RED RIVER VALLEY WATER SUPPLY PROJECT CLASS I CULTURAL RESOURCES INVENTORY AND ASSESSMENT, EASTERN NORTH DAKOTA AND NORTWESTERN MINNESOTA

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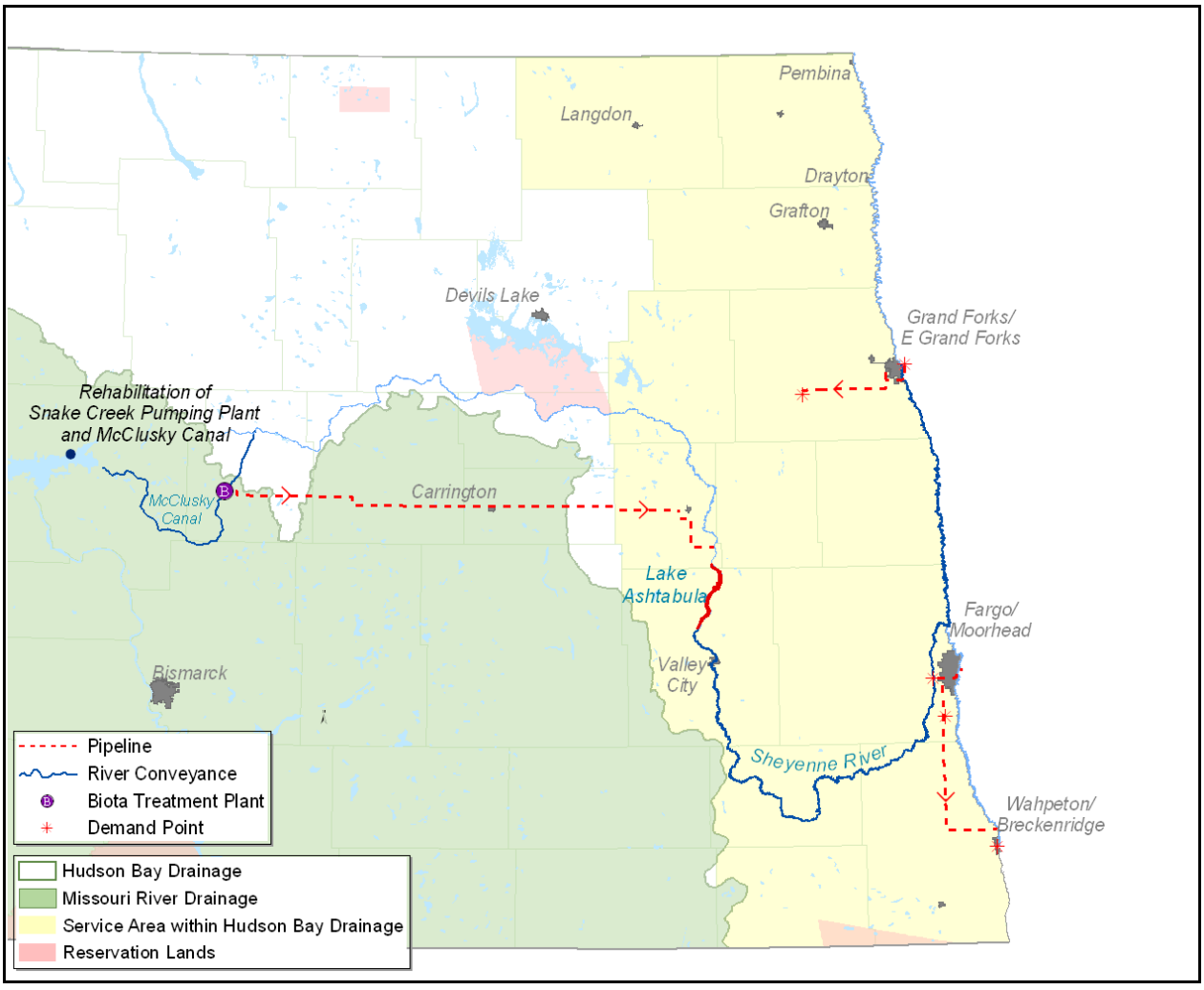

ABSTRACT

In 2004-2006, personnel from Anthropology Research, Department of Anthropology, University of North Dakota, Grand Forks, conducted a Class I inventory (file search) for the Red River Valley Water Supply Project (RRVWSP). This work was carried out in cooperation with the USDI Bureau of Reclamation, Dakotas Area Office, Bismarck, ND. The file search dealt with hundreds of cultural resource sites across much of eastern North Dakota and northwestern Minnesota. Archeological sites, architectural sites, site leads, and isolated finds were examined for 14 North Dakota counties and four Minnesota counties.

Five different action alternatives were investigated to determine the number and types of previously recorded cultural resources located within each. Each alternative was ranked in terms of its potential to cause impacts to cultural resources, both known and (presently) unknown. Analysis indicated that the Red River Basin Alternative (#3) has the largest potential for cultural resource site impacts. From a least-impact cultural resources perspective, the other four alternatives represent the best, least-impact options for construction of the RRVWSP.

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DESCRIPTION OF THE PROPOSED UNDERTAKING

Introduction

The Dakota Water Resources Act of 2000 charges the Secretary of the Interior with the implementation of a study on the water supply needs of the inhabitants of the Red River Valley in North Dakota over the next several decades, and to develop a number of alternatives for meeting those needs into the foreseeable future. Named the Red River Valley Water Supply Project (RRVWSP), the Dakotas Area Office of the USDI Bureau of Reclamation (Reclamation) has been designated as the lead federal agency in this endeavor, along with the Garrison Diversion Conservancy District (GDCD) as the lead state agency. Additional information on the Red River Valley Water Supply Project can be found on the internet at the RRVWSP web site (http://www.rrvwsp.com).

An important part of the study process for the RRVWSP is the preparation of an environmental impact statement (EIS) according to the guidelines set forth in the National Environmental Policy Act (NEPA). Under NEPA guidelines, consideration of potential impacts to cultural resources, such as archeological sites, architectural properties, and traditional cultural properties, is an integral part of the EIS. In this regard, Reclamation has entered into an agreement with the Anthropology Research section of the Department of Anthropology, University of North Dakota (UND), Grand Forks, to prepare a Class I (file and literature search) study of cultural resources located within the areas of potential effect for the various project alternatives. The findings of the Class I cultural resources study will be incorporated into the EIS, and used to consult with various interested parties, including the North Dakota and Minnesota State Historic Preservation Officers (SHPO), as well as appropriate Tribal Historic Preservation Offices (THPO).

This report presents the findings of the UND Class I cultural resources study of the RRVWSP. The study was conducted under the overall direction of Dennis L. Toom, Ph.D., the project principal investigator and director of UND Anthropology Research. The study was conducted under the authority of Task No. 22, Cooperative Agreement No. 00FC601382 between Reclamation and UND. Toom was assisted in the completion of the study by Michael A. Jackson, M.A., and Cynthia Kordecki, M.A., of the UND Anthropology Research staff. Mr. Jackson was primarily responsible for preparing Geographic Information Systems (GIS) databases and graphics for the project, as well as the analysis and reporting of such data. Ms. Kordecki's main responsibility was to gather the needed raw data from various sources and to prepare summaries of previous investigations. The late Kim Breakey, formerly of Schoell & Madson, Inc., Minneapolis, assisted with the compilation of data for the Minnesota portions of the project.

Class I Project Objectives

Quoting from the Task No. 22 Statement of Work (SOW), the objectives of the present study are as follows:

1) Identify previously recorded archaeological, historical, and architectural buildings, structures, sites, objects, and districts and properties of traditional religious and cultural importance listed in SHPO (and possibly THPO) site files, as well as site leads and isolated finds. Urban surveys of buildings will be included as a block rather than as individual properties.

2) Include evaluations of buildings, structures, sites, objects, and districts and properties of traditional religious and cultural importance with respect to their eligibility as historic properties (36 CFR Part 800.2[e]).

3) Identify and assess the adequacy of previous cultural resources inventories of substance that have occurred in the undertaking area of potential effects.

4) For each alternative, list cultural resources by county and SITS number in a table. Include the (1) SITS number, (2) site type, (3) brief description, (4) whether it has been evaluated or mitigated, and (5) National Register of Historic Places status (if it has been recommended eligible by a researcher, determined eligible by the lead federal agency in consultation with SHPO, or listed).

5) Compare alternatives in general terms suitable for inclusion in an EIS and in enough detail that SHPOs and THPOs can recommend a preferred alternative(s) to Reclamation. The report will also be used by Reclamation when consulting with SHPOs and THPOs regarding a Class II and/or Class III inventory of a preferred alternative.

6) Prepare a report using GIS maps provided by Reclamation for North Dakota and created by UND for Minnesota that show previous inventories and site locations.

Project Location and Alternatives

The overall study area for the Red River Valley Water Supply Project is located in parts of central and eastern North Dakota and northwestern Minnesota (Figure 1.1). West of the Red River, parts of 14 North Dakota counties are touched by the study area, including, from north to south, Grand Forks, Sheridan, Wells, Foster, Griggs, Steele, Traill, Burleigh, Kidder, Stutsman, Barnes, Cass, Sargent, and Richland counties. East of the Red River, parts of four Minnesota counties are situated in the study area, including, from north to south, Polk, Clay, Becker, and Otter Tail counties. Townships and counties per alternative for both states are summarized in Table 1.1 and detailed in Appendix A.

Within the general project study area for the RRVWSP, six alternatives have been developed for specific study. The six alternatives are listed below; additional information regarding each can be found on the RRVWSP web site:

1) No Action Alternative
2) North Dakota In-Basin Alternative (Figure 1.2)
3) Red River Basin Alternative (Figure 1.3)
4) Garrison Diversion Unit (GDU) Import to Sheyenne River Alternative (Figure 1.4)
5) GDU Import Pipeline Alternative (Figure 1.5)
6) Missouri River to Red River Valley Import Alternative (Figure 1.6)

All of the alternatives, with the exception of the No Action Alternative, are overlaid in Figure 1.1 and presented individually as Figures 1.2-1.6. The alternatives variously consist of pipelines and aquifer well fields. Linear features are two-mile-wide corridors (one mile on either side of a centerline) where pipelines are proposed. The block (polygon) features are aquifer well fields. The present study was designed to include data on recorded cultural resources within the two-mile-wide corridors and aquifer fields that make up the five action alternatives. The Sheyenne and Red rivers would be used to convey water in two of the action alternatives (#2 and #4). Hydrological models prepared by Reclamation indicate that such water conveyance, which will affect only low stream flows, will not result in any appreciable increase in stream bank erosion. In view of this, the Sheyenne and Red rivers were not included in the study areas of these two alternatives, nor in any of the other study areas, because the proposed project will have a net “no effect” on these rivers.

General Project Methodology and Data Sources

The present report is based on data on file and/or in computer databases at the Historic Preservation Division (ND-SHPO) of the State Historical Society of North Dakota, Bismarck, and at the Historic Preservation Department (MN-SHPO) of the Minnesota Historical Society, St. Paul. Other primary sources of data include the *Mn/Model Final Report 2002: A Predictive Model of Precontact Archaeological Site Location for the State of Minnesota* (Hudak et al. 2002), and *The North Dakota Comprehensive Plan for Historic Preservation: Archeological Component* (SHSND 1990). The Mn/Model is potentially a very useful document for purposes of the RRVWSP cultural resources study in Minnesota.

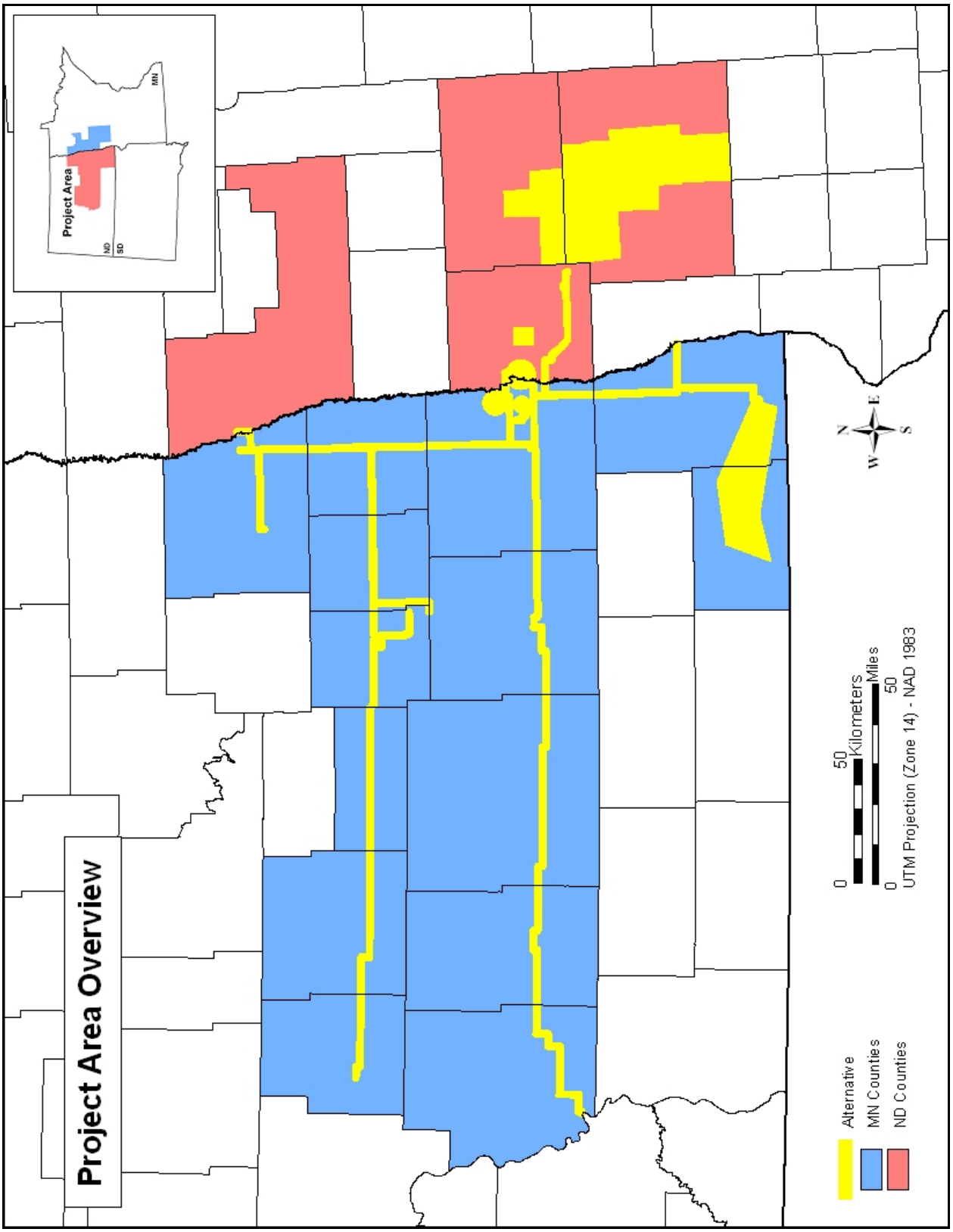

Figure 1.1. Overview map of the Red River Valley Water Supply Project, 2004-2006 UND investigations.

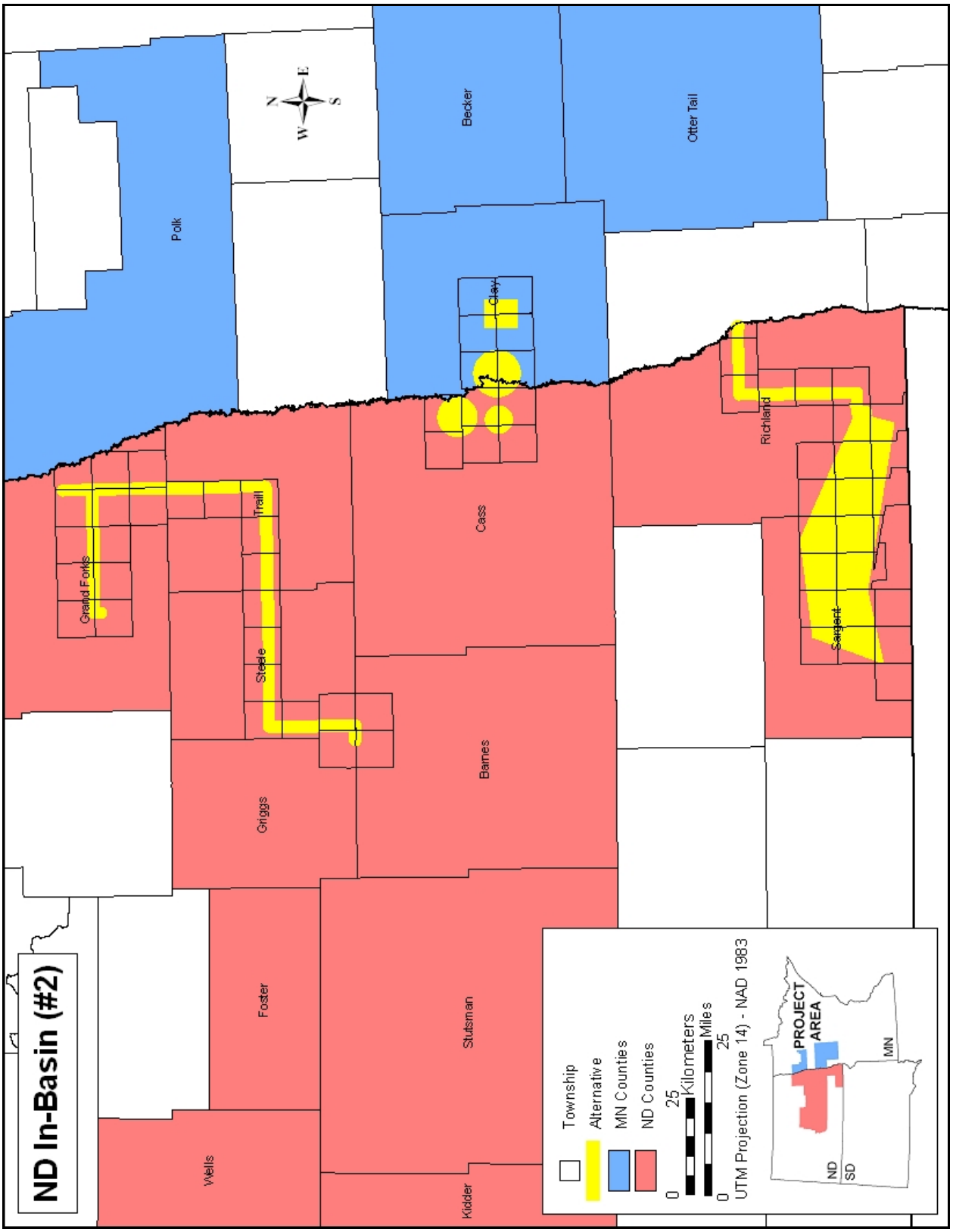

Figure 1.2. Map of the North Dakota In-Basin Alternative (#2), Red River Valley Water Supply Project, 2004-2006 UND investigations.

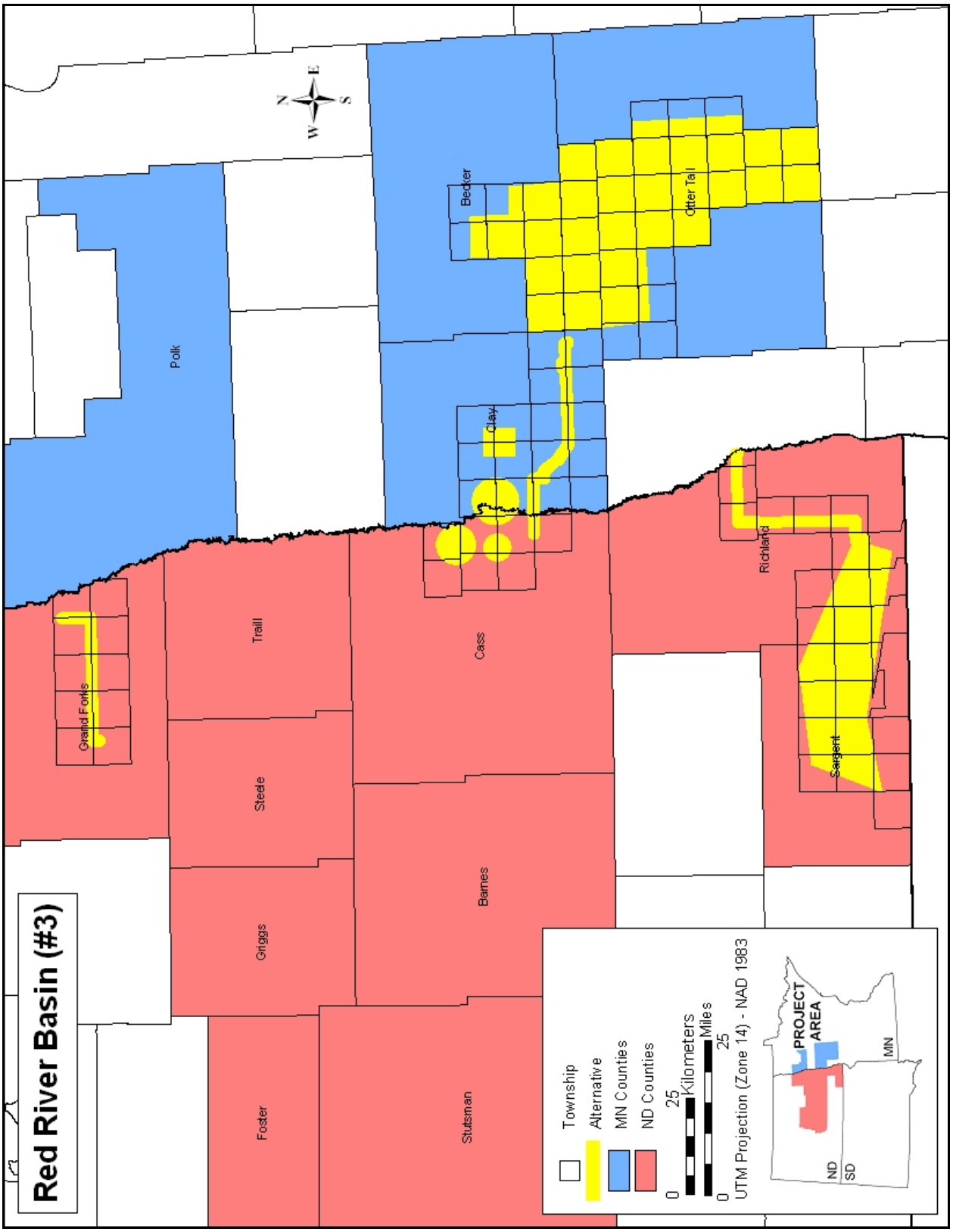

Figure 1.3. Map of the Red River Basin Alternative (#3), Red River Valley Water Supply Project, 2004-2006 UND investigations.

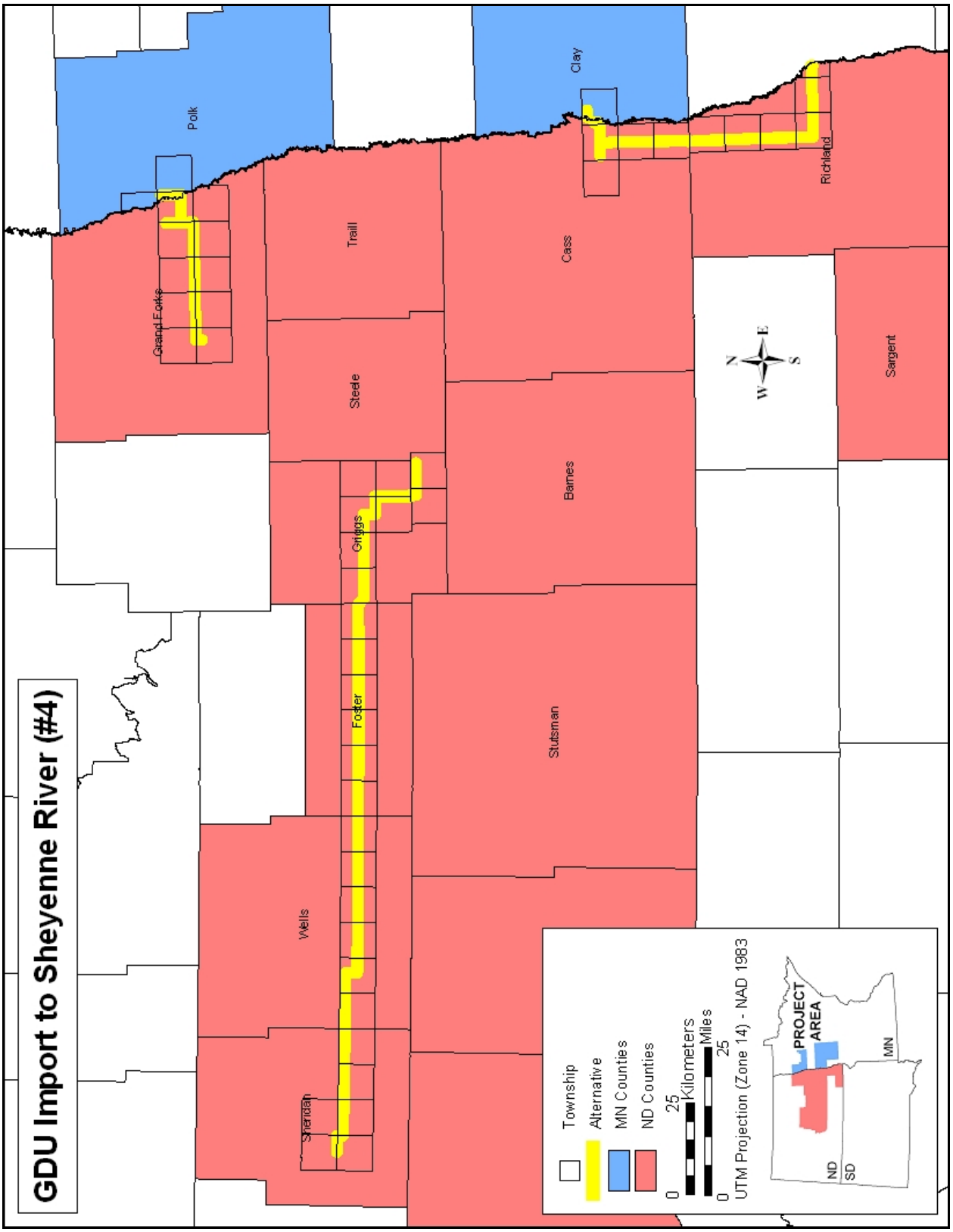

Figure 1.4. Map of the Garrison Diversion Unit Import to Sheyenne River Alternative (#4), Red River Valley Water Supply Project, 2004-2006 UND investigations.

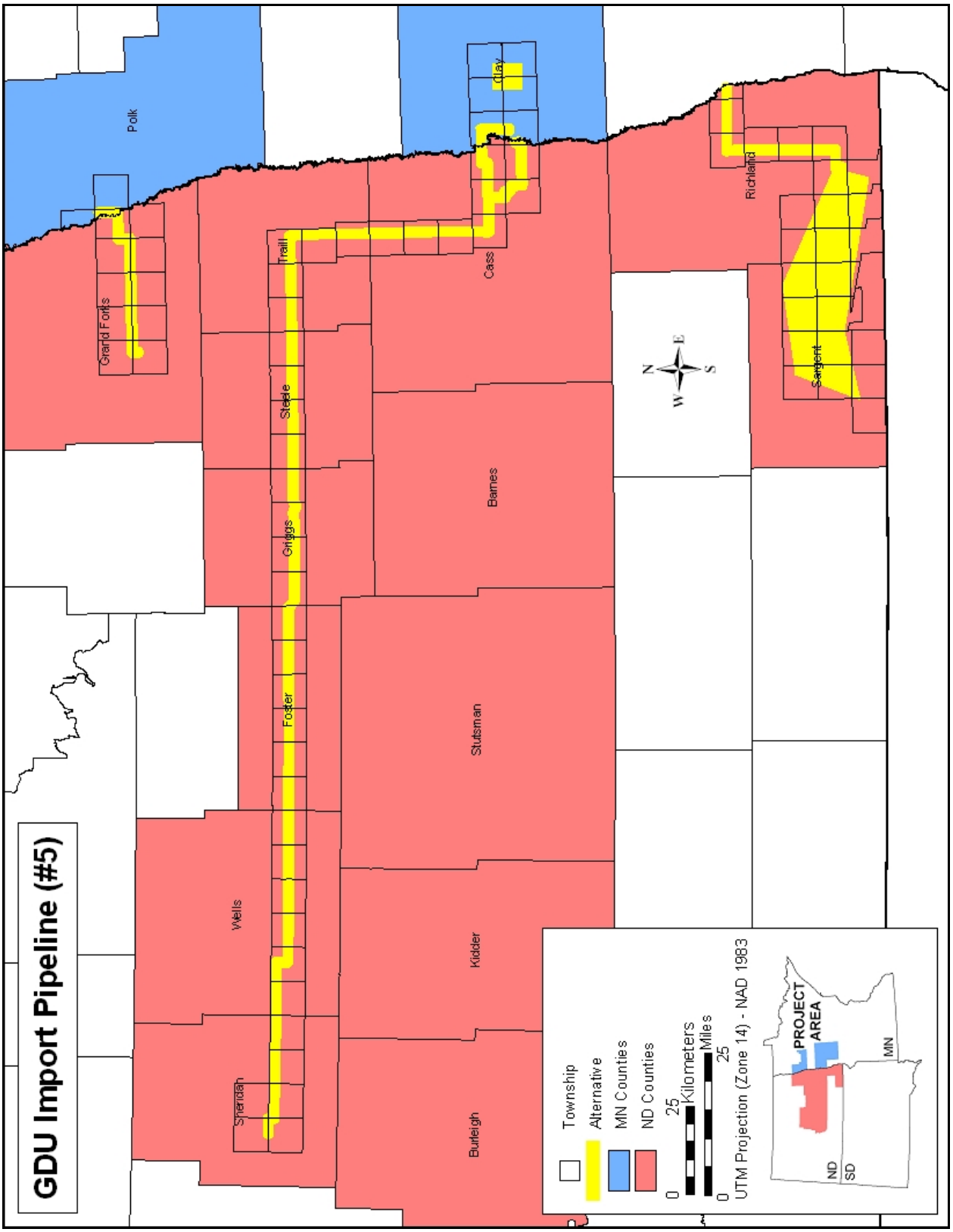

Figure 1.5. Map of the Garrison Diversion Unit Import Pipeline Alternative (#5), Red River Valley Water Supply Project, 2004-2006 UND investigations.

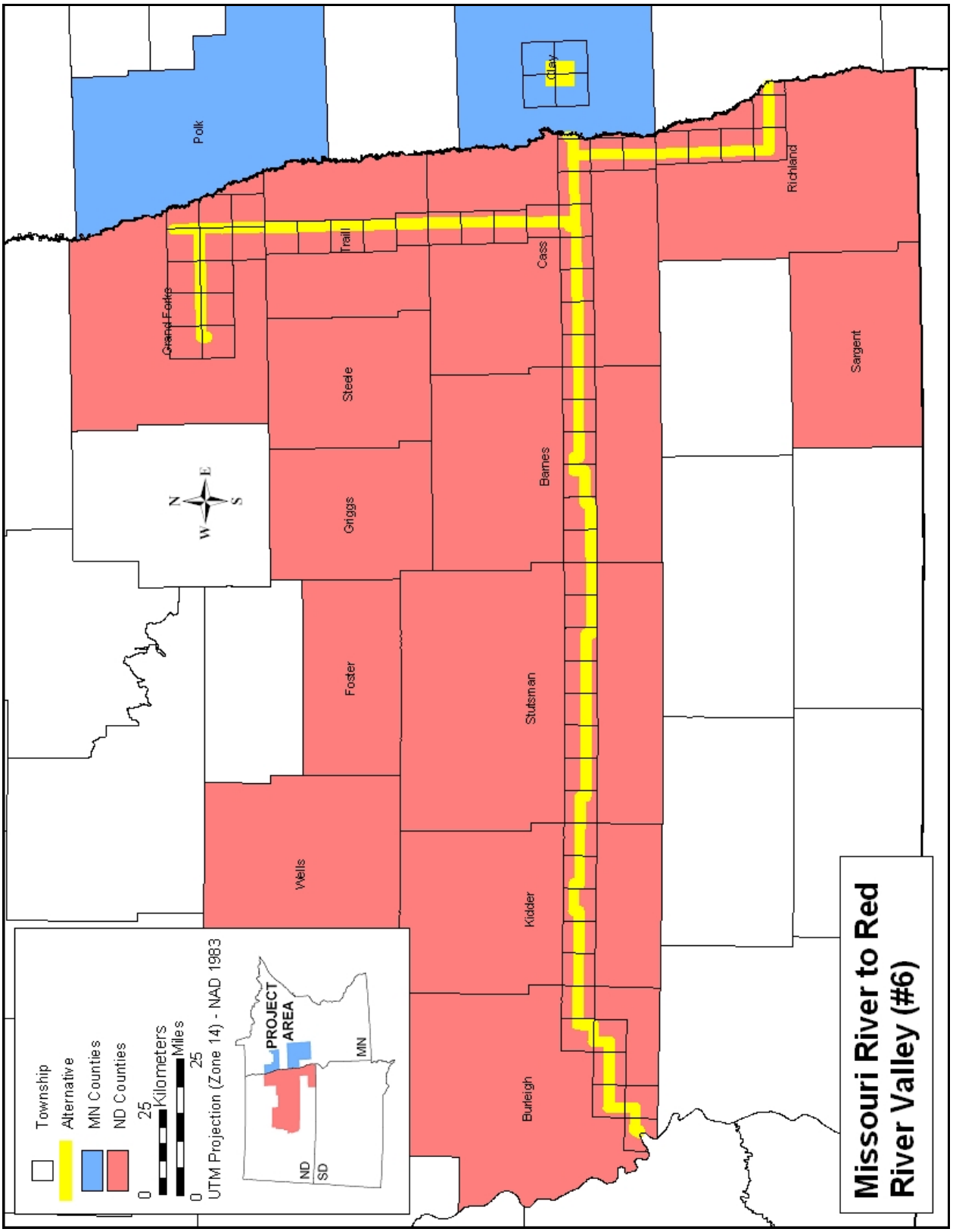

Figure 1.6. Map of the Missouri River to Red River Valley Import Alternative (#6), Red River Valley Water Supply Project, 2004-2006 UND investigations.

Table 1.1. Summary of Counties and Townships in the Project Area According to Proposed Alternatives, Red River Valley Water Supply Project, 2004-2006 UND Investigations.

No.	Alternative	Counties (n)		Townships (n)	
		ND	MN	ND	MN
No Action Alternative					
1	No Action	N/A	N/A	N/A	N/A
In-Basin Alternatives					
2	North Dakota In-Basin	8	1	61	7
3	Red River Basin	4	3	47	54
Import Alternatives					
4	Garrison Diversion Unit (GDU) Import to Sheyenne River	7	2	47	4
5	GDU Import Pipeline	10	2	78	10
6	Missouri River to Red River Valley Import	8	1	63	4

We were not able to realize the full potential of the Mn/Model for the present report because of certain time constraints. The Mn/Model was used as an important source of background information on Minnesota for this report. However, we believe that the predictive components of the model may hold important implications for the Minnesota portions of the study and should be given detailed consideration in the next phase of research. The Mn/Model may be accessed on-line at the following URL: (http://www.mnmodel.dot.state.mn.us).

Data on Minnesota cultural resource sites and related reports are extensively computerized and readily accessible to researchers. Unfortunately, the same cannot be said for North Dakota. Comparatively little computerization of data on North Dakota cultural resource sites and reports has been accomplished, at least in a form that is easily accessed by outside researchers, requiring researchers to rely for the most part on cumbersome paper records. Thus, the North Dakota part of the study required original entry of a considerable volume of data into computer databases for use in the present study. Such was not the case for Minnesota, as its site and report data were easily adapted to the needs of the study. Because of its lack of computerization, and the substantial amount of original data entry required for this study, the North Dakota information cannot be considered as accurate and comprehensive as the Minnesota data.

Cultural resource site locations and pertinent site data were organized in a Geographic Information System (GIS). The software program ArcGIS 9.1, produced by ESRI, Inc., was used for this project. North Dakota site locations were provided by Reclamation. Pertinent data for North Dakota sites was acquired by archival research (Kordecki) at the ND-SHPO, Bismarck. Minnesota site locations were extracted from a database provided by the MN-SHPO. Likewise, pertinent data for Minnesota sites was provided in the same database. The locations of pipelines and aquifer well fields were provided by Reclamation. Additional GIS data necessary to the project (state and county outlines, township-range-section information, municipal city outlines, etc.) were downloaded from three state clearinghouses for GIS data on the web:

- MN Department of Natural Resources Data Deli (http://deli.dnr.state.mn.us/).
- ND GIS Hub (http://www.state.nd.us/gis/).
- MN Dept. of Transportation, Office of Data and Analysis (http://www.dot.state.mn.us/tda/basemap/).

Specific File Search Methodology

The methods used in the Class I inventories (file searches) were quite different for North Dakota and Minnesota portions of the RRVWSP. For this reason, the work conducted for each state is discussed separately.

The North Dakota file search was conducted in two parts. The first part was carried out by Mr. Davin Olson, an intern with the Dakotas Area Office, USDI Bureau of Reclamation. Mr. Olson queried the ND-SHPO site location database for all cultural resource sites located within project area sections, which produced an extensive list of sites. Next, Mr. Olson pulled the site file folders to obtain the site plot, located on a copy of a 7.5' USGS quadrangle map included with most site forms; some of the site leads and isolated finds lacked such maps. Site locations were then digitized to computer. Sites were added to one of two ESRI shapefiles according to county. Most individual site locations were plotted in a shapefile composed of polygons, while a few of the small sites, site leads, or isolated finds were added to a separate shapefile composed of individual points. Urban surveys of buildings were included as a block, named for the city containing the sites, rather than as individual properties. All sites were plotted using Universal Transverse Mercator (UTM) Zone 14 coordinates referenced to the North American Datum of 1983 (NAD83).

At the same time, Mr. Olson examined the manuscript library at the ND-SHPO to find the locations of surveyed areas. Areas that had been surveyed were digitized to computer and two shapefiles were created for each county. The first shapefile contained polygons that represented block surveys. The second shapefile contained lines that represented linear surveys. These data were also plotted according to UTM-NAD83 (Zone 14) coordinates.

The site and survey shapefiles were delivered to UND, and a master set of shapefiles was compiled from these for the state. Data proofing and editing was then conducted by UND. A master list of site numbers per alternative was extracted from the GIS and imported to a MS Access® database. Ms. Cynthia Kordecki (UND) then returned to the ND-SHPO office to obtain pertinent attribute data for each of the cultural resource sites. These data were entered into the database and included information such as site type, age, previous investigations, National Register eligibility status, and so on (see Appendix B). Lastly, most alternatives' routes were modified by Reclamation during the course of this project. This necessitated an updated search of the state site files and report manuscripts. This work was completed by Mr. Jackson, of UND. Given the time constraints, the locations of surveyed areas in the newly examined sections were not digitized to computer.

The process of acquiring site data was much less complicated for Minnesota. The MN-SHPO maintains a large quantity of information in a database for each recorded site in Minnesota. Virtually all information recorded on a cultural resource site form can be found in this database. The only information not included in the database are site locations plotted on 7.5' USGS quadrangles. A list of project area townships and ranges was submitted to the MN-SHPO. Mr. Tom Cinadr, MN-SHPO Inventory and Information Management Coordinator, extracted data for all cultural resource sites located within the queried area and provided this information to UND on cd-rom.

Site locations were extracted from a file containing UTM coordinates for each site. UTM coordinates in Minnesota are set in Zone 15 and referenced to the North American Datum of 1927 (NAD27). These data were imported into the GIS as points. These data were then reprojected to UTM-NAD83 (Zone 14) coordinates to be consistent with North Dakota site locations. A few Minnesota sites lacked UTM coordinates, so these were manually digitized using township, range, section, and quarter-quarter-quarter data.

Next, data editing was required to remove (1) cultural resource sites located outside the project area, and (2) historic structures in the project area within urban survey blocks. Cultural resource sites outside of project area aquifers and corridors, but within the queried townships and ranges, were removed by a series of simple GIS queries. To remove sites within urban survey blocks, a shapefile of city boundaries was used to select and remove historic structures falling within city boundaries. City boundaries containing historic structures were exported to a new polygon shapefile reserved for urban survey blocks.

The master list of Minnesota sites per alternative was exported from the GIS and imported into the MS Access® project database. These data were added to the master list of site numbers already created for the North Dakota portion of the project. This master site list table was then linked to two tables containing cultural data for (1) archeological sites and (2) architectural structures. Very different information is collected for archeological and structural sites in Minnesota (see Appendices C and D), which makes the separation into two files a necessity. In Minnesota, Smithsonian Institution Trinomial Site (SITS) numbers are assigned to archeological sites, while an inventory number was assigned to architectural sites. The latter is a trinomial code identifying the county, civil subdivision, and the individual property number.

Lastly, the locations of previous cultural resources surveys were not digitized and plotted for Minnesota in the project GIS. No extensive and substantive surveys have occurred in the Minnesota portions of the study area. The surveys that have been done were mainly small, linear inventories for specific development projects whose locations are not readily available on a single set of quadrangle maps. Therefore, because of the low value of the information, as well as time constraint factors, no attempt was made to sift through the large volume of survey reports to acquire and map the locations of past surveys in the Minnesota study area.

Chapter 2
ENVIRONMENTAL AND CULTURAL SETTING

Physiographic Overview of Eastern North Dakota

North Dakota is a northern prairie state with a semiarid, continental climate. Prior to European American settlement, mixed grass prairie communities dominated the landscape. Roughly bisecting the state diagonally is the Missouri Escarpment (Figure 2.1), a prominent feature that marks the contact between the two physiographic provinces within the state, the Central Lowlands in the east and the Great Plains in the west (Fenneman 1931; Thornbury 1965). The Missouri Escarpment is the eastward facing edge of the Missouri Plateau section of the Great Plains and is manifest as a slope some 5 to 20 miles in width and several hundred feet high (Fenneman 1931:74).

The rolling prairie landscape of much of the state is a result of glaciation. The final retreat of the continental ice sheet, at about 8000 B.C., left much of the state covered with hundreds of feet of glacial till over bedrock formations. The flat and fertile Red River Valley in the eastern part of the state was covered by glacial Lake Agassiz (Figure 2.1). The valley is characterized by lake-bottom sediment near the Red River and beach ridges farther west. The Pembina Escarpment is an abrupt rise in elevation that marks the boundary of the lake plain. The Red River flows north, ultimately draining to Hudson Bay.

The extensive glaciated area west of the Red River Valley and extending to the Missouri Escarpment is known as the Drift Prairie, or Glaciated Plains (Bluemle 1991). The surface features of the Glaciated Plains are attributed to the orderly retreat of the glacial ice mass, with occasional halts and minor readvances (Winters 1963:47). The Glaciated Plains are characterized by generally flat terrain made up of ground moraine and glacial outwash; most visible features are meltwater channels, kames, eskers, low hummocky end moraines, and washboard moraines (Clayton and Freers 1967). Drainage is integrated only along the edges of large meltwater channels on the Glaciated Plains, and shallow seasonal pothole lakes are not uncommon. Other prominent features of the Glaciated Plains are the Devils Lake Basin, the Turtle Mountains, and the Souris Plain (Figure 2.1).

The major streams dissecting the Glaciated Plains are the Sheyenne and the James rivers, young and poorly defined drainage systems formed by glacial meltwater. The surface of North Dakota slopes generally northeastward and prior to glaciation all drainage was toward Hudson Bay. Glacial sediments blocked old drainage routes and forced new ones to form. Approximately 40% of the state is drained northward by such rivers as the Souris, Sheyenne, and the Red River of the North (Bluemle 1991:6). The James River, along with all the rivers in the western part of the state, drains the remaining 60% of the state into to the Missouri River; this runoff ultimately makes its way to the Mississippi River and the Gulf of Mexico.

The elevated plain west of the Missouri Escarpment is known as the Missouri Plateau. In North Dakota, the Missouri River bisects the Missouri Plateau in a general northwest to southeast direction, dividing it into glaciated and unglaciated sections, with the Glaciated Missouri Plateau section located to the north and east of the Missouri River, and the Unglaciated Missouri Plateau section located to the south and west (Thornbury 1965:289-290). Three physiographically distinct areas of the Missouri Plateau have been identified and mapped in North Dakota, and these finer subdivisions are most often used for purposes of detailed discussion: the Missouri Coteau, the Coteau Slope, and the Missouri Slope (Figure 2.1). The Missouri Coteau and the Coteau Slope are within the Glaciated Missouri Plateau section, and the Missouri Slope is within the Unglaciated Missouri Plateau section. The hummocky Missouri Coteau area is the result of large-scale glacial stagnation, rather than normal ice recession (Clayton and Freers 1967:5). The rather rugged landscape of closely spaced hills and depressions are primarily dead-ice moraine deposits (Bluemle 1988:8; Clayton 1967:27). Glacial advances overrode the steep Missouri Escarpment, repeatedly carrying drift material up onto the plateau and depositing sediments on top of stagnant ice. The hilly topography of the Coteau is the result of the melting ice dropping sediments on the plateau (Bluemle 1988; Clayton 1967). Drainage on the Coteau is almost completely nonintegrated. Streams are absent, but pothole lakes and sloughs occupy the numerous glacial depressions.

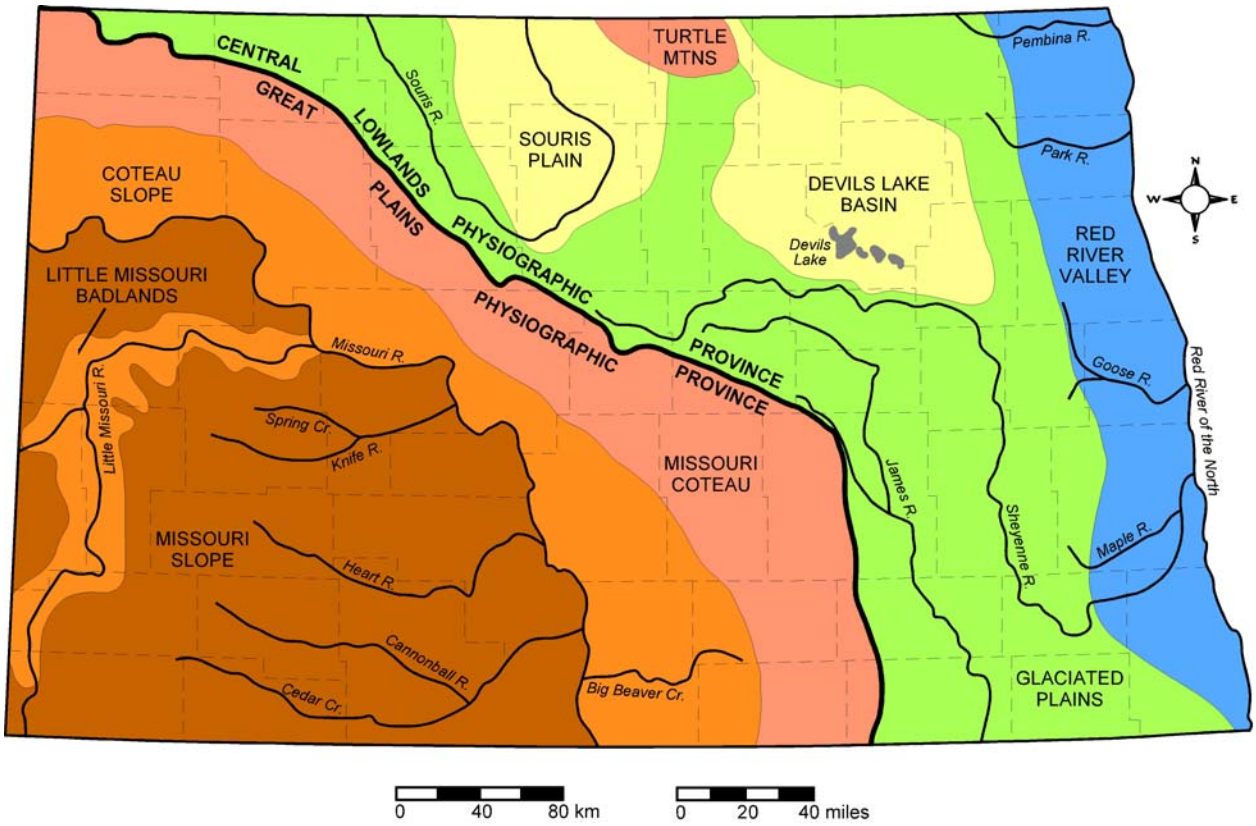

Figure 2.1. Physiographic map of North Dakota (adapted from Bluemle 1991:Figure 1).

The Coteau Slope is that area between the Missouri Coteau and the Missouri River, consisting of rolling to hilly plains that have both erosional and glacial landforms. Gentle slopes characterize 50 to 80 percent of the area and local relief ranges from 300 to 500 feet (Bluemle 1991:4). Minor tributaries flow west and south to the Missouri River.

The Missouri Slope is that portion of the plateau west of the Missouri River. Thin glacial deposits are found near the river, but most of the Missouri Slope consists of easily eroded sedimentary rock (Bluemle 1991:5). The topography, primarily the result of erosion, is rolling to hilly with many high, flat-topped buttes. Numerous streams that flow to the Missouri River, including the Heart and the Cannonball rivers, have cut into the soft sands and clays. Badlands topography has developed near some streams, especially along the Little Missouri River.

That part of the Red River Valley Water Supply Project study area located in North Dakota is principally within the eastern part of the state, but two alternatives begin in central North Dakota. The Missouri River to Red River Valley Import Alternative (#6) begins at the Missouri in south-central North Dakota just south of Bismarck. It crosses the Missouri Coteau region of the Great Plains province, bringing Missouri River water to the eastern part of the state. The very western end of the two GDU alternatives (#4 and #5), located in central North Dakota, begin at the McClusky Canal, just north of the city of McClusky, on the eastern margin of the Missouri Coteau. The rest of the alternatives, as well as the eastern parts of the three aforementioned alternatives, are within the Central Lowlands province, including portions of the Glaciated Plains and Red River Valley regions.

Cultural-Historical Overview of Eastern North Dakota

Eastern North Dakota occupies the Northeastern subarea of the Great Plains culture area of North America. The Missouri River valley proper and its immediately adjacent upland plains are within the Middle Missouri subarea of the Plains (see Wood 1998). Except for the very western end of the Missouri River to Red River Valley Alternative, which is in the Middle Missouri subarea, the rest of the RRVWSP alternatives, including most of the Missouri River to Red River Valley Alternative, are in the Northeastern Plains subarea. The *North Dakota Comprehensive Plan for Historic Preservation*, often called the State Plan for short, divides the state into 13 study units based on the segmentation of major river basins (see SHSND 1990). The greater RRVWSP study area includes parts of the following study units in central and eastern North Dakota: Southern Missouri River, Sheyenne River, James River, Northern Red River, and Southern Red River. These comprise all of the study units in the eastern half of the state, excepting only the Souris River study unit.

Human occupation of North Dakota is documented as early as 12,000 years ago, first by American Indian (Amerindian) peoples and much later by European Americans (Euroamericans) in recent historic times. In order to organize and interpret this broad sweep of human time, a general taxonomic model has been developed for the prehistoric and historic cultures of eastern North Dakota (Figure 2.2). Based in part on an organizational structure originally proposed by Schneider (1982a) for the James River valley of North Dakota, the model uses conventional terminology to identify and order broadly defined archeological cultures, including named traditions and certain named complexes (see SHSND 1990). The model is organized according to five basic cultural periods: (1) Paleoindian, (2) Plains Archaic, (3) Plains Woodland, (4) Plains Village, and (5) Historic. For the most part, the periods are named for the cultural traditions that predominated during those times. The first four periods refer to prehistoric Amerindian cultural traditions, with the Plains Village tradition extending into early historic times. The Historic period encompasses that span of time following the decline of the Plains Village tradition and the rise of the Plains Equestrian tradition, as a result of the introduction of the horse and European manufactured trade goods and epidemic diseases among native peoples. It subsumes Amerindian lifeways during protohistoric and early historic times in the Northern Plains, from about A.D. 1750-1880. Later in the Historic period, at the end of the Plains Equestrian tradition, by ca. A.D. 1880, the Euroamerican tradition becomes dominant.

Paleoindian Period (9500-5500 B.C.)

The Paleoindian period has been provisionally dated to approximately 9500-5500 years B.C. The date range of this period is based mainly on Paleoindian finds elsewhere in the Great Plains because the number of Paleoindian artifacts and sites identified in eastern North Dakota is minimal at best (Gregg et al. 1996; Schneider 1982b). This period began with the initial entry of humans into the Northeastern Plains following the retreat of the last Pleistocene glaciers. These Paleoindian peoples exhibited nomadic settlement patterns and subsistence economies based on hunting and gathering that were adapted to late Pleistocene and early Holocene climates, animals, and plants. The period was characterized by a highly visible emphasis on the exploitation of Pleistocene megafauna, leading some to refer to Paleoindian as the Big Game Hunting tradition (Willey 1966). Most of the evidence regarding Paleoindian subsistence has been garnered from the excavation of kill sites, mainly found in the southern and western Great Plains. Nonetheless, these people must have also focused on the gathering of wild plant foods, as have all subsequent Northern Plains hunter-gatherers. Much less is known concerning the exploitation of plant resources during this period than for any of the subsequent periods.

Various types of lanceolate spear points are distinctive of this period, and their wide geographic distribution across North America indicates the presence of geographically extensive interaction networks between social groups (Hayden 1982). Distinctive and expertly-crafted point types of the Paleoindian period include Clovis, Goshen, Folsom, Agate Basin, Hell Gap, Cody complex (Alberta, Scottsbluff, and Eden), Parallel-Oblique Flaked (e.g., Angostura, Milnesand, and Lusk), Pryor Stemmed, and Caribou Lake (see Frison 1991; Hofman and Graham 1998; Wedel 1961; Willey 1966; Wormington 1957).

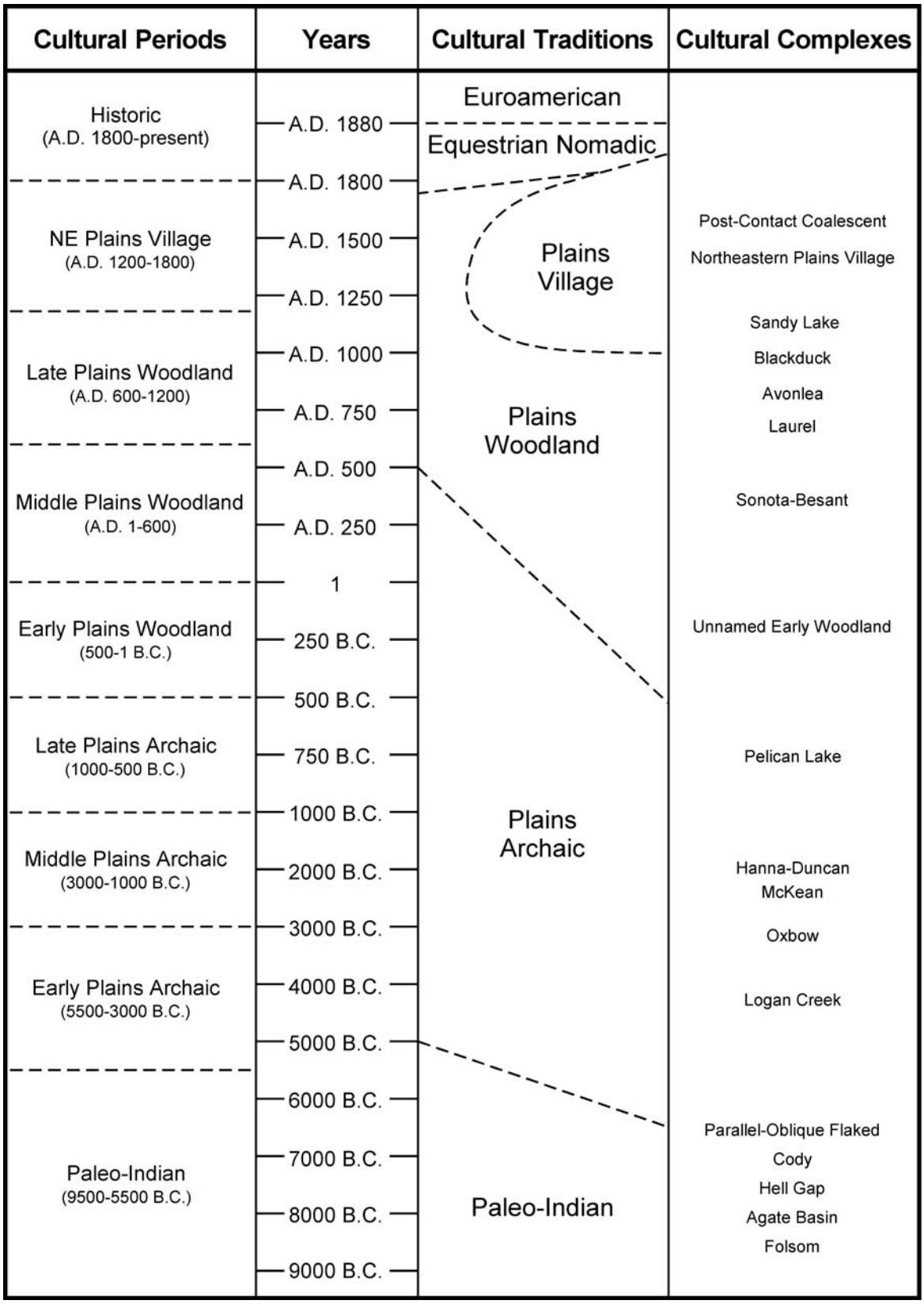

Figure 2.2. Cultural-Chronological model of Eastern North Dakota (from Toom et al. 2002:Figure 3.1).

Plains Archaic Period (5500-500 B.C.)

The Plains Archaic period follows the Paleoindian period, spanning from approximately 5500-500 years B.C. Relatively few Plains Archaic sites have been identified in eastern North Dakota, and even fewer have been extensively investigated. Most of what we know about the period in the Northern Plains is based on research in the Northwestern subarea (e.g., see Frison 1991). The period is characterized as an extension of the nomadic hunting and gathering adaptation from the preceding period, but adapted to essentially modern (Holocene) climate, fauna, and flora (Anderson 1980; Frison 1991, 1998; Gregg 1985; Gregg et al. 1996). Bison remained the principal quarry of these people, although deer, elk, and moose were exploited along the prairie/woodland border. There is also evidence for intensified seed and plant gathering and processing during the Plains Archaic. Other changes occurred during the Plains Archaic, and these generally consisted of the adoption of the atlatl and dart, and an overall decline in the quality of flintknapping. Most excavated Plains Archaic sites in North Dakota are in the western part of the state (e.g., Toom and Gregg 1983), reflecting adaptation to the more arid Plains environment. However, recent archeological investigations have documented Early Archaic bison processing sites in eastern North Dakota as well (Larson and Penny 1991; Michlovic and Running 2003).

The period is divided into Early Plains Archaic (5500-3000 B.C.), Middle Plains Archaic (3000-1000 B.C.), and Late Plains Archaic (1000-500 B.C.) sub-periods primarily on the basis of distinct projectile point types, which were widely distributed throughout the Northern Plains. Prominent Early Plains Archaic complexes include Logan Creek/Simonsen, Hawken, and Oxbow, defined on the basis of distinctive types of side-notched dart points. The McKean complex is characteristic of the Middle Plains Archaic period, with its McKean Lanceolate and Duncan/Hanna stemmed point types. The Pelican Lake complex, identified by the corner-notched Pelican Lake dart point, was the most prominent and widespread Late Plains Archaic complex yet identified.

Plains Woodland Period (500 B.C.-A.D. 1200)

Plains Woodland lifeways are thought to have shared many similarities with those of the Plains Archaic, particularly subsistence economies based on hunting and gathering. However, the practice of mound burial, possibly indicative of more complex ceremonialism, the production and use of ceramic vessels, and the first use of the bow and arrow, all appear to have been developments unique to Plains Woodland. It is also possible that garden agriculture, or horticulture, makes its first appearance during Plains Woodland times, but clear, unequivocal evidence of horticulture is lacking in the Northeastern Plains prior to the Plains Village period. In keeping with the horticulture hypothesis, it also has been suggested that Plains Woodland peoples enjoyed a somewhat more settled lifeway, going from the fully nomadic settlement pattern of the Plains Archaic to a semi-nomadic pattern.

Artifact assemblages of the Plains Woodland tradition reflect the introduction of ceramic technology and the acquisition of exotic trade materials. Late in the tradition, the transition from dart or spear points to arrow points can be seen in weapons technology. The lifeway is characterized by increased sedentism, population growth, and the construction of earthen burial mounds (Caldwell and Henning 1978; Johnson 1988; Johnson and Johnson 1998; Neuman 1975). The appearance of Plains Woodland in eastern North Dakota is an extension of the general Woodland lifeway that flourished throughout the Midwest, to the east and southeast, at this time. Again, adaptation to the plains-prairie environment resulted in a distinctive subsistence pattern that relied heavily upon bison hunting. Plains Woodland campsites generally are identified where river and stream valleys extended into the Plains proper, affording a riparian setting for the establishment of base camps (Caldwell and Henning 1978; Gregg and Picha 1989; Gregg et al. 1996).

Burial in earthen mounds, a hallmark of the general Woodland tradition, is thought to have had its inception at the beginning of the Middle Plains Woodland period in the eastern Dakotas. There is archeological evidence that bison played a key role in burial ceremonialism (Neuman 1975; Wedel 1961:221). That extensive trade systems were utilized during this time is evidenced by nonlocal materials such as marine shell, native copper, and exotic lithic materials often found in mortuary contexts, placed in the mounds with the burial as grave goods (Howard 1953; Neuman 1975; Snortland 1994). The phenomenon of mound building itself reflects diffusion of a unique burial practice from its prehistoric cultural center in the eastern United States.

Like the Plains Archaic period, Plains Woodland is divided into Early (500 B.C.-A.D. 1), Middle (A.D. 1-600), and Late (A.D. 600-1200) sub-periods. Early Plains Woodland manifestations are rare, typically blending with or being virtually indistinguishable from those of the antecedent Late Plains Archaic, except for the telltale presence of pottery and, seemingly, a reduction in projectile point size. This first use of ceramic vessels in the Northern Plains, a key change in material culture, signals the beginning of what is often referred to as the ceramic period. The ceramic period is a generic time frame encompassing both the Plains Woodland and Plains Village periods when the use of native-made ceramic vessels is a key diagnostic attribute. Our best look to date at Early Plains Woodland comes from the Naze site (32SN246) on the upper James River (Gregg ed. 1987; Gregg and Picha 1989). At Naze, the earliest Woodland levels contained small corner-notched projectile points, conical-shaped pottery vessels, and the remains of the oldest known house in North Dakota (Gregg 1990). Similar small projectile points, apparently in association with early pottery, were identified at the nearby Nelson site and attributed to an Early Plains Woodland occupation (Toom and Jackson 2003). These have been named the Naze point group after the original type-site.

Middle Plains Woodland manifestations are relatively common in eastern North Dakota, especially in the upper James River valley, suggesting that population was increasing (Gregg and Picha 1989). Mound burial and mortuary ceremonialism are postulated to have begun at this time, as mentioned above. The period continues until the introduction of the bow and arrow, signaling the start of the Late Plains Woodland period. Group interaction networks were extended considerably over what they had been earlier. For example, Knife River flint from western North Dakota was traded into Hopewell and other Eastern Woodland sites at this time (Benn 1983; Clark 1984). Western obsidian was also exchanged over vast regions of North America during Middle Woodland times, some of it passing through North Dakota (Baugh and Nelson 1988). On this basis, it seems certain that Middle Woodland peoples in eastern North Dakota were articulated to some extent with the Hopewell Interaction Sphere in the Midwest. The Sonota complex, originally defined by Neuman (1975), is the only widely recognized cultural complex of the Middle Plains Woodland period in eastern North Dakota. Sonota is defined on the basis of Besant-type side-notched dart points, conoidally shaped ceramic vessels, and earthen burial mound features. There is also some suggestion of a Laurel complex presence in eastern North Dakota at this time (Schneider 1982a:117-119). Identified on the basis of its distinctive ceramics and construction of earthen burial mounds, Laurel is best known from sites in the adjacent Eastern Woodlands area and was once widely distributed throughout the northern mid-continent, including northern Minnesota (Anfinson et al. 1978; Stoltman 1973).

The introduction of the bow and arrow and changes in ceramic technology and style mark the transition from the Middle to the Late Plains Woodland period. Improvements in ceramic technology at this time enabled the production of thinner and better made vessels, a trend that carries over into the succeeding Plains Village period. Ceramic vessel shapes also change from Middle to Late Plains Woodland times. Middle Plains Woodland vessels were typically unshouldered and conical shaped, while the shapes of Late Plains Woodland vessels tended to be more globular with distinctive shoulders, like those of the Plains Village period. Use of the bow and arrow, as indicated by the presence of various styles of small-sized arrow points, also signals the beginning of the late prehistoric period. The more general late prehistoric period, encompassing Late Plains Woodland and Plains Village times, ends at the beginning of the Historic period and the widespread changes in traditional native cultures that it ushered in. Little is presently known about specific Late Woodland cultural complexes in eastern North Dakota. However, Sandy Lake, Blackduck, St. Croix, and Brainerd pottery, all centered in the woodlands of northern Minnesota, have been identified in Late Plains Woodland assemblages in eastern North Dakota (Gregg et al. 1996:85-86; Schneider 1982a; Toom 2000, 2003). The Arvilla complex, another Late Woodland archeological manifestation, was located in the Red River Valley of eastern North Dakota and northwestern Minnesota (Johnson 1973).

Up until a few years ago, the ending date of the Plains Woodland period in eastern North Dakota was generally placed at ca. A.D. 1000, based for the most part on Middle Missouri subarea cultural-chronological interpretations. However, on the basis of new information from the Kirschenman-III site on the James River (Toom 2003), as well as an in-depth analysis of the succeeding Northeastern Plains Village complex (Toom 2004), we are now able to more precisely place the Plains Woodland to Plains Village transition at ca. A.D. 1200 in eastern North Dakota. This is an important refinement because it shows a 200-year lag in the development of the Plains Village tradition in this part of the Northeastern Plains.

Minnesota Woodland Period (500 B.C.-A.D. 1700)

It is obvious from the preceding discussion that some specific mention must be made of Woodland culture in Minnesota, because certain ceramic types identified in eastern North Dakota sites, such as the Horner-Kane (Toom 2000) and Bivouac sites on Devils Lake (Jackson and Toom 2004) and the Kirschenman-III site on the upper James River (Toom 2003), are directly relatable to those originating in northwestern and west-central Minnesota. Moreover, Schneider (1982a) was tentatively identifying Minnesota Woodland ceramic types in upper James River assemblages some 20 years ago, and Snortland (1994) has described such pottery for the Jamestown Mounds.

Minnesota Woodland pottery found in eastern North Dakota includes examples of Laurel, Brainerd, and Saint Croix wares, dating to the Middle Minnesota Woodland period (ca. 100 B.C.-A.D. 900), and Blackduck and Sandy Lake wares, dating to the Late Minnesota Woodland period (ca. A.D. 900-1700) (see Anfinson 1979). The Middle Minnesota Woodland pottery in eastern North Dakota tends to date to the end of the period, from ca. A.D. 600-900, following the Middle Plains Woodland Sonota complex, placing it within a Late Plains Woodland time frame. Even though clear evidence of these ceramic-based cultural complexes is present in eastern North Dakota, their center was in the adjacent Eastern Woodlands area of Minnesota. The presence of this typically Minnesota Woodland pottery in eastern North Dakota reveals the area as a cultural crossroads, where Northeastern Plains and Northwestern Woodlands cultural complexes came into direct contact with one another at various times in the prehistoric past. Such contact situations would have resulted in the exchange of goods and information, as well as certain cultural traits, perhaps leading to the formation of distinctive regional expressions.

Plains Village Period (A.D. 1200-1800)

In the northern Plains, the Plains Village tradition is best known from its many village sites found in the Middle Missouri subarea, a region consisting essentially of the Missouri River trench in the Dakotas. The Plains Village tradition first appeared in the southern Middle Missouri subarea at about A.D. 1000. It flourished there throughout most of the late prehistoric period and persisted in attenuated form well into historic times (see Johnson 1998; Lehmer 1971; Thiessen 1993; Toom 1992a, 1992b, 1996; Winham and Calabrese 1998). As noted above, we start the Plains Village period in eastern North Dakota somewhat later, at ca. A.D. 1200, based on ceramic and radiocarbon analyses specific to the area (Toom 2004). The period is brought to a close at ca. A.D. 1800, following the decimation of the Plains Village population base along the Missouri River by the 1780-1781 smallpox epidemic that originated in the North American Southwest (see Fenn 2002; Lehmer 1971). The date of A.D. 1800 also marks the beginning of the era of Euroamerican exploration in the Northern Plains, most notably the 1804-1806 Lewis and Clark Expedition, as well as the beginning of a more or less regular Euroamerican presence in the area during the fur trade era (e.g., see Wood and Thiessen 1985).

Plains Village culture was distinctly different from its Plains Woodland antecedent. It was characterized by the construction of substantial, permanent dwellings, known as earthlodges, which were arranged into villages of various sizes and configurations, some of which were fortified and some not. Subsistence was based on a mixed strategy that consisted of (1) horticulture, or garden agriculture, including the cultivation of maize, beans, squash, and sunflowers, (2) bison hunting, and (3) general hunting and gathering, or foraging (Toom 1992b). Continued elaboration and sophistication in ceramic manufacture also typify the period, with well-made, globular shaped and shouldered pots exhibiting a wide variety of stylistic variability typifying most village collections (see Johnson 1980, 1996). The Plains Village settlement pattern is interpreted as semisedentary, with people residing in their villages at various times of the year, especially during times of important horticultural activity, and leaving their villages at other times to go on extended hunts (Toom 1992a). A key element in the Plains Village adaptation was the production of a dependable, storable, surplus food supply (Lovick and Ahler 1982:55). This surplus consisted of both meat and garden produce that was usually stored in subterranean storage pits, commonly called cache pits, another identifying attribute of the tradition. Considerable archeological and ethnohistorical evidence indicates direct connections between the prehistoric Plains Village tradition in the Northern Plains and the historically known Mandan, Hidatsa, Arikara, and Cheyenne peoples (see Ahler et al. 1991; Lehmer 1971; Schneider 1990; Thiessen 1993; Wood 1971).

Although Plains Village manifestations are found mainly along the Missouri River in the Dakotas, some smaller villages and other kinds of sites of the Plains Village tradition, such as campsites and activity areas, have been recorded in eastern North Dakota along the James, Sheyenne, Maple, and Red rivers (e.g., Good, Dahlberg et al. 1977; Gregg ed. 1987; Gregg et al. 1986; Gregg et al. 1987; Michlovic 1987; Michlovic and Schneider 1988, 1993; Wheeler 1963; Wood 1971), as well as on the shores of Devils Lake (e.g., Gregg 1994; Toom 2000). These eastern North Dakota sites have come to be associated with the Northeastern Plains Village complex (Gregg et al. 1996; Michlovic and Swenson 1998; Toom 2004). Michael Gregg, writing in the North Dakota State Plan, provides a succinct description of the complex:

> The Northeastern Plains Village complex is characterized by technologically and stylistically diagnostic ceramics, high frequencies of Knife River flint in chipped stone assemblages, regular occurrence of catlinite artifacts, semisedentary village settlements, earthen mound mortuary features, and Devils Lake-Sourisford mortuary goods. People lived semisettled ways of life based out of small residential base villages. They hunted and gathered and did some gardening for food, but their gardening appears not to have been as intensive as that of the Middle Missouri or Coalescent Villagers (SHSND 1990:B.36).

The Northeastern Plains Village (NEPV) complex appears rather suddenly in eastern North Dakota after ca. A.D. 1200. Prior to this date, eastern North Dakota, particularly the Red and Sheyenne river valleys, the upper James River valley, and the area around Devils Lake, was occupied by Late Woodland complexes such as Laurel, Brainerd, St. Croix, Blackduck, and Sandy Lake, all centered in the woodlands of northern Minnesota. The arrival of the NEPV complex appears to have displaced some late Minnesota Woodland occupants of eastern North Dakota, but co-existence with the Sandy Lake complex is clearly indicated at a number of sites in the Red River basin, including Devils Lake (see Toom 2000).

The NEPV complex might be characterized as villagers without villages. We say *might be* because there are a few villages and village-like sites recorded in eastern North Dakota. Only two bona fide earthlodge village sites are known in eastern North Dakota—the Hintz site and the Biesterfeldt site—and both of these are protohistoric in age (ca. A.D. 1700s). The Hintz site (32SN3) on the James River north of Jamestown is the type site for the Stutsman focus (Wheeler 1963), the precursor to the NEPV complex. Biesterfeldt (32RM1), located on the Sheyenne River near Lisbon, was most likely occupied by the Cheyenne and exhibits pottery that is not typical NEPV (Wood 1971). Other small village-like sites are present along the James, the Sheyenne, and their tributaries, but these are more like fortified encampments than full-blown earthlodge villages. For example, the Hendrickson-III site on the James River south of Jamestown is a small, fortified site with a few associated “lodge” depressions. However, test excavations at the site failed to confirm any earthlodge-type structures (Good, Dahlberg et al. 1977). The Shea site, located on the Maple River near Enderlin, a tributary of the Sheyenne, is much like the Hendrickson-III site in this regard (Michlovic and Schneider 1988, 1993). Such “villages” are a far cry from the true earthlodge villages of the Middle Missouri subarea that are so definitive of what we think of as the northern Plains Village tradition. Interestingly, these small, fortified sites may be similar to those recorded on Big Stone Lake and Lake Traverse, and assigned to the Big Stone phase of the Cambria complex (Anfinson 1997:104-112). In this regard, Henning and Toom (2003) have suggested that NEPV was a direct outgrowth of Cambria, and Toom (2004) has marshaled considerable data in support of this position.

Aside from these small fortified encampments, the most common type of site recorded for the NEPV complex are its numerous open campsites, known best from sites along the James River (Gregg ed. 1987; Gregg et al. 1986; Gregg et al. 1987; Toom 2003) and on Devils Lake (Gregg 1994; Toom 2000). Such sites were clearly a significant, if not the most significant, part of the NEPV settlement pattern. Most appear to have been warm-weather occupations that supported hunting and gardening activities. Evidence of gardening, mainly in the form of *Zea mays* (corn), has been found at a number of sites on the James River and at the Shea site on the Maple River (Schneider 2002), but not at the Devils Lake sites (Toom 2000).

Historic Period (A.D. 1800-present)

The Plains Equestrian tradition, also referred to as the Equestrian Nomadic tradition, evolved during protohistoric and early historic times following the introduction of the horse via trade networks extending into the Spanish Southwest. In the Northern Plains, acquisition of the horse by Amerindian peoples was well underway by about A.D. 1750, but horses were not especially common until the early A.D. 1800s (Secoy 1953). The Plains Equestrian tradition represents the well-known nomadic bison hunters of early historic times who spent much of the year in tipi (tent) camps (see Schneider 1991; Webb 1959; Wissler 1948). During this period, there was greater cultural interaction among native groups as a consequence of improved transportation (i.e., the horse) and ever increasing Euroamerican influence.

The protohistoric period refers to the time of initial Euroamerican cultural impact on native cultures prior to actual contact and documentation. European cultural influence may have come as early as the A.D. 1600s with European manufactured goods, used in the fur trade, filtering into the area from the north and east via native trade networks and intermediaries. As mentioned above, horses were introduced from the south by the mid-1700s. By the end of the eighteenth century and the beginning of early historic times, fur trade expansionism had profoundly influenced Amerindian lifeways in what is now North Dakota. Participation in the trading system brought changes in material culture and subsistence practices as interaction with Euroamericans intensified (see Ritterbush 1991; Rogers 1990; Thiessen 1993; Toom 1979; Wood and Thiessen 1985).

Early exploration and the operation of the fur trade provided initial contact between Euroamerican and Amerindian peoples during the A.D. 1700s. Western influence on native lifeways in the form of trade goods, horses, and epidemic diseases had preceded European contact via complex native trade systems. Trade centers, such as the Dakota Rendezvous, held annually in the spring on the banks of the lower James River, were formally established sites of exchange among native groups. These annual trade fairs functioned as centers of commerce for the eastern Dakota tribes who served as middlemen in exchanging European manufactured goods for horses and buffalo hides acquired by the more western tribes (Howard 1966; Picha 1996; Wood 1980). Before 1800, the British dominated the fur trade in eastern North Dakota by operating within the established native trade networks. After 1800, contact between Indians and American traders increased with the Americans replacing the British as the dominant trade force in the region (Ray 1974; Wishart 1979). Large fur companies were organized and operated until the 1860s when expansion of the Euroamerican frontier, the resultant Indian wars, and the forced settlement of Amerindians on reservations all contributed to the decline of the fur trade as the primary economic enterprise of the West. Except for the fur trade industry, Euroamerican activity in eastern North Dakota was minimal until the last half of the nineteenth century.

Permanent Euroamerican settlement of the area came about with the construction of railroads and the security of military protection. Military occupation of the Dakotas was accelerated in response to the Sioux Uprising in 1862 in Minnesota. Retaliatory skirmishes and the battle of Whitestone Hill were fought against the Dakota Indians in southeastern North Dakota the following year (Black 1981:26-29). Fort Abercrombie was built in 1858 in the southern Red River Valley; Fort Wadsworth (renamed Fort Sisseton in 1876) was built in 1864 in northeastern South Dakota; Fort Ransom was built in 1867 on the Sheyenne River; and Fort Totten was also erected in 1867 on Devils Lake (Athearn 1967; Robinson 1966; Schell 1975). The main purpose of these military establishments was to protect overland trails and peaceful Indian groups. Fort Seward (originally named Fort Cross) was erected in 1872 at Jamestown as a replacement to Fort Ransom (Robinson 1966). Its purpose was to protect railroad workers and a newly established railroad supply depot at Jamestown, as well as to protect the first Euroamerican settlers to arrive in the upper James River valley.

Euroamerican domination of what was to become eastern North Dakota was complete by the late nineteenth century. Permanent settlement of the state came about with the construction of railroads made possible under the umbrella of military protection. Settlers acquired land from the railroads or from the government through the Homestead, Pre-emption, and Timber Culture acts in the 1870s and 1880s. Agricultural settlement followed a cyclical pattern of boom and decline, especially in the eastern part of the state. Settlement spread generally from east to west, and in 1889, North Dakota achieved statehood (Robinson 1966).

Physiographic Overview of Northwestern Minnesota

Minnesota is a northern woodland state with a subhumid, continental climate. Prior to European American settlement, mixed conifer and deciduous woodland communities dominated the landscape of much of the state, with areas of tall grass prairie found in its extreme northwestern, southwestern, and southeastern parts. On this basis, the state is divided into three primary biotic provinces: (1) Coniferous Forests in the northeast, (2) a belt of Oak Savanna crossing from northwest to southeast, and (3) Prairie in the extreme northwest, southwest, and southeast (Figure 2.3). These general biotic provinces are themselves divided into a number of more specific ecological zones (Figure 2.4). Physiographically speaking, Minnesota is a complex patchwork of glacial features, including extensive glacial lake beds, moraine and drumlin areas, and till plains (Figure 2.5). The northwestern and southern parts of the state occupy the Central Lowlands province of North America, while the northeastern part of the state extends into the Canadian Shield province (Fenneman 1931; Thornbury 1965). Minnesota truly is "the land of 10,000 lakes." The state is dotted with numerous lakes, both large and small, especially in central and northern Minnesota. These are bodies of water left behind in the vast glacially modified landscape following the retreat of the last of the great Wisconsin ice sheets, which once covered nearly all of the state (Gibbon et al. 2002:5-6).

One of the RRVWSP alternatives, the Red River Basin Alternative (#3), has a substantial presence in Minnesota outside of the Red River Valley proper. The Minnesota portion of this alternative would bring water from the Pelican River Aquifer and the Ottertail Outwash Aquifer by pipeline to the Red River Valley; these aquifers are located east of Barnesville and northeast of Fergus Falls, Minnesota. This Minnesota alternative crosses or takes in parts of all three biotic provinces and three different ecological zones, including the Red River Prairie zone of the Prairie province, the Hardwood Hills zone of the Oak Savanna province, and the Pine Moraines & Outwash Plains zone of the Coniferous Forests province (Figure 2.4). Physiographically, they cross or take in parts of the Glacial Lake Agassiz (Red River Valley) area proper, the Olivia Till Plain, the Alexandria Moraine, the Itasca Moraine, and the Wadena Drumlin areas of northwestern Minnesota, bordering on the Western St. Croix Moraine area of central Minnesota (Figure 2.5).

Cultural-Historical Overview of Northwestern Minnesota

Northwestern Minnesota straddles the extreme Northeastern subarea of the Great Plains culture area and the extreme northwestern part of the Eastern Woodlands culture area (Willey 1966). It comes as no surprise, then, that its cultural traditions exhibit aspects of convergence and transition over time between these two major ecological zones of North America. The Mn/Model divides Minnesota into nine archeological regions (Gibbon et al. 2002:14) based on a structure first proposed by Anfinson (1990). The parts of the RRVWSP located in Minnesota fall within parts of three of these regions: Red River Valley, Central Lakes Deciduous, and Central Lakes Coniferous (Figure 2.6). The bulk of the project study area is within the Red River Valley and Central Lake Deciduous regions; only a relatively small part of the Central Lakes Coniferous region is taken in.

The broad cultural-historical framework of northwestern Minnesota is generally similar to that for eastern North Dakota, considered above, with some exceptions. These are noted in the discussion that follows, which was abstracted in large part from Gibbon et al. (2002). Although most of the named cultural periods are essentially the same for both the North Dakota and the Minnesota cultural-taxonomic models, the most current Minnesota model uses a general three-period heading structure, pertaining to the prehistoric (Precontact), protohistoric (Fur Trade), and historic (American) periods.

Precontact Period

The Paleoindians were most likely the first human inhabitants of Minnesota, however, sites are rare and little is known about these first occupants of the state. Furthermore, because glacial ice covered

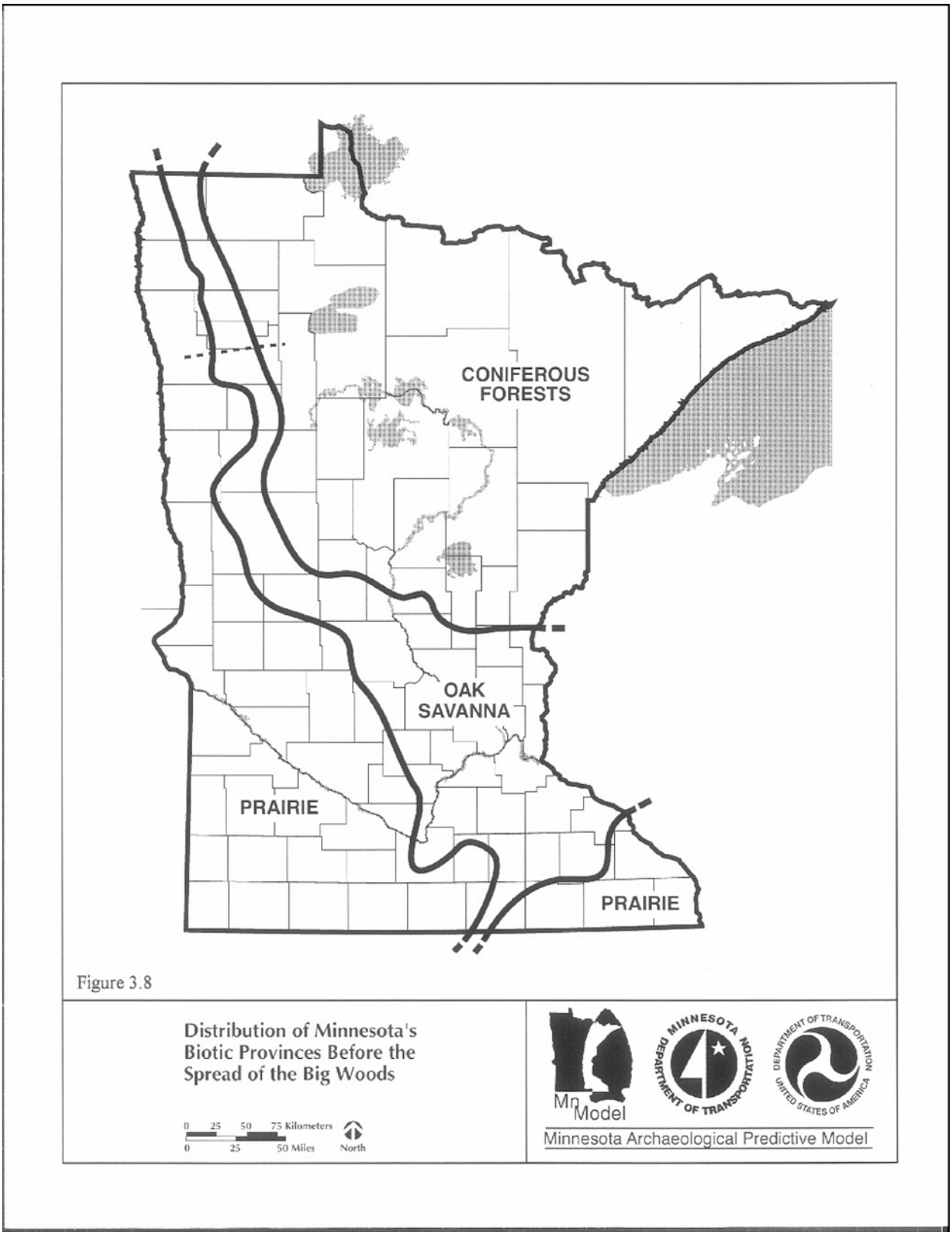

Figure 2.3. Biotic provinces map of Minnesota (Hudak et al. 2002:Figure 3.8).

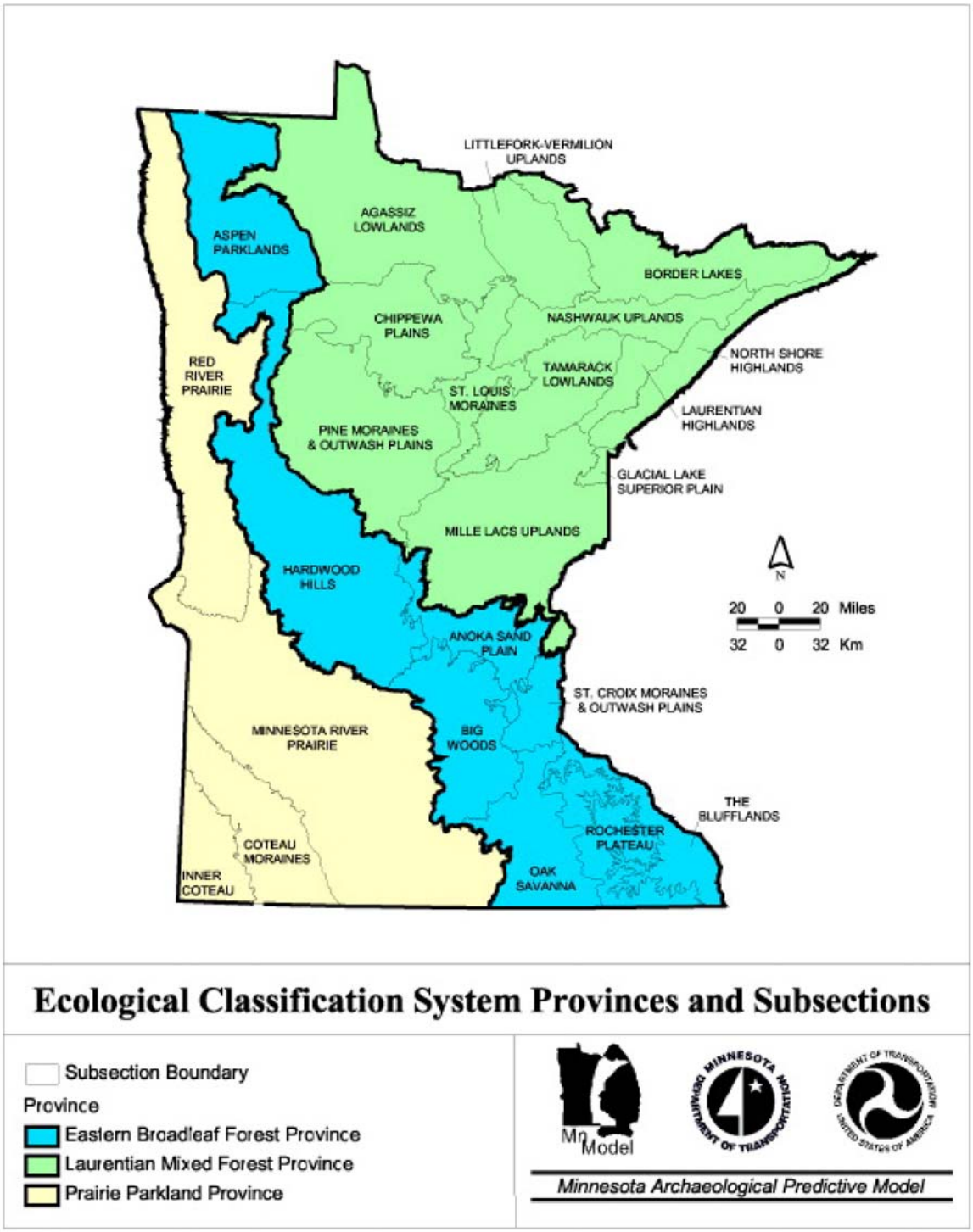

Figure 2.4. Ecological zones map of Minnesota (Hudak et al. 2002:Figure 3.11).

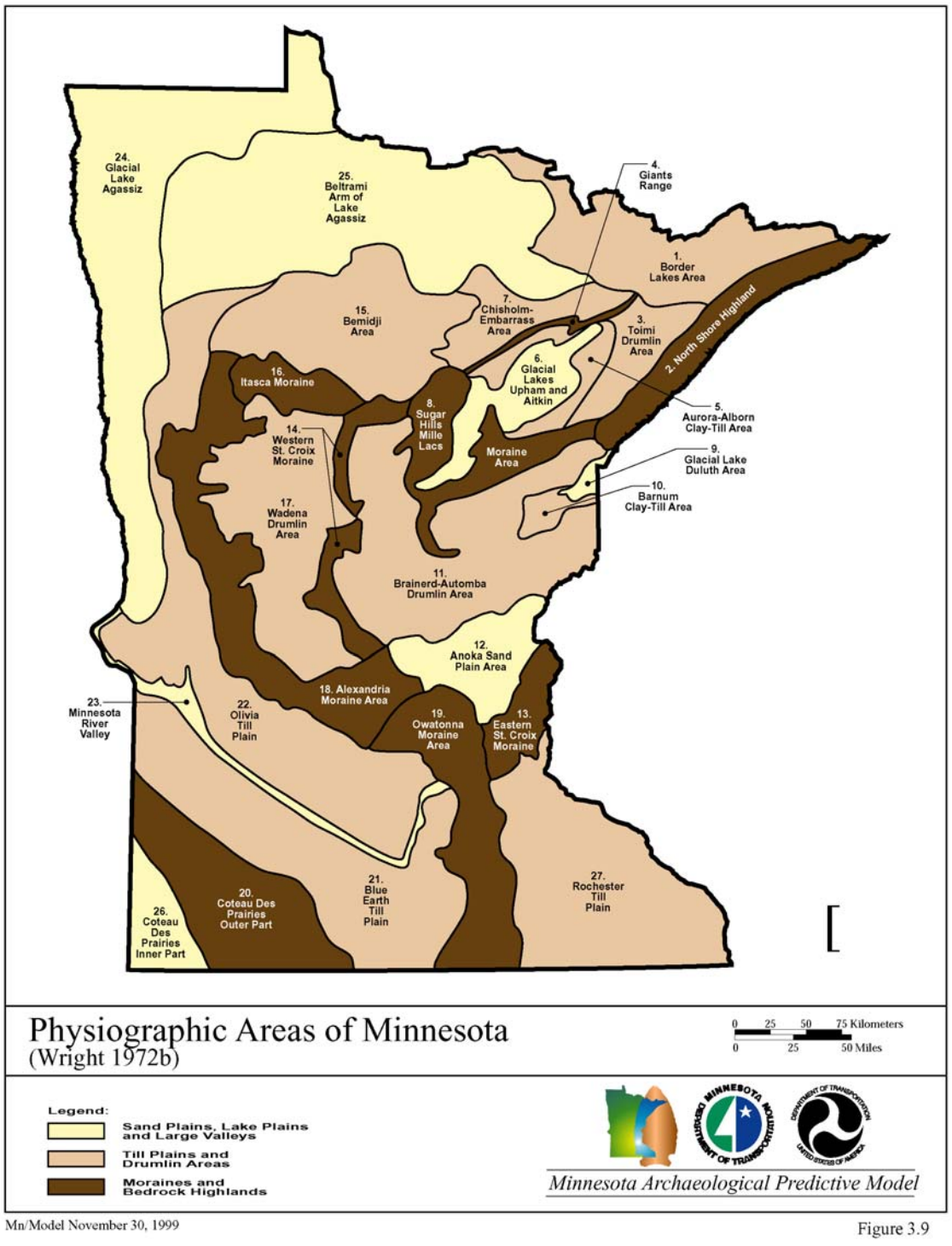

Figure 2.5. Physiographic map of Minnesota (Hudak et al. 2002:Figure 3.9).

Figure 2.6. Archeological regions map of Minnesota (Hudak et al. 2002:Figure 3.10).

most of the state up until about 10,000 years ago, it is probable that only the latest phases of Paleoindian in the upper Midwest are represented. Archaic sites are more common but the Archaic presence in Minnesota is still largely enigmatic, due in large part, it is thought, to the deep burial of habitation sites in river valleys as a result of massive sedimentation during Early and Middle Holocene times. For these reasons, the Paleoindian and Archaic traditions are acknowledged in Minnesota, but no named cultures or cultural complexes have been as yet identified (Gibbon et al. 2002:11-12). This stands in marked contrast to eastern North Dakota, where a number of Paleoindian and Plains Archaic complexes are named and defined, albeit mainly on the basis of finds made elsewhere in the northern Plains.

Woodland culture is the predominant prehistoric archeological entity found throughout Minnesota. The Woodland period extends from ca. 500 B.C.-A.D. 1650, and is divided into two sub-periods: Initial Woodland (ca. 500 B.C.-A.D. 500) and Terminal Woodland (ca. A.D. 500-1650) (Gibbon et al. 2002:12). Previous divisions of the Woodland period in Minnesota recognized Early, Middle, and Late Woodland sub-periods (e.g., Anfinson 1979). These latter are similar to the Early, Middle, and Late Plains Woodland periods defined for eastern North Dakota, but with some important chronological differences. All Woodland peoples in Minnesota were essentially nomadic hunter-gatherers, but it is presumed that by Terminal Woodland times some experimentation with agriculture would have taken place, particularly in the southern climes of the state.

Initial Woodland is marked by the first use of pottery and earthen burial mounds, hence the term "Initial." Regional archeological complexes such as Howard Lake, Fox Lake, Malmo, and Laurel, previously referred to as Early Woodland, are now assigned to Initial Woodland. Population increased during Terminal Woodland times, resulting in considerable cultural diversity as well. Harvesting of wild rice became an increasingly important subsistence activity in the north, while experimentation with maize (corn) cultivation took place in the south. Terminal Woodland regional archeological complexes previously assigned to the Middle or Late Woodland periods include Brainerd, St. Croix, Onamia, Kathio, Blackduck, Psinomani, and Sandy Lake.

In southern Minnesota, certain Terminal Woodland peoples adopted a more sedentary way of life around A.D. 1000 that has come to be regarded as a northern expression of "Mississippian" culture. Three such Mississippian complexes have been identified in Minnesota: Silvernale in the east and Oneota and Plains Village in the west. They are distinguished from their Terminal Woodland counterparts on the basis of distinctive ceramics, larger and more complex habitation sites with greater artifact densities, and subsistence economies based in part on maize agriculture (Gibbon et al. 2002:12). In this regard, the Northeastern Plains Village complex of eastern North Dakota has been tentatively linked to the Cambria (Plains Village) complex of southwestern Minnesota (Toom 2004).

Fur Trade Period

Late in the A.D. 1600s, French Canadian fur traders based in Quebec and Montreal began operating in what is today Minnesota. For decades before, their influence came indirectly to the state through intertribal trade networks. In the late A.D. 1700s, British traders, also based in Canada, supplanted the French. Legal possession of Minnesota passed from the British to the United States in 1783. The United States did not take control of the areas until the early 1800s, however, following the 1805-1807 expedition of Zebulon Pike and the establishment of Fort Snelling at the confluence of the Minnesota and Mississippi rivers (now in St. Paul) in 1819 (Gibbon et al. 2002:12-13).

The dynamic events of the fur trade period had a profound effect on the traditional native cultures of Minnesota. New Native American groups were being pushed into the area from the east due to the pressures of the ever expanding Euroamerican frontier. Warfare and epidemic diseases were causing severe depopulation in certain areas, and the fur trade itself demanded a basic economic reorientation from subsistence hunting to the production of furs for trade. Even more profound was the impact of European manufactured goods, especially metal tools, on the stone age technologies of Native American peoples. Rather than living simply within the constraints of local subsistence economies, the native peoples of Minnesota were being drawn ever deeper into the world market economies of the eighteenth and early nineteenth centuries.

American Period

Settlement of the state by Euroamericans was well underway by the mid A.D. 1800s. Minnesota became a territory of the United States in 1849 and less than a decade later, in 1858, was admitted to the Union as the thirty-second state (Gibbon et al. 2002:13-14). As a result, Euroamericans came to the state in ever larger numbers, establishing towns and cities and businesses and industry, thereby creating the Minnesota that we know today. The early economy of the state was agricultural based, and agriculture remains as one of the economic mainstays today. Logging and the lumber industry were another major economic pursuit early in the American period. Later, these were joined by mining and manufacturing. Minneapolis and St. Paul, referred to as the "Twin Cities," today comprise one of the great metropolitan areas of North America.

Chapter 3
PREVIOUS CULTURAL RESOURCES RESEARCH

Eastern North Dakota Overview

The earliest archeological investigations in eastern North Dakota focused on the impressive, highly visible mounds and earthworks situated on high terraces and hills overlooking lakes and river valleys. Interest in the mounds as curiosities is documented as early as the initial stages of Euroamerican penetration into the Dakotas. Explorers and military personnel had occasion to remark on the features (Bray and Bray 1976; Jackson and Spence 1970; Marshall 1927). A. J. Comfort (1873), an army surgeon stationed at Fort Wadsworth in 1871, reported mound groups on the James River, as did original land surveyors' notes (Beardsley 1875). Cyrus Thomas, investigating mounds for the U.S. Geological and Geographical Survey in 1872, reported mounds in the northeastern plains (Thomas 1894). During a geological survey of former glacial Lake Agassiz, Warren Upham (1896) identified earthworks around the periphery of Devils Lake. Henry Montgomery, an avocational archeologist, was the first to report "archeological excavations" in the Devils Lake Basin and the Red River Valley (Montgomery 1906). Unfortunately, Montgomery's work is not well documented, and the ages and cultural affiliations of the archeological materials he uncovered are uncertain.

In 1881, Alfred J. Hill of St. Paul privately initiated the Northwestern Archaeological Survey (NWAS) and supported it until his death in 1895. He had contracted with T. H. Lewis to conduct "field surveys of rapidly disappearing antiquities . . . to ensure the permanent preservation of facts on the basis of which the archeology of the Northwest might sometime be studied and an account of it written" (Keyes 1928:97). Lewis's commitment to documenting the archeological record took him to parts of 18 states and Manitoba including eastern North Dakota (Keyes 1928; Lewis 1898:8). In North Dakota, over 200 earthworks, petroglyphs, and boulder formations were recorded in 12 counties (Haury 1990:2).

The next major episode of archeological work in eastern North Dakota was done in the late 1940s and early 1950s as part of the Smithsonian Institution River Basin Surveys (SIRBS) program. The Federal government was looking ahead to the end of World War II, when it could channel its resources into internal development projects. The River Basin Surveys program came about because of professional concern about the effects of proposed large dam projects on archeological data (Glenn 1994:5). The Missouri River Basin was one of the major waterways affected by proposed construction projects. Funding and/or support for the archeological salvage projects in North Dakota was provided by the USDI Bureau of Reclamation (Reclamation), the National Park Service, and the Corps of Engineers. Much of the work focused on the anticipated construction on the Missouri River of the Garrison Reservoir (Metcalf et al. 1953) and the Oahe Reservoir (Cooper 1953). Proposed reservoirs on other waterways in eastern North Dakota included the Jamestown and Pipestem reservoirs investigated by SIRBS personnel (Bauxar 1947; Mallory 1966a, 1966b; Wheeler n.d., 1953, 1954). In the Sheyenne River Basin, preliminary reconnaissance surveys were conducted around Devils Lake (Cooper 1947) and surveys and excavations were done along the river for the proposed Baldhill Reservoir (Hewes 1949). In the Northern Red River Study Unit, Wheeler (1948) reported on surveys undertaken for the Homme Reservoir along Park River as well as other work along the Pembina River and the Tongue River. Site surveys were conducted in the southern Red River Valley by the University of Minnesota between 1959 and 1961. The work was part of a larger research project aimed at the prehistory of the Red River Valley (Johnson n.d., 1962; SHSND 1990:10.9).

In the 1970s, additional major archeological investigations were conducted in response to the Garrison Diversion Project, an ambitious undertaking by Reclamation to channel Missouri River water from the Garrison Reservoir into eastern North Dakota. The University of North Dakota conducted site survey and testing on the James River, the Sheyenne River, and in the Devils Lake Basin for various Garrison Diversion Unit (GDU) efforts. Survey and excavation investigations at the proposed Lonetree Reservoir on the Sheyenne River were reported by Larson (1976), Schneider (1974, 1976), and Schneider and Treat (1974). Investigations in the James River Basin in the central and southern sections of the Garrison Diversion Project were reported in Good et al. (1976), Good, Dahlberg et al. (1977), Good, Kinney et al. (1977), and Vehik (1976). Archeological surveys and excavation were conducted along the shoreline of Lake Tewaukon (Haberman 1978). Sample survey work was conducted in 1978 on

the Minnesota side of the Red River by Moorhead State University as part of the Minnesota Statewide Archaeological Survey (MHS 1981; Michlovic 1979, 1983a; SHSND 1990).

Garrison Diversion Project investigations continued in the 1980s. UND conducted a series of investigations on the James River for Reclamation as follow-up studies to the 1970s GDU work. The multi-year research program consisted of extensive survey work, including an innovative riverbank float survey (Kordecki and Gregg 1985, 1986), test excavation and other evaluation work at numerous prehistoric sites (Gregg et al. 1985; Gregg et al. 1986; Gregg et al. 1987), and a large block excavation at the key Naze site (Gregg ed. 1987). These studies done in the James River Basin contributed greatly to refining our knowledge of the prehistory of the area, to the point where detailed synthesis and overview studies were now possible, on a local as well as a regional basis (Gregg ed. 1987, 1994; Gregg et al. 1996; Gregg and Picha 1989; Michlovic and Swenson 1998; Picha and Gregg 1993). Other work for Reclamation included a cultural resources inventory and evaluation of sites on lands within portions of the Jamestown Reservoir by Dakota Interactive Services (DIS), of Vermillion, South Dakota (Brown et al. 1982). Garrison Diversion planning provided for surveys of proposed canals and irrigation areas near the headwaters of the James and Sheyenne rivers (Deaver and Coutant 1986; Deaver and Schweigert 1985). A historical and architectural site survey was conducted in 1980 in central North Dakota by ESCA-Tech Corporation for Reclamation (Starr and Reynolds 1981).

Other major archeological investigations were conducted in eastern North Dakota during this time. Undertakings by the St. Paul District of the U.S. Army Corps of Engineers (USACE) include an extensive survey along the lower and middle Sheyenne River Basin conducted by Vehik (1979). Surveys and test excavations were conducted along the middle Sheyenne River valley including Lake Ashtabula (Fox 1980, 1982). In 1986 and 1987, archeologists from Powers Elevation undertook site survey work for the USACE in areas to be impacted by a Devils Lake flood control project (Floodman 1989a). In 1988, the Omaha District of the USACE conducted surveys of Camp Grafton North, near Devils Lake, and Camp Grafton South, in Eddy County, for the North Dakota Army National Guard (Otto and Quivik 1993). An extensive survey of the Sheyenne River drainage was conducted by UND in 1985 (Haury and Schneider 1986). Also in 1985, an extensive survey of the Forest River drainage in Walsh County was conducted by personnel of Larson-Tibesar Associates of Laramie, Wyoming (Larson et al. 1986). In 1989, the State Historical Society of North Dakota (SHSND) contracted with UND for a project aimed at relocating and rerecording all of the mound sites documented in North Dakota by T. H. Lewis of the original Northwest Archaeological Survey (Haury 1990). Other SHSND projects included a search for fur trade posts in northeastern North Dakota conducted by UND (Ritterbush 1991), survey and testing in Cass County conducted by Moorhead State University (Michlovic 1987; Michlovic and Schneider 1988, 1993) and a sample survey of the Drift Prairie lakes conducted by UND (Kordecki and Toom 1996). A literature review of the cultural resources within the Red River Basin of North Dakota was produced by Larson-Tibesar Associates, Inc. for the Corps of Engineers in 1994 (Larson et al. 1994).

Reclamation continued follow-up work in eastern North Dakota, sponsoring an intensive resurvey of the Jamestown Dam and Reservoir project area in 1992 (Kordecki et al. 1993). Site evaluation and mapping work at Jamestown Reservoir was performed by UND in 1998 (Jackson 2001). In 1994, at the Lonetree Wildlife Management Area (WMA), previously recorded sites were relocated and reassessed, and selected portions of the WMA were resurveyed. In addition, excavations were conducted at a large stone circle site, 32SH161, at Lonetree (Toom et al. 1998). Under cooperative agreements with Reclamation, UND continued archeological investigations on the James River Archeological Projects south of Jamestown throughout the 1990s (Toom ed. 2003; Toom and Jackson 2003). Investigations at Grahams Island State Park on Devils Lake have been ongoing for over a decade, with much work focusing on the Horner-Kane site (32RY77) (Driscoll and Toom 1995; Floodman 1989b; Gregg 1993, 1994; Jackson 1999; Picha and Gregg 1991; Toom ed. 2000). Excavations at the Smilden-Rostberg site (32GF123) in the Northern Red River Study Unit by Larson-Tibesar Associates exposed Early/Middle Archaic deposits (Larson and Penny eds. 1991).

More recent, substantial archeological investigations in eastern North Dakota include work for the North Dakota Army National Guard. Site survey, relocation, and mapping have been conducted by UND at Camp Grafton North and Camp Grafton South training areas near Devils Lake (Jackson and Kordecki 2003; Kordecki et al. 2003). Excavations at the Bivouac site (32RY189) are reported in Jackson and Toom (2002, 2004). Reports of the results of other excavations at the Camp Grafton training areas are in preparation.

Numerous sites have been recorded by other recent projects in eastern North Dakota. Archeological survey and excavations for the Alliance Pipeline Project were primarily reported by IMA Consulting, Inc. of Minneapolis (Fassler 2000; Forsberg et al. 2000; Stine, Cassell et al. 1998; Stine, Hannum et al. 1998). In 2001, IMAC conducted a survey of the Sheyenne River cutbanks, recording numerous buried sites (Stine and Kulevsky 2002).

Several recent investigations in eastern North Dakota, as well as northwestern Minnesota, have been concerned with the Red River flood protection projects. Much of this work was performed for the St. Paul District, U.S. Army Corps of Engineers. Surveys and excavations on the North Dakota side of the river are reported in Bailey (2004), Blikre and Benn (2003), Breakey et al. (2002), Diesen et al. (2003), Fassler and Madigan (2000), Florin (2003a, 2004a), Florin et al. (2002), Harvey et al. (2004), and Madigan et al. (2002).

Thousands of architectural sites have been recorded by numerous urban architectural inventories performed in the state. Inventories such as the one in Devils Lake by Roberts (1987) record hundreds of historic structures. Buildings in many smaller towns have also been recorded (e.g., Crampton and Anderson 1980; Granger and Kelly 1989). Hundreds of urban and rural churches have been recorded as historic properties (Ford-Dunker et al. 2000; Schimmer 1987; Vyzralek 1985). Renewable Technologies, Inc., of Butte, Montana prepared a report of historic bridges in North Dakota in 1992 (Johnson et al. 1992). A report of a more recent bridge inventory by RTI is in preparation.

Many small-scale, on-the-ground cultural resources surveys have been done throughout eastern North Dakota for various projects, such as road and bridge construction, borrow pits, power lines, waterlines, and wildlife development areas. These are too numerous to list and discuss here. Such surveys are not considered to be substantive within the context of the present study given its large scale. Furthermore, if cultural resource sites were recorded by certain small surveys, coinciding with the RRVWSP alternative study areas, these would be identified and considered in Chapter 4. For purposes of the present study, substantive on-the-ground surveys are those involving relatively extensive portions of major stream courses included within RRVWSP alternative study areas—specifically, linear surveys along the Sheyenne River and the North Dakota side of the Red River. These are few in number and consist of four surveys along the Sheyenne and one along the Red (Table 3.1).

Table 3.1. Substantive Cultural Resources Surveys Conducted in North Dakota within RRVWSP Alternative Study Areas.

River	Survey	Year	Report
Sheyenne River	Lower and Middle Sheyenne River Basin Survey	1978	Vehik 1979
Sheyenne River	Middle Sheyenne River Valley and Lake Ashtabula Survey	1978-1979	Fox 1980
Sheyenne River	Sheyenne River Drainage Survey	1985	Haury and Schneider 1986
Sheyenne River	Sheyenne River Cutbanks Survey	2001	Stine and Kulevsky 2002
Red River	Grand Forks Levee and Floodwall Alignments Survey	1999	Larson and Penny 2000a

Northwestern Minnesota Overview

As in North Dakota, the earliest archeological investigations in Minnesota focused on the mounds and earthworks situated on high terraces and hills overlooking lakes and river valleys. Interest in the mounds as curiosities is documented early on, with the works of Alfred J. Hill, T. H. Lewis, and Jacob Brower (Keyes 1928; Lewis 1898; Winchell 1911). Burial mound excavations are reported in 1969 by Wilford et al. (1969). A synthesis of work to date on Minnesota's Indian mounds and burial sites was produced in 2003 by the Minnesota Office of the State Archaeologist (Arzigian and Stevenson 2003). Early research in the Red River Valley on Glacial Lake Agassiz beaches was reported in Johnson (1964).

Various Minnesota agencies have been issuing annual reports concerning archeological and other cultural resource properties. The Minnesota Municipal and County Highway Archaeological Reconnaissance Study have been producing a report since 1976 (e.g., Anfinson and Peterson 1990). The Minnesota Trunk Highway Archaeological Reconnaissance Study has had a report since 1971 (e.g., Peterson et al. 1990). The Minnesota Department of Natural Resources Trails and Waterways Cultural Resources Program has had a report since 1987 (e.g., Skaar 1996).

In the 1970s, research conducted by the St. Cloud Museum of Man furthered the documentation of prehistoric cultural resource sites in parts of the project areas. Survey and testing on the Snake River in Marshall County was performed for the Corps of Engineers in 1975 (Lane 1975). A records search for the location and documentation of historic/archeological sites in waterfowl production areas included parts of the project areas (Lane 1977). An environmental impact assessment of the Roseau River flood control project was issued in 1974 by the Institute for Ecological Studies at the University of North Dakota (Reid et al. 1974). A preconstruction cultural resource survey of a proposed transmission line route across northern Minnesota was performed for Northern States Power Company in 1978 by Terra Archaeological Services. Few sites, nearly all historic, could be confirmed and documented within the project corridor because of physical inaccessibility in the low, poorly drained, densely overgrown bog in that area of the state (Watson et al. 1978).

As part of the Minnesota State Historic Preservation Office's Comprehensive Preservation Planning Process, investigations were launched for the Minnesota Statewide Archaeological Survey, begun in the late 1970s. Sample surveys of Norman and Clay counties in the Red River Valley documented intensive prehistoric utilization of the valley (MHS 1981; Michlovic 1979, 1981, 1983a, 1984a, 1984b). Historic site surveys were conducted in Hubbard County in 1986 and Becker County in 1987 (Hightower and Hess 1986; Koop 1987).

In 1988, a report of the Minnesota Historic Bridge Survey was prepared (Hess 1988), as was a report of the Minnesota State Park CCC/WPA/Rustic Style Historic Resources (Anderson 1988). In 1990, Hess, Roise, and Company (1990) produced a final report for the Historic Stage Roads Project. A report was prepared for the Minnesota Department of Transportation on Historic Roadside Development Structures on Minnesota Trunk Highways in 1998 (Granger et al. 1998). A literature search and records review of the Red River Drainage in Minnesota was conducted by the Institute for Minnesota Archaeology for the U.S. Army Corps of Engineers in 1993 (Dobbs et al. 1994).

Several larger, linear surveys traversing the project area were conducted by the Institute for Minnesota Archaeology in the mid-1990s. Portions of the Lakehead Pipe Line Company corridor fall within target project sections (Breakey et al. 1994a). Six archeological sites were evaluated for potential listing on the National Register of Historic Places (Breakey et al. 1994b). Survey and testing were conducted along portions of the Viking Gas Transmission Company corridor in Kittson and Norman counties (Cater et al. 1995). A portion of the pipeline corridor of the Great Lakes Gas Transmission Company in northwest Minnesota was surveyed in 1996 (Florin 1996).

More than a dozen small archeological inventories have been conducted in the RRVWSP project areas in the last two decades. These include surveys for development of parks and wildlife areas (see Gonsior 1998; Kluth and Kluth 1994; Magner and Emerson 2003; Ollendorf 1999; Radford 1995; Stemper 1989). Other surveys were conducted for state and county road improvements (see Gonsior 1991; Granger et al. 2002; Harrison 1989; Magner et al. 1995; McCauley 1994). Surveys for improvements to

sewage disposal sites in Becker County are reported in Brew (1992) and Michlovic (1983b), and a survey for the Detroit Lakes-Becker County airport improvement project is reported by the 106 Group Ltd. (2003).

Although flood control projects for the Corps of Engineers have recently been the focus of archeological investigations around the city of East Grand Forks, surveys have been conducted near Breckenridge in Wilkin County (Florin 2002a; Florin and Mitchell 2000), at Halstad in Norman County (Historical and Archaeological Surveys, Inc. 1982), and near Roseau in Roseau County (Florin 2003b). Cultural resources work in East Grand Forks for flood control concerns began as early as 1980 when surveys were performed by Archaeological Field Services, Inc. (Hudak 1980, 1981). Post-flood archeological surveys and excavations near East Grand Forks are reported in Florin (2001a, 2001b, 2002b. 2004b), Larson and Penny (1999), Lyon, Bakken et al. (2003), Lyon, Ekstrom et al. (2003), and Nienow and Baltus (2003).

Many small-scale, on-the-ground cultural resources surveys have also been conducted in northwestern Minnesota for various construction projects, including roads and bridges, borrow areas, pipelines, sewer systems, and the like. Like North Dakota, these are too numerous to list and discuss here for Minnesota. Also like North Dakota, such small surveys in Minnesota are not considered to be substantive given the scope of the present project. Moreover, if cultural resource sites were recorded by certain small surveys, coinciding with the RRVWSP alternative study areas, these would be identified and considered in Chapter 4. For purposes of the present study, substantive on-the-ground surveys are those involving relatively extensive portions of major stream courses included within RRVWSP alternative study areas—specifically, linear surveys along the Minnesota side of the Red River. Except for the levee and floodwall alignments survey for the East Grand Forks flood control project (Larson and Penny 2000b), no substantive surveys have been conducted in the alternative study areas in Minnesota.

Chapter 4
RECORDED CULTURAL RESOURCE SITES IN THE FIVE ACTION ALTERNATIVES

Introduction

Recorded cultural resource sites in the project area are summarized in this chapter; more detailed site-specific information is presented in Appendices B-D. Before proceeding, it is worth reiterating that the study areas of multiple alternatives do overlap in certain parts of the larger project area. Cultural resource sites located within these overlap areas will be included in the results for each alternative. Because of such overlaps, certain sites are "shared" by multiple alternatives. This means that inter-alternative site discussions and calculations cannot be subjected to summation or statistical analysis (percentages of the whole). Such duplicate site counting is unavoidable if one is to fully realize the numbers and kinds of sites involved for a particular alternative.

The total number of sites varies markedly between the five action alternatives (Table 4.1; Figure 4.1). The total site count per alternative can be used to separate the five alternatives into two groups, or tiers. The upper tier contains one alternative, the Red River Basin alternative (#3), which contains 391 cultural resource sites. Most of these are located in a large aquifer well field in Minnesota. The second tier contains the remaining four alternatives (#2, #4, #5, and #6), whose site totals range between 77-170 sites. Site locations for each alternative are broadly depicted in Figures 4.2-4.6. For the sake of clarity, site leads, isolated finds, and urban survey blocks have been removed for these graphics. Cities within each of the alternatives are summarized in Table 4.2.

Recorded Site Types

Cultural resource sites are broadly separated into seven site type groups: (1) prehistoric archeological sites, (2) prehistoric site leads, (3) prehistoric isolated finds, (4) historic archeological sites, (5) historic architectural structures, (6) historic site leads, and (7) historic isolated finds. Historic architectural structures within urban survey blocks are removed from consideration because it is assumed that none of the proposed alternatives will directly affect standing structures within city limits.

On average, historic architectural sites (32.6%; n=59) and prehistoric archeological sites (28.2%; n=51) are the most common site type groups among the five action alternatives; historic site leads (20.4%; n=37) also occur with some frequency (Table 4.3). These three site type groups are the most commonly occurring groups for all of the action alternatives. The seven site type groups are divisible into specific site types. The considerable variation in terminology between North Dakota and Minnesota records dictated that specific site types for each state be tabulated and discussed separately (Tables 4.4 and 4.5).

Prehistoric Archeological Sites

In North Dakota, the most common prehistoric archeological site type among the alternatives is the cultural material scatter, or artifact scatter (85.7%; n=12/14) (Table 4.4). A few hearth, mound, and other rock feature sites also occur in the various alternatives. In Minnesota, the most common prehistoric archeological site type among all of the alternatives is the artifact scatter (67.6%; n=25/37) (Table 4.5). Earthworks (mounds), either with or without documented burials, were the next most common site type. Nearly all of the recorded earthwork sites are present in the Red River Basin Alternative (#3), which includes a large aquifer area in Becker and Ottertail counties. Other prehistoric site types represented in Minnesota include cemeteries, rock alignments, and structural ruins. Lastly, there is one site which lacks a defined site type.

Table 4.1. Summary of Cultural Resource Sites According to Proposed Alternative, Red River Valley Water Supply Project, 2004-2006 UND Investigations.

No.	Alternative	State	Sites (n)	Total (n)	Rank	Urban Blocks (Cities)
2	North Dakota In-Basin	ND	135			10
2	North Dakota In-Basin	MN	20	155	3	3
3	Red River Basin	ND	94			10
3	Red River Basin	MN	297	391	1	14
4	GDU Import to Sheyenne River	ND	56			9
4	GDU Import to Sheyenne River	MN	21	77	5	3
5	GDU Import Pipeline	ND	139			15
5	GDU Import Pipeline	MN	31	170	2	4
6	Missouri River to RRV	ND	116			3
6	Missouri River to RRV	MN	1	117	4	2
2-6	**Average**	**ND**	**108**			n/a
2-6	**Average**	**MN**	**74**	**182**	n/a	n/a

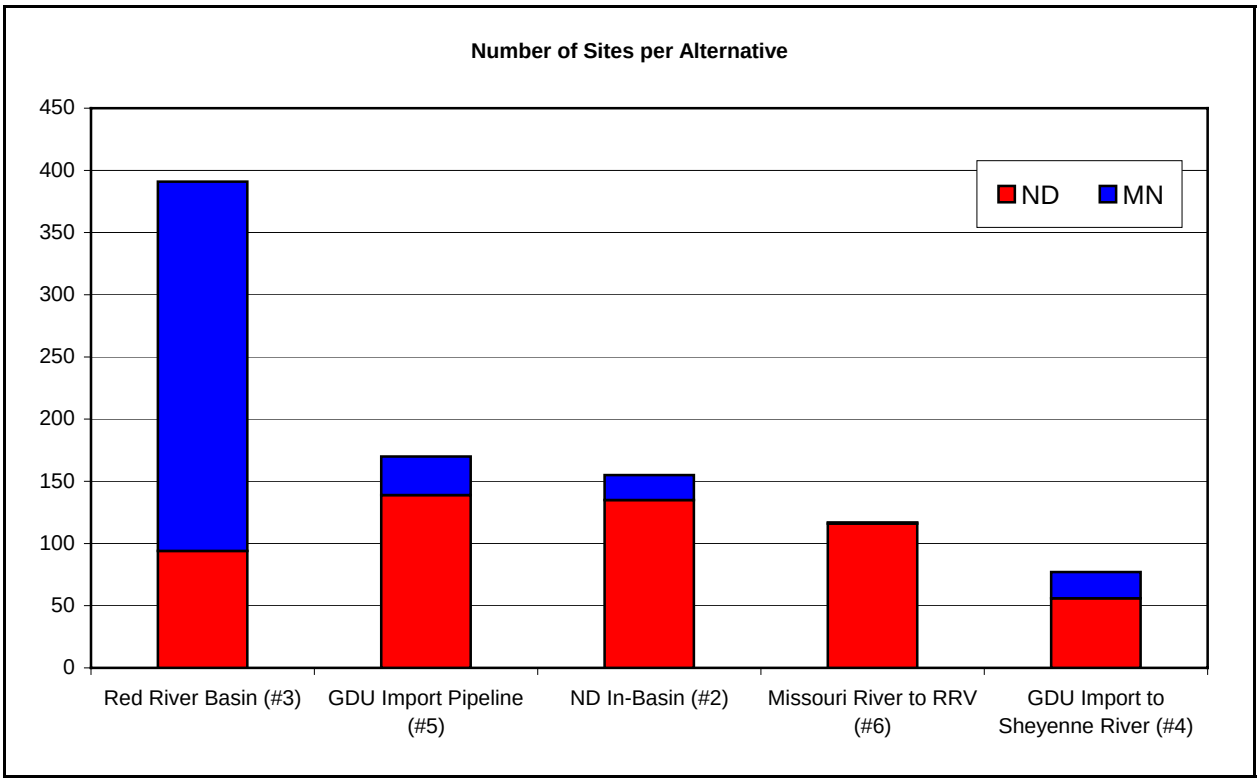

Figure 4.1. Bar chart depicting the number of all cultural resource sites per alternative, in descending order, for the Red River Valley Water Supply Project, 2004-2006 UND investigations.

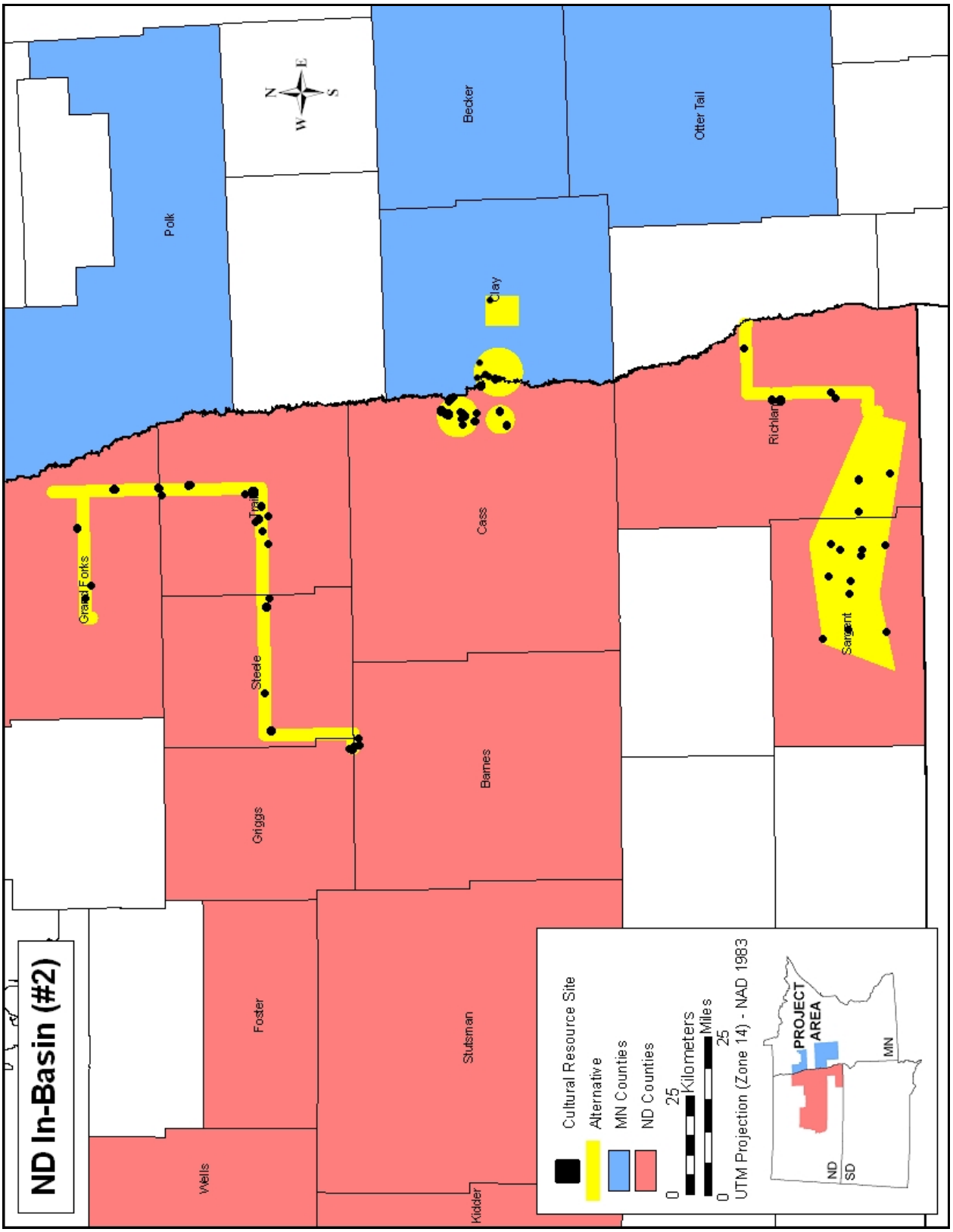

Figure 4.2. Cultural resource sites map for the North Dakota In-Basin Alternative (#2), Red River Valley Water Supply Project, 2004-2006 UND investigations. Please note that archeological sites and architectural structures are the only site types depicted, so that their distribution may be more accurately visualized (site leads, isolated finds, and urban survey blocks are excluded).

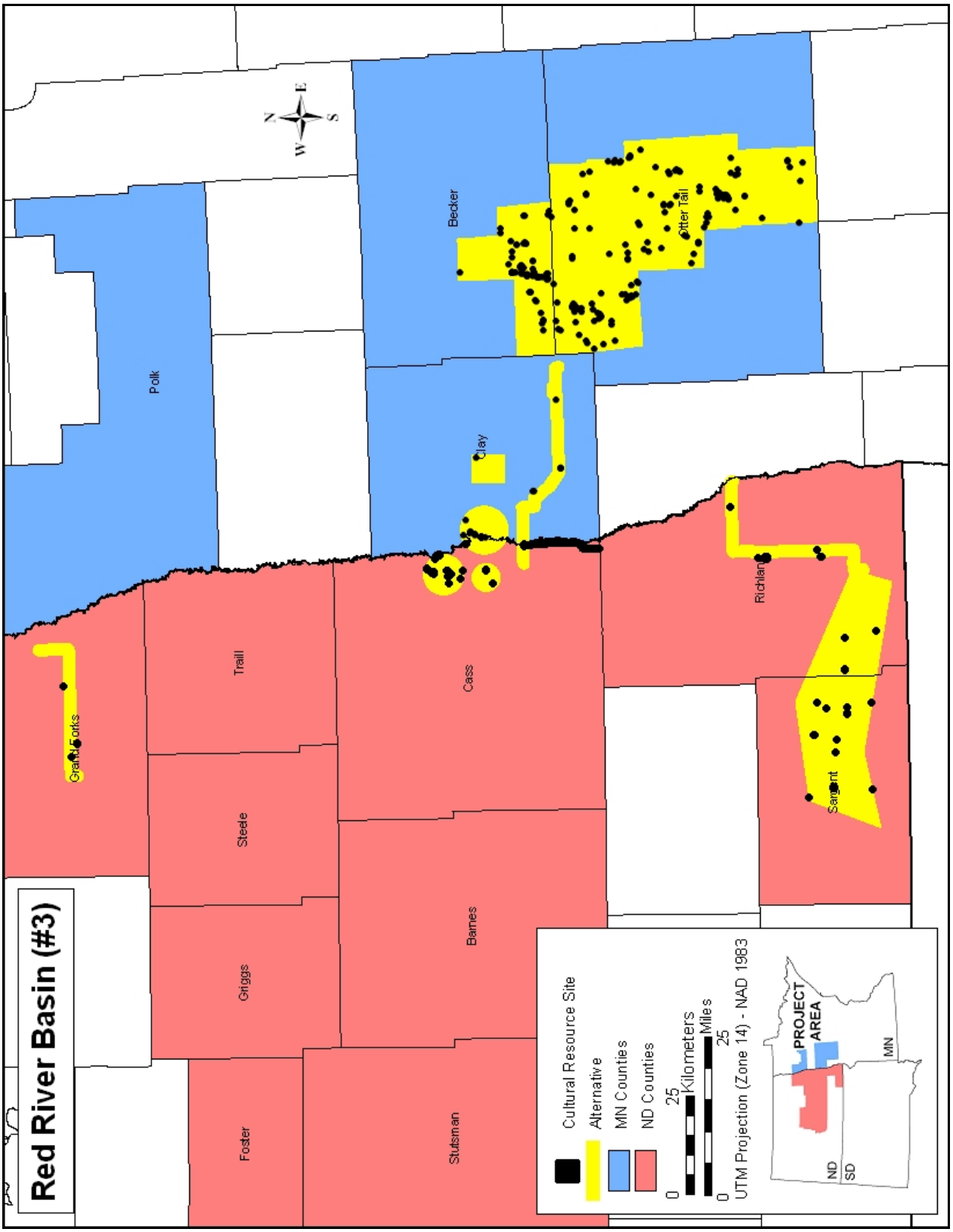

Figure 4.3. Cultural resource sites map for the Red River Basin Alternative (#3), Red River Valley Water Supply Project, 2004-2006 UND investigations. Please note that archeological sites and architectural structures are the only site types depicted, so that their distribution may be more accurately visualized (site leads, isolated finds, and urban survey blocks are excluded).

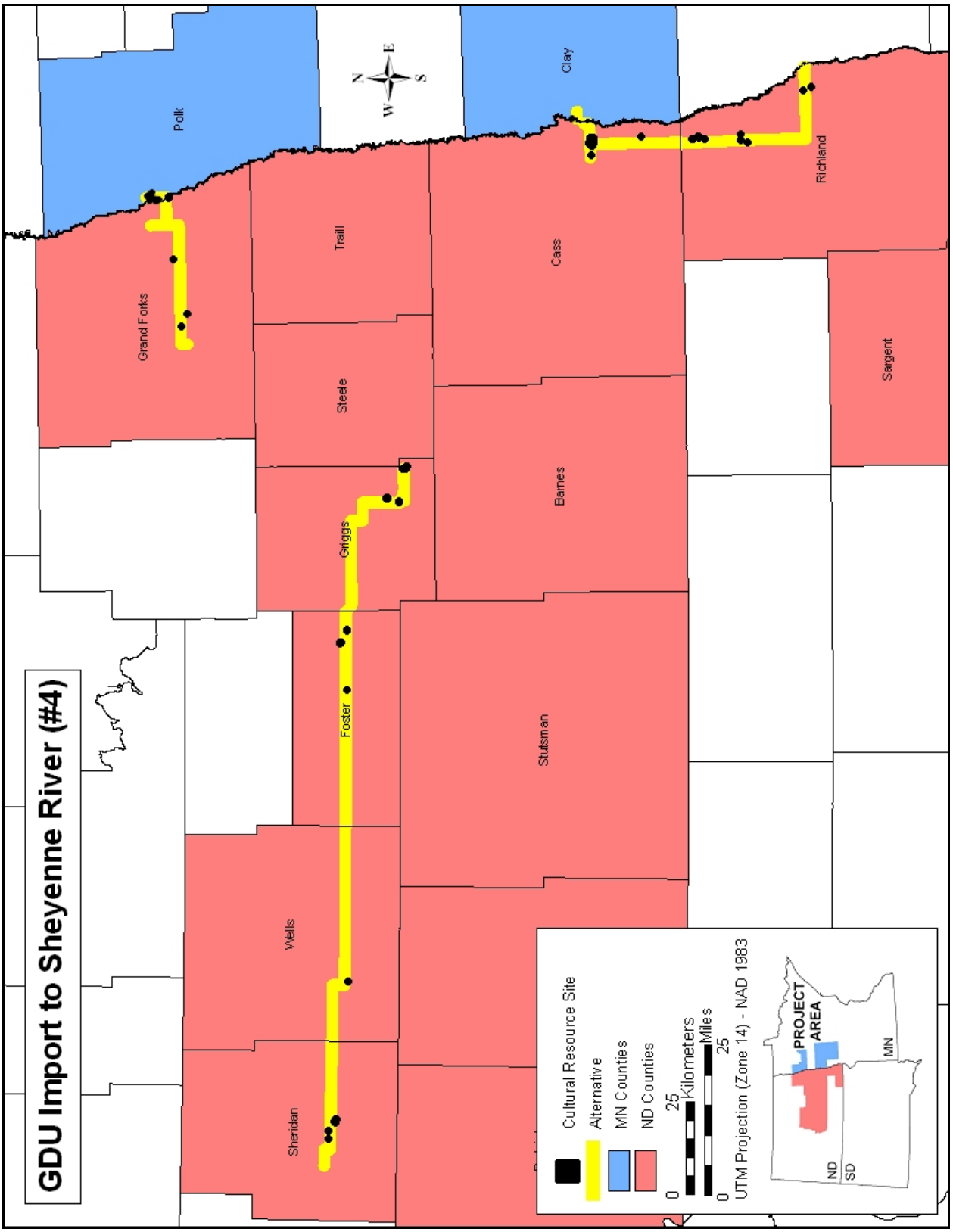

Figure 4.4. Cultural resource sites map for the Garrison Diversion Unit Import to Sheyenne River Alternative (#4), Red River Valley Water Supply Project, 2004-2006 UND investigations. Please note that archeological sites and architectural structures are the only site types depicted, so that their distribution may be more accurately visualized (site leads, isolated finds, and urban survey blocks are excluded).

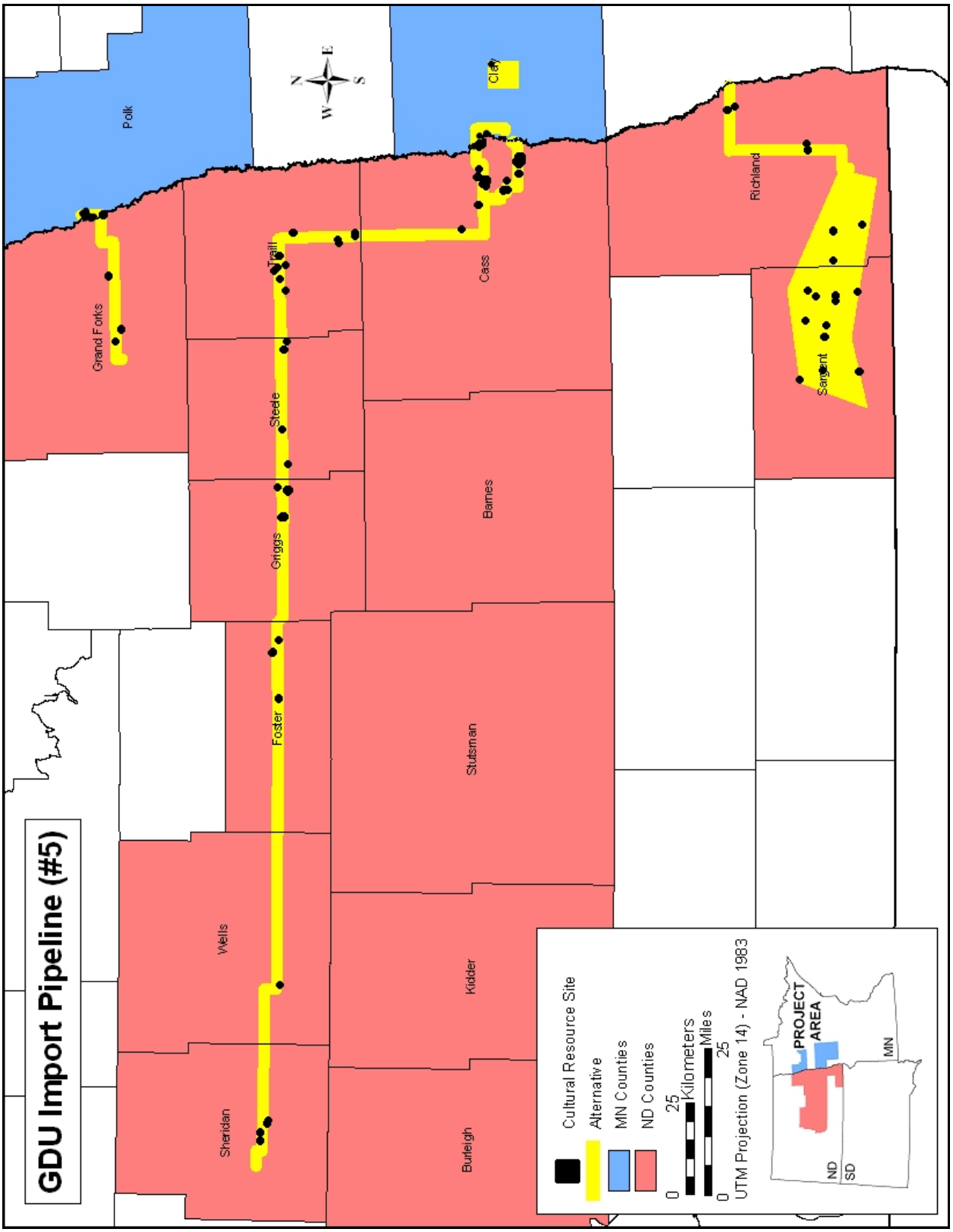

Figure 4.5. Cultural resource sites map for the Garrison Diversion Unit Import Pipeline Alternative (#5), Red River Valley Water Supply Project, 2004-2006 UND investigations. Please note that archeological sites and architectural structures are the only site types depicted, so that their distribution may be more accurately visualized (site leads, isolated finds, and urban survey blocks are excluded).

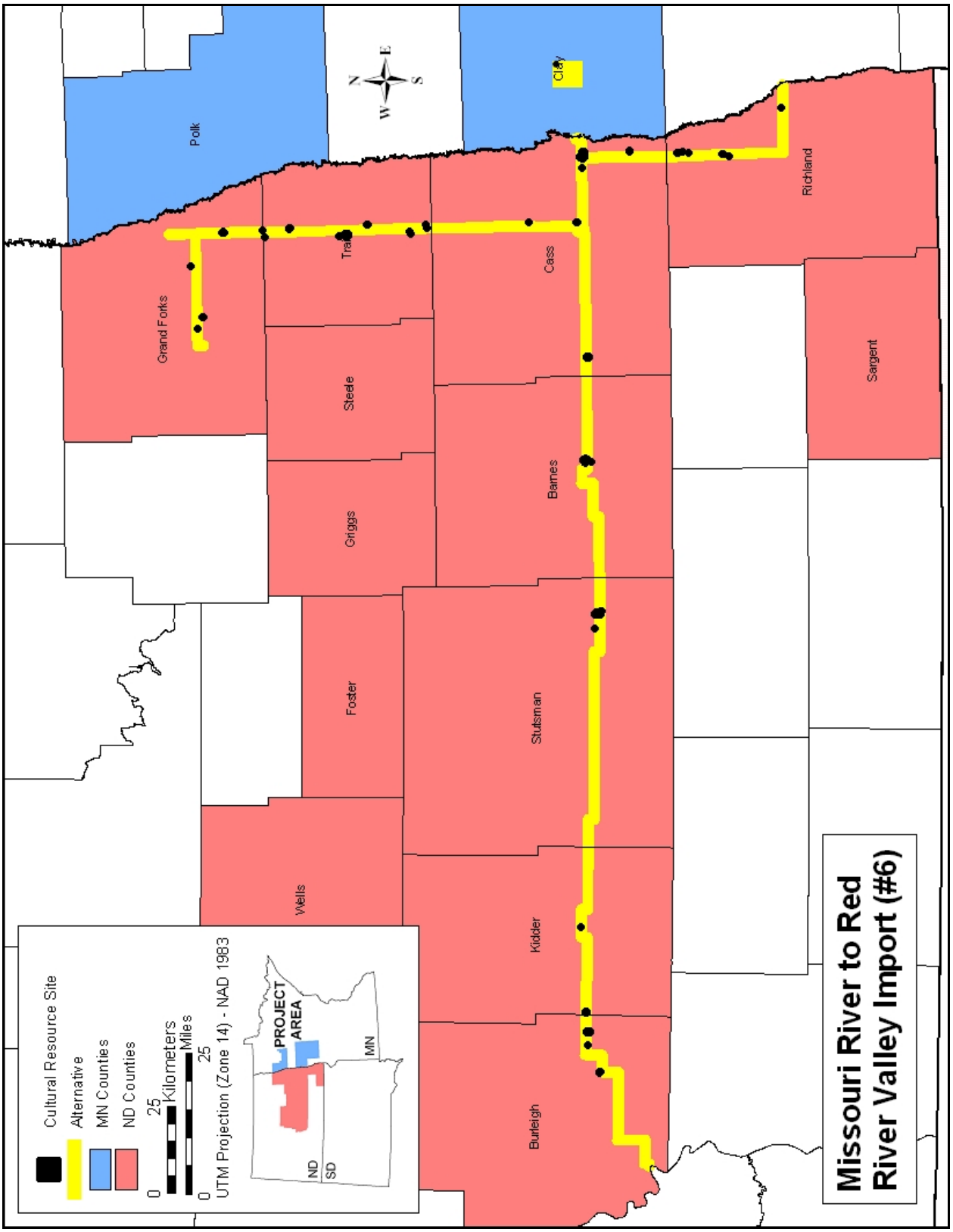

Figure 4.6. Cultural resource sites map for the Missouri River to Red River Valley Import Alternative (#6), Red River Valley Water Supply Project, 2004-2006 UND investigations. Please note that archeological sites and architectural structures are the only site types depicted, so that their distribution may be more accurately visualized (site leads, isolated finds, and urban survey blocks are excluded).

Table 4.2. Summary of Cities Encountered According to Proposed Alternative, Red River Valley Water Supply Project, 2004-2006 UND Investigations.

City	State	Alternative					No. of Occurrences
		2	3	4	5	6	
Bowden	ND			x	x		2
Carrington	ND			x	x		2
Cayuga	ND	x	x		x		3
Denhoff	ND			x	x		2
Fargo	ND	x	x	x	x	x	5
Forman	ND	x	x		x		3
Geneseo	ND	x	x		x		3
Goodrich	ND			x	x		2
Grand Forks	ND	x	x	x	x	x	5
Hankinson	ND	x	x		x		3
Hardwood	ND	x	x				2
Lidgerwood	ND	x	x		x		3
McClusky	ND			x	x		2
Rutland	ND	x	x		x		3
Sykeston	ND			x	x		2
West Fargo	ND	x	x	x	x	x	5
Subtotals		*10*	*10*	*9*	*15*	*3*	*n/a*
Battle Lake	MN		x				1
Clitherall	MN		x				1
Dent	MN		x				1
Detroit Lakes	MN		x				1
Dilworth	MN	x	x	x	x		4
East Grand Forks	MN			x	x		2
Frazee	MN		x				1
Glyndon	MN	x	x		x	x	4
Moorhead	MN	x	x	x	x	x	5
Ottertail	MN		x				1
Pelican Rapids	MN		x				1
Perham	MN		x				1
Richville	MN		x				1
Sabin	MN		x				1
Vergas	MN		x				1
Subtotals		*3*	*14*	*3*	*4*	*2*	*n/a*
Totals		**13**	**24**	**12**	**19**	**5**	**n/a**

Table 4.3. Summary of Cultural Resource Site Type Classes According to Proposed Alternative, Red River Valley Water Supply Project, 2004-2006 UND Investigations (excludes urban survey blocks).

No.	Alternative	State	Site Type Group [a]							Total [b]
			1	2	3	11	12	13	14	
2	North Dakota In-Basin	ND	19	7	9	2	52	43	3	135
2	North Dakota In-Basin	MN	5	10	1	1	2	1	0	20
2	*Total*		*24*	*17*	*10*	*3*	*54*	*44*	*3*	*155*
2	*%*		*15.5*	*11.0*	*6.5*	*1.9*	*34.8*	*28.4*	*1.9*	*100.0*
3	Red River Basin	ND	15	3	6	3	32	32	3	94
3	Red River Basin	MN	147	36	15	2	92	5	0	297
3	*Total*		*162*	*39*	*21*	*5*	*124*	*37*	*3*	*391*
3	*%*		*41.4*	*10.0*	*5.4*	*1.3*	*31.7*	*9.5*	*0.8*	*100.1*
4	GDU Import to Sheyenne	ND	5	1	3	3	21	22	1	56
4	GDU Import to Sheyenne	MN	15	3	3	0	0	0	0	21
4	*Total*		*20*	*4*	*6*	*3*	*21*	*22*	*1*	*77*
4	*%*		*26.0*	*5.2*	*7.8*	*3.9*	*27.3*	*28.6*	*1.3*	*100.1*
5	GDU Import Pipeline	ND	18	6	10	6	58	39	2	139
5	GDU Import Pipeline	MN	17	8	3	1	2	0	0	31
5	*Total*		*35*	*14*	*13*	*7*	*60*	*39*	*2*	*170*
5	*%*		*20.6*	*8.2*	*7.6*	*4.1*	*35.3*	*22.9*	*1.2*	*99.9*
6	Missouri River to RRV	ND	12	6	7	6	39	45	1	116
6	Missouri River to RRV	MN	0	0	0	0	1	0	0	1
6	*Total*		*12*	*6*	*7*	*6*	*40*	*45*	*1*	*117*
6	*%*		*10.3*	*5.1*	*6.0*	*5.1*	*34.2*	*38.5*	*0.9*	*100.1*
2-6	**Average**	**ND**	**14**	**5**	**7**	**4**	**40**	**36**	**2**	**108**
2-6	**Average**	**MN**	**37**	**11**	**4**	**1**	**19**	**1**	**0**	**73**
2-6	**Total**		**51**	**16**	**11**	**5**	**59**	**37**	**2**	**181**
2-6	**%**		**28.2**	**8.8**	**6.1**	**2.8**	**32.6**	**20.4**	**1.1**	**100.0**

[a] Prehistoric archeological site (1), prehistoric site lead (2), prehistoric isolated find (3), historic archeological site (11), historic architectural site (12), historic site lead (13), and historic isolated find (14).

[b] Site totals exclude urban survey blocks.

Table 4.4. Summary of Cultural Resource Site Types in North Dakota According to Proposed Alternative, Red River Valley Water Supply Project, 2004-2006 UND Investigations (excludes urban survey blocks).

Site Type Group (Code)		Alternative					Avg
	Specific Site Type	**2**	**3**	**4**	**5**	**6**	
Prehistoric Archeological Sites (1)	Cultural material scatter	17	14	4	15	12	12
	Hearth	0	0	0	1	0	0
	Mound	1	0	0	0	0	0
	Other rock features	1	1	1	2	0	1
	Subtotal	*19*	*15*	*5*	*18*	*12*	*14*
Prehistoric Site Leads (2)	Site lead	7	3	1	6	6	5
Prehistoric Isolated Finds (3)	Isolated find	9	6	3	10	7	7
Historic Archeological Sites (11)	Cultural material scatter	1	1	0	1	2	1
	Depression	0	0	0	1	0	0
	Dump	0	0	1	1	0	0
	Foundation	1	1	1	2	3	2
	Other (describe)	0	0	1	1	1	1
	Trail	0	1	0	0	0	0
	Subtotal	*2*	*3*	*3*	*6*	*6*	*4*
Historic Architectural Sites (12)	Bridge	19	13	7	23	11	15
	Building	23	9	14	26	27	20
	Cemetery/grave	1	1	0	0	1	1
	Railroad	9	9	0	9	0	5
	Subtotal	*52*	*32*	*21*	*58*	*39*	*40*
Historic Site Leads (13)	Site lead	43	32	22	39	45	36
Historic Isolated Finds (14)	Isolated find	3	3	1	2	1	2
Total		135	94	56	139	116	108

Table 4.5. Summary of Cultural Resource Site Types in Minnesota According to Proposed Alternative, Red River Valley Water Supply Project, 2004-2006 UND Investigations (excludes urban survey blocks).

Site Type Group (Code)		Alternative					Avg
	Specific Site Type	**2**	**3**	**4**	**5**	**6**	
Prehistoric Archeological Sites (1)	Artifact scatter	5	89	14	16	0	25
	Cemetery	0	7	0	0	0	1
	Earthwork	0	28	0	0	0	6
	Earthwork with burial	0	19	1	1	0	4
	Rock alignment	0	1	0	0	0	0
	Structural ruin	0	2	0	0	0	0
	Unknown	0	1	0	0	0	0
	Subtotal	*5*	*147*	*15*	*17*	*0*	*37*
Prehistoric Site Leads (2)	Artifact scatter	0	9	0	0	0	2
	Cemetery	0	2	0	0	0	0
	Earthwork	0	8	0	0	0	2
	Historic documents	0	4	0	0	0	1
	Trail	10	13	3	8	0	7
	Subtotal	10	36	3	8	0	11
Prehistoric Isolated Finds (3)	Single artifact	1	15	3	3	0	4
Historic Archeological Sites (11)	Structural Ruin	1	2	0	1	0	1
	Subtotal	*1*	*2*	*0*	*1*	*0*	*1*
Historic Architectural Sites (12)	Bank	0	1	0	0	0	0
	Bar	0	1	0	0	0	0
	Barn (round)	0	1	0	0	0	0
	Brewery	0	1	0	0	0	0
	Bridge	0	5	0	0	0	1
	Cabin	0	12	0	0	0	2
	Camp	0	1	0	0	0	0
	Church	0	11	0	0	0	2
	Clubhouse	0	1	0	0	0	0
	Farmstead	0	8	0	0	0	2
	Flour mill	0	1	0	0	0	0
	General store	0	3	0	0	0	1
	Geographic feature	0	1	0	0	0	0
	Governmental office	0	1	0	0	0	0
	Historic site	0	1	0	0	0	0
	Marker	0	1	0	0	0	0
	Outbuilding	0	5	0	0	0	1
	Outdoor facility	0	1	0	0	0	0
	Post office	0	1	0	0	0	0
	Rail related	0	2	0	0	0	0
	Residence	1	5	0	1	0	1
	Resort	0	3	0	0	0	1
	School	0	2	0	0	0	0
	Seasonal residence	0	13	0	0	0	3
	Service station	0	1	0	0	0	0
	Township hall	1	9	0	1	1	2
	Subtotal	*2*	*92*	*0*	*2*	*1*	*19*

Site Type Group (Code)		Alternative					Avg
	Specific Site Type	**2**	**3**	**4**	**5**	**6**	
Historic Site Leads (13)	Historic Documents	1	4	0	0	0	1
	Mill	0	1	0	0	0	0
	Subtotal	1	5	0	0	0	1
Historic Isolated Finds (14)	Single artifact	0	0	0	0	0	0
	Total	**20**	**297**	**21**	**31**	**1**	**73**

Prehistoric Site Leads and Isolated Finds

In North Dakota, site leads are not separated into specific site types. They typically refer to mound sites originally noted by T. H. Lewis in the late 1800s, but which have not been subsequently relocated and formally recorded. Some of the Lewis mound site leads may exist in locations away from where his notes placed them, while others may have been destroyed in the intervening years by agricultural practices or construction. Other site types include cultural material scatters, campsites, villages, burials, stone circles, rock alignments, and so on (Appendix B).

In Minnesota, five different site types are listed under prehistoric site leads (Table 4.5). These include artifact scatters, cemeteries, earthworks, trails, and sites referenced in historic documents. Trails are the most commonly occurring site lead type for each alternative.

Isolated finds in both states consist of locations where one or only a few artifacts have been found (Appendices B and D). Occasionally, these artifacts might be temporally diagnostic, but most often they are not. Little more can be stated for these find spots.

Historic Archeological Sites

In North Dakota, the historic archeological sites group is composed of six individual site types (Table 4.4). These include foundations, cultural material scatters, dumps, depressions, trail segments, and an “other” category. In Minnesota, recorded historic archeological sites are few in number and they consist solely of structural ruins (Table 4.5).

Historic Architectural Sites

Most of the historic architectural sites in North Dakota are standing buildings or bridges (Table 4.4). Most of the buildings are churches, followed by farmsteads, houses, municipal buildings, and so on. Most of the bridges are county bridges that carry section line roads over various minor streams, and occasionally, major rivers. A few of the bridges carry state highways over major streams. The other architectural site types include cemeteries (city, denominational, or family) and railroad track segments (no stations) (Appendix B).

In Minnesota, the group of historic architectural sites is divided into 26 individual site types on the basis of function (Table 4.5). The most common site types are seasonal residences, cabins, churches, and township halls (Appendix D). The majority of the historic architectural sites are located in the Red River Basin Alternative (#3), which has the largest areal coverage in Minnesota.

Historic Site Leads and Isolated Finds

The vast majority of the recorded historic site leads are present in North Dakota. Most of these refer to early buildings, schools, post offices, rail and mail stations, which have been identified on old maps and through archival research. For most site leads, there has been no "on-the-ground" effort made to verify their existence and/or location. It is likely that many site leads no longer exist, except perhaps, as archeological sites. In Minnesota, historic site leads refer to ghost towns documented in historic records, and one mill.

Historic isolated finds are recorded only in North Dakota, and these are locations where one or only a few historic artifacts have been found (Appendix B). Occasionally these artifacts might be more specifically temporally diagnostic, but most often they are not. Little more can be stated for these find spots.

Cultural Resources Work at Recorded Sites

Various levels of cultural resources work have been carried out at known sites in the study area. Summary data per alternative and state are presented in Table 4.6. More detailed information is also presented for North Dakota (Table 4.7) and Minnesota (Table 4.8).

In North Dakota, an average of 63.9% (n=69/108) of the recorded cultural resource sites are listed as unevaluated, which means they have not been subjected to formal test excavations, mitigative block excavations, formal architectural or historical assessment, or historic documentation mitigation. Nearly all of the prehistoric and historic site leads and isolated finds are unevaluated. An average of 78.6% (n=11/14) of the prehistoric archeological sites have not been evaluated, and the remainder have been test excavated (Table 4.7). Nearly all of the historical archeological sites are also unevaluated. In contrast, a majority of the historic architectural sites have been evaluated or mitigated through documentation and historical records research. On average, only 17.1% (n=7/41) of these sites remain unevaluated. These patterns are generally consistent across all five alternatives.

In Minnesota, most of the cultural resource sites have not had formal evaluation-type work carried out. Work at some sites has included pre-field preparations or reconnaissance survey, but work at most sites is listed as unknown, if it is indicated at all (Table 4.8). On average, only 12.2% (n=9/74) of the Minnesota cultural resource sites have been formally evaluated through test excavations or mitigation/data recovery measures. Nearly all of these are prehistoric archeological sites. This general pattern is consistent across all five alternatives.

Site Evaluations and NRHP Eligibility

Site evaluations, with regard to the National Register of Historic Places (NRHP) criteria A-D, have been carried out at some of the sites in the project area. Summary data according to alternative and state are presented in Table 4.9, while more detailed information is presented in Tables 4.10 and 4.11.

An average of 61.1% (n=66/108) of the North Dakota cultural resource sites have not been formally evaluated according to NRHP criteria (Table 4.9). Of the evaluated sites, an average of 1.9% (n=2) are listed in the NRHP, 1.9% (n=2) have been determined eligible for listing, and another 4.6% (n=5) have been researcher-recommended as eligible for listing in the NRHP. Among the seven site type groups, prehistoric archeological sites and historic architectural sites were the only groups to have individual sites listed, determined eligible, or recommended as eligible for the NRHP (Table 4.10). Among the remaining five site type groups, very few individual sites have been positively evaluated. These patterns are consistent among the five alternatives.

Table 4.6. Summary of Evaluation and Mitigation Work at Sites According to Proposed Alternative, Red River Valley Water Supply Project, 2004-2006 UND Investigations (excludes urban survey blocks).

Work Status	Alternative					Average
	2	3	4	5	6	
ND Sites						
Archeological test excavation	2	0	4	4	5	3
Architectural assessment evaluation	39	19	16	39	28	28
Architectural documentation mitigation	3	1	0	1	2	1
ND-SHPO evaluation	10	8	2	7	4	6
Unevaluated	81	66	34	88	77	69
Subtotal	*135*	*94*	*56*	*139*	*116*	*108*
MN Sites						
Pre-field preparation	11	17	3	8	0	8
Reconnaissance survey (Phase I)	4	71	9	10	0	19
Evaluation/informal testing (Phase II)	3	18	8	10	0	8
Mitigation/data recovery (Phase III)	0	5	0	0	0	1
Other, non-archeological studies	0	0	1	1	0	0
Unknown (not indicated)	2	186	0	2	1	38
Subtotal	20	297	21	31	1	74
Total	**155**	**391**	**77**	**170**	**117**	**182**

In Minnesota, an average of 94.6% (n=70/74) of the cultural resource sites do not have information regarding their evaluation in terms NRHP criteria (Table 4.9); it is assumed that these sites have not been formally evaluated. A small number of sites have been formally evaluated: they are either listed in the NRHP, have been certified eligible for the NRHP by the MN-SHPO, or have been determined eligible for the NRHP by the National Park Service. One site has been determined not eligible for the National Register. The historic architectural sites and prehistoric archeological sites are the only groups that contain listed, certified eligible, or determined eligible sites (Table 4.11). The formally evaluated sites are almost all found in the Red River Basin alternative (#3).

Overview of Recorded Sites in Each Alternative

This section provides additional details about the cultural resource sites recorded in the five action alternatives. This includes a summary of the sites that are listed, eligible, or recommended eligible for the NRHP. Additional site information can be found in Appendices B-D.

North Dakota In-Basin Alternative (#2)

Alternative #2, the North Dakota In-Basin Alternative, contains the third highest number of previously recorded cultural resource sites (n=155) among the five alternatives studied (Figure 4.1; Table 4.1). Most of the sites (87.1%; n=135) are in North Dakota (Figure 4.2). Thirteen cities are crossed by this alternative (Table 4.2). The most common site type groups are the historic architectural structures (34.8%; n=54) and the historic site leads (28.4%; n=44) (Table 4.3). Overall, 12 sites (7.7%) are either listed (n=4), eligible (n=3), or are researcher-recommended eligible (n=5) for the National Register of Historic Places (Table 4.9). The following discussion of cultural resource sites in Alternative #2 is organized by site type group.

Table 4.7. Summary of Evaluation and Mitigation Work at North Dakota Sites According to Alternative and Site Type Class, Red River Valley Water Supply Project, 2004-2006 UND Investigations (excludes urban survey blocks).

Alternative	Work Status	Site Type Class Code							Total	%
		1	2	3	11	12	13	14		
North Dakota In-Basin (2)	Archeological test excavation	2	0	0	0	0	0	0	2	1.5
	Architectural assessment evaluation	0	0	0	1	38	0	0	39	28.9
	Architectural documentation mitigation	0	0	0	0	3	0	0	3	2.2
	ND-SHPO evaluation	1	1	0	0	7	0	1	10	7.4
	Unevaluated	16	6	9	1	4	43	2	81	60.0
	Total	*19*	*7*	*9*	*2*	*52*	*43*	*3*	*135*	*100.0*
Red River Basin (3)	Archeological test excavation	0	0	0	0	0	0	0	0	0.0
	Architectural assessment evaluation	0	0	0	1	18	0	0	19	20.2
	Architectural documentation mitigation	0	0	0	0	1	0	0	1	1.1
	ND-SHPO evaluation	0	0	0	0	7	0	1	8	8.5
	Unevaluated	15	3	6	2	6	32	2	66	70.2
	Total	*15*	*3*	*6*	*3*	*32*	*32*	*3*	*94*	*100.0*
GDU Import to Sheyenne River (4)	Archeological test excavation	4	0	0	0	0	0	0	4	7.1
	Architectural assessment evaluation	0	0	0	0	16	0	0	16	28.6
	Architectural documentation mitigation	0	0	0	0	0	0	0	0	0.0
	ND-SHPO evaluation	0	0	0	0	0	2	0	2	3.6
	Unevaluated	1	1	3	3	5	20	1	34	60.7
	Total	*5*	*1*	*3*	*3*	*21*	*22*	*1*	*56*	*100.0*
GDU Import Pipeline (5)	Archeological test excavation	4	0	0	0	0	0	0	4	2.9
	Architectural assessment evaluation	0	0	0	0	39	0	0	39	28.1
	Architectural documentation mitigation	0	0	0	0	1	0	0	1	0.7
	ND-SHPO evaluation	0	0	0	0	7	0	0	7	5.0
	Unevaluated	14	6	10	6	11	39	2	88	63.3
	Total	*18*	*6*	*10*	*6*	*58*	*39*	*2*	*139*	*100.0*
Missouri River to RRV Import (6)	Archeological test excavation	5	0	0	0	0	0	0	5	4.3
	Architectural assessment evaluation	0	0	0	0	28	0	0	28	24.1
	Architectural documentation mitigation	0	0	0	0	2	0	0	2	1.7
	ND-SHPO evaluation	0	0	0	0	2	2	0	4	3.4
	Unevaluated	7	6	7	6	7	43	1	77	66.4
	Total	*12*	*6*	*7*	*6*	*39*	*45*	*1*	*116*	*99.9*
Averages (2-6)	Archeological test excavation	3	0	0	0	0	0	0	3	2.8
	Architectural assessment evaluation	0	0	0	0	28	0	0	28	25.9
	Architectural documentation mitigation	0	0	0	0	1	0	0	1	0.9
	ND-SHPO evaluation	0	0	0	0	5	1	0	6	5.6
	Unevaluated	11	4	7	4	7	35	2	70	64.8
	Total	**14**	**4**	**7**	**4**	**41**	**36**	**2**	**108**	**100.0**

Table 4.8. Summary of Evaluation and Mitigation Work at Minnesota Sites According to Alternative and Site Type Class, Red River Valley Water Supply Project, 2004-2006 UND Investigations (excludes urban survey blocks).

Alternative	Work Status	Site Type Class Code							Total	%
		1	2	3	11	12	13	14		
North Dakota In-Basin (2)	Pre-field preparation	0	10	0	0	0	1	0	11	55.0
	Reconnaissance Survey (Phase I)	3	0	1	0	0	0	0	4	20.0
	Evaluation/Informal Testing (Phase II)	2	0	0	1	0	0	0	3	15.0
	Mitigation/Data Recovery (Phase III)	0	0	0	0	0	0	0	0	0.0
	Other, Non-Archeological Studies	0	0	0	0	0	0	0	0	0.0
	Unknown/Not Indicated	0	0	0	0	2	0	0	2	10.0
	Total	*5*	*10*	*1*	*1*	*2*	*1*	*0*	*20*	*100.0*
Red River Basin (3)	Pre-field preparation	0	13	0	0	0	4	0	17	5.7
	Reconnaissance Survey (Phase I)	60	2	8	1	0	0	0	71	23.9
	Evaluation/Informal Testing (Phase II)	17	0	0	1	0	0	0	18	6.1
	Mitigation/Data Recovery (Phase III)	5	0	0	0	0	0	0	5	1.7
	Other, Non-Archeological Studies	0	0	0	0	0	0	0	0	0.0
	Unknown/Not Indicated	65	21	7	0	92	1	0	186	62.6
	Total	*147*	*36*	*15*	*2*	*92*	*5*	*0*	*297*	*100.0*
GDU Import to Sheyenne River (4)	Pre-field preparation	0	3	0	0	0	0	0	3	14.3
	Reconnaissance Survey (Phase I)	6	0	3	0	0	0	0	9	42.9
	Evaluation/Informal Testing (Phase II)	8	0	0	0	0	0	0	8	38.1
	Mitigation/Data Recovery (Phase III)	0	0	0	0	0	0	0	0	0.0
	Other, Non-Archeological Studies	1	0	0	0	0	0	0	1	4.8
	Unknown/Not Indicated	0	0	0	0	0	0	0	0	0.0
	Total	*15*	*3*	*3*	*0*	*0*	*0*	*0*	*21*	*100.1*
GDU Import Pipeline (5)	Pre-field preparation	0	8	0	0	0	0	0	8	25.8
	Reconnaissance Survey (Phase I)	7	0	3	0	0	0	0	10	32.3
	Evaluation/Informal Testing (Phase II)	9	0	0	1	0	0	0	10	32.3
	Mitigation/Data Recovery (Phase III)	0	0	0	0	0	0	0	0	0.0
	Other, Non-Archeological Studies	1	0	0	0	0	0	0	1	3.2
	Unknown/Not Indicated	0	0	0	0	2	0	0	2	6.5
	Total	*17*	*8*	*3*	*1*	*2*	*0*	*0*	*31*	*100.1*
Missouri River to RRV Import (6)	Pre-field preparation	0	0	0	0	0	0	0	0	0.0
	Reconnaissance Survey (Phase I)	0	0	0	0	0	0	0	0	0.0
	Evaluation/Informal Testing (Phase II)	0	0	0	0	0	0	0	0	0.0
	Mitigation/Data Recovery (Phase III)	0	0	0	0	0	0	0	0	0.0
	Other, Non-Archeological Studies	0	0	0	0	0	0	0	0	0.0
	Unknown/Not Indicated	0	0	0	0	1	0	0	1	100.0
	Total	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*1*	*100.0*
Averages (2-6)	Pre-field preparation	0	7	0	0	0	1	0	8	11.1
	Reconnaissance Survey (Phase I)	15	0	3	0	0	0	0	18	25.0
	Evaluation/Informal Testing (Phase II)	7	0	0	1	0	0	0	8	11.1
	Mitigation/Data Recovery (Phase III)	1	0	0	0	0	0	0	1	1.4
	Other, Non-Archeological Studies	0	0	0	0	0	0	0	0	0.0
	Unknown/Not Indicated	13	4	1	0	19	0	0	37	51.4
	Total	**36**	**11**	**4**	**1**	**19**	**1**	**0**	**72**	**100.0**

Table 4.9. Summary of National Register of Historic Places Data According to Proposed Alternative, Red River Valley Water Supply Project, 2004-2006 UND Investigations (excludes urban survey blocks).

NRHP Status	Alternative					Average
	2	3	4	5	6	
ND Sites						
Listed	3	1	0	2	2	2
Eligible, individual or district	3	2	0	2	2	2
Eligible, researcher recommendation	5	3	3	7	7	5
Not eligible	14	11	5	9	3	8
Not eligible, researcher recommendation	31	14	17	33	29	25
Unevaluated	79	63	31	86	72	66
Unknown (not coded)	0	0	0	0	1	0
Subtotal	*135*	*94*	*56*	*139*	*116*	*108*
MN Sites						
Listed, individual or district	1	10	0	1	0	2
Certified eligible by MN-SHPO	0	6	0	0	0	1
Determined eligible by NPS	0	2	0	0	0	0
Not eligible	0	1	0	0	0	0
Unknown (not indicated)	19	278	21	30	1	70
Subtotal	*20*	*297*	*21*	*31*	*1*	*74*
Total	**155**	**391**	**77**	**170**	**117**	**182**

Prehistoric archeological sites account for 15.5% (n=24) of the recorded cultural resources in this alternative. Nineteen of these are in North Dakota and five are in Minnesota (Table 4.3). The North Dakota sites consist of 17 cultural material (artifact) scatters, one mound site, and one rock feature site (Table 4.4). The mound site (32BA416) contains four rock-covered mounds; the rock feature site (32SA52) contains a single rock cairn. Three sites, all cultural material scatters, have been formally evaluated through test excavations or by the ND-SHPO (Table 4.7). One cultural material scatter site (32BA7) is eligible for the NRHP (Table 4.10). Two sites have been determined not eligible and one has been researcher recommended as not eligible for the NRHP. In Minnesota, all five prehistoric archeological sites are artifact scatters (Table 4.5), and two have been test excavated (Table 4.8). The NRHP status is not listed for any of the five sites (Table 4.11).

There are 17 prehistoric site leads in Alternative #2, including seven in North Dakota and 10 in Minnesota (Table 4.3). The North Dakota site leads refer to three mound locations, one village location, two sites collected by private individuals, and one bison skull. The mound site leads were originally recorded by T. H. Lewis in the late 1800s. They are treated as site leads because they have yet to be relocated by professional archeologists (c.f. Haury 1990). The Minnesota site leads all reference the Red River Trail in Clay County (21CYr) (Table 4.5). There are another 10 prehistoric isolated finds in this alternative, nine of which are in North Dakota (Table 4.3). The isolated finds in both states consist of one or a few artifacts. One of the North Dakota isolated finds has been evaluated by the ND-SHPO, and the remainder are unevaluated; the Minnesota find spot has not been investigated beyond the survey level (Tables 4.7 and 4.8). None of the site leads or isolated find spots are listed, eligible, or recommended eligible for the NRHP (Tables 4.10 and 4.11).

Table 4.10. Summary of National Register of Historic Places Data for North Dakota Sites According to Alternative and Site Type Class, Red River Valley Water Supply Project, 2004-2006 UND Investigations (excludes urban survey blocks).

Alternative	NRHP Status	Site Type Code							Total	%
		1	2	3	11	12	13	14		
North Dakota In-Basin (2)	Listed	0	0	0	0	3	0	0	3	2.2
	Eligible, individual or district	1	0	0	0	2	0	0	3	2.2
	Eligible, researcher recommendation	0	0	0	0	5	0	0	5	3.7
	Not eligible	2	1	0	0	10	0	1	14	10.4
	Not eligible, researcher recommendation	1	0	0	2	28	0	0	31	23.0
	Unevaluated	15	6	9	0	4	43	2	79	58.5
	Total	19	7	9	2	52	43	3	135	*100.0*
Red River Basin (3)	Listed	0	0	0	0	1	0	0	1	1.1
	Eligible, individual or district	0	0	0	0	2	0	0	2	2.1
	Eligible, researcher recommendation	0	0	0	0	3	0	0	3	3.2
	Not eligible	0	0	0	0	10	0	1	11	11.7
	Not eligible, researcher recommendation	1	0	0	3	10	0	0	14	14.9
	Unevaluated	14	3	6	0	6	32	2	63	67.0
	Total	15	3	6	3	32	32	3	94	*100.0*
GDU Import to Sheyenne River (4)	Listed	0	0	0	0	0	0	0	0	--
	Eligible, individual or district	0	0	0	0	0	0	0	0	--
	Eligible, researcher recommendation	1	0	0	0	2	0	0	3	5.4
	Not eligible	3	0	0	0	0	2	0	5	8.9
	Not eligible, researcher recommendation	0	0	1	1	15	0	0	17	30.4
	Unevaluated	1	1	2	2	4	20	1	31	55.4
	Total	5	1	3	3	21	22	1	56	*100.1*
GDU Import Pipeline (5)	Listed	0	0	0	0	2	0	0	2	1.4
	Eligible, individual or district	0	0	0	0	2	0	0	2	1.4
	Eligible, researcher recommendation	1	0	0	0	6	0	0	7	5.0
	Not eligible	0	0	0	0	9	0	0	9	6.5
	Not eligible, researcher recommendation	2	0	0	3	28	0	0	33	23.7
	Unevaluated	15	6	10	3	11	39	2	86	61.9
	Total	18	6	10	6	58	39	2	139	*99.9*
Missouri River to Red River Valley Import (6)	Listed	0	0	0	0	2	0	0	2	1.7
	Eligible, individual or district	0	0	0	0	2	0	0	2	1.7
	Eligible, researcher recommendation	4	0	0	0	3	0	0	7	6.0
	Not eligible	0	0	0	0	1	2	0	3	2.6
	Not eligible, researcher recommendation	2	0	1	2	24	0	0	29	25.0
	Unevaluated	6	6	6	3	7	43	1	72	62.1
	Unknown (not coded)	0	0	0	1	0	0	0	1	0.9
	Total	12	6	7	6	39	45	1	116	*100.0*
Averages (2-6)	Listed	0	0	0	0	2	0	0	2	1.9
	Eligible, individual or district	0	0	0	0	2	0	0	2	1.9
	Eligible, researcher recommendation	1	0	0	0	4	0	0	5	4.7
	Not eligible	1	0	0	0	6	1	0	8	7.5
	Not eligible, researcher recommendation	1	0	0	2	21	0	0	24	22.4
	Unevaluated	10	4	7	2	6	35	2	66	61.7
	Unknown (not coded)	0	0	0	0	0	0	0	0	0.0
	Total	**13**	**4**	**7**	**4**	**41**	**36**	**2**	**107**	**100.1**

Table 4.11. Summary of National Register of Historic Places Data for Minnesota Sites According to Alternative and Site Type Class, Red River Valley Water Supply Project, 2004-2006 UND Investigations (excludes urban survey blocks).

Alternative	NRHP Status	Site Type Code							Total	%
		1	2	3	11	12	13	14		
North Dakota In-Basin (2)	Listed on NRHP, individual or district	0	0	0	0	1	0	0	1	5.0
	Unknown/not indicated	5	10	1	1	1	1	0	19	95.0
	Total	*5*	*10*	*1*	*1*	*2*	*1*	*0*	*20*	*100.0*
Red River Basin (3)	Listed on NRHP, individual or district	3	0	0	0	7	0	0	10	3.4
	Certified eligible for NRHP by MN-SHPO	4	0	0	0	2	0	0	6	2.0
	Determined eligible for NRHP by NPS	0	0	0	0	2	0	0	2	0.7
	Determined not eligible	0	0	0	0	1	0	0	1	0.3
	Unknown/not indicated	140	36	15	2	80	5	0	278	93.6
	Total	*147*	*36*	*15*	*2*	*92*	*5*	*0*	*297*	*100.0*
GDU Import to Sheyenne River (4)	Unknown/not indicated	15	3	3	0	0	0	0	21	100.0
	Total	*15*	*3*	*3*	*0*	*0*	*0*	*0*	*21*	*100.0*
GDU Import Pipeline (5)	Listed on NRHP, individual or district	0	0	0	0	1	0	0	1	3.2
	Unknown/not indicated	17	8	3	1	1	0	0	30	96.8
	Total	*17*	*8*	*3*	*1*	*2*	*0*	*0*	*31*	*100.0*
Missouri River to RRV Import (6)	Unknown/not indicated	0	0	0	0	1	0	0	1	100.0
	Total	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*1*	*100.0*
Averages (2-6)	Listed on NRHP, individual or district	1	0	0	0	2	0	0	3	4.1
	Certified eligible for NRHP by MN-SHPO	1	0	0	0	0	0	0	1	1.4
	Determined eligible for NRHP by NPS	0	0	0	0	0	0	0	0	0.0
	Determined not eligible	0	0	0	0	0	0	0	0	0.0
	Unknown/not indicated	35	11	4	1	17	1	0	69	94.5
	Total	**37**	**11**	**4**	**1**	**19**	**1**	**0**	**73**	**100.0**

Three historic archeological sites are recorded in this alternative (Table 4.3). The two in North Dakota include one foundation site and one cultural material scatter (Table 4.4). The foundation site has had an architectural assessment evaluation and the second has not been evaluated beyond the survey level (Table 4.7). Both sites have been researcher recommended as not eligible for the NRHP (Table 4.10). The Minnesota site is a structural ruin that has been tested (Tables 4.4 and 4.8); the NRHP status of this site is unknown (Table 4.11).

There are 54 historic architectural sites in non-urban settings within Alternative #2; all but two of these are in North Dakota (Table 4.3). The North Dakota structures include 23 buildings, 19 bridges, nine railroad segments, and one cemetery or grave (Table 4.4). The buildings group includes 17 churches/other religious structures, three farms or farm buildings, two houses, and a bank. Most (92.3%; n=48) of the North Dakota architectural sites have been evaluated (n=38) or mitigated (n=3) through historical research, or were evaluated by the ND-SHPO (n=7) (Table 4.7). Three architectural structures are listed, two have been found eligible, and five have been recommended eligible for the NRHP (Table 4.10). The two Minnesota architectural sites consist of a residence and a township hall (Table 4.5). The evaluation/fieldwork status of both sites is not listed (Table 4.8). One site, the Randolph M. Probstfield House (CY-OAK-001), is listed on the NRHP. The NRHP status of the other site is unknown (Table 4.11).

Forty-four historic site leads are recorded in this alternative, and 43 of these are in North Dakota (Table 4.3). The North Dakota site leads refer to 13 post offices, nine townsites, eight railroad stations, seven schools, two houses, one loading station, one railroad junction, one trail segment, and one military outpost. The Minnesota historic site lead refers to a trading post noted in historical documents (Table

4.5). No site leads in either state have been formally investigated (Tables 4.7 and 4.8). No historic site leads in either state are listed, eligible, or have been recommended eligible for the NRHP (Tables 4.10 and 4.11).

There are three historic isolated find spots in this alternative, and they are all located in North Dakota (Table 4.3). The isolated finds each consist of one or only a few pieces of historic material that were too few in number for a site number to be assigned. One North Dakota find spot has been evaluated by the ND-SHPO as not eligible, while the other two remain formally unevaluated (Tables 4.7 and 4.10).

Red River Basin Alternative (#3)

Alternative #3, the Red River Basin Alternative, contains 391 previously recorded cultural resource sites. This is the highest site count among the five alternatives (Figure 4.1; Table 4.1). Roughly three-quarters of the sites (76.0%; n=297) are located in Minnesota and the remainder are in North Dakota (Figure 4.3). The abundance of Minnesota sites reflects a large aquifer well field in Becker and Otter Tail counties. Twenty-four cities are crossed by this alternative (Table 4.2). The most commonly represented site type groups are the prehistoric archeological sites (41.4%; n=162) and historic architectural structures (31.7%; n=124) (Table 4.3). Overall, 24 sites (6.1%) are either listed (n=11), eligible (n=10), or are researcher recommended as eligible (n=3) for the National Register of Historic Places (Table 4.9).

Of the 162 prehistoric archeological sites in this alternative, 90.7% (n=147) are present in Minnesota (Table 4.3). The 15 North Dakota sites consist of 14 cultural material (artifact) scatters and one rock feature site (Table 4.4); the latter contains a single rock cairn. None of these sites have been investigated beyond the survey level (Table 4.7). One has been researcher recommended as not eligible for the NRHP, and the remainder are formally unevaluated (Table 4.10). The 147 prehistoric archeological sites in Minnesota include 89 artifact scatters, 47 earthworks or earthworks with documented burials (mounds), seven cemeteries, and four other sites (Table 4.4). Seventeen sites have been tested and five have been mitigated through block excavations (Table 4.8). Seven prehistoric archeological sites are listed (n=3) or have been certified eligible for listing (n=4) in the NRHP (Table 4.11).

There are 39 prehistoric site leads, of which 36 are in Minnesota (Table 4.3). The three North Dakota site leads all refer to mound sites. The Minnesota prehistoric site leads include 13 trail sites, nine artifact scatters, eight earthworks, four sites noted in historic documents (contact period trading post, etc.), and two cemeteries (Table 4.4). There are 21 prehistoric isolated find spots in this alternative, including 15 in Minnesota and six in North Dakota (Table 4.3). The isolated finds in both states each contain one or only a few artifacts. None of the site leads or isolated finds have been tested, however, four site leads in Minnesota have had collections or other non-field work carried out (Tables 4.7 and 4.8). None of the prehistoric site leads or isolated find spots in either state are listed, eligible, or recommended eligible for the NRHP (Tables 4.10 and 4.11).

There are five historic archeological sites in Alternative #3; three are in North Dakota and two are in Minnesota (Table 4.3). The North Dakota sites consist of one artifact scatter, one foundation, and one trail (Table 4.4). One site has had architectural assessment evaluation work completed and the others have not been investigated beyond the survey level (Table 4.7). All three are researcher recommended as not eligible for the NRHP (Table 4.10). Both Minnesota sites are structural ruins (Table 4.5). One has been tested (Table 4.8) but neither is listed or eligible for listing in the NRHP (Table 4.11).

There are 124 historic architectural structures in this alternative, including 32 in North Dakota and 92 in Minnesota (Table 4.3). The North Dakota sites total 13 bridges, nine buildings, nine railroad segments, and one cemetery (Table 4.4). The buildings group includes seven churches and two farms or farm buildings. Eighteen historic structures have had architectural assessment evaluation, one has had architectural documentation mitigation, and seven have been evaluated by the ND-SHPO (Table 4.7). One architectural site is listed on the National Register, two are eligible, and three have been researcher recommended as eligible for the NRHP (Table 4.10). The Minnesota architectural sites have been classified into 26 separate site types, based on function. Most of the sites fall within the following types: seasonal residences (n=13), cabins (n=12), churches (n=11), township halls (n=9), farmsteads (n=8),

bridges (n=5), residences (n=5), and outbuildings (n=5) (Table 4.4). There is no data on the type of evaluation work, if any, carried out at these architectural sites (Table 4.8). However, the same dataset indicates that seven sites are listed in the NRHP, two are certified eligible by the MN-SHPO, and two have been determined eligible by the NPS (Table 4.11).

Thirty-seven historic site leads have been recorded in this alternative, including 32 in North Dakota and five in Minnesota (Table 4.3). The North Dakota site leads consist of ten post offices, six railroad stations, six townsites, five schools, a loading station, a trail, a railroad junction, a military outpost, and an occupied mobile home. The Minnesota site leads consist of four sites documented in historic records (ghost towns, trading posts, homes, etc.) and one mill (Table 4.4). Lastly, there are three historic isolated finds in this alternative, and all are in North Dakota (Table 4.3). None of the historic site leads or isolated finds are listed, eligible, or recommended eligible for the NRHP (Tables 4.10 and 4.11).

Garrison Diversion Unit (GDU) Import to Sheyenne River Alternative (#4)

Alternative #4, the GDU Import to Sheyenne River Alternative, contains the fewest number of previously recorded cultural resources sites (n=77) among the five action alternatives (Figure 4.1; Table 4.1). Almost three-quarters (72.7%; n=56) of these sites are in North Dakota (Figure 4.4). Twelve cities are crossed by this alternative (Table 4.2). The most common site type groups are historic site leads (28.6%; n=22), historic architectural structures (27.3%; n=21), and prehistoric archeological sites (26.0%; n=20) (Table 4.3). Overall, three sites have been recommended eligible for listing in the NRHP (Table 4.9); the remainder are unevaluated or have been determined/recommended not eligible for listing.

Of the 20 prehistoric archeological sites in this alternative, 15 are located in Minnesota and five are in North Dakota (Table 4.3). The North Dakota sites include four cultural material (artifact) scatters and one rock feature site (Table 4.4). Four of the sites (all four cultural material scatters) have been formally evaluated through test excavations, while the rock cairn site remains unevaluated (Table 4.7). One cultural material scatter site has been researcher recommended eligible for the NRHP; the other three cultural material scatter sites are not eligible for the NRHP, and the rock cairn site remains formally unevaluated (Table 4.10). Of the 15 prehistoric archeological sites in Minnesota, 14 are artifact scatters and the other is an earthwork with a burial (Table 4.5). Eight of these have been tested, six have been investigated only at the survey level, and one has had other, non-archeological studies carried out (Table 4.8). The NRHP status is not listed (unknown) for any of the sites (Table 4.11).

There are four prehistoric site leads in Alternative #4, of which three are in Minnesota (Table 4.3). The North Dakota site lead refers to a rock cairn, while the Minnesota site leads all refer to the Red River Trail in Clay County (21CYr). There are another six prehistoric isolated finds in this alternative, which are evenly split between the two states (Table 4.3). The isolated finds each contain one or only a few artifacts. None of the site leads or isolated find spots are listed, eligible, or recommended eligible for the NRHP (Tables 4.10 and 4.11).

The three historic archeological sites recorded in this alternative are all present in North Dakota (Table 4.3). They include one foundation site, one dump, and one “other” site (townsite) (Table 4.4). None have been investigated beyond the survey level (Table 4.7), consequently, none are formally evaluated with regard to NRHP criteria (Table 4.10); one of the three has been researcher recommended as not eligible.

Twenty-one historic architectural sites are present in Alternative #4; and every one is present in North Dakota (Table 4.3). These sites include 14 buildings (8 churches, 6 farms) and seven bridges (Table 4.4). A majority of the North Dakota architectural sites have been formally evaluated (n=16) through historical research (Table 4.7). Two sites have been researcher recommended eligible for the NRHP, while 15 have been researcher recommended not eligible and four remain unevaluated (Table 4.10).

All of the 22 historic site leads in this alternative are located in North Dakota (Table 4.3). They refer to six railroad stations, five schools, three post offices, two townsites, two military campsites, two ranches, a mansion, and a mobile home. There is one historic isolated find spot in this alternative, and it is in North Dakota (Table 4.3). It is a single fragment of whiteware. None of the historic site leads or isolated find spots have been investigated beyond the survey level, and none have been formally evaluated in terms of NRHP criteria (Tables 4.7 and 4.10).

Garrison Diversion Unit (GDU) Import Pipeline Alternative (#5)

A total of 170 cultural resource sites has been recorded within the proposed study area for Alternative #6, the Garrison Diversion Unit (GDU) Import Pipeline Alternative (Table 4.1). This is the second highest site total among the five action alternatives (Figure 4.1). Most of these (81.8%; n=139) are located in North Dakota (Figure 4.5). Nineteen cities are crossed by this alternative (Table 4.2). The most common site type groups are the historic architectural structures (35.3%; n=60), historic site leads (22.9%; n=39), and prehistoric archeological sites (20.6%; n=35) (Table 4.3). Overall, 12 sites (7.1%) are listed (n=3), eligible (n=2), or are researcher-recommended eligible (n=7) for the National Register of Historic Places (Table 4.9).

There are 35 prehistoric archeological sites in this alternative, which are split fairly evenly between North Dakota (n=18) and Minnesota (n=17) (Table 4.3). In North Dakota, there are 15 cultural material (artifact) scatters, two sites with rock features, and one site with a hearth feature (Table 4.4). Four of these 18 sites have had test excavations carried out (Table 4.7). One site has been researcher recommended as eligible for the NRHP, two have been researcher recommended not eligible, and the other 15 are unevaluated with regard to NRHP criteria (Table 4.10). Sixteen of the 17 sites in Minnesota are artifact scatters, and the other is an earthwork with a confirmed burial (mound) (Table 4.5). Nine of these have been tested and another has been the subject of other, non-field studies (Table 4.8). The NRHP status of all 17 Minnesota sites is unknown (not listed) (Table 4.11).

There are 14 prehistoric site leads (6 in ND, 8 in MN) and 13 prehistoric isolated finds (10 in ND, 3 in MN) in this alternative (Table 4.3). The North Dakota site leads reference three mound sites, two sites that have been collected by private individuals, and one rock cairn site. The mound sites were mapped by T. H. Lewis in the late 1800s, but have yet to be relocated by professional archeologists. The eight Minnesota site leads all refer to the Red River Trail in Clay County (21CYr). The isolated finds in both states each contain one or a handful of artifacts. None of the prehistoric site leads or isolated find spots are listed, eligible, or recommended eligible for the NRHP (Tables 4.10 and 4.11).

This alternative contains seven historic archeological sites, six of which are in North Dakota (Table 4.3). The North Dakota sites include two foundation sites, one depression site, one dumpsite, one cultural material scatter, and one “other” site (townsite/railroad station) (Table 4.4). None of the six sites have been investigated beyond the survey level (Table 4.7). Three are unevaluated and three have been researcher recommended as not eligible for the NRHP (Table 4.10). The Minnesota site is a structural ruin with an associated artifact scatter (Table 4.4). It has been tested, but its NRHP status is not indicated (Tables 4.8 and 4.11); it is presumed to be not eligible for the NRHP.

Sixty historic architectural structures are present in Alternative #6, and all but two are present in North Dakota (Table 4.3). The North Dakota sites consist of 26 buildings, 23 bridges, and nine railroad segments (Table 4.4). The buildings group is composed of 18 churches, six farms, one masonic lodge, and a county courthouse. One architectural site has been mitigated through historic documents research, 39 have been evaluated, and seven have been formally evaluated by the ND-SHPO (Table 4.7). Ten of these sites are listed (n=2), eligible (n=2), or have been researcher recommended eligible (n=6) for listing in the National Register (Table 4.10). The two architectural structures in Minnesota include a residence and a township hall (Table 4.5). The residence is listed on the National Register (Table 4.11).

All 39 of the historic site leads recorded in this alternative are located in North Dakota (Table 4.3). They include 14 post offices, nine schools, seven railroad stations, two military camps/other sites, two farms, two townsites, one railroad junction, one loading station, and a mobile home. None of the site leads have been formally investigated (Table 4.7). None of the historic site leads have been evaluated with regard to NRHP (Table 4.10).

There are two historic isolated finds and both are in North Dakota (Table 4.2). Each find spot consisted of one or a few historic artifacts. Neither has been formally evaluated with regard to the NRHP (Tables 4.7 and 4.10).

Missouri River to Red River Valley Alternative (#6)

Alternative #6, the Missouri River to Red River Valley Alternative, contains 117 previously recorded cultural resource sites, which is the second lowest site total among the five alternatives (Figure 4.1; Table 4.1). All but one of the sites are located in North Dakota (Figure 4.6). Five cities are crossed by this alternative (Table 4.2). The most common site type groups are the historic site leads (38.5%; n=45) and the historic architectural structures (34.2%; n=40) (Table 4.3). Overall, 11 sites (9.4%) of the sites are listed (n=2), eligible (n=2), or are researcher recommended as eligible (n=7) for listing in the National Register of Historic Places (Table 4.9).

Twelve prehistoric archeological sites are recorded for this alternative, and every one is located in North Dakota (Table 4.3). All 12 of these sites are cultural material (artifact) scatters (Table 4.4). Five sites have been test excavated (Table 4.7), and four of these have been researcher recommended as eligible for listing in the NRHP (Table 4.10); two have been recommended not eligible for the NRHP.

There are six prehistoric site leads and seven prehistoric isolated finds in Alternative #6, and they all are in North Dakota (Table 4.3). The site leads reference three cultural material scatters, two mound sites, and a site that has been collected by a private individual. The isolated find spots each consist of one or a few artifacts. None of the prehistoric site leads have been formally investigated, and none of the isolated finds have been investigated beyond the survey level (Table 4.7). None of the prehistoric site leads or isolated finds are listed, eligible, or have been recommended eligible for the NRHP (Table 4.10); one isolated find has been researcher recommended as not eligible.

Six historic archeological sites are in this alternative, and every one is present in North Dakota (Table 4.3). This group is composed of three foundation sites, two cultural material scatters, and one “other” site (Table 4.4); the latter is an old townsite. None of the six sites have been investigated beyond the survey level (Table 4.7). The NRHP status of three sites are listed as unevaluated, two have been recommended as not eligible, and the NRHP status of one site is unknown (Table 4.10).

There are 40 historic architectural structures in Alternative #6, of which 39 are in North Dakota and one is in Minnesota (Table 4.3). The North Dakota sites include 27 buildings, 11 bridges, and one cemetery (Table 4.4). The buildings consist of 17 churches, five farms and one farm district, two houses, one school, and a bank. Among the 39 North Dakota architectural sites, 28 have been evaluated through historic records research, two have been mitigated through historic documents research, and two more have been evaluated by the ND-SHPO (Table 4.7). Seven sites are either listed (n=2), eligible (n=2), or have been researcher recommended as eligible (n=3) for the NRHP (Table 4.10). The Minnesota architectural site is a township hall (Table 4.5) whose NRHP status is not known (Table 4.11).

A total of 45 historic site leads has been recorded in this alternative, and every one is located in North Dakota (Table 4.3). They include references to 16 schools, ten townsites, ten railroad stations and sidings, three post offices, three houses, two military campsites or battlefields, and one mansion. Two of the site leads have been formally evaluated by the ND-SHPO (Table 4.7); both were determined to be not eligible for the NRHP (Table 4.10). The remaining 43 historic site leads remain formally unevaluated (Tables 4.7 and 4.10).

Lastly, there is one historic isolated find spot in this alternative, and it is in North Dakota (Table 4.3). It has not been investigated beyond the survey level (Table 4.7), and it has not been formally evaluated with regard to NRHP criteria (Table 4.10).

Closing Remarks

This chapter provides a basic summary of the recorded cultural resource sites and site leads within each of the five proposed alternatives of the Red River Valley Water Supply Project. We started by making broad site comparisons between the five alternatives, and then followed with summary discussions of the cultural resources within each alternative. The information presented in this chapter is very basic and is designed to allow the broad analysis and assessment of potential impacts to cultural resource sites within the project area. Detailed site discussions have been avoided due to the scope of the project, including the sheer number of sites involved as well as the geographic extent of the project. Analysis of the cultural resources data presented herein follows in Chapter 5 of this report. For additional, site specific information, the reader is referred to Appendices B-D.

Chapter 5
ANALYSIS AND CONCLUSIONS

Previous Cultural Resources Surveys

Analysis and assessment of previous cultural resources surveys conducted in the RRVWSP alternative study areas is really quite simple. No substantial parts of any of the proposed action alternative study areas have been subjected to systematic survey coverage that meets modern standards. Parts of the Sheyenne River have been systematically surveyed, however, this river valley is only crossed in a few specific locations by alternatives of the proposed project, which is projected to have only a negligible effect on average flows in this stream. Nevertheless, the shifting nature of the Sheyenne river channel could expose previously unexposed archeological deposits, which would make previous surveys of the river outdated within only a matter of years. The Red River of the North has been systematically surveyed only near the cities of Grand Forks and East Grand Forks, largely in response to recent flood control projects; the entire length of the river has not been systematically surveyed, and survey coverage elsewhere is very spotty. It is our conclusion and recommendation that all high potential site areas that will be affected by the selected alternative be subjected to intensive, on-the-ground cultural resources surveys. It is especially important that all major stream crossings and areas close to substantial water bodies be intensively surveyed for cultural resources.

Some comment is also necessary regarding Lake Ashtabula, the man-made reservoir formed by the impoundment of the Sheyenne River behind Baldhill Dam in Barnes County, ND. The dam and reservoir are managed by the US Army Corps of Engineers, primarily for flood control and water supply needs. The reservoir shoreline was surveyed in the late 1970s, but the inundated landscape beneath the reservoir received no comprehensive survey coverage prior to impoundment. Some of the proposed alternatives would use Lake Ashtabula as a regulating reservoir. According to Reclamation planning documents, use of the reservoir within the RRVWSP will not substantially change from its current usage; the reservoir will be essentially maintained at or near its maximum pool capacity, resulting in a net “no effect” insofar as reservoir operations are concerned. Still, maintaining the reservoir at peak capacity could cause increased rates of shoreline erosion that may impact recorded archeological sites, as well as exposing undiscovered deposits. Based on this reasoning, an updated shoreline survey of Lake Ashtabula is recommended to better assess such potential impacts. On the other hand, the no action alternative likely will result in periodic low lake levels, as the reservoir is drawn down in times of drought, potentially exposing inundated archeological sites that could then experience increased rates of lateral erosion and illicit artifact collecting. Following this reasoning, the no action alternative could be construed as potentially more damaging to cultural resource sites than those project alternatives that maintain water levels in Lake Ashtabula.

Recorded Cultural Resource Sites

This section provides an analysis of recorded cultural resource sites within each of the five proposed alternatives that comprise the RRVWSP study areas. This analysis focuses on three of the seven site type groups used in Chapter 4 to characterize previously recorded cultural resource sites and potential sites within the study areas, namely, those that represent bona fide cultural resource sites: (1) prehistoric archeological sites, (2) historic archeological sites, and (3) historic architectural sites. Prehistoric and historic site leads and isolated finds are excluded from the analysis because of their generally tenuous and/or unconfirmed nature as genuine cultural resource properties. Eliminating the site lead and isolated find groups is necessary to reduce the considerable amount of “noise” that they represent in the data, enabling us to provide a much clearer and more concise analysis picture.

The numbers of prehistoric archeological sites, historic archeological sites, and historic architectural sites recorded in each alternative varies considerably from a high of 291 to a low of 44 (Table 5.1). This variation is more a function of study area size than actual site densities, when the numbers of sites per square mile of study area are considered (Table 5.2). Still, there is no denying that the Red River Basin (#3) alternative contains the most recorded sites as well as the highest recorded site density of any of the other alternatives (Figures 5.1 and 5.2). The Red River Basin (#3) alternative includes two large aquifer well fields, one of which covers large portions of Ottertail and Becker counties in Minnesota, which are dotted with numerous lakes; most of the recorded sites are located near these bodies of water. This phenomenon likely reflects truly higher numbers of sites in the Red River Basin (#3) alternative, particularly where it overlaps portions of Minnesota lake country, but it also could reflect, at least in part, the more extensive state-wide survey efforts that have occurred in Minnesota. In comparison, the other four action alternatives, restricted for the most part to eastern North Dakota, exhibit roughly comparable numbers of sites, as well as nearly identical site densities. Historic architectural sites are the most frequent kind of recorded site in all cases, except, once again, for the Red River Basin (#3) alternative, where greater numbers of prehistoric archeological sites are recorded (Table 5.1).

Clearly, the Red River Basin (#3) alternative would have the greatest potential impact to recorded and unrecorded cultural resource sites. Impacts to sites within the other four action alternatives are judged to be less, at more or less comparable levels. Therefore, based on cultural resources considerations alone, one can readily exclude the Red River Basin (#3) alternative as being the most problematic. However, there is no logical basis for choosing among the other four action alternatives in regard to cultural resources.

Conclusion

It is the archeological sites, both prehistoric and historic, that are the most likely cultural resource sites to be affected by the RRVWSP project. Based on the number of known sites, the Red River Basin Alternative (#3) is potentially the most destructive in terms of cultural resources. It is our conclusion that the GDU Import Pipeline (#5), the North Dakota In-Basin (#2), the Missouri River to Red River Valley (#6), and the GDU Import to Sheyenne River (#4) alternatives are the best options, in no particular order, from a least-impact cultural resources perspective. Be this as it may, it also must be recognized that none of the alternative study areas has received anything like comprehensive cultural resources survey coverage, so intensive survey specific to the selected alternative is likely to result in the discovery and recording of many currently unknown sites. Just how many unrecorded sites might be present within the area of a given alternative is impossible to say on the basis of currently available information.

Final Caveat

It should be remembered that what is known for previously recorded sites is based on previous survey work. None of the existing surveys was comprehensive in terms of areal coverage. Previous surveys largely reflect small-scale projects involving road surveys, rural water system surveys, cell tower placements, and the like. These projects provide only a small glimpse of the archeological record that may be affected by the RRVWSP. Any of the five action alternatives may in fact pose a greater risk to the archeology of the region than can currently be estimated. Comprehensive and intensive cultural resources survey of the selected alternative will be necessary to accurately assess the quantity and types of sites located in areas not previously surveyed.

Table 5.1. Rank Order of Numbers of Archeological and Architectural Sites According to Alternative, Red River Valley Water Supply Project, 2004-2006 UND Investigations.

Alternative	Prehistoric Archeological Sites (1)	Historic Archeological Sites (11)	Historic Architectural Sites (12)	Total	Rank	NRHP [a] Sites
Red River Basin (#3)	162	5	124	291	1	16
GDU Import Pipeline (#5)	35	7	60	102	2	12
North Dakota In-Basin (#2)	24	3	54	81	3	12
Missouri River to RRV (#6)	12	6	40	58	4	11
GDU Import to Sheyenne (#4)	20	3	21	44	5	3

[a] Includes sites listed, determined eligible, or researcher recommended as eligible for listing in the National Register of Historic Places.

Table 5.2. Rank Order of Archeological and Architectural Site Densities According to Alternative, Red River Valley Water Supply Project, 2004-2006 UND Investigations.

Alternative	Sites	Mi^2	Sites/Mi^2	Rank
Red River Basin (#3)	291	1,778	0.16	1
GDU Import Pipeline (#5)	102	1,011	0.10	2t
North Dakota In-Basin (#2)	81	795	0.10	2t
GDU Import to Sheyenne (#4)	44	444	0.10	2t
Missouri River to RRV (#6)	58	713	0.08	5

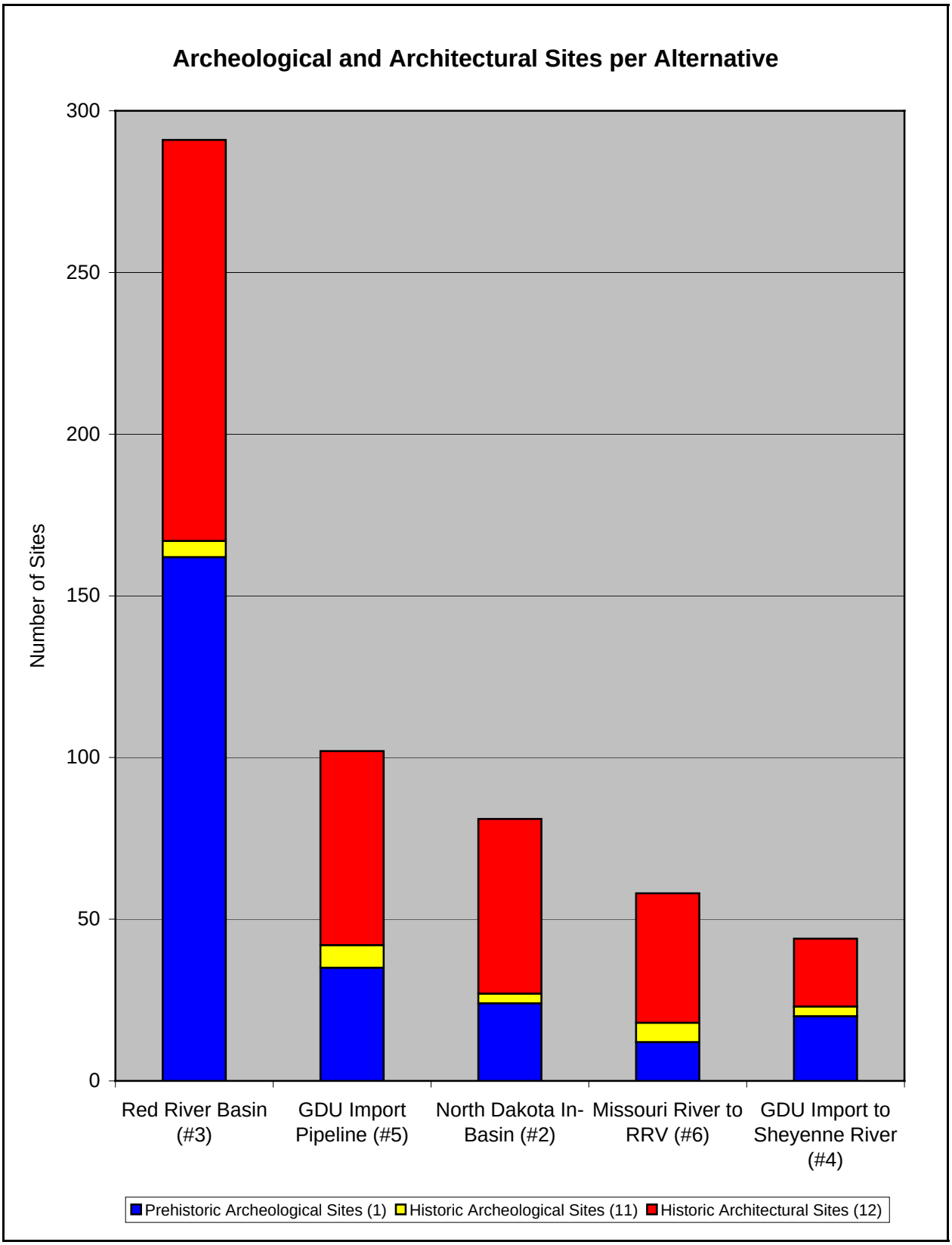

Figure 5.1. Bar chart depicting the ranked number of recorded archeological and architectural sites per alternative, Red River Valley Water Supply Project, 2004-2006 UND investigations.

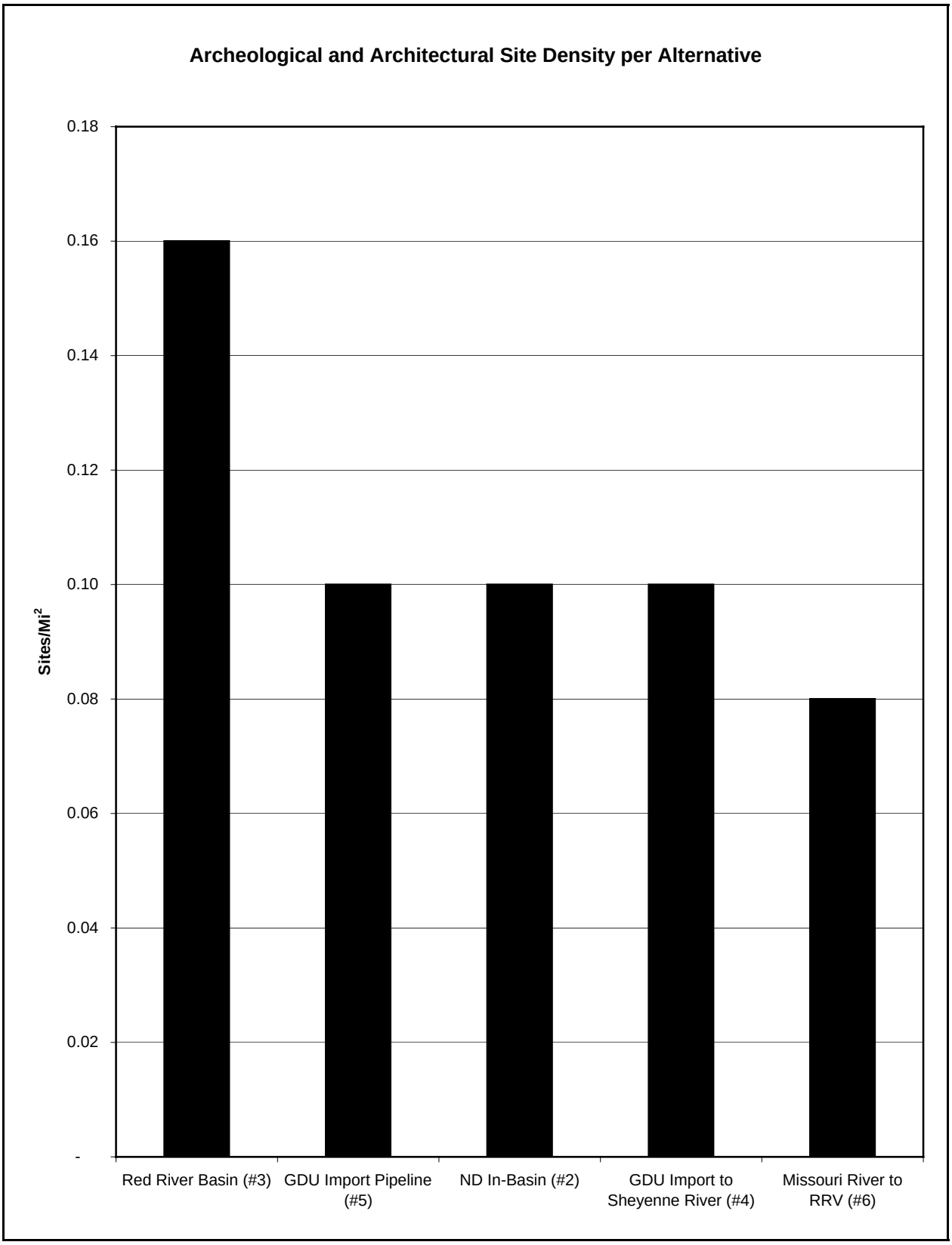

Figure 5.2. Bar chart depicting the ranked density of recorded archeological and architectural sites per alternative, Red River Valley Water Supply Project, 2004-2006 UND investigations.

Chapter 6
MANAGEMENT SUMMARY

The Dakotas Area Office of the USDI Bureau of Reclamation (Reclamation), Bismarck, North Dakota, is preparing an environmental impact statement (EIS) for the proposed Red River Valley Water Supply Project (RRVWSP). The RRVWSP is an ambitious undertaking, covering parts of eastern North Dakota and northwestern Minnesota, to insure a reliable and continuous supply of water to the Red River Valley for future needs. As a part of the EIS process, Reclamation requested that the Anthropology Research section of the Department of Anthropology, University of North Dakota (UND), Grand Forks, prepare a Class I (file and literature search) cultural resources inventory report for the study areas of the various RRVWSP alternatives. The present report is that document. It presents information on the environmental and cultural settings of the larger RRVWSP study area, previous cultural resources investigations of some substance, recorded cultural resources sites, and an analysis and assessment of the various alternatives with respect to potential impacts to cultural resources.

At present, the RRVWSP is divided into six alternatives for purposes of study. The first alternative is the no action option. The other five alternatives each pertain to one of the five project action alternatives involving specific study areas. The six alternatives, including the no action alternative, are listed as follows:

1) No Action Alternative
2) North Dakota In-Basin Alternative
3) Red River Basin Alternative
4) Garrison Diversion Unit (GDU) Import to Sheyenne River Alternative
5) GDU Import Pipeline Alternative
6) Missouri River to Red River Valley Alternative

The action alternatives use various combinations of river channels, existing canals, new pipelines, and new aquifer well fields to bring water to the Red River Valley from Missouri River sources or in-basin sources.

The cultural resources survey status of each action alternative study area was examined using information on file at the State Historical Society of North Dakota, North Dakota State Historic Preservation Office (ND-SHPO), Bismarck, and the Minnesota Historical Society, Minnesota State Historic Preservation Office (MN-SHPO), St. Paul. Based on this research, it was found that none of the proposed alternative study areas has been subjected to intensive, on-the-ground cultural resources survey work of any substance, meeting modern survey standards. The Red River of the North has received substantive survey coverage in the Grand Forks, ND, and East Grand Forks, MN, areas in response to ongoing flood control projects. Otherwise, substantive, systematic survey coverage of the five action alternative study areas is quite limited. On this basis, it is recommended that all high site potential areas along the alternative selected for construction be subjected to intensive, on-the-ground cultural resources inventory work. It is especially important that substantial bodies of water (river crossings, lake shores, and the like) receive comprehensive survey coverage.

Information also was compiled from ND-SHPO and MN-SHPO sources on previously recorded cultural resource sites located within each action alternative study area. This resulted in the identification of a complex array of bona fide cultural resource sites, as well as the more dubious site leads and isolated finds. These cannot be readily summarized here. Suffice it to say that the genuine, confirmed cultural resource sites (excluding the site leads and isolates) consisted of various kinds of prehistoric archeological sites, historic archeological sites, and historic architectural sites. Excluding urban block surveys, the historic architectural sites are comprised mainly of rural churches and bridges. The alternatives have been ranked, in terms of potential impacts to cultural resources, according to the total count of cultural resource sites within a given alternative study area, as well as site density per square mile of study area.

The alternative with the largest potential for cultural resource impacts is the Red River Basin Alternative (#3). This alternative contained the highest number of previously recorded sites (291), as well as the greatest site density (0.16/mi^2). The other four action alternatives have less potential for site

impacts because each contains far fewer sites (between 44-102) and nearly identical site densities (three at 0.10/mi^2 and one at 0.08/mi^2). The fact that the North Dakota In-Basin (#2), GDU Import to Sheyenne (#4), GDU Import Pipeline (#5), and Missouri River to RRV (#6) all exhibit nearly the same site density numbers leaves little logical basis for selecting among them in regard to potential impacts to cultural resource sites. Therefore, from a cultural resources perspective, these four alternatives represent the best, least-impact options for construction of the RRVWSP. Nevertheless, one must be cognizant of the fact that that none of the alternative study areas has received anything like comprehensive cultural resources survey coverage. Intensive survey specific to the selected alternative is likely to result in the discovery and recording of many currently unknown sites, findings that could substantially change the conclusions of the cultural resources assessment made here. In essence, we are dealing with a largely unknown cultural resources landscape, which makes reliable predictions about sites and site impacts difficult, if not impossible.

Finally, little comment has been made up to this point in the analysis on the no action alternative (#1). Obviously, if the RRVWSP is not constructed, direct impacts to cultural resources sites will be avoided. However, this does not take into account potential indirect site impacts, those arising from local and/or state entities taking various actions on their own, or in concert, to secure additional water supplies. Such actions could include the construction of small-scale reservoirs, drilling new wells, and installation of new pipelines, all of which could impact any number of cultural resource sites. Furthermore, such impacts could occur under less comprehensive cultural resources study and mitigation mandates than would a federally sponsored project. These indirect impacts, which, once again, cannot be accurately measured, are very real nonetheless and need to be considered in a full environmental assessment of the RRVWSP.

Chapter 7
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