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The Cannonball River Study Unit

Michael L. Gregg and Amy C. Bleier
2021

The Cannonball River Study Unit (CRSU), like other large parts of western North Dakota, is a land of prominent buttes. From west to east, the major named buttes are White Butte, West Rainy Butte, East Rainy Butte, Whetstone Buttes, Wolf Buttes, Tepee Buttes (another Tepee Buttes is in the northern portion of the Little Missouri River Study Unit), Rocky Ridge, Twin Buttes (not the Twin Buttes on the Fort Berthold Indian Reservation in the Garrison Study Unit), Square Butte (there is also the Square Buttes in Oliver County), Cedar Butte, Pretty Rock Butte, and Dogtooth Butte. The western, windward edges of most of these buttes were good places to trap eagles.

Description of the Cannonball Study Unit

The CRSU covers 4,171 mi². The maps (Figures 2.1 and 2.1A) on the next pages illustrate the configuration of the area and several of the principal tributaries. Portions of Adams, Bowman, Grant, Hettinger, Morton, Sioux, and Slope counties are included. The Cannonball River is entirely within North Dakota, but portions of its tributaries in the southern portion of the drainage basin are in South Dakota. Following the maps is a complete list of all townships in the Study Unit (Table 2.1).

The Standing Rock Sioux Tribe assumed State Historic Preservation Officer functions in Sioux County effective August 14, 1996 (National Park Service letter dated September 11, 1996, to James E. Sperry of the State Historical Society of North Dakota). The functions assumed by the tribe in Sioux County include:

- Conduct survey and maintain an inventory of historic properties
- Review Federal undertakings pursuant to Section 106
- Carry out comprehensive historic preservation planning
- Conduct educational activities
- Advise and assist Federal and State agencies and local governments

Any projects in Sioux County should be directed to:

Tribal Historic Preservation Officer
Standing Rock Sioux Tribe
PO Box D
Fort Yates ND 58538

There are 460 mi² of Sioux County within the Cannonball River Study Unit. Information in the CRSU provides information housed at the State Historical Society of North Dakota (SHSND) through December 31, 2020. The SHSND is not the repository for forms or cultural resource reports in Sioux County since the National Park Service approved

Figure 2.1: Map of the Cannonball River Study Unit.

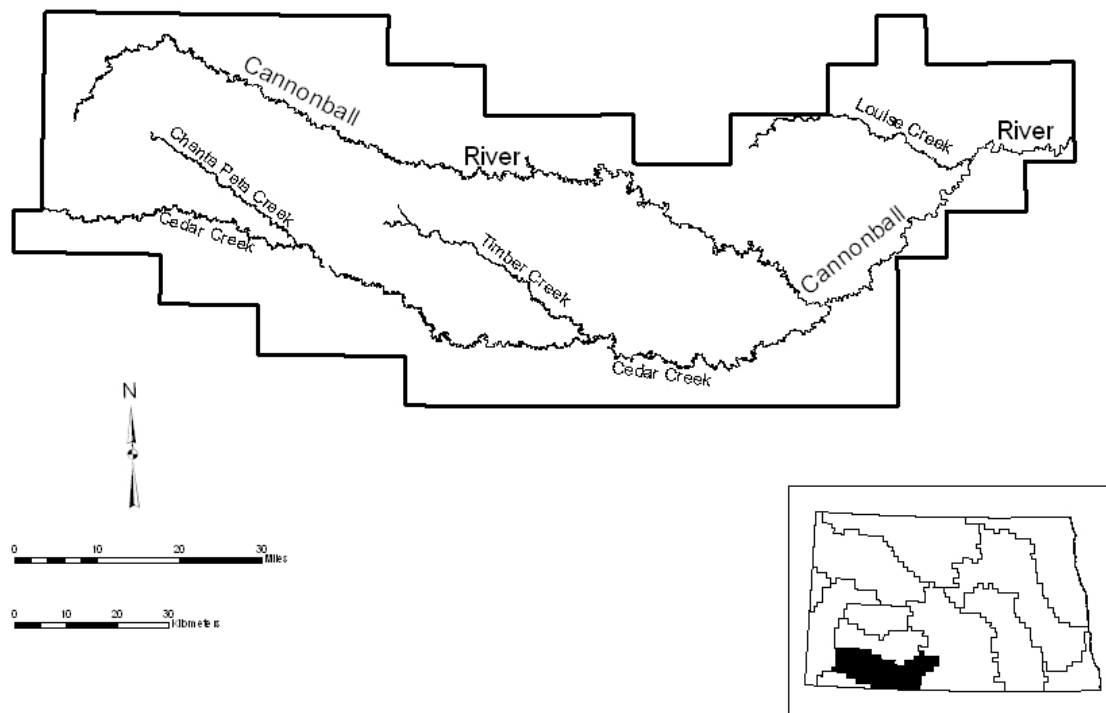


Figure 2.1A: Shaded Relief Map of the Cannonball River Study Unit.

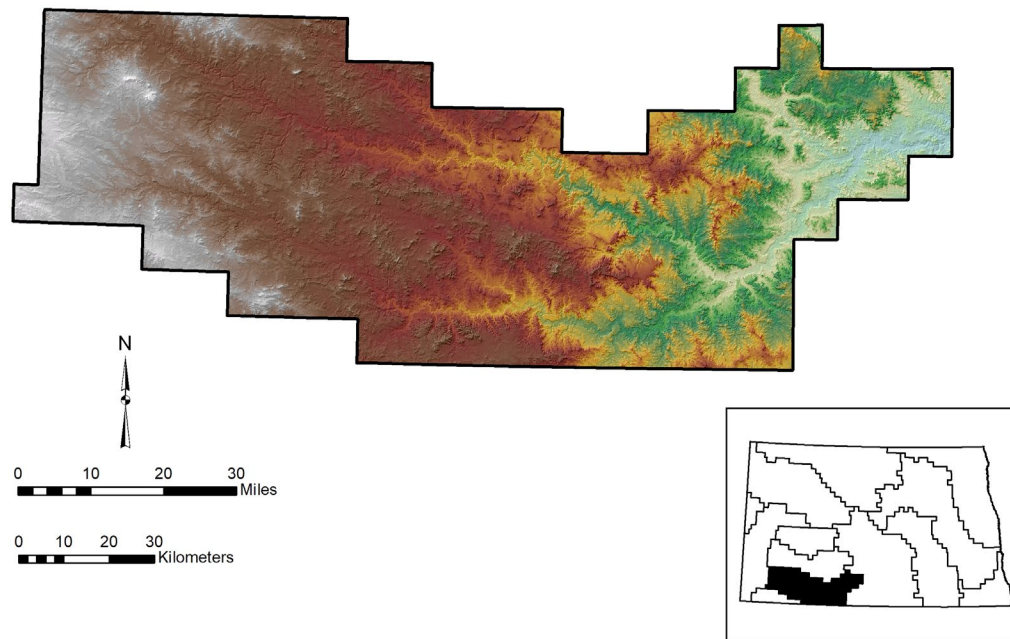


Table 2.1: Townships in the Cannonball River Study Unit.

TOWNSHIP	RANGE
129	84
129	85
129	86
129	87
129	88
129	89
129	90
129	91
129	92
129	93
130	84
130	85
130	86
130	87
130	88
130	89
130	90
130	91
130	92
130	93
130	94
130	95
130	96
131	84
131	85
131	86
131	87
131	88
131	89
131	90
131	91
131	92
131	93
131	94
131	95
131	96
131	97
131	98
132	83
132	84

TOWNSHIP	RANGE
132	85
132	86
132	87
132	88
132	89
132	90
132	91
132	92
132	93
132	94
132	95
132	96
132	97
132	98
132	99
132	100
132	101
133	81
133	82
133	83
133	84
133	85
133	86
133	87
133	88
133	89
133	90
133	91
133	92
133	93
133	94
133	95
133	96
133	97
133	98
133	99
133	100
134	80
134	81
134	82

TOWNSHIP	RANGE
134	83
134	84
134	85
134	86
134	89
134	90
134	91
134	92
134	93
134	94
134	95
134	96
134	97
134	98
134	99
134	100
135	80
135	81
135	82
135	83
135	84
135	92
135	93
135	94
135	95
135	96
135	97
135	98
135	99
135	100
136	83
136	94
136	95
136	96
136	97
136	98
136	99
136	100

Standing Rock as the Tribal Historic Preservation Office. Thus, any information from August 1996 to the present pertaining to Sioux County is not included in this chapter.

Physiography

The upper part of the Cannonball River basin is a rugged dissected plateau with many buttes including the highest point in North Dakota, White Butte, at an elevation of 3,506 ft. This butte is on the divide between the Cannonball River and Little Missouri River study units. Most of the basin is rolling prairie. Included here are portions of the Knife River Upland and Missouri Slope Upland (Bluemle 1989). The Russian Springs Escarpment cuts across the eastern portion (ibid.).

Exposures of sandstone and knappable stone such as Rainy Buttes silicified wood (RBSW), silcrete (including Tongue River silicified sediment or TRSS), and great varieties of agatized wood can be found in many places throughout the Study Unit (SU). Silcrete, chalcedony, and quartzite are common in the Whetstone Buttes locality (Artz et al. 1987:6.1). Tongue River silicified sediment and other North Dakota silcretes are considered in detail from a geological perspective by Wehrfritz (1978). There are extensive eroded exposures of the stratum of geologic origin of TRSS, rather than the Rhame bed marking the contact between the Slope and Bullion Creek formations. Tongue River silicified sediment grades from fine-grained (silicified sediment crystal facets barely visible) smooth material with no fossil inclusions or vugs to coarse-grained material full of plant fossil inclusions and other faults. Smooth TRSS can be flaked with a well-controlled conchoidal fracture, while the coarse material is barely knappable. Colors range from light gray to yellowing-brown unheated. The light gray smooth TRSS is sometimes distinctively mottled. Colors change to pink and red when thermally altered (D. Anderson 1978; R. Fox 1979). This material was important for tool making throughout most of prehistory across much of the Northern Plains including all of North Dakota (cf. Ahler 1977b; D. Anderson 1978; C. Johnson 1984; Keyser and Pagan 1987; Porter 1962). Additional information on stone lithology is presented in the Heart River Study Unit.

Elevated landforms in the western part of the basin are often capped with sandstone while those in the eastern part are capped with sandstone or TRSS (Fox 1979). Bedrock exposure overhangs of these resistant materials sometimes formed rock shelter settings which were temporarily occupied during prehistory.

Drainage

The Cannonball River is 295 miles long, including its meanderings, with an elevation of about 3,000 feet in its headwaters area and an elevation of about 1,620 feet at its confluence with the Missouri River (NDSPB, 1937:Volume 5). The valley of the Cannonball River varies in width from 0.25-1.5 miles. The valley drops about eight feet per mile while the meandering river channel drops about four feet per mile. From west to east, named tributaries include Philbrick Creek, Coal Bank Creek, Indian Creek, Thirtymile Creek, Cedar Creek, Louise Creek, and Chantapeta Creek. Cedar Creek is a

permanent tributary nearly the size of the Cannonball itself. Named tributaries to it, from west to east, are another Chantapeta Creek, Timber Creek, and Hay Creek. Most of the tributary stream channels drop about 10 feet per mile (NDSPB 1937:Volume 5).

Climate

The average annual precipitation is about 15 inches, 10 inches of this falling during the growing season, May through September. The eastern portion of the SU shares the distinction of having the highest annual mean temperature with the southeastern and southwestern corners of the state (Jensen 1971:Figure 2).

Landforms and Soils

Soils are developed primarily from sediments originating in the Slope, Bullion Creek, and Sentinel Butte formations (cf. Clayton 1980). Natural Resources Conservation Service (NRCS) official soil survey resources are available online (NRCS 2021 a, b):

- Electronic Field Office Technical Guide: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/fotg/>
- Web Soil Survey: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/>

Flora and Fauna

Most of the area is grassland, but there are some trees in riparian zones along the lower reaches of the Cannonball River and some tributaries. The grassland is representative of the “grama-needle and thread grass ecosystem” of the mixed grass prairie environmental region (S. Brown et al. 1983:73-76). Bison, elk, mule deer, pronghorn antelope, wolf, coyote, jack rabbit, prairie dog, badger, golden eagle, and the prairie chicken were all adapted to this ecosystem (ibid.:81-82). Stands of trees also grow adjacent to springs issuing from the sides of some of the buttes. Indian breadroot (*Psoralea esculenta*), a favored native food, is common on the prairie. Cottonwoods (*Populus deltoides*) are found near water. American elm (*Ulmus americana*), box elder (*Acer negundo*), green ash (*Fraxinus pennsylvanicus*), juneberry (*Amelanchier alnifolia*), chokecherry (*Prunus virginiana*), and buffaloberry (*Shepherdia argentea*) grow in some of the draws and coulees.

Other Natural Resource Potential

Most of the streams are nearly dry in summer, except after rainstorms, but springs are found on the valley side slopes and on the sides of buttes in places (NDSPB 1937:Volume 5). Spring locations are small spots of biotic diversity which should have been regularly exploited by hunter-gatherers.

Rainy Buttes silicified wood (RBSW) is a distinctive dark reddish brown cryptocrystalline stone with good conchoidal fracture characteristics. The only known source area for this material is in the vicinity of East and West Rainy Buttes at the headwaters of Coal Bank Creek and Chantapeta Creek in eastern Slope County. Gravel

deposits with RBSW can be found on hills and low rises for miles around the Rainy Buttes, and evidence for prehistoric procurement and workshop activities is common in these gravelly areas (cf. Artz et al. 1987:5.3). Previously, the material was identified as “waxy brown chert” (e.g., Ahler and Weston 1981:121; Toom 1983b:10.45). The most distinguishing characteristic of the stone is its high density and specific gravity due to high iron content (Loendorf et al. 1984). It may have been necessary to consider the high density of this material in its applications, particularly when it was used for projectile points.

In 2021 the South Dakota State Historical Society published *Tool Stone Found at South Dakota Archaeological Sites* edited by Renee M. Boen. The document contains information, photographs, and maps on raw stone materials found at archaeological sites in South Dakota and will be a valuable reference for archaeologists in North Dakota as well. Craig Johnson’s *Chipped Stone Technological Organization: Central Place Foraging and Exchange on the Northern Great Plains* (2019) is likewise a valuable resource regarding lithics resources and provides important research questions for future studies.

Overview of Previous Archaeological Work

There has been a fair amount of archaeological work in this SU, almost none of it funded for research purposes alone. Looking through the projects that have been reported, most of the work has been conducted in compliance with federal regulations pertaining to reservoir construction, energy exploration and production, construction of roads, rural water facilities, and cellular communication towers. Practically nothing would be known about the archaeology of this SU were it not for the federal cultural resources legislation and regulations requiring consideration of historic properties in planning federally funded, licensed, or permitted projects.

Inventory Projects

As of 31 December 2020, there were 396 archaeological sites, and 423 archaeological isolated finds and site leads in the state site data file for the CRSU. With an area of 4,171 mi², there is one site per 10.5 mi². The paucity of recorded sites may be (1) a reflection of the amount of inventory work that has been conducted here in comparison with other *western* study units and/or (2) because there are 460 mi² of Sioux County in the CRSU and projects and sites within that area are not treated in this document.

Tables 2.2 and 2.3 summarize data coded on the site forms for feature types by landform and cultural/temporal affiliation, respectively.

Table 2.2: Feature Type by Landform for Archaeological Sites in the Cannonball River Study Unit, 31 December 2020.

SU 2	Cairn	CMS	Village	Fort	Grave	Hearth	Mound	ORF	Pit	Quarry	Art	Shelter	Circle	Misc	TOTAL
Beach/ Riverbank		7			1	2									10
Butte	3	4				1				1	1		1		11
Delta		1													1
Draw		5						2			1		1		9
Floodplain		4													4
Hill/Knoll/ Bluff	35	107			1	1		17		3			27		191
Other	3	5						1					2		11
Ridge	28	37			2	1		5		2	1		17		93
Saddle	3	8											3		14
Sandbar		1													1
Spur	1	3				1		2							7
Swale		3													3
Terrace	10	93	2	1	2	7	1	5	4	2			18	1	146
Upland plain	7	23						6					2		38
Valley wall foot slope	3	15			3	1				3		1	5		31
TOTAL	93	316	2	1	9	14	1	38	4	11	3	1	76	1	570
CMS=Cultural Material Scatter; Village=Earthlodge Village; Fort=Fortification; ORF=Other Rock Feature; Art=Rock Art; Shelter=Rock Shelter; Circle=Stone Circle; Misc=Miscellaneous															

Table 2.3: Cultural/Temporal Affiliation of Archaeological Resources in the Cannonball River Study Unit, 31 December 2020.

Paleo-Indian	
Unspecified	1
Folsom	1
Plano (Cody)	1
Total	3
Archaic	
Unspecified	10
Early Large Side-Notched	1
Oxobw	2
McKean/Duncan/Hanna	7
Pelican Lake	2
Total	22
Woodland	
Sonota/Besant	7
Avonlea	2
Total	9
Late Prehistoric	
Unspecified	15
Plains Village	6
Plains Equestrian	5
Total	26
TOTAL	60

Stone circles, cairns and other rock features are well-represented in the basin. Many stone circles undoubtedly date to the Plains Village period, and some may be from late prehistoric Northwestern Plains hunter-gatherers traveling to and from the horticultural villages along the Missouri River. One of the three rock art sites is Medicine Rock (32GT129), a state historic site listed in the National Register of Historic Places (NRHP) (Snortland-Coles and Loendorf 1987). The other two sites are 32GT206 and 32GT411. The quarry/mine sites are procurement/workshops on hills and terraces where TRSS and agatized wood resources are concentrated and exposed on the surface.

Upland landform site settings predominate in the sample, but riverbank and terrace alluvial settings are represented too. In part this is due to the great age of some of the terraces. The identification of Plains Archaic sites on terraces is evidence for this antiquity. While relatively few sites are coded as Paleo-Indian and Woodland Besant/Sonota, it's probably not a reflection of significant numbers of properties of these cultural/temporal affiliations in the SU (Table 2.3). The number of Archaic and Late Prehistoric sites are low, as well.

As of 31 December 2020, 356 inventories had been conducted in the CRSU. Inventory work began in earnest in the late 1970s. Thereafter, a variety of different kinds

of surveys were conducted, primarily small locations, but including (1) several significant transects such as the Northern Border and Southwest Pipeline right-of-ways; (2) a few large-area Class III intensive surveys for proposed coal strip mine areas; and (3) a sampling survey of Coal Study Areas (CSAs) for the Bureau of Land Management (BLM) (Metcalf et al. 1988).

Fox (1979) surveyed a 6,880-acre prospective strip mine location immediately west of New Leipzig in southwestern Grant County for Knife River Coal. Site surveyors walked transects spaced 50 m apart. With 33 prehistoric sites recorded, the site density is one site per 208 acres or one per 10.75 mi². Recalling that the overall density of recorded sites for this SU is one per 10.5 mi², the intensive survey of this one block area recorded a site density close to that presently represented in the site files. More than half of the 33 sites were evaluated as having sufficient information potential to warrant mapping and testing.

The Northern Border Pipeline right-of-way transected less than 15 km of the northeastern corner of the CRSU. Four sites and six isolated finds were recorded (Root, Kordecki, Billeck et al. 1983:1000-1004). Two of the sites were sparse lithic scatters on ridges (32MO85 and 32MO86), and two were solitary stone circles: one at the base of a knoll (32MO94) and the other on a hilltop (32MO62). None of the sites yielded temporally diagnostic artifacts or other evidence of cultural/temporal affiliation. All shovel probes at the four sites were negative, but the stone circle at 32MO94 was slated for testing anyway, mainly because it was nearly centered in the pipeline right-of-way and would be destroyed by construction. Subsequent intensive shovel probing and test excavation produced artifacts and revised the initial assessment of site content based on cursory shovel probing (see Formal Test Excavation Projects section below).

The Southwest Pipeline survey covered 113 mi (181 km) of right-of-way and 9 special facility locations in the CRSU recording 40 sites (Artz et al. 1987; Gregg et al. 1985). Site density was greatest near Mott where the pipeline is near the Cannonball River. In the “low-relief” upland south and west of the river, sites were “few in number and widely dispersed” (Artz et al. 1987:9.11). Sites evincing lithic procurement and workshop activities predominated in the sample. From 1994 to 2002, more inventories were conducted for the Southwest Pipeline. These include thousands of acres of proposed linear routes and small project blocks for ancillary facilities (Klinner 1995b, 1996, 1999a, b, 2000a, b; Kordecki 1995; Larson et al. 1998; Wermers 2000a, b, c, 2002, 2003). Over 40 archaeological sites were recorded, and numerous previously recorded sites reevaluated during that time. Most archaeological sites consist of lithic scatters, stone circles, and cairns.

The BLM’s sampling survey of western North Dakota Coal Study Areas (CSAs) covered 40 sample units (each 160 acres) in the Bowman-Gascoyne, Mott, and Elgin-New Leipzig CSAs in the upper and middle reaches of the Cannonball River basin (Metcalf et al. 1988). Survey spacing was 30 meters, and no subsurface probing was conducted. Twenty-five prehistoric archaeological sites were recorded yielding a density of one site per 256 acres. Property types were predominantly (1) stone feature sites with

one to eight stone circles per site and (2) light density lithic scatters. No ceramic sites were identified.

In 1997 the University of North Dakota intensively inventoried 1,270 acres of State School Lands along the Cannonball River in Grant County (Wermers et al. 1998). Three landform types were used in distributional analyses: “(1) high-elevation landforms such as hills, ridges, and plains associated with the uplands adjacent to but back from the river, and a high terrace surface along the river, (2) intermediate-elevation landforms represented by mid-level river terraces, and (3) low-elevation terraces immediately bordering the river” (ibid.:107). Locations of sites were as anticipated. The data were presented in a tabular format (ibid.: Table 7), and it is reproduced here:

Site Category	Landform	Subtotal n	Subtotal %	Total n	Total %
Lithic Scatter	Uplands and high terrace	16	84		
	Mid-level terrace	3	16		
	Low terrace	0	0		
Subtotal		19	100	19	47.5
General debris scatter	Uplands and high terrace	2	20		
	Mid-level terrace	3	30		
	Low terrace	5	50		
Subtotal		10	100	10	25
Stone Feature	Uplands and high terrace	10	100		
	Mid-level terrace	0	0		
	Low terrace	0	0		
Subtotal		10	100	10	25
Rock art	Uplands and high terrace	1	100		
	Mid-level terrace	0	0		
	Low terrace	0	0		
Subtotal		1	100	1	2.5
Total				40	100

The Thunder Spirit Wind Energy was inventoried in the CRSU during in 2013-2015. The project area consisted of linear corridors and polygonal tracts covering pasture, plowed fields, and exposed bedrock. It resulted in the recordation of 15 stone feature sites and 8 lithic sites (Holven 2014; Brooks and Domine 2015; Brooks 2015). The stone feature sites are cairns, circles, and alignments. All sites but two are located on ridges, hills, and terraces (Holven 2014). Lithic scatters primarily consist of local silcrete and agatized wood, but Rainy Buttes silicified wood, White River Group silicates (South Dakota and Nebraska) and Hartville Uplift chert (Wyoming) are present as well (ibid.). One site, 32AD195, dates to the Plains Archaic period based on the observation of Hawken, Oxbow, and McKean projectile points (ibid.).

Cultural resource investigations were conducted for the Brady Wind Energy Center in 2016-2017. Pedestrian survey and shovel probes revealed two lithic scatter sites, a cairn and lithic scatter site, and over a dozen isolated finds. (Holven et al. 2016). Sites 32HT232 and 32HT246 are sparse, subsurface deposits of KRF flakes. Site 32HT233 comprises three cairns and a medium density, subsurface scatter of KRF flakes, cores, tested raw material, and a scraper. Further testing is necessary to evaluate the sites for listing in the NRHP.

As part of background studies for large-scale inventory projects, researchers should attempt to make use of Landsat imagery of groundcover available for North Dakota (cf. Reid and Johnson 1978) supplemented by aerial photographic coverage (cf. USDA 1937). LIDAR coverage should be reviewed. Recent digital imagery is available from several internet sources including the North Dakota GIS Hub (2021), <https://www.gis.nd.gov/>.

In general, site avoidance, rather than formal testing and/or mitigation, has been the choice of applicants. The result is initial documentation of many new sites but relatively few evaluative investigations and no mitigation or major excavation, and therefore little new knowledge about the prehistory of North Dakota.

Formal Test Excavation Projects

The Northern Border Pipeline project personnel tested 32MO94 (Gregg et al. 1983), a stone feature site with a solitary single-course stone circle situated at the base of a small knoll in an area capped with a veneer of glacial rocks. It is at the headwater of two ephemeral tributaries of the Northwest Branch of Cantapeta Creek. Although shovel probes and surface reconnaissance at the time of survey failed to identify any artifacts in association with the stone circle, 13 of 38 shovel tests produced flaking debris and/or fire-cracked rock when the site was carefully assessed in preparation for test excavation. A 10 m square shovel test grid was placed over a 30-x-60-m area around the stone circle, and a 3 m shovel test grid was placed over the stone circle-proper. This enabled interior and exterior assessments of artifact densities. Six 1-x-1-m units were excavated and 57 flakes, two chipped stone tools, and 93 pieces of fire-cracked rock were retained in the quarter-inch mesh screens; 34 size grade 4 (G4) flakes were recovered in fine-mesh screened matrix samples. This represents a salvage of perhaps 10% of a 60-m² activity area in and immediately around the stone circle. Artifacts were concentrated within 15 cm of the surface. The fire-cracked rock and ring course rocks were found to be resting on a living surface at ca. 12 cm surface depth. Some of the flaking debris was natural glass, either in the form of obsidian or NVN glass of coal burn origin. No temporally diagnostic artifacts were recovered. Based on the 10% sample, projected artifact densities for a 60 m² area taking in the entire ring are 20 chipped stone tools, 570 pieces of G1 to G3 flaking debris, 3,060 pieces of G4 flaking debris, and 930 pieces of fire-cracked rock weighing 23.9 kg. Artifact densities such as these would seem to indicate more than overnight camping. Inferring from the testing results, this stone circle site may have been occupied by a small hunting party or a nuclear family for several days. This case indicates the sort of significant artifact deposit which can be totally missed by surface

survey and cursory shovel probing. Had it not been for the stone circle feature, the associated artifact deposit would not have been noticed at all.

Table 2.4: Formal Testing Projects in the Cannonball River Study Unit, 31 December 2020.

Year	First Author	Second Author	Title	Sites Tested	MS #
1983	Root, M.	M. Gregg	Archaeology of the Northern Border Pipeline, North Dakota: Vol. 3, Test Excavations, McIntosh, Emmons, Morton, Stark, Mercer, Dunn, McKenzie, & Williams Counties, ND	32MO94	3456
1990	Borchert, J.	J. Brownell, et al.	Final Report: The Evaluation of Select Sites Along the Gladstone to Regent Road, Stark & Hettinger Counties	32HT54	6185
1991	Good, K.		Testing of Archaeological Site-32MO172 (Chantapeta Creek Tipi Ring Site) Aggregate Pit Associated with the Resurfacing Project of Highway 1806 Near Ft. Rice, Morton, Co., ND	32MO172	5411
1998	Klinner, D.		Site 32AD78, Archaeological Site Evaluation Testing Project, Adams Co., ND	32AD78	7065
2001	Klinner, D.	G. Wermers	Evaluative Testing at 32GT198, Grant County, ND, 2001 Field Season	32GT198	8170
2016	Jackson, M.		Havelock Road Project 2016 Archeological Test Excavations at Site 32HT71, Hettinger County, North Dakota	32HT71	16660

Site 32MO172 required test excavations resulting from a transportation project associated with ND Highway 1806 in Morton County (Good 1991). The site is located on a terrace above the North Branch of Chantapeta Creek. Initially, a stone circle site, consisting of 10 rings, was recorded during the inventory of an area slated for aggregate mining. Testing of the site revealed no buried features, datable material, or cultural materials lower than 10 cm below ground surface (ibid.:3). Artifacts recovered included a heavily patinated McKean Lanceolate point and patinated and unpatinated flakes (ibid.:6). McKean stone circle sites are known from a variety of topographic settings in the Northern Plains (Keyser and Klassen 2001:48). Two occupational episodes likely occurred at the site, one during the Plains Archaic as evinced by the McKean point and one during the Late Prehistoric as assumed due to the presence of stone circles (Good 1991.:5). Investigators noted that a portion of the site already had been disturbed, probably destroying any cultural deposits.

Several years passed before the next test excavation project was undertaken in the CRSU. As with previous transportation-sponsored testing endeavors here, overall results of excavation at 32AD78 were poor. The cultural material scatter is located on a terrace

above Cedar Creek to the west and north, and Russian Slough to the southeast. Testing of the site included 80 auger probes, 5 test units, and 4 backhoe trenches (Klinner 1998a:iii). Although a fair amount of excavation took place, it appears that the surface expression of the site proved more informative than the shallow, disturbed buried deposits. The site has been cultivated and the eastern portion of the site has been affected by erosion and deflation (ibid.:23). No features were uncovered. The four diagnostic artifacts, projectile points dating to the Middle Plains Archaic and Late Prehistoric/Plains Village, were collected from the surface (ibid.). Investigators recommended no further work at the site based on the lack of contextual integrity due to ongoing disturbances.

In 2001, evaluative testing was conducted at 32GT198 because of planned road improvements in Grant County. The site, consisting of two cairns, is situated atop a high hill with drainages to the south and north. The testing project involved a surface inventory and excavation of two test units, one place within each feature (Klinner and Wermers 2001:8). No cultural materials were observed on the surface or recovered during testing (ibid.:12). Investigators recommended no further work at the site.

Stone Circle and Cairn Sites

Seventy-six stone circle sites have been identified during surveys (see Table 2.2) in this study unit. Table 2.5 lists the sites that have been tested or excavated. For sites to be listed in this table there had to be **formal testing (at least one 1-x-1-m unit)** at the site. Review of the literature reveals the changing research questions addressed over time for this feature type. Table 2.5 was developed so these data would be readily available for researchers.

The monograph on stone circle sites in *Plains Anthropologist Memoir 19* is a valuable source of information (Davis 1983). Compilations of radiocarbon dates from sites in McLean, Mercer, and Oliver counties can be found in Strait and Peterson (2007:4.6-4.8), in Mclean County (Thomas and Peterson 2010:6.2-6.3) and from Besant/Sonota sites in Deaver and Deaver (1987). A useful discussion of single-circle site function based on ethnographic accounts is available in Gregg et al. (1983:[3]864-869). An assessment of nomadic settlement-subsistence structure and bison ecology is discussed by Hanson (1983:1342-1417). Additional references for stone features can be found in the reference section of the [Cultural Heritage Form](#).

Ninety-three cairn sites have been identified in the CRSU. Suggested uses of cairns include markers for events and travel routes, bracing poles for a variety of camp structures, caches, drive lines, or covering a burial. Hecker (1937-1950:161) reports that piles of stones were placed over buffalo chip fireplaces to heat stones used to dry meat.

Table 2.5: Stone Feature Sites Formally Tested in the Cannonball River Study Unit, 31 December 2020.

Site Number	Tested Feature Type	Test Unit Location	Cultural Material	Cultural/Temporal Affiliation	MS #
32GT198	Cairns	Inside	No		8170
32MO94	Circle	Inside	Yes		3456
32MO172	Circles	Inside	Yes	McKean (surface)	5411

National Register of Historic Places

Medicine Rock (32GT129), a multi-ethnic, prehistoric, and historic rock art site, is listed in the National Register of Historic Places (NRHP). Medicine Butte, the location of Medicine Rock in Grant County is south of Elgin, North Dakota. A “dance ring” feature is a highlight. The 200-ft diameter ring is marked by a vegetation color change with a dark ring band set off by lighter vegetation inside and out. This ring has been discernible for more than five decades. Is the dark ring of vegetation resultant from dancing or some other activity related to Medicine Rock ceremonialism?

A list of sites in the NRHP is available on the National Park Service website.

Major Excavation Projects

No major excavations have been conducted within the CRSU as of December 31, 2020. Whatever the source of funding, there is a need to carry out major excavations to recover several large artifact samples from controlled proveniences to develop more particular historic contexts.

Other Work

The Sappington (1980) manuscript is a brief letter report to Jim Connolly of Fargo, North Dakota, regarding sourcing of obsidian artifacts reportedly found along the Cannonball and Heart rivers. No site numbers or cultural/temporal affiliations are mentioned. Samples from the “South bank of Cannonball Creek, Hettinger Co., N. Dakota” were sourced to “obsidian Cliff in Yellowstone.”

In 1992, Bureau of Reclamation archaeologists re-evaluated several sites and recorded one new site along two Southwest Pipeline segments. Site types included 11 lithic scatters and six cultural material scatters. Four archaeological sites (32HT28, 32HT32, 32HT69, 32SK86) were recommended as potentially eligible under Criterion D for listing in the NRHP. All the sites are lithic scatters, almost exclusively comprising KRF, located near intermittent streams (Banks 1992:12-19). Sites 32HT32 and 32SK86 have been disturbed by the installation of buried telephone cable.

Publications

It is critical for archaeologists to publish their work to enhance public support and understanding of the value of conducting formal archaeological investigations. In the 2021 edition of the Archaeological Component of the State Plan, we include a table (Table 2.6) in each study unit of selected publications available to general audiences. Of particular interest may be the journal of the Plains Anthropological Society (*Plains Anthropologist*) and the journal of the North Dakota Archaeological Association (*North Dakota Archaeology*), in addition to published books.

Table 2.6: Selected Published References for the Cannonball River Study Unit.

Author(s)	Year	Reference
Baugh, Timothy G., and Fred W. Nelson	1988	Archaeological Obsidian Recovered from Selected North Dakota Sites and Its Relationship to Changing Exchange Systems in the Plains. <i>Journal of the North Dakota Archaeological Association</i> 3:74-94.
DeMallie, Raymond J.	2001	Sioux until 1850. In <i>Handbook of North American Indians</i> , Vol. 13, edited by Raymond J. DeMallie. Smithsonian Institution, Washington, DC.
DeMallie, Raymond J.	2001	Yankton and Yanktonai. In <i>Handbook of North American Indians</i> , Vol. 13, edited by Raymond J. DeMallie. Smithsonian Institution, Washington, DC.
DeMallie, Raymond J., and Elaine A. Jahner (editors)	1991	<i>Lakota Belief and Ritual</i> by James R. Walker. University of Nebraska, Lincoln.
Denig, E. T.	1961	<i>Five Indian Tribes of the Upper Missouri</i> . Edited by John C. Ewers, University of Oklahoma Press, Norman.
Drennan, Kathryn A.	2002	An Overview of Yanktonai Archaeology in North and South Dakota. Master's thesis, Department of Anthropology, University of Missouri, Columbia.
Drennan, Kathryn A. (editor)	2011	An Overview of Yanktonai Archaeology in the Dakotas. <i>South Dakota Archaeology: The Journal of the South Dakota Archaeological Society</i> 27.
Floodman, Mervin G.	2012	<i>Prehistory of the Dakota Prairie Grasslands: An Overview</i> . US Forest Service, Bismarck, North Dakota.
Graber, Kay (editor)	2004	<i>Sister to the Sioux: The Memoirs of Elaine Goodale Eastman</i> . University of Nebraska Press, Lincoln.
Johnson, Craig M.	2007	<i>A Chronology of Middle Missouri Plains Village Sites</i> . Smithsonian Contributions to Anthropology, 47, Smithsonian Institution, Washington DC.
Johnson, Craig M.	2019	<i>Chipped Stone Technological Organization: Central Place Foraging and Exchange on the Northern Great Plains</i> . University of Utah Press, Salt Lake City.
Joyce, Dennis C.	1978	The Thunderbird Motif at Writing Rock State Historic Site. <i>North Dakota History</i> 45(2):22-25.
Keyser, James D., and John L. Fagan	1987	ESP: Procurement and Processing of Tongue River Silicified Sediment. <i>Plains Anthropologist</i> 32(117):153-194.
Keyser, James D., and Michael A. Klassen	2001	<i>Plains Indian Rock Art</i> . University of Washington Press, Seattle.
Lehmer, Donald J.	1971	<i>Introduction to Middle Missouri Archeology</i> . Anthropological Papers, No. 1 National Park Service, Washington, DC.
Loendorf, Lawrence L., David D. Kuehn, and Nels F. Forsman	1984	Rainy Buttes Silicified Wood: A Source of Lithic Raw Material in Western North Dakota. <i>Plains Anthropologist</i> 29:335-338.

Paleo-Indian Period

There is every reason to expect that there was regular use of this area throughout Paleo-Indian (Paleo) times. Settlement would not have been inhibited by glacial ice because this area was unglaciated. During the more mesic early Holocene, there may have been numerous playa lakes present, especially in the upper portions of the basin. Further, there was an abundance of raw material available for flintworking, most notably the colored silicified woods.

Paleoenvironmental Modeling

There is nearly a total lack of Holocene environmental data for this unit. Efforts should be made to identify the early Holocene Leonard paleosols of the Aggie Brown Member of the Oahe Formation which are so prominent in other parts of the state (cf. Clayton et al. 1976).

Cultural Chronology

A variety of Paleo points, including a Folsom point made from KRF, reportedly have been found in the Rhame locality (Keim and Simon 1983:5). What is the range of named archaeological units evidenced by diagnostic point types in private collections of artifacts from sites in the SU?

The discovery of a Folsom point made from RBSW at Lake Ilo in Dunn County is further evidence that people with Folsom material culture were using this part of the state around 9000-8000 BC. There is no reason not to expect earlier Goshen and Clovis components; the land was certainly open to settlement, and big game resources ought to have abounded. Should sites of the earlier and later Paleo complexes be found in similar geomorphic settings?

Settlement Behavior

At least by Folsom times, temporary camps should have been established in the Rainy Buttes locality when RBSW was being procured. Did Paleo peoples surface collect or quarry for RBSW? Were Paleo workshop strategies for RBSW like those for KRF where procured materials were tested and worked into cores and preforms at workshop sites near the source? How did Paleo strategies for RBSW procurement differ from those of subsequent time periods?

Native Subsistence Practices

At the Lange-Ferguson site (39SH33) in the White River Badlands (South Dakota) less than 200 miles to the south of the Cannonball, Clovis points have been found in proximity to butchered mammoth bone (Hannus 1981). At the Mill Iron site (24CT30) in the Box Elder Creek drainage of southeastern Montana, about 50 miles to the southwest of the Cannonball headwaters, there is a Goshen bison-butcherer

component with three dates on charcoal averaging over 11,200 BP (Frison 1986, 1988b). The most readily identifiable Paleo sites in the CRSU should be expected to be either (1) big game kill or butchering sites or (2) RBSW or TRSS lithic procurement/workshops. Suspected early Holocene megafaunal bone deposits should be tested carefully for the presence of cultural remains because chipped stone artifact densities can be surprising low at some Paleo butchering sites (cf. Hannus 1981), and archaeological components can easily be misidentified as paleontological sites. Big game kill and butchering sites should be expected in former playa lake settings in areas which would have received accumulations of sediments during the mid-Holocene. A major gap in knowledge of Paleo subsistence practices regards use of small animals and floral resources. Camps in proximity to kill and butchering sites can be expected to hold information concerning subsistence practices other than big game hunting. Flotation recovery procedures should be applied to all sediments excavated from Paleo residential sites.

Technologies

The discovery in the KRF primary source area of a Folsom point made from RBSW (J. Borchert, personal communication to Gregg, November 1989) is of technological interest because of the material's unusually high density due to high iron content (Loendorf et al. 1984). Does the time of the Folsom complex mark the beginning of the use of RBSW or was it used by earlier people who made Goshen and Clovis points? Were indirect percussion and pressure fluting techniques equally effective with RBSW? With reference to the agatized woods, was fluting any less difficult "with the grain" than "against the grain?"

Artifact Styles

The Goshen point style was first identified at the Hell Gap site in southeastern Wyoming where it was represented in a discrete cultural zone interpreted by the excavators as positioned stratigraphically beneath Folsom (Irwin-Williams et al. 1973). The style was described as resembling Clovis in overall outline form but being basally thinned by the removal of multiple flakes rather than flutes (ibid.:46). During the decade and a half following that discovery, Goshen points have been reported throughout eastern Wyoming, western Nebraska, western South Dakota, and eastern Montana but were misidentified as Plainview (Frison 1985). Are there Goshen points from the Cannonball drainage that have been misidentified as Plainview?

The base of a large, stemmed point, perhaps representing either the Hell Gap or Alberta style, was collected as an isolated find on a sample survey unit in the BLM's Mott Coal Study Area south of the Cannonball River west of Mott (Metcalf et al. 1988:171). Cody complex points are reported in the Rainy Buttes locality (Keim and Simon 1983:5). The diversity of Paleo projectile point styles in the CRSU should be studied with an eye toward identifying stylistic affinities with surrounding areas.

Regional Interaction

Hayden (1982:18) has argued that finely crafted chipped stone projectile points and high quality lithic raw materials for flintknapping were widely exchanged during Paleo times to maintain far-flung alliance networks which could be relied upon for support during times of subsistence resource scarcity. Whatever the reason, interaction networks were not only extensive but seem to have been particularly active during the eras of the earlier Paleo complexes. Distinctive high grade lithic raw materials are good indicators of exchange/interaction. Paleo points of RBSW found in other areas are evidence for contacts with the CRSU. Clark (1985:80) reported a Paleo projectile point of RBSW from the KRF quarry area not far to the north in the Knife River Study Unit. Folsom deposits containing RBSW artifacts have been excavated near the Lake Ilo National Wildlife Refuge within the Knife River Study Unit (Root 2000; Shifrin 2000; William 2000).

One problem with RBSW is that it is poorly known and not readily recognized by most archaeologists outside of North Dakota, notwithstanding the type-description article in *Plains Anthropologist* (Loendorf et al. 1984). What nonlocal raw materials are represented by Paleo points in surface collections from sites in the CRSU?

Historic Preservation Goals, Priorities, and Strategies

Basic Paleo site inventory work needs to be done to build a sample of site cases. This should be a top priority for upgrading the Paleo contexts for this SU. Collector-informant interviewing is a way to secure site leads to follow up with on-the-ground inspections and site recording.

Plains Archaic Period

Plains Archaic sites have been identified within the CRSU. A tributary drainage basin such as the Cannonball, upstream from the reliable Missouri River water source, ought to have been used regularly throughout prehistory.

Paleoenvironmental Modeling

A possible Early Plains Archaic large side-notched point was found on the surface of 32GT139 south of the Cannonball River during the sample survey of the BLM's Mott Coal Study Area (Metcalf et al. 1988:114). The site is on a ridge, and other heavily patinated KRF or agatized wood artifacts were associated with it. Sites dating to the early Holocene and mid-Holocene ought to be surface-evident only on erosional landforms such as hills, ridges, and knolls. While the side-notched point is not of the Simonsen type, heavy patination does evince considerable antiquity. What were the environmental conditions in the Cannonball basin during the Early, Middle, and Late Plains Archaic periods?

Cultural Chronology

Lacking excavated components and radiocarbon dates, identification of Plains Archaic archaeological materials must rely primarily upon typological dating of distinctive projectile point styles. But other relative dating techniques such as assessment of patination intensity on KRF artifacts may be of value. Heavily patinated shallow side-notched and incurvate base point fragments from 32HT410 (Fox 1979) may be Early Plains Archaic specimens classifiable as Simonsen (“early side notched”) and attributable to the Logan Creek/Mummy Cave complex (Agogino 1962:247; Agogino and Frankforter 1960a; Frankforter and Agogino 1959, 1960; Gregg 1985a:101-105; Gryba 1980; Kivett 1962; McCracken et al. 1978; Wedel et al. 1968). Some Simonsen points are very small and are indistinguishable from some late prehistoric Prairie side-notched forms (cf. Kehoe 1966b:830-834). What are the functional differences represented by small versus large Simonsen points? How can small Simonsen points be distinguished from Prairie side-notched points?

A Duncan point is reported from 32GT419 near the Cannonball in the north-central portion of the CRSU (Fox 1979). With the Duncan complex seemingly so well represented to the southwest in the Grand River Study Unit, occurrences of Duncan components are expected to extend eastward throughout the Cannonball River basin and eastward into eastern North Dakota.

Knife River flint corner-notched points from 32GT422 (Fox 1979) could signal a Late Plains Archaic or possibly Early Plains Woodland component. Lack of radiocarbon dates from Plains Archaic components is a major data gap.

Settlement Behavior

Given the range of functional site types expected of collectors (cf. Binford 1980), what attributes should be used to identify Plains Archaic residential base, field camp, station, locations, caches, and mortuary sites in the CRSU?

Native Subsistence Practices

What subsistence resources were available to people of the Plains Archaic period inhabiting the CRSU? How did subsistence resource availability vary from Early to Middle to Late Plains Archaic periods in the CRSU?

Technologies

Was RBSW unsuitable for any of the regional Plains Archaic chipped stone technologies? Were any essential technological resources unavailable in the CRSU?

Artifact Styles

Are any concentrations of Plains Archaic point styles represented within the CRSU indicative of maintenance of a core area within the Cannonball River basin?
Regional Interaction

Clark (1985:80) reported Middle and Late Plains Archaic projectile points made from RBSW in private collections in the KRF quarry area. What extents of regional interaction are indicated by finds of RBSW artifacts in Plains Archaic sites in surrounding areas?

Historic Preservation Goals, Priorities, and Strategies

The top priority is to excavate samples of artifacts from intact Plains Archaic deposits.

Plains Woodland Period

Sites of the Early, Middle, and Late Plains Woodland periods can all be expected here. If Early Plains Woodland adaptations evolved in the Northeastern Plains from a Pelican Lake milieu at the approximate latitude of the CRSU in the James River valley, about 200 miles to the east, on a 400 BC time level as suggested by Gregg (ed. 1987:443); there is every reason to anticipate sites of similar antiquity with ceramics in the CRSU. The Early Plains Woodland component at the Naze site (32SN246) does contain smooth gray TRSS and dark chalcedony agatized wood flaking debris which may have been collected in the Cannonball River drainage (Picha and Gregg 1987:200).

Paleoenvironmental Modeling

Sites such as 32HT22, recorded during a survey based on flaking debris eroding from a stream cutbank, might be relatively datable if late Holocene sequences of mesic and xeric periods were known. In a Spring Creek cutbank, between Mott and Elgin, two dark organic-rich buried soils were exposed by erosion at depths of ca. 80 cm and 90 cm below the surface. Two near-surface buried soils in a stream floodplain setting such as this might be the pair of paleosols often seen in the Upper Submember of the Riverdale Member of the Oahe Formation which correlate with the mesic conditions of the Neo-Atlantic and Pacific climatic episodes (cf. Clayton 1976:11). If this is the case, the artifacts in the lower paleosol should date to either the Late Plains Woodland period or early in the Plains Village period. Holocene geomorphic sequences need to be identified for the main valley of the Cannonball and its tributaries. How much does the depth of Holocene alluvial sediments vary in the valley of the Cannonball and its tributaries?

Cultural Chronology

While Early Plains Woodland sites have not yet been identified, Middle Plains Woodland Besant/Sonota components have been registered in the site files. The

Cannonball drainage is immediately west of one of the core territories of people with Besant/Sonota material culture (cf. Neuman 1975). The Wounded Knee site (32EM21) contains the remains of a 2,000-year-old Sonota settlement just across the Missouri River from the mouth of the Cannonball River (Root 1983v). There are other Sonota sites on the western side of the Missouri River in Sioux County directly east of the CRSU (Scheans 1975). Site 32HT101 within the Cannonball River drainage, just south of Regent on a tributary of Indian Creek, was recorded by Franke in his 1974 survey for the Indian Creek recreation dam (Franke 1974) as a site with eight possible Plains Woodland mounds (Fox 1979). Are there Besant/Sonota earthen mortuary mound features in the CRSU?

Settlement Behavior

The West and East Rainy Buttes locality attracted at least temporary settlement during the Middle Plains Woodland period associated with collection or quarrying RBSW (cf. Loendorf et al. 1984) for making chipped stone tools. People with Sonota material culture residing in the eastern part of North Dakota made Besant side-notched points from this stone (cf. Gregg 1987d:274). There should be Sonota/Besant field camps and RBSW procurement/workshop sites in the Rainy Buttes locality. The same types of sites should be anticipated in areas of TRSS outcrops and lag deposits.

If there are Middle Woodland Besant/Sonota mounds in the Indian Creek locality south of Regent at 32HT101 and 32HT401 near Mott (cf. Fox 1979), then there may well be Besant/Sonota residential bases nearby. With the mesic climatic conditions of 2,000 years ago, water and timber resources may have been sufficient in that locality to support semi-permanent settlement. The range of Besant/Sonota settlement types in the CRSU needs to be identified. Perhaps Middle Plains Woodland body sherd attributes could be specified to enable distinguishing Sonota from late prehistoric sherds and thus facilitate identification of Middle Plains Woodland sites in the basin (cf. Gregg 1987a; Snortland-Coles 1985). If Besant/Sonota residential bases and mortuary mounds are identified in the interior portions of the CRSU, then the full range of Besant/Sonota settlement types can be expected to occur. With the suite of settlement types unknown, it is impossible to specify the breadth of the data gap. How big is the Plains Woodland settlement data gap?

Native Subsistence Practices

The length of the growing season and amount of annual precipitation are historically about the same for most of the CRSU and the Missouri River valley to the east (cf. Jensen 1972). Considering conditions and cultigens acclimated to the Northern Plains, in the past what sorts of gardening would have been possible in the CRSU during the three Plains Woodland periods?

Technologies

Ceramics identified as “possibly Woodland” have been reported from 32HT403 west of Regent on a bluff overlooking the Cannonball River valley (Fox 1979). The

sherds were assessed as more likely to be Plains Woodland than Plains Village based on cord-impressed decoration in combination with coarse friable paste (ibid.). If these are Plains Woodland sherds, they are more likely to be Late than Early or Middle Plains Woodland because of the rarity of cord-impressed decoration on Early and Middle Woodland vessels in the Northern Plains. Are Early, Middle, and Late Plains Woodland ceramic technologies represented in the CRSU?

Artifact Styles

Temporally diagnostic artifacts other than ceramic wares and types are less common for Plains Woodland complexes than they are for the complexes of other traditions. The corner-notched dart points found in Early Plains Woodland components are also characteristic of Late Plains Archaic Pelican Lake components. Late Plains Woodland side-notched arrowpoints are sometimes indistinguishable from Plains Village forms. The most distinctive Plains Woodland artifact styles are represented by Besant side-notched and Samantha side-notched dart points (cf. Johnson 1970; Reeves 1970b:41-45) and Besant/Sonota ceramic vessels with cord roughened exterior surfaces, cord wrapped tool-impressed decorations on the lips, and punctates and/or nodes on the exterior rims. Are there distinctive Plains Woodland complexes geographically limited to core areas within the Cannonball River drainage? Contemporary with Early Plains Woodland, there may be localized Late Plains Archaic complexes in the nearby Pine Parklands areas of Montana, Wyoming, and South Dakota which represent small, conservative local populations adapted to very small core areas (Beckes and Keyser 1983:102; Keyser and Davis 1981).

It would be helpful if distinct Plains Woodland artifact styles could be identified within the CRSU. Controlled excavation or controlled surface collection of single component deposits with scientific study of data collected from recovered artifacts will be necessary to achieve this goal.

Regional Interaction

Rainy Buttes silicified wood and TRSS should have fit well in the system of Besant/Sonota long distance exchange of exotic flintknapping materials. Stones which were moved west to east were most notably obsidian and KRF. However, the two Cannonball River basin stones were also involved to some extent. A RBSW Besant side-notched point and 100 smooth gray TRSS flakes were identified in an excavated sample of the Sonota component of the Naze site (32SN246) in the James River Study Unit (Gregg 1987d:274; Picha and Gregg 1987:200). Other reports could be reviewed to determine the quantity of Cannonball River basin materials present to get a better indication of the extent to which groups with Besant/Sonota material culture were linked into the vast Middle Plains Woodland exchange networks. This is the sort of library research project which could be accomplished by an undergraduate student enrolled in a North Dakota prehistory course at one of the institutions of higher education in the state.

Historic Preservation Goals, Priorities, and Strategies

There is a need to recover samples of Plains Woodland deposits through controlled excavation in the CRSU to identify their make-up. Stratified sites with two or more Plains Woodland cultural zones would be likely to yield more important information than sites with only one cultural zone. Site 32GT437, in a low river terrace setting near New Leipzig, may be such a site (cf. Fox 1979). Further evaluation is recommended before it is targeted for excavation with this specific research topic in mind. This site has four stratified cultural zones; the earlier ones may be Plains Archaic and latest may be Plains Village, but several could be Plains Woodland.

Plains Village Period

Sites of the Plains Village period should abound throughout the drainage basin. Thousands of Plains Village lifetimes were lived out of earthlodge village communities situated near the confluence of the Cannonball and Missouri rivers. These include the Extended Middle Missouri Bendish (32M02), South Cannonball (32SI19), and Badger Ferry (32EM7) sites as well as the Terminal Middle Missouri North Cannonball (32M01), Lower Fort Rice (32M03), Shermer (32EM10), and Tony Glas (32EM3) sites (Lehmer 1971).

Paleoenvironmental Modeling

Almost any intact deposit has potential to yield important paleoenvironmental information. At 32HT9 on a low Cannonball River terrace, an intact deposit was identified beneath the plow zone (Gregg et al. 1985:83). If this is an indication of where the land surface was when the site was occupied during Extended or Terminal Middle Missouri times, then at least one major episode of deposition associated with a drought period may be indicated. Was there Pacific climatic episode drought in the Cannonball River basin? Studies of artifactual and ecofactual remains from Plains Village components could provide answers. What were the environmental conditions of the Plains Village period in the CRSU?

Cultural Chronology

The Plains Village chronology for the Cannonball region of the Middle Missouri subarea should be applicable to this entire Study Unit. The Extended Middle Missouri variant predominated from the inception of the Plains Village period until ca. 1550 (Lehmer 1971). This was represented by the Fort Yates phase with an “occupational hiatus” between AD 1300 - 1400 (Lehmer 1966, 1971; Thiessen 1976). Extended Middle Missouri sites are distributed upstream into the Garrison region and down the Missouri into South Dakota (Lehmer 1971:66). The Terminal Middle Missouri variant is represented by settlements of the Huff focus dating from AD 1500 to the late 1600s (Lehmer 1971; Wood 1967). During the 1600s, there may have been a time when the southern Cannonball region was an unoccupied “buffer zone” between peoples with Terminal Middle Missouri and Extended Coalescent material culture. However, this is

merely a projection of the chronology for the adjacent archaeological subarea into the Study Unit.

When Plains Village sites turn up in inventories, attempts should be made not merely to classify them within this chronology but appraise their material content with reference to the defining characteristics of the named archaeological unit under scrutiny. To this end, Craig M. Johnson's 2007 publication *A Chronology of Middle Missouri Plains Village Sites* is an important reference in Plains Village studies.

Settlement Behavior

A range of Plains Village settlement types should be represented in proximity to the earthlodge village residential bases along the nearby reaches of Missouri River. Ritual/sacred sites should be well-represented because the CRSU includes areas removed from the villages yet within just a few hours travel. Medicine Rock (Me-me-ho-pa, site 32GT129) is one such sacred place. The significance of Medicine Rock extends back to times before writing for the Mandan and Hidatsa, and it was recognized by the earliest explorers to be a cultural and natural landmark (Snortland 1986, NRHP form on file, SHSND). The site "preserves a record of native [*sic*] American art and religious values and continues to be used as a religious shrine by Plains Indian tribes" (ibid.). Petroglyphs and pictographs include handprint, footprint, rider on horseback, shield bearing warrior, bear paw, pecked bighorn sheep, pecked bison figure, incised turtles, and ungulate hoof prints (ibid.). Can ethnic affiliations be ascribed to particular glyphs? What sorts of activity areas are archaeologically detectible in proximity to Writing Rock outside the bounds of the National Register property?

Hunting sites, stone procurement sites, and petroforms are also suggested (cf. Fox 1979). If there are Plains Village residential sites in the Cannonball basin interior, should mortuary sites also be expected? The earthen mounds reported at 32HT101 and 32HT401 could be Plains Village rather than (or in addition to) Plains Woodland. While Plains Village mortuary tumuli in the Cannonball subarea are more likely to be stone cairns than earthen mounds, Plains Villagers did erect earthen mounds in the eastern Dakotas (cf. Alex 1981; Snortland-Coles 1985; Swenson and Gregg 1988).

There may be a few residential base settlements along the Cannonball River. Site 32HT9 just east of Mott discovered during survey of the proposed Southwest Pipeline is a likely candidate (Gregg et al. 1985). There is also 32GT102 recorded as a Terminal Middle Missouri variant site along the Cannonball River, southwest of New Leipzig (Gregg 1985a:Figure 34). This site has never been tested, but two buried cultural zones in an eroded terrace setting contain Riggs ware ceramics, bone, stone tools, flaking debris, charcoal, and fire-cracked rock (site form on file, SHSND). How would Plains Village residential base settlements in the Cannonball interior vary from similar settlements along the Missouri River?

Native Subsistence Practices

Because of the lack of artifact samples from controlled excavation, the database pertinent to the topic of Plains Village subsistence is quite feeble. One shovel probe at 32HT9 near Mott along the Cannonball River recovered a sample of artifacts which is all probably Plains Village. The probe produced a stone tool, potsherds, flaking debris, burned rock, butchered bone, and freshwater mussel shell (Gregg et al. 1985:84). Big game hunting and mussel collecting in the Mott locality are indicated. But data are missing evincing horticultural activities. If there were residential bases in the Cannonball River basin interior, should garden locations be anticipated?

Technologies

Plains Village peoples are known to have frequented the Rainy Buttes territory and collected RBSW from which to make tools. Plains Village artifacts were recovered during testing in a sheltered location near a spring on a bench north of West Rainy Butte. Was the heavy weight of this iron-rich stone a factor in its selection for use in making projectile points?

Sites such as the Cedar Creek site (32AD26) along the Southwest Pipeline right-of-way between New England and Wolf Butte (Artz et al. 1987:5.37-38) may be aceramic Plains Village field camps. Arrowpoint preforms and bipolar cores from the site are generic late prehistoric indicators. Some means should be devised to differentiate between aceramic Plains Village and aceramic Late Plains Woodland components.

Smooth gray TRSS was favored by the Villagers for flaking small and large patterned bifacial tools such as arrowpoints and side-hafted knives. It may be possible to identify specific reduction procedures which were employed to produce these tool forms from the blocks and chunks of raw material found in this Study Unit. During pedestrian inventory of procurement/workshop areas, the surface should be examined closely for discrete flintknapping activity areas. The activity area hit by a shovel probe at 32HT9 may be such a case (Gregg et al. 1985:85). The probe and a surface artifact concentration surrounding it produced two arrowpoints which broke while being made, an expended smooth gray TRSS core, and 349 pieces of flaking debris, 325 of which were smooth gray TRSS. This spot should be relocated based on information in the field notes, and a salvage excavation should be conducted to identify diagnostic traits of a Plains Village TRSS reduction strategy.

Artifact Styles

Ceramic styles in the form of Riggs ware from site 32GT102 and Fort Yates Incised from site 32HT9 have been the basis for identifying Extended Middle Missouri and Terminal Middle Missouri Plains Village components at these sites (Fox 1979; Gregg et al. 1985:85). Does the seriation of ceramic vessel styles which has been developed for the Cannonball region, of the Middle Missouri subarea, hold for the modest-sized Cannonball drainage basin?

Regional Interaction

Interactions of hunting and gathering groups of the Northwestern Plains with Villagers in the Trench has long been recognized as an important adaptation of peoples living different lifeways to their natural and cultural environments. This topic has been raised specifically for the CRSU because this area is immediately upstream from the Cannonball region of the Middle Missouri subarea where several large Extended and Terminal Middle Missouri villages were situated (cf. Fox 1979:14; Thiessen 1975, 1976). Temporary campsites of Northwestern Plains peoples with Beehive complex. Old Women's complex, and possibly Absaraka phase material culture ought to be identifiable in the CRSU. One clue to western cultural affinities could be dominance of western lithic materials in samples of lithic artifacts representative of overall deposits of target components.

Historic Preservation Goals, Priorities, and Strategies

In the CRSU, 10% of archaeological sites, with cultural/temporal affiliation, have been assigned to the Plains Village period (Table 2.3). Site surveyors should watch carefully for potsherds when they are on sites. There should be an attempt to identify potsherds at least to the gross cultural/temporal affiliations of Plains Woodland versus Plains Village.

Plains Equestrian Period

There is thought to have been relatively little Disorganized Coalescent occupation of the Cannonball region of the Middle Missouri subarea after the plague of 1780 which decimated the Villagers (Lehmer 1971). Arikaras would have traveled up and down the Missouri River valley in their sojourns back and forth between their South Dakota homelands and the shrinking Mandan-Hidatsa core territory at the confluence of the Knife and Missouri rivers upstream. The principal users of the Cannonball basin in the Equestrian period were probably Sioux and possibly Cheyenne.

Paleoenvironmental Modeling

How greatly did environmental conditions vary through Equestrian period of AD 1780-1880 in the CRSU?

Cultural Chronology

Warner (2011) provides an updated overview of Yanktonai archaeology, specifically Scheans (1957) investigations at the Yellow Lodge (32SI76) and Young (32SI6) sites. What archaeological complexes can be identified through analysis of artifacts and features at Equestrian period sites in the CRSU?

Settlement Behavior

Settlement behavior should have shifted when the Cannonball basin territory came under the control of the Sioux and was lost by the Villagers. In 1855, Denig (1961:25) specified this basin as part of the territory of the “Honc pa pas, Se ah sap pas, and Etas epe chos.” How did Sioux Equestrian period settlement behavior differ from that of the Villagers’ Equestrian period settlement behavior in the tributary basin interiors, and how would those differences be archaeologically detectible?

Native Subsistence Practices

Is there archaeological evidence for Villagers and other equestrian groups aggregating for communal bison hunts?

Technologies

Did TRSS and RBSW continue to play any part in native technologies of the Equestrian period?

Artifact Styles

What artifact styles are diagnostic of Equestrian period archaeological sites in the CRSU?

Regional Interaction

There was more regional interaction during this period than at any time during prehistory due to the mobility afforded by use of horses. Through established trade networks, peoples of the Northern Plains were linked with others in the Southwest and Pacific Northwest (Wood 1980). Sioux and Cheyenne peoples became spread out from the Northeastern Plains-Woodlands border area westward into the Northwestern Plains and southwestward into the High Plains. Individual bands of Cheyenne moved westward from their Northeastern Plains homeland, perhaps beginning in the AD 1600s or 1700s (Wood 1971:67-68). Some of them may have constructed earthlodge villages and established new core areas centered at locations in the Missouri River Trench between the mouth of the Heart River in North Dakota and the mouth of the White River in South Dakota (ibid.). It should be possible to identify Cheyenne sites in the Cannonball basin. How can such sites be distinguished from protohistoric Siouan sites?

Historic Preservation Goals, Priorities, and Strategies

There is first a problem of identifying archaeological sites of the Equestrian period on the ground, and then one of identifying ethnicity or tribal affiliation. A high priority is to develop methodologies for identifying sites of this period. This could be approached by locating historically recorded Equestrian encampments and studying them in detail to determine their distinguishing characteristics.