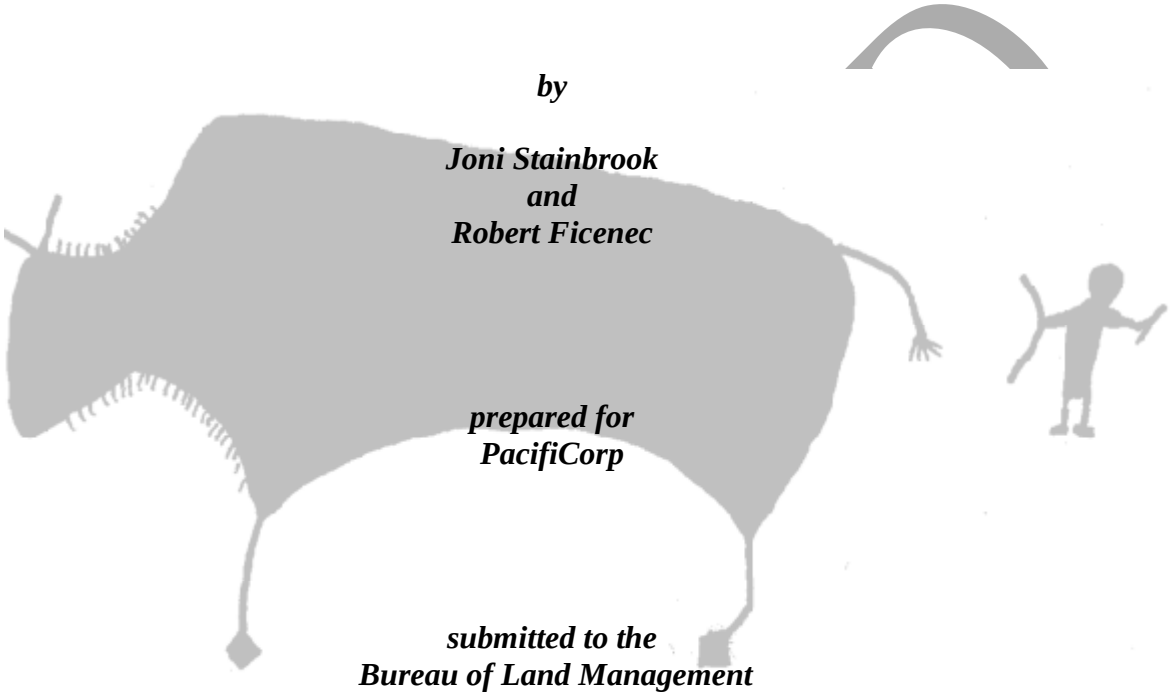
Class I Cultural Resource Data Review and Field Visit
for
PacifiCorp
Foote Creek Rim I
Carbon County, Wyoming
18-WAS-118



by

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prepared for
PacifiCorp

submitted to the
Bureau of Land Management
Rawlins Field Office

by
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010-WY-SR18
and Limited Testing Permit No.
374-WY-LTC18

Western Archaeological Services
Rock Springs, Wyoming
September 14, 2018

UNDERTAKING/PROJECT DESCRIPTION

PacifiCorp proposes to replace all 69 existing wind turbines in the Foote Creek Rim 1 study area with 12 larger and more efficient models that are approximately twice the size of the existing wind turbines. The existing Foote Creek Rim 1 project consists of 69 600 kw wind turbines in located in Sections 5, 6, 7, 18 and 19, T19N, R78W, Carbon County, Wyoming (Figures 1 and 2). Sections 6 and 18, T19N, R78W, are public land administered by the Wyoming Bureau of Land Management Rawlins Field Office (BLM RFO). Sections 5, 7 and 19, T19N, R78W, are private land.

All of the 69 existing turbines are proposed to be removed and the pads reclaimed. Twelve larger and more efficient models of turbines will be constructed in new locations. The new turbines and their associated pads will have a footprint of approximately 50 ft in diameter, or 2,000 ft^2 per turbine. The turbine dimensions will be around 20 ft (6.1 m) base diameter, 262.5 ft (80 m) hub height, 383.9 ft (117 m) rotor diameter, and an overall height of less than 492 ft (149 m). Access into the proposed wind turbines will utilize most of the existing roads, which will be widened to 24 ft wide for construction. Approximately 3000 ft of new access road will be constructed to tie the proposed wind turbines into the existing roads. To allow for transport of the larger wind turbines, approximately 2800 ft of new access road will be constructed in the NW¼ NW¼ SE¼ NW¼, SE¼ SW¼ NE¼ NW¼, SE¼ NE¼ NW¼ and W½ W½ SW¼ NE¼ of Section 5, T19N, R78W, and approximately 2000 ft in the NW¼ SW¼ SW¼ NE¼, SE¼ SE¼ NW¼, NW¼ NE¼ NE¼ SW¼, and NW¼ NE¼ SW¼ of Section 17, T19N, R78W. The existing road will also be temporarily widened beyond the proposed 24 ft in two areas in the S½ SW¼ NE¼ SE¼ of Section 6 and the E½ NE¼ NW¼ NW¼ NE¼ of Section 7, T19N, R78W. During construction, a crane will follow a path approximately 2.9 miles in length between the 12 proposed turbine sites. Approximately 22,400 ft (4.24 miles) of collection lines are proposed to be constructed to tie the proposed wind turbines into an MV switchbox on the existing substation. The switchbox will tie into the Foote Creek Rim 1 office via a fiber optic line which will parallel the northern access road reroute and the existing road. Two meteorological towers (MET) will also be constructed as part of the Foote Creek Rim 1 project. The MET towers will be constructed in the NW¼ SW¼ SW¼ SE¼ SE¼ of Section 6 and the C SW¼ NE¼ SE¼ NW¼ of Section 18, T19N, R78W. An additional 1650 ft of collection lines will be constructed to tie the two MET towers into the proposed collection lines.

The history of the project area includes a Class III cultural resource inventory conducted for the proposed KENETECH Windpower project in 1994 by TRC Environmental Corporation (TRC) in Sections 5, 6, 7, 18 and 19, T19N, R78W. A Class III cultural resource inventory was conducted by TRC for the PacifiCorp Miners to Foote Creek Rim Transmission line to convey electric power generated by the wind farm to Miner's substation near Hanna, Wyoming. The BLM received comments on the Final Environmental Impact Statement (FEIS) and a Record of Decision (ROD) was prepared. Prior to the completion of governmental approval, KENETECH filed for bankruptcy. Sea West purchased the assets of the proposed wind power project in Carbon County and requested BLM to assign the ROW grant application to Sea West for the purposes of windfarm development.

A Memorandum of Agreement (MOA) was completed among the BLM, the Advisory Council on Historic Preservation and the Wyoming State Preservation Officer regarding the Sea West/PacifiCorp Phase 1 Windpower Project (BLM 1997a). Stipulations within the MOA included fencing of all construction within 150 feet of any feature and construction monitoring by a BLM permitted archaeologist. A stone alignment at Site 48CR5585, located within the Foote Creek Rim Archaeological District, 48CR5834, was disturbed during road construction (BLM 1997b). Two rocks were broken within linear feature No. 201.

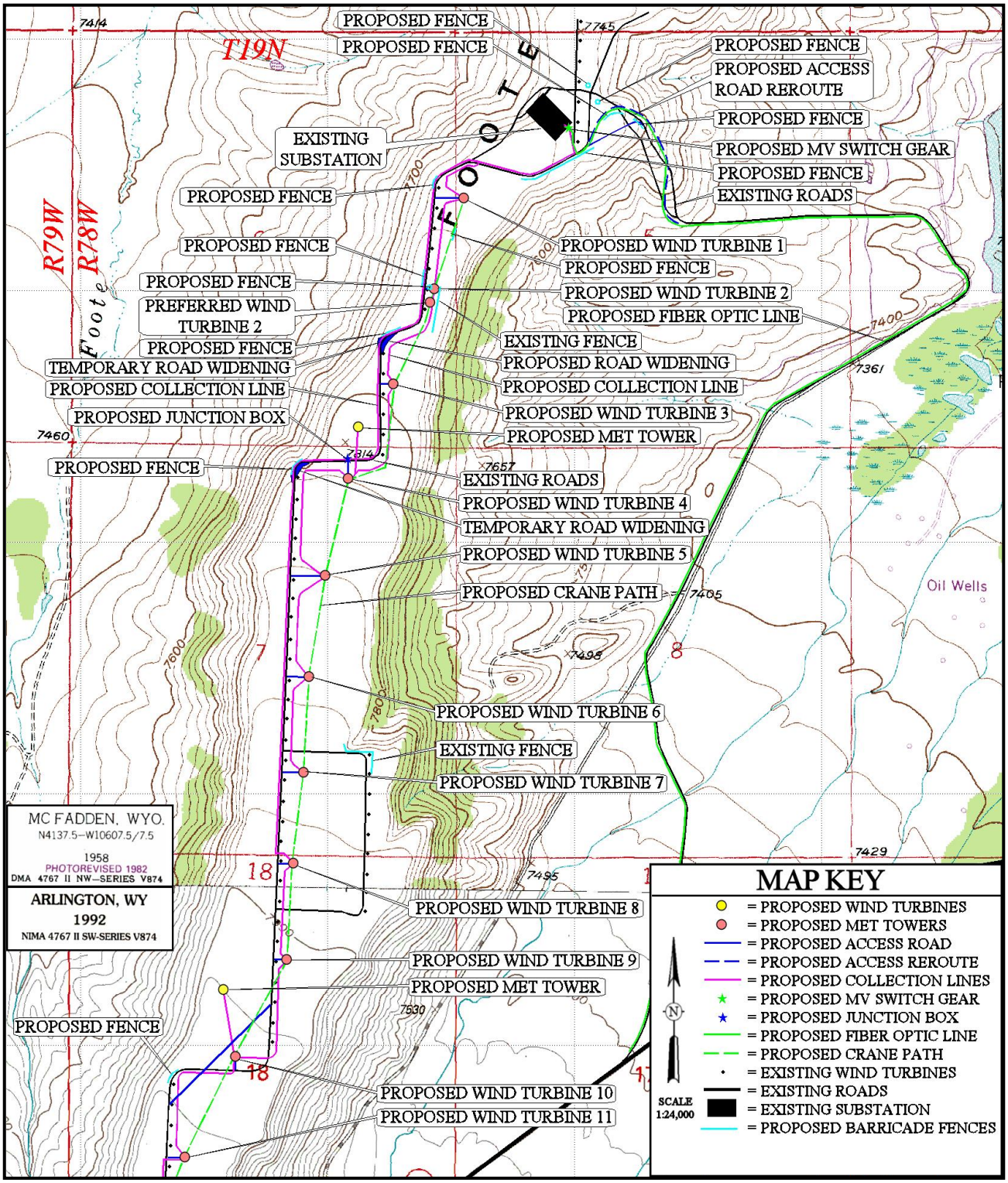

Figure 1. USGS topographic map showing the location of the northern and central portion of the PacifiCorp, Foote Creek Rim 1, Wind Turbine Replacement 2018 Project in Sections 5, 6, 7, 8, 17, and 18, T19N, R78W, Carbon County, Wyoming and the known cultural resources.

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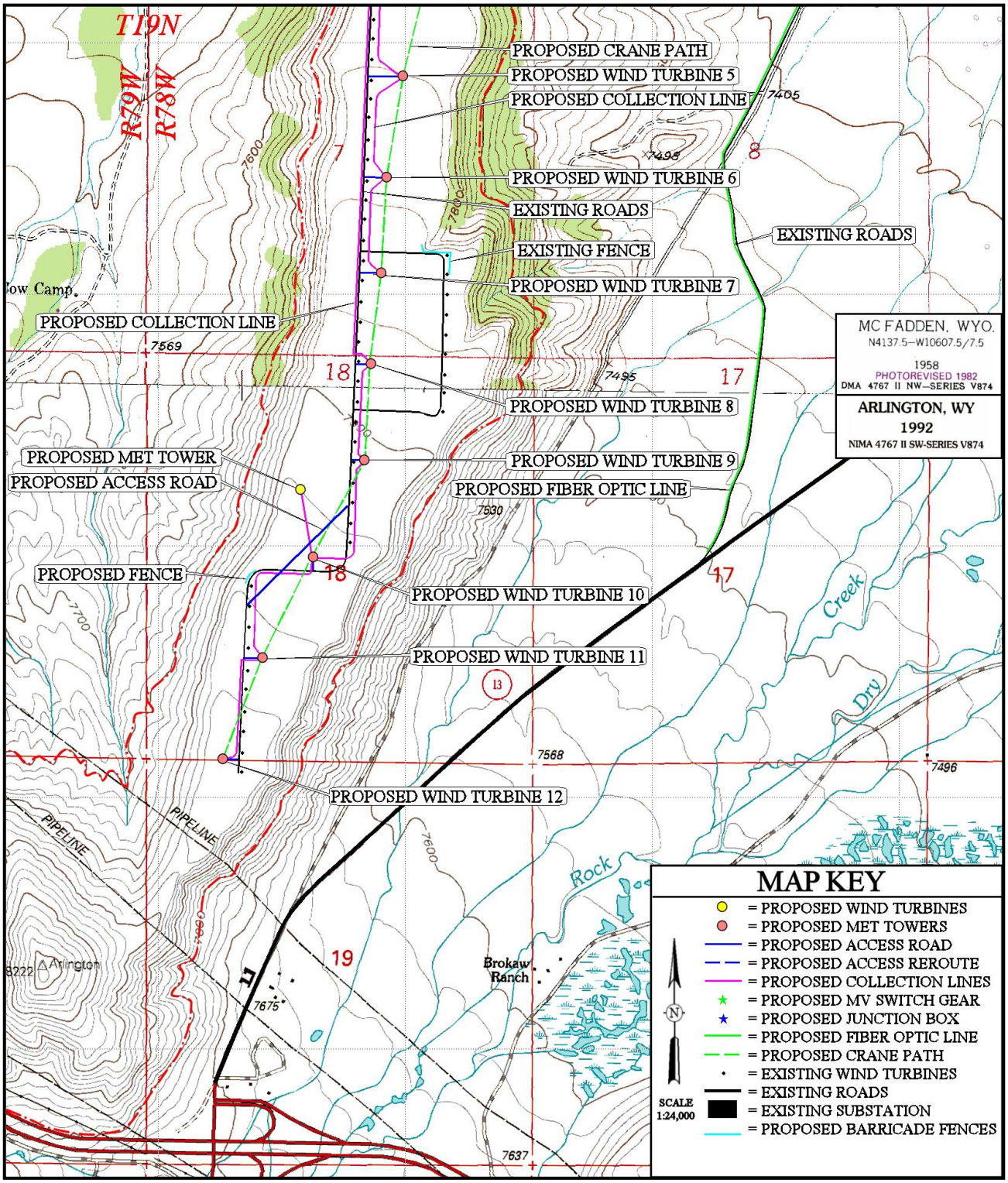

Figure 2. USGS topographic map showing the location of the southern and central portion of the PacifiCorp, Foote Creek Rim 1, Wind Turbine Replacement 2018 Project in Sections 7, 8, 17, 18 and 19, T19N, R78W, Carbon County, Wyoming and the known cultural resources.

The BLM RFO required a Class I data review and associated site visits prior to construction. The following report documents the data review and site visits.

CLASS I METHODS

The objective of the Class I cultural resource data review is to identify existing cultural resources in the project area using previously documented information. To meet this objective, a cultural records search was completed with the use of existing data from cultural resource inventory files maintained by the State Historic Preservation Office (SHPO) Cultural Records Office (CRO) website (2017). Files at Western Archaeological Services (WAS) were investigated for past work in the project area. The BLM RFO was contacted in August and September, 2017, regarding site shape files and significant cultural resources in the study area.

Class I inventories are used to determine if a more intensive inventory of specific areas is appropriate. This determination is made in consultation with the Wyoming SHPO and often results in the completion of Class II or Class III inventories (United States Department of Interior 2004).

On July 24 and 25, and August 7, 2018, Robert Ficenec of WAS conducted a field visit . . . (Omitted text as per BLM Regulations)

ENVIRONMENTAL SETTING

The PacifiCorp, Foote Creek Rim 1 study area is located in southeastern Wyoming approximately 1.0 to 4.2 miles north of the town of Arlington. The project is situated on Foote Creek Rim and is located between the Hanna-Carbon Basin to the northwest and the Laramie Basin located to the southeast. The Laramie Mountain bound the Laramie Basin to the east. The North Laramie Basin is northeast of the study area and the Medicine Bow Mountains are to the south (SHPO 2017). The Medicine Bow Mountains were formed when Precambrian metamorphic rocks were uplifted by the Arlington thrust fault. Sandstone beds in the overlying Cretaceous Mesaverde formation form cliffs to the north of Interstate 80. From the Paleocene Ferris and Hanna formations, the Hanna Basin contains abundant coal reserves. The Shirley Mountains extend east from the Granite Mountains and are north of the study area (Lageson and Spearing 1991).

Foote Creek Rim is a large, northeasterly trending, flat-topped interfluvial divide that separates Foote Creek to the west and Rock Creek to the east. The headwaters of Rock Creek and Foote Creek are located in the Medicine Bow Mountains south of the study area. Rock Creek flows northeasterly for 15.0 miles, beyond the town of Rock River, Wyoming, where it curves back to the northwest, west/southwest of Pine Tree Ridge. Rock Creek flows through a gap on Como Bluff and then trends southwest towards its confluence with the Medicine Bow River, east of the town of Medicine Bow, Wyoming, and southeast of Fossil Ridge. Foote Creek flows northeast and then curves back to the west/northwest to its confluence with the Medicine Bow River, southeast of the town of Medicine Bow, Wyoming, and 3.0 miles south of the confluence of Rock Creek and the Medicine Bow.

Environmental information was obtained from the Natural Resources Conservation Services website (2017). The elevation of the study area is between 7800 and 7930 feet above mean sea level. The mean annual precipitation in the area is 8-12 inches. The mean annual temperature is 40-46º F. Sediment in the Foote Creek Rim 1 study area is sandy loam and gravelly sandy loam alluvium. The alluvium is derived from igneous, metamorphic and sedimentary rock. The top of the rim is a gentle slope of 0-2%.

Vegetation in the study area and in the surrounding region varies depending on the topography. The vegetation within the study area is dominated by various mixed grasses, alpine

grasses, sagebrush, wildflowers and low-lying forbs. Vegetation in surrounding areas includes a cool desert sagebrush and short grass community and may include sagebrush, rabbitbrush, Great Basin wild rye, Indian ricegrass and wheatgrass with old growth sage in the drainage bottoms. Other vegetation that may be found in the general area includes shadscale, saltbush, prickly pear cactus, greasewood and desert cushion plants. A thick stand of pine, juniper, and aspen is present along portions of the eastern slope of Foote Creek Rim. Riparian zones found in along the rivers and creeks including the agricultural fields around Arlington, Wyoming, include such flora as cottonwood trees, willow trees, cattails, bull-rush and sedge. Crops grown are primarily native hay and pasture. To the south, towards the Medicine Bow Mountains including Elk Mountain, various species of pine trees, stands of juniper and aspen trees become common with increasing elevation and subsequent moisture. Mountain shrub is dominated by mountain mahogany which is found in shallow soil in the foothills. Serviceberry, chokecherry, and other shrub species may also present.

CULTURAL CHRONOLOGY

Archaeological investigations in the Wyoming Basin indicate the area has been inhabited by people for at least 12,000 years from Paleoindian occupation to the present. The accepted cultural chronology is based on the Wyoming Basin chronology by Metcalf (1987) and revised by Thompson and Pastor (1995). The Wyoming Basin prehistoric chronology is again revised by WAS and documented in Table 1 as proposed by Pastor et al. (2015).

Paleoindian Period

The oldest period in the Wyoming Basin for which there is solid archaeological evidence is the Paleoindian, beginning ca. 12,000 B.P. and ending ca. 8700 B.P. (Pastor et al. 2015). This period occurred during the transition from the periglacial conditions of the Wisconsin ice advance during the terminal Pleistocene to the warmer and drier climatic conditions of the Holocene (COHMAP 1988; Thompson et al. 1993). Paleoclimatic conditions during this period were conducive to increased plant biomass across North America. This environment supported a variety of large herbivores such as the mammoth, horse, camel, and extinct forms of bison. The climate continued to become warmer and drier after 10,150 B.P. (COHMAP 1988; Thompson et al. 1993). Temple Lake cirque in the Wind River Range was essentially ice free (Zielinski and Davis 1987) until after about 5000 B.P. during the Neoglacial era.

The lithic technology of the Paleoindian period is distinctive for its meticulous workmanship in the manufacture of projectile points. Projectile point styles are distinctive and serve as chronological/cultural indicators within the period. Projectile points are usually lanceolate, some have distinctive shoulders or stemmed, basally ground hafting elements, but they lack notching evident in the later periods. Paleoindian tool assemblages are characterized by a high percentage of gravers and spurred end-scrapers, and burination, especially on broken projectile point fragments (Frison 1978:77-78). More variation with the projectile point styles is seen after about 10,000 B.P., perhaps representing the presence of diversified cultural groups during the Pleistocene/Holocene transition.

As work progresses researchers are recognizing that early Americans had a wide and varied diet and generalized subsistence strategy (Largent 2008). Kornfeld and Larson (2008) have noted that the majority of Plains and Rocky Mountain Paleoindian sites were not bison-focused with regard to subsistence and generally trend toward a broad-based subsistence strategy similar to that of Archaic period hunter-gatherers.

Table 1. Cultural chronology of the Wyoming Basin.

Period	Phase	Age (B.P.)
Paleoindian		12,000 – 8700
Early Archaic	Great Divide	8700 – 6500
	Opal	6500 – 4300
Late Archaic	Pine Spring	4300 – 2800
	Deadman Wash	2800 - 2000
Late Prehistoric	Uinta	2000 – 650
	Firehole	650 – 250
Protohistoric		250 - 150

Source: Metcalf (1987), modified by Thompson and Pastor (1995), and proposed by Pastor et al. (2015).
B.P. = years before present

Very few sites dating to the Paleoindian period have been excavated in the Wyoming Basin. Our understanding of this time period is less than what is known for the Great Basin or the High Plains. Thompson and Pastor (1995) provide a summary of work that has been conducted at Paleoindian sites in southwestern Wyoming. Additions to this synopsis include excavations at the Pine Spring site (Kelly et al. 2006, Sharrock 1966), North Table Mountain site (Kautzman and Pastor 2002), Site 48SW8842 (Pool 2001), the Krmpotich site (Kornfeld et al. 1999, Mayer 2001, Peterson 2001, Wimer 2001), Site 48UT375 (Smith et al. 2003), the Blue Point site (Johnson and Pastor 2003), the East Cottonwood Creek site (Buenger 2011b), and the Battle Spring Draw Paleoindian site (Craven 2005). In addition to these sites, rock art dating to more than 10,000 B.P. has been identified at the Black Rock site in southwestern Wyoming (Liu and Dorn 1996; Tanner et al. 1995). Isolated surface finds of Paleoindian projectile points are not uncommon and suggest that site preservation may be a major factor affecting the number of known sites.

The Finley site (48SW5) is a bison kill site located in the Upper Green River Basin. Remains of approximately 59 bison were found in association with Cody Complex Scottsbluff and Eden projectile points. Radiocarbon dates place the occupations at 9026 B. P. and 8950 B.P. Because the Finley site may fit the pattern for Northwest Plains communal bison hunting subsistence, it was assumed that models of Northwest Plains Paleoindian big game procurement and processing could be applied to the western portions of the Wyoming Basin. When Thompson and Pastor (1995) suggested moving the date for the Terminal Paleoindian/Early Archaic transition from ca. 7300 to 8500 B.P., it was based on the idea that no sites in the Wyoming Basin post-dating the Cody Complex occupation of the Finley site contained both classic Paleoindian diagnostic artifacts combined with megafaunal remains. The Finley site has been referred to as "perhaps the last true vestige of Paleoindian traditions in the Green River Basin" (McKern and Creasman 1991:80).

The Blue Point site (48SW5734) is located adjacent to a playa lakebed northeast of Granger, Wyoming. The site was excavated from sandy deposits within an extensive dune field (Johnson and Pastor 2003). Component 1 is an Alberta Complex Paleoindian occupation dating to 9540 $\pm$ 50 B.P. Fragments of seven Alberta and one Cody Complex Scottsbluff projectile points were found along with other tools and debitage. Small, medium and large mammal bones were identified in the cultural component. The stratigraphic pollen record indicates that riparian vegetation around the playa before 12,100 B.P. had largely disappeared by 9500 B.P. While cattails were still present up to or slightly before the 9500 B.P. Alberta occupation, other riparian plants including lilies, bedstraw, phlox, plantain, buttercups and members of the rose family had disappeared.

Paleoenvironmental studies at the Blue Point site provided clear evidence that by 9500 B.P. the local environment had dried and the inhabitants of the interior basin were practicing broad based resource procurement. Geomorphology and palynological analyses of samples collected from the site provided significant data on changing climatic conditions in the Green River Basin during the late Pleistocene and early Holocene. The site occupants were sufficiently aware of their environment as to exploit the local Green River pebble obsidian as well as other local raw material sources (Johnson and Pastor 2003). Analysis of the stratigraphic pollen samples from the Blue Point site also substantiated that climate became progressively more xeric through time. Pollen recovered from the lower levels of Stratum I dating to before 12,100 B.P. indicates that permanent water with a riparian plant community was present in association with the Green River Basin interior playa. By 9500 B.P. the riparian vegetation around the playa had largely disappeared. Moister intervals occurred after 9400 B.P. and again between 7300 and 7200 B.P.

The East Cottonwood Creek site, 48FR5611, is located along the southern margin of the Sweetwater Arch. Four conventional radiocarbon age estimates from Component 2 date between 8680 ± 50 and 8960 ± 60 B.P. Component 2 appears to be representative of at least two temporally punctuated short-term Late Paleoindian hunter-gatherer occupations of the site locality (Buenger 2011b). The Paleoindian occupations are associated with recovered Foothill-Mountain-like lanceolate projectile points. Of note was a potential fragmented turtle shell bowl and a modified jackrabbit tibia shaft fragment potentially representative of bone bead production (Buenger 2011b).

The Battle Spring Draw Paleoindian site, 48SW13156, located north of Battle Spring Draw and 4.0 mi north of the nearest Chain Lake, was excavated from an eolian deposits. Data recovered from the site determined the locale was occupied over time for a period of 1,300 years between 9430–8150 B.P. (Craven 2005). The faunal assemblage was dominated by small animal bones. A modified turtle carapace was recovered during excavation. The artifact exhibited 17 incised lines on the ventral surface and exhibited evidence of thermal alteration.

WAS proposes that Paleoindian hunter-gatherers in the Wyoming Basin fluidly moved across the landscape and occupied the entire region. They had an intimate knowledge of the landscape, and their annual movements habitually encompassed all biomes. As the area dried, water was at a premium so much of their activities became tethered to the reliable sources. The diversity offered by the permanent water courses in the form of floral and faunal species, also added to the attraction to these areas. They were also tethered to predictable resources in other biomes and would seasonally return to areas rich in a particular resource. Thus far, very little evidence has been found that the Paleoindian hunter-gatherers occupied a particular site locale for extended periods of time. Instead, a pattern has emerged of short-term, but often repeated, occupations of a locale in response to a patchy distribution of resources. This degree of high residential mobility resulted in small, redundant archaeological expressions with relatively sparse cultural remains (Pastor et al. 2015).

Archaic Period

In *People of the Sage* (Thompson and Pastor 1995), the date of the Paleoindian/Archaic transition was pushed back from the previously proposed ca. 7300 B.P. date (e.g., Metcalf 1987; McKibbin et al. 1989) to ca. 8500 B.P. to correspond with a period of climatic change characterized by significantly reduced precipitation, warmer average temperatures, and changes in weather patterns. Thompson and Pastor (1995) suggested that an Archaic, broad spectrum subsistence pattern was established in the region earlier than 7300 B.P. as a response to environmental change associated with the onset of post-glacial aridity. This was based in part on the virtual absence of communal bison kill sites in the Green River Basin. In *A Chronicle of Past*

Land Use in the Upper Green River Basin: Class I Inventory Report for the La Barge Platform (Pastor et al. 2015), the transition date of 8700 B.P. has been proposed.

Environmental conditions during the Early Middle Holocene (7500-6000 B.P.) marked the beginning of a trend in which environmental conditions within the interior regions of North America were characterized as having been dry (Antevs 1955; Bryson 1994; COHMAP 1988; Kutzbach 1987; Thompson et al. 1993). Increased eolian activity within the major dune fields of Wyoming, including the Casper, Ferris, and Killpecker dune fields, has been shown to have occurred from the Early Middle Holocene through the Late Middle Holocene (Ahlbrandt 1974; Ahlbrandt et al. 1983; Gaylord 1982, 1990; Eckerle 1989; Forman et al. 2001; Halfen et al. 2010; Mayer and Mahan 2004; Stokes and Gaylord 1993). Corollaries of arid conditions in portions of Wyoming during the Early Middle Holocene are also seen from the alluvial record, which showed evidence of reduced stream flow (Eckerle 1990, 1994). Eckerle (1997) has suggested that a decrease in effective precipitation during this period resulted in reduction of grassland biomass and a shift toward increased desert shrubland vegetation in the Wyoming Basin. Based on evidence from the archaeological record, Byers (et al. 2005) and Byers and Smith (2007) have suggested that reduction in forage productivity and large game populations in the Wyoming Basin occurred between 8500-6000 B.P.

During the Archaic period in the Wyoming Basin there was more intensive utilization of plant foods and exploitation of a broader range of fauna than in the preceding Paleoindian period (Thompson and Pastor 1995). The Archaic period is recognized as being reflective of highly mobile groups who left an overlapping labyrinth of cultural remains on the landscape. There is a great deal of cultural continuity during this time span marked by a series of cultural changes which is discussed below for each phase. High mobility was an important defining factor in subsistence-settlement practices. Small groups of hunter-gatherers likely moved as resources became depleted and/or available. Their intimate knowledge of resource patches, seasonality, and availability probably conditioned their deliberate movements across the landscape. This logistical system included brief stops in some areas and more extended stays in others depending on resource availability (Thompson and Pastor 1995; Metcalf 2010).

At the general level, the forager/collector spectrum provides a model with which to compare the settlement and subsistence patterns during the Archaic era. However, it can be assumed that placement on the spectrum would vary through space, time, and probably season for even the same cultural group (Kelly 1995). During certain times, we would expect foraging for a wide range of roots, seeds, greens, small game and occasional large game. At other times, a logistical orientation targeting large game and specific resources would have been organized. It must be recognized that the subsistence strategy being practiced at any time was fluid, responding to a number of cultural and natural variables. Nonetheless, there are broad patterns in settlement and subsistence that can be elucidated in the archaeological record (Pastor et al. 2015).

The inability to identify indicators of seasonality in the archaeological record is a major impediment to understanding prehistoric settlement, subsistence, sedentism and mobility. Archaeofaunal data provide good potential for seasonality information based on seasonal increments in animal tissues plus ages of animals born in discrete seasons. These can be measured with tooth eruption and wear, bone metrics, bone epiphyseal fusion, dental cementum increment analysis, and other methods (Kornfeld et al. 2010). The presence of seasonally-limited plant remains has also proven useful. The potential effect of storage for future consumption can obfuscate the meaning of seasonality data, and this is certainly an area in need of investigation.

Although settlement-subsistence evidence is limited for the Archaic period, it exhibits variability in the spatial and temporal distribution of different types of cultural remains, guided by environmental conditions. Environmental conditions ranging from the dry, hot Altithermal to the wetter, moister Neoglacial affected both floral and faunal communities, with obvious impacts

on the human population. Larson (1997:126) proposes "A mix of residential mobility, tethered nomadism, and logistical mobility strategies in the basins...could accommodate the cyclical, widely distributed and variable nature of basin resources". Foraging for a wide range of roots, seeds, greens, small game and occasional large game was widely practiced; with logistically-targeted large game and specific resources procured when available. This fluidity in resource procurement was likely necessary to maximally exploit needed resources available during different times of the year (Pastor et al. 2015).

Great Divide Phase

The Great Divide phase was originally proposed to extend from 8700 to 6500 B.P. based on paleoenvironmental data from the Blue Point site and cultural remains from other sites dating to this time period (Johnson and Pastor 2003). Assigning a date to the earlier end of this phase is problematic and probably will be changed in the future. As more archaeological and environmental data are compiled, it has become apparent that this transition is gradual and began long before early researchers envisioned. Paleoindians exploited a wide and diverse suite of flora and fauna, and this diversity continued into the Archaic times. In the Great Basin, researchers have long recognized that the early inhabitants of this region practiced a different subsistence strategy than other places and argued for the term PaleoArchaic instead of Paleoindian (Graf and Schmitt 2007).

The climate during the Great Divide phase continued to dry and get warmer and by 7500 Altithermal climatic conditions prevailed (COHMAP 1988; Thompson et al. 1993). Archaeological sites dating to this time period were rarely found prior to the 1990s when numerous early Archaic sites began to be discovered in the Jonah Gas Field of southwestern Wyoming. Dated Great Divide phase housepits have been recorded in the Upper Green River Basin. The presence of housepits has been firmly established to the latter portion of this phase including three sites located in the Jonah Gas Field and the Anticline. The McKeva Ryka site (48SU2094) dates between 6210-6880 B.P. and contained two housepits and a cluster of hearth features (McKern and Current n.d.-a). The Jonah House site (48SU2324) also dated to between 6360-7070 B.P. and contained multiple housepits with post holes (McKern and Current n.d.-b). Site 48SU261 contained a housepit dating to between 7620-7895 (Johnson 2005). Although the discovery of housepits dating to the Great Divide phase is relatively recent, researchers have predicted that the prehistoric inhabitants of Wyoming would have utilized some form of shelter given the climate, seasonal settlement pattern, and need for stored food (Buenger 2011a; Thompson and Pastor 1995; Thompson et al. 1996).

Projectile point styles from the Great Divide phase were thought to be dominated by corner-notched dart points (Thompson and Pastor 1995). Research at the Trappers Point site revealed that both side-notched and stemmed specimens were used relatively equally during this phase. The Trappers Point site, 48SU1006, is a large antelope procurement locale containing the largest projectile point assemblage documented from southwest Wyoming to date (Miller et al. 1999). Early occupations at the site date to the Great Divide phase. The projectile points encompassed a wide range of variation and significantly added to our understanding of Archaic points. Stratum III, dating to the Great Divide phase, contained 24 projectile points. Of these, 48% were side notched, 38% were stemmed, and 14% were corner notched. By the Opal phase occupation in Stratum V, the projectile point styles had not changed but the distribution changed dramatically. Of the 78 projectile points found in Stratum V, 72% were side notched, 14% were corner notched, and 14% were stemmed. Miller et al. (1999:166) concluded that because many different projectile point types occurred in the different cultural levels, it should not be expected that any one projectile point type is diagnostic of a restricted time period. Throughout the Archaic period, there was very little variability in the overall tool set. Technologies such as

weaponry, chipped stone and ground stone technology, hearth features, and housepits or shelters, are characterized by minimal variation (Pastor et al. 2015).

Bach's (2005:15) research has demonstrated how the percentage of charred seeds and cactus pad fragments recovered from prehistoric features from different time periods changed over time. An analysis of the remains from 750 samples showed that during the Opal phase there was significantly less seed processing compared to the Late Prehistoric period, as well as, a decrease in either the consumption or use of cactus pads. Seed processing and cactus use or consumption was higher during the Great Divide phase than the Opal phase. This may be reflected in the occurrence of ground stone implements in site assemblages.

The East Cottonwood Creek site is located in the Sweetwater Arch. Component 1 at the East Cottonwood Creek site, 48FR5611, yielded a radiocarbon date of 7030 ± 60 B.P. placing the occupation in the Great Divide phase of the Early Archaic period. Component 1 likely represents a single ephemeral hunter-gatherer occupation (Buenger and Goodrick 2011).

Component 1 at the Flying A Ranch site, 48NA1431, located in the western portion of the Casper Arch, dated to 6650 ± 70 B.P. The component was interpreted as a discontinuous series of short- to moderate-term residential camps. Northern side-notched and Mount Albion points were recovered from the component. Duncan/Hanna points displaced from the overlying Late Archaic component were also recovered (Martin and Smith 1999).

Opal Phase

The Opal phase dates from 6500-4300 B.P. The climate was warm and dry and by 5000 B.P. began ameliorating due to Neoglacial conditions (COHMAP 1988; Thompson et al. 1993). Evidence of seed use is relatively rare during this time period, but not completely lacking. The paucity of recovered charred seeds from the Opal phase has been attributed to cultural preference (i.e., Smith and Creasman 1988), and recent analysis by Bach has substantiated this stance (Bach 2005). The Chenopodiaceae family is the highest genera recovered in Opal phase components (Kautzman 2012). Of a sample of 41 housepits, 20 lacked charred seeds and the majority of the others contained less than one seed per liter of sediment (Smith 2003). However, information is still sparse for sites in the basin margins and critical to our understanding of Archaic subsistence patterns.

Faunal remains are limited in interior basin Opal phase sites and are mostly comprised of small- to medium-sized mammals (Lubinski 2000). The generally low effective moisture during this period has been suggested to have been sufficient for sagebrush and other shrubs important for pronghorn, but grass and other forage targeted by bison was only present in limited amounts (Byers and Smith 2007). During times when bison populations were proposed to have been rare; their recovered archaeological remains are very fragmented, which is indicative of intensive processing (Smith et al. 2008).

Slab-lined pits were used most frequently during the Opal phase. Over 50 slab-lined roasting pits have been recorded in sites in the Rock Springs Uplift, in sites located approximately 30 miles east of Rock Springs, Wyoming. Eleven elaborate, well-made cylindrical slab-lined hearths were excavated at the Haul Road site, 48SW11645, which showed evidence of continued re-use (Murray 2004). During construction, sandstone slabs were tightly aligned around the excavated pit and extended above the ground surface. This visibility would have facilitated site reoccupation, which is substantiated by evidence of reuse in many slab-lined features (Smith and McNees 1999). While there seems to be a general geographical co-occurrence of housepits and slab-lined hearths, there is no strong site-by-site correlation between the two feature types. This suggests their use is related to the same settlement and subsistence pattern, but with differences in settlement/subsistence focus (Pastor et al. 2015). It has been proposed that slab-lined hearth use was potentially related to the seasonal exploitation of specific floral resources such as sego lily (Smith and McNees 1999).

Housepits dating to the Opal phase were previously thought to reflect the initial housepit use in the Wyoming Basin, although some sort of shelter was postulated for every time period. Relatively recent discoveries of housepits in the Upper Green River Basin dating to the Great Divide phase have cast new light on this research topic. However, the majority of housepits recorded in the Wyoming Basin date to the Opal phase. In his study of Archaic housepits, Buenger (2011a) compiled the frequency of conventional radiocarbon ages for 88 housepits. These data show that 73 (82.95%) housepits date to the Opal phase (4300-6500 B.P.) of the Early Archaic with the peak frequency of dated housepits falling between 4900-5700 B.P. in which 50.00% of the sample is represented within this 800-year span. Ten (11.36%) housepits date to the Pine Spring phase (2800-4300 B.P.) of the Late Archaic period, although an additional seven (7.95%) date relatively close to the 4300 B.P. boundary between the Pine Spring and Opal phases. Only five (5.68%) of the sampled housepits date to the Great Divide phase (6500-8500 B.P.) of the Early Archaic period with averaged dates ranging between 6645 and 7290 B.P.

Housepit data reveal repeated use of housepits and reuse of sites containing housepits (Smith and McNees 2011). This repeated use of sites and housepits tends to obscure on the duration and intensity of any single occupation. Ideally, the diversity and density of artifact and floral and faunal assemblages, evidence of site cleaning, investment in site structure construction, and degree of charcoal staining would indicate the duration of occupation and intensity of site activities. Unfortunately, multiple occupations with no apparent stratigraphic division create a palimpsest of material that hinders these interpretations.

The Jeffrey City site, 48FR2330, is located northwest of the study area. The site consists of a single housepit containing seven subfeatures dating to 5700 B.P. Three of the subfeatures are directly associated with the floor of the housepit. Cultural material recovered includes lithic debris, non-diagnostic tools, one lanceolate projectile point, groundstone and faunal debris. The projectile point was identified as a Paleoindian point but was not collected *in situ*. The faunal debris included smaller mammals such as rabbits and rodents, rattlesnake, and few elements of artiodactyls (Reiss 1990).

Opal phase components dominated the data recovered during excavations along the Lost Creek Pipeline including Chain Lakes Rim Housepit sites the Moneta Divide, Black and Red Housepit sites, the Two-Fisted Manos site, Headlining Housepit site and the Jeffrey City Housepit site (McNees 2005).

Pine Spring Phase

The Pine Spring phase beings at ca. 4300 B.P. and ends around ca. 2800 B.P. or slightly thereafter. Climate conditions began to improve from the xeric conditions of the Altithermal to more mesic conditions similar to those of today (COHMAP 1988; Thompson et al. 1993). The climate was more mesic during this period and Wyoming dune fields were not active (Ahlbrandt et al. 1983; Forman et al. 2001; Halfen et al. 2010; Mayer and Mahan 2004; Stokes and Gaylord 1993). The stabilization of dune surfaces was followed by a pattern of regionally distinct Late Holocene soil formation in many areas within the Wyoming Basin (Albanese 1989, 1995; Albanese and Frison 1995; Eckerle 1989, 1997). In the Wyoming Basin, the soil is often referred to as a Neoglacial soil that typically contains a weathered Bw horizon or an illuvial Bt horizon that dates between approximately 3000-1500 years B.P.

Features 6 and 18 from the Crescent site, 48SW13552, located along the eastern edge of the Rock Springs Uplift, dated to the Pine Spring phase (Buenger et al. 2007). Radiocarbon analysis of the two basin-shaped hearths returned dates of 3430 ± 60 B.P. (Beta #203423) for Feature 6 and 3210 ± 50 B.P. (Beta #203427) for Feature 18. Prickly pear cactus may have been processed in these two features.

Component II at the Sheep Mountain site, 48FR5125, dated between 4000 B.P. and 3800 B.P., the Pine Spring phase of the Late Archaic period. The site is located south of Jeffrey City, Wyoming. Component II represents at least three temporally discrete hunter-gatherer occupations. Cultural material encountered included four hemispherical basin-shaped hearths, 35 chipped stone tools, 1840 pieces of lithic debris, 14 groundstone specimens, 490 faunal fragments and evidence of floral and faunal resource processing (Buenger and Goodrick 2011).

Component II at the Five Mile Ditch site dates to the Pine Spring phase of the Late Archaic period. Radiocarbon analysis of features excavated from Component II, Block 2 are between 3120-2990 B.P. The site is located in the Great Divide Basin. Projectile points similar in style to the Pelican Lake were recovered (McNees 2005).

The McKean Complex on the Northwestern Plains first occurred during the Middle Archaic and is characterized by a shift in subsistence patterns as compared to the preceding Early Plains Archaic period. The bison-oriented subsistence strategy also includes a shift towards an increased reliance on gathering and processing plant foods as compared to earlier periods (Kornfeld and Todd 1985; Frison 1991). The complex is defined by McKean Lanceolate, Duncan, Hanna, and Mallory projectile points (Kornfeld et al. 2010). These style points are widespread across the Wyoming Basin and Colorado Plateau, as well as the Northwest Plains. The McKean complex appears to have developed into a well-established endemic cultural tradition in the Big Horn Basin, whereas in southwest Wyoming the appearance of these projectile point styles is problematic. The underlying question is, did these point styles appear in the context of an adaptation by local Archaic groups or did McKean groups occasionally occupy the area as postulated by McNees (2005)? If McKean points represent an influx of people one would expect an associated influx of exotic lithic raw material types and cultural material. This assertion is not valid for McKean Complex finds in the southwest Wyoming.

The only unifying aspect of the McKean Complex in southwest Wyoming is the point style which appears in sites interpreted as representing broad-spectrum hunter-gatherer locales. Very little comprehensive analyses have been completed on McKean occupations which makes any assumption difficult. However, it appears that McKean technology represents an influx of ideas and techniques and not an emigration of people from the Plains into the Green River Basin. According to McNees (2005), McKean-type points apparently gave way rather abruptly to corner-notched points around 2900 B.P. in the western Wyoming Basin, after which corner-notched points in assemblages became dominant.

A McKean-like projectile point was collected from the Mark Twain site, 48SW13992, in the Rock Springs Uplift during excavations south of Black Butte. The artifact is a stemmed McKean-style projectile point recovered from Component 2. Radiocarbon analysis of a slab-lined pit, Feature 3, returned a date of 4410 ± 50 B.P. placing the occupation in the transition between the Pine Spring phase of the Late Archaic and the Opal phase of the Early Archaic periods (Buenger et al. 2007).

Deadman Wash Phase

The Deadman Wash phase dates between 2800-2000 B.P. The regional climate became drier with increased dune activity towards the end of the phase (Ahlbrandt et al. 1983; COHMAP 1988; Thompson et al. 1993). Increased eolian activity likely led to desiccation of vegetation and loss of forage productivity, which subsequently would have affected grazing mammal populations. The most severe general decline in radiocarbon age frequencies for southwest Wyoming occurs at approximately 2600-2300 B.P. (McNees 2005). Changes in hunter-gatherer population density or in subsistence strategies are possible explanations for the depressed frequencies of radiocarbon dates during the Deadman Wash phase. Movement of groups out of the area would result in a reduction of the total number of components; however, the

archaeological record provides no evidence to suggest movement of population out of the region (Thompson and Pastor 1995).

Projectile points from the Deadman Wash phase are dominated by triangular shaped corner-notched dart points, similar to Pelican Lake type specimens from the Northwestern Plains and Elko points from the Great Basin (Thompson and Pastor 1995). Wheeler and others (1986) defined a distinctive corner-notched point termed the Craven Creek corner-notched type in the Shute Creek Basin in southwestern Wyoming. A distinctive side-notched dart point was also identified at the Maxon Ranch site by Harrell and McKern (1986). However, much more data needs to be compiled to substantiate these point types and their role in Deadman Wash phase cultural behavior.

Greater emphasis on procurement of larger game is somewhat more evident during the Deadman Wash phase compared to earlier phases, but smaller animals are predominantly represented in most site faunal assemblages (Lubinski 2000). Bison remains are more numerous, but still rare for archaeological contexts dating to this time period (Byers et al. 2005; Lubinski 2000). Charred seeds become more common during the later portions of the Deadman Wash phase leading to the increased seed exploitation seen in the Late Prehistoric period (Thompson and Pastor 1995).

Housepits have been rarely identified that date to the Deadman Wash phase. Only one has been identified that dates to less than 3700 B.P. (Buenger 2011a). The paucity of data available for the entire Deadman Wash phase makes discussion of this phase problematic. Very few components from this phase have been excavated; therefore, there is little information to build on.

Component I at the Spratt site, 48FR1419, dates to the Deadman Wash phase of the Late Archaic period. Feature 95-4, a rock-lined basin hearth, returned a date of 2200 B.P. One of the rocks lining the basin was a complete mano. Flaked tools, groundstone, lithic debris and heat-altered rock fragments were recovered during excavation. One bone fragment and two tooth fragments of an unidentified medium to-large-sized mammal was recovered from Feature 95-4. Processing of *Chenopodium* and *Amaranth* seeds and/or roots was the primary focus of the site occupations along with various other domestic activities that include tool maintenance and limited tool manufacture (McNees et al. 1999).

Two features excavated from the Mark Twain site, 48SW13992, located in the Rock Springs Uplift, date to the Deadman Wash phase of the Late Archaic period. Feature 2, excavated during the Salt Wells testing program returned a date of 2330 ± 60 B.P. (Stainbrook et al. 2002). Radiocarbon analysis of Feature 5 from Component 2, returned a date of 2030 ± 60 B.P. (Buenger et al. 2007). Component 2 represented a mix of cultural remains from the Pine Spring phase and the Deadman Wash phase of the Late Archaic period. MNI estimates associated with Component 2 consist of two bison, one antelope, one jackrabbit, one cottontail rabbit, one ground squirrel and one sage grouse. The faunal data show that a range of large and small as well as avian species were likely procured on an encounter/availability basis during the Archaic occupations of the Mark Twain site (Buenger et al. 2007).

Late Prehistoric Period

The Late Prehistoric period is divided into the Uinta and Firehole phases. The Uinta phase begins shortly after 2000 B.P. and continues until ca. 650 B.P. The Firehole phase is relatively short in duration (between 650 and 250 B.P.), and represents the period immediately prior to the introduction of European trade goods and later the arrival of Euro-American populations in Wyoming. Differentiating between the Uinta and Firehole phases reflects the change in cultural continuity from the relatively stable earlier Uinta to the complexities

associated with the later Firehole phase. The Late Prehistoric period ends ca. 250 years ago when European trade goods began to reach the area.

Distinguishing between the Archaic and Late Prehistoric periods is predicated on technological innovations and a notable increase in radiocarbon frequencies (Thompson and Pastor 1995). The beginning of the Late Prehistoric period was marked by the introduction of pottery and the bow and arrow. Intensive exploitation of seed resources and increasing numbers of features suggest a notable change in subsistence strategy accompanied by increased social complexity (Thompson and Pastor 1995).

Late Prehistoric period projectile points are smaller than Archaic period specimens as a result of the introduction of bow and arrow technology. The Rose Spring projectile point is common during the early portion of the Uinta phase, replaced almost entirely by small side- and tri-notched points during the later Firehole phase (Smith and Creasman 1988; Thompson and Pastor 1995).

Pottery is occasionally found in Late Prehistoric period site assemblages in the Upper Green River Basin and appears in the archaeological record about 1300 B.P. (Creasman et al. 1990). The pottery does not exhibit high quality workmanship and is usually referred to as Intermountain Tradition (Frison 1973, 1978). It is regarded as having cultural affiliation with the Shoshonean groups and is characterized by a flat bottom, flowerpot shape (Frison 1978). In addition to the Intermountain ware, specimens resembling Fremont (Uinta Gray ware) and Ute (Uncompaghre Brown) have been identified in the Wyoming Basin (Middleton et al. 2007). A number of Black-on-White and Black-on-Orange sherds have been surface collected in southwest and south-central Wyoming.

Subsistence patterns during the Late Prehistoric appear to be similar to the Archaic period and are based on seasonal movement throughout the basins and foothills in response to the availability of floral and faunal resources (Creasman and Thompson 1997). A generalized hunting and gathering subsistence pattern was utilized which focused on faunal resources such as pronghorn antelope, deer, elk, bighorn sheep, and small mammals and rodents. Bison were likely procured on an encounter basis when available.

Uinta Phase

The Uinta phase, which extends from 2000 B.P. to 650 B.P., is marked by a shift from the dart-based hunting technology of the Deadman Wash phase to bow and arrow, the first appearance of ceramics, and an increase in seed use (Smith and Creasman 1988). Seeds are expensive (based on caloric return rate) to harvest and process, and are thought to be used either in the harshest environments or where population growth and over-exploitation of higher yield resources forces them into a larger role in the subsistence economy (Smith 1988). Uinta phase characteristics include Rose Spring points, small, triangular corner-notched points, limited numbers of Desert and Uinta side-notched points, and pottery (Thompson and Pastor 1995). There are an increased number of housepit-like features and slab-lined features in the archaeological record from this time (Smith and McNees 1999; Thompson and Pastor 1995). In addition, the interior basin adaptation type, as proposed by McNees (2006), is suggested to have ended abruptly at 1000 B.P. Its disappearance coincides with the abrupt replacement of the Uinta complex by the side-notched arrow points, a decrease in the number of interior basin sites, a shift to the use of different types of site locations, and a subsistence focus on different types of resources.

Increased dryness returned to the region at some point after 1800 B.P. during the beginning of the Middle Late Holocene (1800-900 B.P.) (COHMAP 1988; Thompson et al. 1993). This trend continued and intensified into the Late Holocene between approximately 900-500 B.P. during the Little Altithermal. Dry conditions induced by a reduction in precipitation, soil moisture, and vegetation disturbance resulted in an increase in regional eolian activity

between approximately 2000-1000 B.P. and periodically between 1000-500 B.P. (Ahlbrandt et al. 1983; Forman et al. 2001).

The most prevalent point style recorded in the Wyoming Basin during the Uinta phase is Rose Spring (Thompson and Pastor 1995). These points are small, delicate, and elongated, with corner-notches and rounded bases. Their presence is typically interpreted to represent the introduction of bow and arrow technology. In some sites, Rose Spring points co-occur with larger and somewhat thicker, notched specimens that closely resemble Elko points (Thompson and Pastor 1995). Elko series points are usually associated with atlatl/dart technology, and these could conceivably represent the period of transition from dart to bow and arrow. The initial appearance of these specimens is of great interest and identifying their first appearance could give some clues to cultural interaction and/or cultural affiliation.

Within the interior Green River Basin, Uinta phase hunter-gatherers apparently hunted both bison and pronghorn interchangeably, depending on their availability (Smith and McNees 2000). Site 48SW270, located in the Rock Springs Uplift near Black Butte, is a winter occupation, where Smith and McNees (2000) propose that limbs were frozen and transported between campsites. This would account for the limited total quantities of bison and pronghorn bone recovered from excavated Uinta phase sites.

Excavations of Uinta phase components in the region have been relatively plentiful and produced evidence of a wide range of resource exploitation of sites located along rivers. Excavations along the Green River and the Hams Fork River resulted in the documentation of multiple sites with Uinta phase components. These excavations were conducted on the Green River northwest of Green River, Wyoming, and included the Hugh site, 48SW6454, the Mann's Flat site, 48SW9251, the Ceramic site, 48SW10233 and the Hearth in Road site, 48SW10888, and on the Hams Fork River, the Pescadero site, 48LN2068. The Hugh site (48SW6454), the Mann's Flat site (48SW9251), and the Pescadero site (48LN2068) contained evidence of fishing and exploitation of riparian resources along the Green and Hams Fork rivers, north/northeast of the project area (Kautzman 2000; Murray 2000; McKibbin 1995). Of particular interest was a stone axe found imbedded in a tree near the Hugh site. The Ceramic site (48SW10233) was a late winter/early spring hunting camp where small numbers of antelope were killed and processed (Johnson 2000). At the Hearth in Road site (48SW10888), Component 3 included seven occupations dating between 770 ± 80 B. P. at Occupation 1 and 1050 ± 40 B.P. at Occupation 6 placing the use of the features in the Uinta phase of the Late Prehistoric period (Stainbrook 2000). Occupation 7 was not dated. Of interest at Hearth in Road is the burned *canis* and *canis*-sized specimens recovered from Feature 13, Occupation 4. The presence of Feature 13 from Hearth in Road, with 10 *Canis* sp. specimens and 520 other specimens in the size range of canid is unique in the Green River Basin with 94% of these specimens burned.

Uinta phase sites in the Rock Springs Uplift are common and some contain slab-lined roasting pits. The Raptor site (48SW1090), contained the remains of 65 cottontails, two jackrabbits, one antelope, and one bison, along with numerous rodents. The assemblage contained 131 specimens of groove-and-snap or abraded bead production material or waste made from cottontail rabbit long bones. In addition, cottontail long bone elements were found cached in the southwest portion of a housepit (Stainbrook 2004). Rabbit remains are found in most of the faunal assemblages from sites in southwest Wyoming throughout prehistory (Lubinski 2003), and were obviously an important resource, much like in the Great Basin. The quantity of rabbits at the Raptor site reflects the utilization of rabbits for food, clothing and adornment. Rabbit bone bead production was also noted at a sand dune site near the Eden Farson site near Eden, Wyoming. The Late Prehistoric site assemblage included 51 jackrabbit tibiae, several in the process of bone bead production (Frison 1971).

The Battle Spring site (48SW14254) is located in the north-central portion of the Great Divide Basin. The multi-component site is short-term occupation dating to the Uinta phase of the

Late Prehistoric period and included the excavation of two cultural components. The recovery of debitage, tools, and faunal and floral remains resulted in the identification of distinct activity areas in Component I. The occupants exploited medium and small mammal resources but lacked evidence of vegetable processing which may indicate the site was occupied in colder months. Groundstone was identified in Component 2 which would indicate processing of floral resources (Murray 2007).

The Horton site, 48NA844, is located in the Sweetwater Arch. Radiocarbon analysis from Component 1 returned dates between 1400 and 1200 B.P. Component 1 is represented by at least two short-term occupations by hunter/gatherers. Analyses of the component resulted in the documentation of stone tools, lithic reduction debris and faunal remains. Two hearth features included one hemispherical-shaped hearth and one bell-shaped hearth (Buenger and Goodrick 2011).

Firehole Phase

The Firehole phase extends from 650 to ca. 250 B.P., and is accompanied by a significant decline in the number of dated components (Thompson and Pastor 1995). The variables associated with the decrease in cultural components are largely unknown. We do not suggest that the paucity of cultural components during the Firehole phase is a result of wholesale abandonment or depopulation of the Wyoming Basin; however, there may well have been some decrease in population density and a change or reversion to land use patterns more similar to the Archaic. Dry conditions induced by a reduction in precipitation, soil moisture, and vegetation disturbance resulted in an increase in regional eolian activity continued periodically between 1000-500 B.P. (Ahlbrandt et al. 1983; Forman et al. 2001). The "crash" of the Uinta phase subsistence system may have been related to climatic changes associated with the dry climatic intervals and the inability of marginal arid environments to support relatively high population densities using intensive hunting and gathering strategies.

Restricted mobility strategies associated with limited home ranges related to population pressures has been suggested for the Uinta phase (Thompson and Pastor 1995). With the pressure lessened by the decrease in population seen during the Firehole phase, an increase in mobility may have occurred. Lubinski (2000) sees antelope, not bison, as the predominant game animal during the Firehole phase. One of the current distinctions between the Uinta and Firehole phases is the utilization of large quantities of seeds during the Uinta phase. In addition, Rose Spring projectile points are no longer present, while Tri-notched, Desert Side-notched, and Cottonwood Triangular projectile points typify the stone tool assemblage (Thompson and Pastor 1995). Desert Side-notched points are consistent in style across a vast area, which Simms (2008) says reflects a spread by far-ranging foragers on the move. In one sense, the Desert Side-notched point traces the expansion of the Uto-Aztecan language groups. In another sense, however, it indicates a degree of contact among different languages and even language families over an enormous swath of the Desert West from Mexico to Canada during the last thousand years. Cottonwood points are also wide spread across the Desert Southwest.

Shoshones were the major aboriginal group present in the Wyoming Basin at the time of Euro-American contact, continuing through the Reservation period. By the end of the Firehole phase, at approximately 250 B.P., Shoshone groups were well established in the region, based on ethnographic and ethnohistoric accounts (Shimkin 1947; Cowie 1958). The nature and dating of the movement of Shoshone-speaking (Numic) groups into the Wyoming Basin is unclear. Rock art styles and skeletal remains reflect a long-term occupation of the region by Numic-speaking ancestors (Kornfeld et al. 2010).

Firehole phase pottery studies remain inconclusive and in need of more objective quantification. The presence of two separate wares has been postulated during the Firehole (Creasman et al. 1990). Further work in dating and describing pottery styles is necessary to

elucidate the relationships. This topic has the potential to address questions of seasonal movement, food storage and trade or contact with external groups (Pastor et al. 2015).

The South Baxter Brush Shelter and Firehole Basin 11, located in the Rock Springs Uplift, are Firehole phase Late Prehistoric period sites. Within the South Baxter Basin Brush Shelter complex, 48SW5170, four surface exposures of pottery were identified. The discovery of 50 sherds of pottery on the surface, identified as Pottery Scatter 3 at the complex, resulted in the excavation of a 21 m² block. A total of 196 ceramic sherds was recovered from the block excavation (Hoefer et al. 1992). Radiocarbon analysis of Feature 3, identified within the block excavation, returned a date of 500 ± 50 B.P. placing the occupation within the Firehole phase of the Late Prehistoric period.

Firehole Basin 11, 48SW1217, located south of Rock Springs, Wyoming, includes a bone midden and a ceramic scatter. Radiocarbon analysis returned dates of 625 ± 50 and 645 ± 45 B.P. The first charcoal sample was submitted from the bone midden and the second charcoal sample was from a ceramic concentration. Antelope dominates the faunal debris with a minimum of 433 specimens from 26 individual animals. An additional 5397 specimens were Antelope-sized bones. Eight projectile points collected from the site include two small tri-notched, two small side-notched, three small unnotched and one Rose Spring point (Lubinski et al. 2007).

The Powder Wash Archaeological District, 48SW18660, is a Late Prehistoric site listed on the National Register of Historic Places (NRHP). It is comprised of 29 contributing sites including 19 rock art sites located in small rockshelters and a complex of apparently related structures consisting of an extensive wooden drift fence corral, four separate groups of wickiups constructed of deadfall juniper poles, two known rockshelters with entrances partially enclosed by low walls of rock and juniper logs, and three low circular stone-walled structures that may have served as breastwork fortifications (Benner 2013). Site 48SW18660 is located approximately 130 miles southwest of the study area along the Wyoming-Colorado border.

Proto-Historic Period

The Protohistoric period begins sometime after 250 B.P. when European trade goods reached the area and ends with the development of the Rocky Mountain fur trade 190 years ago (Thompson and Pastor 1995). The Wyoming Basin was the heart of Shoshone territory during this period, with occasional forays into the area by other groups such as the Crow and Ute (Smith 1974). Metal trade goods were introduced which have been found in surface and subsurface contexts.

Adoption of the horse by Native American groups influenced many aspects of their lifeways. Eckles and others (1994:57) found butchered horse bone in southwestern Wyoming at 48SW8319. The site dates to the mid-1600s. Because the horse had been hacked with a metal axe and buried along with three coyote skulls, Keyser and Poetschat (2005:6) interpret this to indicate that the Indians feared the first horses in the area. By the early 1700s the Shoshone horse culture was full blown with its attendant mobility enabling the resident Shoshone Indians to expand their range (Cowie 1958). The Shoshonean groups commonly referred to as the Sheepeaters did not acquire the horse (Kornfeld et al. 2010:136). Plentiful water and forage would have been a requirement for maintaining horse herds and it is unlikely that ephemeral water sources would have been adequate. The range of movement afforded by horse use would have increased dramatically, possibly leading to shifts in subsistence emphasis.

With horse-associated mobility came armed conflict, which is exhibited in the skeletal remains recorded in the region. The Plains Archaic average age at death calculates to 48 years but by the Late Prehistoric drops to 32 years, and by Protohistoric/Historic times falls to 25 years of age (Gill 2010:539). Three examples from southern Wyoming show evidence of conflict, sometimes in the extreme. The Deer Butte 2 skeleton from north of Rock Springs, the Bairoil

skeleton from near Bairoil, and the Robbers Gulch skeleton from southeast of Rawlins all showed signs of severe trauma and/or projectile point injuries (Gill 2010:546-552). The Lonetree Mummy burial, from south of Mountain View, Wyoming, richly illustrates the cultural changes and exchanges that were occurring at this time. The grave goods included guns, ammunition, a Navajo blanket, horse tack, beaded moccasins, a saddle, and much more (Pastor et al. 2015).

Protohistoric artifact assemblages show Euro-American influences and often include metal knives and projectile points, glass beads, copper implements, and lead shot. Preliminary work by John Kennedy (2009) concentrated on the distribution and types of metal projectile points across the interior west. His analysis focused on several questions including: Does point morphology change over time and space? Can Native-made versus blacksmith-made points be confidently identified? Are tasks such as hunting and battle reflected in certain point types? Since most of these specimens are surface finds with no spatial context, the analysis is difficult. However, this is an important research topic in terms of Euro-American interaction with local Native American populations.

An important site in our understanding of the Protohistoric period is the Eden-Farson site (Frison 1971). The site, located near Eden, Wyoming, is listed on the NRHP. The remains of at least 212 pronghorns and Shoshonean artifacts, including flat-bottomed, flanged-based Intermountain ware pottery were recovered. All of the animals were killed in the late fall and the existence of a trap was speculated. As with the Archaic period Trappers Point site, it is unknown if the pronghorn remains at the Eden-Farson site represent large-scale communal activities or a series of hunting and game processing episodes.

Historic Period

By the second half of the nineteenth century, the Northern Cheyenne and Northern Arapaho claimed all of Wyoming south and east of the North Platte River loop. The Shoshone occupied the Green River Basin and the area north and east toward the Continental Divide where they bordered the Utes in the Great Divide Basin. U. S. geopolitical boundaries during the episode of military exploration and emigrant protection also were rather fluid and clearly ignored the territorial claims of Indian tribes (SHPO 2012).

The Utes were among the first indigenous groups in North America to acquire and master the horse, which contributed to their remarkable success in the seventeenth and early eighteenth centuries. Horses allowed the Utes to travel farther than previously possible for subsistence. Ute territory at its apex is generally considered to have reached from western Utah to the eastern slope of the Rocky Mountains in Colorado, and from northern New Mexico to the northernmost reaches of western Colorado. Recent investigations cite evidence of rock art, wickiups and brush fences suggesting that the Utes ranged as far northward as Wyoming's Upper Powder Springs Basin during the Late Contact phase (Ott et al. 2011).

The White River Agency was established for the northern Ute Indians in northwestern Colorado in 1868. The nearest supply point was the Union Pacific Railroad at Rawlins, Wyoming. The Rawlins to Baggs/White River Road, 48CR3648, was established to supply the agency on the White River near present day Meeker, Colorado. The road was a continuation into Colorado of the Rawlins to Baggs Road. Relationships between Agent Nathan Meeker and the Utes deteriorated and Meeker was attacked. Military aid was requested to quell the rebellion by the Ute tribe. Military troops led by Major Thornburgh left Fort Steele to restore order. Before the troops arrived, Meeker and eight employees were killed. Thornburgh and 13 soldiers were killed in route when his troops were attacked by the Ute Indians. The remaining soldiers were rescued by Colonel Merrit and a detachment of soldiers he led from Fort Steele. As a result of this rebellion, the Uncompaghre Utes and the White River Utes were relocated to the Uintah

Reservation in Utah in 1881 and the Ute lands in Colorado were opened by Congress for non-Indian settlement (Rosenberg 2006).

Historic use of the area by Euro-Americans is marked by the mountain man, military exploration, emigration, and ranching activities. The purchase of the Louisiana Territory in 1803 opened the American west for exploration. The exploration of the Rocky Mountains, by mountain men and later by military expeditions led by Evans and Stansbury, aided in the identification of various routes through the Rocky Mountains. Early emigration across the western United States was by covered wagon. The Oregon, California, Mormon and Pony Express routes crossed Wyoming north of the study area. The Overland Trail crossed the route immediately south of the study area. The completion of the transcontinental railroad north of the study area in 1868 opened south-central Wyoming to settlement. Timbering, ranching and mining were important industries in the early settlement of Wyoming. Table 2 presents the historic chronology of the Wyoming Basin.

Forts were established as trading posts for travelers and a place where trappers could trade their furs. Forts were later occupied by the United States military to provide protection for emigrants travelling to the western territory.

The combined company, made up of people from Cherokee Nation, plus both white and Cherokee from Arkansas, Missouri and Tennessee became known as the Evans/Cherokee company. They pioneered a route through Kansas and Oklahoma that was traveled until 1862, during the Civil War. The Evans/Cherokee trail was continuously used through Colorado and Wyoming before, during and after the Colorado Pikes Peak gold rush beginning in 1858, the Idaho and Montana gold rushes of the 1860s, for stock drives westbound and eastbound into the 1880s, and by emigrants to the turn of the century (Fletcher et al. 1999). Fletcher et al. (1999) depicts the 1849 Evans Route of the Cherokee Trail, 48CR3651 across Rock Creek at what is now Arlington, Wyoming (Figure 3). This is the general route of the Overland Trail. The Overland Trail was a wagon and stage route through southern Wyoming beginning in the 1850s. The route was used by emigrants travelling to California, Oregon and Utah. Due to generally poor forage for livestock and the alkaline water, its use during that decade was limited. Beginning in 1858, the United States Military improved portions of the Overland Trail to facilitate the transport of supplies and military personnel in response to the Mormon War. The southern route became more popular because of conflicts with Native Americans along the northern route and because of the military improvements. The Overland Trail is depicted on the 1872 GLO for T19N, R78W, as the Old Salt Lake Road (Figure 4).

Overland Trail stage stations in Carbon County include Rock Creek (Arlington) located 11 miles west of Cooper Creek, then 17 miles west to Medicine Bow (Elk Mountain), and 8.0 miles to Elk Mountain (Fort Halleck). The Rock Creek Stage Station is located approximately 1500 feet south of the study area. A log bridge was built over Rock Creek and a toll of $0.75 was charged at the crossing. During low water, a ford was located down river to avoid paying the toll (Erb et al. 1989). Local ranch road and interconnecting stage roads continued using routes such as the Overland Trail past completion of the transcontinental railroad. One such route was the Rock Creek and Fort Fetterman Stage Road that was established in 1877. The stage road was a little over 85 miles long. The route traversed rough country in the Laramie Hills where canyons were filled with snow half the year, across four river crossings, and across woodless areas with poor grass. It appears on GLO maps surveyed in the early 1880s as the Medicine Bow-Fort Fetterman Wagon Road (SHPO 2014).

The Union Pacific Railroad is located 15 miles north/northeast of the study area at Rock River, Wyoming and is part of the original Transcontinental Railroad which connected the eastern United States with the west in 1869. Its presence stimulated economic and social growth throughout the intermountain west during the late 19th and 20th centuries. The early development of coal mining, ranching and urban centers of southern Wyoming resulted from the

Table 2. Historic Chronology of Wyoming.

Phase	Age A.D.
Proto-Historic	1720 - 1800
Early Historic	1800 - 1842
Pre-Territorial	1842 - 1868
Territorial	1868 - 1890
Expansion	1890 - 1920
Depression	1920 - 1939
Modern	1939 - Present

Source: Massey 1989

presence of the Union Pacific Railroad which provided an efficient and relatively inexpensive mode of transportation. Without this transportation system large scale extractive industries and urban population centers could not have long survived in the arid conditions of the Intermountain West (Klein 1987). The Union Pacific Railroad is eligible under Criterion A.

Construction of the Union Pacific Railroad resulted in the need for materials including railroad ties. The Medicine Bow Mountains provided wood needed for the railroad ties to supplement those sent from the mid-west. Wood cutters cabins are documented in Section 6, T18N, R79W, on the 1884 GLO plat. A mill road trends northeast from Section 31, T19N, R78W, 1872 GLO plat. Harpers Mill and O'Haley's Mill are found on the T18N, R78W, 1878 GLO plat. Ties were transported down the North Platte River, located west of the study area, to the railroad camps.

The Lincoln Highway, 48CR1191, followed the original grade of the Union Pacific Railroad, through Rock River and on to Carbon, Wyoming. Interstate 80 generally follow the route of the Overland Trail south of the study area.

With the completion of the transcontinental railroad, distant cattle markets could be reached. The grass and sagebrush lands of the Wyoming Territory were found to be conducive to the fattening of livestock (SHPO 2014). The open range cattle industry allowed cattle to graze over unfenced areas year-round. Strong winds cleared snow so cattle could feed on the open range during winter months. Several cattle ranches surround the fertile valleys of the study area along Rock Creek and Foote Creek.

In 1841 Congress passed the Pre-emption Act entitling citizens of the United States to occupy public land and later purchase that land. The Homestead Act of 1862 allowed citizens to file on up to 160 acres of unappropriated public land, to "prove up" on that land by cultivating or improving the property. The citizen was able to purchase the land for $1.25/acre after a six-month occupancy or for a filing fee of $26.00 after five years of residence and improvements. Farmers irrigated land by excavating ditches from rivers and creeks to their homesteads. The Taylor Grazing Act (1934) withdrew the remaining public land ending the homesteading era (SHPO 2014). Ranchers were adjudicated water rights in the 1880s through the early 1900s in the valley east of Foote Creek Rim.

Oil and gas exploration began in the early 1900s. The earliest gas and oil leases surrounding the study are were let to Ohio Oil in 1918 (Wyoming Geological Association 1972). McFadden, Wyoming, is a mining camp established in the Rock Creek Oil Field, east of the study area. The Diamond Dome Gas Field is approximately 8.0 miles to the northeast of the study area.

BACKGROUND RESEARCH

A file search (FS#33697) was received on August 28, 2017, from the State Historic Preservation Office (SHPO), Cultural Records Division (WYCRO). Records at WAS were also consulted.

General Land Office (GLO) maps on the Bureau of Land Management (BLM) web site were consulted and no historic resources are located within the study area. . . (Omitted text as per BLM Regulations)

SITE RESULTS

A total of 13 sites have been documented within the PacifiCorp, Foote Creek Rim 1 study area. Of the 13 recorded sites, one (8%) is a prehistoric site, two (15%) are historic sites, and 10 (77%) are multi-component sites that include both prehistoric and historic components. These sites are all situated within the Foote Creek Rim Archaeological District, 48CR5834. The Foote Creek Rim Archaeological District includes a total of 20 recorded prehistoric and/or historic sites and contain over 560 stone features. Over 300 of these stone features are located within the sites documented in the study area and comprise a medicine wheel, cairns, stone circles, stone arcs and stone lines. Some of the features have been documented as prehistoric and some are historic. Prior to the designation of the district, the sites within the district were assigned Smithsonian Numbers from Cultural Records (Schneider 1994).

Prehistoric Sites

Prehistoric site types include prehistoric camps, lithic scatters, human burials, housepits, rock art, both pictographs and petroglyphs, rock alignment sites, rock shelters, stone circles, pottery/ceramic sites, milling and vegetable processing sites, bone butchering sites, quarries, and secondary lithic procurement sites. In general, prehistoric site densities are highest along streams, creeks and natural springs. These areas are rich in flora and fauna. Stone alignments, stone circles, and cairns occur along the rocky ridges. Rocky outcrops were utilized as camp areas along with providing exposures for prehistoric rock art and rock shelters. As in much of the Wyoming Basin, sandy deposits were the preferred areas for prehistoric occupations.

Prehistoric camps contain evidence of a broad range of activities including subsistence-related activities. Cultural remains include formal features such as fire hearths, stone rings, cairns, rock art, lithic debris, chipped stone tools, and evidence of bone processing and milling/ vegetable processing activities including groundstone and pottery. Stone circle and cairn sites and sites containing pottery are discussed below. Single as well as long-term occupation(s) may be represented in prehistoric camp sites. One large, side-notched dart point was collected from Site 48CR5579. One scraper was reported at Site 48CR5574. Stained sediment has not been documented in the study area although heat-altered rock concentrations have been identified in sites on Foote Creek Rim.

Human burials, rock art, both pictographs and petroglyphs, rock alignment sites, cairns, stone circles, wickiups, and rock and brush shelters have been identified as sensitive to Native Americans. Stone circle, rock alignment sites and cairns are generally found on the ridges overlooking seasonal drainages. Sites may consist of multiple stone circles or a combination of stone circles, rock alignments and/or cairns. Specific to the study area, nine sites containing prehistoric cairns, a medicine wheel, stone rings, stone circles, stone alignments, and/or stone arcs have been documented. Eight of the sites include a historic component, which are discussed below in the multi-component sites. The sites include 48CR2, 48CR695, 48CR5579, 48CR5580, 48CR5581, 48CR5582, 48CR5583, 48CR5584 and 48CR5585. A medicine wheel was

documented at Site 48CR5579. All nine sites are considered eligible to the NRHP and are contained within the Foote Creek Rim Archaeological District. Mitigation measures, developed in consultation with the tribes include avoiding all stone features during wind farm development and operation and providing access to the rim top for Native Americans (TRC Mariah 1997). No human burials have been documented in the study area. No pottery sites have been documented in the study area.

Lithic scatters consist of sites containing lithic debitage, stone tools, and quarries. By definition, no features or feature remnants are present at lithic scatter sites. The sites are interpreted as representing short-term activities. No lithic scatters have been recorded in the study area. Quarries are sites where lithic raw material was obtained and initially processed. Primary and secondary lithic procurement areas are geologic locations where chert and quartzite cobbles have been re-deposited and later used by prehistoric inhabitants for tool manufacture. Quarries have not been recorded in the study area. Primary and secondary landscapes have not been reported within the PacifiCorp Foote Creek Rim 1 study area.

Multi-component sites include both prehistoric and historic cultural occupations. Sites 48CR2, 48CR695, 48CR5579, 48CR5580, 48CR5581, 48CR5582, 48CR5583, 48CR5584, 48CR5585 are eligible multi-component sites located on Foote Creek Rim within the Foote Creek Rim Archaeological District, 48CR5834 (see Figures 1 and 2). The features have been identified as both prehistoric or historic. When assigning rock features to the historic component, the features were identified for historic or possible historic use (Schneider 1994). Site 48CR2 consists of 20 prehistoric features and five historic features. The prehistoric features include 16 prehistoric cairns, two stone circles and two stone arcs. The historic features consist of five cairns. Site 48CR695 consists of 33 prehistoric features and eight historic features. The prehistoric features include 16 prehistoric cairns, 16 stone circles and one linear cairn. The historic features consist of eight cairns. Site 48CR5579 consists of 69 rock features. The prehistoric rock features consist of one medicine wheel, 26 cairns, six stone circles, seven stone arcs, two stone lines, two linear cairns, three excavated pits and one fire-cracked rock (FCR) scatter. The historic features include seven cairns, five stone letters, six stone lines and one excavated pit. Site 48CR5580 consists of four rock features including two prehistoric cairns and two historic cairns. Site 48CR5581 consists of 15 stone features. The prehistoric features include two cairns, five stone circles and four stone arcs. The historic features include two cairns. Site 48CR5582 consists of 24 rock features. The prehistoric features include 15 cairns, four linear cairns and two stone lines. The historic features include two cairns and one linear cairn. Site 48CR5583 consists of 42 rock features. The prehistoric features include 26 cairns, six stone circles, one linear cairn, two stone arcs and one FCR scatter. The historic features include six cairns. Site 48CR5584 consists of 31 stone features. The prehistoric features include 25 cairns, one stone arc and one stone arrow. The historic features include four cairns. Site 48CR5585 consists of 71 rock features. The prehistoric features include 46 cairns, seven stone arcs, four stone lines, eight stone circles and one FCR scatter. The historic features include four cairns. Only one site within the study area is considered not eligible to the NRHP. Site 48CR5574 is a multi-component site that consists of a historic tin can scatter and a prehistoric non-diagnostic tool.

Historic Sites

Historic use of the project area began with early exploration of the west. The 1849 Evans Route of the Cherokee Trail crossed south of the study area. Howard Stansbury travelled through the area on route to explore the Great Salt Lake. It was on this route that Stansbury identified coal deposits in what would become Carbon and Sweetwater counties in Wyoming. Emigrants travelled the Overland Trail through this southerly route across Wyoming as early as the 1850s.

The route became more popular due to conflicts with the Native Americans along the northern emigrant route.

Historic site types include historic trails, wagon roads, historic inscriptions, roads, stage stations, ranches and corrals, homesteads, cabins and dugouts, irrigation ditches, buildings, bridges, schools, churches, graves and cemeteries, historic cairn sites, historic debris, mines, and oil and gas exploration sites . . . (Omitted text as per BLM Regulations)

Data Recovery Results

No data recovery projects have been conducted in the Foote Creek Rim 1 study area. Site 48CR1482 is located in the Hanna-Carbon Basin of southern Wyoming, northwest of the study area. Site 48CR1482 consists of 76 stone circles. Cultural materials collected by Metcalf-Zier during the initial recording included two biface artifacts, one scraper, one flake, and a side-notched projectile point base of unspecified cultural affiliation (Kalaz and Pastor 1981). The point fragment was collected from Stone Circle 51. The average size of the stone features was approximately 6.0 m in diameter. No stained-sediment, deflated hearths or FCR were identified. The site was revisited by TRC Mariah and testing was recommended (Batterman and Nelson 1997). Data recovery was recommended that proposed 10-1x1 m excavation units be placed in the eolian sediment to ascertain the extent and location of buried deposits within and adjacent to the stone circles (Lowe and Smith 2005). A data recovery plan was implemented by WAS (Ficenec 2011) to determine if intact buried cultural deposits were present in eolian sediment at the site. Based on the results of the initial units, additional excavation units could expand up to 100 m². WAS excavated 12-1x1 m units at Site 48CR1482. No intact subsurface cultural material was encountered (Ficenec 2011).

The Northern Arapahoe and Northern Cheyenne cultural representatives visited the site in 2004. The tribal members concurred the site was culturally significant and was eligible for the NRHP as a traditional cultural property under Criteria A (Lowe 2004). The tribal members indicated the site represented a location that was used repeatedly for seasonal subsistence. The site size suggested that it likely contained special purpose features for ceremonial activities, such as smaller stone circles that might represent private medicine lodges or ceremonial sweat lodges. Avoidance or monitor during construction was recommended by the tribal members in case of unanticipated discoveries.

The excavation of the Hedgehog Site, 48CR7035, resulted in the excavation of eight features in two separate blocks. Limited amounts of cultural material were recovered with most of the debris recovered from within the features. The housepit was dissected by a pipeline trench. One of the four internal features from within the housepit dated to the Great Divide phase of the Early Archaic period (Murray 2008). Material recovered from the hearth features suggested that small to rabbit-sized mammals were consumed. Lithic remains were extremely sparse suggesting stone tool manufacture and maintenance was not an important activity within the living structure. The presence of the structure indicated domestic occupation as opposed to a logistical camp.

Data recovery at the Canid Housepit site (48CR8818) comprised of a single housepit features, three subfloor internal features, debitage, three flaked tools and faunal remains. Cultural material was viewed as representing the utilization of the site locality by a small group of hunter-gatherers during at least one, but potentially multiple temporally punctuated occupations, of the housepit structure and site locality. The proximity to Dry Cow Creek and Muddy Creek were likely contributing factors that conditioned the occupation, and potential reoccupations, of the housepit and site locality by Mid-Holocene hunter-gatherers (Buenger 2015).

Component II at the Five Mile Ditch site dates to the Pine Spring phase of the Late Archaic period. Radiocarbon analysis of features excavated from Component II, Block 2 are

between 3120 B.P. and 2990 B.P. Projectile points similar in style to the Pelican Lake were recovered (McNees 2005).

The Nova Housepit site, 48CR4419, was excavated in south-central Wyoming (Thompson 1989). The site dates to the Uinta phase of the Late Prehistoric period. The faunal assemblage debris suggests intensive processing for maximal resource extraction. Juniper berries were being processed in the subfloor features. The lithic assemblage includes a Desert side-notched projectile point, a final biface, a core, a fragment of worked bone (distal tip of a deer antler), lithic debitage and groundstone (Thompson 1989).

The Vent Enfer Site (48CR9597) is a multi-component open-air camp site that included a house structure, hearth-tethered activities conducted by mobile hunter-gatherers (Murray 2015). Pit roasting features, diagnostic faunal remains, projectile points and lithic debris were recovered from the excavation of the site. Three components were identified. Two components (A and B) date to the Uinta phase of the Late Prehistoric period and one component (C) dates to the Deadman Wash phase of the Late Archaic period. Component C is an ephemeral short-term occupation manifested as five features, five tools including a drill, lithic debris and faunal material.

Occupation of the stabilized dune at the site reflects the habitation of small groups of hunter-gatherers exploiting seasonally available plant resources and supplementing these with small mammals. Larger individual mammals such as bison and antelope were taken on an encounter basis as demonstrated by the butchered bison bone recovered from Component B. Groundstone implements and lithic debris recovered from within the housepit structure indicate its use as a confined work space in the processing of food stuffs and tool maintenance.

SUMMARY

Information was compiled during the Class I Data Review for the proposed PacifiCorp, Foote Creek Rim 1 study area. The data review indicates the study area has been inventoried at a Class III level . . . (Omitted text as per BLM Regulations)

It is recommended both the construction of the new turbines, access roads, and collection lines, and the removal of the existing turbines and access roads, located 150 ft or closer to rock features, be monitored by a permitted archaeologist. It is also recommended, as per the existing MOA, that the construction of new turbines or the dismantling of existing turbines located 150 ft or closer to rock features be fenced prior to construction activities.

FIELD METHODS

Vegetation cover throughout the APE was light to moderate (estimated at 10 to 25%). Overall surface visibility ranged from 75 to 90%, with an average surface visibility of 85%. The entire area has been previously inventoried at the Class III level and no new acreage was inventoried during the current project . . . (Omitted text as per BLM Regulations)

Collection Policies

Collection policies employed by WAS are in line with policies established by the Wyoming State BLM Office and BLM Field Offices. No collections were made during the current project.

WEATHER AND GROUND CONDITIONS

Weather conditions during the fieldwork phase of the project consisted of mild to hot conditions (60 to 95°), and variably cloudy skies. The wind was generally from the west/ southwest and ranged from 5 to 25 mph. The field conditions prevalent during the fieldwork phase of this project had no effect on the results of this project.

RESULTS

. . . (Omitted text as per BLM Regulations)

48CR2

Description

Site 48CR2 is a . . . (Omitted text as per BLM Regulations)

No additional work is recommended for Site 48CR2 for the current project.

48CR695

Description

Site 48CR695 is a . . . (Omitted text as per BLM Regulations)

No additional work is recommended for Site 48CR695 for the current project.

48CR5582

Description

Site 48CR5582 is a . . . (Omitted text as per BLM Regulations)

A ca. 2000 ft long access road reroute is proposed to be constructed to the east of Site 48CR5582 and is located more than 250 ft from the rock features. Since the existing road is proposed to be reclaimed as part of the project, a temporary barricade fence measuring 250 ft (76 m) in length is recommended to be placed along the western margin of existing road east of Features 1-4 (see Figure 25). In addition, a monitor of construction is recommended during construction activities along the road in this area. Provided the temporary barricade fence is erected prior to construction and a monitor of construction is conducted, construction of the new wind turbines, MET towers, and the associated access roads, collection lines, and crane path and removal/reclamation of the existing wind turbines and access roads will not impact any of the features associated with Site 48CR5582 and will have no adverse effect on any known, significant cultural resources.

48CR5583

Description

Site 48CR5583 is a . . . (Omitted text as per BLM Regulations)

As a result, a temporary barricade fence is not necessary to be constructed prior to removal of the existing wind turbines and reclamation of the existing road. However, a monitor of construction is recommended to ensure that the fence is not removed and that no construction activities occur beyond the existing fence. Provided that no construction activities occur beyond the existing fence and a monitor of construction is conducted, construction of the new wind turbines, MET towers, and the associated access roads, collection lines, and crane path and

removal/reclamation of the existing wind turbines and access road will not impact any of the features associated with Site 48CR5583 and will result in no adverse effect.

48CR5584

Description

Site 48CR5584 is a . . . (Omitted text as per BLM Regulations)

Two temporary barricade fences are recommended to be placed on Site 48CR5584 prior to construction. In addition, a monitor of construction is recommended during widening of the road and construction of the collection line in these two areas. Provided the temporary barricade fences are erected prior to construction and a monitor of construction is conducted, construction of the new wind turbines, MET towers, and the associated access roads, collection lines, and crane path and removal of the existing wind turbines will not impact any of the features associated with Site 48CR5584 and will result in no adverse effect.

48CR5585

Description

Site 48CR5585 is a . . . (Omitted text as per BLM Regulations)

In addition to the barricade fences, a monitor of construction is recommended during construction activities in the above-mentioned locations. Provided the construction modifications are made, and the temporary barricade fences are erected prior to construction and a monitor of construction is conducted, construction of the new wind turbines and the associated access roads, collection lines, and crane path and removal of the existing wind turbines will not impact any of the features associated with Site 48CR5585 and will have no adverse effect on any known, significant cultural resources.

CONCLUSIONS/SUMMARY

A Class I Cultural Resource Data Review and Field Visit was conducted for the proposed PacifiCorp, Foote Creek Rim 1 project. . . . (Omitted text as per BLM Regulations)

In addition to placement of the temporary barricade fences in the locations described above, a monitor of construction is also recommended in the same locations. Table 5 outlines all construction recommendations. Provided that the barricade fences are placed prior to any construction activities and a monitor of construction is conducted, construction of the proposed Foote Creek Rim 1 project will have no adverse effect on any known, significant cultural resources.

REFERENCES CITED

Ahlbrandt, Thomas S.
1974 Dune Stratigraphy, Archaeology, and the Chronology of the Killpecker Dune Field. In *Applied Geology and Archaeology: The Holocene History of Wyoming*, edited by M. Wilson, pp. 51-60. The Geological Survey of Wyoming: Report of Investigations 10.

Ahlbrandt, Thomas S., James B. Swinehart, and David G. Maroney
1983 Dynamic Holocene Dune Fields of the Great Plains and Rocky Mountain Basins, U.S.A. In *Eolian Sediments and Processes*, edited by Michael E. Brookfield and Thomas S. Ahlbrandt, pp. 374-406. Elsevier Scientific Publishing B. V. Amsterdam.

Albanese, John
1989 *Quaternary Geologic Study Lost Soldier-Wertz Oil Field Area, Sweetwater and Carbon Counties, Wyoming*. John Albanese, Consulting Archaeologist. Submitted to John and Mavis Greer, Archaeological Consultants. Copies available from the Bureau of Land Management, Rawlins, Wyoming.

1995 *Geologic Investigation of Prehistoric Sites 48FR3091, 48FR3242, 48FR3243, 48FR3092, 48FR3244, and 48FR3245, Beaver Creek Valley, Fremont County, Wyoming*. John Albanese, Consulting Archaeologist. Submitted to Pronghorn Archaeological Services. Copies available from John Albanese, Consulting Geoarchaeologist, Casper, Wyoming.

Albanese, John P., and George C. Frison
1995 Cultural and Landscape Change During the Middle Holocene, Rocky Mountain Area, Wyoming and Montana. In *Archaeological Geology of the Archaic Period of North America*, edited by E. Arthur Bettis III, pp. 1-19. Geological Society of America Special Paper 297. Geological Society of America, Boulder.

Antevs, Ernst
1955 Geologic-Climatic Dating in the West. *American Antiquity* 20:317-335.

Bach, Daniel R.
2005 Macrofloral and Limited Geomorphological Analysis of 750 Prehistoric Hearths from Southwestern Wyoming. Paper presented at the 7th Biennial Rocky Mountain Anthropological Conference, Park City, Utah.

Batterman, Bill and Mark Nelson
1997 IMACS Form for 48CR1482. TRC Mariah Associates, Inc., Laramie, Wyoming.

Bellar, J.
1975 Site Form for 48CR2. Form on file with the Wyoming BLM, Rawlins Field Office. Wyoming BLM, Rawlins District, Rawlins Field Office.

Benner, Melissa

2013 United States Department of the Interior, National Park Service, National Register of Historic Places Registration Form for Site 48SW18660. Prepared by the Wyoming State Historic Preservation Office, Laramie, Wyoming.

Berry, Derek

2004 Wyoming Cultural Properties Form for 48CR695. Form on file with the Wyoming BLM, Rawlins Field Office. HRA Gray and Pape, LLC., Houston, Texas.

Bryson, Reed A.

1994 On Integrating Climatic Change and Culture Studies. *Human Ecology* 22(1):115-128.

Buenger, Brent

2011a Discussion and Synthesis. In *Data Recovery Excavations along the Anadarko Howell CO_2 Pipeline: 8,000 Years of Hunter-Gatherer Adaptation in Central Wyoming*, edited by Brent A. Buenger and Stacy R. Goodrick, pp. 752-837. Prepared for Anadarko Exploration and Production. Western Archaeological Services, Rock Springs, Wyoming.

2011b The East Cottonwood Creek Site (48NA5611). In *Data Recovery Excavations along the Anadarko Howell CO_2 Pipeline: 8,000 Years of Hunter-Gatherer Adaptation in Central Wyoming*, edited by Brent A. Buenger and Stacy R. Goodrick, pp. 677-749. Prepared for Anadarko Exploration and Production. Western Archaeological Services, Rock Springs, Wyoming.

2015 Data Recovery Excavations at Site 48CR8818, Canid Housepit Site, for Anadarko Exploration and Production Sun Dog Transconnect Pipeline Project Carbon County, Wyoming. Prepared for Anadarko Exploration and Production. Submitted to the Bureau of Land Management Rawlins Field Office. Cultural Resource Management No. 87. Western Archaeological Services, Rock Springs, Wyoming.

Buenger, Brent A. and Stacy R. Goodrick

2011 *Data Recovery Excavations along the Anadarko Howell CO2 Pipeline: 8000 Years of Hunter-Gatherer Adaptation in Central Wyoming.* Report prepared for Anadarko Petroleum and submitted to the Bureau of Land Management, Casper Field Office. Western Archaeological Services, Rock Springs, Wyoming.

Buenger, Brent A., David G. Darlington, David E. Johnson, and Matthew D. Kautzman

2007 *Data Recovery at Sites 48SW11618, 48SW13490, 48SW13552, 48SW13648, 48SW1390 and 48SW13992 For the Black Butte Coal Company Salt Wells Mine Expansion Project*. Prepared for Black Butte Coal Company. Submitted to the Wyoming Bureau of Land Management, Rock Springs Field Office. Western Archaeological Services, Rock Springs, Wyoming.

Bureau of Land Management and the State Historic Preservation Office

1977a Memorandum of Agreement regarding the SeaWest/PacifiCorp Phase I Windpower Project. Document on file at the BLM Rawlins Field Office, Rawlins, Wyoming.

1997b Information letter to John Keck, State Historic Preservation Officer, from Gary DeMarcy, BLM Rawlins Field Office Archaeologist. The letter pertains to impacts to Site 48CR5834, a significant cultural resource, located within the SeaWest/PacifiCorp Phase I Windpower Project. Letter on file at the BLM Rawlins Field Office, Rawlins, Wyoming.

2014 *Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers, Regarding the Manner in which the BLM will meet its Responsibilities under the National Historic Preservation Act, State Protocol between the Bureau of Land Management, Wyoming State Director, and the Wyoming Historic Preservation Officer*. Bureau of Land Management, Cheyenne, Wyoming.

Byers, David A., and Craig S. Smith

2007 Ecosystem Controls and The Archaeofaunal Record: An Example from the Wyoming Basin, USA. *The Holocene* 17:1171-1183.

Byers, David A., Craig S. Smith, and Jack M. Broughton

2005 Holocene Artiodactyl Population Histories and Large Game Hunting in the Wyoming Basin, USA. *Journal of Archaeological Science* 32:125.142.

COHMAP Members

1988 Climatic Changes of the Last 18,000 Years: Observations and Model Simulations. *Science* 241:1043-1052.

Cowie, James E.

1958 *The Areal Distribution of the Eastern Shoshone*. Unpublished M.A. thesis, Department of Anthropology, University of Colorado, Boulder.

Craven, Cynthia D.

2005 The Battle Spring Draw Paleoindian Site (Site 48SW13156). In *The Archaeology Along the Lost Creek Pipeline, Fremont and Sweetwater Counties, Wyoming*: Volume IV: Great Divide Basin Sites, edited by Craig S. Smith, pp. 3-1 to 3-99. Prepared by TRC Mariah Associates Inc., Laramie, Wyoming, for Lost Creek Gathering Company.

Creasman, Steven D., Kevin W. Thompson, and Beth Sennett

1990 Prehistoric Pottery of Southwest Wyoming: A Preliminary Assessment. Paper presented at the 48th Annual Plains Anthropological Conference, Oklahoma City, Oklahoma.

Creasman Steven D., and Kevin W. Thompson

1997 Settlement and Subsistence of the Archaic Period in the Green River Basin, Wyoming. In *Changing Perspectives on the Archaic of the Northwestern Plains*, edited by Mary Lou Larson and Julie E. Francis. University of South Dakota Press, Vermillion.

Eckerle, William

1989 *Geoarchaeology of Altithermal Sand Dunes: Adaptation to Eolian Environments During the Early Plains Archaic*. Unpublished M.A. thesis, Department of Anthropology, University of Wyoming, Laramie.

1990 *Geoarchaeology of the Dead Indian Creek Site (48PA551)*. William Eckerle, Consulting Geoarchaeologist. Submitted to the Office of the Wyoming State Archaeologist. Copies available from the Office of the Wyoming State Archaeologist, Laramie.

1994 *Geoarchaeological Assessment of Sites 48SU1386 and 48SU1499, Sublette County, Wyoming*. Western GeoArch Research. Submitted to Archaeological Services of Western Wyoming College. Copies available from Western GeoArch Research, Salt Lake City.

1997 Eolian Geoarchaeology of the Wyoming Basin: Changing Environments and Archaic Subsistence Strategies in the Holocene. In *Changing Perspectives of the Archaic on the Northwestern Plains and Rocky Mountains*, edited by Mary Lou Larson and Julie E. Francis, pp. 139-167. University of South Dakota Press, Vermillion.

Eckles, David G., Jeffrey Lockwood, Rabinder Kumar, Dale Wedel, and Danny N. Walker

1994 An Early Historic Period Horse Skeleton from Southwestern Wyoming. *The Wyoming Archaeologist* 38(3-4):55-68.

Enders, Dick

1977 Site Form for 48CR695. Form on file with the Wyoming BLM, Rawlins Field Offices. Archaeological Services of Western Wyoming College, Rock Springs, Wyoming.

Erb, Louise B., Ann B. Brown and Gilberta B. Hughes

1989 *Overland Trail: The Bridger Pass 1862-1869 Through Colorado and Wyoming and Cross Roads at the Rawlins-Baggs Stage Road in Wyoming*. ERBGEM Publishing Company, Littleton, Colorado.

Ficenec, Robert

2011 *Data Recovery Report for Site 48CR1482 Carbon County, Wyoming. Prepared for Ark Land Company*. Submitted to the Office of Surface Mining, Reclamation and Enforcement, Casper Field Office. Western Archaeological Services, Rock Springs, Wyoming.

Fletcher, Patricia K., Jack E. Fletcher, and Lee Whitley

1999 *Cherokee Trail Diaries.* Caxton Printers, Ltd., Caldwell, ID.

Forman, Steven L., Robert Oglesby, and Robert S. Webb

2001 Temporal and Spatial Patterns of Holocene Dune Activity on the Great Plains of North America: Megadroughts and Climate Links. Global and Planetary Change 29(2001):1–29.

Frison, George C.
1971 Shoshonean Antelope Procurement in the Upper Green River Basin. *Plains Anthropologist* 16(54):258-284.

1973 *The Wardell Buffalo Trap 48SU301: Communal Procurement in the Green River Basin*. Museum of Anthropology, University of Michigan, Anthropological Papers No. 48. Ann Arbor, Michigan.

1978 *Prehistoric Hunters of the High Plains*. Academic Press, New York, New York.

1991 *Prehistoric Hunters of the High Plains*, second edition. Academic Press, New York, New York.

Gaylord, David R.
1982 *Geologic History of the Ferris Dune Field, South-Central Wyoming*. Geologic Society of America Special Paper 192, pp. 65-82.

1990 Holocene Paleoclimatic Fluctuations Revealed from Dune and Interdune Strata in Wyoming. *Journal of Arid Environments* 18:123-138.

Gill, George, W.
2010 Advances in Northwestern Plains and Rocky Mountain Bioarchaeology and Skeletal Biology. In *Prehistoric Hunter-Gatherers of the High Plains and Rockies*, third edition. Left Coast Press, Walnut Creek, California.

Graf, Kelly E., and Dave N. Schmitt
2007 *Paleoindian or Paleoarchaic? Great Basin Human Ecology at the Pleistocene-Holocene Transition*. The University of Utah Press, Salt Lake City.

Halfen, Alan F., Glen G. Fredlund, and Shannon A. Mahan
2010 Holocene Stratigraphy and Chronology of the Casper Dune Field, Casper, Wyoming, USA. *The Holocene* 2010 20: 773.

Harrell, Lynn L., and Scott T. McKern
1986 *Maxon Ranch: Archaic and Late Prehistoric Habitation in Southwest Wyoming*. Cultural Resource Management Report No. 18, Archaeological Services, Western Wyoming College, Rock Springs, Wyoming.

Hoefer, Ted, III, Steven D. Creasman, Dirk Murcray and Joseph Bozovich
1992 The South Baxter Brush Shelter Site: An Early Shoshonean Occupation In Southwest Wyoming. The Wyoming Archaeologist, Volume 36, Nos. 3-4, 1992.

Johnson, David E.
2000 The Ceramic Site. In *"Seeds-Kee-Dee" Riverine Adaptation in Southwest Wyoming* edited by Jana V. Pastor, Kevin W. Thompson, Richard K. Talbot, William P. Eckerle, and Eric E. Ingbar. Museum of Peoples and Cultures Technical Series 99-3. Brigham Young University, Provo, Utah.

2005 *Archaeological Investigations at 48SU261, Sublette County, Wyoming*. Prepared for Jonah Gas Gathering Company and Mountain Gas Resources and submitted to the Wyoming Bureau of Land Management, Pinedale Field Office. Western Archaeological Services, Rock Springs, Wyoming.

Johnson, David. E., and Jana Pastor

2003 *The Blue Point Site: Paleoindian/Archaic Transition in Southwest Wyoming*. Prepared for FMC Corporation by Western Archaeological Services, Rock Springs, Wyoming.

Kalasz, S. and Jana V. Pastor

1981 Site Form for 48CR1482. Metcalf-Zier Archaeologists, Eagle, Colorado.

Kautzman, Matthew D.

2000 The Hugh Site. In *"Seeds-Kee-Dee" Riverine Adaptation in Southwest Wyoming* edited by Jana V. Pastor, Kevin W. Thompson, Richard K. Talbot, William P. Eckerle, and Eric E. Ingbar. Museum of Peoples and Cultures Technical Series 99-3. Brigham Young University, Provo, Utah.

2012 *Archaeological Data Recovery of the Sidewinder Site (48SU379), A Multi-Occupation Prehistoric Camp Located on the South Terrace of the New Fork River*. Prepared for Jonah Gas Gathering Company and Questar Energy Production and submitted to the Wyoming Bureau of Land Management, Pinedale Field Office. Western Archaeological Services, Rock Springs, Wyoming.

Kautzman, Matthew D., and Jana Pastor

2002 *The Bozovich Site Complex: Archaeological Investigations at the North Table Mountain Site.* Report on file at Western Archaeological Services, Rock Springs, Wyoming.

Kelly, Robert L.

1995 *The Foraging Spectrum. Diversity in Hunter-Gatherer Lifeways*. Smithsonian Institution Press, Washington, D.C.

Kelly, Robert L., David A. Byers, William Eckerle, Paul Goldberg, C. Vance Haynes, R. Mark Larsen, John Laughlin, Jim Mead, and Sage Wall

2006 Multiple Approaches to Formation Processes: The Pine Spring Site, Southwest Wyoming. In *Geoarchaeology: An International Journal,* Vol. 21, No. 6, 615-638.

Kennedy, John

2009 Metal Projectile Point Survey of the Interior West: Preliminary Numbers and Directions for Future Research. Poster Paper presented at the 2009 Rocky Mountain Anthropological Conference.

Keyser, James D., and George Poetschat

2005 *Warrior Rock Art of Wyoming's Green River Basin: Biographic Petroglyphs Along the Seedskadee*. Published by the Oregon Archaeological Society, Publication No. 15, Portland, Oregon (expanded version printed in 2011).

Klein, Maury
1987 *Union Pacific: The Birth of a Railroad, 1862-1893.* Doubleday, New York.

Kornfeld, Marcel, George C. Frison, and Mary Lou Larson
2010 *Prehistoric Hunter-Gatherers of the High Plains and Rockies*, third edition. Left Coast Creek, California.

Kornfeld, Marcel, and Mary L. Larson
2008 Bonebeds and Other Myths: Paleoindian to Archaic Transition on North American Great Plains and Rocky Mountains. *Quaternary International* 191:18-33.

Kornfeld, Marcel, Michael R. Peterson, and George C. Frison
1999 *The Krmpotich Folsom Site: 1998 Test Excavations and Preliminary Report*. Technical Report No. 17b, George C. Frison Institute of Archaeology and Anthropology, University of Wyoming, Laramie.

Kornfeld, Marcel and Lawrence C. Todd (editors)
1985 *McKean/Middle Plains Archaic: Current Research*. Occasional Papers on Wyoming Archaeology, No. 4. Wyoming Recreation Commission, Cheyenne.

Kutzbach, John E.
1987 Model Simulations of the Climatic Patterns During the Deglaciation of North American. In: Ruddiman, William F., Wright Jr., Herbert E. Eds., *North America and Adjacent Oceans During the Last Deglaciation*. Geology of North America, Vol. K3, Geological Society of America, Boulder, CO, pp. 425–446.

Lageson, David R., and Darwin R. Spearing
1991 *Roadside Geology of Wyoming*. Second Edition. Mountain Press Publishing Company, Missoula, Montana.

Largent, Floyd
2008 Marcel Kornfeld: Paleoindian Subsistence and Folsom in the Rockies. In *Mammoth Trumpet*, Vol. 23:1-4. College Station, Texas.

Larson, Mary Lou
1997 Housepits and Mobile Hunter-Gatherers: A consideration of the Wyoming Evidence in *Plains Anthropologist* Vol. 42, No. 161, pp. 353-69.

Larson, Tom
2009 Wyoming Cultural Properties Form for 48CR5585. Form on file with the Wyoming, BLM, Rawlins Field Office. LTA Inc., Laramie, Wyoming.

Liu, Tanzhuo, and Ronald I. Dorn
1996 Understanding the spatial variability of environmental change is drylands with rock varnish microlaminations. *Annals of the Association of American Geographers* 86 (2) 187-212.

Lowe, Jim

2004 Results of native American Consultation for 42 Prehistoric and Historic Sites within Arch of Wyoming's Proposed Carbon Basin Mines Permit Area, Carbon County, Wyoming. Prepared for Arch of Wyoming, L.L.C. Hanna, Wyoming. TRC Mariah Associates, Inc., Laramie, Wyoming.

Lowe, Jim and Craig Smith

2005 Data Recovery Plan for Arch of Wyoming's Carbon Basin Mines Project, Carbon County, Wyoming. TRC Mariah Associates, Inc., Laramie, Wyoming.

Lowe, Jim and R. Sterling

1997 IMACS Form: 48CR6885. On file at the Wyoming Cultural Records Office, Laramie, Wyoming. http://wyshpo.uwyo.edu/wycorgis/#Home

Lubinski, Patrick M.

2000 Of Bison and Lesser Mammals: Prehistoric Hunting Patterns in the Wyoming Basin. In *Intermountain Archaeology*, edited by David B. Madsen and Michael D. Metcalf, pp. 176-188. Anthropological Papers No. 122, University of Utah Press, Salt Lake City, Utah.

2003 Rabbit Hunting and Bone Bead Production at a Late Prehistoric Camp in the Wyoming Basin. *North American Archaeologist* 24(3):197-214.

Lubinski, Patrick M., Lowell T. Evans, and Michael D. Metcalf

2007 *Lithic Artifacts of the Firehole Basin Site (48SW1217*). In The Wyoming Archaeologist, Volume 51 (1), Spring 2007. Wyoming Archaeological Society.

Martin, William and Craig Smith (Editors)

1999 *Archaeological Investigations Along the Wyoming Segment of the Express Pipeline: Volume 5 Project Synthesis*. TRC Mariah Inc. Submitted to Express Pipeline. Copies available from TRC Mariah Inc. Laramie, Wyoming. Submitted to Express Pipeline. Copies available from TRC Mariah Inc. Laramie, Wyoming.

Massey, R.

1989 Wyoming Comprehensive Historic Preservation Plan. Report Prepared for Archive, Museums, and Historic Department. Wyoming State Historic Preservation Office, Cheyenne.

Mayer, James H.

2001 The Krmpotich Folsom Site (48SW9826): Geoarchaeology of a Paleoindian Locality in the Killpecker Dune of Southwestern Wyoming. M.A. thesis, Department of Anthropology, University of Wyoming, Laramie.

Mayer, James H., and Shannon A. Mahan

2004 Late Quaternary Stratigraphy and Geochronology of the Western Killpecker Dunes, Wyoming, USA. *Quaternary Research* 61:72-84.

McKern, Scott T., and Steven D. Creasman

1991 *Salvage Excavations at the Vegan Site 48LN1880 in the Green River Basin, Wyoming*. Prepared for Colorado Interstate Gas Company and submitted to the Bureau of Land Management, Kemmerer Field Office. Archaeological Services of Western Wyoming College, Rock Springs, Wyoming, Cultural Resource Management Report No. 58.

McKern, Scott T., and William Current

n.d.-a *Archaeological Investigation of the McKeva Ryka Site (48SU2094): A Multi-Occupational Way Station on Sand Draw*. Draft report prepared for McMurry Oil Company and submitted to the Wyoming Bureau of Land Management, Pinedale Field Office. Current Archaeological Research, Rock Springs, Wyoming.

n.d.-b *Archaeological Investigation of Jonah's House Site, Site 48SU2324: A Multi-occupational Way Station on Sand Draw*. Draft report prepared for McMurry Oil Company and submitted to the Wyoming Bureau of Land Management, Pinedale Field Office. Current Archaeological Research, Rock Springs, Wyoming.

McKibbin, Anne

1995 *The Pescadero Site (48LN2068), Final Report of Excavations, Lincoln County, Wyoming*. Prepared for Williams Field Services. Metcalf Archaeological Consultants, Inc., Eagle, Colorado; and Archaeological Energy Consulting, Casper, Wyoming.

McKibbin, Anne, Ronald J. Rood, Michael D. Metcalf

1989 Archaeological Excavations at Six Sites in the Leucite Hills, Sweetwater County, Wyoming. Prepared for Black Butte Coal Company, Point of Rocks. Report submitted to the Wyoming Bureau of Land Management, Rock Springs District, Metcalf Archaeological Consultants, Eagle, Colorado.

McNees, Lance M.

2005 Project Overview and Discussion. In The Archaeology Along the Lost Creek Pipeline, Fremont and Sweetwater Counties, Wyoming. Volume I: Project Overview and Discussion,, edited by Craig S. Smith. Prepared for Lost Creek Gathering Company, by TRC Mariah Associated, Inc., Laramie, Wyoming.

2006 *Cultural Resource Overview of the Pinedale Field Office, Bureau of Land Management, Volume 2: Central Subregions*. Prepared for the Pinedale Field Office, Bureau of Land Management. TRC Mariah Associates, Inc., Laramie, Wyoming.

McNees, Lance, James Lowe, William Martin, Craig Smith, William Batterman, and William Eckerle

1999 *Archaeological Investigations Along the Wyoming Segment of the Express Pipeline*. Volume 1: Project Overview. Edited by William Martin and Craig Smith. TRC Mariah Inc. Submitted to Express Pipeline. Copies available from TRC Mariah Inc. Laramie, Wyoming.

Metcalf, Michael D.

1987 Contributions to the Prehistoric Chronology of the Wyoming Basin, pp. 233-261. In *Perspectives on Archaeological Resources Management in the Great Plains*, edited by A. J. Osborn and R. C. Hassler. I & O Publishing Company, Omaha, Nebraska.

2010 Revised Model of the Archaic-Paleoindian Transition and the Archaic Era Occupation of the Pipeline Corridor. In *Synthesis of Archaeological Data Compiled for the Piceance Basin Expansion, Rockies Express Pipeline, and Uinta Basin Lateral Projects Moffat and Rio Blanco Counties, Colorado and Sweetwater County, Wyoming, Volume 2* edited by Michael D. Metcalf and Alan D. Reed. Metcalf Archaeological Consultants, Inc. and Alpine Archaeological Consultants, Inc., for Rockies Express Pipeline LLC and Wyoming Interstate and El Paso Company. Manuscript on file with Office of Archaeological and Historic Preservation.

Middleton, Jessica L., Patrick M. Lubinski, and Michael D. Metcalf

2007 Ceramics from the Firehole Basin Site and Firehole Phase in the Wyoming Basin. *Plains Anthropologist* 52(210):29-4.

Miller, Mark E., Paul H. Sanders, and Julie E. Francis (editors)

1999 *The Trappers Point Site (48SU1006): Early Archaic Adaptations in the Upper Green River Basin, Wyoming.* Cultural Resource Series No. 1. Office of the Wyoming State Archaeologist, Laramie.

Murray, Susan D.

2000 The Manns Flat Site, 48SW9251. In *"Seeds-Kee-Dee" Riverine Adaptation in Southwest Wyoming*, edited by Jana V. Pastor, Kevin W. Thompson, Richard K. Talbot, William P. Eckerle, and Eric E. Ingbar. Museum of Peoples and Cultures Technical Series 9-3. Brigham Young University, Provo, Utah.

2004 The Haul Road Site, 48SW11645. In *Data Recovery Investigations at Five Sites in the Bridger Coal Mine Permit Area, Sweetwater County, Wyoming* (edited by Brent Buenger). Prepared for Bridger Coal Company. Western Archaeological Services, Rock Springs, Wyoming.

2007 Data Recovery Excavations at the Battle Spring Site (48SW14254), Sweetwater County, Wyoming. Appendices by Linda Scott Cummings and Richard Hughes. Prepared for Samson Resources. Western Archaeological Services, Rock Springs, Wyoming.

2008 Archaic Settlement at Echo Springs: The Split Hearth Housepit and Hedgehog Sites, Carbon County, Wyoming. Appendix by Linda Scott Cummings. Prepared for Samson Resources. Western Archaeological Services, Rock Springs, Wyoming.

2015 *LIFE ON A HIGH AND WINDY HILL: Data recovery excavation at Site 48CR9597 (Vent Enfer Site) for Williams Field Services Muddy Creek 3-30 Pipeline Project Carbon County, Wyoming.* Cultural Resource Management No. 90. Submitted tot eh Bureau of Land Management, Rawlins Field Office. Western Archaeological Services, Rock Springs, Wyoming.

Ott, Richard, Betsy Chapoose, Clifford Duncan, Terry Knight, Lynn Albers and Carol Patterson
2011 Perspectives on Ute Ethnohistory in West Central Colorado. Prepared for Ute Indian Tribe of the Uinta and Ouray Reservation, Ute Mountain Ute Tribe, and Southern Ute Tribe and Bureau of Land Management Colorado State Office, Glenwood Springs, Grand Junction and Uncompahgre Field Offices. Dominquez Archaeological Research Group, Grand Junction, Colorado.

Pastor, Jana V., Stacy Goodrick, Brent A. Buenger and David Darlington
2015 A Chronicle of Past Land Use in the Upper Green River Basin: Class I Inventory Report for the La Barge Platform. Prepared for AECOM. Submitted to the Wyoming Bureau of Land Management, Pinedale Field Office. Western Archaeological Services, Rock Springs, Wyoming.

Pastor, Jana V., Kevin W. Thompson, Richard K. Talbot, William P. Eckerle and Eric E. Ingbar (editors)
2000 "*Seeds'Kee'Dee" Riverine Adaptation In Southwest Wyoming*. Brigham Young University Museum of Peoples and Cultures. Technical Series N. 99-3.

Peterson, Michael R.
2001 *Folsom Mobility and Technological Organization at the Krmpotich Site: An Analysis of the Lithic Artifact Assemblage*. M.A. thesis, Department of Anthropology, University of Wyoming, Laramie.

Pool, Kelly
2001 Eating Roots and Rabbits for 7600 Years in Southwest Wyoming: Results of Data Recovery at 48SW8842. Paper presented at the Colorado Council of Professional Archaeologists Annual Meeting, La Junta, Colorado.

Reiss, David, (editor)
1990 *Archaeological Excavations at Site 48SR2330. Wyoming Project SCP-PS-020-2 (24). Muddy Gap-Lander, Fremont County, Wyoming*. Prepared for the Wyoming Highway Department. Office of the Wyoming State Archaeologist Wyoming Recreation Commission, Laramie, Wyoming.

Rosenberg, Robert
2006 A Historical Assessment of the Rawlins to Baggs Wagon Road from Sulphur Springs Ranch to Baggs Carbon County, Wyoming. Prepared for Anadarko Petroleum Corporation. Submitted by Rosenberg Historical Consultants, Cheyenne, Wyoming.

Schneider, Edward
1994a IMACS Form for Site 48CR2. Form on file with the Wyoming BLM, Rawlins Field Office. Mariah Associates, Inc., Laramie, Wyoming.

1994b IMACS Form for Site 48CR695. Form on file with the Wyoming BLM, Rawlins Field Office. Mariah Associates, Inc., Laramie, Wyoming.

1994c IMACS Form for Site 48CR5582. Form on file with the Wyoming BLM, Rawlins Field Office. Mariah Associates, Inc., Laramie, Wyoming.

1994d IMACS Form for Site 48CR5583. Form on file with the Wyoming BLM, Rawlins Field Office. Mariah Associates, Inc., Laramie, Wyoming.

1994e IMACS Form for Site 48CR5584. Form on file with the Wyoming BLM, Rawlins Field Office. Mariah Associates, Inc., Laramie, Wyoming.

1994f IMACS Form for Site 48CR5585. Form on file with the Wyoming BLM, Rawlins Field Office. Mariah Associates, Inc., Laramie, Wyoming.

Sharrock, Floyd W.
1966 *Prehistoric Occupation Patterns in Southwest Wyoming and Cultural Relationships with the Great Basin and Plains Cultural Areas*. University of Utah Anthropological Papers No. 77. Salt Lake City, Utah.

Shimkin, Demitri B.
1947 Wind River Shoshone Ethnogeography. *Anthropological Records* 5(4):245-284. University of California, Berkeley.

Simms, Steven R.
2008 *Ancient Peoples of the Great Basin and Colorado Plateau*. Left Coast Press, Walnut Creek, California.

Smith, Anne M.
1974 *Ethnography of the Northern Utes*. Museum of New Mexico Papers in Anthropology No. 17, Albuquerque.

Smith, Craig S.
1988 Seeds, Weeds, and Prehistoric Hunters and Gatherers: The Plant Macrofossil Evidence from Southwest Wyoming. *Plains Anthropologist* 33(120):141-158

2003 Hunter-Gatherer Mobility, Storage, and Houses in a Marginal Environment: An Example from the Mid-Holocene of Wyoming. In the *Journal of Anthropological Archaeology*, 22 (2003): 162-189.

Smith, Craig S., David A. Byers, and Cynthia D. Craven
2008 Bison Exploitation in the Wyoming Basin at the Middle/Late Holocene Transition: A View from the Graham Ranch Site. *Plains Anthropologist* 53: 313-332.

Smith, Craig S., and Steven D. Creasman
1988 *5000 Years of Prehistory in Southwest Wyoming: The Taliaferro Site*. Wyoming Bureau of Land Management, Cultural Resource Series No. 6. Cheyenne, Wyoming.

Smith, Craig S., and Lance M. McNees
1999 Facilities and Hunter-Gatherer Long-Term Land Use Patterns: An Example From Southwest Wyoming. *American Antiquity* 64(1):117-136.

2000 Pronghorn and Bison Procurement During the Uinta Phase in Southwest Wyoming: A Case Study from Site 48SW270. In *Plains Anthropologist Pronghorn Past and Present: Archaeology, Ethnography, and Biology*, edited by Jana V. Pastor and Patrick M Lubinski, Vol. 45, Memoir 32: 71-88.

2011 Persistent Land Use Patterns and the Mid-Holocene Housepits of Wyoming. In *Journal of Field Archaeology*, Vol. 36:298-311.

Smith, Craig S., Thomas P., Reust, and Russell D. Richard

2003 Site 48UT375: Late Paleoindian Subsistence and Land Use Patterns in the Green River Basin, Wyoming. *Plains Anthropologist* 48(186):133-149.

Spath, Carl and Robert Rowe

2000 Wyoming Cultural Properties Form: 48CR7317. Document on file at the Wyoming Cultural Records Office, Laramie, Wyoming. http://wyshpo.uwyo.edu/wycorgis/#Home

Stainbrook, Joni

2000 The Hearth in Road Site, 48SW10888. In *"Seeds-Kee-Dee" Riverine Adaptation in Southwest Wyoming,* edited by Jana V. Pastor, Kevin W. Thompson, Richard K. Talbot, William P. Eckerle, and Eric E. Ingbar. Museum of Peoples and Cultures Technical Series 9-3. Brigham Young University, Provo, Utah.

2004 The Raptor Site, 48SW1090. In *Data Recovery Investigations at Five Sites in the Bridger Coal Mine Permit Area, Sweetwater County, Wyoming* (edited by Brent Buenger). Prepared for Bridger Coal Company. Western Archaeological Services, Rock Springs, Wyoming

Stainbrook, Joni, Stacy Goodrick and Jan Yerkovich

2002 *Class III Inventory, Testing and Data Recovery Plan for the Black Butte Coal Company, Salt Wells Mine Expansion Project, Volume I.* Prepared for Black Butte Coal Company. Western Archaeological Services, Rock Springs Wyoming.

Stokes, Steven, and David R. Gaylord

1993 Optical Dating of Holocene Dune Sands in the Ferris Dune Field, Wyoming. *Quaternary Research* 39 (3):274–281.

Tanner, Russel L., Joseph Bozovich, Julie E. Francis, and Ronald I. Dorn

1995 The Black Rock Petroglyphs: A Possible Clovis-Age Rock Art Site. Poster paper presented at the 53rd Annual Plains Anthropological Conference, Laramie, Wyoming.

Thompson, Kevin W.

1989 *Archaeological Investigations at the Nova Site: A Late Prehistoric Housepit in Southcentral Wyoming*. Prepared for Nova Petroleum. Cultural Resource Management Report No. 49. Archaeological Services, Western Wyoming College, Rock Springs, Wyoming.

Thompson, Kevin W., and Jana V. Pastor

1995 *People of Sage: 10,000 Years of Occupation in Southwest Wyoming.* Cultural Resource Management Report No. 67. Archaeological Services of Western Wyoming College, Rock Springs, Wyoming.

Thompson, Kevin W., Jana V. Pastor, Linda W. Thompson, and William Current

1996 *The Birch Creek Site: Fifth Millennium B.P. Habitation in Southwest Wyoming*. Cultural Resource Management Report No. 62. Archaeological Services of Western Wyoming College, Rock Springs, Wyoming.

Thompson, Robert S., Cathy Whitlock, Patrick J. Bartlein, Sandy P. Harrison, and W. Geoffrey Spaulding

1993 Climatic Changes in the Western United States since 18,000 yr B.P. In *Global Climates Since the Last Glacial Maximum*, edited by Herbert E. Wright, Jr., pp. 468-513. University of Minneapolis Press, Minneapolis, Minnesota.

? TRC Mariah Associates, Inc.

1997 Final Phase I Plan of Development SeaWest Energy Land Associates, LLC., Windfarm Project. Presented to SeaWest Energy Land Associates, LLC., and the Bureau of Land Management, Great Divide Resource Area, Rawlins Wyoming. TRC Mariah Associates Inc., Laramie, Wyoming.

United States Department of Agriculture

2017 Natural Resources Conservation Services Web Soil Survey. Accessed on August 30, 2017. http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

United States Department of the Interior

2004 BLM Manual Section 8110 – Identifying and Evaluating Cultural Resources.

2017 BLM Master Plats List. www.blm.gov/wy/mtps/search.php?meridian=6 Accessed in September 2017.

Wheeler, Charles W., Gail S. Firebaugh, W. Lane Shields, and Elisa K. Wade

1986 *5500 Years on the Great Plains-Great Basin Frontier: An Excavation of Sites in Section 14, Volumes I-II*. Submitted to the Wyoming Bureau of Land Management, Rock Springs District. Western Cultural Resource Management, Boulder, Colorado.

Wimer, Alan E.

2001 *Folsom Sites in Southwestern Wyoming*. M.A. Thesis, Department of Anthropology, University of Wyoming, Laramie.

Wyoming Cultural Records Office

2017 Wyoming Cultural Records Office Web Database. Website accessed in August and September 2017. http://wyshpo.uwyo.edu/wycorgis/#Home

Wyoming State Historic Preservation Office

2012 *Military Sites in Wyoming 1700-1920: Historic Context.* Wyoming Department of State Parks and Cultural Resources, Cheyenne, Wyoming. Document available on the Wyoming State Historic Preservation web site. http://wyoshpo.state.wy.us/HC/Available.aspx

2014 *Historic Preservation In The Cowboy State: Wyoming's Comprehensive Statewide Historic Preservation Plan 2016-2016.* Wyoming Department of State Parks and Cultural Resources, Cheyenne, Wyoming. Document available on the Wyoming State Historic Preservation web site. http://wyoshpo.state.wy.us

2017 Wyoming Geographic Land Forms Map. Accessed on August 30, 2017. http://wyoshpo.state.wy.us/Images/geomap.jpg

Wyoming Geological Association

1972 *Listing of Wells Drilled for Oil and Gas in the State of Wyoming to January 1, 1950.* Document on file, Western Archaeological Services, Rock Springs, Wyoming.

Zielinski, Gregory A., and P. Thompson Davis

1987 Late Pleistocene Age of the Type Temple Lake Moraine, Wind River Range, Wyoming, U.S.A. *Géographie physique et Quaternaire* 41(3):397-401.