically as Intermountain Ware and Southern Idaho Plain or Great Salt Lake Grey. XRF analysis of the sherds indicated that all were characterized by the same locally acquired constituents suggesting that what have been seen as "culturally" distinct forms were likely produced by the same potters. This may reflect the pattern described by Plew (1979) in which it was argued that variation in form in southwestern Idaho pottery reflected a knowledge of variance in regional forms.

A large number of small late stage (<1 cm) lithic flakes (78%) suggests on-site maintenance though some may represent late stage biface reduction or flakes struck from small locally acquired basalt and cryptocrystalline cores. This is further indicated by the distribution of raw materials. Sixty percent of the lithic assemblage was manufactured from obsidian, while 28% were produced from basalts and 12% from cryptocrystalline materials.

The activities indicated by the range of tools, debitage, and ecofactual remains recovered from Medbury site suggest activities of the kind often associated with highly mobile foragers (cf. Gould and Plew 2000). In a recent analysis of the use of Kelly's (2001) chipped stone index for assessing the degree to which mobility may be informed through the analysis of chipped stone, Roberts (2015) found that the Medbury site assemblage meets most of the criteria identified by Kelly as representing a high level of residential mobility. Though sample sizes vary considerably among the sites tested within the area, the assemblage from the Medbury site appears most similar to assemblages and occupations at Kanaka Rapids (Butler and Murphey 1983) and Bonus Cove Ranch (Yohe and Neitzel 1998), and to a lesser extent Indian Cove (Young 1986), the Hagerman Fish Hatchery sites (Pavesic and Meatte 1980), King Hill Creek (Willson and Plew 2010), and the Swenson site (Plew and Willson 2007).

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REPORT

Difficulties in Developing an Interactive Cultural Resources Database

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Abstract

Having a reliable and intuitive electronic database can make a difference when trying to conduct visual and spatial analysis of archaeological data. Unfortunately, to someone with limited time and budget, access to such a database may not always be possible. This report explores the methods and procedures used to update the cultural resources database at the Idaho Army National Guard when faced with fiscal and temporal restrictions.

KEYWORDS: non-invasive, ArcGIS, database integration, coding, cultural resource management

Introduction

As technology advances, archaeology must adapt in order to stay relevant with regard to data management. While working for the Idaho Army National Guard (IDARNG), I assisted in developing an information management system that would be highly applicable in both military and private sectors. This system consisted of a front-end database developed in Microsoft Visual Studio 2010, a back-end database developed in Microsoft Access 2010, and an interactive mapping portion developed in Microsoft Silverlight. The intended effect of the application was for cultural resource managers to be able to quickly, easily, and more efficiently analyze potential impacts to site and artifact integrity without disturbing or damaging pre-established archaeological sites. Users are able to track migration and quality of sites through consistent collection of annual monitoring data acquired via Trimble survey grade global positioning system (GPS) units. By utilizing the technology available to us, it is now possible to predict, locate, and monitor sites with greater precision than has been available before. This also opens the door to visually and spatially analyzing archaeological data in ways not possible without these technologies.

At the time of development, I was employed at the IDARNG as the Archaeological Resources Data Manager. By working closely with the Geographic Information Systems (GIS) Program Manager at the IDARNG, Nick Nydegger, and utilizing his previously established Silverlight mapping application, the proposed program would allow users to easily access and visualize archaeological site information specific to the Orchard Combat Training Center (OCTC) south of Boise, Idaho. Information would be included from site forms, previous monitoring activities, photos and maps, as well as ongoing site artifact and feature data collected as part of the annual monitoring program. Over twenty years of detailed site data obtained as a result of this program would be able to be utilized in addition to any data collected in future surveys. Highly accurate data acquired with survey grade Trimble GPS units would be loaded directly into the application which would give the user the ability to visually assess and query the data in a number of different fashions. Due to the non-invasive nature of the program, Cultural Resource Program Managers would be able to quickly assess areas in which sites are located in order to assure minimal site impacts as well as alleviate adverse impacts to eligible resources. This in turn, would result in higher work efficiency and quicker turnaround for National Guard training. They would also be able to develop scientifically accurate predictive models relating to artifact and overall site migration patterns. Predictive models stemming from this type of data analysis would be a very valuable tool for military environmental programs in cooperation with training range managers, in scheduling future training activities and developing new training formats.

This would allow the archaeologist to non-invasively investigate and interpret site behavior including spatial organization and impacts in a real time scenario. My original hope was that after thorough testing on the OCTC, the application would have the potential to be applied to not only any Department of Defense (DoD) training range across the United States, but also to any CRM firm looking to further improve their data collection and analysis methods.

Background

GIS falls within the realm of non-invasive archaeological techniques which are preferred in situations when artifacts cannot be dismantled or destroyed due to value or rarity. In cases of Native American concern where handling of precious cultural material may be criticized, academic approaches that limit the amount of exposure sites have to potential destructive elements are encouraged. Therefore, as a result of increased consultation with Tribes and other interested parties, the need for non-invasive data analysis like GIS is always expanding. This is especially apparent on the OCTC, as ground-breaking disturbances and sub-surface testing is highly discouraged. Alternative ground survey techniques can also be utilized when a project must be completed quickly, or if terrain proves difficult.

Geospatial software can be used for three simple roles: an analytical tool, a visualization tool, and as a spatially referenced database (Gregory et al. 2001). Because of these basic features, GIS software and hardware has been used by a multitude of professions where gathering geospatial data is necessary. Additionally, this technology has enabled the use of data integration across organizations, aiding in collaborations between agencies by providing a common file format to utilize (Nedović-Budić et al. 2004). Free to use satellite imagery is available from a multitude of sources on the internet—from state sponsored GIS websites to BLM-sanctioned imagery of wilderness areas difficult to access. Techniques such as viewshed analysis can be conducted with programs like ArcGIS to identify the total amount of visual area one could see if they were placed at a specific point on the landscape (Rennell 2012). This allows an archaeologist to decide if the location of the site was chosen for optimization of visibility as well as determine if there may be a connection between visual dominance and territoriality (Ebert 2004). Methods like suitability analysis can also be conducted by selecting beneficial habitation variables (such as slope degree, landform, and distance to water) and assigning rankings in order to predict site probability.

The use of GIS has grown exponentially over the last 40 years due to increasing GPS and hardware capabilities. The field is presently dominated by Environmental Systems Research Institute's (ESRI) ArcGIS, who profited greatly in the 1980s due to its state-of-the-art software coupled with beneficial relationships with the education and government sectors (Coppock and Rhind 1991). Additional GIS services have been established since then, but ESRI continues to innovate in order to stay ahead of the pack. Its new application, ESRI Collector allows the capture of data on mobile devices without the requirement of a survey-grade GPS unit. This allows individuals to collect and update their data from anywhere as well as attach photos and videos to points taken. Granted, the ubiquitous nature of the "update anywhere" software suite does come at the price of decreased accuracy typically found in cell phones and tablets.

The wikification of GIS, or the conversion of lightweight code to HTML, has also added to the popularity of using web-based geospatial browsers (Sui 2008). This has the benefit of allowing large portions of the general populace access to the once-complicated expensive programs of GIS. Geocortex Essentials' software is a suite of tools that administrators can use to construct an easy-to-use web-based GIS user interface which can be developed to meet the specific needs of the project. It also works in conjunction with ESRI-based software, so a complete migration and re-training of database procedures is unnecessary. It does lack some functionality when compared to ESRI's plethora of programs; however, to those that aren't necessarily looking for ultra-detailed analysis or don't have the requisite funding, Geocortex might fulfill those needs.

Criticisms that are leveled at applications that utilize GIS are understandable. Many times, an archaeologist needs to visit a site in person in order to get a better understanding of the surrounding environment to be able to properly interpret the activity that once occurred (Tilley 2004). This is a perspective that is almost impossible to replicate through maps, photos, and descriptions. The complicated nature of GIS applications, which often require lengthy training to be able to properly utilize, is also a problem (Llobera 2012). Many of the computer aided techniques mentioned here also carry a hefty price tag. Some of these technologies can run into thousands of dollars, so they are simply not economically feasible to an archaeologist on a budget.

Ultimately, the best way to combat these criticisms is not with one individual approach but rather with a collaboration and collection of different methods. The power and scope of the techniques we are able to employ are only as limited as the amount of data that is able to be obtained, therefore more data will equate to more varied and accurate tests (Llobera 1996). By combining different procedures, one can compensate for critiques aimed at one aspect of a technique. GIS is no exception in this respect, and by merging several different techniques, a well-rounded interpretation of cultural properties may be conducted.

Project Planning and Preparation

I had anticipated creating a standalone program that would allow the user to quickly and efficiently view, create, edit, and print site forms that correspond to the IDARNG's cultural resource database. Having worked at the National Guard for several years prior to beginning this project, I received a great deal of experience interacting with the previous SHPO database. Before I began my employment, the database had been in use for five years. It was originally constructed in Microsoft Access, and allowed the user to create, search, edit, and print site records. Due to the combination of how the database was constructed in addition to shortcomings of Access, the database was clunky and sometimes confusing to use. Multiple years of users submitting inconsistent terminology and incorrect phrasing had left the backend of the database convoluted. Coupled with unused fields with cryptic headings, deciphering was a difficult task for anyone attempting maintenance of the data. After discussion with the GIS Program Manager, it was found that he was in the planning stages of creating an interactive GIS database that was accessible through the internet and allowed the users to not only view and query information, but also to create and develop maps. He had already developed a version of it based on an old geodatabase that was operational. Further streamlining of the existing database was still necessary, however. Through the supervision of my superiors, I intended to write a piece of software that would communicate with both the cultural resources database and the interactive GIS program so that users with proper security authorizations could have access to a variety of information and abilities without having to have any prior GIS experience. What I envisioned was a seamless process in which the user would input, edit, and print through my program, have the information stored in an Access database, and then be able to immediately log into the interactive GIS database to be able to run queries and build maps based on the information.

By using the integrated development environment within Visual Studio 2010 Professional, an application could be created that did three processes simultaneously when data from an archaeological site form is entered:

1st – When submitted, data entered into fields in the application would be stored in an Access database. These fields would correspond with the standard Idaho archaeological site form. Any changes to the form in the future would result in a visual restructuring of the application;

2nd – At the same time, a geospatial record containing all of the site information would be created within ArcGIS from the UTM locational data pulled from the site datum field;

3rd – The geospatial data that was created during the site form submission would then be uploaded to the GIS Program Manager's high resolution mapping software. From this program, users would be able to click on different sites and receive a variety of information including artifact migration and visual site impacts, as well as have the ability to create site and topographic maps.

While the program was being developed, a four-person field crew working to conduct pedestrian surveys of the OCTC from May to September would be necessary in order to acquire geospatial data from items located at both annually monitored and newly established sites. This data was imperative to the project, as the collection of this data allows the Cultural Resource Manager to quickly and non-invasively assess site impacts when conducting clearances for National Guard training or building projects.

Before development of the application could begin, however, cleaning and organizing of all the collected data was conducted. Almost ten years of data had been inputted with the Access database with no maintenance performed on it. As the upkeep commenced, rogue fields were deleted which had no information stored yet had somehow continued to exist, field descriptions were renamed that were far easier to identify what the information contained within was, and fields were moved around to correspond to the order in which they appeared on the State of Idaho site inventory form. This step was perhaps the most crucial, as simply

TABLE 1. A Sample Comparison of Database Fields in the Order They Appear in the SHPO Version Versus the Restructured One

Original SHPO DB	*Reorganized DB*
Site Number	SiteNumber
CO	SiteNumberOrig
NO	AgencyNum
Temp Number	TempNumber
Status	SiteName
ProjNo	County
Land Owner	SiteType
Recorder	Prehistoric
Recorded	Historic
Survey Org	TCP
Site Name	UnkPeriod
Prehistoric	LandOwner
Hist/Recent	FedAdUnit
Unknown Period	Project
Site Type	ProjNo
Attributes	Recorder
Euro American	SurveyOrg
Native American	DateRec
Chinese	LastUpdate

placing the fields in a more cohesive pattern allowed those working in the back end of the database to quickly locate errors that arose, either with the data or the form itself. Unfortunately, at this time there is no automatic way to transfer data from a database using the old SHPO naming method to the reorganized database. A unique data dictionary for the Trimble that matched the project's database was also developed. The data fields consisted of material type, predicted use, measurement, and additional comments. Once this work was completed, the difficult task remained of learning to program in Visual Basic with little prior coding experience.

Procedure and Execution

After consultation with Nick Nydegger, we decided to use Microsoft Access as the back-end database because we wanted it to be as in sync with the SHPO database as much as possible. Our anticipation was the SHPO either requesting copies of our digital data or wishing to look at all of the data within something similar to the original Access database. By keeping it in this format and not deviating too far from what was already established, we could still backtrack and use Access at the front end if, for some reason, SHPO had a problem with how we kept our records.

Work soon began on the front end of the application in Visual Studio 2010, marking a long period of trial and error. While certain coding elements were familiar due to previous dabbling in HMTL, a project of this magnitude had never before been attempted by myself and lots of self-teaching regarding the basics of coding was required. Visual Studio uses its own programming language, Visual Basic, created by engineers who wanted a more intuitive, simplistic way for users to produce executable programs from the ground up (Willis and Newsome 2010). A drag-and-drop interface to design applications as well as a background code editor combines both the construction of the visual representation of the executable file with the required coding elements that one finds behind the scenes of the program.

The designing of the input form was fairly straightforward and consisted of mimicking the format of the State's site inventory form. For every space that could be written in on the form, both the description text and the associated text box had to reflect what database field it would correspond with. This meant not only typing out the text that appears before the blank text box, but also naming those elements in the same manner that they were stored in the database. Thankfully, after the maintenance that was performed on the database in the months leading up to the creation of the front end application, this process went fairly smoothly. The difficult part was getting the information transferred back and forth between the Access database and the application smoothly without any problems.

Many hours were spent combing books and internet forums trying to troubleshoot problems that arose with the coding. Eventually, a breakthrough happened with regard to how the information was stored within the database. For the first time in close to two months, when the submit button was clicked, the information entered in the specific text boxes were stored in their corresponding Access fields. Unfortunately, this was only part of what needed to be accomplished by this application. Not only did it need to store information, but it also needed to recall, edit, and print the information. All of these specific tasks required numerous lines of slightly different code in order to perform the requested operations. At this point in the project, difficulties were encountered due to how the code needed to be written.

While information could be stored fairly easily, pulling it out was another matter. The type of code that was required to do what was needed ended up not being compatible with the direction the project had taken. There are many ways to write code to perform a task; however, not all of them should be used—either because of security concerns, or possible corruption of the data when transferring it to the database. Surprisingly, the print function was the most difficult issue encountered. A solution was attempted by purchasing and utilizing some third party print function add-ons for Visual Basic. However, the manner in which the data was stored in the database ended up being incompatible with the software. For instance, when a checkbox is ticked on the form, it is stored as a 1 in the database, or a zero for blank checkboxes. When the program attempted to recall this data for editing or printing purposes, the checkboxes were returned blank. The program was not recognizing the data in the field, be it 0 or 1, and not translating it to whether the box was checked or unchecked. It was at this point that progression on the project hit a wall, and more research had to be conducted to come to a better solution for the implementation of the software. While this may seem like a fairly remedial problem, a large portion of the Idaho site form consists of checkboxes, so not displaying the correct value would result in a loss of data.

More than six months were spent attempting to remedy this problem. In that time the program performed all four required tasks—store, recall, edit, and print—just not simultaneously. It was found that the strings of code that were worked on for weeks were invalidated because the code that was being used turned out to be incompatible with the methods used to get the program to print and edit. The checkbox problem was never entirely solved. When the code was altered to get the program to behave in one way, it ended up breaking another portion of the application that, again, would need to be re-written. Progress was gained for a month, only to have it invalidated in one day due to compatibility problems. Keep in mind that this is only the portion of the project that consisted of getting the front end of the application to communicate with the database. Work had not yet begun on trying to establish a geospatial record within ArcGIS.

Due to budget restrictions, the field crew that season consisted of one technician, whose sole duty was to re-record the original 28 monitored sites for data collection and analysis purposes. This led to the workload being divided between the database and processing the data that the technician brought in daily. Because the database was stripped down of any front-end accessibility, much of the data needed to be stored directly into fields and checked by hand, as opposed to filling out an electronic form and hitting submit.

At the beginning of August 2014, the decision was made to completely scrap the Visual Studio element of the project due to time constraints, and build a rudimentary front end within Microsoft Access itself, similar to the appearance of the original SHPO database. Several long step-by-step documents were created for users to follow in order to accomplish the four basic tasks—recall, store, edit, and print. Additional instructions were also written in order to convert newly discovered sites into geospatial points, utilizing datum locations. Given further time and funding from the National Guard, I am confident that the state of the database can reach its original intended goal.

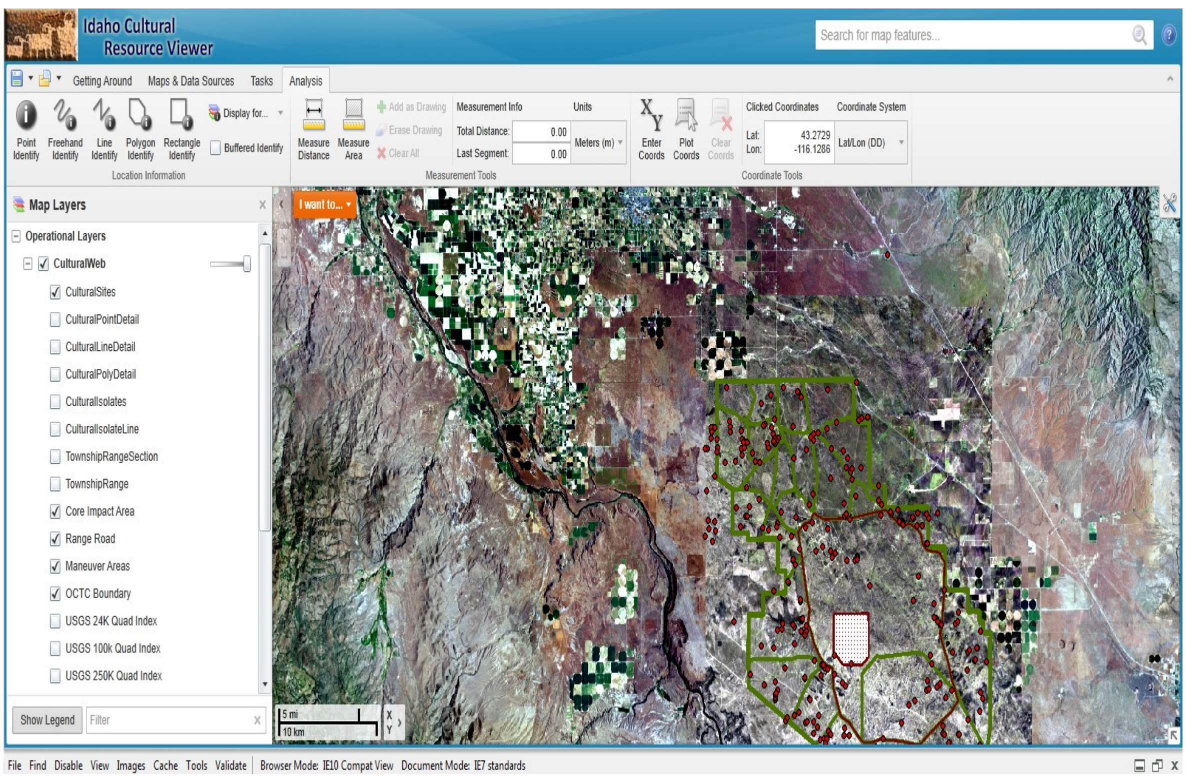

Figure 2. A sample interactive mapping application view illustrating database elements.

Results and Conclusions

In hindsight, the final project had lofty aspirations considering the lack of programming experience involved. If it had not been for the innumerable setbacks with the coding, the project certainly could have been accomplished by the deadline. Presently both the front and back end of the database are operating within Microsoft Access. Any GIS work that needs to be done—such as creating geospatial points with sites, artifacts, or features—requires utilizing ArcGIS software. Nick Nydegger's interactive mapping software had several issues that hindered production during a recent update of the architecture, although presently it works well as a standalone application. It is able to display geospatial points from sites and items;

however, they are not generated in real time. Instead, a copy of the database is created and the GIS software uses that in lieu of processing the points simultaneously. While this is not the seamless integration of multiple applications that was proposed, the present work-around addresses the needs of the Cultural Resource Department at the Idaho Army National Guard.

To summarize, the development of a standalone application that would process site form information in addition to the auto-generation of geospatial points failed. The front end development in Microsoft Visual Studio also failed to meet expectations and was scrapped due to time constraints in favor of a more immediate, compatible fix within Microsoft Access. The part of the project that was fully accomplished was the maintenance and reconstruction of the National Guard cultural resources database. This process required not only assessing form and database records to reorganize and display them in a more streamlined, efficient manner, but also cleaning and updating the data to make sure that it was held to higher professional standards. Additionally, a complete Trimble data dictionary was generated in order to standardize field data collection methods so that the terminology and descriptions stored in the database are regulated without the constant need for maintenance by technicians. Detailed instructions were also written on how to create, edit, and print site forms and how to generate the geospatial points they require. This method of data storage will continue to be used until the database can be further improved.

While it seems that the project took one step forward and three steps back in regards to developing an interactive database, I still consider it a partial success. The back-end maintenance alone was certainly necessary and was worth the time spent doing it. We now also have a clear picture of where the National Guard would like to take their production in the future, given time and funding. The final product is not what was specifically envisioned in the beginning; however, the training that was received in coding, database management, and ArcGIS software and hardware is invaluable. Through what was accomplished, the IDARNG is able to monitor and assess impacts to its sites in a far more non-invasive manner than was previously employed. By using the software developed with Microsoft Silverlight, we are able to compare and contrast many sites at once, display a multitude of monitoring data, and view artifacts and items of importance all from one web-based application. By viewing multiple years of data at once per site, we are able to better understand the processes of site migration in relation to impacts both natural and man-made, as well as forming predictive models about where artifacts may be moving. This data will ultimately assist the CRM department at the IDARNG with making more informed decisions about the quality and location of their managed sites and artifacts.

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BOOK REVIEW

Bodies and Lives in Ancient America: Health Before Columbus

Debra L. Martin and Anna J. Osterholtz

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Bodies and Lives in Ancient America provides an introduction to the field of bioarchaeology in the assessment of health before Columbus. This book is a quick read that provides case studies of health and disease in four main culture areas of the United States. Throughout the text the authors identify and refer to other important published works as lines of further inquiry for the reader. These characteristics make this book perfect for the intended audience of anthropology students and those interested in bioarchaeology.

The first chapter of the book is an introduction to bioarchaeology. A significant portion of this chapter addresses ethical concerns relating to human remains and the importance of working with living descendants. The authors chose to look at the California coast, the Pueblo Southwest, the Mississippian River Valley, and the Georgia Bight. The areas were chosen because of existing research and variation in environment, adaptation, and subsistence. The time period analyzed is 1000 AD to 1500 AD. Within this time period the authors examine how increasing population density, changes in substance, intensification, and adoption of agriculture all affected health and disease. Each area is examined before and after these changes in order to assess their effects.

The second chapter is an introduction to the methods of bioarchaeology and paleopathology. This chapter covers what markers bioarchaeologists look for on bones and how they inform us about the health and disease of the individual. The authors stress the importance of using life history theory and biocultural models when thinking out about health and disease in the archaeological record. This is accomplished by looking at health and disease at a population level and how it changes over time.

Chapters three through six examine the different stages in life history. Each chapter addresses a different stage in each of the four areas. The third chapter addresses pregnancy and birth. This chapter, along with Chapter 4 which discusses childhood, is seen by the authors as providing limited data concerning these two stages in life history. The authors do note that in one archaeological excavation a fine mesh screen was used, and this provided a large amount of infant and sub-adult remains that are not present at other sites. The authors focus on weaning in these chapters because it is a period of time where children are the most affected by stressors to their health.

Chapter five addresses adulthood. Owing to a larger data set, each area is divided into separate sections dealing with health and violence. Additional data on adult life will make possible additional inferences relating to stress markers. The authors look specifically at adaptations from changes in climate, subsistence, and population density. These adaptations to change are also used when looking at violence in the archaeological record.

Chapter six concerns the elderly in ancient America. This is another period of time in life history that is underrepresented in the archaeological record. The authors note that this is due to the difficulty of identifying the age of individuals over 50 and identify the need for better methods when assessing age. Finally, the authors explain the relevance of bioarchaeology and how it can contribute to the understanding of the archaeological record in addition to addressing modern day problems.

This book meets its goal of providing a broad overview of health and disease in ancient America. The authors stress the importance of using the perspectives of life history theory as the basis for developing research questions. The case studies provide examples of the inferences that can be made when looking at change. They also identify areas within the field where research is needed. These factors—along with the authors referencing other important works that serve as a starting point for further inquiry—make this a great read for students and those interested in bioarchaeology.