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The Heart River Study Unit

Michael L. Gregg, Amy C. Bleier, and Fern Swenson
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The Heart River Study Unit (HRSU) is somewhat understudied considering its central location within North Dakota. Much of this Study Unit (SU) has remained topographically intact while strip mines have been developed to the north and south, oil and gas developments to the west, and expansive portions of the Missouri River valley have been inundated to the southeast. Wind energy and a few oil well pads/access roads projects have occurred in the SU since the last update in 2007.

Description of the Heart River Study Unit

The HRSU covers about 3,346 mi². Figures 4.1 and 4.1A present maps of the SU, followed by a complete listing of townships within it (Table 4.1). The SU comprises portions of Billings, Grant, Hettinger, Morton, and Stark counties. The headwaters of the Heart River drainage lie near Fryburg, just west of the Billings County line along the Heart-Little Missouri divide. Its confluence with the Missouri River is in the community of Mandan in Morton County in the Southern Missouri River SU.

Physiography

The HRSU straddles the Unglaciaded Missouri Plateau and Glaciated Missouri Plateau Subsections of the Missouri Plateau Section of the Great Plains Physiographic Province (cf. Fenneman 1931; Hunt 1974; Pirkle and Yoho 1977). Part of the lower one-third of the Heart River basin is covered by glacial drift. The terrain is gently rolling in the headwaters areas and rougher near the courses of the main stream and its tributaries. In the lower part of the basin, the uplands rise 300 feet above the river channel which lies in a valley about 1.5 miles wide. Differences in elevation are not so great in the upper parts of the basin (NDSPB 1937:Volume 5). Prominent high points, from east to west, include Clark's Butte, Heart Butte, Camel Buttes, Sheppard Butte, and Rattlesnake Butte.

In addition to the buttes, there are frequent smaller outcroppings of sandstone, silt, sand, clay, and lignite of the Slope and Bullion Creek formations (Clayton et al. 1980). Occasionally, one encounters bedrock outcroppings large enough to have been used as rock shelter encampments. One example is at the Boulder site (32MO72) in the uplands near Big Muddy Creek where there was a Plains Village encampment involving lithic workshop and big game processing activities (Billeck 1983e). Another is 32GT5 at Lake Tschida along Heart Butte Reservoir—an impounded segment of the Heart River in Grant County (Cooper 1958; Toom et al. 1999).

Figure 4.1: Map of the Heart River Study Unit.

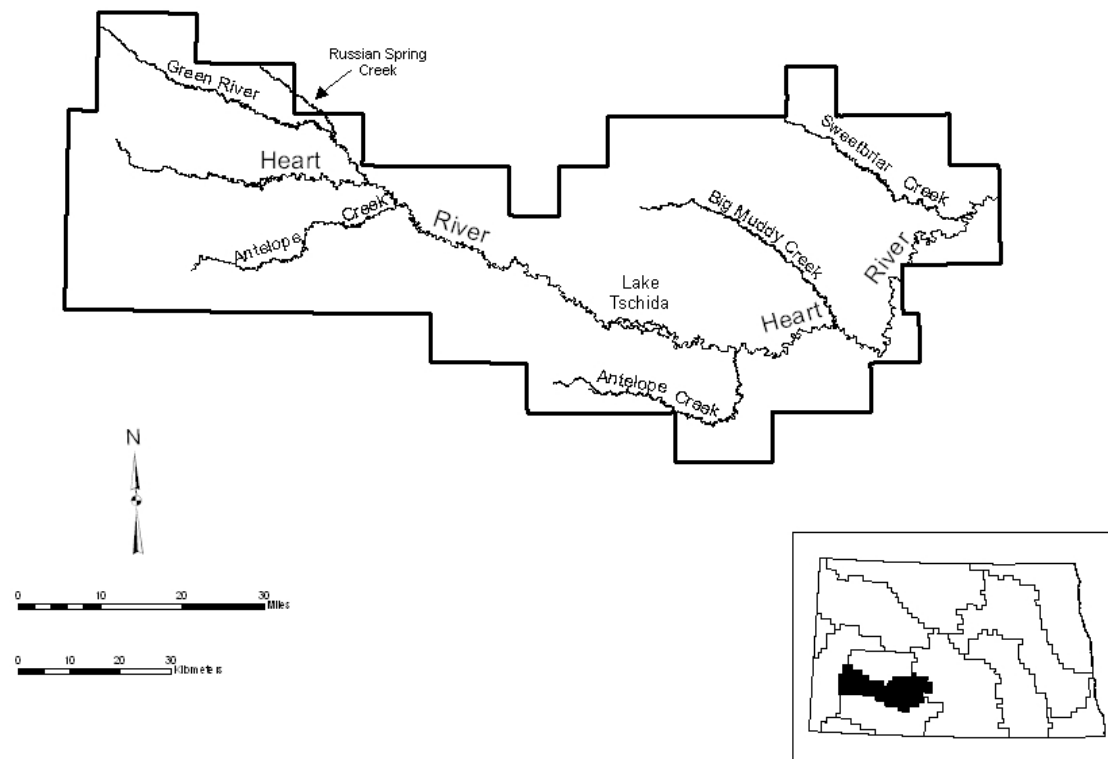


Figure 4.1A: Shaded Relief Map of the Heart River Study Unit.

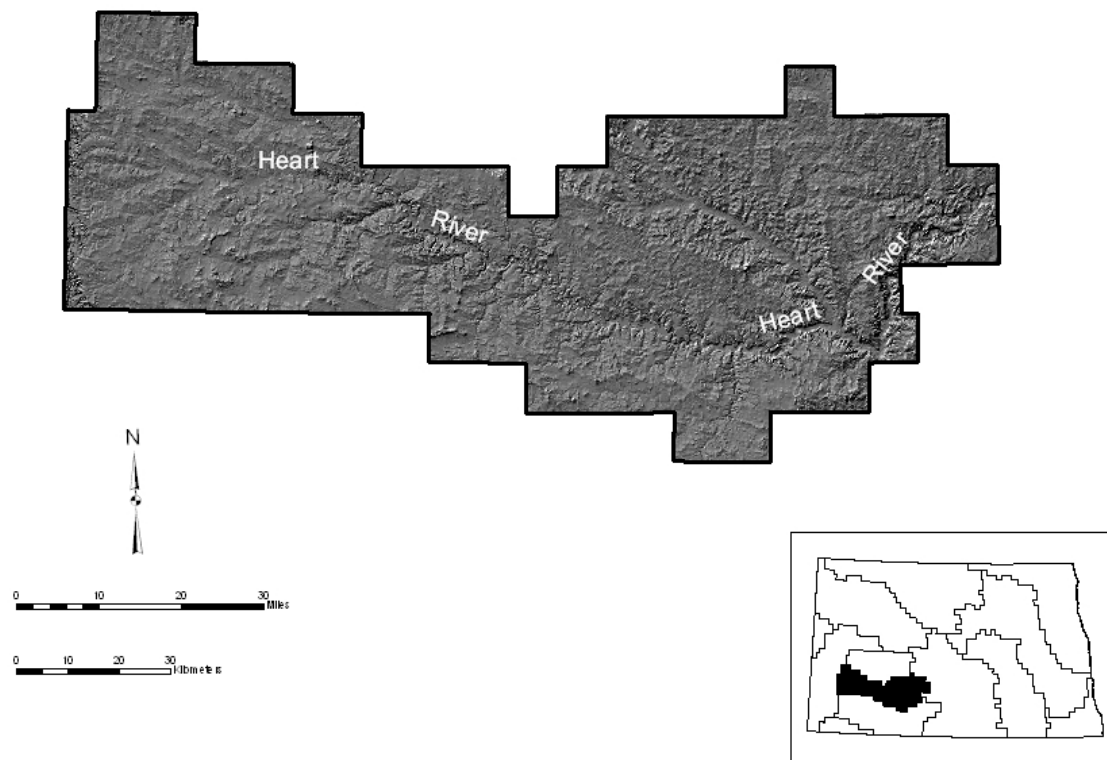


Table 4.1: Townships in the Heart River Study Unit.

TOWNSHIP	RANGE
134	87
134	88
135	85
135	86
135	87
135	88
135	89
135	90
135	91
136	84
136	85
136	86
136	87
136	88
136	89
136	90
136	91
136	92
136	93
137	84
137	85
137	86
137	87
137	88
137	89
137	90
137	91
137	92
137	93
137	94
137	95

TOWNSHIP	RANGE
137	96
137	97
137	98
137	99
137	100
138	82
138	83
138	84
138	85
138	86
138	87
138	88
138	89
138	90
138	91
138	92
138	93
138	94
138	95
138	96
138	97
138	98
138	99
138	100
139	82
139	83
139	84
139	85
139	86
139	87
139	88

TOWNSHIP	RANGE
139	89
139	90
139	92
139	93
139	94
139	95
139	96
139	97
139	98
139	99
139	100
140	83
140	84
140	85
140	86
140	87
140	88
140	89
140	95
140	96
140	97
140	98
140	99
140	100
141	85
141	96
141	97
141	98
141	99
142	98
142	99

Drainage

The valley of the Heart River is about 130 miles long and drops from an elevation of about 3,000 feet at its head to about 1,610 feet where it flows into the Missouri River at Mandan, averaging about 16 feet of drop per mile. The river channel is about twice as long as the valley, therefore the actual drop of the river averages 8 feet per mile (USGS 1968).

Some of the larger named tributaries of the Heart River from west to east include Bull Creek, Ash Creek, the Green River, Russian Spring Creek, Plum Creek, Beaver Creek, Antelope Creek (of Stark County), Heart Butte Creek, Big Muddy Creek, Hailstone Creek, Sweetbriar Creek, and Antelope Creek (of Grant County). Only the Green River and the Antelope creeks are permanent streams.

Climate

The average precipitation is 15 inches per year with about 10 inches falling from May through September. The eastern portion of the SU near the Missouri River usually gets more precipitation than the western portion near the Badlands (cf. Jensen 1972). The mean annual temperature for Morton County is ca. 41°F (Edwards and Ableiter 1951:Table 1). An average growing season is 124 frost-free days (ibid.).

Landforms and Soils

The upland soils are loam and silt loam with patches of sandy loam. The soils of the breaks are clay loams, and the bottomlands have sandy to clay loams. Parent materials are predominantly shale, sandstone, and glacial till (NDSPB 1937:Volume 5). Terrace soils consist of silty clays, silt loams, and fine sandy loams formed over fine textured alluvial sediments in some places and coarser sands and gravels in others. Soils formed in alluvial fans are sometimes classed as gravelly loam (Edwards and Ableiter 1951:89-101). Floodplain soils are typically silty clay loams, silt loams, and sandy loams (ibid.:102-111).

Natural Resources Conservation Service (NRCS) official soil survey resources are available online (NRCS 2016a, b, c). The Web Soil Survey in particular may be useful, as it has replaced the traditional county soil survey books.

- Electronic Field Office Technical Guide: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/fotg/>
- Soil Data Mart: <http://sdmdataaccess.nrcs.usda.gov>
- Web Soil Survey: <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

Flora and Fauna

Most of this area is grassland. An important dietary item for prehistoric native populations, Indian breadroot (*Psoralea esculenta*), is common on the prairie. Chokecherry (*Prunus virginiana*), juneberry (*Amelanchier alnifolia*), buffaloberry

(*Shepherdia argentea*), and gooseberry (*Ribes* sp.) are fruit-bearing shrubs found in sheltered areas. Riparian zones along watercourses and hardwood draws support cottonwood (*Populus deltoides*), box elder (*Acer negundo*), green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*), and burr oak (*Quercus macrocarpa*) in places. In the more rugged areas, Rocky Mountain red cedar (*Juniperus scopulorum*) may be found.

Bison once abounded in the grasslands of the Heart River drainage. Today, deer and antelope are the remaining big game animals in the region. These and other species such as elk figure prominently in the journals of the early explorers who visited the region. The wooded bottomlands of stream valleys were home to beavers, raccoons, and other furbearers. The Heart River and its tributaries contain numerous fish species along with freshwater mussels (cf. Cavanaugh 1983). Many of these floral and faunal resources were exploited by Native groups occupying the basin (cf. Cooper 1958).

Other Natural Resource Potential

This SU contains outcroppings of good quality Tongue River silicified sediment (TRSS) (cf. Ahler 1977). “A silcrete indistinguishable from the coarser varieties of TRSS is also found in the Taylor Bed, in the Bear Den Member of the Golden Valley Formation (Ahler and Christensen 1983; Clayton 1980; Wehrfritz 1978)” (Artz et al. 1987:2.6). A TRSS quarry is present at the Split Boulder site (32GT37) (Jackson et al. 2001:11.4). Jackson & Toom (ibid. 11.12) describe the raw material at 32GT37 as follows:

The local variety of fine-grained TRS is variegated bluish-gray in color and contains a few small fossil plant inclusions or voids. It is a siltstone that is cemented with microcrystalline quartz (Wehrfritz 1978:6). Its cortex has a rough surface (typical of a bedrock exposure) and its color is characteristically a dull gray; it is often stained rust-red by iron oxidation. The local variety of coarse-grained TRS is similar to the fine-grained variety except that grain sizes are larger and fracture qualities are poorer. It also contains larger and more frequently occurring plant inclusions or voids. The local variety contains substantially fewer plant inclusions and voids than the more widely recognized forms of coarse-grained TRS.

The Dual Butte site (32GT42) was identified by Jackson and Toom (2001:11:42-11.44) as a prehistoric lithic procurement location along two buttes in an upland ridge system. Although a number of knappable gravels and cobbles are present, the primary raw material was Heart Butte orthoquartzite (HBO). This material is also present at the Big Hill site (32GT38). The material is described as follows:

HBO has certain similarities with various orthoquartzites found in the Black Hills and in Wyoming, but it is typically fine-grained, rather than medium-grained, and it is a local stone that occurs in association with Tongue River silcrete in the project area. Given the distribution of various silcrete rocks in southwestern North Dakota (see Wehrfritz 1978), this raw

material type may have a similarly broad distribution. It has been variously described in the project area as a bluish-gray or blue-gray quartzite, pseudoquartzite, or silcrete (Picha and Gregg 1991; Plochman et al. 1982; Toom et al. 1999). It is generally a fine-grained silicified sandstone cemented with microcrystalline quartz. There has been no metamorphism of this rock type. It is typically a variegated bluish-gray color and overall hues vary between light and dark. While uncommon, a few specimens contain plant fossils or voids, indicating that it may have formed in association with silcrete. It has good to excellent conchoidal properties and fractures occur between mineral grains. The cortex is typically light gray in color. It is similar to the Tongue River silcrete identified at the Split Boulder site (32GT37), however, its grain sizes are larger and easily visible without magnification.

Other flakable stones such as chalcedonies and silicified woods can be found in the gravelly surface lag deposits in the basin. These stones attracted prehistoric knappers who sought stock material from which to make chipped stone tools. The remains of lithic workshops occur at many locations within the HRSU.

Overview of Previous Archeological Work

Looking at the lists of reports in the manuscript file at the State Historical Society of North Dakota (SHSND), it is evident that the vast majority of the surveys have been of small areas or narrow right-of-ways for transportation, energy, and communications projects. Excavations have been related to activities at Heart Butte Reservoir, Dickinson Dam, Northern Border gas pipeline, other pipelines, roads, and seismic activities. In addition, 63% of excavated sites are at Heart Butte Reservoir or in the right-of-way of Northern Border.

Inventory Projects

As of 5 August 2015, there were 582 archeological sites and 670 archeological site leads and isolated finds in the state site file database for this SU. With its 3,346 mi² area, there is one recorded site per 5.7 mi². With site leads and isolates included there is one site per 2.7 mi². Only 8.3% of the study area has been surveyed.

Table 4.2 presents a cross tabulation of data for recorded sites and the landforms upon which the sites are situated. Table 4.3 is a tally of identified cultural/temporal affiliations of recorded archeological resources. There are 10 Paleo-Indian (Paleo) components in the database. At least one other is indicated by a site lead (32SKX48). Archaic complexes are quite well represented making up about 40% of the 184 sites where a specific cultural temporal affiliation is recorded. There are 15 Plains Village sites recorded where there likely are hundreds given that 10,000 or so Mandans had their earthlodge village core areas in the lower Knife-Heart region for a century or more. A high priority is to identify the affiliations of stone circle sites in the HRSU.

Table 4.2: Feature Type by Landform for Archeological Sites in the Heart River Study Unit, 5 August 2015.

	Cairn	Conical	CMS	Village	Grave	Hearth	Jump	ORF	Pit	Quarry	Shelter	Circle	Trail	Misc	TOTAL
Alluvial fan			3					1							4
Beach/River bank			23			1		1		1		1		1	28
Butte			6									1			7
Canyon			2												2
Draw	3		15				1	3							22
Floodplain			25			2			1						28
Hill/Knoll/Bluff	7		133		2	2	1	9	5	8		19		1	187
Island			1												1
Other			4									1			5
Ridge	7	1	77			1		1	1	10	1	13		4	116
Saddle			4				1					1			6
Spur			9					1		1		2			13
Swale			1												1
Terrace	2		143	4	1	10	1	1	5	5	1	4	1	1	179
Upland Plain	1		70			1		1		4	1	5		3	86
Valley wall foot slope			8						1	1			1		11
TOTAL	20	1	524	4	3	17	4	18	13	30	3	47	2	10	696

Conical=Conical Timber Lodge; CMS=Cultural Material Scatter; Village=Earthlodge Village; ORF=Other Rock Feature; Shelter=Rock Shelter; Circle=Stone Circle; Misc=Miscellaneous

Table 4.3: Cultural/Temporal Affiliation of Archeological Resources in the Heart River Study Unit, 5 August 2015.

Paleo-Indian	
Goshen	1
Plano	4
Unspecified	5
Total	10
Archaic	
Early Large Side-Notched	5
Hawken	1
Oxbow	5
McKean/Duncan/Hanna	24
Pelican Lake	23
Unspecified	16
Total	74
Woodland	
Sonota/Besant	28
Avonlea	2
Early Woodland	1
Middle Woodland	2
Late Woodland	1
Total	34
Plains Village	
Total	15
Plains Nomadic	
Total	1
Late Prehistoric	
Unspecified	50
Total	50
Unknown	
Unknown	1,099

As in all SU, most recorded sites are situated on elevated erosional landforms (hills, knolls, bluffs, terraces, and ridges). Approximately one-quarter of the sites are partially or entirely on terraces. Why are so many sites recorded on terraces in the Heart River basin?

The earliest reported cultural resource inventory and site evaluation work in the Heart River basin was carried out by personnel affiliated with the Smithsonian Institution River Basin Surveys (SIRBS) program. The proposed Dickinson Reservoir (Cooper 1947) and Heart Butte Reservoir (Cooper 1947) were two of more than 200 impoundments planned nation-wide which received attention from the SIRBS program (cf. Jennings 1986:57). About 10 Plains Village (Heart River phase) sites were recorded by the Heart Butte Reservoir survey (Cooper 1958).

A period of nearly 30 years passed before the next reported investigations took place. These included small surveys at Lake Tschida (Heart Butte Reservoir) (Franke 1975) and Edward Arthur Patterson Lake (Dickinson Reservoir) (Carmichael 1974).

In 1982, archeologists returned to Lake Tschida to conduct a block survey covering the area around the reservoir. Plochman et al. (1982:38) reported finding 80 prehistoric sites in the area they surveyed. The remains of lithic workshops, campsites (both cultural material scatters and stone circles), and cairns were recorded. Diagnostic artifacts were from the Middle Plains Archaic to late Prehistoric periods.

This SU has not witnessed surveys of large blocks of lands to be strip mined, as have adjacent SU to the north, south, and east. Surveys of right-of-way transects have been most productive in terms of recording quantities of sites. Major transect surveys include the Northern Border Pipeline, the Southwest Pipeline, and the Sprint fiber optic line. In reporting the results of a sample survey of the Sprint line in 1988, Deaver and Deaver highlighted the point that “areas of significant topographic diversity in the western part of the state have relatively high site densities” (1988:1). Areas of topographic diversity are ecologically diverse and present greater resource potential than featureless areas. Sloping areas offer erosional exposures where bedrock resources are available. For example, exposed alluvial gravel deposits contain pebbles and cobbles of quartzite and Knife River flint (KRF) of sufficient quality and quantity to have attracted prehistoric procurement groups (e.g., Billeck 1983e; Plochman et al. 1982). More buried archeological deposits are exposed in eroding environments than in depositional environments.

The Northern Border Pipeline survey recorded about 40 sites along a ca. 60-mile transect running in a northwest to southeast direction across Morton County. Most sites were appraised as representing field camps, possibly a few base camps, and probably some transient camps established by people moving into and out of the KRF primary source area to the north (Root et al. 1983:1021). Small sites and low surface artifact densities along the Northern Border Pipeline transect across the Heart basin were interpreted as a reflection of relatively low occupational intensity across the interior upland portions of the basin compared to the KRF primary source area and the Missouri River

valley (ibid.:1024). One-third of the 216 stone tools collected from the untested sites along this transect reflect biface and flake blank production activities; 11.3% were projectile points indicative of hunting (ibid.). Three sites along Big Muddy Creek in the Curlew Valley and one along Bahr Creek yielded high frequencies of fire-cracked rock in surface collections possibly indicating food processing or lodge heating (ibid.:1023).

The Bureau of Land Management's (BLM) sampling survey of five western North Dakota Coal Study Areas (CSAs) covered two 160-acre sample units in the northern portion of the Elgin-New Leipzig CSA in the south-central portion of the Heart River basin (Metcalf et al. 1988:7, 111). Two sites were recorded yielding one site per 160 acres.

In the late 1980s, as a result of regional drought, water levels dropped at the Heart Butte Reservoir (Lake Tschida). Many artifact deposits were exposed along the dry shorelines. Observing this circumstance and opportunity, the Bureau of Reclamation (BOR), the land managing agency, quickly funded a comprehensive shoreline archeological survey of the Heart Butte Reservoir. Twenty-two prehistoric sites and 13 prehistoric isolated finds were recorded and seven prehistoric sites were relocated as a result of the inventory (Picha and Gregg 1991). A previously recorded and tested rock shelter (32GT5), thought to have been inundated decades ago by filling the reservoir, was found above the waterline (ibid.:34). The most common types of recorded sites were cultural material scatters and lithic scatters, probably representing hunting camps or kill and processing locales (ibid.:38). Discovery of diagnostic artifacts aided in the determination of cultural/temporal affiliation of sites, including: Plano (32GT158 and 32GT164), Duncan (32GT164), Late Plains Archaic (32GT159 and 32GT164), Besant (32GT164 and 32GT165), Plains Village (32GT5), and Late Prehistoric (32GT154, 32GT155, 32GT161, 32GT162, and 32GT171) (ibid.:40). Inundation, erosion, and modern human activity persistently are affecting site integrity in and along the shoreline of the reservoir. Recommendations for future work include monitoring and testing.

Beginning in 1984 and continuing through 2003, inventories have been conducted along proposed routes of the Southwest Water Pipeline right-of-way (Artz et al. 1987; Borchert et al. 1995a, b; Gregg et al. 1985; Klinner 1995, 1998, 1999a, b, 2000; Klinner and Wermers 2000; Kordecki 1995; Larson et al. 1998; Wermers 2000a, b, c). Hundreds of miles of Class III inventory have consisted of 50-100 foot linear corridors and small block surveys for ancillary facilities within the HRSU and the Cannonball River SU. The right-of-way crosses the Heart River in several locations, all of which previously have been disturbed by urban development. Lithic and cultural material scatters have been the most common site types recorded during survey. Sites with stone circles and cairns have been noted.

Since the last update in 2007 there have been 316 inventories conducted in the HRSU. Most inventories relate to wind energy, transmission lines, telecommunication, pipelines, transportation (including material sources), well pads/access roads, tree plantings and agricultural infrastructure. Ninety-one archeological sites were recorded during this time, over half (56%) of these were cultural material scatters. Additional sites

with Archaic components (9) and Plains Village (3) components were identified but most were of unknown cultural/temporal affiliation.

Formal Test Excavation Projects

The first test excavations reported in the Heart River drainage were conducted during a one-week period in 1947 by Gordon Hewes (1949b, c) at the Plains Village Koehler site (32GT1). Hewes excavated eight 5-x-5-ft units (Cooper 1958:12). Cultural deposits were found to contain stone tools, flaking debris, pottery, bone, and mussel shell fragments, but no cache pits or earthlodge remains. Subsequent major excavations were undertaken by SIRBS personnel the following year (1948) and supported the Heart River phase taxonomic assignment.

The next reported subsurface investigation in the Heart River basin involved the use of limited shovel probing as an aid in site evaluation. This took place as part of a Heart Butte Reservoir survey project (Plochman et al. 1982).

A number of test excavations were undertaken in the SU as part of the Northern Border Pipeline project (cf. Root and Gregg 1983). Cultural remains dating from the Early Plains Archaic through Plains Village periods were found at the 18 sites test excavated. Middle and Late Plains Archaic components were most common followed by Plains Village and Middle Plains Woodland.

Subsurface testing was conducted at 32SK855 for the North Dakota Department of Transportation (NDDOT). The site, located on a bluff above the Heart River, has been classified as a workshop/chipping station (Kulevsky and Stine 1993). Testing included 110 auger probes along three transects and three formal test units. Flaking debris, a core, tested raw material, a McKean projectile point, and bone were recovered at the site (ibid.:i). Lithic raw material types included KRF, petrified wood, TRSS, agates, and chalcedonies. The site was recommended by investigators as eligible for the NRHP due to the presence of intact deposits and its possible connection to a nearby, multi-component habitation site (32SK854) (ibid.:14).

During the field season of 1992, a NDDOT-sponsored test excavation project was conducted at 32BI828. This stone feature site is situated on a rise south of an unnamed drainage and two miles east of the Little Missouri Badlands (Stine 1993b). The site consists of two stone circles and eight depressions. No cultural materials were recovered from shovel probes placed within selected depressions. However, shovel probes placed in and outside of the stone circles produced flaking debris, bifaces, core fragments, a retouched flake, and tested raw material. Lithic raw material types consisted of KRF, chalcedonies, Rainy Buttes silicified wood (RBSW), petrified wood, quartzite, moss agate, and cherts. Tongue River silicified sediment comprise the stone circle feature rocks but no chipped or ground TRSS artifacts were recovered. Investigators suggest the site functioned as a “single use intensive lithic reduction site possibly with emphasis on early stage biface manufacture” (ibid.:15).

Test excavations were undertaken at 32SK809 in 1995 because of damage caused by vehicles used during a seismic project on Bureau of Reclamation (BOR)-managed land (Olson 1996). The site crosses three physiographic zones, including the Heart River and Ash Creek floodplains, Pleistocene terrace remnants, and an upland (ibid.:3). Ninety-one auger probes and eight formal test units were placed along four transects at the site. Cultural materials at the lithic scatter included flaking debris, ground stone fragments, and a projectile point mid-section, all manufactured from a variety of lithic raw materials. Bone fragments and charcoal also were found. Radiocarbon tests of charcoal samples reveal dates for two separate occupations at the site, ca. 2500 and 1000 radiocarbon years BP (ibid.:66). Additionally, one buried rock feature was unearthed. It is composed of a single course of 16 rocks in a straight line measuring 1.2 m , 2-15.5 cm below a cultural component (ibid.:47-50). Archeologists suggest the feature may be a remnant of a hide windbreak (ibid.:50).

Formal subsurface testing occurred at 11 archeological sites at the Dickinson Dam in 1996. Investigators recommended no sites as eligible for the NRHP due to the scarcity of cultural materials and the sites' lack of integrity (Klinner et al. 1999).

Test excavations were conducted at 32SK134 in 1998 for the NDDOT. The site is located on the edge of a valley overlooking the Heart River. Two hundred shovel and auger probes and 11 formal test units comprise the subsurface investigation (Larson et al. 1999). Cultural materials recovered from the site included flaking debris, a KRF biface fragment, projectile point fragments, fire-cracked rock, hearth remnants, and large mammal bone (ibid.). Knife River flint was the most common lithic raw material type but a few chalcedony, TRSS, and porcellanite flakes were present. Based on point typology and radiocarbon dating, the site appears to date to the Pelican Lake Complex (ibid.:38).

Test excavations were required at 32MO66, west of the community of Mandan, because of the slumping and sliding of the bank along Business I-94. Prehistorically, the confluence of the Heart and Missouri rivers was approximately six miles east of the site. In 1980, a local resident reported that there had been stone circles, depressions, and a stone effigy in the area before it was plowed (Stine and Morrison 2004:8). Sixty-three shovel probes and five formal test units were excavated (ibid.:ii). Testing included the salvage of an eroding pit feature atop a hill. In total, five features were excavated, four in the upper Plains Village component and one in a second, deeper (180 cm below ground surface) component (ibid.). Two features were post molds. Although the tested portion of the site is small, investigators have not ruled out the possibility that it could be part of a village. No horticultural tools were recovered but floral remains included corn and sunflower seeds. Radiocarbon dates indicate the age of the Plains Village component is AD 1400-1450 which corroborates the recovered diagnostic artifacts (ibid.). The second component was not dated. Investigators recommended listing in the NRHP and further testing, as the site has potential to provide information about site function and regional horticulture and seasonality (ibid.).

During the field seasons of 1998, 1999, and 2000, the University of North Dakota (UND) conducted test excavations at seven sites near the Heart Butte Reservoir for the

BOR (Jackson et al. 2001). Three of the sites (32GT11, 32GT69, and 32GT238) were recommended eligible for the NRHP primarily based on research potential. Below are brief descriptions of test excavations conducted at these sites.

The Black Pearl site (32GT11), a single component early Plains Village campsite, is situated on a low terrace of the Heart River (ibid.:5.1). Five formal test units were excavated. A basin-hearth feature, containing flaking debris, a stone tool, a modified bone (possibly an ornament), and lesser amounts of bone, fire-cracked rock and charcoal, were salvaged (ibid.:5.15). Other cultural materials recovered from the site were projectile points, a scraper, retouched flakes, tested raw material, a smoking pipe, ceramics, large and small mammal bone, mussel shell, and one black freshwater pearl (ibid.:5.15-5.24). The cultural/temporal affiliation was determined by the ceramics present. Investigators recommended salvage excavation of the site due to continual erosion caused by the Heart River.

Site 32GT69 is a multi-component cultural material scatter situated on a terrace overlooking the Heart River to the north. Subsurface testing consisted of the excavation of three formal test units (ibid.:6.4). Two ceramic pieces date the component within the A Horizon to the Plains Village period (ibid.:6.9). The second component is located within the B Horizon. No datable materials were recovered from this layer but investigators suggest a pre-ceramic period, such as Plains Archaic or Paleo, based in part on the recovery of heavily patinated KRF artifacts (ibid.). A shallow surface hearth, containing scant amounts of fire-cracked rock, shell, and burned bone, was excavated from Test Unit 1 (TU1) (ibid.:6.10). Flaking debris, fire-cracked rock, unidentifiable burned and unburned bone, and shell also came from TU1. Artifacts recovered from the site include bifaces, flake tools, cores, and ground stone tools, all manufactured from TRSS and KRF (ibid.:6.13). At the time of excavation, the site was in good condition and protection and preservation were recommended.

The Beadmaker site (32GT238), within the floodplain of the Heart River, along with 32GT8 and 32GT69, is one of the three sites comprising the Beadmaker site locality. The name of the site is derived from the stone beads, a bone bead, and bead manufacturing debris recorded at the Beadmaker site. Other cultural materials recovered from the site include ceramics (early Heart River phase), stone tools, flaking debris, modified and unmodified bone, modified and unmodified shell, fire-cracked rock, burned seeds, and charcoal (ibid.:10.1). No projectile points were found. The site appears to have functioned as a field camp. Subsurface testing consisted of 10 formal test units and 26 auger probes (ibid.:10.13-10.14). Three features were revealed, two basin hearths and a bison bone concentration. Radiocarbon tests date the site to ca. AD 1480-1650 (ibid.:10.32). Investigators “are inclined to assign the Plains Village component at Beadmaker to the early Post-Contact Coalescent variant, not so much because of the interpretation of its radiocarbon dates, but because of its ceramic assemblage” (ibid.:10.32). Rapid erosion has affected the site but it retains potential for archeological research. Moreover, project archeologists suggest that “It is clearly the most significant, remaining archeological site in the Heart Butte locality that is presently known....the Beadmaker site has the ability to contribute substantial and important new information on

the full range of Plains Village settlement and subsistence patterns, and therein lies its true significance” (ibid.:10.70).

Thirteen sites were investigated by UND in 2001 and 2002 near the Heart Butte Reservoir for the BOR (Jackson and Toom 2005). The main component at 32GT32 was identified as an early Post-Contact Coalescent variant (AD 1443-1644). The second component at that site was identified as a Plains Village temporary field camp that served mainly as a lithic workshop. A Plains Archaic or Paleo lithic procurement location and workshop was identified at 32GT55. A Late Plains Archaic (810-540 BC) field camp and lithic workshop was identified at 32GT241. A Middle Plains Archaic (Duncan/Hanna) possible game lookout was identified at 32GT188. A preceramic lithic workshop or game lookout was identified at 32GT186. Site 32GT118 had a late prehistoric lithic workshop or possible temporary field camp and a Late Plains Archaic temporary field camp. Other lithic procurement and workshop areas include 32GT87 and 32GT240. A stone circle site (32GT67) was identified as a short-term field camp. An Early Plains Village/Plains Woodland field camp was identified at 32GT251. Sites 32GT244 and 32GT250 had prehistoric components of unknown function and 32GT246 was a possible temporary field camp.

Two sites were tested above the Green River as a result of a proposed road project (Wermers 2004). Both sites (32DU1283 and 32DU1284) were identified as lithic scatters. A Middle Plains Archaic (Duncan/Hanna) affiliation was determined for 32DU1284.

Table 4.4: Formal Test Excavation Projects in the Heart River Study Unit, 5 August 2015.

Year	First Author	Second Author	Title	Site Number	Ms #
1983	Root, M.	M. Gregg	Archeology of the Northern Border Pipeline, North Dakota: Vol. 3, Test Excavations, McIntosh, Emmons, Morton, Stark, Mercer, Dunn, McKenzie, & Williams Counties, ND	32MO240, 32MO242, 32MO243, 32MO244, 32MO245, 32MO249, 32MO251, 32MO250, 32MO252, 32MO253, 32MO255, 32MO254, 32MO72, 32MO74, 32MO73, 32MO75, 32MO76, 32MO58	3456
1986	Christensen, R.	A. Porsche	Muddy Waters II, 32MO113: A Besant Occupation on Big Muddy Creek, Western Morton Co., ND	32MO113	4101

Year	First Author	Second Author	Title	Site Number	Ms #
1989	Borchert, J.		Evaluative Test Excavations at 32MO137, 32MO138 & 32MO140 Morton Co., ND	32MO137, 32MO138	4796
1990	Pool, K.		Testing of Archeological Site 32MO164 for Lyons Road Improvement, Morton County, ND	32MO164	5312
1990	Borchert, J.	J. Brownell	Final Report: The Evaluation of Select Sites Along the Gladstone to Regent Road, Stark and Hettinger Counties	32SK793	6185
1993	Stine, E.		Swenson Site Testing and Evaluation of 32BI828 Billings Co., ND	32BI828	6001
1993	Kulevsky, A.	E. Stine	Testing & Evaluation of Site 32SK855 Stark Co., ND	32SK855	6331
1995	Olson, B.		32SK809 & 32SK829: Evaluative Testing of Two Late Archaic Sites Stark Co., ND	32SK809, 32SK829	6569
1998	Scott, J.		Forty-Eighth Avenue Bridge Replacement Project: Archeological Testing of 32MO353 & 32MO354 in Morton Co., ND	32MO354	7215
1999	Klinner, D.	G. Wermers	Dickinson Dam 1996 Archeological Site Evaluation Project, Stark County, ND	32SK806, 32SK807, 32SK810, 32SK814, 32SK815, 32SK816, 32SK817, 32SK820, 32SK822, 32SK823, 32SK830	7177
1999	Larson, T.	D. Penny	Results of Stage 1 Investigations at 32SK134	32SK134	7414
1999	Toom, D.	M. Gregg	Heart Butte Reservoir Archeological Excavations and Reconnaissance, Grant County, ND, 1992 & 1993 Fieldwork	32GT90, 32GT158, 32GT160, 32GT161, 32GT164, 32GT167, 32GT169, 32GT185,	7211
2001	Jackson, M.	D. Toom	Heart Butte Reservoir 1998-2000 Archeological Investigations, Grant Co., ND Vols. I & II	32GT8, 32GT11, 32GT69, 32GT85, 32GT97, 32GT175, 43GT238	9074
2003	Stine, E.	J. Morrison	Sunny Slide Test Excavations at 32MO66 Morton Co., ND	32MO66	8738
2004	Wermers, G.		Testing at Sites 32DU1283 &	32DU1283,	8744

Year	First Author	Second Author	Title	Site Number	Ms #
			32DU1284, Dunn Co., ND	32DU1284	
2005	Jackson, M.	D. Toom	Heart Butte Reservoir 2001-2002 Archeological Test Excavations, Grant Co., ND	32GT32, 32GT55, 32GT67, 32GT87, 32GT118, 32GT188, 32GT240, 32GT241, 32GT244, 32GT246, 32GT250, 32GT251	11026

National Register of Historic Places

No sites have been listed in the National Register of Historic Places (NRHP).

For future reference the current list of archeological sites in North Dakota listed in the NRHP is available on the National Park Service website. The following links are useful (NPS 2016a, b):

- General information and links to specific information: <http://www.nps.gov/nr/>
- National Register Information System: <http://www.nps.gov/nr/research/>

Major Excavation Projects

Excavations were undertaken at the Koehler site (32GT1) by SIRBS in the Heart Butte Reservoir (Cooper 1958). The remains of a Heart River phase camp were excavated, and is suggested to be Mandan based on similarities in cultural material to On-A-Slant and Double Ditch village sites. LeBeau Ware ceramics from the site support the Heart River phase taxonomic assignment. Contact material was not recovered suggesting a possible AD 1600s time frame for the camp. In the appendix of this report several other camps were located in the area with pottery similar to the Koehler site.

Mitigation was conducted at 32SK965 after it had been identified during a monitoring program for a pipeline (Stine and Hiemstra 2005). The site is located along the Heart River. Based on the investigations the site was determined to be a short-term occupation or series of short-term occupations during the Plains Village period. Botanical remains indicated an autumn occupation. Pottery suggested a Middle Missouri tradition site affiliation dating prior to AD 1500 and possibly earlier than 1400. Ceramics were similar to those from the Shermer site that is identified as Terminal Middle Missouri. The series of radiocarbon dates had ranges at two locations of AD 1460-1660 and AD 1430-1530 and then AD 1410-1480 and AD 1270-1400.

A data recovery program was undertaken by UND at the Beadmaker site (32GT238) in 2003. A full report on the archeological investigation at the site is in preparation and will be completed in 2017 by the SHSND.

Table 4.5: Major Excavation Projects in the Heart River Study Unit, 5 August 2015.

Year	First Author	Second Author	Title	Site Number	Ms #
1958	Cooper, P.		Archeological Investigations in the Heart Butte Reservoir Area North Dakota. River Basin Surveys Papers (9):	32GT1	Not on file*
2005	Stine, E.	D. Hiemstra	Grasslands Pipeline: Archeological Investigations in Billings, Dunn, Golden Valley and Stark Counties, ND	32SK965	9154
*Note: Although the Cooper report is not in the Archeology and Historic Preservation Division (AHP) manuscript collection, that publication is available in the AHP library.					

Stone Circle and Cairn Sites

Forty-seven stone circles and 20 cairn sites have been identified in the SU (Table 4.2). Only three stone circle sites and one cairn site have been tested (Table 4.6). Sites listed in this table were formally tested meaning at least one 1-x-1 m unit was excavated at the site.

Table 4.6: Formally Tested or Excavated Stone Feature Sites in the Heart River Study Unit, 5 August 2015.

Site Number	Tested Feature Type	Test Unit Location	Cultural Material	Comments	Cultural/ Temporal Affiliation	Ms #
32BI8282	Circle	Inside	Yes	Lithic reduction activity		6001
32GT67	Circle	Inside, Outside	Yes Yes	Short-term field camp		11026
32GT97	Circle	Inside, Outside	Yes Yes	"Circles" may be natural lag deposits	Plains Woodland or Plains Village	9074
32MO240	Cairn	Outside	Yes			3456

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. Samples from an undesignated site at the confluence of an unspecified stream and the Heart River in T136N, R88W, Grant County, were sourced to the Centennial Mountains along the Idaho-Montana border. No site numbers or cultural/temporal affiliations are mentioned.

In 1993, Toom and Kordecki (1994) assessed the condition of 28 flood-damaged sites across the state. Ten sites were reported as significantly damaged due to high water levels. Recommendations for bank stabilization were made for nine of the sites. Complete salvage of 32MO97 was recommended because it is a known ossuary.

Paleo-Indian Period

Paleo sites are underrepresented in the site file database. Considering the greater numbers of Paleo finds reported in the Knife River and Cannonball River SU, to the north and south, the earliest North Dakotans should have been regular users of the HRSU.

Paleo-Environmental Modeling

The identification of late Paleo land surfaces in the Heart River drainage may be explored through the use of remote sensing techniques coupled with soil bore-hole data. Studies along the South Sulphur River in northeastern Texas indicate that electrical resistivity survey can be used to delineate basin morphology and buried geomorphic features (Darwin et al. 1990:77). Can electrical soil resistivity survey or other remote sensing techniques be used to identify the Leonard paleosol in the Oahe Formation in the Heart River drainage?

Cultural Chronology

All Paleo complexes specified in the statewide chronology should be represented in the HRSU. The base of a Goshen point (32SKX53) was found with several bone fragments and a piece of shell in stripped railroad right-of-way near the community of Richardton. Other cultural resources (32MO320, 32SK37, 32SK844, and 32SKX48) within the HRSU, temporally affiliated with the Plano period, are known from private collections. An effort should be made to work with artifact collectors to identify types of Paleo points that have been surface collected.

Settlement Behavior

Paleo settlement strategies in the basin are not known. Terrace settings along the Missouri may have been preferred over settings along tributary drainages such as the Heart River. The occurrence and availability of necessary resources such as chippable stone and the location of prey animals within the drainage may have dictated the settlement options of early groups. Do TRSS and HBO lithic procurement and workshop sites exhibit the time depth of the KRF quarry area to the north?

Native Subsistence Practices

Varying climatic conditions, on both a seasonal and a year-to-year basis, undoubtedly affected Paleo strategies for taking large prey such as mammoth and bison. Herd size and composition at a given time were certainly related to environmental factors. Similarly, wild plant foraging behavior would have been affected by these same environmental constraints. What was the range of floral and faunal resources available to Paleo peoples in the HRSU?

Technologies

Small groups of hunters armed with Paleo weaponry could readily dispatch their big game quarry based on experimental studies involving the African elephant (cf. Frison 1989). Frison (1989) has reported that certain key technological components of Paleo weaponry needed to work in tandem. He also presented experimental results concerning the use of bifacial thinning flake tools made from Spanish Diggings quartzite to butcher an African elephant. This material was found to hold an edge better, thus requiring less frequent re-sharpening than fine-grained chert specimens employed in the study. Does KRF utilization supersede that of TRSS during Paleo times because of specific constraints imposed by the characteristics of the raw material? (cf. Goodyear 1989; Kelly 1988:718).

Artifact Styles

Finds of Paleo projectile points from Stark County suggest that Plano materials can be expected to occur in the SU. The specimens are from a private collection. A Scottsbluff point was found at 32SK37, and an Eden point is reported from a second location (32SKX48) (Jack Stewart, personal communication to M. Gregg, December 1989). Do any of the Paleo point type styles in the HRSU differ in any way from those in other parts of North Dakota?

Regional Interaction

Paleo groups likely traversed the Heart River drainage enroute to and from the KRF flint quarries during the course of other subsistence pursuits. The occurrence of both Folsom and Agate Basin lanceolate projectile tips made of KRF at the Agate Basin site in northeastern Wyoming suggests direct acquisition of this stone from the quarry area. The most direct travel route between these two locales would cross portions of the HRSU (cf. Frison 1982:Figure 2.119). The recovery of exotic stone materials of Hartville Uplift origin in Paleo-age contexts would lend additional support to the former existence of trans-Heart travel routes to and from the KRF quarries.

Historic Preservation Goals, Priorities, and Strategies

A high priority is to record a sample of Paleo sites in the Heart River basin. The most expedient strategy is to work with collector-informants who have personally surface collected Paleo points from HRSU contexts.

Plains Archaic Period

All three Plains Archaic periods are represented by finds from the Heart River basin. In most SU, corner-notched points of inferred Late Plains Archaic origin are more numerous than points of earlier Plains Archaic types.

Paleo-Environmental Modeling

Plains Archaic components in the Heart River basin are best known from upland settings where artifact deposits are either deflated or shallowly buried. As with the preceding Paleo period, Early and Middle Plains Archaic remains may well be deeply buried by alluvial and colluvial fill in the valley bottoms. Late Plains Archaic components can be expected within soil zones above present-day river levels along the lower reaches of the Heart much the same as in the other major rivers valleys. Whenever possible, archeologists should work with the North Dakota Geological Survey in identifying sedimentary and topographic contexts of Holocene soils and paleolandscapes.

Cultural Chronology

The Plains Archaic chronology in the HRSU broadly conforms to that outlined for the state as a whole. Most of the components discussed below have been classified using artifact style cross dating rather than absolute dating methods. Early Plains Archaic materials have been reported from few sites in the SU (Table 4.3). Oxbow or Simonson points were present at 32MO250 (Billeck:1983:682).

Middle Plains Archaic materials are better represented. Various lithic materials including KRF, petrified wood, TRSS, agates, and chalcedonies were recovered during testing at 32SK855, a workshop/chipping station. A McKean projectile point dates the site to the Middle Plains Archaic (Kulevsky and Stine 1993). Plochman et al. (1982:60) reported a cultural material scatter at 32GT34 near Beaver Creek contained an Oxbow point. A second Middle Plains Archaic component was identified at 32GT66, along Lake Tschida, where a Hanna point was found associated with other stone tools and flaking debris (ibid:115). A 1990 inventory of sites, also along Lake Tschida, recorded a Duncan point at 32GT164 (Picha et al. 1991).

The Northern Border Pipeline project recorded a number of Middle Plains Archaic components. These were mostly in upland settings because the pipeline route kept to that landform type as much as possible. The components included a McKean Lanceolate point from 32MO74 (Billeck 1983f). An Oxbow point was found at 32MO245 (Billeck 1983i). Hanna points were recovered from three sites: 32MO58 (Meier 1983j), 32MO74 (Billeck 1983f), and 32MO255 (Billeck 1983p).

Late Plains Archaic components were identified at eight sites along the route of the Northern Border Pipeline across the eastern portion Heart River drainage. These cultural/temporal assessments were based on the recovery of corner-notched points. Included are 32MO253 (Billeck 1983n), the Jones site (32MO242) (Gregg 1983c), and the Judson site (32MO58) (Meier 1983j), among others. None of the eight sites produced any associated pottery. Corner-notched points are not always Late Archaic. They are found in Early and Middle Plains Woodland components too (Gregg 1987d). What traits can be used to distinguish between Plains Archaic and Plains Woodland corner-notched point styles?

Late Plains Archaic sites are well represented within the HRSU. A Pelican Lake point was recovered during testing at 32SK134 and radiocarbon assays confirm the age of that component (Larson et al. 1999:38). Two occupational episodes have been identified at 32SK809, a lithic scatter with bone and charcoal. Here, radiocarbon assays of charcoal samples date to ca. 2500 and 1000 radiocarbon years BP (Olson 1995:66), the Late Plains Archaic and Late Plains Woodland periods.

Settlement Behavior

Many of the known Plains Archaic components are in upland settings. This locational correlation is thought to reflect patches of intact landscape of Late Plains Archaic age combined with some site locational preferences. Eroded or deflated upland deposits are interpreted as representing primarily temporary campsites. A major activity which took place at these locations was procurement of lithic raw materials for tool production from deposits of stones such as KRF, TRSS, and various chalcedonies and silicified woods (cf. Plochman et al. 1982:Table 6.3; Root and Gregg 1983:Part 2).

Few bottomland sites have been investigated in detail. An exception is the Bahm site (32MO97), located on the Heart River floodplain north of Flasher in Morton County. A buried rock-lined pit containing ocher-stained human remains was found exposed along the cutbank three meters below the surface in a paleosol (SHSND site files). A few flakes and bone fragments also were noted in the paleosol. Due to lack of diagnostic artifacts, cultural/temporal affiliation is not known. Buried Plains Archaic sites in the bottomlands along the Heart River need to be identified and evaluated in order to learn something of settlement variation.

Native Subsistence Practices

Little is known concerning Plains Archaic subsistence regimens in the Heart River drainage. The occurrence of projectile points/cutting tools in assemblages indicates that hunting was a major subsistence pursuit. Undoubtedly, prey included bison and antelope. The recovery of small amounts of freshwater mussel shells from 32MO249 (Billeck 1983j) and 32MO252 (Billeck 1983m) in upland settings suggests mussels may have served as a dietary supplement to Plains Archaic groups in the basin. What were the variations in subsistence resource potential across the basin as climatic conditions varied through the Plains Archaic periods?

Technologies

Stone, bone, shell, wood, fiber, and other technologies can be analyzed only when discrete Plains Archaic artifact samples are recovered. There is a need to recover samples of Early, Middle, and Late Plains Archaic artifact deposits by controlled hand excavation from sites with depositional integrity in the Heart River basin. Floodplain alluvial contexts would be the most likely setting to hold such deposits.

Artifact Styles

The projectile point forms identified thus far in the HRSU conform to well-known Northern Plains styles. Middle Plains Archaic remains in the Heart Butte Reservoir include an Oxbow point from 32GT34 and a Hanna point from 32GT66 (Plochman et al. 1982:Figure 8.2). Additional Middle Plains Archaic components represented by Hanna points include 32MO58, 32MO74, and 32MO255 found in Morton County during the Northern Border Pipeline project. What is the variation in the Hanna point style represented by finds from the Heart River basin?

Regional Interaction

Extents of regional interaction involving people whose material culture is classified in one of the named archeological units can be determined by (1) identifying artifacts of Heart River basin origin in distant archeological sites and (2) identifying artifacts of distant origin in Heart River sites. Can any Plains Archaic artifacts be specified which are distinctly of Heart River basin origin?

Historic Preservation Goals, Priorities, and Strategies

A priority is to establish a Plains Archaic cultural chronology for the HRSU based on chronometrically dated components. Single component deposits need to be identified and sampled by controlled hand excavation in order to learn more about subsistence practices, technologies, and artifact styles.

Plains Woodland Period

Sixty-three sites have been assigned to the Plains Woodland tradition (Table 4.3). However, 40 of these sites are “unspecified” Plains Woodland without associated potsherds. Plains Woodland components are difficult to identify. Most occupations likely will be buried in floodplain alluvial contexts.

Paleo-Environmental Modeling

The Scandic climatic episode of AD 400-750 is thought to have been generally arid. Windblown sediments should have capped Early and Middle Plains Woodland sites in the bottomlands and on the south and east slopes of hills and ridges in the uplands. Attempts should be made to identify sedimentary units of this age in these topographic contexts.

Cultural Chronology

Early Plains Woodland cultural remains rarely have been identified in the Heart River basin. One small corner-notched point from the Judson site (Meier 1983j:Figure 52.6d) is similar to Early Plains Woodland points from the James River valley (cf. Gregg 1987d:Figure 8.2b). The occurrence of Late Plains Archaic Pelican Lake and Middle

Plains Woodland Besant side-notched materials point to cultural continuity between Archaic and Woodland periods. More Early Plains Woodland sites will undoubtedly be found as work progresses.

Middle Plains Woodland components containing Besant/Sonota materials have been reported from 18 sites in the basin. Plochman et al. (1982) collected an isolated Besant side-notched point during the Heart Butte Reservoir survey. Another was found at 32MO76 during Northern Border Pipeline investigations (Billeck 983r:810). Diagnostic artifacts recorded at 32GT164 and 32GT165 along Lake Tschida date to the Besant period (Picha et al. 1991).

Three Late Plains Woodland components are represented in the site file database. Given the occurrence of a full-blown Plains Village lifeway in the SU in subsequent centuries, many more Late Woodland sites are expected. What accounts for the paucity of Late Plains Woodland period components in the HRSU?

Settlement Behavior

Settlement systems of Plains Woodland peoples in the Heart River drainage are unknown. Middle Plains Woodland sites are recorded in terrace, canyon, and upland settings. With few Late Plains Woodland components identified, settlement behavior hardly can be considered.

Additional survey work in the breaks terrain near the Missouri-Heart River confluence may serve to locate Late Plains Woodland sites in topographic/physiographic settings similar to those reported on the Cross Ranch in the Southern Missouri River SU to the north (cf. Ahler et al. 1981, 1982). Do Late Plains Woodland components occur in terrace and breaks terrain along the drainage?

Native Subsistence Practices

Presently, little is known about Plains Woodland subsistence practices because recovered floral and faunal samples have not been studied in detail. Projects which involve test excavation should use fine-mesh screen recovery techniques in processing site matrix in order to collect samples of floral and faunal remains for study. When did corn and other domesticated garden crops begin to be cultivated regularly in the Heart River drainage? Was gardening principally a Late Plains Woodland or Plains Village subsistence pursuit?

Technologies

Knife River flint was locally available in lag deposits in the HRSU. Where were the most heavily exploited KRF source areas within the HRSU?

Ceramic remains attributable to the Plains Woodland period have not been reported at many sites in the basin. Middle Plains Woodland Besant/Sonota groups

frequenting the basin undoubtedly made and used ceramic containers similar to those reported from nearby sites located along the Missouri River (Neuman 1975). What are the technological differences between ceramics from Besant/Sonota residential base settlements along the Missouri River and field camps in the interior portions of the Heart River basin?

Artifact Styles

A Besant side-notched point was collected from an isolated find spot along the Heart Butte Reservoir (Plochman et al. 1982:Figure 8.2). What is the frequency of occurrence of Samantha side-notched points at sites in the Heart River basin?

Some of the large corner-notched Pelican Lake and small corner-notched projectile points found at sites in the basin were likely made during Early Plains Woodland times. The lack of cultural deposits from dated contexts has hindered their identification in the archeological record.

Diagnostic projectile point forms such as Besant side-notched presently provide the best indication of Middle Plains Woodland occupation in the SU. Pottery remains occur much less frequently in collections. Pottery styles are thought to follow regional Sonota decorative modes.

Late Plains Woodland peoples are thought to have been the forebears of Plains Village culture in the region. Are there material traits or artifact styles distinctive to proto-Mandan and proto-Hidatsa groups in the Heart River valley?

Regional Interaction

The Heart River valley would have been a natural east-west travel route between the Little Missouri Badlands and the Missouri River Trench (cf. Cooper 1947:3). Prehistoric hunters likely followed the drainage westward during hunting treks.

Historic Preservation Goals, Priorities, and Strategies

The identification and recording of mound sites in the SU should be a top priority. These data may provide clues concerning the intensity and location of Woodland habitation sites in the Heart River drainage. Residential bases, special purpose mortuary sites, and temporary campsites should be present near these earthworks (cf. Gregg 1987c).

Plains Village Period

Plains Village properties abound in this SU, even though only 15 were identified as such in the site data files on 5 August 2015. Plains Village cultural fluorescence in North Dakota may have peaked in the late prehistoric earthlodge communities concentrated in the Heart River-Missouri River confluence locality.

Paleo-Environmental Modeling

Plains Village fluorescence in the Heart River drainage is suspected to have coincided with favorable climatic conditions occurring on a regional scale in the Upper Missouri River valley during the Neo-Atlantic climatic episode sometime after AD 1000 (cf. Wedel 1986:Table 3.1). A climatic deterioration is postulated to have occurred during the following centuries. About AD 1550, conditions are thought to have improved once again during the Neo-Boreal episode.

The collection of paleo-environmental data from Plains Village sites in the basin will aid in clarifying the current climatic model. Future excavations at sites such as the Koehler site (32GT1) will provide an excellent opportunity to examine climatic change for sites located off the Missouri River Trench. The cultural deposits at the Koehler site were encountered in a light-colored silt layer (Zone D) comprising a number of thin, discontinuous lenses of darker earth (Cooper 1958:16). Unfortunately, absolute dating techniques were not commonplace when the site was excavated.

Cultural Chronology

As in most other SU, with the possible exceptions of those removed from the Missouri River and James River valleys, Plains Village components of all time periods can be expected to occur in the Heart River drainage. Sites dating to the era of the Heart River phase in the upper Knife-Heart region (ca. AD 1400-1710) may be expected to be most common because the population density of the Villagers was probably densest during that era. Many of the Plains Village sites investigated in the basin do indeed date to this era which is mostly contemporary with the “Terminal variant of the Middle Missouri tradition” in the Cannonball region and lower portion of the Knife-Heart region (Lehmer 1971) or Huff focus (Wood 1967) and Fort Yates phase (Thiessen 1976) combined (cf. Gregg 1985c:Figure 31). The Boulder site hunting camp (32MO72) yielded a radiocarbon date (UCR-1628) which, when corrected and calibrated, indicates Plains Village occupation during the period AD 1405-1695 (Billeck 1983e:741). Early Heart River Phase ceramics were recovered during testing at the Beadmaker site (32GT238) (Jackson et al. 2001:10.1). A radiocarbon date range (ca. AD 1480-1650) for the Beadmaker site correlates with the diagnostic materials (ibid.:10.32). The Koehler site (32GT1) and other sites in the Heart Butte Reservoir locality appear to be of similar antiquity based on cross dating of pottery vessel styles (cf. Cooper 1958:plates; Johnson 1983:9.44). How does the Plains Village cultural chronology for the interior Heart River basin differ from that of the upper Knife-Heart region?

Settlement Behavior

The Heart River basin interior was probably used by the Villagers generally in the same manner they used other major tributary basins. This use has been described summarily by Wedel (1961:160): “These valleys have so far disclosed...few evidences of fixed towns and villages; but scattered campsites suggest that they furnished routes of travel for small groups engaged in hunting, trading, raiding, and other...short-term

activities” such as durable raw material procurement. Were interior basin localities ever used for residential base purposes?

Native Subsistence Practices

The Koehler site (32GT1) faunal assemblage consisted primarily of bison (*Bison bison*) and dog (*Canis familiaris*); other identified mammal remains included beaver (*Castor canadensis*) (Cooper 1958:31-32). Freshwater mussels were well represented in the collection; five species were identified including *Quadrula quadrula* and *Amblema costata* which had not been known to occur in the Missouri River or its tributaries (cf. Cvancara 1983:Table 1). Horse bones and other Euro-American trade materials were not found during excavations. Botanical remains and other evidence of gardening (e.g., scapula hoes) were not present. The overall composition of the faunal inventory is concordant with remains expected at a hunting camp (cf. Hurt 1969).

The Plains Village component tested at the Boulder site contained large quantities of bison remains along with some small mammal and bird bones (Billeck 1983e:761-763). This site too has been interpreted as a Plains Village hunting camp.

Floral remains recovered from the Beadmaker site (32GT238) include 49 burnt seeds (Jackson et al. 2001:10.66). Investigators suggest that activities at the site may have included use and/or processing of maize, wild grasses, and wild berries. A maize kernel underwent AMS radiocarbon analysis. The result is an uncalibrated age of 230±35 years BP. Did the Villagers do any gardening in the Heart River basin upriver from the Missouri?

Technologies

“Bone uprights,” most commonly associated with Besant/Sonota components, occur in Plains Village sites where they functioned as pegs, wedges, and possibly even anvils upon which marrow and grease bones were broken up for processing (cf. Billeck 1983e:742-746).

Plains Villagers occupying the Koehler site (32GT1) made and used a number of bone and antler tools. Identified forms include awls, spatulates, fleshers, a perforated rib tool, and a bone bead (Cooper 1958:Table 1). The majority of these items were likely used in hideworking and stone tool manufacture activities.

Seventeen stone bead artifacts, including one finished bead, 14 bead fragments, two bead blanks, and three pieces of manufacturing debris, were recovered from the Beadmaker site (32GT238) (Jackson et al. 2001:10.48). The majority of the beads came from hearth fill (ibid.). Made from a locally available silty mudstone, the items are disk-shaped with a central hole (ibid.). The beads recovered at the Beadmaker site closely resemble those from the Koehler site (32GT1), On-A-Slant Village (32MO26), and Huff Village (32MO11) (ibid.:10.54).

Plains Village groups undoubtedly undertook a variety of activities at campsites away from their earthlodge village locations. Lithic procurement and stone working of KRF were well represented at the Boulder site (Billeck1983e). Plochman et al. (1982:Table 6.3) also identified a number of lithic procurement/workshop sites around the Heart Butte Reservoir.

One of the hallmarks of the Plains Village lifeway was the production of well-made ceramic containers (cf. Cooper 1958:Plates 6, 7). Pottery samples from other sites in the basin such as 32MO72 (Billeck 1983e) are too small to draw many meaningful comparisons. Are there technologically diagnostic attributes of Plains Village ceramics such that small samples of body sherds from campsites could be identified as Plains Village?

Artifact Styles

The Plains Village stone tool aggregate from the Koehler site (32GT1) contains many patterned forms which are nearly identical to those from Heart River phase villages attributed to the Mandan near the Missouri-Heart River confluence (Cooper 1958:29). These include On-A-Slant (32MO26) and Double Ditch (32BL8). Small well-made side-notched arrowpoints are a frequent occurrence. The asymmetrical bifacial cutting tool is also common (Cooper 1958:Plate 9). Pottery remains recovered from the Koehler site share stylistic similarities in rim form and decorative attributes with Le Beau ware vessels from On-A-Slant village (cf. Breakey and Ahler 1985:Figure 2; Cooper 1958:25-26). How would it be possible to test the hypothesis that Mandan people from On-A-Slant village were the occupants of the Koehler site? Similarly, which Mandan village is the home of the Beadmaker site (32GT238) occupants?

Regional Interaction

Plains Village social interactions during prehistoric times, prior to the advent of the Fur Trade and the introduction of the horse, likely were dominated by contacts with neighboring earthlodge village communities. Lithic resources necessary for stone working were locally available. Sources of clay materials for making pottery were found locally. What did the Villagers need which could be acquired only by long-distance trade?

Historic Preservation Goals, Priorities, and Strategies

An effort should be made to build a Plains Village cultural chronology for the Heart River basin and compare it to the chronology for the upper Knife-Heart region. Were the Plains Village cultural developments of the Knife-Heart region paralleled in the Heart River basin? Stratified, multiple component Plains Village deposits in floodplain alluvial contexts would be ideally suited for such studies.

Equestrian/Fur Trade Period

The Equestrian Period in the HRSU virtually is unknown archeologically. This condition of the archeological record is much the same as reported by Paul Cooper (1947:2) during preliminary reconnaissance in the Dickinson area over 70 years ago.

Paleo-Environmental Modeling

During the period AD 1780-1880, what were the climatic conditions and floral and faunal resource potentials of the HRSU?

Cultural Chronology

During early historic times, the western reaches of the Heart River basin would have been frequented by various equestrian groups including Villagers from the Missouri River, the Crows, and the Teton Dakota (Cooper 1947:3). The earthlodge villages near the present-day Bismarck-Mandan community are thought to have been abandoned as a consequence of late 18th century depopulation resultant from plagues of European diseases which ravaged the sedentary village communities. What is the nature of material cultural complexes typical of native peoples who utilized the HRSU during this period?

Settlement Behavior

Stone circle sites are a common occurrence in the HRSU. Surely, some of these locations were repeatedly occupied by Equestrian groups during this general time span. What was the nature of native settlement here during the Equestrian period?

Native Subsistence Practices

Equestrian lifeways are often linked in peoples' minds with bison hunting on the northern Great Plains (Bamforth 1988:97). In other regions of North Dakota such as the Souris River, James River, and Sheyenne River SU, bison bone was a common occurrence on the prairies before it was gathered up between 1880 and 1910 by Euro-American settlers (Barnett 1972; Hecker, [State Archives](#)). Historic documents should be reviewed in an attempt to identify bone collecting locations in the Heart River basin which might have been the sites of Equestrian period bison kills. These sites could then be excavated to recover information concerning a variety of Equestrian period research topics.

Technologies

The horse and gun, along with a vast assortment of other items of Euro-American origin, were available to Northern Plains groups by the late 18th century (cf. Secoy 1953). Equestrian period sites are often identified by the recovery of trade goods such as gunflints, brass or iron arrowpoints, and glass beads. Villages along the Missouri River were focal points for receiving and distributing Euro-American goods in the fur trade (cf.

Wood 1972). What were the changes in the technologies of nomadic equestrian groups during the 100 year duration of the Equestrian period?

Artifact Styles

Distinctive stylistic elements of Native American origin dating to the Equestrian period are seen in hide paintings, winter counts on rawhide, petroglyphs and pictographs depicting horses and guns, and ledger book art. Some of these stylistic elements may have been incorporated in beadwork and quillwork, but these are not the sorts of artifacts preserved in open-air archeological sites in the Northern Plains. Are there any distinctively styled artifacts produced by Native Americans and diagnostic of Equestrian period groups in the HRSU?

Regional Interaction

Regional trade centers such as Fort Union and Fort Clark could have supplied some of these Native groups with goods of Euro-American origin in exchange for bison hides. Inter-tribal exchange relations were also far-flung during this period (cf. Wood 1972, 1974). This may be the only time period for which artifactual remains of nonlocal origin are more important for chronological considerations than artifacts produced within the SU.

Historic Preservation, Goals, Priorities, and Strategies

A sample of Equestrian period sites will someday be identified in the Heart River basin. Artifact content and information potentials ought to be assessed. Any site with potential to add information to these contexts should be considered eligible for listing in the NRHP. A review of historic records and documents could provide leads to sites of this period in the Heart River basin.