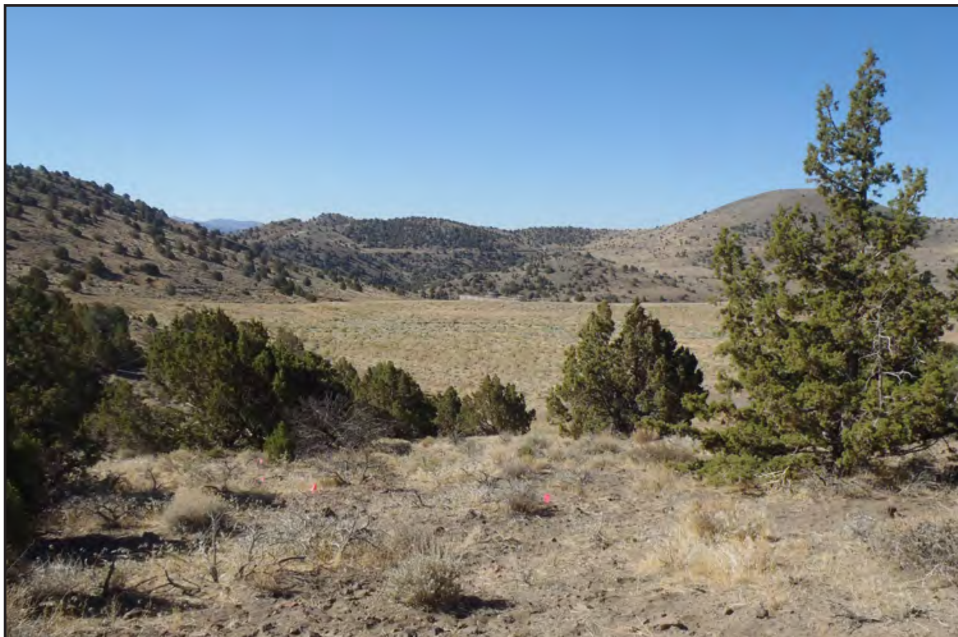
Data Recovery Plan for Prehistoric Resource CrNV-03-8903 for Comstock Mining LLC's Right-of-Way Permit, Storey County, Nevada

Prepared by Barbi Harmon, M.A.



BLM Report No. CRR3-2643-2(P)

DRAFT

Submitted to:
U.S. Bureau of Land Management
Sierra Front Field Office

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Cover photo is an overview
of the project area.

Frontpiece illustration, in
lower right corner, is of a
pecked and grooved saurian effigy head
discovered in an Archaic site
in the South Truckee Meadows, Nevada.
Illustration by J.W. Oothoudt

Data Recovery Plan for Prehistoric Resource CrNV-03-8903 for Comstock Mining LLC's Right-of-Way Permit, Storey County, Nevada

BLM Report No. CRR3-2643-2(P)

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KEC Project 875

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MANAGEMENT SUMMARY

Comstock Mining LLC proposes exclusive use of an existing road located on both public and private lands in Storey County to haul ore from its mining operations in Gold Canyon to its processing facility located in American Flat. The public lands are managed by the Sierra Front Field Office of the Bureau of Land Management (BLM). The project requires the issuance of a Right-of-Way permit pursuant to the Federal Land Policy and Management Act of 1976, as amended (43 USC § 1761). Consequently, the project is defined as a federal undertaking, which requires that BLM take into account effects to historic properties resulting from the permit's issuance (36 CFR § 800).

BLM has determined that the undertaking will have an adverse effect on one known prehistoric-era resource (CrNV-03-8903) within the APE, and must ensure that those adverse affects resulting from the Right-of-Way grant are mitigated. Consequently, Comstock Mining LLC, requested that Kautz Environmental Consultants, Inc. (KEC), prepare a treatment plan to mitigate adverse effects to this historic property resulting from the federal undertaking. This document presents a plan to mitigate adverse effects to prehistoric-era resources only. Plans to mitigate adverse effects to historic-era resources are contained within a separate document (Spidell and Kautz 2015).

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Figures with site information have been redacted.

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1.0 INTRODUCTION

1.1 PROJECT HISTORY AND COMPLIANCE FRAMEWORK

Comstock Mining LLC proposes exclusive use of an existing road located on both public and private lands in Storey County to haul ore from its mining operations in Gold Canyon to its processing facility located in American Flat, neat Virginia City, Nevada. The public lands are managed by the Sierra Front Field Office of the Carson City District of the Bureau of Land Management (BLM). The project requires the issuance of a Right-of-Way permit pursuant to the Federal Land Policy and Management Act of 1976, as amended (43 USC § 1761). Consequently, the project is defined as a federal undertaking, which requires that BLM take into account effects to historic properties resulting from the permit's issuance (36 CFR § 800).

The direct Area of Potential Effects (APE) for this project is defined as 250 ft. on either side of the right-of-way centerline, for a total of 178 acres (Appendix A, Figure 1.1). The APE is located in the SE1/4 of Section 6, T.16N., R.21E., and is depicted on the *Virginia City, Nev.* (1994) 7.5' USGS Topographic Quadrangle. BLM has determined that the undertaking will have an adverse effect on known historic properties within the APE, and must ensure that those adverse affects resulting from the Right-of-Way grant are mitigated. Consequently, in April 2015 Ms. Rachel Yeldermam, Environmental Affairs Director at Comstock Mining LLC, contacted Dr. Robert R. Kautz of Kautz Environmental Consultants, Inc. (KEC), to request the preparation of treatment plans to mitigate adverse effects to known historic properties resulting from the federal undertaking. This document presents a plan to mitigate adverse effects to a *prehistoric-era* resource only. Plans to mitigate adverse effects to *historic-era* resources are contained within a separate document (Spidell and Kautz 2015).

1.2 ADVERSE EFFECTS TO HISTORIC PROPERTIES

One prehistoric-era historic property will be adversely affected by the federal undertaking. An adverse effect is found when "an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register of Historic Places in a manner which would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association" (36 CFR 800.5(a)[1]). The historic property is a multi-component archaeological site CrNV-03-8903, located entirely on lands managed by the Sierra Front Field Office of BLM (Appendix A, Figure 1.2). The prehistoric component of this site is small lithic scatter containing what appears to be the remains of a Late Archaic tool production/rejuvenation episode. While stratified, intact cultural assemblages are not anticipated at this locale, the surface assemblage contains artifacts that can yield additional information with the potential to address research questions deemed relevant to the region. The documented assemblage includes one obsidian Rosegate Series projectile point, one unmodified Olivella shell (almost certainly *O. biplicata*, see Milliken and Schwitalla 2012:14) , one biface, one hammerstone, one scraper, and two cores, as well as an estimated 60 flakes of CCS, fine-grained volcanic items, and obsidian. This locale has been impacted by historic and modern era mining and mineral exploration, which occurs within the boundaries of the site and in the immediate surrounding vicinity.

The Bureau of Land Management determined the prehistoric component of this archaeological site eligible for the National Register of Historic Places under Criterion D for its research potential (Spidell et al. 2014). The undertaking will adversely affect those characteristics of this property which qualify it for inclusion in the National Register of Historic Places. Data recovery is deemed the most appropriate measure for mitigation of those effects. This document outlines the research questions that this site may address, and the methods best suited for recovery of relevant data.

1.3 REPORT OUTLINE

Chapter 1 has presented the project background and compliance framework for this site and has provided a description of the National Register eligible prehistoric site affected by the federal undertaking. Chapter 2 presents the environmental and cultural contexts for this site, while the research design and appropriate research questions are outlined in Chapter 3. The field and laboratory methods deemed appropriate for obtaining the data needed to address the research questions in Chapter 3 are detailed in Chapter 4. Chapter 5 outlines deliverables anticipated for this project. The bibliography of cited references can be found in Chapter 6.

Appendix A of this document contains the map figures referenced in the report chapters. The IMACS form for site CrNV-03-8903 is located in Appendix B. The curation agreement between Kautz Environmental Consultants, Inc., and the Nevada State Museum can be found in Appendix C.

2.0 ENVIRONMENTAL AND CULTURAL CONTEXTS

2.1 ENVIRONMENTAL CONTEXT

2.1.1 Topographic Location and Sediment Deposition

Site CrNV-03-8903 is located on the south-facing slope of a low ridge overlooking American Flat (Figure 2.1). Sediments are a very cobbly loam, formed in residuum from volcanic rocks (NRCS n.d.). The site is located in a deflating context. Fine-grained sediments and artifacts are moving downslope, and soil accumulation is not significant at this locale. For these reasons, deeply buried, intact cultural strata are not expected, although artifacts may be shallowly buried in secondary context in the sediments by slope wash.

2.1.2 Vegetation and Fauna

The site is located at approximately 5,580 ft. amsl in a pinyon-juniper community. The pinyon and juniper are relatively thin at this location, and the understory, which consists of tall sagebrush, rabbitbrush, ephedra, and cheat grass, is the main plant community within the boundary of the site. The presence of the cheat grass is an indicator of the significant historic and modern era disturbance within the site boundaries and the immediate vicinity, resulting primarily from mining and grazing activities.

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With respect to the terrestrial fauna, numerous species of reptiles, birds, and mammals may have been present in the vicinity during the prehistoric period (Hall 1946; Zeveloff 1988). Reptiles of note include a variety of snakes and lizards. Upland game birds, such as sage grouse and mourning doves, are not uncommon in the area. Common birds of prey include turkey vultures, eagles, and various hawks, falcons, and owls. Upland game mammals may have been of particular interest to prehistoric hunter-gatherers in the region. Common game species include the jack rabbit, cottontail rabbit, yellow-bellied marmots, Townsend and California ground squirrel, and a variety of mice, rats, and other small mammals. Deer and bighorn sheep are/were the primary large herbivorous mammals. Among the significant carnivores are coyotes, striped skunks, badgers, and bobcats.

2.1.3 Water Sources

There are no known permanent water sources in the immediate vicinity of this site. A cluster of three unnamed springs is located about one mile to the west of the site location, and Gold Canyon is located downslope and approximately 1/3 mile to the east. Identification of prehistoric assemblages in association with the springs suggest that they may have been reliable water sources for part of the prehistoric period. While Gold Canyon is currently dry except in the event of flash-flooding episodes, it likely held water at least seasonally during the prehistoric period. The general area surrounding this site is relatively dry, although this may be a result of the extensive mining that has occurred in the area since the mid-19th Century, and not reflective of prehistoric conditions.

2.2 CULTURAL CONTEXT

The prehistoric archaeological sequence reflecting the cultural history of the western Great Basin and Eastern Front of the Sierra Nevada has been discussed by Ataman (1999), Bard et al. (1981); Clay et al. (1996), Elston (1971, 1979, 1982, 1986); Elsasser and Gortner (1991), Elston et al. (1977, 1994, 1995); Hester (1973); Kautz (1991), papers in McGuire (2002), Moore and Burke (1992), Pendleton et al. (1982), among others. In this region, temporal/spatial units have been constructed largely by correlating projectile point morphology with perceived functional changes through time, based on type seriation and cross-dating methods. These relationships have been tested and refined many times (Beck 1998; Bettinger et al. 1991; Elston 1971, 1979; Elston et al. 1977, 1994, 1995; Heizer and Hester 1978a, 1978b; Hildebrandt and King 2002; Kautz 1991; O'Connell and Inoway 1994; Thomas 1981, 1983). Informative syntheses of regional past lifeways are provided by Beck and Jones (1997), Bettinger (1999), Elston et al. (1977, 1994, 1995), Kautz (1991), Kelly (1997, 2001), papers in McGuire (2002); Simons and Kautz (2004), and Simons and Malinky (2006). A summarized prehistoric chronology of the area is outlined in Table 2.1.

Table 2.1 Summary of Prehistoric Chronology: Eastern Sierra Nevada Front (after Elston et al. 1995:13-18, Table 2)

Adaptation	Phase/Subphase		Age (Yrs. B.P.)	Diagnostics and Interpretations
Late Archaic	Kings Beach Phase	Late Kings Beach	150-700	Desert Series points. Numic expansion, reduced residential mobility.
		Early Kings Beach	700-1,300	Rosegate Series points. Possible introduction of Washoe-speakers, introduction of bow and arrow technology, further intensification and specialization. Maximum population levels occur during this period.
Middle Archaic	Martis Phase	Late Martis	1,300-3,000	Martis/Elko Series points. People focusing upon ecologically rich resource patches, emphasis on use of basalt in Martis assemblages.
		Early Martis	3,000-5,000	Gatecliff, Martis Contracting Stem, and Steamboat Series points. Long-term residence, intensive seed processing, and food storage occur.
Early Archaic	Spooner	n/a	5,000-8,000	Stemmed and large side notched points are rare locally, split-stem forms occur late. Characterized by low population denisities, lack of archaeological visibilities.
Paleoarchaic	Tahoe Reach	n/a	8,000 to 10,000	Great Basin Stemmed points. People are highly mobile.
	Washoe Lake	n/a	>10,000	Fluted points. Small, highly mobile groups are probably present, as inferred from elsewhere.

2.2.1 Paleoarchaic (>10,000-8,000 B. P.)

The contention that Paleoarchaic (i.e., Terminal Pleistocene and Early Holocene) hunters occupied the Eastern Sierra Front and the western Great Basin as early as 11,000 or 12,000 years ago generally rests upon typological cross-dating and technological studies (cf., Beck and Jones 1997; Bryan and Tuohy 1999; Dansie and Jerrems 2004, 2005; Jones and Beck 1999; Tuohy 1974; Willig et al. 1988). Distinctive artifacts resembling those used by early extinct-megafauna hunters, (i.e. "Paleo-Indians") have been found in unambiguous early contexts throughout southwestern, southeastern, and northeastern North America. Radiocarbon dates obtained from the Spirit Cave mummy and associated organic remains found near Fallon, Nevada, form a relatively tight cluster of 10 dates, with a mean radiocarbon (^{14}C) date of 9,410 ± 60 years ago (Beck and Jones 1997; Tuohy and Dansie 1997). Evidence from this unique site and other Late Pleistocene/Early Holocene burials in Nevada (Dansie 1997) establish an unequivocally early presence of humans in the western Great Basin. Additional data derived from other Late Pleistocene/Early Holocene western Nevada sites (e.g. Fishbone Cave, Handprint Cave, Shinner's Site A, Wizard's Beach, Grimes Point Cave, Crypt Cave, Last Supper Cave, Leonard Rockshelter) also point to an early occurrence of people in the Great Basin (Beck and Jones 1997; Dansie and Jerrems 2004, 2005). Coprolites recovered from Paisley 5 Mile Point Caves in south-central Oregon are directly dated to 12,300 ^{14}C years B.P., which argues for a relatively ancient human presence in the North American Great Basin (Gilbert et al. 2008).

Recent paleoecological and archaeological evidence (see Beck and Jones 2009; Goebel et al. 2007, 2011; Rhode et al. 2005; and Smith and Kielhofer 2011) from recovered materials at Bonneville Estates Rockshelter, Smith Creek Cave, Last Supper Cave, the Black Rock Desert, the Sunshine Locality, and Danger Cave indicates that there was a robust occupation of the Great Basin during the Younger Dryas (12,900-11,600 calendar years ago). These archaeological studies have since been incorporated into paleoecological models (Pinter et al. 2011), use wear analyses (Lafayette 2006, 2008), and studies of early human genetic signatures

(Dillehay 2009), the synthesis of which offers insights into the nexus between culture and human adaptation, as nuanced by the Great Basin environment.

The Fluted Point Tradition and the Great Basin Stemmed Tradition are two principal Pre-Archaic archaeological manifestations that have been identified in the western Great Basin and adjacent portions of the intermontane Desert West (Aikens and Jenkins 1994; Beck and Jones 1997, 2009; Bryan 1988; Bryan and Tuohy 1999; Grayson 1993:233-244; Jones and Beck 1999; Moratto 1984:75-103; Willig and Aikens 1988). The essential diagnostic artifact of the Fluted Point Tradition is a large, lanceolate projectile point that possesses one or more distinctive flake scars (i.e. "fluting") initiated from the base. Prominent specimens of fluting extend to considerable lengths. These artifacts are sometimes found with square-based spear points, large bifaces, backed scrapers, heavy core tools, burins, and gravers. Termed "Clovis" and/or "Folsom" points elsewhere in North America, ancient fluted points and associated finds occur at numerous sites and localities in the Desert West, including the western Great Basin (Davis and Shutler 1969; Tuohy 1985, 1988). Unfortunately, most of these are isolated surface finds, or artifacts derived from depositional contexts of doubtful integrity.

The second dominant Pre-Archaic material culture present in the western Great Basin is the Stemmed Point Tradition, also referred conventionally as the "Western Pluvial Lakes Tradition" (Aikens and Jenkins 1994; Bedwell 1973; Beck and Jones 1997, 2009; Bryan and Tuohy 1999; Graf 2002; Graf and Schmitt 2007; Grayson 1993:238-244; Jones and Beck 1999; Moratto 1984:90-103; Rhode et al. 2000; Smith 2005a, 2005b; Willig and Aikens 1988). Diagnostic artifacts associated with this tradition include stemmed and non-notched lanceolate projectile points (e.g., Great Basin stemmed series); various types of lanceolate knives, scrapers, crescent shaped lithics, and possible core-blades and burins. Originally, the Western Pluvial Lakes Tradition (WPLT) was regarded as a technological bridge between earliest North American lifeways and the subsequent *Archaic* cultural tradition that dominates the Great Basin until contact times. The WPLT derives its name because characteristic assemblages often occur in lowlands and former margins of extinct pluvial lakes. It was hypothesized that human populations were increasingly attracted to relatively productive margins around lakes and stream courses during a Late Pleistocene period (ca. 11,000-8,000 B.P.) shift to warmer climate.

It is now understood that considerably more variability characterizes artifact types and spatial distributions of the Stemmed Point Tradition. People inferentially associated with these tools probably were highly mobile, and they occupied a wide range of environments that included lakes and marshes as only a subset of their subsistence round (Smith 2010; Smith and Kielhofer 2011). Many sites contain both fluted and stemmed projectile points (Kautz and Harmon 2012). Lithic analysis has demonstrated these points were made in distinctly different ways, however, and that they likely were deposited as a consequence of two different sets of occupations occurring at different times. Locally, the Paleoarchaic is tentatively divided into two phases. The Washoe Lake Phase (>10,000 B.P.) is based solely upon the presence of isolated fluted projectile points found east of Washoe Lake (Elston et al. 1995:14). The subsequent Tahoe Reach Phase (10,000-8,000 B.P.) is regarded as the local manifestation of the Stemmed Point Tradition (Elston et al. 1995:14-15). That this assemblage follows the Fluted Point Tradition is entirely a figment of chronological modeling conducted almost thirty years ago, but its time sequence has not yet been substituted by unequivocal evidence.

2.2.2 Archaic (8,000-150 B.P.)

The Archaic lifeway is one marked by a "broad-spectrum adaptation" of increasing dependance upon a markedly diversified resource base (Kautz 1991). Archaic settlement patterns become more complex through time: sites vary more in size, contain evidence of larger populations, and are returned to more often. Site assemblages also display a wider range of site functions. These trends result from an increasingly complex need to synchronize human scheduling activities with seasonal availability of a large range of subsistence resources. Use of greater quantities and increasingly diversified food stuffs begins to pit resources against their alternatives for the attention of human hunter-gatherers, with *timing* becoming a critical gauge to measure the success of a particular strategy. In addition to trade and barter arrangements, social organization, rules, obligations, and informal networks of human interaction became increasingly important as conduits of critical *information* for timing resource availabilities, thereby potentially reducing or mitigating the subsistence gamble (see Kautz 1991). Specific details regarding the Early, Middle, and Late Archaic presented below are abstracted from Elston (1986:138-146), Elston et al. (1995:13-18), Kautz (1991), and Pendleton et al. (1982:36-40).

2.2.3 Early Archaic (8,000-5,000 B.P.)

The Early Archaic in the western Great Basin begins about 8,000 B.P., and ends sometime around 5,000 B.P. Diagnostic projectile point types for this period include Pinto and Gypsum Cave points, which have been subsumed into the Gatecliff Series by Thomas (1981, 1983), and Humboldt Series points. However, the latter are often regarded as a poor time marker because they are found throughout the archaeological time sequence. These projectile points generally are smaller than many Pre-Archaic forms, but they also were probably used to take big game by means of an atlatl-dart weapon system. Grinding implements become more common, indicating indirectly that more intensive hard seed processing contributed to the diet (Rhode and Madsen 1998). Where preservation permits, recovery of other Early Archaic cultural elements includes baskets, nets, mats, cordage, bone tools, bone and marine shell ornaments, and fur and bird skin robes. Food and other domestic and ritual supplies were commonly cached in caves, rock shelters, and house pits. Site density for this period is quite low, suggesting overall population size was low, but a marked preference for specific lowland locations near permanent water also becomes evident.

Locally, the Early Archaic is represented by the Spooner Phase, lasting roughly between 8,000 and 5,000 years ago (Elston et al. 1994:13-14; 1995:15). This still-hypothetical and little-known phase is very poorly represented along the Eastern Sierra Front, and probably needs revision. Its archaeological invisibility may be due to small human populations practicing a highly mobile lifestyle, *or* perhaps the phase is populated by assemblages lacking distinctive temporal markers. This is a common outcome with fine-grained volcanic tool stone assemblages (Duke 1998; Page 2008).

2.2.4 Middle Archaic (5,000-1,300 B.P.)

The Middle Archaic lasted from about 5,000 B.P., until about 1,300 B.P. This period is characterized by a continuation and acceleration of trends first established during the Early Archaic, but the process appears gradual and does not involve marked technological shifts. Major changes during the Middle Archaic seem to involve settlement and subsistence patterns, stylistic elaboration, and the presence of many more sites. For potentially the first time, seasonal camps and winter sites were regularly re-occupied. House pits at winter camps often contain hearths, storage areas, and the occasional burial. Evidence accumulated from these sites, along with frequent signs of resource caching, combine to suggest that groups exploited resources within a defined territory. Big game hunting continues, with bighorn sheep achieving some prominence. Hunting is not exclusively focused on large mammals; there is also a marked expansion in the frequency and variety of smaller game birds and mammals. Seed procurement and processing also appears to increase during this period. Sites are commonly strewn with the debitage from quarry-derived waste flakes, which enhances their footprint in the archaeological record. Trade in marine shell and obsidian is now well developed (Bennyhoff and Hughes 1987:159-160; Hughes 1994; Hughes and Bennyhoff 1986:246-259). Diagnostic projectile point forms of the Middle Archaic include the Martis/Elko Series.

The Middle Archaic is divided locally into Early Martis (5,000-3,000 B.P.) and Late Martis (3,000-1,300 B.P.) Subphases (Elston et al. (1994:14-17; 1995:15-16). Diagnostic artifact types of the Early Martis include Martis Split Stem, Martis Contracting Stem, and Steamboat Leaf-shaped projectile points. These frequently are made from basalt, which Elsasser and Gortner (1991) regard as a Martis Phase "signature." The Late Martis Subphase is marked by Elko Eared, Elko Corner-notched, and Martis Corner-notched projectile points. Other than points, large bifaces, retouched flakes, and perforator/gravers are the most common tools found at Martis Phase sites. The primary differences observed between Early and Late Martis/Elko Subphases occur in projectile point technology, and a postulated increase in population. Distinctions are much more slight among cultural traits that signify aspects of group settlement patterns, mobility, and economic systems.

2.2.5 Late Archaic (1,300-150 B.P.)

The Late Archaic begins about 1,300 B.P., and continues until shortly after contact with Euro-Americans around 150 years ago (Bettinger 1999; Kelly 1997; Simms 2008). Arguably the most important technological change during this period is the substitution of the atlatl-dart combination with the bow and arrow. The logistical and technological requirements involved in this transition produced smaller, lighter, and more fragile arrow points, and the development of a finely-flaked stone technology, often emphasizing the use of flakes over formal bifaces. Chipping emphasized elaborate pressure flaking and retouch of thin, quarried blanks. Diagnostic points for this period include the Rose Spring and Eastgate forms (1,300-700 B.P.), referred to by Thomas (1981, 1983) as the Rosegate Series, and small side-notched and triangular Cottonwood points of the Desert Series. Pottery is another fundamentally important addition to material culture during this time, with low-fired brownware becoming archaeologically visible by about 700 B.P. Seed processing equipment may also become more common during the Late Archaic, although Simms (1983) has cautioned that the higher proportion of seed grinding artifacts may be the product of scavenging and reuse of ground stone objects from earlier sites. Convincing evidence indicates that plant foods and small game (e.g. rabbits) replaced large game as a major constituent of the diet.

It has been debated whether this period was marked by a relatively recent intrusion of Numic speakers, represented in this portion of the western Great Basin by the Northern Paiute, sometime around 1,000 years ago (Bettinger and Baumhoff 1982; Fowler 1972; Lamb 1958; papers in Madsen and Rhode 1994). Three principal models of Numic territorial expansion receive attention. Grayson (1993) argues for a Late Holocene reoccupation of more or less abandoned portions of the Great Basin after 600 B.P. Others (Aikens 1994; Aikens and Witherspoon 1986) posit an initial migration of Numic speakers into the central Great Basin around 5,000 B.P., with subsequent expansions west and east by about 1,000 B.P. A separate model hypothesizes Numic speakers possessing a more adaptive strategy under certain contingencies; one that is based upon the intensification of dependable, low-return resources, emphasizes female labor, and produces a more effective settlement system for increasing populations. This combination led to the competitive exclusion of predecessors in the region (cf. Bettinger 1993; Bettinger and Baumhoff 1982; Young and Bettinger 1992). Population growth and climate change (often combined) remain popular causal factors for explaining the spread of Numic speakers. Although questions surrounding the details of prehistoric chronology and territoriality remain, the Northern Paiute people who occupied the Great Basin during the subsequent historic period are their descendants. The principal archaeological correlates are Desert Side-notched points, certain forms of basketry, and Great Basin Brownware pottery.

Numic territorial occupation of the Great Basin was not absolute. The project area lies well within the traditional territorial boundaries of the Washoe, the only non-Numic speaking people of the Great Basin. The Washoe speak a language belonging to the Hokan stock, and exhibit a material culture suggesting strong, perhaps ancient, ties to California (d'Azevedo1986). Hokan-speaking groups surround Penutian-speaking tribes, suggesting that California was once widely occupied by Hokan speakers. The spatial distribution of these language groups indicates that Hokan speakers were eventually displaced from some locations to the known periphery, presumably as a consequence of an expansion of Penutian speakers from somewhere in central California (Kroeber 1925). Biological evidence (e.g. mtDNA) demonstrates that ancient western Great Basin populations are dissimilar to their modern counterparts, which is consistent with the notion of a relatively recent spread of Numic speakers into the Great Basin from southern California about 1,000 B.P. (Kaestle and Smith 2001; Bettinger and Baumhoff 1982). A subsequent study uses genetic distance analyses to identify similarities between Washo, Yuman, and Takic groups, evidence consistent with a notion that posits Washo groups inhabiting parts of the southern Sierra Nevada and Great Basin before a recent Numic spread (Eschleman et al. 2004).

The archaeological complex representative of the local Late Archaic period is known as the King's Beach Phase, which is thought to have emerged in the Lake Tahoe region and along the Eastern Sierra Nevada Front. The King's Beach Phase has been parsed into "early" and "late" subdivisions. The Early King's Beach Subphase (1,300-700 B.P.) is marked by Rosegate and Gunther Series points, percussion-thinned triangular chert bifaces, bedrock mortars, and pine nut hullers. It is also characterized by the presence of stratified sites, house pits, and other associated features (Elston et al. 1994:18; 1995:16-17). Late King's Beach Subphase sites (700-150 B.P.) exhibit many of the same characteristics as the earlier sites, except for the presence of Desert Series points as the temporal marker, and an additional type of triangular biface made entirely by pressure reduction (Elston et al. 1994:18; 1995:17-18).

There are debates about what the perceived differences in the record means. It may represent a territorial connection with the Martis archaeological complex of the Sierra Nevada, potentially tracing Washoe origins and early movements east into their historic territory by about 6,000 years ago (d'Azevedo 1986:466; Elston 1982:198-199). Other investigators have regarded the King's Beach and the Martis complexes as exclusive manifestations (Elsasser 1960:72-74; Heizer and Elsasser 1953:4;). Both complexes often occur at the same sites and may be related, but there is no unequivocal evidence to discount them as separate, spatially overlapping traditions (Elston 1971:10-11, 1979:46; Elston, et al. 1977:167-168; Kautz 1991). Elston (1994) notes that regardless of whether any population displacements occurred, the Washoe model of culture change corresponds to the timing of changes postulated by the Numic expansion model, and yet the Washoe speak a language belonging to the Hokan stock. Chronological specifics will remain problematic until the relationship between culture transmission and population migration becomes better known for this region.

3.0 RESEARCH DESIGN

Site CrNV-03-8903 was determined eligible for inclusion on the National Register of Historic Places under Criterion D for its potential to yield data which can address research questions considered pertinent to our understanding of prehistory of the western Great Basin. Research priorities and information needs are organized into domains, or thematic categories. CrNV-03-8903 has the potential to yield information relevant to the themes of *Chronology*, *Lithic Technological Organization,* and *Trade and Exchange*. Each of themes is discussed below, and broad relevant research topics are proposed. During field research and subsequent post-field analyses, it may be discovered that other research topics can be addressed by this site. However, the goal of the field and laboratory methods posed in Chapter 4 is addressing the research topics outlined below.

3.1 PREHISTORIC CHRONOLOGY

The research theme of *Chronology* seeks to understand when particular "events" occurred (e.g. shifts in adaptation, adoption of new technology, introduction of new populations, etc.), diachronic change in strategies through time. In the Great Basin, chronological control of archaeological sites has been obtained by comparing independent data sets derived from radiometric dating and artifact seriation. Seriation is usually established by means of artifacts obtained from stratified cultural deposits occurring in rock shelters and caves. Artifact cross-dating has focused upon projectile points, but other time-sensitive artifacts include ceramics, shell beads (Milliken and Schwialla 2012), and perishable remains such as basketry. Recently, obsidian hydration chronologies, rate computations, and obsidian sourcing have been conducted and in many instances have been used to construct tightly controlled relative dating schemes of use locally (Hughes 1984, 1985, 1990, 1994, 1995, 2001).

Chronological control of prehistoric archaeological assemblages is crucial when inserting those individual locations and activities into the larger frameworks of settlement patterns and economic and/or subsistence strategies. Consequently, care must be taken that those materials used to radiocarbon-date a site are appropriate. Multiple proxy data sets should be employed to ensure accuracy and rule out factors such as the prehistoric use of "old wood," which would provide a false (too old) radiocarbon date. Data obtained from such assemblages may address descriptions of aboriginal procurement strategies, subsistence practices, seasonal scheduling, task-specific tool kits, shifts in food preferences, organization of domestic space, reactions to environmental stress, population replacement, socio-cultural organization, and many other allied topics. Data categories include dateable materials such as temporally sensitive projectile point forms, ceramics, or basketry, obsidian artifacts from which hydration dates may be obtained, and radiocarbon-dateable organic materials identified in direct association with prehistoric assemblages.

Ideally, sites that have the potential to increase our understanding of the cultural chronology of the western Great Basin are those that contain artifacts or deposits that can be directly calendar dated, or those that have stratified deposits from which relative-dating sequences can be obtained. Direct dating can be gleaned from organic material that can be radiocarbon-dated, pottery that can be thermo-luminescence dated, or obsidian, which can yield relative dates based on hydration rim measurements. The best dates are those stratigraphically associated with cultural materials or with temporally diagnostic artifact types. Researchers can infer the relative dating of artifacts or occupations by means of superimposed cultural layers and the application of the "law of superposition," which can yield information regarding the relative ages of particular artifact types, even in the absence of materials that can be directly dated.

Research Questions

- To what period(s) does this site date? Do diagnostic materials associated with absolute or relatively dated periods confirm known cultural chronologies?

- Does site CrNV-03-8903 demonstrate change through time in technological organization, landscape use, or access to exotic materials?

3.2 PREHISTORIC LITHIC TECHNOLOGICAL ORGANIZATION

The theme of *Lithic Technological Organization* is concerned with how tool stone materials are acquired, reduced, and discarded, and how the costs of these processes are mitigated and/or embedded in other activities. Surface assemblages like the one at CrNV-03-8903 can best lend themselves to the discussion of questions related to the theme of *Lithic Technological Organization* because the pertinent artifact category, lithic tools and waste flakes, are some of the best preserved artifacts in surface assemblages. As with previous themes, identification of single components and their specific functions is crucial. In the case of this theme, temporal control is also particularly important, especially in regard to documenting changes in lithic use through time.

The various kinds of objectives this theme offers include use-wear analysis (Hayden 1979; Semenov 1964) and aggregate analysis (Hall and Larson 2004). Also of particular use to the archaeologist is the more traditional activity of attempting the reconstruction of changing technological organization strategies and lithic tool analysis (Andrefsky 2008; Odell 1996; Swanson 1975).

Research Questions

- Can tool stone raw materials identified at site CrNV-03-8903 be defined as either “local” or “exotic”? If so, do strategies in the reduction of these materials support the hypothesis that “local” materials are used in more expedient ways, while “non-local” materials are more heavily re-worked, with concomitant evidence of curation (Eerkens et al. 2007)? Do these economic strategies change through time?

- Can correlations be made between raw tool stone choice and functional preferences? How would such preferences impact the use of the landscape and strategies for procurement of other resources? Does this change through time?

- Are data available to test “efficiency” and/or “cost benefit” models of changing tool stone utilization and assemblage composition? Do these change through time?

3.3 PREHISTORIC TRADE AND EXCHANGE

Questions related to the existence and breadth of exchange networks during the prehistoric period are concerned primarily with identifying the movement of artifacts across the landscape. Identification of that movement is obtained by the analysis of artifacts whose constituent parts have a specific provenance on the landscape. The identification of a “source area” for an artifact or its components allows the researcher to discuss the movement of that item, from its source location to its ultimate discard location. Once “paths” of movement have been ascertained, inferences can be made regarding the social, economic, and/or political interactions of the people who moved within those exchange “spheres.” At site CrNV-03-8903, the *olivella* shell has the greatest potential to provide information about trade and exchange. Obtaining marine shell requires some level of inter-group cooperation, whether the implements are exchanged hand-to-hand to get from their place of origin to their place of discard, or whether passage is granted for individuals from one territory or region to access into another’s territory to acquire resources. Obsidian, because it is often transported long distances, also has the potential to address questions of exchange and intergroup dynamics.

Research Questions

- When were the exotic items transported into the region, and does the nature of the transport (the source location or distance) change through time, indicating shifting intergroup social dynamics?

- How are materials such as obsidian and marine shell transported into the region? What are the political and social prerequisites necessary to move the commodity?

- Is "curation" of exotic material indicative of the ease with which materials can be acquired? What are the factors that determine the ease of accessibility of various exotic materials?

- Does evidence of prehistoric enmity occur as suggested by the presence of a barrier in distribution of tool stone or other materials? If enmity existed, between what regions and at what time(s)?

4.0 METHODS AND TREATMENT PROTOCOLS

Site CrNV-03-8903 is a multi-component site containing both a prehistoric lithic scatter and the remnants of small-scale late 19th or early 20th Century mineral exploration. The prehistoric component consists of a presumed surface lithic scatter consisting of approximately 60 flakes, one Rosegate projectile point, one apparently unmodified *Olivella* shell, one biface, one scraper, one hammerstone, and two cores (Appendix A, Figure 4.1). The prehistoric component is relatively thinly dispersed across the site surface, with a maximum density of only three artifacts per square meter. No prehistoric features were noted during the Class III documentation of this site, which was interpreted the site as the remains of a tool production or rejuvenation episode, possibly dating to the Late Archaic period (Spidell et al. 2014).

The historic component that overlies the prehistoric assemblage consists of two prospects pits and an associated cairn, as well as a light scatter of consumption, mining, and personal items, including tin cans, bottle glass, ceramic vessel fragments, eating utensils, a shovel, blasting caps, and buttons. This assemblage is interpreted as a the remains of one or more short-lived mineral exploration episodes. There is no indication that the lithic artifacts and historic debris are temporally or functionally related, and therefore this "not eligible" historic-age assemblage is noted exclusively as an impact to the prehistoric component. Other impacts to the site include the construction of the American Flat Haul Road and opportunistic roadside dumping (Figure 4.2).

[redacted]

Historic property CrNV-03-8903 has been determined eligible for inclusion on the National Register of Historic Places under Criterion D for its potential to address research questions pertinent to the prehistory of the region. Data recovery is deemed the most appropriate method of mitigating adverse effects to historic properties eligible under Criterion D. At CrNV-03-8903, methods of data retrieval will include surface and subsurface field investigations, laboratory artifact attribute analysis, and outside analyses in the form of obsidian hydration and fine-grained volcanic chemical characterization, radiocarbon dating, macro/micro botanical analyses, and vertebrate faunal analyses, when appropriate. The historic component of this site has been determined not eligible for inclusion on the National Register of Historic Places and consequently does not require treatment.

4.1 FIELD METHODS

4.1.1 Surface Investigations

Due to the small size of the assemblage documented as part of this site during the Class III inventory, all prehistoric surface materials will be collected for analysis. Archaeological investigations at this site will begin with a surface inventory to verify the site's horizontal distribution and to locate or relocate surface artifacts and features. The site will be subjected to a close-interval pedestrian survey of 2 to 3 meters in order to ensure that all prehistoric temporally or behaviorally diagnostic artifacts are identified with pin flags. Obsidian flakes will also be marked. Following the identification of these materials, all will be recorded. Provenience information will be gathered using a GPS unit with sub-meter accuracy, and artifacts will be collected. If surface features are observed, they will also be GPS-located, and detailed sketches and photographs will be obtained. In order to obtain provenience information for this site's flake assemblage without individually GPS-locating each flake, a grid of 10-x-10 meter sectors will be laid out across the site's surface and the flake assemblage will be completely collected within each grid. This site measures 78-x-58 meters, for a total of 45 10-x-10 meter grids (Appendix A, Figure 4.3).

Prehistoric artifact types considered for individual GPS-identification include ground stone implements, ceramic fragments, shell, assayed cobbles, cores, formal lithic tools including projectile points, bifaces, scrapers, drills, spokeshaves, and knives, as well as expedient lithic tools such as utilized and retouched flakes. Fire-affected rock (FAR) may be collected or simply noted, weighed and GPS-located, at the discretion of the archaeologist.

4.1.2 Subsurface Investigations

Site CrNV-03-8903 is located in an environment where sediment deposition, and subsequent intact burial of cultural components, is not expected. Instead, this site is in a deflating environment in which surface sediments are moving downslope through the force of gravity. This movement of sediments has the potential to also move artifacts in a downward trajectory, which can result in shallow burial of materials in secondary context. Initial subsurface investigations at CrNV-03-8903 will include 50-x-50 cm shovel probes spread throughout the site to confirm that an intact buried subsurface component does not exist at this location.

4.1.2.1 Shovel Probes

Five or more shovel probes will be excavated throughout this site to explore the subsurface stratigraphic package. Shovel probes will be approximately 30-x-30 cm, and will be excavated in arbitrary 10 cm levels. All materials excavated from the shovel probes will be passed through 1/8th inch mesh screen and all recovered artifacts will be collected. Shovel probes will be terminated when sterile (non-cultural) sediments are reached. If shovel probes suggest that the site contains intact subsurface cultural components, hand excavation units will be employed to explore those components (Section 4.1.2.2 below). If the shovel probes indicate that no subsurface buried cultural components exist, and that all buried artifacts result from post-depositional processes, additional subsurface excavations in the form of shovel scrapes will be conducted (Section 4.1.2.3 below).

4.1.2.2 Hand Excavation Units

If intact subsurface cultural components are identified, the number of hand excavation units necessary to adequately recover the data contained at this site will be determined in consultation with the lead agency. Each EU will measure 1 x 1 meter, although multiple 1 x 1 meter units may be excavated adjacent to each other in order to open a larger "block" where deemed appropriate, such as when there is the possibility for reconstructing "living surfaces." In such cases, each 1 x 1 meter unit will still be individually excavated for the purposes of artifact and feature provenience. Each unit will be hand excavated using shovels, trowels, brushes, picks, or rock hammers, as appropriate, and oriented to cardinal directions where possible. Standardized forms, noting date, excavators, depth of level, materials identified, features identified, and sediment composition will be completed for each level within each EU. In the absence of identifiable cultural or natural strata, EUs will be excavated in arbitrary 10 cm levels. Features will be sketched and photographed, and screened and bagged separately. Sediments will be screened though 1/8-inch mesh.

Artifacts identified within EU levels *in situ* will be plotted on level records, and collected and bagged separately from the remaining materials collected from that level. A variety of samples may also be encountered, including materials for dendrochronology, radiocarbon dating, tool stone samples, sediment samples for macro- and micro-constituents, and materials suitable for DNA analysis. If samples are collected, the location of the collected material will be plotted on level forms.

4.1.2.3 Shovel Scrapes

Shovel scrapes will be employed at this site in locations where shovel probes confirm that subsurface materials are shallowly buried and resulting from post-depositional movement of artifacts and sediments, rather than representing an intact buried cultural component. The purpose of this activity is to recover artifacts related to this site in order to supplement the site's potentially small assemblage. This technique removes the top 5 to 10 cm of sediments within a particular block location, as quickly and efficiently as possible, by means of flat shovels. Although precise locational data is lost due to the nature of this technique, the purpose of this subsurface phase is to increase the sample size of the site's assemblage while little important information will be lost since the shallowly buried artifacts are likely not in their original position. The technique was developed on the eastern seaboard by South (1977:304), who used it more often to detect historic features. It has been used effectively in Nevada, with the caveat that it is less effective in forested areas where vegetation makes shovel scrapes more difficult (McQueen et al. 1997:80).

No fewer than four 5-x-5 meter shovel scrapes will be excavated throughout the site, for a total of 100 sq. meters of surface area covered. All sediments removed in this manner will be passed through 1/8-inch screen. This process is accomplished by several technicians who shovel the soil directly into a nearby screen. The screen and screener move with the technician wielding the shovel, as that person progresses across the block. All recovered materials will be collected and returned to the KEC Prehistoric Laboratory for analysis. Should intact subsurface features or cultural components be exposed during this activity, these features or components will be further explored using hand-excavation units.

4.2 LABORATORY METHODS

All recovered materials will be collected and transported to the KEC Laboratory for accessioning and analysis. All collected artifacts and samples will be bagged in sealable plastic bags with artifact tags identifying collector, date, provenience, and material. For both surface and subsurface investigations, a master Bag Log will be maintained and completed with all appropriate information for each collected item. During surface collection, bagged materials will be cross-referenced with Sector Collection Forms. During subsurface investigations, bagged materials will be cross-referenced with their appropriate Level/Unit Excavation Forms. Bags will be placed in lots, corresponding to provenience, and kept in cardboard boxes for transport back to the KEC artifact laboratory in Reno.

Once artifact assemblages have entered the KEC Prehistoric Laboratory, the items will be accessioned, with all documentation retained (e.g., level records, feature records, sample records, bag catalogs, photograph records, individual bag tags, and, in some cases, copies of field notes, maps, and/or stratigraphic profiles). Materials will be processed to standards that meet or exceed those outlined in the Nevada State Museum Curation Agreement (Appendix C) made between the Nevada State Museum and KEC.

Prior to processing, a thorough check-in inventory (reconciliation) will be conducted by the laboratory manager as part of the laboratory accessioning procedure. When a group of items is deemed complete, it is boxed along with its bag catalogue and sent to the washing station. Each item is examined before being washed to determine whether washing is appropriate. Items such as animal bone, other organic materials, the grinding surfaces of ground stone tools, or soil samples, are not washed. During washing, items are gently scrubbed with a soft toothbrush to dislodge soil still adhering following an initial rinse. After all items are thoroughly air-dried, they are placed back in their original bags along with their tags, then re-boxed and formally catalogued.

Cataloguing is initiated when each laboratory technician is assigned a unit and then checks the bag log to make sure all materials from the unit are present. Each bag representing a single provenience then is sorted into class, object, type, and material categories. Each of these separate categories is assigned a unique catalogue number. This consists of the site number plus a sequential number beginning with the number "1." Objects are formally classified by senior archaeologists based upon criteria derived from standardized Great Basin artifact typologies. Most items are catalogued according to their object name alone (e.g., debitage, projectile point, metate, bone fragment, etc.).

After items from a field bag have been sorted and assigned catalogue numbers, artifact provenience and classificatory information for each are entered onto catalogue sheets, along with data regarding material(s), count(s), and weight(s). Each catalogued item then is placed into an unused permanent container and receives its final inventory tag. Most items have their unique catalogue number written upon their surface in permanent ink. The cataloguer then checks to make sure that data on the item tag matches data on the catalogue sheet and the artifact, that there are no duplicate or missing catalogue numbers, and that all items are packaged neatly and efficiently.

The laboratory manager conducts numerous quality control checks throughout these activities to insure that item processing is carried out using procedures defined as appropriate by both KEC's and the Nevada State Museum's standards. Following cataloguing, items are shelved in numeric order. Catalogue sheets are then sent to data entry to be entered into the *Access®* database for subsequent inventory, analytical manipulation, and catalogue production. Following data entry, a final quality assurance check of the printed catalogue is conducted to ensure its correctness before materials are made available for analysis. All recovered materials will be curated by the project proponent at the Nevada State Museum, Carson City, a federally approved repository. The assemblage will be accompanied by copies of the final project report approved by BLM nad Nevada SHPO.

4.2.1 Flaked Stone Analysis

All lithic debitage and flaked stone tools returned to the lab will be identified as to the tool stone (raw material) employed. A representative sample of flaked CCS (cryptocrystalline silicate) stone tools and flake debris will also be exposed to ultraviolet short- and longwave fluorescence by means of a Raytech Model LS-88CB UV lamp (3500 angstrom [long] to 2600 angstrom [short] wave light). Results of these tests will be compared intra-assemblage. The use of UV light (ultraviolet fluorescence analysis) to distinguish stone sources is a common petrographic and mining procedure that has been adapted to deal with archaeological problems (Banks 1990; Hofman et al. 1991).

Basic metric attributes will be provided for all tool forms. Both debitage and biface assemblages are analyzed as the byproduct of a single behavioral system (Collins 1975) in the development of final tool forms (e.g., flake, blade, and biface trajectories; see Hayden et al. 1996; Odell 2004:91-110). Information regarding both the flake stage and biface reduction sequence continua can be used to infer site function and to recreate mobility and settlement patterns. Nomadic hunter-gatherer populations schedule their movements to coincide with the availability of seasonal resources, but their access to native stone sources is part of the equation regarding when and where they position themselves across the landscape when pursuing other extractive tasks. This type of planning, termed "embedded procurement," stands in contrast with a strategy for obtaining tool stone and finished tools that emphasizes trade (Morrow and Jeffries 1989).

It is common, but not universal (see Elston and Raven 1992, Part 3:81), that the various tasks associated with the reduction sequences as defined above take place at different locations. For example, Stage I and II (early stage) bifaces may be removed from a quarry and prepared (heated with initial reduction) there, but then transported to another location where they are reduced to a Stage III or IV tool, and then transported to another location where the hafting element is added. Finally, the finished point may be discarded at a kill site following breakage. Accordingly, each of these locations will have variable assemblage composition that should be reflected in both their flake and the biface assemblages.

The stone knapper's choice of a tool production strategy is situational in nature. The concept of "progress" in tool manufacture has been an archaeological will o' the wisp since it served a Victorian mentality. Variables such as population packing, environmental change, risk, uncertainty, variability in logistical mobility, or storage technology can, and do, impact procurement reliability/ efficiency and how behavior is organized on a moment to moment basis (Boydston 1989). It may be best to think in terms of conceptual dichotomies such as expedient vs. curated technology; reliable vs. maintainable tools; exotic vs. local raw materials; collecting strategy vs. foraging strategy; or risk vs. efficiency. These sets of concepts contain the principals of optimization that allow stone tools to be viewed in a larger cultural adaptive and systems framework while utilizing an economic analytical framework (Elston and Raven 1992; Jochim 1989). It is the cumulative outcome of human technological choice at various points in time that helps characterize the economically adaptive response.

4.2.1.1 Debitage

Debitage is the by-product of stone tool manufacture. It is the residuum resulting from the behavior of impacting one stone with another. The impact causes "flakes" of the impacted stone to break away, resulting in either the shaping of the object stone or the creation of a thin "flake" from which smaller, narrower tools can be manufactured. If chosen, these latter "blanks" can be used as they are first generated, as an expedient tool, or they may be further modified and reduced to provide a more formal tool such as a knife or a projectile point. Thus, depending on the stone tool reduction strategy and the raw material, the stone flakes may be 1) considered as waste, 2) used immediately as expedient tools, 3) saved or cached for later use, or 4) further reduced immediately into formal tools.

Each stone tool reduction strategy results in a somewhat different pattern of debitage assemblage (Andrefsky 2001a, 2001b). This analysis of flaked stone debitage, often termed *aggregate analysis*, allows the investigator to characterize the assemblage and to objectively attempt to recreate the reduction sequence present at a single-component site (Hall and Larson 2004; Larson 2004). However, in cases where the site is multi-component (i.e., a mixed assemblage from different points in time), a substantial obstacle appears to be the smearing effect of blending the results from several varieties of debitage assemblages (Carr and Bradbury 2004:41-44). It will be important to characterize the as to whether it is single- or multiple-component.

Analysis of the flake assemblage involves the observation of each flake's morphological characteristics. This may include whether a flake has retained remnant cortex (outside or weathered surface). These various "types" of flakes are the result of their earlier place in the reduction sequence and are the result of similar behavioral and tool stone variables. These flake types are described below.

Primary, or *Core Reduction Flakes*. These flakes are formed during the first stage of stone tool manufacture, which entails the relatively rapid removal of the unwanted outer portion of the stone. If this occurs at the quarry site, these large and thicker flakes may have the outer, weathered surface of the stone, referred to as *cortex*, present. Cortex will be tallied. The ventral (or interior) surface of the flake is flatter than other kinds of flakes, and there is likely to be a prominent bulb of percussion present due to the violence of the initial flake removals. The striking platform will most often be oriented perpendicular to the flake's ventral surface, and there normally will be few, but deeper and variously oriented, dorsal (convex outer surface) scars.

Secondary, or *Biface Thinning Flakes*. These flakes are indicative of a more careful removal of flakes from a primary flake in order to refine the tool's shape. This applies to both the outline of the tool, and perhaps more important and demanding, the thinning of the flake to reduce its overall size and weight. In essence, this is the beginning of the production of a biface, an artifact that has been flaked along both faces and/or edges. Biface thinning flakes are identified most easily by the presence of an acute, lipped, and generally multifaceted striking platform, sometimes with evidence of grinding (preparation). These flakes are usually thinner in cross-section and slightly curved around their ventral surface and possess a diffuse bulb of percussion. There can be two forms of this flake type. The first is the lipped flake with a multifaceted platform. A less commonly encountered form resembles a fish scale in plan view; and while often slightly lipped, the platform is typically narrow and curvate or recurvate. These latter flakes are the result of later stage thinning and resharpening of a relatively refined later stage biface.

Tertiary, *Retouch*, or *Pressure Flakes*. These flakes are usually the byproduct of sharpening or resharpening the edges of cutting and piercing tools (points, scrapers, knives, etc.). As such, they are usually produced during the last stage of formal tool manufacture. These flakes are usually quite small and thin and have an elongated form. They also possess small point platforms that may be lipped and are often crushed. Pressure flakes often have a central dorsal ridge or *arris* perpendicular to the platform extending the length of the flake.

Shatter. These are the angular or blocky fragments that constitute a byproduct of stone tool manufacture, but cannot be identified as flakes or portions of flakes. They are more common when poor quality or internally flawed stone is used.

Unidentified. When flakes break during the manufacturing process or afterwards and it is impossible to assess the nature of a flake, this category will be used.

4.2.1.2 Bifaces

As above, bifaces are simply flakes or cores that have been flaked on both (dorsal and ventral) sides. Bifaces can be considered either preforms or generalized bifacial tools depending on the intent or need of the stone knapper as inferred by the investigator (Kelly 1988). Bifaces lack temporal significance (Bettinger 1978), but like flakes, can also be classified according to stage in the reduction process from a generalized preform, to a completed formal tool. The types of bifaces presented below are the product of a long history of lithic analysts' work to operationalize a behaviorally relevant biface typology; or more precisely, a biface continuum. These early methodological and regional (Great Basin) contributors include Bradley (1975), Callahan (1979), Crabtree (1971, 1972), Muto (1971a, 1971b), Pendleton (1979:15-20), Self (1980:65-71), Sharrock (1966), and Womack (1977). The resulting classification is presented below.

Stage I Bifaces. This stage represents the beginning of the biface classification and may consist only of an unmodified or slightly modified piece of lithic material struck from a core or lithic exposure. Cortex may have been removed (over 50 percent of the Stage I bifaces from Lowe Shelter still had cortex visible, Self 1980:68), but it will have retained an irregular, often asymmetrical plan edge and will usually be diamond shaped in cross-section. It may be difficult or impossible to distinguish a "tip" from a "base." In practice, it may also be impossible to distinguish this stage from other blanks that have been discarded by the knapper. An exception would be if a number of these are discovered in a cache. Please note that Stages II through V apply to *any* biface, whether or not it began as a flake blank.

Stage II Bifaces. This stage is most notable for the fact that flakes will have been removed from the edge by means of percussion and/or pressure in order to give the item its general shape and reduce its thickness. The initial striking platform that was present in Stage I is maintained, and other striking platforms will have been prepared resulting in edge abrasion and striation (Sheets 1973). The edges will have been regularized resulting in a recognizable "tip" and "base." The biface will be biconvex in cross-section and thinner as a result. Cortex should be fully removed.

Stage III Bifaces. This stage in the biface reduction continuum is most notable for an effort to continue thinning the artifact by either percussion or pressure. Platform maintenance, often by means of edge grinding, is an effective way to operationalize the thinning process. The object's edges will become less sinuous and more centered when viewed from the side, and the biface becomes generally lenticular in cross-section.

Stage IV Bifaces. Pressure flaking is the dominant technique used during this stage to regularize the outline of the biface, to produce a regular and centered edge when viewed from the side, and to establish a flaking pattern, if desired (e.g., collateral, parallel oblique, etc.). As a result, the thickness-to-width ratio will be reduced. The lenticular cross-section will be maintained. Artifacts at this stage of production are often called "preforms" (Bradley 1975:6).

Stage V Bifaces. This is the finished stone tool distinguishable from Stage IV by the addition of a hafting element such as side or basal notching.

4.2.1.3 Ground Stone Tools

Analyses of ground stone tools have proceeded along several different lines of inquiry at prehistoric sites in the American West. Considerable attention has been paid to the ways in which ground stone tools were produced and used. This has involved studies of prehistoric quarry production of ground stone tools (Conlee 2000; Rozaire 1983; Schneider 1996; Schneider and Osborne 1996; Schneider et al. 1995; Stone 1994) and experimental analyses of ground stone use wear and replication (Adams 1988, 1989a, 1989b, 1993a). Technological changes in ground stone tools, especially as these have been conditioned by the introduction of agriculture or its intensification, have been an important issue, especially in the American Southwest (Adams 1993b, 2002; Maudlin 1993; Morris 1990; Wright 1994).

Implications of ground stone tool use with regards to sexual division of labor have led to interesting conclusions (Jackson 1991; Jones 1996; McGuire and Hildebrandt 1994; Rucks 1995, 1996). Other topics of note include land-use patterning and its effect upon ground stone tool design (Nelson and Lippmeier 1993), implications of ground stone tool representations for the history of site occupancy (Schlanger 1991), and consideration of ground stone tools as indicators of changes in hunter-gatherer subsistence and exchange patterns (Delaney-Rivera 2001).

Grinding Stones/Milling Stones/Metates are the lower fixed stone platforms upon which *handstones/manos* are moved to grind or process matter. Metates may have one or more flat, slightly concave, basined, or troughed working surfaces, largely determined by the metate's thickness. Grinding areas also can be created on bedrock outcrops. *Handstones/manos* are held in one or both hands and, using various types of motion, moved over a *grinding stone/metate*. Manos often have battered ends resulting from use as hammerstones. Handstones/manos vary in size and shape. *Mortars* are bowl-shaped stones with a central, generally circular depression of varying depth and diameter, within which materials are pounded, crushed, or ground. Mortars often are created in bedrock exposures. *Pestles* are cylindrical/subcylindrical stones of varying length, often with wear at one or both ends, used within mortars to crush, pound, or grind materials. *Hullers* generally are relatively small, tabular stones, displaying use wear on one or both surfaces. As their name implies, their principal function is to hull nuts or seeds. Significant attributes exhibited by ground stone tools include the material(s) from which they are made, their margins (shaped, unshaped), number of facets (unifacial, bifacial, or multifacial), condition (e.g., whole artifact, half specimen, edge fragment, interior fragment), surface configuration (metates: flat, dished, basin; manos: flat, convex, concave), degree of use wear, whether or not a specimen was fire-affected, dimensions, and presence of battering, pecking, and so forth.

4.3 OUTSIDE ANALYSES

Artifacts that are appropriate for analyses which are conducted by specialists outside of the KEC office will be submitted to the appropriate specialists. For site CrNV-03-8903, the following outside analyses may be anticipated due to the site's location, and artifact and feature assemblage: obsidian hydration rim measurement and fine-grained volcanic (FGV) chemical characterization, radiocarbon dating, macrobotanical analyses, and vertebrate faunal analysis.

4.3.1 Volcanic Chemical Characterization and Obsidian Hydration Rim Measurements

Obsidian and FGV artifacts have the potential to be assigned to their points of origin. All obsidian and FGV materials collected will be submitted for analysis. Obsidian artifacts for sourcing and hydration rim measurement, and FGV artifacts for sourcing, will be prepared (cleaned photographed and catalogued) and their provenience and/or particular significance recorded prior to delivery. Obsidian tools will be drawn and photographed prior to being submitted for hydration analysis, because that procedure removes a section of the obsidian, and in some rare instances, may shatter the item. All items sent to subcontractors will be returned to KEC following their analysis.

4.3.2 Radiocarbon Dating

Items that may be submitted for AMS dating to yield absolute dates are organic materials, and include but are not limited to, bone, charcoal, and shell. The *olivella* shell from this site will be submitted for AMS dating, as prior studies have indicated success in dating shells from surface contexts (Fitzgerald et al. 2005). Bone or charcoal may be recovered from feature contexts, and will be submitted should appropriate materials be recovered during data retrieval activities.

4.3.3 Macrobotanical Analysis

Macrobotanical materials recovered from subsurface contexts will be submitted to the Desert Research Institute for identification. These analyses can provide information about prehistoric foodways and plant use, as well as information regarding past environments. When possible, materials identified during macrobotanical studies may also be submitted for radiocarbon dating.

4.3.4 Vertebrate Faunal Analysis

All recovered vertebrate faunal remains retrieved during data recovery will be collected for analysis. Elements identifiable to family/genus/species level will be segregated from those assignable to more general categories such as vertebrate class or a general size class. Following identification, various data will be recorded for each identified specimen, data such as taxonomic identity, skeletal element, side of the body or body segment, portion of the element, adult/juvenile status, and signs of cultural and/or natural modification. These data will be tabulated and summarized. Skeletal element counts and minimum numbers of individuals represented will be determined. Animal bone assignable to general categories will be counted, weighed, and signs of cultural/natural modification noted.

5.0 DELIVERABLES

5.1 DELIVERABLES

Site CrNV-03-8903 has been determined eligible for inclusion in the National Register of Historic Places under Criterion D, only. The treatment measure deemed appropriate to mitigate adverse effects to this resource is data retrieval, which will be accomplished by means of appropriate field investigations and laboratory analyses. The primary deliverable for this project is a final *Data Recovery* report which will meet BLM Standards and Guidelines, follow the treatment protocols outlined in Chapter 4 of this document, and address the research priorities presented in Chapter 3.

All collected materials will be curated at the Nevada State Museum upon acceptance of the *Data Recovery* report by BLM and the Nevada SHPO. KEC has a curatorial agreement with the Nevada State Museum, Carson City, Nevada. All artifacts will be formally accessioned into the Museum's collections. In doing so, KEC will adhere to all requirements for transfer and accessioning as specified by the Museum. These requirements and the current contractual agreement between KEC and the Museum are contained in Appendix C.

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