ASSESSMENT, EVALUATION, AND SIGNIFICANCE: A MANAGEMENT PLAN
FOR TUNNA’ NOSI’ KAIVA’ GWAA

A Thesis

Presented to the faculty of the Department of Anthropology
California State University, Sacramento

Submitted in partial satisfaction of the requirements for the degree of

MASTER OF ARTS

in

Anthropology

by

Angela K. Calloway

SUMMER
2013
ASSESSMENT, EVALUATION, AND SIGNIFICANCE: A MANAGEMENT PLAN
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Department of Anthropology
Abstract

of

ASSESSMENT, EVALUATION, AND SIGNIFICANCE: A MANAGEMENT PLAN

FOR TUNNA’ NOSI’ KAIVA’ GWAA

By

Angela K. Calloway

A mesa within the Humboldt-Toiyabe National Forest (Bridgeport Ranger District) named Tunna’ Nosi’ Kaiva’ Gwaa is rich with features associated with both pronghorn and pine nut procurement. It is inferred that prehistoric use of the area spans at least 7000 years and several sites are representative of the protohistoric era.

This thesis identifies research and cultural themes incorporated into a management plan for Tunna’ Nosi’ Kaiva’ Gwaa. The themes underpinning the management plan set the framework for future studies including eligibility evaluation. It is recommended that Tunna’ Nosi’ Kaiva’ Gwaa be nominated as a District on the National Register of Historic Places, ensuring its preservation and protection as mandated by Section 106 of the National Historic Preservation Act.

_____________________, Committee Chair
David W. Zeana, Ph.D.

_______________________
Date
I dedicate this thesis
in honor of my newborn daughter,
Ellery Quinn Calloway
and in memory of my grandmother,
Mary Bell Harrison.
ACKNOWLEDGEMENTS

I am indebted to many individuals instrumental in my completion of this thesis. I was starting to question if I would ever finish, but the support of family, friends, and my committee encouraged me to not give up.

My committee, David Zeanah and Michael Delacorte, provided guidance and advice along the way including editorial and contextual expertise. I am extremely grateful for their continual support.

Thanks to Cliff Shaw, if it were not for him exposing me to the great “Tunna’ Nosi’,” I would probably still be struggling with a thesis topic. Cliff’s dedication to the area is remarkable, volunteering his time for years piecing together the “Tunna’ Nosi’” puzzle. Cliff has been supporting me since day one, always available for advice and I could always count on him to keep me in check.

Jack Scott, the BRD archaeologist when I started this project, allowed me to pursue my thesis research on the Forest and whose support also never waivered. Thanks to Brian Wickstrom for providing obsidian hydration readings at no cost. My in-laws, Chris and Roger Calloway, for their hard work in the field (and Chris’s editorial expertise). Tom Mills provided helpful advice and his field expertise. In addition, I want to thank the support of the USFS and Caltrans.

A special thanks to my husband, Brent Calloway, who endured numerous weekends away from his “mountains” to assist me in the field. He provided his GIS
expertise and has patiently stood by me while I consistently claimed, “I’m almost finished.” I swear…I’m finally finished…now let’s go hike!

Lastly, I am forever grateful for my cultural mother, Kathleen Heath. She has always believed in me and encouraged me. Her support and guidance through the years has shaped the person I am today. I am extremely thankful for all the time she has invested in me, especially during “the thesis”.

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Chapter 1

INTRODUCTION

The law of the United States of America mandates federal and state agencies to manage and protect prehistoric and historic archaeological remains located on public lands. The United States has a long history of valuing cultural resources. In 1906, Congress passed the Antiquities Act allowing the President of the United States to set aside lands to protect associated antiquities from looters and collectors. No further regulations are promulgated until 1966, when legislation created the National Historic Preservation Act (NHPA), which developed specific guidelines and protocols for protecting cultural resources, and created the State Historic Preservation Offices and National Register of Historic Places (NRHP). More than 100 years of federally mandated protection of cultural resources on public lands throughout the United States, as well as the development of archaeology as an official academic discipline, generated a vast array of information pertaining to prehistoric and historic remains.

The American Indian Religious Freedom Act (AIRFA) became law in 1978 requiring evaluation of policies and procedures in an effort to protect Native Americans’ religious freedom (National Park Service 1998). In 1980, it was directed that clear guidelines be documented for recognition and evaluation of Traditional Cultural Properties (TCP). A TCP is eligible for the NRHP because of its association with cultural practices and beliefs rooted in a community’s history and its importance in maintaining the cultural identity of that community (National Park Service 1998). The
traditional and cultural elements of a community that may contribute to a TCP include the beliefs, customs, lifeways, and practices that have been passed down through the generations (National Park Service 1998). Therefore, a property may be NRHP eligible because of its cultural significance and its role in the beliefs, customs, and practices of a contemporary community. Examples of such property types that may potentially pertain to the thesis area are:

• locations associated with cultural beliefs of a community’s origin and culture-history;
• a location where a community is known to have historically gone and may still go today to perform ceremonial activities;
• a location where a community goes to carry out traditional economic, artistic, or other cultural practices.

The National Park Service (1995) has defined an Archaeological District as, “possessing a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.” Archaeological Districts offer the opportunity to evaluate and manage discrete properties from a large area in a unifying context. A District incorporates ecological, economic, and technological aspects of cultures along with sociological and ideological facets that also play an important role in determining its eligibility as a TCP. The benefits of this holistic approach for managing cultural properties are multifaceted, incorporating several aspects of the natural environment and human activities, and offer the opportunity to understand human activities over a large spatial area.
This research focused on one particular concentration of sites known as Tunna’ Nosi’ Kaiva’ Gwaa (TNKG) – a Paiute term meaning “antelope-dreaming-mountain-place.” Two goals of this thesis are to set up the framework toward the justification that TNKG should be defined as a National Register District and build the case that future studies be directed toward the identification of the area as a TCP. A management plan is designed to facilitate the preservation and protection of the location, as well as set up a framework for future research.

The Study Area

TNKG is located on a 5,000-acre mesa in Mineral County, Nevada. The mesa is located approximately 26 km northeast of Bridgeport, California and 35.5 km southwest of Hawthorn, Nevada (see Maps 1.1 and 1.2 and Figure 1.1), and is administered by the Bridgeport Ranger District (BRD) of the Humboldt-Toiyabe National Forest.
Map 1.1. Map of study area vicinity.
Map 1.2. Map of study area location.
The mesa is located within the western Great Basin, an internally draining portion of the larger Basin and Range Province, characterized by valleys flanked by mountain ranges that run in a general north-south direction. The study area occurs within the Aurora-Bodie volcanic field adjacent to Aurora Crater, a 1.7 km diameter volcanic feature that formed approximately 250,000 years ago (Wood and Kienle 1990). Elevations range from 1,890 to 2,316 meters, although peaks surrounding TNKG reach 2,743 meters. The two main streams bordering the study area are Bodie Creek to the east, Rough Creek to the west, and numerous ephemeral drainages and springs flow throughout the study area.

The climate of the TNKG vicinity is semi-arid with hot, dry summers with average temperatures ranging between 15 and 40 degrees C followed by cool nights. Winters are cold and snowy with average high temperatures ranging between -20 and 5 C.
with cold nights (Halford 2008). Precipitation averages 24.5 inches per year, much of which occurs as snow (Halford 2008). Seasonal extremes in climate strongly affect the type and distribution of plants and animals in the study area.

Two distinct biotic communities, Sagebrush Scrub and Pinyon Juniper Woodland occur in the area, but the latter covers most of the TNKG (Figure 1.2). Flora include single-leaf pinyon (*Pinus monophylla*), juniper (*Juniperus occidentalis*), Great Basin sagebrush (*Artemisia tridentata ssp. tridentata*), low sagebrush (*A. arbuscula*), curly leaved rabbitbrush (*Chrysothamnus viscidiflorus*), wild onion (*Allium sp.*), needlegrass (*Acnatherum spp.*), squirreltail (*Elymus elymoides*), vetch (*Astragalus maculatus*), bitterroot (*Lewisia rediviva*), phlox (*Phlox longifolia*), hawkesbeard (*Crepis sp.*), buckwheat (*Eriogonum ovalifolium*), current (*Ribes aureum*), and wild rose (*Rosa woodsii*). Fauna include mule deer (*Odocoileus hemionus*), pronghorn (*Antilocarpa americana*), coyote (*Canus latrans*), kit fox (*Vulpes macros*), grey fox (*Urocyon cinereoargentus*), raccoon (*Procyon lotor*), bobcat (*Lynx rufus*), mountain lion (*Felis concolor*), badger (*Taxidea taxus*), jackrabbit (*Lepus spp.*), and rodents, while avifauna include sagehen (*Centrocercus urophasianus*) and mountain quail (*Oreortyx pictus*).

Reports and observations note that mountain sheep once summered in this area (Cliff Shaw, personal communication 2012) and wintered nearby (Halford 2008; Hall 1980).
Previous Research in the Study Area

study area, was nominated and included as a District in the NRHP (National Register of Historic Places 2002).

Clifford Shaw, Lands Officer for the BRD, first noted TNKG’s archaeological features on May 12, 1996. He identified several rock corrals and fences, wood fences, rock alignments, hunting blinds, rock rings, wickups, hearths, petroglyphs, a potential prehistoric trail, lithic scatters, projectile points, and pinyon ladders. Additionally, he also identified several historic road segments and camps, including a cabin site.

Mark Swift, District Archaeologist at the time, accompanied Shaw during subsequent field trips over the next year and informally named the area “Mesa Verdi.” They found the rock alignments previously discovered by Shaw to be part of an extensive, but previously unrecorded prehistoric game drive and habitation complex. The potential importance of the site prompted the United States Forest Service (USFS) to sponsor weeklong Passport-in-Time (PIT) volunteer archaeological survey projects in 1997 and 1998. Although the results of the PIT projects were never summarized in a final report, the data collected, as well as Shaw’s site files from his fieldwork as an archaeological volunteer, are available at the BRD office. The PIT volunteers recorded a total of 15 petroglyph sites including “Eagle Feather” consisting of 51 panels, “Spiral Ledge” containing 13 panels, “Lizard Knob” with 12 panels, the “Corral Entrance Petroglyphs” consisting of four panels, and the remaining petroglyph sites each recorded as one panel. One site that was previously recorded by the PIT project was re-recorded for this project.
Shaw served as an archaeological volunteer at the BRD for a decade, following his retirement from the USFS in 1999. As part of his volunteer work, he conducted a number of “intuitive” archaeological surveys within the study area under the direction of the new District Archaeologist Jack Scott, using a Trimble GPS unit and digital camera. Scott contacted the Yerington Paiute Tribe to inquire about the site and received the following email from Marlin Thompson regarding the traditional Paiute name for the “Mesa Verdi” area (September 12, 2006):

D. Scott; Here is a name we came up with for the Mesa Verde area. TUNNA’ NOSI’ KAIVA’ GWAA meaning: antelope-dreaming-mountain-place a place in the mountains where people went to dream and the antelope and where to build the corral and side wings to bring in the herd. A lot of ceremony and prayers were said preparing the place and people to bring a successful hunt. If everything was done in proper manner the people would have plenty of meat from the antelope.

The correspondence suggests that local tribes may still consider TNKG a sacred place. Shaw (2009b) reports evidence of ongoing use of TNKG for traditional purposes in the form of an offering of eagle feathers he observed at a TNKG site in 1996. This thesis reports recent pinyon debris suggesting TNKG is currently used as a gathering area. These signs that local Native Americans still use TNKG for traditional purposes suggest it may be eligible as a TCP. Although this thesis does not evaluate this possibility, it does
recommend that tribal consultation and an extensive ethnographic literature search be conducted to further investigate and determine TNKG’s significance as a TCP.

**Research Potential of the Study Area**

TNKG is likely a location where indigenous people procured two important subsistence resources – pronghorn and pinyon. An early account by Steward (1938) argues that hunting of pronghorn in the Great Basin was often a “communal” activity, as evident from the various rock wall and corral features constructed to drive game. Although archaeological researchers posit that communal pronghorn drives were important to the prehistoric culture of the area, the antiquity of this hunting strategy has been debated. The game drive features at TNKG appear to be one of the more complex systems within the Mono region, as well as the Great Basin, and may provide valuable evidence pertaining to pronghorn hunting, communal drives, and chronology of this subsistence activity.

In addition to game drive complexes, numerous rock ring features occur at TNKG. This area is located within pinyon-juniper forest, and archaeological and ethnographic evidence demonstrate the importance of the pinyon seed as a subsistence staple for indigenous people of the area (Lanner 1981; Steward 1938). TNKG is clearly a pinyon gathering site and further investigation may clarify the intensification, processing strategies, and chronology of this subsistence activity.

Lastly, TNKG contains sites dating after local Native Americans came into contact with European Americans. The post-contact history of this area is well known
and the study area is located near once-prospering frontier towns such as Aurora. The post-contact period represents a significant culture change from the traditional life of the indigenous peoples (Davis-King 1998, 2010; Delacorte and McGuire 1993; Mills 2003; Wall 2009), and TNKG offers a unique glimpse into their acculturation into Euro-American society.

In addition, TNKG may have potential to be defined as cosmological and spiritual landscapes, due to landmarks and certain features, including petroglyphs identified at TNKG. Also, it is potentially a contemporary use area based on evidence of recent activity presumably by local tribes. Further ethnographic research and tribal consultation and interviews will contribute to assessing such associations.

The research effort for this thesis focused on recording a sample of the surface archaeology. A temporary boundary was delineated and the project area was divided into four sampling strata further divided into 200 x 200 meter quadrats that were randomly chosen for survey. A site approach was implemented to assess the age, assemblage content, and data recovery potential at TNKG, particularly regarding occupations relating to game drives, pinyon utilization, and acculturation.

**Developing a Management Plan**

Another objective of this thesis was to develop a management plan for the TNKG study area along with evaluating it for site significance. The Advisory Counsel on Historic Preservation’s regulations, 36 CFR Part 800, mandates that it is the responsibility of federal agencies to identify and protect significant cultural resources
through means of cultural resource management mandated by Section 106. For this management plan, it is recommended that TNKG is eligible as a District on the NRHP based on the combined findings of earlier investigations and the systematic survey conducted for this thesis research. In addition, the management plan initiates discussion regarding the potential of the area as a TCP. To be eligible for listing on the NRHP, a property must be significant, maintain a clear association with a time in history or prehistory, or an ethnic group, and exhibit integrity. The significance of TNKG is highlighted by addressing three research themes that will be used to evaluate the significance of both the individual sites found on the sample survey and TNKG as an entire District. In addition, three cultural themes are introduced that appear pertinent to evaluating TNKG as a TCP in future studies.

Research Themes:
- Game Drives/Communal Hunting
- Pinyon Utilization
- Acculturation

Cultural Themes:
- Cosmology
- Spiritual
- Contemporary Use

Therefore, this management plan with a data recovery element addresses the identification and evaluation of TNKG cultural resources and significance justification of the TNKG sites individually and as a District as a whole.
Summary

This chapter identified the TNKG study area as a potential District and TCP, an approach that will define the inter-relationship between the natural environment and the prehistoric and traditional culture of the area. Chapter 2 presents the historic context for TNKG, providing an overview of previous archaeological and ethnographic research, and reviews the culture history of the region. Chapter 3 offers an in-depth discussion of the research themes used in this thesis. Chapter 4 discusses the survey methods and spatial structure at TNKG while Chapter 5 presents the analyses of the data. Chapter 6 examines the significance of TNKG, followed by Chapter 7, which serves as a data recovery plan to conclude the thesis material. This thesis, therefore, is offered as a plan to guide and direct future studies and will also serve to ultimately protect and preserve TNKG, as mandated under Section 106 of the NHPA.
Chapter 2

PROJECT CONTEXT: PALEOENVIRONMENT, PREHISTORY, HISTORY, AND ETHNOGRAPHY

Previous research in the Inyo-Mono region and wider Great Basin are critical for understanding the temporal, spatial and behavioral attributes of TNKG. This chapter provides an overview of pale environmental, archaeological, and historic era research guiding the present study.

Paleoenvironment

Models of Great Basin climate change began in the 1940s with the work of Ernst Anteves (1948, 1955). These were followed in later times by researchers such as Thompson (1990) and Wigand (1995). Most of these studies divide the Holocene into three climatic periods: Anathermal (9000-7000 BP/warm-moist), Altithermal (7000-4500/hot-dry), and Medithermal (4500 BP-present/cooler-moister). Recent data from pollen cores, tree rings, lacustrine sediments, and packrat middens, however, indicate a more dynamic scenario. This includes a cool-moist early Holocene (ca. 10500-8500), warm-dry climate during the mid-Holocene (ca. 8500-6000), and varied conditions during the late-Holocene (cool-moist from ca. 6000 to 5300 BP; warm-dry from ca. 5300 to 3400 BP; cool-moist from ca. 3400 to 2200 BP; warm-dry and warm-moist from ca. 2200 to 1700 BP; cool from ca. 1700 to 1100 BP; cool-moist from ca. 1100 to 950 BP; arid from ca. 950 to 750 BP; and cool from ca. 750 to 200 BP) (Basgall and Delacorte
Closer to home in the immediate project vicinity, proxy climatic records from Mono and Walker lakes and tree ring data from the White Mountains indicate profound changes around 3800 BP, with Mono Lake reaching its highest stand of the Holocene and the bristlecone tree line descending dramatically (Stine 1995). This was followed around 2000 BP by more arid conditions, with Mono and Walker lakes reaching extremely low levels between 1000 and 600 BP, coinciding with the MCA or climatic warm period (Stine 1995). In spite of these climatic shifts, archaeological data from the south-central Owens Valley suggest comparatively stable settlement intensity during the MCA (Basgall 2008; Basgall and Delacorte 2003, 2011, 2012; Stine 1995).

**Cultural Chronology**

The following chronological sequence follows that of Bettinger and Taylor (1974), the most commonly used sequence in the Mono region. This sequence remains somewhat fluid, however, and is in obvious need of some revision (Basgall and Delacorte 2011, 2012; Zeanah and Leigh 2002). Recent data do much to improve this situation and permit the following chronological sequence for understanding TNKG culture history.

**Mojave Period (pre-5950 BP)**

Assemblages of the Mojave period are generally defined by large bifacial knives, stemmed and concave base (fluted and non-fluted) projectile points, crescents, gravers,
scrapers, choppers, bifaces, and unifaces (Arkush 1995; Basgall 1987, 1989; Basgall and Delacorte 2003, 2011; Basgall and McGuire 1988; Elston 1982, 1986; Hall 1990; Zeanah and Leigh 2002). Common types of projectile points include Silver Lake and Lake Mojave morphologies and Pinto Style forms (Basgall and Delacorte 2012; Basgall and McGuire 1988; Bryan 1980; Gilreath and Hildebrandt 1990; Hall 1990; Jackson 1985; Jurich et al. 2000). Milling equipment is rarely found at sites during this time, indicating a diet with little emphasis on seed resources. Subsistence appears instead to have focused on game. A wide-ranging and mobile settlement pattern is inferred from the diversity in toolstone material sources (Basgall and Delacorte 2003, 2011).

Mojave period sites have been found throughout the Inyo-Mono region (see Basgall and Giambastiani 1995; Basgall and McGuire 1988; Giambastiani 2004), including a 9000 year old site in Mono County (Basgall 1988, 1989; Basgall and Delacorte 2003; Basgall and McGuire 1988). A site adjacent to TNKG, CA-MNO-3126, shows evidence of a Mojave period occupation (Goebel et al. 2008; Halford 2000, 2001) and TNKG also contains a potential Mojave period component, based on a diagnostic projectile point.

*Little Lake Period (5950-3150 BP)*

Assemblages of the Little Lake period are defined by Little Lake or Gatecliff series projectile points (Basgall and Delacorte 2003, 2011; Basgall and McGuire 1988; Elston 1982, 1986; Zeanah and Leigh 2002). In addition to these are several side- and corner-notched point morphologies of similar antiquities (Basgall and Delacorte 2003,
2011, 2012) identified as Fish Slough Side-notched (Basgall et al. 1995) and “thick Elko” types (Gilreath and Hildebrandt 1997). Manos and metates proliferate in the archaeological record during this time, although they are often portable with less intensive shaping than later forms (Giambastiani 2004).

Settlement patterns show extreme residential mobility with camps occupied briefly and sporadically (Arkush 1995; Basgall and Delacorte 2003, 2011; Basgall and McGuire 1988; Bettinger 1975; Delacorte 1990; Delacorte et al. 1995; Hall 1980; Zeanah and Leigh 2002). Subsistence strategies relied on a variety of resources, most notably seeds. Pinyon hulls were found in deposits dating between 3700 and 3200 BP south of Big Pine, CA – the oldest date yet recorded for pinyon use in the eastern Sierra (Jackson et al. 2009; Zeanah and Leigh 2002). Although seeds enter the diet during this time, the emphasis on hunting appears to have remained (Basgall and Delacorte 2003, 2011; Elston 1982; Giambastiani 2004). Extensive trans-Sierran obsidian exchange may have also arisen during this period, with an increase in tool manufacture documented at major obsidian quarries by ca. 4000 BP (Ericson 1977, 1982; Hall 1983; Jackson 1974).

Newberry Period (3150-1350 BP)

Assemblages of the Newberry period are worked by the appearance corner-notched (Elko series), concave base (Humboldt series), and contracting stem (Gypsum) projectile points (Basgall and Delacorte 2003, 2011, 2012; Zeanah and Leigh 2002). Tools are typically formalized and heavily used, consistent with a mobile, curated technology (Basgall and McGuire 1988). Milling equipment also increased during this
time, indicating a growing reliance on plant resources. Other artifacts include bone awls, beads, scapula saws, and basketry winnowing trays (Basgall and Delacorte 2003, 2011; Elston 1982; Zeanah and Leigh 2002).

Occupations reflect residential stability within a mobile subsistence-settlement system, where seasonal base camps were often re-occupied, indicating habitually exploited territories (Arkush 1995; Basgall and Delacorte 2012; Elston 1982, 1986). Settlement shifts were organized along a north-south axis, traversing the length of Owens Valley, with other important resources procured on logistical forays into the nearby mountains (Basgall 1989; Basgall and Delacorte 2003, 2011, 2012; Basgall and McGuire 1988; Delacorte 1999; Delacorte et al. 1995).

Diverse subsistence strategies prevailed during the Newberry period. Although large game remained important, seeds and smaller mammals comprised a large portion of the diet. Obsidian source variability indicates a wide-ranging mobility pattern, but one that was highly regularized, given the consistency in source types and their conveyance across the region (Basgall and Delacorte 2011, 2012).

Three important Inyo County sites with discrete Newberry period deposits are INY-2146, INY-1384/H (Basgall and Delacorte 2011, 2012; Basgall et al. 2003; Bettinger et al. 1984), and INY-30 (Basgall and McGuire 1988; Zeanah and Leigh 2002). The latter two appear to be seasonal base camps occupied by several families and contain significant midden deposits, diverse artifact and ecofact assemblages, and multiple residential features (Basgall and Delacorte 2003; Basgall and McGuire 1988). Large and well constructed structures, with a range of debris implies an emphasis on plant resources
(Basgall and McGuire 1988). Recently, the discovery of 12 residential structures, various intramural features, and other deposits at INY-1384/H has augmented the current understanding of late Newberry settlement (see Basgall and Delacorte 2012).

Two models of late Newberry period settlement have been advanced. The first proposes structured mobility with extensive seasonal movements, where some occupations were centralized for prolonged periods, logistically exploiting surrounding habitats, as seen at CA-INY-30 and recently investigated INY-1384/H (Basgall and Delacorte 2011, 2012; Basgall and McGuire 1988). Support for this argument is found in the frequent caching of artifacts, use of logistical hunting and other ancillary sites, and toolstone profiles indicating a regularized pattern of north-south movement within valleys (Basgall and Delacorte 2012).

The competing model suggests that late Newberry period hunter-gatherers resided in permanent villages, relying on long distance logistical forays and trade to obtain subsistence and other distant resources (Hildebrandt and McGuire 2002; McGuire and Hildebrandt 2005). The discovery of the numerous house features of different age at CA-INY-1384/H supports the former not the village model, as it implies numerous independent events, rather than a single residential event (Basgall and Delacorte 2012). What we know about the Newberry period generally dates to the latter part of the interval, with earlier deposits seemingly smaller, houses rare or absent, and occupation intensity similar to that in earlier (i.e., Little Lake) times (Basgall and Delacorte 2012).
**Haiwee Period (1350 -650 BP)**

Assemblages from the Haiwee period are dominated by Rose Spring and Eastgate series points (Basgall and Delacorte 2011; Basgall and McGuire 1988; Zeanah and Leigh 2002). Plant processing tools are abundant and often less elaborate than those in earlier times, but now include the hopper, small bowl, and bedrock mortars (Basgall and Delacorte 2003, 2011; Elston 1982; Zeanah and Leigh 2002). Pinyon zone and alpine settlements are recorded for the first time, indicating more intensive land-use patterns (Bettinger 1989, 1991).

Plant resources, especially pinyon, increase in importance as does the use of apparently low-ranked small game. Many of those resources were exploited from specialized pinyon and other camps occupied by small groups or families (Basgall and Delacorte 2003, 2011; Basgall and McGuire 1988; Bettinger 1975, 1976; Delacorte 1990; Zeanah and Leigh 2002). Alpine settlements were also established during this period and occupied for likely weeks or even months by multi-family groups during the summer (Bettinger 1991; Delacorte 1990). Flake blank technology prevailed during this time with a marked reduction in toolstone variability, indicating reduced mobility (Basgall and Giambastiani 1995; Bettinger 1977; Bettinger and Baumhoff 1982; Halford 1998a).

**Marana Period (650 BP – Contact)**

Markers of the Marana period include triangular/leaf-shaped, Cottonwood and Desert Side-notch projectile points and Owens Valley brownware pottery (Basgall and

Land-use strategies underwent significant intensification during the Marana period (Basgall and Delacorte 2003). Numerous habitats were exploited, including upland, dryland, and wetland biomes supporting a diverse resource base (Basgall and McGuire 1988). Intensive pinyon procurement incorporating green cone processing is evident, with radiocarbon assays in the Sherwin Summit area, north of Bishop, suggesting a date 300 to 400 BP for the inception of this practice (King and Hildebrandt 2009). High-altitude camps remained in use throughout this interval, their occupation linked, perhaps, to rising populations (Bettinger 1991).

**Ethnography: The Mono-Paiute**

The Mono Basin and surrounding area were utilized by many different groups. These include Paiute and Shoshone speakers from Walker, Smith, Mason, and Owens valleys, Washoe groups from the north, and Miwok peoples from the west (Fowler and Liljeblad 1986; Halford 1998b; Hall 1980). Interactions between these groups were extensive, the cordial relations between them incorporating intermarriage, defense alliances, trade, casual visiting, and feasting (d’Azevedo 1986).

The seasonal round dominated cultural life. Thus, the cluster of households residing together during winter months would disband at other times into smaller hunting and gathering parties or independent families to exploit seasonal resources such as deer,
pronghorn, bighorn sheep, hares and rabbits, grass seeds, roots, tubers, fruits, pine nuts, fish, fowl, and insects (Davis 1965; Fowler and Leljeblad 1986). During the spring and early summer, people resided along streams, moving to meadows and lakeshore areas later in the summer (Davis 1965). Hunters traveled to the Sierran uplands and Jeffrey pine forest for deer and sheep, and to trade with adjacent populations during this time. The caterpillar harvest was a signature event every other year, whereas kutsavi, or brine fly-larvae were available every summer (Davis 1965; Fletcher 1987; Steward 1938). During the late summer and early fall rabbit drives, antelope drives, and the pine nut harvest began. These events were often organized as multi-day festivals known as fandangos, with people traveling from across the region to attend (Davis-King 2010; Steward 1938).

Walls and corrals made of either sagebrush or rock were often used to drive and trap pronghorn (Arkush 1995; Hall 1990; Hockett and Murphey 2009). Documents describe 20-50 men needed for a successful communal drive, with several additional days of travel and ceremonial events before the beginning of trap construction which could take up to a week (Hill 1938). Some of Steward’s (1938) ethnographic accounts document this as a winter event, where large groups of people drove the pronghorn into a corral, most on foot with some on horseback. Other accounts describe smaller drive events of approximately 10 men using fire to drive pronghorn into a post corral and brush (Steward 1938). Shamans, or priests, who used magic to cure the sick or control events, typically managed communal antelope hunts. Several days were spent singing before the men would spread out over miles of countryside to begin the slow drive to the corrals
(Steward 1938). After a herd was corralled, the men would start killing pronghorn sometimes six at a time. Common methods of killing included shooting with arrows, clubbing, or running them to exhaustion. Women and children might also participate in communal drives, with women later cutting and drying the meat (Egan 1917; Steward 1938).

Pine nuts were another important food that could be stored and provided an important winter staple. Cropswere, however, unreliable from one year to the next, requiring travel to sometimes distant pinyon groves (Davis 1965; Fletcher 1987; Lanner 1981). If crops were poor, pinyon camps were abandoned after the harvest for lowland settlements, where most of the food consumed consisted of stored pine nuts, roots, and seeds (Bettinger 1976; Steward 1938). Pinyon groves were purportedly owned by districts or families in Owens Valley, but others might be invited to harvest on family plots (Steward 1933, 1938, cf. 1970).

**Contact Period (ca. 1800-1900)**

The lifeways of eastern Sierran native peoples were virtually untouched until the onset of European exploration during the early nineteenth century. With the discovery of gold, Euro-American settlement expanded into the western Great Basin and eastern flank of the Sierra Nevada, forever changing the traditional lifeway and natural environment of the region. Pushed from their traditional territories, native populations sought to co-exist with an unfamiliar Euro-American culture. Disruption of the native lifeway ensued from the development of Euro-American settlements, lumbering, grazing, and overhunting.
 Massive amounts of lumber were cut to operate mines, pinyon groves were destroyed, animal habitats altered, and the hydrology forever changed (Malouf and Findlay 1986). Subsistence and material culture were among the first elements of the indigenous culture to change, although other elements of traditional social organization, religion, and subsistence were retained (Davis-King 1998, 2010; Delacorte and McGuire 1993; Wall 2009).

Trade between indigenous and Euro-American people was perhaps the earliest exchange between cultures, but a market/monetary system followed soon thereafter, as wage-labor and dependency upon Euro-American goods became customary (Davis-King 1998, 2010; Delacorte and McGuire 1993; Mills 2003). Traditional milling equipment remained in use, given a lack of suitable replacements, and women continued to weave basketry as a source of cash income (Davis-King 1998; Delacorte and McGuire 1993; Wall 2009). Flaked stone tools, however, were immediately replaced with glass and steel (Delacorte and McGuire 1993; Mills 2003; Wall 2009). Thus, ground stone occurs commonly, within historic era assemblages, but other elements of material culture less frequently (Davis-King 2010; Delacorte and McGuire 1993; Jackson et al. 2009).

Wikiups maintained a traditional domed appearance, but modern material was often incorporated until the late 1920s or early 1930s (Delacorte and McGuire 1993; Wall 2009).

Trade and subsistence patterns were probably altered by the 1860s (Davis-King 2010). Prior to 1862, accounts described the Indians as healthy and friendly, but shortly thereafter western food, medicine, tools, and wage labor were introduced. Reservations
were established in 1859 at Pyramid Lake and Walker River, but many natives refused to leave (Fowler and Liljeblad 1986). The government set aside land in Mono and Inyo counties for the creation of a reservation, but Euro-Americans sought to drive off or kill the native inhabitants (Davis-King 2010). Nonetheless, many Native Americans remained or returned to the region and survived by adapting to the Euro-American lifestyle (Davis-King 2010).

**Euro-American History (ca. 1826)**

The first known explorer and trapper to traverse west into California was Jedediah Smith. His expedition into California occurred during 1826 via the Inconstant River (a.k.a., Mojave River). His return trip in 1827 took him north of the Great Salt Lake for provisions (Fletcher 1987). Much speculation surrounds the exact route of Smith’s return east, and it is unknown whether he crossed the Sierra Nevada at Donner or Walker Pass (Fletcher 1987).

Joseph R. Walker led an expedition down the Humboldt River over the Sierra Nevada and returned via Owens Valley between the years 1833 and 1834 (Malouf and Findlay 1986). There is also some speculation that Walker made his way into the Mono Basin during this initial expedition, yet there is nothing to confirm such a route until 1854, when Walker organized a party to prospect for gold (Fletcher 1987). Walker and his men reacted violently to encounters with Native Americans (Malouf and Findlay 1986).
In the 1840s, John C. Fremont made several expeditions to Utah, Nevada, and California. On his second excursion, Fremont and 39 men crossed the Sierra Nevada somewhere near Bridgeport Valley and were forced to abandon his famed howitzer in the vicinity due to the difficulty of traveling across the Sierra Nevada in winter (Davis-King 2010; Wedertz 1978). Documentation puts Fremont and his crew in the TNKG vicinity around January 24, 1844, where he allegedly camped on Rough Creek which forms the western boundary of TNKG. Fremont may have entered the Bridgeport area via Aurora Canyon, where he noted a dam built by the Indians to catch fish (Davis-King 2010).

The first group of Euro-American emigrants crossed the Sierra Nevada in 1841 and was soon followed by a steady stream of settlers crossing into California in search of gold after its discovery in 1848 (Wedertz 1978). Conflict between the emigrants and indigenous peoples ensued, and in 1852 Lt. Tredwell Moore of the U.S. Army led a pursuit to find and punish Chief Teneiya and his band of Yosemite Miwok for supposedly killing and injuring white prospectors (Fletcher 1987). Lt. Moore’s expedition may have led him to be the first white man to discover the Mono Basin, although direct evidence of this is lacking and other explorers and prospectors likely traversed the area. Moore’s exploration of Mono Basin led to the first published accounts and maps of the area, a catalyst to white settlement in the basin (Fletcher 1987). In 1855, the first survey of Mono Basin was undertaken by A.W. von Schmidt and again in 1856 taking him south into Owens Valley (Fletcher 1987).

Josiah Dwight Whitney was the first State Geologist of California (1860-1873) to survey the area (Davis-King 2010). He noted Indians while traveling from Aurora to
Sonora Pass, typically noting in his journal whenever he observed them (Davis-King 2010). The following summary emphasizes the history of Euro-American settlements nearest TNKG, with Aurora located approximately three miles southeast and Bodie nine miles southwest. Road construction and lumbering operations for these towns had a direct effect on TNKG, where pinyon was cut for various purposes (Shaw 2009a). The presence of these towns altered the TNKG inhabitants forever, as the culture and environment changed around them.

**Aurora**

Gold and silver were discovered in the region on August 22, 1860, and the town of Aurora was founded in the same year (Shaw 2009b). Most of the town’s inhabitants arrived for employment in the mines and mill, but others came to open businesses. Aurora reached its peak population of approximately 5,000 residents in the summer of 1863, when the town supported over 40 stores, almost 50 saloons, seven restaurants, and four hostels (Shaw 2009b). At the height of production in 1864, 14 mills with 120 stamps were operating (Shaw 2009b; Stewart 2004). Due to falling stocks and failing mines, Aurora’s population fell from 5,000 to only 280 residents between the summer of 1863 and 1870 (Federal Census, 1870). After a brief resurgence in mining during World War I, Aurora was completely abandoned when the remaining mines, mills, and post office closed in 1919 (Shaw 2009b). Although the town was completely destroyed by commercial brick contractors in the 1950s, the site was added to the National Register of Historic Places in 1974 (Shaw 2009b).
Bodie

The town of Bodie, California is located 13 miles southwest of Aurora near the Nevada border at an elevation of 8375 feet. Gold was discovered at Bodie in 1859, but the camp was minimally populated during Aurora’s boom years in the 1860s (Wedertz 1978). Between 1877 and 1881, however, Bodie became a prolific mining town. In 1878, the population reached 1,200 residents, with 175-180 cabins and dwellings, several saloons, six restaurants, and three general stores, eclipsed in 1881 by a population that may have reached 10,000 residents (Watson and Brodie 2000). Bodie was a melting pot of Euro-American, Chinese, Mexican, and Native American peoples and had a reputation as one of the roughest towns in the West (Watson and Brodie 2000).

The population of Bodie slowly diminished after 1881, until the town was deserted by 1935 (Watson and Brodie 2000). Bodie was controlled by the state of California and in 1964, became a State Historical Landmark and a National Historic Site. Today, Bodie is a ghost town with 175 buildings surviving in a “state of arrested decay” maintained as a California State Park (Watson and Brodie 2000).

Roads

Routes across the Sierra Nevada were used for aboriginal trade and other purposes, circumventing the most treacherous terrain. Many of these later became wagon roads, highways, and railroad corridors. During the 1860s, six new roads were built to Aurora from places like Carson City, Monoville, Bodie, Bridgeport, Owens Valley, and Sonora.
During Aurora’s most prosperous years, five roads were built to and from Bodie (Shaw 2009b). Toll roads were first constructed during the Aurora years and eventually connected to Bodie and the outside world. Most of these roads followed earlier foot trails employed by Native Americans and early explorers. The roads permitted owners to collect tolls and were eventually purchased by local governments (Wedertz 1978). The roads to Aurora are described below as well as a reference to “Table Mountain” presumably the same mesa or landform as TNKG.

“In coming from Aurora to Bridgeport in the early 1860’s the traveler went two miles down Esmeralda Gulch, then three miles southwesterly up Bodie Creek, then three miles to the head of Rough Creek and across Table Mountain. It was here that Dave Hays froze several toes, held up in a cave, and decided to build a better route to Aurora down the East Walker Canyon. From Table Mountain the road went east three miles to the head of Long Canyon (Aurora Canyon) and down it mouth eight miles and west one mile to the bank of the East Walker River at Bridgeport. The promoter and owners of this toll road were I. Garrison, J.M. Garrison, A.J. Severe, J.N. Dudleston, G. Raymond, J.B. Hawkins, D. H. Haskell, M. Bixby, and Jacob George” [Wedertz 1978:64-65]).

A road built from Carson to Aurora and Bodie in 1879 had eight daily stage stops (Cain 1961). Two stage stops built along the road, Nine Mile Station and Fletcher, are near TNKG. Nine Mile Station still operates today as a privately owned ranch. Fletcher Station was halfway between Nine Mile Ranch and Aurora and consisted of a post office
and telephone switchboard operator (Stewart 2004). It is visible from one of the TNKG sites.

Lumbering

Because pinyon wood burns extremely hot, it furnished much of fuel used in Aurora homes, brickworks, stamp mills, and mines (Cain 1961; Davis-King 2010; Shaw 2009b; Wedertz 1969). In the 1860s, much of this wood was purchased from local Paiutes, but during the 1870s and 1880s, many Chinese were employed as woodcutters to supply the mills at Bodie and Aurora (Shaw 2009b; Stewart 2004). Most of the Chinese population arrived from Virginia City and settled in Bodie, although many wood camps were located around Bodie and Aurora, where small stone cabins were erected. Remnants of such cabins are still visible around Rough Creek and Clark Canyon (Wedertz 1969). Chinese woodcutters also resided at TNKG and an adjacent area known as China Camp (Cliff Shaw, personal communication 2007). Much of the cordwood cut for the mines and mills came from the pinyon woodlands, critical and sacred to the local Paiute (Cain 1961; Davis-King 2010). This encroachment eventually led to retaliations by some Native American that sometimes ended in murder (Davis-King 2010; Fletcher 1987).

Conclusion

The cultural-history of the Mono region, from its first early Holocene inhabitants to the mining settlements of Aurora and Bodie, provides a framework and context for this
thesis. Information from TNKG can be used to refine our current understanding of culture-history. Thorough recording and limited testing of the site would substantially enhance our understanding of diachronic subsistence-settlement patterns at TNKG and elsewhere in the region. Detailed ethnographic analysis of TNKG would likewise enrich our understanding of the ethnographic Paiute and interactions with Euro-American settlers. This has the potential to expand our understanding of acculturation processes at TNKG and the wider Great Basin and beyond.
Chapter 3

RESEARCH THEMES: COMMUNAL PRONGHORN HUNTING, PINYON
UTILIZATION, AND ACCULTURATION

Prehistoric archaeological sites are evaluated as eligible for the NRHP if they have potential to yield important data for understanding prehistory. The previous chapter defined the context of the project, providing background information to which the research potential relates. This chapter focuses on the primary research themes specific to TNKG: (1) communal pronghorn hunting, (2) pinyon utilization, and (3) acculturation. The three themes form the framework for evaluating the research potential of TNKG addressed later in this thesis.

Research Theme I: Communal Pronghorn Hunting

TNKG is a complex of wood and stone features presumably used for driving pronghorn. If so, associated surface scatters provide a direct record of that activity. The organization of driving game as a communal event is well documented in the ethnographic record (Steward 1938, 1941), but the prehistoric development of communal hunting is poorly understood. This section outlines pronghorn ecology and environment, hunting methods and archaeological indicators, and game drive trap spatial and temporal distribution.
Pronghorn Ecology and Environment

Understanding pronghorn ecology and evolution are essential to understanding the strategies Native Americans employed for hunting pronghorn. The life expectancy of pronghorn is generally six to eight years but can be longer or shorter depending on climatic and other conditions (Frison 2004). Females tend to birth twin fawns, which helps populations rebound quickly after mass kills (Frison 2004). Pronghorn are easy to spot in open areas, since they rely on excellent vision and extreme speed for defense, probably because they co-evolved with extinct predators such as the American cheetah (Micracinonyx trumani) (Byers 1997). Pronghorn avoid slopes, forested areas, and obstacles. They have difficulty crossing fences, although does usually try to crawl through or underneath while bucks occasionally will jump over a fence they are forced to traverse. Pronghorn generally migrate along consistent and predictable routes during the spring and fall, making it possible for hunters to intercept herds (Frison 2004; Hockett and Murphy 2009).

Climatic variability over time may have affected pronghorn densities sufficiently to influence prehistoric hunting strategies. Paleoenvironmental data indicate that Holocene climate has fluctuated between generally wet, “good years” and generally dry, “bad years” (Elston 1982). During periods of unfavorable or “bad years,” lack of summer precipitation, the quality of the growing season, and winter severity may have had devastating effects on pronghorn gestation periods and reproduction rates. Prolonged spans of such bad years over the Early and Middle Archaic may have reduced pronghorn
population densities. Pronghorn populations may have surged during a spate of good years at the beginning of the Late Holocene (Broughton et al. 2008).

Such climatic fluctuations and differences in seasonality have been correlated with archaeological artiodactyl abundances across western North America. Late Pleistocene and Early to Middle Holocene archaeological sites generally exhibit relatively low ratios of artiodactyl to leporid remains (see Broughton et al. 2008). “These indices suggest that artiodactyls occurred in low densities from the terminal Pleistocene through the middle Holocene, with substantial increases occurring during certain stretches of the late Holocene” (Broughton et al. 2008:1933). These data suggest that pronghorn mass hunting may have been infeasible or rare until the Late Holocene, when pronghorn populations reached densities making drives worthwhile (Byers and Hill 2009).

In contrast, Hockett (2005) argues that ratios of artiodactyl versus leporid remains at individual sites under represent the actual abundance of large game, especially during the Middle-Late Holocene transition. Based on analysis of depositional rates of faunal remains in cave deposits, Hockett argues that artiodactyl hunting was constant throughout the Holocene. He further contends that the proximity of Archaic dart point accumulations to Late Prehistoric drive fence complexes in northeastern Nevada suggests that the antiquity of communal hunting of pronghorn extends back at least to the Middle Holocene.
Pronghorn Hunting Methods and Archaeological Indicators

One ethnographically documented method of hunting pronghorn incorporated the use of game drive facilities. Hunts utilizing these facilities, at least occasionally, employed relatively large numbers of people to construct and repair fences, drive, dispatch, and butcher antelope en masse. Archaeological remains of three types of drive facilities have been identified: fences, corrals with wings, and corrals with hunting blinds and wings (Jensen 2007; Murphy and Frampton 1986; Pendleton and Thomas 1983; Raymond 1982). These were usually constructed of juniper or pinyon branches, stackedstone, or combinations of the two. Corrals contained extensions of V-shaped walls that often angle at the point of contact between the wing and corral entrance (Hockett and Murphy 2009). Most archaeologists assume these features pertain to communal hunting events, undertaken because of the social opportunities offered by communal gatherings of people (Hockett et al. 2013; Thomas 1983). However, direct archaeological evidence of mass butchery of pronghorn or nearby social gatherings has rarely been reported at Great Basin sites.

Another hunting method was the surround, which was conducted like a drive without use of corral features. Hunters would hide behind rock blinds, and then close in on the herd until they were within shooting range. Ambushing was a similar method but could be conducted either by individuals or small hunting groups. Hunters would hide, sometimes in blinds, near where pronghorn frequent (Hockett and Murphy 2009).

All of these methods could have produced similar archaeological traces, but several archaeologists have proposed distinguishing features. Hockett and Murphy (2009)
argue that projectile point concentrations are the recognizable signature of drives, even if associated fences and pens have not preserved. Hockett (2005) suggests that kill spots within a corral or from a surround should possess a higher number of projectile points than from ambushing sites and should have a combination of the following indicators: a) tightly clustered projectile points; b) 20 or more diagnostic points, or points with impact fractures; c) point tips; d) point type uniformity; e) raw material similarity; and f) high tool to flake ratio with minor amounts of debitage. Although similar assemblages may accrue from repeated use of the same spot for hunting, Hockett (2005) suggests that palimpsest should be identifiable as small concentrations of projectile points within a large and diffuse scatter of artifacts.

By contrast, Jensen (2007) argues that projectiles may have been unnecessary for drives using fences and corrals because trapped pronghorn were often simply clubbed, accounting for the large number of traps that appear, on the surface, to lack point assemblages. An alternative explanation for point concentrations is that they represent locations where points were repaired and manufactured on the spot to gear up for surround or ambush opportunities (Zeanah and Elston 1997). Evidence of a retooling site includes: a) uniformity of point types; b) step, burination, and fluting fractures; c) retouch along point margins; d) large numbers of detached point barbs, ears, and haft elements; e) pressure, notching, and alternate flakes in debitage assemblage; and f) large number of point distal fragments (Zeanah and Elston 1997).

Archaeological bone beds have been recognized as a signature of pronghorn drives on the Great Plains (Fenner 2009; Lubinski 2013). Such faunal assemblages could
result from multiple, palimpsest encounter hunts instead of from a single mass butchery event (see Lubinski 2013). However, palimpsest accumulations would be distinguishable from mass kill events, if the faunal assemblage contains sufficient individuals to construct mortality profiles (Byers and Hill 2009) and sample isotopic ratios (Fenner 2009).

Spatial and Temporal Distribution of Trap Complexes

Various trap complexes have been observed throughout the Great Basin, but most occur in one of four geographic areas: western, central, and northeastern Nevada, and the Mono region of Eastern California. This discussion focuses on previous research within northeastern Nevada and the Mono region, where game drive complexes appear to occur in greatest densities. The chronology of trap complexes is debated, but the co-occurrence of points with traps leads many researchers to suggest that the use of traps began in the Middle Holocene (approximately 5000 BP) and continued until after Euro-American contact (Arkush 1995; Hall 1990; Hockett 2005; Jensen 2007; Murphy and Frampton 1986; Parr 1989; Pendleton and Thomas 1983; Raymond 1982; Thomas 1988; Thomas and McKee 1974).

Various investigators in northeastern Nevada have examined a number of corrals and point concentrations. The densest concentration of corrals to date is the Spruce Mountain Trap Complex (SMTC), which includes corral features associated predominately with arrow points, and older, isolated, but nearby dart point concentrations (Hockett and Murphy 2009). Hockett and Murphy argue that the isolated dart point
concentrations are probably kill spots associated with older, now decayed trap facilities. Based on the span of time represented by the projectile points in the SMTC, Hockett and Murphy see evidence that a communal hunting strategy began approximately 5000 to 3500 BP and continued relatively unchanged until historic times.

However, other analysts in the region (Jensen 2007; Schroedl 1994; Stearns and Peterson 1987; Zeanah and Elston 1997), point out that isolated dart point concentrations are retooling stations and overlooks, not kill spots, and do not appear to represent a communal hunting strategy. Jensen (2007) examined 34 corrals, noting that they often do not appear to be directly associated with large numbers of points. The most recent radiocarbon dates from several of the traps was late prehistoric or historic times, whereas the oldest was approximately 1,500-1,800 years old, suggesting that ancient traps might be preserved had they been constructed. She also argued, based on the diagnostic point types represented at 22 point concentrations dating between 5000 BP and 1300 BP, that dart point concentrations appear to be related to ambush or surrounds, rather than drives.

Because of opposing interpretations regarding the function of dart point concentrations with corrals, caution should be exercised in inferring the antiquity of communal hunting strategies from projectile point concentrations alone. Further research should be directed at accumulating evidence that such sites are indeed associated with older, now decayed trap facilities.

The Mono region is saturated with trap complexes. Many features have been noted, but few thoroughly investigated. For example, during his seven summers as a USFS archaeological volunteer, Cliff Shaw (2008) found and documented over 40 game
drive and other game procurement or hunting features on the Nevada portion of the BRD, although these have never been fully recorded. Among the better documented examples within the Mono region, site CA-MNO-2122 is a major trapping area consisting of four corrals and 10 drive features, where the trap facilities were likely used for the past 1,400 years with three prehistoric facilities and one historic mustang trap (Arkush 1995). The historic mustang trap dated AD 1880-AD 1920, suggesting that Paiutes incorporated traditional practices with new resources and technology after contacting Euro-Americans. There is documented evidence of Euro-American use of this trap as well (Arkush 1995).

Similarly, the Huntoon Trap Complex in Mineral County, Nevada comprises features dating to three major episodes from the Archaic through Late Prehistoric, suggesting a prolonged subsistence tradition (Parr 1989). Hall (1990) discovered the Anchorite Pass Site Complex in the Walker Basin, dating between 2500 and 1500 BP. Kill sites, butchering sites, pinyon processing sites, and habitation sites are all represented at this complex. This complex included a bone bed categorized as a butchering locale, where pronghorn carcasses were processed to extract marrow and to remove the brain/tongue in preparation to move the carcass elsewhere (Hall 1990). Other trap complexes identified in the area include the Whiskey Flat Pronghorn Trap Complex and Excelsior “Deer” Trap (Wilke 1986), the Teels Marsh Antelope Trap (Giambastiani 2011), and Alkali Lake (Switalski 2006). Figure 4.1 shows the locations of game drive trap complexes in the Mono region.
Map 3.1. Previously investigated game drive trap complexes in the Mono region.

A=TNKG; B= Excelsior “Deer” Trap; C=Whiskey Flat Pronghorn Trap Complex; D= Anchorite Pass Site Complex; E= Teels Marsh Antelope Trap; F= Huntoon Trap Complex; G= CA-MNO-2122

*Tunna’ Nosi’ Kaiva’ Gwaa*

An intuitive survey of TNKG began in 2001, when Cliff Shaw independently documented the prehistoric and historic features in the project area. Shaw located and plotted various prehistoric and historic features and artifacts within the boundaries of the area surveyed for this thesis. Some of these features consist of several rock wall alignments and corrals (some of which overlap) and may be representative of re-use over time (cf. Hockett and Murphy 2009). The topographic location of corrals and rock wall
features is in relatively flat portions of the canyon corridor, ideal terrain for driving pronghorn. The features also occur at a natural constriction where the steep canyons of Bodie and Rough Creeks come together, thus reducing the amount of wings needed to funnel game in traps. Nonetheless, rock wall and wooden fence features have been noted and in some locations, wood pieces are still intact within and around the rock wall structure. Some of the wood has been burned at the base indicating that fire, not stone or metal tools, was used to cut stems and logs. Various smaller rock alignments and rock cairn concentrations have also been observed throughout TNKG. These may be remnants of a surround or ambush strategy not directly associated with the game drive corrals and include approximately 15 hunting blinds, most of which are situated along ridge tops or knolls. TNKG contains numerous petroglyphs that are commonly interpreted as hunting motifs (Heizer and Baumhoff 1962; Thomas 1983). Many of the panels were recorded during a USFS PIT volunteer investigation.

Discussion

What communal hunting is and the number of people required for a communal event needs to be defined. Communal hunting is often equated with large-scale cooperative events as documented in ethnographic records. However, some mass hunting may have required only a few individuals (also documented in the ethnographic record). Thus, for future discussion, pronghorn hunting will be defined as either small scale, of either an individual family or small family groups, or large scale, consisting of multiple families.
Much debate has surrounded the longevity of communal hunting and game drive facilities in general. Elsewhere in the Great Basin, it has been proposed that the communal hunt via game drive facilities is a 5000 year old tradition based on projectile point concentrations and assumptions that Middle Holocene populations were sufficiently large, dense, and organized to assemble a large number of people for a cooperative endeavor (Hildebrandt and McGuire 2002; Hockett 2005; Hockett and Murphy 2009; McGuire and Hildebrandt 2005). However, evidence in the Inyo-Mono region suggests that population densities were low and organized as small and extremely mobile bands until at least the Late Newberry Period. In addition, although populations were dense and semi-sedentary after 1300 BP, they may have been organized as independent family households rather than village communities. The village settlements reported for the ethnographic Owens Valley Paiute were likely a recent result of Euro-American assimilation (Basgall and Delacorte 2012). The degree to which subsistence-settlement patterns changed through time in the Inyo-Mono region suggests that the organization of “communal” drives was likely similarly variable.

Hockett et al. (2013) constructed a mock facility in order to calculate the costs associated with building such features. They concluded that it took a great deal of time and calories to build, such that it would require numerous individuals to build such structures in an adequate time frame or take fewer individuals years to construct. Ethnographic accounts state that construction only took a few days, although the number of people involved is unclear (Wilke 2013). Hockett and colleagues (2013) experimental work was modeled on a large prehistoric trap; the construction of smaller facilities would
have taken less time and effort. Could it be that traps gradually accrued over time, starting as small facilities that eventually expanded to accommodate a hundred or more people in a large communal event? If that were the case, then it would be expected that the original facilities would be re-used through time and not abandoned unless pronghorn were no longer present. Alternatively, construction of expensive trap facilities may not have been worthwhile until larger human populations in late prehistory made it possible to assemble a large group of people.

Another consideration is changes in hunting technology, such as the bow-and-arrow, which allowed for more efficient hunting by individuals and could have changed the dynamic and necessity for game drives (Basgall and Delacorte 2012). The advantage of game drive facilities and the effort expended to build them was necessitated by the difficulty in capturing or shooting pronghorn. The introduction of the bow-and-arrow would have presumably lessened the need for game drive facilities. So, why do such facilities persist during the late prehistoric period when the bow-and-arrow was an efficient and available weapon? It seems that large-scale communal drives were not necessarily, if at all, about calories, but rather about an important practice serving numerous social purposes, especially as populations were expanding.

I expect that pronghorn hunts and drives prior to 1350 BP were conducted either by small bands or logistic task groups during their seasonal round. These groups could have used either surround or ambush methods, although they may have constructed blinds, small fences or corrals to facilitate the endeavor. Any wooden facilities are unlikely to have been preserved, but Jensen’s (2007) research in northeast Nevada shows
the potential that some could date to late Newberry times. Evidence of pre 1350 BP strategies should be found in concentrations of Archaic type projectile points and bone beds. A band temporarily residing at TKNG would likely have processed and consumed the pronghorn at a nearby campsite, leaving the kill area barren of evidence for butchery or tool maintenance. In contrast, a logistical party would likely have partially processed the game near the kill location before transporting it back to a more distant base camp outside TNKG.

Archaic dart point concentrations could be interpreted several ways: 1) a palimpsest of projectile points deposited at a hunting location over time, a likely scenario if a hunting locale was recurrently used by individual hunters; 2) remnants of an ambush kill location, surround, or small scale drive conducted by a band or family group; 3) a retooling or repair activity area occurring in an overlook or short-term campsite.

After 1350 BP it is expected that larger groups started temporarily residing at TNKG for the communal mass driving of antelope, necessitating the construction of larger trap facilities. Archaeological evidence should indicate a mass drive and kill conducted by a relatively large groups of people engaged in a cooperative “communal” endeavor. Existing wooden corrals, wings, and fences at TNKG will probably date to either the late prehistoric or historic periods. Arrow point concentrations are likely to occur at kill locations, closely associated with the pens of these features. Evidence of pronghorn butchery and consumption should be evident in campsites and domestic features situated near TNKG kill localities. Evidence of retooling, if any, should be found in the same nearby occupation sites.
At TNKG, then, we can expect three types of pronghorn hunting sites: 1) small scale hunting, 2) large scale communal, and 3) logistical task group. Small scale hunting should date prior to 1350 BP with habitation camps at TNKG and should contain butchering areas and retooling stations near those camps. Large-scale communal sites should look similar to small scale hunting sites, but post-date 1350 BP. Bone beds should contain numerous pronghorn in comparison to small scale butchering locales. Many of the families likely dispersed after communal events, such that habitation residues would reflect that of one or a few families or more ephemeral appearances. Logistical camps should be small, located near kill sites, and contain evidence of partial butchering and point retooling.

**Research Theme II: Pinyon Utilization**

Singleleaf pinyon (*Pinus monophylla*) was an important resource used as a storable food, fuel, and construction material, as well as a medicinal and ceremonial plant. This section outlines pinyon habitat distributions, spatial and temporal variations, logistical versus residential use, and archaeological indicators.

**Environment and Distribution**

The distribution of plant communities shifts when environmental conditions change. Pinyon was restricted to the Mojave Desert during the Pleistocene (pre-10,000 BP) and expanded northward and upslope throughout the Early (10,000-8000 BP) and Middle Holocene (8000-4500 BP) (Grayson 1993; Halford 1998a). During the early Late
Holocene (4500 BP-present), western juniper began to expand into its modern range, with pinyon advancing rapidly to its modern limits about 1,400 years ago (Halford 1998a).

Some of the earliest pinyon remains in the western Great Basin were discovered in a packrat midden from the White Mountains dating 8790 BP (Grayson 1993; Halford 1998a). However, pinyon did not arrive in the Stillwater Range, in north central Nevada, until approximately 1,250 years ago (Kelly 2001; Wigand and Nowak 1992). Halford (1998a) reconstructed the paleoenvironment of the Dry Lakes Plateau in the Bodies Hills, adjacent to the TNKG study area, on the base of packrat midden data. His data indicate that precipitation levels were relatively high and winter conditions mild. These are ideal conditions for pinyon, leading Halford to surmise that pinyon was probably available in the area by 4950 BP (Halford 1998a).

**Spatial and Temporal Variation in the Great Basin and California**

Pinyon camps typically consist of lithic and ground stone artifact surface scatters and rock ring features from which few radiocarbon dates or pinyon macrofossils have been obtained. As such, demonstrating when prehistoric use of pinyon began has relied heavily on statistical associations of artifact assemblages and obsidian hydration readings within pinyon woodlands (Bettinger 1976, 1989). The inception of pinyon use appears to vary across the Great Basin, with evidence placing it anytime in the last 6000 years (Grayson 1993; Lanner 1981; Rhode and Madsen 1998; Thompson and Hattori 1983; Zeanah 2002). In Owens Valley, the oldest pinyon hulls thus far found in archaeological deposits date between 3700 and 3200 BP, but were in a lowland site outside the pinyon
zone (Jackson et al. 2009; Zeanah and Leigh 2002). Reynolds (1996) argues that pinyon utilization began as early as 9000 BP, with more intensive use by 5500 BP. Other researchers also contend pinyon was an important resource for at least 5,500 years in the Bodie, Truman Meadows, and Huntoon Valley (Hall 1980; McGuire and Garfinkel 1976; Reynolds 1996).

However, pinyon camps and caches are lacking in the archaeological record of Owens Valley until 1350 BP, suggesting the ethnographic pattern of intensive pinyon exploitation did not develop until then (Bettinger 1976, 1977, 1989; Delacorte 1990). For example, Crater Middens, a centrally located lowland site occupied year round, contained no pinyon remains, whereas pinyon camps such as Pinyon House served for the intensive procurement of pine nuts during the fall and sometimes fall and winter (Bettinger 1989). Nonetheless, the recovery of pinyon hulls from lowland sites predating 1350 BP such as CA-INY-1384/H near Bishop and CA-INY-30 near Lone Pine demonstrates that pinyon was used prior to 1350 BP by at least the late Newberry Period. It seems likely the appearance of pinyon camps after 1350 BP represents the intensification of pinyon procurement as a resource staple culminating during the Marana Period (Basgall and Delacorte 2012; Basgall and McGuire 1988).

Residential versus Logistical

Thomas argues that the arrival of pinyon in central Nevada correlates with the inception of pinyon camps in Reese River, Monitor, and Grass Valleys (Simms 1985; Thomas 1973, 1982; Thomas and Bettinger 1976). However, it does not correlate with
the arrival of pinyon and the inception of pinyon camps in the White Mountains of Owens and Deep Springs Valleys (Bettinger 1977; Delacorte 1990; Simms 1985). The Reese River Valley evidence reflects a split logistical/residential settlement pattern, where in Owens Valley a different pattern existed. Residential pinyon camps in Owens Valley woodlands do not appear until 1350 BP, despite the fact that pinyon was available by approximately 8800 BP in the White Mountains (Jennings and Elliot-Fisk 1993; Zeanah 2002). However, organization of pinyon procurement and the residues left behind may not be in pinyon camps. Choices were made to either reside in the pinyon zone or logistically procure pine nuts and transport them back to a residential base (Simms 1985; Zeanah 2002). Temporary occupation was common during the fall and sometimes winter, especially during a successful harvest. The logistical organization of pinyon may have been an economic decision based on travel and transport costs between pinyon and other resources, especially if pinyon made a minor contribution to the food supply of lowland camps (Zeanah 2002). Post 1350 BP pinyon camps in the Owens Valley region appear to include both logistical and residential use of pinyon-juniper habitats. The intensification of pre-existing pinyon collecting strategies through residential use (McGuire and Garfinkel 1980; Simms 1985; Zeanah 2002) is presumably due to population pressures (Bettinger 1991; Zeanah 2002).

Archaeological Indicators

Pinyon camps are typically located within the pinyon-juniper zone and consist of domestic facilities such as rock rings, ground and battered stone, and projectile points and
bifaces. Rock rings may have been foundations of house structures, caches, roasting features, or may have served multiple purposes over time (Delacorte 1990). They can vary from 3-9 meters in diameter and typically consist of a single or sometimes 2-3 courses of rock. Pinyon cache sites, or specialized collecting stations, are smaller and consist exclusively of rock rings or storage pits and lack plant-processing equipment such as milling stones (Delacorte 1990). Storage pits are steep sided and vary between 2-5 meters in diameter. Storage pits stored seeds, while green cones were likely cached in rock rings (Delacorte 1990).

There are two approaches or strategies for pine nut procurement and processing: brown cone and green cone. Brown cone processing involves harvesting mature seeds. It requires relatively low processing costs and yields a high return, but it must be conducted in a brief period after the seeds have erupted from the cone, before they are eaten by rodents and birds. Archaeological indicators of brown cone processing camps may include unhooked poles, no roasting pits, minimal ground stone, and exhibit little evidence of tree/ground maintenance (Basgall 1984; Delacorte and Basgall 2002).

The green cone technique involves extraction of the seeds while still embedded in green cones. It is more time consuming with higher costs and lower returns than brown cone procurement, but can be conducted over a longer period yielding sufficient quantities of nuts to be a staple food store (Basgall 1984; Delacorte and Basgall 2002). The larger yields reflect a prolonged harvest window with decreased competition from other pinyon consumers (Basgall 1984; Bettinger and Baumhoff 1983; Delacorte and Basgall 2002). Green cone caches were most likely constructed near collection sites
(Eerkens et al. 2002) and may contain hooked poles, roasting features, ground stone, and an absence of tree pruning/duff clearing (Basgall 1984; Delacorte and Basgall 2002).

Brown cone procurement is often assumed to have begun relatively early in prehistory and the recovery of pinyon hulls from lowland sites pre-dating 1350 BP may reflect this. The appearance of pinyon camps with rock ring caches is interpreted as evidence that green cone procurement began only after 1350 BP. However, Delacorte and McGuire (1993) observed that this intensive development likely occurred later, approximately AD 800. Radiocarbon dates obtained from rock rings near Sherwin Summit in Mono County also indicate that green cone processing was primarily a late prehistoric to historic phenomenon (Eerkens and King 2002; Eerkens et al. 2002; King and Hildebrandt 2009). In fact, Eerkens et al. (2002) suggest that green cone processing evolved to resolve scheduling conflicts between the pinyon harvest, field irrigation, wetland seed harvesting, fall festivals, and pronghorn drives.

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The study area is located within the pinyon-juniper woodland and some TNKG loci appear to qualify as pinyon camps. Prior to this research, rock rings, wikiup features, and pinyon ladders (notably situated within a concentrated area of cache type rock ring features) had been noted and some formally recorded in various locations throughout TNKG. During thesis fieldwork, rock ring features and 16 ground and battered stone artifacts were recorded throughout the study area with no discernible spatial pattern. Isolated rock rings often occurred neargame drive features and intense evidence of
hunting activity. It has been theorized that incised stone relates to pinyon processing or “pinyon magic” as petroglyphs relate to hunting (Heizer and Baumhoff 1962; Reynolds 1996; Thomas 1983). Several sites in the project area also contain incised stone that could potentially be related to pinyon procurement processing. Recent pinyon hull debris was also observed next to a bedrock mortar and rock ring.

Discussion

There is little doubt the TNKG area was used as a pinyon camp and potentially as a winter base camp, given the availability of food, fuel, temperature amelioration, and shelter (Bettinger 1976; Steward 1938; Thomas and Bettinger 1976). It is also likely that pinyon grew in the study area by 4950 BP (Halford 1998a). The organization and intensity of pinyon utilization at TNKG would likely be determined by the processing and transporting costs and the availability of higher ranked and less costly resources (Simms 1985; Zeanah 2002).

Given the above, it is expected that brown cone procurement could have been first practiced at TNKG as early as 3700-3200 BP. Archaeological evidence of this may, however, be difficult to identify at TNKG, unless pinyon was occasionally processed and consumed on-site. Pinyon macrofossils should be ubiquitous at lowland Newberry Period sites, but determining that pinyon was transported logistically from TNKG will be difficult. A tenuous association might be made if obsidian from lowland sites derives from the nearby Mt. Hicks or Bodie Hills localities.
I will argue, however, that TNKG was used for both pronghorn and sometimes pinyon procurement prior to 1350 BP, and expect that the procurement of these resources was both logistical and residential in nature. It is likely that small, family groups resided at TNKG throughout the fall and winter if conditions were favorable, as in years of high pinyon productivity. As such, seasonal habitation sites dating prior to 1350 BP should contain evidence of pronghorn procurement or both pinyon and pronghorn procurement.

Pinyon camps appear to be a late prehistoric development, so pinyon camp features should contain evidence such as projectile points, beads, radiocarbon dates from pinyon hulls and associated hydration readings that postdate 1350 BP. Post-1350 BP the dynamics of pronghorn hunts changed to include large groups of people; therefore, the organization of these events was likely focused on the driving of pronghorn only, with the possibility that a family or small family group harvested pinyon prior to the drive event, if pinyon was available. It is also likely that some years were focused on pinyon procurement only. Therefore, residential sites prior to 1350 BP should include both antelope bone and pinyon hulls. Sites post 1350 BP should have distinct butchering and pinyon camp features, although it is likely that pronghorn bone will exist in pinyon features and vice versa.

In sum, it is assumed that TNKG begun as a hunting camp of initially small and later large, communal scales. During small scale hunting events prior to 1350 BP, it is likely that pinyon utilization at TNKG developed as both a logistical and residential activity that continued into the late prehistoric period, when residential pinyon camps became more prominent.
Research Theme III: Acculturation

Acculturation was a gradual adaptive process, but eventually the native inhabitants assimilated within Euro-American culture. Exploration and mining expeditions changed the native inhabitants’ lifeway forever. This section outlines the basics of acculturation including recent studies in the Mono County region.

Acculturation

Under the onslaught of western technology, wage labor, military conflict, geographic isolation, environmental deterioration, and communicable diseases, the Paiute people experienced several phases of contact and acculturation: (1) indirect interaction and incipient contact, (2) direct contact and cultural disruption, and (3) post-contact economic assimilation and marginalization (Delacorte and McGuire 1993). In the first phase prior to extensive exploration and settlement of the area, European goods made their way to the Eastern Sierra Nevada via aboriginal trade and exchange networks (Delacorte and McGuire 1993; Malouf and Findlay 1986). Trade beads were the most common introduced good during this time. Native inhabitants likely came into direct contact with Euro-Americans by the early nineteenth century, but it was not until AD 1859 that Euro-American influence had a significant impact on traditional lifeways (Delacorte and McGuire 1993). Over the 15-year period of the second phase, Euro-American settlement and mining and ranching activities devastated the native subsistence base by slaughtering game, grazing seed patches, and lumbering pinyon woodlands.
(Delacorte and McGuire 1993). Traditional material culture changed significantly as new items were introduced in the culture, while some traditional items persisted. By the 1870s, assimilation and marginalization of the native inhabitants’ lifeway was incorporated into the Euro-American economy (Delacorte and McGuire 1993). Native settlements were pushed out to ranches and mines or the edges of towns to serve as sources of wage labor.

Traditional culture started to disintegrate, especially with the replacement of traditional foods with store-bought goods. Davis-King (1998, 2010) argues that Native Americans likely chose Euro-American over traditional foods if they were affordable. But others contend that the relationship between traditional and Euro-American goods was based on a more comprehensive cost-benefit analysis, regardless of accessibility and affordability (Arkush 1995; Steward 1938; Wall 2009). Under their reasoning, traditional foods were replaced with store-bought goods only when there was an equal or higher economic return. High-ranked traditional foods were not replaced unless the purchasing cost was low relative to the effort required to procure the traditional item (Simms 1987; Wall 2009). Therefore, indigenous people of this period faced a scheduling conflict between wage labor and subsistence foraging; the choice to pursue one imposed an opportunity cost on the other that had to be reconciled by social, cultural, and technological change.
Mono Region

More studies are emerging concerning the native lifeway during historic times (ca. 1840-1900) and the adaptive mechanisms employed by indigenous people for survival in the Mono region (Arkush 1995; Davis-King 1998, 2010; Delacorte and McGuire 1993; Mills 2003; Wall 2009). Davis (1965) noted that the Paiute continued to practice many of their traditional seasonal activities such as pinyon and kutsavi, or brine fly collecting, rabbit and pronghorn drives, and trade excursions. However, indigenous people fled to more isolated areas such as the Sierra Nevada canyons and Bodie Hills, which allowed a more gradual change in behavior and culture.

In Mono County, several Contact period sites clearly indicate assemblages reflective of the two different phases of contact, Indirect Interaction and Incipient Contact phases and the later Economic Assimilation and Marginalization phase (see Delacorte and McGuire 1993). Dating after the eighteenth century, assemblages of the former include traditional flaked stone and ceramic technologies and show little evidence of subsistence change, but include ubiquitous glass trade beads (Arkush 1995; Delacorte and McGuire 1993; Mills 2003). Assemblage of the latter phase sites consist mostly of store-bought goods, including historic containers. Chipped stone tools, pottery, and stone beads are absent, with the exception of curated or keepsake items (Arkush 1995; Delacorte and McGuire 1993; Mills 2003). Euro-American goods replaced many traditional counterparts. For example, glass beads replaced stone and shell beads, metal cans replaced pottery, firearms replaced the bow and arrow, European dress was preferred over blankets, rabbit skins, and moccasins, wire and nails replaced hide and plant
fibers, and metal axes, shovels, and steel knives replaced stone tools (Arkush 1995; Delacorte and McGuire 1993; Mills 2003; Wall 2009). In contrast, milling equipment and basketry were retained because there were no superior replacements to milling equipment in the Euro-American repertoire, and basketry proved a craft of commercial value (Davis-King 1998; Delacorte and McGuire 1993; Wall 2009).

Pinyon exploitation continued as a common practice and Paiute often abandoned their wage labor jobs during the fall harvesting season (Delacorte and McGuire 1993; Wall 2009). Pine nuts were not only a high-ranked traditional food item, but could also be sold, earning natives money for store goods (Wall 2009). Although there was a commercial market for pinyon nuts, the role of the pinyon harvest in maintaining traditional culture also had to be an important factor in its perseverance. Hunting continued, although with firearms and horses reducing travel and pursuit time, hunts were usually short-term events conducted by individuals or a few family members (Wall 2009). Arkush (1995) documented a traditional corral that was used to trap feral horses instead of antelope as an example of the application of traditional technology to a new purpose.

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Two sites recorded in the study area have evidence of post-Contact occupation, such as beads and one button, in addition to cut nails, broken windows, and bottle glass that were not individually inventoried or described. Also, one dilapidated wikiup was recorded, and more than 12 wikiups have been observed throughout TNKG (Cliff Shaw,
personal communication 2011). Flaked glass was also observed outside a survey quadrat boundary. Two Euro-American settlements, Aurora and Fletcher, were also close to the study area and visible from a large site recorded with post-Contact occupation. A number of historic trails and roads, as well as historic camps, cabins, and carbonera sites used for making charcoal, have been partially recorded by Shaw (2009a). These are evidence that the project area was lumbered in the late 1800s to supply wood and fuel to Aurora and Bodie, probably disrupting pinyon harvests at TNKG.

Discussion

Contact period material was recorded at two sites, implying Native American occupation at TNKG during the contact period. Numerous trade beads dating prior to 1860 have been recorded at TNKG, documenting use of the site complex during the Indirect Interaction and Incipient Contact phase. Few other Euro-American goods are expected to be associated with such sites.

Significant changes in the use of TNKG and native culture should have developed during the Direct Contact and Cultural Disruption phase. The mining town of Aurora was established by 1860, quickly attaining a population of 10,000. Although the traditional pinyon harvest persisted throughout the post-Contact period, logging of the TNKG area to supply Aurora and Bodie with fuel would have eventually disrupted pinyon harvesting at TNKG. Communal pronghorn drives were another element of traditional culture that persisted, but such events were also short lived and intermittent as pronghorn populations were quickly depleted. Use of the corrals at TNKG for pronghorn drives likely pre-dates
the disruption and assimilation phases, but they could have been used for feral horses or other domestic animals (Arkush 1995). Given the above, we can expect that pine nut and communal hunting camps were abandoned at TNKG while Aurora and Bodie were booming. Residential camps likely persisted at TNKG as the occupants slowly assimilated into a Euro-American lifeway, and assemblages should reflect that lifeway of primarily Euro-American goods such as store bought containers and metal. Milling equipment and basketry are the few traditional items expected to persist in such assemblages. The proximity of Aurora would have been convenient for TNKG occupants who could have resided in a traditional environment yet travel a short distance for wage labor and/or to sell pine nuts and basketry to Euro-Americans.

It is likewise possible that pinyon harvesting became economically viable again as logging declined with Aurora's collapse, while serving the additional purposes of maintaining traditional elements of a changing culture. However, it likely would have taken several decades for pinyon groves to recover. Thus, any post-contact pinyon campsites should significantly post-date the 1870s, unless portions of the TNKG pinyon woodland survived logging. Use of trap facilities for coralling feral horses and other domestic animals may have continued, so horse and domestic animal bone is expected at sites post-dating 1870.
Chapter 4

SURVEY METHODS AND ASSEMBLAGE PATTERNS

An objective of this thesis was to survey a sample of TNKG to record archaeological sites and evaluate their significance. This chapter discusses the design and implementation of the survey sample and inventory methods. It also presents survey results, site descriptions, and assemblage patterns.

**Survey Methods**

Cliff Shaw, USFS archaeology volunteer and retired USFS employee, located and plotted many features at TNKG using Trimble Global Positioning System (GPS) between 2001-2007. In addition, a PIT project implemented in 1997 and 1998, focused on recording many of the petroglyph panels within TNKG (see Chapter 1 for previous research details). Although both Shaw and the PIT project volunteers located many features and petroglyph panels, they recorded very few surface artifacts. Hence, this research effort focused on recording a sample of the surface archaeology to assess the age, assemblage content, and data recovery potential of lithic and ground stone scatters within TNKG, particularly as they relate to game drives, pinyon exploitation, and acculturation.

The boundary of the sample universe encloses approximately 5,441 acres. Rough Creek and Bodie Creek canyons are suitable east and west boundaries of the sample area since they are natural barriers and channels for the seasonal migration routes of
pronghorn herds. The northern boundary was chosen based on topography to include primarily flat terrain and known features. The southern boundary was based on private property lines and the distribution of the southernmost TNKG features known. This boundary was only temporarily chosen for the purposes of selecting a survey sample and should not be considered a definitive border of the TNKG site complex. Further investigation of the area should be completed to determine a proper boundary encompassing TNKG.

Table 4.1 shows the project area divided into four sampling strata that were then divided into 200 x 200 meter quadrats to randomly sample the area while avoiding any potential biases to particular areas of TNKG. Stratum areas were bounded around complexes and adjacent relatively flat land. Private property was excluded from the sample universe, as were steep slopes because of the low probability that significant cultural material would be found on precipitous grades. Depending on the size of each stratified area, a representative percentage (@ 14%) of quadrats were randomly chosen for survey. The survey quadrats selected for the survey sample are plotted on Map 4.1.
Table 4.1. Number of quadrats per stratum and number of quadrats to be surveyed.

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Total Quadrats</th>
<th>Selected for Survey</th>
<th>Quadrats Surveyed</th>
</tr>
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<tr>
<td>1</td>
<td>42</td>
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<td>6</td>
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<tr>
<td>2</td>
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<td>5</td>
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</tr>
<tr>
<td>4</td>
<td>43</td>
<td>6●</td>
<td>0</td>
</tr>
</tbody>
</table>

●= Strata 2 & 4 not completed during 2009 field season.

Map 4.1. Map of stratum area and survey quadrats.
A field crew ranging from two to six personnel intensively inventoried the survey quadrats walking transects spaced at 30 meter intervals during six rotations from June through October of 2009. They recorded environmental information for each quadrat, including primary and secondary landforms, vegetation, slope, and nearest water sources. The field crew attempted to relocate previously recorded features falling within quadrat boundaries such as rock rings, wikiups, hunting blinds, rock features, game drive trap complexes, and pinyon caches. They also recorded each concentration of artifacts and features they encountered, filling out IMAC site record forms for each designated as a site.

A site approach was implemented to characterize the cultural remains encountered to satisfy both regulatory imperatives to manage and evaluate sites, and as a research goal to classify sites according to a site taxonomy characterizing temporal and functional parameters pertinent to the TNKG research design. However, it was quickly discovered that a ubiquitous but sparse scatter of flakes and small debitage concentrations occur throughout the entire study area and continue for unknown distances beyond quadrat boundaries. For this reason, sites are defined as three or more tools or two or more features occurring within a concentrated area.

Artifacts and features were piece-plotted using a Trimble handheld receiver. A cursory in-field analysis was performed on flaked stone tools (e.g., projectile points, bifaces, flake tools, cores, etc.), ground stone tools (e.g., handstone, milling stones, bedrock mortar, or miscellaneous ground stone), and any unique artifacts and faunal remains (beads, bone, etc.). Only diagnostic obsidian projectile points and some point
fragments, one formed flake tool, one representative sample of obsidian debitage, and one sample of cryptocrystalline debitage were collected (the latter from a site with a large amount of cryptocrystalline material).

Survey Results

Sample units in strata 1 and 3 were completely surveyed during the 2009 field season. However, quadrats in strata 2 and 4 could not be surveyed in the time available and were dropped from the sample. Consequently, the data presented in this thesis are only a reliable sample of the surface material found in the central two strata of the TNKG.

In stratum 1, quadrats 23, 27, 39, 40, 41, and 42 were randomly chosen for surface survey and in stratum 3, quadrats 5, 6, 11, 13, and 29 were randomly chosen for surface survey. In all, 18 sites were recorded within the pinyon-juniper zone.
Map 4.2. Map of surveyed quadrats and recorded sites.
Site Descriptions: Stratum 1

Two sites apiece were recorded in quadrats 27 and 41. No sites were found in quadrats 23, 39, 40, and 42. Game drive features, originally recorded by Cliff Shaw, were observed throughout the stratum.

Sites 1A and 1B are lithic scatters recorded in quadrat 27. Site S1A included one biface, one projectile point tip, and four unidentified projectile point fragments. Site S1B contained three projectile point midsections and one small flake concentration. Shaw’s features were observed throughout the quadrat, and petroglyphs were noted outside the quadrat boundary. Unlike most quadrats in the project area, few flakes were observed beyond the bounds of designated sites.

The two sites recorded in quadrat 41, sites S1C and S1D, were both lithic scatters. One Rose Spring/Eastgate point, two Desert Side-notched points, one unidentified projectile point tip, one point base, and two core fragments were recorded at site S1C. Constituents at site S1D included one Elko projectile point fragment, two bifaces, one projectile point tip, two projectile point bases, and one unidentified projectile point fragment.

Site Descriptions: Stratum 3

A total of five quadrats was surveyed in stratum 3, which was covered by a ubiquitous, but low-density scatter of flakes extending an unknown distance beyond quadrat boundaries. Stratum 3 contained the majority of sites recorded for the thesis (n=14), most of which were located in quadrats 4, 5, and 6. Sites S3E and S3G were
recorded in quadrat 4, sites S3B, S3C, and S3F were recorded in quadrat 5, sites S3D and S3M were recorded in quadrat 6, and sites S3A and S3L were recorded along the border of quadrats 5 and 6.

Site S3A consists of flaked, ground and battered stone and features. Individual artifacts found at the site include one dart-size projectile point, one Rose Spring/Eastgate point, one Desert Side-notched point, four bifaces, five projectile point tips, five projectile point midsections, one core, three debitage concentrations (one concentration contains approximately 10,000 biface thinning flakes), one hammerstone, one milling stone, one rock feature, one burned bone fragment, and an incised stone.

Site S3B consists of flaked stone tools and refuse, features, beads, and bone, with a wikiup observed beyond the quadrat boundary. The assemblage from S3B included one dart-size projectile point, one Rose Spring/Eastgate projectile point, one biface, four projectile fragments (one tip, one midsection, one base, and one unidentifiable piece), one scraper, one debitage concentration, 10 glass trade beads, one button, one shell fragment, one rock feature, one rock ring, and one concentration of approximately 10 fragments of burned bone.

Site S3C is a large site consisting of flaked and ground stone artifacts and features, including a wikiup structure. One Elko projectile point, one dart-size point, one Desert Side-notched point, three projectile point tips, one projectile point midsection, one projectile point base, one unidentified projectile point fragment, one core, three debitage concentrations, one handstone, one milling stone, the wikiup feature, four rock features, and one historic glass bead were recorded at the site.
Site S3D was previously recorded during the PIT project. It consists of flaked and ground stone and features. These include: one Cottonwood, two Desert Side-notched, and one arrow-size projectile point, one projectile point tip, four projectile point bases, five unidentified projectile point fragments, one core, one scraper, one flake tool, three debitage concentrations, two milling stone fragments, three ground stone fragments, one rock ring, and one hunting blind.

Site S3E consists of a lithic scatter with one dart form projectile point, one Desert Side-notched projectile point, and one projectile point midsection. Site S3F consists of one debitage concentration and one rock ring.

Site S3G is an artifact scatter consisting of one dart-size projectile point, one Rose Spring/Eastgate projectile point, one Cottonwood projectile point, one biface, four projectile midsections, three unidentified projectile point fragments, three flake tools, two debitage concentrations, and one milling stone.

Site S3L is a lithic scatter with one core and two debitage concentrations. Site S3M is a lithic and ground stone scatter that includes one dart-size projectile point, one Desert Side-notched projectile point, one projectile point tip, one projectile point midsection, one flake tool, one debitage concentration, one rock ring feature, two milling stone fragments, and three miscellaneous ground stone fragments.

Stratum 3, quadrat 29 contained a ubiquitous scatter of flakes and abundant points, primarily midsections. Sites 3H, 3I, 3J, and 3K were recorded in this quadrat. Site S3H contains flaked and ground stone artifacts and features, including one wide-stem, one Elko, and one dart-size projectile point, two point midsections, one unidentified
projectile point fragment, two obsidian debitage concentrations, two rock ring features, and one milling stone fragment.

Site S3I contains flaked and ground stone artifacts and a feature. Notable lithics include one Humboldt concave base and one Elko projectile point, one biface, two point tips, eight projectile point midsections, two projectile point margins, one unidentified projectile point fragment, one flake tool, and one concentration of approximately 100 biface thinning flakes. One rock ring feature and a bedrock mortar were also present on-site.

Site S3J consists of two Elko and one Cottonwood projectile point, two bifaces, one projectile point tip, five midsections, one projectile point margin, three cores, a concentration of approximately 600 flakes, and one milling stone fragment. Site S3K is a large lithic and ground stone scatter with a rock wall feature and incised stone. Constituents include three projectile point tips, five projectile point midsections, two projectile point margins, two unidentified projectile point fragments, and one milling stone fragment.

Quadrat 13 contains only one site, S3Z, found amidst a ubiquitous flake scatter. Site S3Z consists of one Elko point, two projectile point tips, and one rock ring feature.

**Conclusion**

The management of archaeological resources begins with site types, function, and temporal occupation. A site’s function (i.e., hunting or processing local) and temporal occupation are essential to understanding prehistoric human behavior and adaptive
strategies, especially regarding game drives, pinyon exploitation, and acculturation.

TNKG is more than a conglomeration of sites. The residues left behind indicate much about the functional and temporal framework of TNKG occupations.
Chapter 5

SURVEY RESULTS AND ANALYSIS

This chapter focuses on the analysis of recorded surface assemblages. The first section discusses chronometric data obtained from time-sensitive artifacts and analysis of other artifact and feature types. The second part of the chapter focuses on site taxonomy and the functional analysis of recorded sites. The final part of the chapter interprets the data in relation to the thesis research.

Chronometrics

The present chronometric analysis dates artifact assemblages on the basis of time-sensitive projectile points, beads, and a select sample of artifacts chosen for obsidian hydration analysis.

Projectile Points

Thirty-two classifiable projectile points were recorded during the project. These were classified on the basis of metric attributes developed by Thomas (1981), although his central Nevada typological key was not employed. Diagnostic types identified in the sample include Humboldt, Elko, Rose Spring/Eastgate, Cottonwood, and Desert Side-notched forms, as well as a generically categorized wide-stem form of likely Early Holocene age (personal communication, Delacorte 2010). Other un-typeable points (n=8) were identifiable as dart- or arrow-sized forms, dating before and after 1350 BP, respectively (Basgall and Delacorte 2003). Table 5.1 shows the distribution of diagnostic
projectile points by site. A description and discussion of the temporal range for each of
the point types follows.

Table 5.1. Diagnostic projectile points by site within survey area.

<table>
<thead>
<tr>
<th></th>
<th>WS</th>
<th>HU</th>
<th>EL</th>
<th>DR</th>
<th>R/G</th>
<th>CT</th>
<th>DS</th>
<th>AR</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1A</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
</tr>
<tr>
<td>S1B</td>
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<td>0</td>
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<td>0</td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
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<td>S3I</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>2</td>
</tr>
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<td>7</td>
<td>4</td>
<td>3</td>
<td>8</td>
<td>1</td>
<td>32</td>
</tr>
</tbody>
</table>

Note: WS=Wide-stem form; HU=Humboldt; EL=Elko; DR=Dart form; R/G=Rose Spring/Eastgate;
CT=Cottonwood; DS=Desert Side-notched; AR=Arrow form
Desert Side-notched points were the most common type, representing 25% of the diagnostic projectile points. Desert Side-notched points are defined as small, triangular forms with lateral notching (Basgall and Delacorte 2003; Thomas 1981). In the Inyo-Mono region, these points date to the terminal Prehistoric Marana period (650 BP-100 BP) (Basgall and Delacorte 2003; Basgall and McGuire 1988; Bettinger 1989; Delacorte 1999).

Cottonwood points represent 9% of the diagnostic points. These are small triangular or leaf shaped points similar to un-notched Desert Side-notched pieces (Basgall and Delacorte 2003; Thomas 1981). They too are attributed to the Marana period (650 BP-100 BP) or markers of the terminal prehistoric/early protohistoric interval (Basgall and Delacorte 2003).

Rose Spring and Eastgate series points represent 13% of the typeable points. Rose Spring points are small, triangular, corner-notched pieces. Eastgate points are often collapsed with the Rose Spring series because they have a similar time span, but are basally notched producing hanging barbs that extend down to the base (Basgall and Delacorte 2003; Thomas 1981). Rose Spring points are attributed to the Haiwhee period (1350 BP-650 BP) in the Inyo-Mono region (Basgall and Delacorte 2003; Basgall and McGuire 1988; Bettinger 1989; Thomas 1981), but may appear slightly earlier to the south in the Mojave Desert (Basgall and Delacorte 2003; Basgall and McGuire 1988).

Elko series points represent 22% of the diagnostic assemblage, and include corner-notched, eared, and contracting-stem variants. All are time-markers of the
Newberry period (3150 BP-1350 BP) pre-dating the introduction of the bow-and-arrow (Basgall and Delacorte 2003; Basgall and McGuire 1988; Thomas 1981).

A single Humboldt Concave-base point was recovered, accounting for 3% of the diagnostic projectiles. These are leaf-shaped points that lack shoulders and exhibit shallow basal notches (Basgall and Delacorte 2003, 2012; Bettinger 1978; Thomas 1981). Humboldt concave-base points date to the Newberry or slightly earlier period in Owens Valley (3150 BP-1350 BP) (Basgall and Delacorte 2003, 2012; Basgall and McGuire 1988; Bettinger 1978; Thomas 1981).

A single wide-stem projectile point was recorded during the survey, comprising 3% of the sample. It is a large stemmed piece that lacks basal grinding, but resembles Great Basin Stemmed series points (c.f. Lake Mojave, Silver Lake, etc.) of the Western Pluvial Lakes Tradition (Basgall and Delacorte 2003; Thomas 1981). This poorly understood style dates to the Lake Mojave period (pre-7500 BP) or early Holocene interval (Basgall and Delacorte 2003).

The remaining projectile points were classified as either “arrow” (3%) or “dart” (22%) forms on the basis of size. “Arrow” forms generally post-date 1350 BP and “dart” forms earlier or pre-1350 times.

The potential occupation of the project area inferred from the points spans 7500 years, with specific occupations dating to the Mojave, Newberry, Haiwee, and Marana periods. The case for Mojave period occupations, however, rest on only one point (3%), whereas 75% of the points date to the last 3500 years.
**Obsidian Hydration**

Obsidian studies have proven invaluable for refining cultural chronologies as well as investigating subsistence-settlement systems, exchange networks, and site formation processes. Obsidian hydration was developed in the 1960s as a technique to directly date artifacts (Friedman et al. 1979). Obsidian is a glassy volcanic rock and a newly exposed surface will absorb water, forming a hydration layer or rind that grows progressively thicker over time. The hydration rate is primarily dependent on three variables: 1) the chemical composition of the glass, 2) temperature, and 3) humidity of environment (Friedman et al. 1979; Hall and Jackson 1989). Temperature and glass chemistry appear to be the primary factors influencing hydration rates, with recent studies indicating that the influence of relative humidity is negligible (Friedman et al. 1979). Kirk Halford (2008) formulated hydration ranges for eastern Sierran temporal periods for Bodie Hills obsidian employing the Casa Diablo obsidian temperature corrected version rate. The proposed hydration ranges for various temporal periods in the project area are provided in Table 5.2.

Table 5.2. Hydration temporal ranges for Bodie Hills obsidian.

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Hydration Ranges (µm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-650 B.P</td>
<td>1.2-2.0 µm</td>
</tr>
<tr>
<td>650-1350 B.P</td>
<td>2.1-3.0 µm</td>
</tr>
<tr>
<td>1350-3500 B.P</td>
<td>3.1-5.1 µm</td>
</tr>
<tr>
<td>3500-4950 B.P</td>
<td>5.2-6.2 µm</td>
</tr>
<tr>
<td>4950-10500 B.P</td>
<td>6.3-9.3 µm</td>
</tr>
</tbody>
</table>

Note: This table uses the Casa Diablo hydration rate; years BP derived using a 1.195 EHT conversion factor (adapted from Halford 2008; Hall and Jackson 1989).
A sample of 10 visually identified Bodie Hills obsidian points was submitted to Brian Wickstrom for hydration analysis. These results are generally consistent with the proposed temporal ranges for the point types (see Table 5.3).

Table 5.3. Obsidian hydration results.

<table>
<thead>
<tr>
<th>Number</th>
<th>Site Number</th>
<th>Artifact Number</th>
<th>Description</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>Mean</th>
<th>STD DEV</th>
</tr>
</thead>
<tbody>
<tr>
<td>1*</td>
<td>S1C</td>
<td>A1</td>
<td>Desert Side-notched</td>
<td>1.3</td>
<td>1.5</td>
<td>1.4</td>
<td></td>
<td></td>
<td>1.4</td>
<td></td>
<td>0.10 M</td>
</tr>
<tr>
<td>1*</td>
<td>S1C</td>
<td>A1</td>
<td>Desert Side-notched</td>
<td>3.8</td>
<td>3.8</td>
<td>3.6</td>
<td></td>
<td></td>
<td>3.7</td>
<td></td>
<td>0.12 N</td>
</tr>
<tr>
<td>2</td>
<td>S3D</td>
<td>A9</td>
<td>Desert Side-notched</td>
<td>2.6</td>
<td>2.6</td>
<td>2.7</td>
<td>2.7</td>
<td>2.6</td>
<td>2.6</td>
<td>2.6</td>
<td>0.05 H</td>
</tr>
<tr>
<td>3*</td>
<td>S3M</td>
<td>A1</td>
<td>Desert Side-notched</td>
<td>0.8</td>
<td>0.9</td>
<td>0.9</td>
<td></td>
<td></td>
<td>0.9</td>
<td></td>
<td>0.06 M</td>
</tr>
<tr>
<td>3*</td>
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<td>A1</td>
<td>Desert Side-notched</td>
<td>3.8</td>
<td>3.7</td>
<td>3.7</td>
<td></td>
<td></td>
<td>3.7</td>
<td></td>
<td>0.06 N</td>
</tr>
<tr>
<td>4*</td>
<td>S3J</td>
<td>A10</td>
<td>Cottonwood</td>
<td>2.6</td>
<td>2.4</td>
<td>2.4</td>
<td></td>
<td></td>
<td>2.5</td>
<td></td>
<td>0.12 H</td>
</tr>
<tr>
<td>4*</td>
<td>S3J</td>
<td>A10</td>
<td>Cottonwood</td>
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<td>3.6</td>
<td>3.5</td>
<td></td>
<td></td>
<td>3.5</td>
<td></td>
<td>0.06 N</td>
</tr>
<tr>
<td>5</td>
<td>S3A</td>
<td>Debitage Coll. Unit</td>
<td>Rose Spring/Eastgate</td>
<td>2.3</td>
<td>2.3</td>
<td>2.4</td>
<td>2.3</td>
<td>2.5</td>
<td>2.4</td>
<td>2.4</td>
<td>0.08 H</td>
</tr>
<tr>
<td>6</td>
<td>S1D</td>
<td>A3</td>
<td>Elko</td>
<td>4.3</td>
<td>4.3</td>
<td>4.3</td>
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<td>4.3</td>
<td>4.3</td>
<td>4.3</td>
<td>0.04 N</td>
</tr>
<tr>
<td>7</td>
<td>S3H</td>
<td>A3</td>
<td>Elko</td>
<td>4.7</td>
<td>4.7</td>
<td>4.8</td>
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<td>4.7</td>
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<td>8</td>
<td>S3J</td>
<td>A2</td>
<td>Elko</td>
<td>4.6</td>
<td>4.6</td>
<td>4.7</td>
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<td>4.5</td>
<td>4.6</td>
<td>4.6</td>
<td>0.08 N</td>
</tr>
<tr>
<td>9</td>
<td>S3D</td>
<td>C2-PP3</td>
<td>Arrow (with serrated edge)</td>
<td>2.4</td>
<td>2.2</td>
<td>2.3</td>
<td>2.4</td>
<td>2.4</td>
<td>2.4</td>
<td>2.4</td>
<td>0.08 H</td>
</tr>
<tr>
<td>10</td>
<td>S3G</td>
<td>A14</td>
<td>Dart</td>
<td>4.4</td>
<td>4.5</td>
<td>4.3</td>
<td>4.5</td>
<td>4.4</td>
<td>4.4</td>
<td>4.4</td>
<td>0.08 N</td>
</tr>
</tbody>
</table>

*Note: Measurements represent hydration rim thickness from different surfaces.

However, there are some discrepancies. Four of the Desert series forms have hydration bands substantially thicker than the range proposed for the Marana period. Three of these are on double-banded specimens, on two of which the smaller band falls within the expected range of the point type. This suggests that the anomalously thick readings on
these specimens result from the scavenging and reworking of old flakes by Marana period people. Nonetheless, the hydration data suggest an occupational span extending back at least 3,500 years ago.

*Beads*

Table 5.4 shows the distribution of beads by site within the survey area. Eleven glass trade beads (two seed beads, two blue hex, one red on white, and five white) were recorded during the project. Blue hexagonal beads are most common between AD 1859 and 1864, but have been noted in earlier contexts; red on white beads peaked from AD 1859-1864; white beads date from AD 1830-1845; and seed beads are generically categorized and have, as yet, no specific temporal parameters (Basgall and Delacorte 2003; Titchenal 1994; Zeanah and Leigh 2002). The presence of trade beads indicates occupation during the Protohistoric period and probably trade between indigenous inhabitants and Euro-Americans.

Table 5.4. Recovered beads by site.

<table>
<thead>
<tr>
<th></th>
<th>WHT</th>
<th>BL HEX</th>
<th>RD/WT</th>
<th>SD</th>
<th>Total</th>
</tr>
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<tr>
<td>S3B</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>10</td>
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<td>S3C</td>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
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<td>5</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>13</td>
</tr>
</tbody>
</table>

Note: WHT=white bead; BL HEX=blue hex bead; RD/WT=red on white bead; SD=seed bead.
Flaked Stone Analysis

Rigorous flaked stone analysis was not an objective of this project. However, analysis of collected specimens and cursory in-field observation makes some inferences possible. These are summarized below.

Debitage Analysis

Based upon a cursory recording of debitage types, bifacial thinning flakes appeared to dominate the assemblages, although percussion and pressure flakes were also noted throughout and beyond the study area. The latter are almost certainly underrepresented in field analyses because of their small size. Ubiquitous debitage scatters were noted throughout the survey quadrats, with dense concentrations of debitage (e.g., > 10,000) recorded in some areas.

Obsidian Sourcing

Obsidian sourcing was not a primary objective of this study, but some observations can be made. The widespread availability of obsidian within the project region included several sources in close proximity. These include Fish Springs, Mono Crater, Casa Diablo, Mono Glass Mountain, Bodie Hills, Mt. Hicks, and Truman Meadow/Queen (see Map 5.1).
Map 5.1. Obsidian sources in proximity to the TNKG study area.
Mt. Hicks and Bodie Hills sources are within 10 kilometers of the project area. Based on visual attributes, most of the diagnostic points collected during the survey are made of Bodie Hills glass (Michael Delacorte, personal communication 2010). Naturally occurring obsidian nodules were noted within the project area. Previous sourcing studies suggest that two of the regional sources supplied obsidian to west-central and/or southwestern California – Bodie Hills and Casa Diablo. Conversely, Truman/Queen and Mt. Hicks obsidian supplied west-central and central Nevada populations, although both are also found to the south in northern Owens Valley (Basgall and Delacorte 2012). Obsidian source use is typically characterized as more diverse during earlier periods, due to the high mobility of hunter-gatherers, with later periods showing use of the nearest obsidian source(s), given more permanent settlements (Basgall 1989).

Cryptocrystalline Sourcing

Cryptocrystalline stone is also notably abundant in the project area. Cryptocrystalline quarries of naturally eroding nodules appear throughout the study area, with others located outside surveyed boundaries. Several cryptocrystalline tools were recorded during the survey and cryptocrystalline debitage was noted at sites throughout the survey quadrats. Cryptocrystalline flakes were found in varying proportions, but some flake concentrations contained more cryptocrystalline than obsidian debitage, and a few scatters had only cryptocrystalline material. Due to the availability of cryptocrystalline stone within the project area, it makes sense that it is found in significant quantities at many sites. Approximately 50 cryptocrystalline biface thinning
flakes (colors range from variations of white, grey, pink, rust, orange, green, and cream) were collected for this thesis.

**Stone Tools**

Table 5.5 provides the distribution of the 143 chipped stone tools recorded by site. These include complete project points, late stage bifaces, point tip, midsection, basal, margin, and other fragments, cores, scrapers, and flake tools. Point midsection dominate (26%) the tool assemblage, followed by complete points (16%), point tips and fragments (14% each), bifaces (8%), basal fragments, cores, and flake tools (6% each).
Table 5.5. Chipped stone tools by site.

<table>
<thead>
<tr>
<th>Site</th>
<th>WHL</th>
<th>TIP</th>
<th>MDS</th>
<th>BASE</th>
<th>MRG</th>
<th>FRG</th>
<th>BF</th>
<th>CR</th>
<th>FL TL</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>7</td>
<td></td>
</tr>
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<td>2</td>
<td>0</td>
<td>7</td>
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<td>0</td>
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<td>0</td>
<td>3</td>
<td>1</td>
<td>0</td>
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</tr>
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</tr>
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<td>0</td>
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</tr>
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<td>0</td>
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<td>20</td>
<td>12</td>
<td>8</td>
<td>9</td>
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</tr>
</tbody>
</table>

Note: WHL=complete projectile points; TIP=projectile point tip; MDST=projectile point midsection fragment; BASE=projectile point base fragments; MRG=projectile point margin fragment; FRG=projectile point fragment; BF=biface; CR=core; FL TL=flake tool.
Ground and Battered Stone

No ground stone tools were collected from TNKG but as Table 5.5 shows, 16 tools were recorded: 11 milling stones, one hammerstone, one handstone, and three ground stone fragments. Many more ground and battered stone pieces were observed outside the surveyed areas. It is also likely that some groundstone artifacts in survey areas were overlooked. Several of the milling stones were inverted, as is commonly noted in ethnographic accounts, making them difficult to identify. Groundstone is indicative of vegetal processing activities, most likely pine nut processing in this instance. This does not mean that other seeds, plants, tubers, etc. were never processed, but paleobotanical studies would probably demonstrate that pinyon was the dominant plant resource used.
Table 5.6. Ground/battered stone by site.

<table>
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<tr>
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<th>HMST</th>
<th>MS</th>
<th>HS</th>
<th>MR</th>
<th>GS FR</th>
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<td>0</td>
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<td>0</td>
</tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
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<td>0</td>
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<td>1</td>
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<td>14</td>
</tr>
</tbody>
</table>

Note: HMST=hammerstone; Ms=milling stone; HS=handstone; MR=mortar; GS FR= ground stone fragment
Features

As Table 5.7 indicates, eight rock rings, seven stacked rock features, one wikiup, one hunting blind, and several panels of incised stone were also recorded during the survey. The eight rock rings range from three to six meters in diameter and probably represent either pinyon caches or house floors. Pinyon cache structures are commonly found within pinyon-juniper woodlands of the Inyo-Mono region (Bettinger 1976; Delacorte 1990; Eerkens et al. 2004; Reynolds 1996). Habitation may have been temporary, semi-permanent, or sedentary residential camps. Although only one wikiup was recorded within survey boundaries, several other wikiups have been observed in the study area.

Seven stacked rock features were recorded. All, save one identified as a wall remnant, are functionally unidentifiable as to feature type (i.e. rock ring, rock wall, cairn, etc.). Only one hunting blind was recorded during the study, but others have been noted outside survey boundaries. Hunting blinds were obviously utilized by hunters as hunting spots and observation stations and could also have been lookout points for monitoring early Euro-American settlers and travelers.

Non-portable incised boulders were recorded at various sites and observed in other locations. These consist of flat slabs of rock cut with shallow lines. There are various interpretations for the function of this “art” (see Thomas 1983), with some believing that it relates to “pinyon magic” in much the same manner that rock art might relate to hunting magic (Heizer and Baumhoff 1962; Reynolds 1996; Thomas 1983).
Although no petroglyphs were recorded in the study area, numerous panels have been identified within the TNKG boundary (see Chapter 1).

Table 5.7. Archaeological features by site within survey area.

<table>
<thead>
<tr>
<th></th>
<th>RR</th>
<th>RK FT</th>
<th>HT BL</th>
<th>IN ST</th>
<th>WK</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>S1B</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
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<td>S1C</td>
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</tr>
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</tr>
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<td>6</td>
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</table>

Note: RR=rockring; RK FT=rock feature; HT BL= hunting blind; IN ST=incised stone; WK=wikiup; *
* = incised stone noted
Ecofacts and Miscellaneous Artifacts

One burned bone fragment and one small concentration of burned bone was recorded during the survey, with other bone concentrations noted on the surface outside surveyed areas. One shell fragment was also recorded, but the type of shell could not be determined. The one button recorded during the study is representative of Euro-American interaction.

Site Taxonomy

The following site taxonomy seeks to establish the functional and temporal parameters of the recorded sites. This is critical for our understanding of the human ecology and social relationships within the Mono region. The approach employed is based on that of Jackson (1985), who was guided by the theoretical perspectives of Struever (1968) and Bettinger (1982). Jackson (1985:161) states:

This approach assumes that: 1) cultures are adaptive systems that respond to the abundance, distribution, and seasonal availability of environmental resources; 2) resources are clustered into discrete biotic communities that can provide a focus for investigation of prehistoric adaptation; and 3) seasonal and spatial patterns of resource availability were accommodated by the careful scheduling of resource procurement activities by social and technological mechanisms.
For the purpose of this thesis, site function and taxonomic categories, were formulated specifically for the project and include habitation, pinyon processing, hunting/kill, butchering, and tool manufacture and repair. Based on surface artifact assemblages, one or more functional activities were ascribed to each site, with many sites exhibiting evidence of more than one functional category.

Hunting/kill sites are characterized by assemblages with 20 or more projectile points, with impact fractures such as flute, step, or burin breaks; medial/margin, tip and/or tang/stem fragments; and late stage bifaces (Hall 1990; Hockett and Murphy 2009; Schroedl 1994; Zeanah and Elston 1997). Butchering sites are distinguished by the presence of knives and faunal bone, specifically bone beds (Hall 1990). Tool manufacture and repair stations have assemblages dominated by snap or hinge fractures, stage III and IV biface forms, basal fragments, proximal and medial/margin fragments, and small pressure/thinning flakes (Hall 1990; Hockett and Murphey 2009; Schroedl 1994; Zeanah and Elston 1997). Habitation areas are marked by domestic features such as rock rings or wikiups, ground stone, points, bifaces, core/core tool, casual and formed flake tool, bone, and miscellaneous objects. Pinyon processing camps are defined by the presence of rock rings and ground stone. The following descriptions characterize each recorded site to one or more of the taxonomic categories: habitation, pinyon processing, hunting/kill, butchering, and tool manufacture and repair.

Fourteen sites have evidence of multiple activities and four sites have evidence of only one activity. Of these site functions, tool manufacture and repair stations occur most frequently (13), followed by hunting/kill components (12), pinyon processing areas (12),
habitation locations (9), and possible butchering location (1). Table 5.8 shows sites by taxonomic category.

Table 5.8. Sites by taxonomic category.

<table>
<thead>
<tr>
<th></th>
<th>Hunting/Kill</th>
<th>Butchering</th>
<th>Tool Manufacture and Repair</th>
<th>Habitation</th>
<th>Pinyon Processing</th>
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Assemblage Discussion

Sites S1A, S1B, S1C, and S1D in Stratum 1, Quadrats 27 and 41 represent hunting/kill and tool manufacturing and repair activities. Projectile point types indicate
occupation from Newberry through Marana periods (i.e., Elko, Rose Spring/Eastgate, and Desert Side-notched projectile point types).

Most sites recorded in Quadrats 4, 5, and 6 of Stratum 3 contained diverse assemblages spanning the Newberry to Protohistoric periods, based on projectile point and other artifact types. Sites S3A, S3B, S3C, and S3D produced varied assemblages containing lithic tools, ground and battered stone, features (e.g., rockrings, rock features, a wikiup, a hunting blind), incised stone, burned bone, and a button. Artifacts and features represent a range of activities including hunting/kill, tool manufacture and repair, pinyon processing, and habitation. Lithic and ground stone artifacts at sites S3E, S3F, S3G, S3L, and S3M appear to represent ephemeral occupations focused on hunting/kill, butchering, tool manufacture and repair, pinyon processing, and/or habitation.

The single site assemblage in Quadrat 13, site S3Z, represents an ephemeral occupation relating to either tool manufacture and repair, pinyon processing, and/or habitation based on lithics and one rockring. One Elko series projectile point indicates occupation during the Newberry period. For the quadrat as a whole, the substantial quantities of obsidian and cryptocrystalline debitage relative to the limited number of projectile points, appears to suggest an emphasis on tool manufacturing.

In Quadrat 29, sites S3H, S3I, S3J, and S3K also produced a dense and diverse assemblage indicative of both hunting/kill, manufacture and repair, pinyon processing, and/or habitation activities. This area is interpreted as a kill site, based on the number of point fragments. Occupations from the Newberry to Haiwee/Marana periods are inferred from the point types, including wide-stem, Humboldt, Elko, dart, and Cottonwood forms.
The presence of rockrings and ground stone indicates that some processing activities took place here as well.

This taxonomy ascribes function to each of TNKG sites, which is used to assess behavioral strategies and settlement and subsistence patterns. Given the taxonomic categories represented, three primary research themes are suggested – Communal Pronghorn Hunting, Pinyon Utilization, and Acculturation.

**Research Themes and Specific Summaries**

Interpretation of the project area as a whole indicates that hunting, especially that involving game drives, and pinyon procurement and/or habitation were important activities. Two sites also show evidence of protohistoric occupation. In fact, given the percentage of various artifacts (e.g., points, bifaces, etc.) compared to features (e.g., rock rings), it might be presumed that the dominant activity was communal or other hunting. Still, pinyon procurement was an obviously significant pursuit in this pinyon-juniper setting.

The interconnection between communal hunting and pinyon processing is also significant. Both activities were known ethnographically to occur during the fall. Acculturation also relates to pinyon procurement and communal hunting, as both persisted into the Contact period.

The following discussion focuses on the three research themes underpinning the thesis: communal pronghorn hunting, pinyon utilization, and acculturation (see Chapter 3). The subsequent section discusses the interpretation of the TNKG data analysis.
**Communal Pronghorn Hunting**

Projectile points indicate that hunting began in the project area at least 7,000 years ago. The same chronological data further suggest that pronghorn hunting employing game drives may date to or before the Newberry period, although it may have involved surround hunting, not trap facilities. Evidence suggests that such trap facilities occurred at TNKG during the terminal prehistoric and protohistoric periods, based on various chronological evidence and presence of milled lumber along drive walls. The two most common point types recorded during the study include Desert Side-notched and Elko forms, indicating hunting during the Newberry and Marana periods. However, many of the projectile points were fragmented and presumably broken from impact, as the fracture types imply. However, none of these fragmentary pieces were typable, so further obsidian hydration studies could reveal different trends in hunting patterns.

It is assumed that pronghorn were the primary target of game drives, although bighorn sheep and mule could have also been procured. Pronghorn would have been available during both fall and spring migrations (Arkush 1995; Hall 1990; Steward 1938). Thus, it is assumed that the area would have been occupied during these seasons to procure pronghorn, especially if drive facilities were employed.

**Pinyon Utilization**

The number of rock rings in the project area is not surprising, given its location within a pinyon-juniper woodland. There is little doubt that pinyon was utilized in years
of adequate crop yields, but whether it was logistically or residentially exploited at TNKG is a question. No discernible pattern was apparent in the projectile points found at sites with rock rings, with both Newberry and Marana period forms equally present. The dating of rock rings on the basis of projectile point associations should be viewed with some caution, given the palimpsest accumulations at sites. Further investigation might, however, identify discrete components in rock ring and other site contexts. In addition, the brown cone processing method would leave little evidence behind, further complicating the recognition of logistical versus residential exploitation (Basgall 1984). Green cone processing produces more telltale evidence from burning and cone caching, making it easier to identify accurately date (Eerkens et al. 2002). Given current understanding of the history of pinyon procurement in the Inyo-Mono region, the use of TNKG as a green cone processing area almost certainly dates to the Haiwee, Marana, and Protohistoric periods. Finds of pinyon macrofossils in the late Newberry period contexts elsewhere in Owens Valley, suggests that pine nut procurement may also have played an important role in Newberry Period occupation of TNKG.

The pinyon harvest would have occurred in the fall, and thus occupations relating to it would have occurred during the same season. The study area may have also been a prime location for winter settlement. The availability and storage of pine nuts would have been attractive features, conditioning winter settlement, when few other resources were available. The geographical location of TNKG would have been a likewise ideal place, given its protection from the elements, compared to nearby Bridgeport Valley, one of the coldest places in the region during winter months. In short, TNKG may have been prime
winter habitat, given ample food, water, fuel, building material, and warmer temperatures.

Acculturation

Two presumably post-contact sites were identified on the basis of beads, a button, and wikiup recorded during the study. In addition to these are more widespread evidence of Euro-American activity in the project vicinity, such as the towns of Aurora, Bodie, and the Fletcher stage stop. Several wikiups with milled lumber have been observed (one was recorded for this project), indicating post-contact habitation and, more importantly, the persistence of traditional lifeways, such as game drives and pinyon harvests after Euro-American settlement.

Conclusion

This analysis and interpretation of results reflects data exclusively from this thesis survey. Recommendations for future research are discussed in a Data Recovery Plan concluding the thesis. In sum, the present document provides a current assessment of TNKG that should be viewed as a building block for future research and basis for an informed management plan.
Chapter 6

CRITERIA FOR INCLUSION IN THE NATIONAL REGISTER OF HISTORIC PLACES: DOES TUNNA’ NOSI’ KAIVA’ GWAA’ QUALIFY?

The National Environmental Protection Act (NEPA) is a federal law defining policies that protect our environment. An aspect of this legislation is the NHPA (Public Law 89-665; 16 U.S.C 470 et seq.), which became a law in 1966 to protect and preserve archaeological and historical sites, then creating the NRHP. A site, district, building, structure, or object may be eligible for inclusion as a historic property on the NRHP if it is found (1) significant, (2) maintains integrity, and (3) demonstrates a developed historic context. The AIRFA (Public Law No 95-341, 92 Stat. 469) became law in 1978 to protect and preserve the traditional religious rights and cultural practices of Native American Tribes; therefore, sites may be eligible for the NRHP as a TCP. TNKG is located on federal lands administered by the USFS. Therefore, if TNKG can be determined eligible as a District on the NRHP under NHPA and determined to be a TCP under both NRHP and AIRFA it would be protected and preserved under federal law.

A historic property on the NRHP will demonstrate significant characteristics and exhibit integrity (National Park Service 1995). Key concepts are significance and integrity defined by historic context. The following concepts are defined:

Significance: the importance of a property to the history, architecture, archaeology, engineering, or culture of a community;
Integrity: the authenticity of a property’s historic identity, evidenced by the survival of physical characteristics that existed during the property’s prehistoric or historic period;

Historic Context: the information about historic trends and properties grouped by an important theme in the prehistory or history of a community, state, or nation, during a particular period of time (National Park Service 1995).

Under the original NHPA, four criteria were identified for eligibility for inclusion in the NRHP:

Criterion A: Association with an event significant to history.

Criterion B: Association with the lives of significant persons in history.

Criterion D: Maintains research potential.

Integrity is based on aspects or primary characteristics of a site. The assessment of integrity is determined by the definition of essential physical features, how well physical features convey significance, and the determination of which aspects are vital (National Park Service 1995). The aspects include location, design, setting, materials, workmanship, feeling, and association; a property does not need to retain all of these
aspects, but should demonstrate several for significance considerations. The seven aspects are:

1) Location: The place where the historic property was constructed or the place where the historic event occurred;

2) Design: The combination of elements that create the form, plan, space, structure, and style of a property;

3) Setting: The physical environment of a historic property;

4) Materials: The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property;

5) Workmanship: The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory;

6) Feeling: A property’s expression of the aesthetic or historic sense of a particular period of time;

7) Association: The direct link between an important historic event or person and a historic property.

The evaluation of the significance and assessment of integrity of each site, based on the historic context, is an objective of this thesis. Historic context of a site or district
may be based on one or a combination of themes, time period, and/or geographical area. Contexts developed for archaeological sites or districts should consider present and past environmental setting, occupation period, the identity of archaeological cultures, description of “likely appearance” during occupation, current and past impacts, and previous investigations (National Park Service 1995).

The historic context and research themes for this management plan were defined in Chapters 2 and 3 and used to define and justify the significance and integrity of TNKG. A property’s characteristics must be definable and justifiable to maintain integrity; this is central to significance evaluations because without integrity, a site may be ineligible. When registering a property, three main informative components must be met, including 1) location identification, 2) an explanation on how it meets one or more of the criteria, and 3) significance and integrity justification (National Park Service 1995).

**The Humboldt-Toiyabe Forest Service Criteria**

TNKG is on lands administered by the Humboldt-Toiyabe USFS managed by the BRD. The BRD has incorporated eligibility criteria unique to their land management area for evaluating sites, which are used in this thesis to develop eligibility recommendations for future management and nomination submittal of TNKG. The BRD policy on evaluation and eligibility follows regulations set forth in the NHPA, in addition to using criteria developed by Bryan Hockett for determining eligibility, and criteria developed by the USFS to determine ineligibility (see Tables 6.1 and 6.2 respectively). The
information in both tables is summarized from the Bridgeport District Prehistoric and Ethnographic Overview and Context (Hamilton 2009).

Table 6.1.BRD Criteria for Evaluation of Sites with Obsidian.

<table>
<thead>
<tr>
<th>Sites that lack cultural and natural depth may be eligible if:</th>
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<tbody>
<tr>
<td>1. sites contain a large quantity of diagnostic obsidian projectile points</td>
</tr>
<tr>
<td>2. sites are small but contain discrete artifact clusters (and contain at least 20 bifaces or flakes suitable for hydration analysis);</td>
</tr>
<tr>
<td>3. sites are large and contain discrete artifact clusters representing individual procurement activities;</td>
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<tr>
<td>4. sites contain exotic obsidian artifacts.</td>
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<tr>
<th>Sites exhibiting depth may be eligible if:</th>
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<tbody>
<tr>
<td>1. integrity is maintained and displays at least one of the characteristics listed above;</td>
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<tr>
<td>2. the data preserved beyond the site’s surface provides additional chronological, subsistence data, etc.</td>
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Table 6.2. BRD Criteria to Determine Ineligibility.

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<th>Criteria</th>
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<td>Sites may be ineligible if (a site must meet all five criteria):</td>
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<tr>
<td>1.  there is little potential for subsurface deposit;</td>
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<tr>
<td>2.  lacks diagnostic artifacts on site;</td>
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<tr>
<td>3.  lacks artifacts other than lithics;</td>
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<tr>
<td>4.  lacks a significant quantity of obsidian for hydration testing (20 pieces of appropriate sized obsidian is necessary based on Hockett’s criteria);</td>
</tr>
<tr>
<td>5.  lacks integrity due to severe ground disturbing activities.</td>
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</tbody>
</table>

Criterion guidelines used by the BRD are conventional directives used to evaluate archaeological sites and maintain controlled and consistent management practices, especially important for agencies dealing with numerous sites. A longstanding issue in Great Basin archaeology is the never-ending site or sites that are too large to adequately define boundaries within project areas or time constraints. Sites located on the BRD often consist of vast lithic scatters (as did most of the sites recorded for this project) that extend unknown distances beyond survey boundaries, and in most cases, overlap other sites. In fact, one could easily define large portions of the BRD as one enormous site, District, or TCP. For example, an entire grove of pinyon-juniper woodland could be considered one large cultural resource site, especially in terms of defining a TCP for its potential as a traditional gathering place.

Sites are often evaluated during initial identification and may be deemed ineligible at this phase. Nonetheless, it is important to not dismiss sites as ineligible until geomorphological processes or landform changes are fully understood and the potential
for subsurface deposits can be assessed (Basgall and Delacorte 2003, 2011, 2012). In addition, a site that appears ineligible when considered in isolation, may gain significance when its functional and temporal relationships to nearby sites in a larger District or TCP are clearly outlined. Sites lacking temporal diagnostics and diverse surface assemblages should remain unevaluated, for purposes of avoiding adverse effects to the property until further assessment such as testing or monitoring can be implemented. However, the BRD criteria seem fair and reasonable for eligibility determinations given their strict requirements for ineligibility determinations.

The following discussion focuses on the integrity and significance (i.e., site impacts, subsurface deposits, spatial loci, and evaluations) of sites recorded during this project. The last section of the chapter describes various features observed during an overview fieldtrip to the project area to relocate features previously discovered outside the present sample survey boundaries. These observations help build a case that the integrity and significance of TNKG warrant its NRHP listing as a District and potentially a TCP.

**Integrity**

An argument can be made that the project area exhibits every characteristic of integrity. The location has three significant characteristics: (1) within a juniper-pinyon woodland, (2) topography suited to herding or corolling animals, and (3) an unobstructed viewshed of surrounding areas. The construction of features or design appears directly related to vegetation and/or topography. Artifacts located within the project area can also
be attributed to the design aspect. Materials or artifacts, specifically diagnostic artifacts, attribute distinctive time periods to most of the sites within the project area. Workmanship can be attributed to such features as the rockwalls, corrals, and rockrings, as well as portable artifacts. The last two aspects, feeling and association, speak strongly to the value of the project area. The interconnectivity of all the artifacts, features, and petroglyphs of the complex convey an association with a distinctive aspect of prehistoric lifeways as well as the assimilation of Native culture in the historic period. Lastly, correspondence with tribes, recently observed memorials (such as feathers placed at petroglyph sites), and fresh pinyon hulls indicative of recent gathering indicate ongoing, traditional use of TNKG, contributing to its potential as a TCP.

*Site Impacts*

Site integrity can be compromised by the severity of impacts it has received. Minimal impacts include grazing and animal burrowing. Impacts resulting from recreation use, especially looting, are more severe. Significant adverse effects to a property may result from destructive impacts such as road construction, mining, or commercial construction. The primary issue concerning impacts is the loss of valuable data. The identification, recording, and monitoring of sites is one practice employed to assess site condition over time. A data recovery plan is usually employed to mitigate adverse impacts and gather as much information as possible if a site will be destroyed and avoidance is impossible.
Land development and resource exploitation impacts to the project area include seasonal grazing, occasional off-highway vehicle (OHV) use on USFS roads that traverse the project area, and hunting. These impacts are not intentionally destructive, but with time degrade archaeological sites little by little. Their impacts often go unnoticed, so the degree of adverse effect that may accrue over time is unknown (Nickens 2000). Unfortunately, such public recreational use has, in the past, included the looting of prehistoric sites within the project area. Several OHVs were seen in the study area during fieldwork, as well as looters’ piles, a screen, and modern trash.

Another impact that concerns the BRD archaeologist is the potential for military training in the project area. The Mountain Warfare Training Center in Pickle Meadow, California is located approximately 20 minutes northwest of Bridgeport. Marines at the Center train for operations in mountainous, high-altitude, and cold environments in simulated war-like scenarios. Extensive damage to the cultural resources at TNKG could result if training breaches into the area, an unlikely circumstance because a USFS permit would be needed. However, this situation requires monitoring to ensure that Marine activity does not encroach upon TNKG (Cliff Shaw, personal communication 2011).

Fire resulting from a lightning strike or arson is another destructive agent that threatens TNKG. The wooden drive fences and wikiups are especially vulnerable to fire, and their destruction would be an irreplaceable loss at TNKG. Rock art and the hydration potential of obsidian artifacts could also be damaged. In the event of either a catastrophic fire or the implementation of fire control measures (i.e., prescribed burns, construction of
fire breaks, aerial bombardments), it is critical that fire fighters be aware of the significance of TNKG and take measures to protect it.

Lastly, there is threat of potential mining within TNKG boundaries and nearby areas. If mineral exploration is permitted at TNKG, Section 106 of the NHRP requires federal agencies to assess the effects of federally funded/_permitted activities and programs on significant historic properties. If this were to happen at TNKG under NRHP eligible status, the properties would have to be mitigated against adverse effects.

A concern with site impacts is irreversible damage to a site’s integrity, which in turn affects a site’s significance. The general integrity of the project area is high because adverse impacts have been minimal so far. It is crucial, therefore, that a management plan be developed and implemented, requiring careful monitoring to assess impacts and initiate a data recovery plan if damages threaten site integrity and significance. It is recommended that all sites and features be identified and recorded, so proper monitoring and site assessment can be implemented.

**Significance**

The significance of TNKG is based on Criteria A, C, and D, with the latter including significance based on Traditional Importance. Archaeological sites are usually nominated under Criterion D. Nomination as a TCP is considered under Criteria A and C.
**Criterion A**

TNKG may be associated with significant events if it can be determined that the area has mythical or historical importance in the lives of Native tribes in the region (Winthrop 1995).

**Criterion C**

It seems likewise reasonable that TNKG is significant under Criterion C as a District that represents a significant and distinguishable entity, assuming that either Criterion A and/or D are applicable (Winthrop 1995). In similar fashion, the construction of the game drive facilities and wikiups are representative of a distinctive period and type of construction that has an ancient history. This criterion is most commonly applied to architectural settings, but it is certainly applicable here. The concentration of trap complexes in this small area is the greatest yet recorded, and it qualifies as a significant set of built structures. The rock art has likewise high artistic value, and is significant under Criterion C.

**Criterion D**

The research potential of TNKG has much to contribute on an array of archaeological research topics, making the site eligible under Criterion D. Future research will, no doubt, afford significant insights on communal hunting, pinyon exploitation, acculturation, other archaeological research topics and ethnographic studies. For properties eligible under Criterion D, integrity is based upon a property’s potential to
yield specific data that addresses important research questions (National Park Service 1995).

*Traditional Importance*

TNKG may also be significant for its traditional importance as a cosmological or spiritual landscape, as well as its contemporary use as a pine nut gathering area. The cosmological landscape pertains to the spiritual geography of TNKG. Winthrop (1995) defines a cosmological landscape as a particular landmark used by the inhabitants to gain comfort, guidance, or power. One such landmark within TNKG is the Aurora Crater. A Spiritual Landscape is a place of prayer, spirit quest activities, and spiritual teaching (Winthrop 1995). Piled rock sites are often taken as evidence of spirit quest activities with such pile rock features documented at TNKG. Contemporary use of an area is defined when tribes continue to maintain traditional practices such as gathering. Recent pinyon debris was observed at one of the TNKG sites and may be evidence of traditional pine nut gathering activities. More research will be necessary before determinations can be made regarding cosmological and spiritual landscapes and contemporary use areas.

*Potential for Intact Subsurface Deposits*

The likelihood of subsurface deposits is a key consideration in eligibility determinations. Generally, the best way to determine subsurface deposition is through test excavation. However, simple observations of topography, soil type, and partially
buried artifacts or features can often suffice for an assessment of the likelihood that buried cultural contexts may exist.

TNKG sits upon a mesa bounded by Rough and Bodie Creeks on the east and west sides, respectively. The vegetation consists primarily of mature groves of pinyon-juniper woodland. The depositional context consists of both aeolian and colluvial sediments intermixed with material from old volcanic eruptions in the Mono Lake area. Rodent burrows and partially buried artifacts and features were observed in many areas of TNKG, indicating the potential for subsurface deposits at most of the TNKG sites.

*Tunna’ Nosí Kava’ Gwaa: Individual Site Evaluations*

Each site was evaluated based on integrity to determine significance and eligibility for inclusion on the National Register of Historic Places. Sites S3A, S3B, S3C, S3D, S3M, S3H, S3I, S3J, and S3K are recommended as significant based on the BRD criteria for significance as listed in Table 6.3. Prehistoric temporal affiliations range from the pre-Newberry to Marana periods, and Protohistoric components are also represented at some sites.
Table 6.3. Sites recommended as significant based on assemblages and BRD criteria.

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<th>Sites that lack cultural and natural depth may be eligible if:</th>
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<td>1. sites contain a large quantity of diagnostic obsidian PP</td>
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<td>2. sites are small but contain discrete artifact clusters (and contain at least 20 bifaces or flakes suitable for hydration analysis);</td>
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<tr>
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<td>4. Sites contain exotic obsidian artifacts.</td>
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The other sites (S3L, S3F, S3Z, S1A, S1B, S1C, and S1D) are small and ephemeral, characteristics that may seem to deny significance. However, based on USFS criteria, these sites would be considered potentially significant (see Table 6.4). As previously mentioned, geomorphology, site interconnectivity, traditional cultural uses, and other nearby activity areas should be assessed before determining ineligibility, and seeking SHPO concurrence. Therefore, their eligibility should remain
unevaluated until they can be examined more extensively and assessed as contributing to a TNKG District.

Table 6.4. Sites potentially significant based on BRD criteria.

<table>
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<tr>
<th>Sites that lack cultural and natural depth may be eligible if:</th>
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<th>S3F</th>
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<td>2. the data preserved beyond the site’s surface provides additional chronological, subsistence data, etc.</td>
<td>x</td>
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Tunna’ Nosi’ Kaiva’ Gwaa: Assessment as a District

The inventory methods employed for this research project only sampled part of the TNKG site complex. Presented here are observations made during an overview field trip to the thesis study area, which include petroglyphs, rockwall and corral features, rock
rings, hunting blinds, and artifacts (specifically projectile points) occurring outside sample units. These observations further support the argument that TNKG should be considered a District eligible for the NRHP. They further suggest that with more evidence and documentation, a TNKP District could be a TCP.

Petroglyphs have been observed throughout TNKG, including the particularly important Eagle Feather Petroglyph Site. It may be the most significant ceremonial site discovered thus far at TNKG (Cliff Shaw, personal communication 2010). The site was discovered in 1996 and recorded in 1999 during a USFS sponsored PIT volunteer project. In addition to the hundreds of petroglyphs that cover the site’s many large volcanic boulders, the site is noteworthy because a bundle of feathers was placed as an apparent offering by local Paiutes in the 1980s and early 1990s (Jack Scott, personal communication, 2007) under a small rock marked with a petroglyph (see Figure 7.1), evidence that TNKG is potentially a TCP. Bridgeport’s wildlife biologist identified these feathers as eagle.
The game drive features were what originally attracted Cliff Shaw to TNKG, and he spent several years tracing alignments throughout the study area. From 2001 to 2009, Shaw surveyed approximately eight miles of these rock and wood features at TNKG (one mile of rock stack alignments, one mile of wood fence features, four miles of rock fence features, and two miles of corral rock walls). Since his surveys were intuitive in nature and did not follow a sample design, future surveys will likely discover additional segments of game drive features.

Shaw identified approximately eight rock wall and corral features in the area (Figure 6.2) some of which retain pieces of wood in the rock wall (see Figure
6.3), illustrating how they were originally constructed. Over time, however, much of the wood has deteriorated due to historic fires, natural decomposition, and scavenging (Cliff Shaw, personal communication 2010). In addition to construction and burning, axe cutting was also observed on several of the remaining wood pieces. Several features were visited and many consisted of complex alignments. Several projectile points were observed along wall features, including both Elko and Cottonwood series forms. In one case, at least 100 point tip and midsection fragments were noted in close proximity to a feature that probably represents a kill site.

Figure 6.2. A corral rockwall feature.
In addition to game drive features, numerous rock rings occur within the study area. These are probably foundations for pinyon caches or housestructures, but could also be for storing snow as drinking water. Several rock rings were recorded during the survey, but many more remain undocumented (Figure 6.4a, 6.4b). One of these had a mortar and pine nut debris nearby (Figure 6.5), suggesting that it has been recently used by local Paiute people, bolstering the idea that TNKG qualifies as a TCP.
Figures 6.4a and 6.4b. Rock rings.
Hunting blinds occur throughout TNKG. Most are found along ridge-tops that offer excellent vantages for monitoring game and the activities and movements of other people. One particular hunting blind contained a substantial debitage concentration (see Figure 6.6), and overview of a large valley (see Figure 6.7) ideal for observing animals in preparation for a hunt or drive. The hunting blinds would have offered great viewsheds for observing the movement of people.
Figure 6.6. Hunting blind with debitage concentration.

Figure 6.7. View from hunting blind with an overview of the valley.
Recommendations

This management plan defines six TNKG primary themes, three of which are research domains developed in the thesis to evaluate the archaeological sites discovered during the sample survey, and three are cultural domains that became evident when considering TNKG as a TCP. The following section identifies the themes of this management plan, separated between topics related to research and culture.

Research Themes:
   Game Drives/Communal Hunting
   Pinyon Utilization
   Acculturation

Cultural Themes:
   Cosmology
   Spiritual
   Contemporary Use

Based on the information above, it is recommended that TNKG be nominated as a District on the NRHP. A National Register District “possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development” (National Park Service 1995:5). A district is a collective system and can consist of a wide variety of resources that provides insight to the overall historic environment. The same arguments developed above for the management advantages of nominating individual sites within the project area as eligible to the NRHP, hold true for a District nomination. Given the number of features, artifacts, sites, and overarching prehistoric/historical importance and research potential of the project area, nominating TNKG as a District will provide better
protection and a simpler management tool for the complex remains characterizing the area.

There have been several indications that TNKG would also qualify as a TCP. These include the presence of a recent offering of eagle feathers at one of the petroglyph sites and continued use of the area for pine nut gathering by native people. As such, further investigation is recommended to assess TNKG as a TCP.

TNKG is a District and potential TCP, abundant with artifacts and features that reveal an ancient lifeway, elements of which persist today in contemporary Paiute/Shoshone life. It is likewise reasonable to conclude that individual sites recorded for this study maintain integrity and are significant. Nevertheless, nomination of TNKG as a District and potential TCP would enhance the management and protection of the area, ensuring its preservation for future generations.
This thesis has demonstrated that TNKG is eligible for inclusion on the NRHP both because of its traditional importance and its potential to yield significant information about prehistory. Therefore, this Data Recovery Plan (DRP) is developed as a management tool specific to TNKG. The data recovery methods presented are more generic than most DRPs, which are designed to mitigate specific adverse effects to a historic property or properties eligible for the NRHP that accrue from a particular undertaking. Here, since no specific undertaking or adverse effects are anticipated, the DRP serves to further investigate and identify the sites, features, and contemporary use of TNKG to further our understanding of TNKG and its history.

Federal law (36 CFR 800) mandates the protection of historic resources, and federally assisted undertakings must consider potential impacts to archaeological sites, districts, buildings, or other properties. Federal, state, and local agencies must consult to avoid, minimize, or mitigate adverse effects in order to meet Section 106 requirements governed by the Advisory Council on Historic Preservation (ACHP) (Caltrans Standard Environmental Reference, n.d.).

If TNKG was nominated as a NRHP District, it would receive the upmost protection, making it difficult to approve any undertaking that would adversely affect the property. Even if such a project was permitted, the law would require extensive mitigation efforts at TNKG. If adverse effects can only be mitigated by data recovery
efforts such as excavation, a research design and data recovery plan should be based on background data, planning, and sound archaeological methods, in addition to regional, state, and local historic preservation plans, land and resource manager needs, research interests, and public interests (Caltrans Standard Environmental Reference, n.d.). Careful consideration should be given to management needs, including the appropriate range of archaeological values and a synthesis of research with other programs (Fowler 1999).

The DRP must be consistent with the *Secretary of the Interior’s Standards for the Treatment of Historic Properties*, the Secretary of the Interior’s Standards and Guidelines for Archaeology and Historic Preservation, and the *Advisory Council on Historic Preservation’s Treatment of Archaeological Properties: A Handbook*. The plan’s specifications should include (Fowler 1999):

- Results of previous research within project area
- Research questions
- Field and laboratory analysis methods
- Artifact, data, and records management methods
- Provisions for disseminating research findings to professional peers
- Public outreach plans
- Curation plans
- Procedures for evaluating and treating unexpected discoveries

In an effort to outline pertinent data needs for future research, preservation, and protection of the project area, this plan should be used as a management tool to continue identification and evaluation efforts and for nomination to the National Register for the protection and preservation of TNKG. To reiterate, this data recovery plan is not intended to mitigate adverse effects to historic properties, but rather as a management
tool for the continued identification and recording, protection, and preservation of the project area.

**Research Themes**

The archaeological sites and features of TNKG encompass several interrelated activities and possess a history of at least 7,000 years. Evidence suggests that at least two important activities were conducted at this location: driving game and pinyon gathering and processing. It is also presumed that native people resided in the area well into the historic era, as evidenced by several sites with Euro-American influences. Numerous historic sites have been identified throughout TNKG, which not specifically considered in this thesis, should be evaluated as contributing elements to the District. As a District, TNKG offers great value to future research, especially investigations focused on communal pronghorn hunting, pinyon use, and acculturation.

*Communal Pronghorn Hunting*

Although numerous game drive complexes have been identified in the Great Basin, TNKG represents one of the largest trap complexes found to-date. Chronological data from the current project suggest TNKG was used for pronghorn drives for the past 3500 years, possibly as early as 7000 years, and persisted until the terminal prehistoric, or post-contact era. Point concentrations are important sources of information regarding this history, because of their chronometric value and associations with surround, ambush, and communal drive strategies. Point concentrations have been observed at TNKG and
numerous fragmented obsidian projectile points were recorded during the survey, with Elko and Desert Side-notch types dominating the surface inventory. Hunting and butchering sites, with point concentrations, no doubt remain to be found at TNKG. Rock wall features have also been observed with wood remnants that can be radiocarbon dated. Invaluable chronological data could be acquired from TNKG to augment what is currently known about game drives and communal hunting. Game drive data should focus on but not be confined to:

- Concentrations of diagnostic projectile points and fragments
- Dense obsidian debitage and chipped stone tool concentrations
- Bone beds, especially adjacent to game drive features
- Wooden drive fence and corral facilities

Given the concentration of game drive features and rich information potential, further work at TNKG can glean answers to the following research questions:

*Did trap facilities start as modest features used by family groups or small hunting groups prior to 1350 BP and later expand to accommodate large communal groups?*

*Were trap facilities used prior to 1350 BP?*

The antiquity of large communal drives comprising multiple families has been a subject of debate. The author argues that pronghorn hunting at TNKG prior to 1350 BP was conducted by both small family band and logistical, task specific hunting groups. These hunts were most likely conducted as ambushes or surrounds, potentially but not necessarily using small-scale trap facilities or corrals. Large scale communal hunting was probably established at TNKG after 1350 BP and lasted until the historic period, when depletion of antelope herds made communal drives uneconomical. Thus, TNKG
should contain archaeological evidence of three pronghorn hunting strategies: 1) small scale band and 2) logistical task group hunting employing surround or ambush strategies, and 3) large scale communal hunting association with drive fences and corrals. Chapter 3 provides a more detailed discussion of the expectations surrounding this hypothesis.

*Pinyon Utilization*

Rock rings, wikiups, pinyon ladders, ground stone, and incised stone are located throughout TNKG. All are probably associated with pinyon procurement, given the sites location in a pinyon-juniper woodland. Further investigation of TNKG will yield information regarding the antiquity, technology, intensification, and mobility strategy of pinyon processing in the Mono region.

Paleoenvironmental studies at TNKG such as packrat midden analysis would improve understanding of pinyon use in the project area. Subsurface testing would be the most beneficial approach to acquire the necessary data. It is recommended that all identified rock rings be recorded in terms of type (i.e., pinyon caches, house structures blinds, etc.) and a random sample tested at each site type.

Extensive analysis and subsurface testing should produce invaluable data on the behavioral strategies and settlement patterns related to pinyon exploitation at TNKG. That said, investigations of pinyon utilization at TKNG should focus on, but not be confined to:

- rock ring structures
- ground stone artifacts
- floor stains
- macrofossils/radiocarbon dates
When pinyon became an important food resource and how and why pinyon procurement intensified over time are likewise important research issues. Archaeologically identifying green and brown cone procurement strategies and distinguishing residential bases from logistical camps are important aspects of these issues. Whether pinyon processing and communal hunting were complimentary or conflicting activities is another critical question, as both activities are evident in the project area. As such, TNKG can provide answers to the following research question:

*Were camps between 3150-1350 BP used for procuring both pronghorn and pinyon by means of both residential and logistical use?*

*Is there a clear distinction between pinyon and communal hunting camps after 1350 BP?*

I have argued that prior to 1350 BP, TNKG was employed in both a logistical and residential fashion for pronghorn hunting and sometimes pinyon procurement. If true, camps dating prior to 1350 BP should contain evidence of pronghorn hunting or both pinyon and pronghorn procurement. After 1350 BP, the large scale organization of communal pronghorn hunting conflicted with small family group harvesting and storage of pine nuts. Pinyon exploitation became a distinct and separate activity conducted from residential camps by small family groups before the communal pronghorn hunt. Pinyon crops were, however, unpredictable, so that use of this resource would have been intermittent at TNKG. Use of TNKG for pronghorn drives and pinyon procurement were
likely palimpsest activities, such that pinyon features post-dating 1350 BP should contain little or no evidence of pronghorn hunting (refer to Chapter 3).

Acculturation

One wikiup and several beads were recorded during the survey, and several other post-contact artifacts were also observed. At least 12 additional wikiups have been reported from TNKG. There are also numerous historic sites and features that remain unrecorded and may relate to the theme of Native American acculturation. The project area is located near the towns of Aurora and Bodie, as well as the Fletcher stage stop, visible from some of the recorded sites. This location may have made TNKG a good place to reside while working for wage labor at nearby towns, yet still maintaining traditional cultural practices.

Detailed recording of these sites will provide a better understanding of the acculturation process that occurred after Euro-American settlement. Analysis of glass trade beads will also help to refine bead typologies. Extensive analysis should likewise be conducted on Euro-American artifacts such as flaked glass or modified cans, to assess how these artifacts were used within the changing Native American lifeway. Subsurface testing of wikiups would also be beneficial in deciphering the post-contact adaptive process. Given the above, acculturation studies should focus on, but not be confined to:

- wikiup features
- beads
- modified glass
- modified historic artifacts
- food containers
The post-contact adaptive process was a difficult and devastating time for Native Americans. Occupational patterns, technologies, and subsistence strategies changed dramatically, but some traditional cultural practices persisted. TNKG can provide answers to the following research questions:

*Do sites dating prior to 1860 exhibit evidence of limited Euro-American goods?*

*Was pronghorn hunting and pinyon procurement abandoned between 1860-1870?*

*Did pinyon camps revive post 1870 and were trap facilities redirected to capture feral horses and domestic animals?*

Significant changes took place during the Contact period. Three phases of change have been identified (see Chapter 3) that define shifts in the indigenous lifeway. I have argued that prior to 1860 little change had occurred at TNKG, save the incorporation of trade beads and limited Euro-American goods. Between the years of 1860 and 1870, however, logging for Aurora likely forced TNKG inhabitants to abandon pinyon and pronghorn procurement, although they may have continued to reside at TNKG as wage laborers in Aurora. Pinyon gathering may have revived after 1870, if groves were not completely destroyed, with trap facilities used for capturing feral horses and domestic livestock. Sites prior to 1860 should, therefore, contain few Euro-American goods, those between 1860-1870 some Euro-American material, along with traditional ground stone and basketry, and sites after 1870 should reflect a revitalization of pinyon camps and use of traditional hunting facilities to capture horses and domestic livestock (refer to Chapter 3).
Cultural Themes

Three cultural themes were identified in Chapter 6, as they pertain to the potential TCP eligibility of TNKG: Cosmology, Spiritual, and Contemporary Use. Additional research is required to determine the significance of these themes to justify the status of TNKG as a TCP. None of the themes were outlined in detail, but based on observations they warrant mention, given their potential significance. A cosmological theme has been identified based on nearby Aurora Crater, visible from TNKG. A cosmological landscape is a landmark used by inhabitants to gain comfort, guidance, or power (Winthrop 1995). A spiritual theme has been identified based on the numerous piled rock features found throughout TNKG - features that may be evidence of spirit quest activities (Winthrop 1995). An extensive petroglyph and ethnographic analysis, including a review of sacred places and myths, would contribute further information pertaining to cosmology and spirituality. The final or contemporary use theme was proposed on the basis of recent pinyon gathering debris at TNKG and offering of eagle feathers at one of the petroglyph sites. All three themes could be profitable if investigated by an ethnographic analysis, including oral histories.

Tasks

As outlined above, management of TNKG requires several tasks in order to gather the necessary information to evaluate and nominate TNKG as a District and TCP. The
following tasks should be undertaken to partially fulfill these management goals and proposed management plan.

(1) Monitoring

Monitoring is the first step to assess any changes or damage to archaeological sites and the larger study area. A field visit should be conducted by a qualified archaeologist at least once a year to monitor and report on recorded sites within the study area.

(2) Identification/Recordation

Complete the identification and recording efforts. If funding is available, it is recommended that the remaining 200 x 200 m quadrats in the present survey sample be completed with at least a cursory recording of newly identified sites. Any further survey/identification efforts should follow the survey design employed here, i.e., a random sample of quadrats within each stratum. After completing the pedestrian survey and cursory site recording, it is recommended that extensive recording of all identified sites be completed. This may lead to the combining of sites based on patterns that emerge during survey and initial recording efforts.

Given that the entire project area could be identified as a single large lithic scatter, only sites with distinct artifact and/or dense debitage concentrations were recorded. But future studies should investigate the sparse lithic scatters, and a robust program of obsidian hydration analysis should be conducted at all sites to clarify their age.
(4) Analysis

All artifacts and features should be recorded, and most analysis done on-site. However, some artifacts should be collected for further analysis and special studies such as obsidian hydration. Extensive in-field recording should focus on both features and ground stone, including artifacts that exhibit characteristics of acculturation, such as flaked bottle glass, beads, modified cans, etc. Special studies that should be completed under this management plan include packrat midden, rock art, obsidian hydration/sourcing, and radiocarbon analyses.

(5) Site Types/Taxonomy

Five site types were identified during this project: habitation, pinyon processing, hunting/kill, butchering, and tool manufacture and repair. Further site recording should employ the same site categories to augment the research themes outlined in this management plan.

(6) Extensive Ethnographic Literature Search

An extensive literature search of published and unpublished material pertaining to the ethnography of the study area needs to be conducted. This may include published and unpublished work, field notes, historic diaries, historic store ledgers, birth, death, and baptism records, and early censuses of local populations. In addition, old photographs can provide useful information regarding the acculturation process. It is possible to match old photo vistas to local topography to identify the location of the photo. Such data would
provide valuable insight on behavior and acculturation and perhaps cosmological and
spiritual landscapes.

(7) Tribal Consultations and Interviews

Tribal consultation is necessary to fully understand the behavior that may have
created the archaeological record and the “meaning” of the project area to local Native
American peoples. Consultation and interviews with tribal members are critical for
understanding both the religious and cultural significance of an event to tribal people and
can provide valuable information regarding past behavior. Interviews should be gathered
from the oldest tribal members regarding their life and oral history, particularly myths
and songs, which change slowly, and stories, which exhibit rapid change (Kathleen
Heath, personal communication 2012).

(8) Nomination

Treating the project area as a District is the first step in the management of
TNKG. Site significance was discussed in Chapter 6 and is briefly summarized here.
Sites S3A, S3B, S3C, S3D, S3M, S3H, S3I, S3J, and S3K are recommended as
significant, and the eligibility of sites S3L, S3F, S3Z, S1C, and S1B remain unevaluated.
A strong case has been built that TNKG should be nominated to the NRHP as a District
and with additional research may be justified as a TCP. It is recommended that steps be
taken to formally nominate TNKG has a District on the NRHP.
Conclusion

Identification, recording, and monitoring TNKG resources are the first steps in managing the eight tasks outlined to guide the data recovery process. Additional data and analyses will serve to better understand the TNKG inhabitants and their culture. The three research themes will enhance our current knowledge of communal hunting, pinyon use, and acculturation. The three cultural themes will also enhance our understanding of cosmological and spiritual landscapes and contemporary use areas. Together, these and continuing efforts will provide numerous research opportunities while preserving and protecting Tunna’ Nosi’ Kaiva’ Gwaa as mandated under Section 106 of the NHPA.
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