An Archaeological Reconnaissance of the Lake Diefenbaker Region in South Central Saskatchewan

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Abstract

In 1958, an initial archaeological assessment of the central portion of the South Saskatchewan River began in anticipation of the construction of two massive rolled earth dams along the South Saskatchewan and Qu'Appelle Rivers. Once completed, the Gardiner and Qu'Appelle Arm dams, respectively, created a vast freshwater reservoir suitable for irrigation, the generation of electric energy, and recreation. At the same time, the formation of Lake Diefenbaker spurred several independent investigations of the region's cultural history and the localized impact of reservoir development on archaeological resources.

The 1995-1996 Lake Diefenbaker archaeological project attempted to summarize the results of previous investigations carried out within the region and to provide contemporary data through field research. The project attempted to address three major objectives: to provide a comprehensive analysis of the cultural history of the region; to assess the impact of the development of Lake Diefenbaker on the archaeological resources of the South Saskatchewan River valley; and to provide data and analysis for the ongoing management of heritage resources affected by the reservoir.

A thirty-five linear kilometer survey was completed along the eastern margin of Lake Diefenbaker during the 1995-1996 field seasons. Eighteen archaeological sites, representing twelve precontact and six contact period occupations, were recorded. At the same time, the rates of erosion for various landforms along the eastern shoreline of the reservoir were measured at several of the heritage site locales. I determined that monitoring of the full extent of the reservoir is necessary to prevent the undocumented loss of archaeological materials and that salvage excavation is required where partially intact archaeological components are threatened by fluvial erosion. I further suggest that a geoarcharchaeological study of the landforms in the region be carried out in order to provide the data necessary for the interpretation of precontact settlement patterns within the South Saskatchewan River valley.

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Chapter One

1. Introduction

As early as 1943, and particularly from 1947 to 1950, the Prairie Farm Rehabilitation Administration (P.F.R.A.) conducted studies concerning the design and location of a hydroelectric dam along the South Saskatchewan River (Royal Commission 1952:9). These studies included comprehensive analyses of soils, climate, the development of irrigation in both Saskatchewan and Alberta, hydroelectric potential, and recreational development (Royal Commission 1952:9). The resulting Coteau Creek and Third Meridian Dam proposal (renamed Gardiner and Qu'Appelle Dams respectively after development) sought to establish large-scale irrigation in the heart of the most arid region of the prairies- the central portion of Palliser's Triangle (Royal Commission 1952:13).

The P.F.R.A. submitted its final reports to Parliament on September 7, 1950 (Royal Commission 1952:9). On August 24, 1951 Order in Council #4435 established a Royal Commission to examine the many considerations of reservoir development within central Saskatchewan and to report on its findings the following year (Royal Commission 1952:xi). Although the commission initially found the project to be cost prohibitive, with expenditures for both dams estimated to total $247,900,000 (Royal Commission 1952:25), an agreement was reached between the federal government and the Province of Saskatchewan in July of 1958 (Mayer-Oakes and Pohorecky 1969:1). Over the next ten year period the development of the South Saskatchewan Reservoir, later named Lake Diefenbaker in honour of Canada's thirteenth Prime Minister, inundated nearly 800 km of river frontage from latitudes 50^{o} 35' to 51^{o} 15' and longitudes 106^{o} 20' to 108^{o} 20' (Mayer-Oakes and Pohorecky 1969:38).

In the years following the completion of the reservoir, there were several independent studies of the archaeological resources of the region. For the most part, however, the investigations were site or project specific with little emphasis on

publication or the development of a regional cultural history. The 1995-1996 Lake Diefenbaker Archaeological Survey project that forms the basis of this study represents an attempt to bring together existing documentation concerning the region and to provide contemporary data through field research. In terms of objectives, the present research seeks to address three major concerns:

1) to provide a comprehensive analysis of the cultural history of the region
2) to assess the impact of the development of Lake Diefenbaker on the archaeological resources of the South Saskatchewan River Valley
3) to provide data and analysis for the future management of heritage resources affected by the reservoir

Chapter one introduces the rationale and objectives of the 1995-96 Lake Diefenbaker archaeological survey. This includes a general description of the study area, the development of the reservoir and a brief overview of the chapters to follow.

Chapter two summarizes the biophysical character of the study area over the past twelve thousand years. The processes of five geologic phases (glacial, glaciolacustrine, glaciofluvial, fluvial, and aeolian) are defined to provide the background for a discussion of major landforms found throughout the region. Variations in climate from the Pre-Boreal climatic episode to the present day are summarized, along with corresponding changes in local vegetation. A description of contemporary flora and fauna commonly found within the study area closes out the chapter.

Chapter three summarizes major archaeological projects which have been conducted within the Lake Diefenbaker Region. An extensive analysis of the previously unpublished South Saskatchewan River Project, which was carried out from 1958 to 1960 in anticipation of the completion of the reservoir, is presented. A summary of other major projects in the region provides the context for the 1995-96 survey. Attention is given to the survey and excavation procedures utilized in each of the previous studies.

Chapter four begins with a description of the research design for the 1995-96 Lake Diefenbaker survey. This includes a summary of Syms (1982) three component model for regional surveys. The Regional Collector Survey, the Land Owner/Operator Survey and the Personal Reconnaissance Survey are defined and described. The 1995-96 survey boundary is then defined and explained. Local factors, such as the cultivation of prairie uplands and the extensive flooding of the South Saskatchewan River during the 1995 field season, are discussed as major considerations in the determination of the final study area. The timing and intensity of surface survey and sub-surface testing procedures are then discussed in section 4.3. The collection strategy for the 1995-96 survey and subsequent laboratory analyses are described in sections 4.4 and 4.5, respectively. Identification procedures and computational management of data (photographic, cataloguing, mapping) are also explained and referenced.

Chapter five documents the twelve precontact period and six contact period occupations that were recorded during the 1995/1996 field seasons. Each site is described in terms of location, historical background, site stratigraphy, construction patterns and materials, features, artifact type and quantity, faunal materials, physical and temporal dimensions, and potential for further archaeological investigation. The impact of shoreline erosion, slumping, and fluvial mixing are addressed in terms of individual site locales. Photographs of diagnostic artifacts and features are included via CD-ROM transfers to illustrate each site description.

Chapter six attempts to establish a comprehensive cultural chronology for the Lake Diefenbaker region. Data gathered by the 1995-96 archaeological survey are compared with private and public archaeological collections and the findings of previous investigations as defined in chapter three. The data includes Tom Stevenson's discovery of Clovis projectile points along the western shoreline of Lake Diefenbaker; SSRP documentation of Agate Basin projectile points; Eldon Johnson's recovery of Plainview, Eden, Scottsbluff, Bitterroot, Oxbow, McKean, Duncan and other diagnostic artifacts;

Hanna, Pelican Lake, Besant, and Avonlea projectile points from the 1995 survey; as well as the Sjovold and Camp Rayner materials. Archaeological cultures characteristic of the Northern Plains region but not represented in the assemblages gathered to date are discussed in relation to the problems of archaeological visibility and limited subsurface testing.

Chapter seven addresses the effects of reservoir development on the archaeological resources of the Lake Diefenbaker region. The chapter begins with a brief introduction of pre-reservoir characteristics of the South Saskatchewan River valley within the study region. An attempt to model pre-reservoir landforms in the region is presented through the use of digitized topographic maps and computer generated images. Section 7.3 examines the post-reservoir morphology of the study area. The transformation of gullies into bays of the lake and the development of cliff and beach areas between the new low and high water levels are discussed as major disturbances to the archaeological resources of the region. A series of regional and site specific recommendations are then forwarded in relation to the above criteria.

The final chapter begins with a restatement of project objectives. An overview of chapter summaries is then presented to combine the various elements of the thesis. This includes a review of the cultural occupations of the region and the recommendations for future research presented in Chapter 7.

Chapter Two

2. Environmental Setting

2.1 Introduction

In general terms, Lake Diefenbaker is a modern component of the South Saskatchewan River system. The system is contained within the Northern Plains physiographic subdivision and is part of the larger Interior Plains division that extends from the Arctic Ocean to the Gulf of Mexico (Christiansen 1995:5). The South Saskatchewan tributary basin includes the headwater basins of the Red Deer, Oldman, Bow, and St. Mary rivers (Kupsch 1969:48). Together, the Oldman and Bow rivers contribute approximately 70 per cent of the total annual runoff of the South Saskatchewan (Kupsch 1969:48). The Bow River originates in a glacier-fed lake in the mountains northwest of Banff, Alberta, while the Oldman and St. Mary rivers originate in Montana and join near Lethbridge to flow east into the South Saskatchewan River (figure 2.1). In total, the river drainage area encompasses 49,000 square kilometers and includes many internal sloughs, lakes and marshes (Germann 1989:5). As part of the larger Saskatchewan drainage system, the South Saskatchewan functions primarily as a canal in the transfer of surface water from the mountains across the plains to Lake Winnipeg (Kupsch 1969:48).

Regional tributaries include Swift Current Creek which originates in the eastern portion of the Cypress Hills and empties into the South Saskatchewan River approximately 60 kilometers southwest of the study area. Sjovold Creek joins the South Saskatchewan approximately 50 kilometers north of Lake Diefenbaker, while Sage Creek empties into the South Saskatchewan midway between the present towns of Riverhurst and Elbow. Aiktow Creek, formerly part of the Qu'Appelle River drainage, was a unique feature of the region. At low water levels, the creek drained east into the Qu'Appelle River system while at high water the creek drained west into the South Saskatchewan at the elbow. Hence the creek was named Aiktow, or "river that ran both ways" (Mayer-

Oakes and Pohorecky 1969:49). The Qu'Appelle juncture was inundated following the completion of the Gardiner and Qu' Appelle Arm dams and today the region is overlain by the Qu' Appelle Arm of the reservoir.

2.2 Geomorphology

Lake Diefenbaker is located in south-central Saskatchewan from latitudes 50° 35' to 51° 15' and longitudes 106° 20' to 108° 20' (Mayer-Oakes and Pohorecky 1969:3). The reservoir occupies the South Saskatchewan River valley from Gardiner Dam in the north, to the Qu' Appelle Dam in the east and extends approximately 50 kilometers west of Saskatchewan Landing Provincial Park (figure 2.1). The valley is immediately east of the Missouri Coteau escarpment, which delineates the Second and Third Prairie Steppes (Agriculture Canada 1975:61). A central feature of the region is the almost 45° turn of the South Saskatchewan from a southeast direction to a northwestern flow at its junction with the Qu'Appelle River. The general consequent direction was deflected by glacial processes during the Late Pleistocene and provides the distinctive geography after which the town of Elbow is named.

The predominant bedrock of the region consists of the shales and sandstones of the Bearpaw Formation (Kupsch 1969:46). Large amounts of sediment were deposited as a result of glaciation both as till and as stratified drift. Battleford and Floral Formations are present within the region, although testing at the Sjovold locality revealed that the site's underlying till may have been exposed by fluvial erosion of the Sjovold Creek Valley and belong to the older Sutherland group (Christiansen 1995:77). The large erratics and unsorted material found scattered throughout the area give evidence of *in situ* wastage of the Laurentian Ice Sheet.Corrugated and arcuate ridges, including both ice-push and ice-thrust ridges which commonly outline ice lobations on the Interior Plains, occur predominantly on the east side of the area now occupied by Gardiner Dam (Kupsch 1969:50-51).

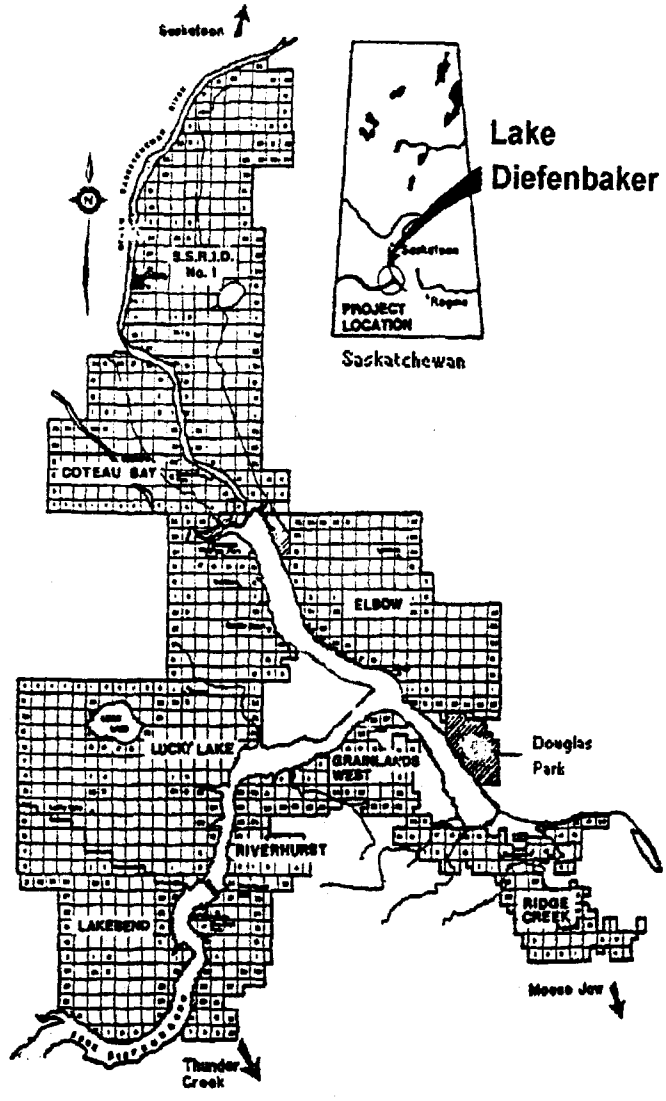


Figure 2.1: Location of the Lake Diefenbaker Reservoir

Hummocky terrain without ridges dominates the local landscape, and overlies Cretaceous rocks which occur throughout the Great Plains Province (Kupsch 1969:41). Often referred to as 'dead-ice moraine', hummocky terrain gives further evidence of large-scale wastage and disintegration in the region (Klassen 1988:77). In addition, hummocky moraine of high local relief covers pre-existing uplands throughout the study area. Glacially-deposited sediments range in depth from a few meters in some areas to over one hundred meters in others. The majority of the region's topography falls within the 554 m to 646 m range, with the Vermilion Hills in the south and the Coteau Hills in the west reaching over 738 m (Kupsch 1969:42-43).

In addition to the central riverine environment, the region includes valley uplands of short grass prairie, valley lowlands of mixed vegetation and fresh water springs, and stabilized sand dunes. Sand deposits originated from stratified drift redistributed by streams during glacial recession in the form of deltas and outwash plains (Klassen 1989:146). Subsequent wind action has molded the parabolic dunes which occur predominantly in the Douglas Park region, as well as along the western shoreline of Diefenbaker Lake near the elbow.

2.3 Geology and Chronology

2.3.1 Glacial Phase

The Quaternary period has been divided into two major epochs: the Pleistocene which began approximately three million years ago and ended nearly 10 000 years ago; and the Holocene which extends from about 10 000 years ago to the present day (Kupsch 1969:48). The landforms of the South Saskatchewan River valley are relatively young in geologic terms and were formed during episodes of deposition and erosion which occurred during the late Pleistocene epoch (Klassen 1989:138). Cultural occupation of the region extends from the onset of the Holocene and thus the present summary focuses

on approximately the last ten thousand years of geomorphological and environmental variability.

The last of the large-scale Pleistocene glaciations, known as the Wisconsinan Glaciation, reached its maximum from approximately 23 000 to 17 000 years before present (BP). The primary characteristic of the glaciation within the region of study, the Laurentide Ice Sheet, encompassed the Canadian Shield and extended to latitudes at least as far south as the present Ohio and Missouri rivers (Klassen 1989:157).

Until recently, the precise timing of Laurentide ice withdrawal in the Saskatchewan region has been a subject of controversy. Kupsch has speculated the southwestern portion of the province may have been free of ice as early as 23 000 BP (1969:48). The Cypress Hills in particular, with elevations above 1000 m, survived as a nunatak through the Wisconsin period and represents a remnant of the much larger plateau that existed in the region 40 Mya (Hildebrandt and Hubner 1994:17). The majority of the Canadian Interior Plains, however, was likely glaciated until approximately 14 000 BP to 12 000 BP based on radiocarbon dates obtained from studies carried out by Klassen (1972, 1975), Christiansen (1979), Teller and Fenton (1980), and Clayton and Moran (1982). Christiansen has refined the estimate for the study area further in the 1995 Sjovold site monograph (1995:81), stating that by about 13 000 BP the glacier stood immediately north of the Bratton Channel, or approximately 50 kilometers north of the present Gardiner Dam location. This provides a reasonably reliable time frame for the following discussion of geologic phases which occurred as a result of glacial recession.

2.3.2 Glaciolacustrine Phase

The retreat of the Laurentide Ice Sheet resulted in the formation of a series of glacial lakes across southern Saskatchewan. Of central importance to this discussion, Glacial Lake Saskatchewan bordered the northern periphery of the study area and drained

in part through the South Saskatchewan Spillway (Christiansen 1995:81). The spillway, in connection with the Qu'Appelle Spillway, comprised the basis for the development of major river drainages of the post-glacial era.

Significant erosion and deposition occurred throughout the glaciolacustrine period as drainage channels were scoured by glacial runoff and lake deposits accumulated within the areas of the former watersheds. Recent studies carried out as part of the Sjovold site excavation (Christiansen 1995:82) concluded:

> During this interval, the South Saskatchewan Spillway was eroded to an elevation of about 534 m at the Sjovold Site.... The outwash plain east of the South Saskatchewan River was formed..., and dune activity was initiated at this time. As the glacier retreated, glacial lake silts and clays were laid down in Lake Saskatchewan. As the lake fell to 534 m, some of these lacustrine sediments were undoubtedly covered by wind-blown silt derived from the outwash deposits and sand bars that probably existed in the river at that time.

In addition to the formation of outwash plains, reworked dunes, and extensive loess deposits, paired terraces were formed as glacial stream flows increased dramatically through established spillways.

2.3.3 Glaciofluvial Phase

A residual process of the glacial period was outburst flooding, which resulted from catastrophic draining of ice-filled lakes (Wilson 1983:66-67). This type of flooding produced in-channel construction barforms, sometimes referred to as 'pseudoterraces', along valley slopes (Wilson 1983:66-67). Exactly when the South Saskatchewan may have been free from such events, and more properly a river system, is still a matter of discussion. It would appear, on the basis of radiocarbon dates from early alluvium and related deposits on the Oldman and South Saskatchewan rivers, that significant downcutting had begun by 11 500 BP (Wilson 1983:87). At the Sjovold locale, the change in direction from a southward-flowing spillway to a northward-flowing river

definitely occurred between the elevations of 534 m and 526 m (Christiansen 1995:82). This supports the chronological date mentioned above. At approximately the same time, valley uplands and lake plains became available for colonization.

The rapid degradation of the South Saskatchewan river valley in some cases completely removed glaciolacustrine sediments. Shallow layers of glacial till thus became re-exposed and this may have contributed to the early anastomizing pattern of the river. In the vicinity of the Sjovold site, for example, when the river eroded below 518 m a.s.l. an entirely new channel was formed west of the previous location. As downcutting continued, tributary valleys were eroded to the same terminal depth as the South Saskatchewan valley (Christiansen 1995:82).

2.3.4 Fluvial Phase

The onset of the Holocene epoch marked a significant new era of landform alteration in the South Saskatchewan region. The river entered a rapid phase of downcutting and alluvial fans and related deposits were constructed within the river valley (Wilson 1983:208). All areas were characterized by the instability of recent deglaciation and fluvial processes began to play an ever-increasing role in shaping the local landscape.

As early as 9 500 BP the forest, parkland, and grassland zones in Southern Saskatchewan approximated their current locations (Dyck and Epp 1983: Table 1). Studies of flora and fauna from the Inner Bow Valley at Calgary have further suggested that by 8 200 BP the climate may have been warmer, although certainly no cooler and wetter, than the present day. This is of particular importance to the fluvial systems of the Great Plains region, which were highly sensitive to climatic change (Summerfield 1991:224). The rapid erosion of earlier periods slowed as sediment deposits adjusted to more stable profiles (Wilson 1983:215). Overbank and slopewash deposition may have

contributed to river morphology and local adjustments in channel gradients occurred throughout the period (Wilson 1983:219).

The onset of the Atlantic climatic episode, from approximately 8 450 BP to 4 680 BP (Dyck and Epp 1983:Table 1), resulted in a significant shift in fluvial activity across the Great Plains region. The loss of vegetation cover and increased fall of rain directly on the mineral soil spurred a denudation of slopes and increased deposition on fans and overbank settings along the river (Wilson 1983:65). High sheetflow and slopewash of sediments, increased river discharges and higher frequencies of floods all characterized fluvial activity during what is often referred to as the Altithermal period (Wilson 1983:243). An increase in the number of natural fires during the period may have further reduced vegetation cover and reinforced extremes in erosion and deposition occurring as a direct result of climate change (Wilson 1983:244). The grassland region expanded dramatically during the Altithermal, with margins approximately 110 km farther north and east than those of the present day (Dyck and Epp 1983:Table 1).

Climatic variation may have been responsible for an initial period of valley degradation during the fluvial phase from approximately 8 000 years to 7 000 years BP (Walker 1992:29). Subsequent overbank depositional events deeply buried prior surfaces and associated cultural remains over the following millennia (Walker 1992:29). Lower terraces were likely formed in response to lower mountain discharges resulting from Neoglacial advances just prior to 6 020 years BP and 4 700 years BP (Walker 1992:29). The latter periods of renewed downcutting may have also contributed to the easterly shift of the South Saskatchewan River within its valley (Walker 1992:29).

The relatively cool and moist conditions of the Sub-Boreal climatic episode from 4 680 to 2 890 BP (Dyck 1983:Table 1) resulted in a gradual reduction of downcutting activity and the formation of even lower alluvial terraces and lateral accretion deposits (Wilson 1983:246). These lowest terraces were formed as the now graded river slowly

incised the alluvial fill in its valley. The resulting flat surface, or tread, provided an ideal site for riverine occupation (Summerfield 1991:263).

The formation of lateral accretion deposits, or point and marginal bars, resulted from constant erosion of concave banks and downstream redeposition on convex slopes within the river valley (Summerfield 1991:221). Such deposits are characteristically composed of uniform cobble gravels overlain by fine sediments (Wilson 1983:246). Vertical accretion deposits, or those which accumulate in overbank and backwater areas during flooding, were also prevalent during the latter stages of fluvial activity (Summerfield 1991:221).

2.3.5 Aeolian Phase

The Lake Diefenbaker region of south central Saskatchewan was particularly sensitive to the erosion, transport, and deposition of sediment resulting from wind action. The occurrences of glacial outwash deposits, fluvial point and marginal bars, and fine-grained colluvial material all provided parent material suitable for aeolian entrainment. Many of the landforms in the region owe their origin to localized wind activity and virtually all are subject to continuous modification by aeolian processes.

The presence of parabolic blowout dunes along both the eastern and western margins of the South Saskatchewan River is an important geomorphic feature of the proposed study area. The dunes represent accumulations of wind-blown sand initially deposited as glacial outwash and alluvial fans. As described by Waters (1992:193):

> blowouts are created where the vegetation cover in a stabilized dune field is disturbed and a vegetation-free surface is exposed to wind erosion. Sand is scoured from the surface, and a depression is excavated by the wind. The sand eroded from the depression accumulates downwind on the margin of the crater. The blowout continues to enlarge until it becomes stabilized by renewed plant growth, which inhibits further erosion and expansion of the depression.

The time period encompassed by the aeolian phase is somewhat uncertain, although existing information does provide a reasonable frame of reference for the current discussion. As cited in the Gowen site monograph, McCallum and Wittenberg determined that dune formation west of Pike Lake was underway by 3 510 years BP (Walker 1992:29). The date would seem to complement the general conclusions of the Sjovold report which recognized a mixture of alluvial and aeolian sediments from approximately 4 000 years to 2 500 years BP (Christiansen 1995:83). The last 2 500 years of sedimentation at the Sjovold site has been dominated by the deposition of unconsolidated wind-blown silts and sands and the development of incipient soils during periods of reduced aeolian activity (Christiansen 1995:83). The uppermost 2.15 m of the Sjovold stratigraphic section is composed of aeolian deposits (Christiansen 1995:87) and is the best regional example of the sedimentation processes which dominated the aeolian phase.

2.4 Sedimentology and Soils

2.4.1 Sedimentology

The sedimentology of the South Saskatchewan River valley has best been described by Hugh E. Hendry in his 1995 analysis of the Sjovold site stratigraphy (Hendry 1995:83-87). Hendry recognized three distinct units within the gravel, sand, silt and clay beds characteristic of the region. His classification, which was established on the basis of grain size and sedimentary structure, provides an accurate overview for the current report. Microanalysis of the variations in the sedimentary sequence found in specific Lake Diefenbaker site locales recorded in 1995 and 1996 can be found in the discussion put forward in Chapter 5.

The deepest of Hendry's units, classified as bedded sandy gravels with clay, extended from approximately 5.60 m below surface to 4.45 m below surface. The unit was comprised of gravel and sand beds up to 30 cm thick separated by clay beds varying

in thickness from one to 15 cm. The majority of the gravel clasts represent source material from the glacial period entrained and later deposited by alluvial processes. A second major unit comprised of stratified silts was encountered from 4.45 m to approximately 3.45 m below surface. Both alluvial and aeolian processes were reponsible for the formation of the unit, as witnessed by the cross-bedding and stratified layering of sandier deposits in conjunction with undifferentiated silt beds. The structureless silts and sands of the third unit likely represent aeolian deposition, as grain sizes of both groups fall well within the boundaries for aeolian entrainment. Figure 2.2 illustrates the sediment stratifications described above with photographs taken of comparable sections in the Lake Diefenbaker region during the 1995/1996 survey.

Figure 2.2: Sedimentology of the Lake Diefenbaker Region

2.4.2 Soils

The diverse topography of the South Saskatchewan River valley is of central importance in the formation of soils within the region. Eroded, or truncated, soils dominate the steep valley slopes, rough broken uplands and escarpments of the current study area (Mitchell, Moss and Clayton 1944:180). As described in the University of

Saskatchewan Soil Survey Report No.12, "where soil development has occurred the profiles are thin and usually lack one or more of the horizons common to the adjacent regional soils. Much of the eroded areas consist of bare steep slopes with mixed colluvial material deposited below" (Mitchell, Moss and Clayton 1944:180). Outcrops of Tertiary and Upper Cretaceous sediments and eroded glacial till deposits are common within the region (Mitchell, Moss and Clayton 1944: 182). One such outcrop was found at EfNq-1 approximately seven kilometers northeast of the town of Riverhurst where grid road construction exposed several tonnes of cretaceous deposits only a few centimeters below the modern surface.

Alluvium consisting of variable textured soils occurs primarily along river and creek flood plains and upland depressional areas. A central characteristic of alluvium is the formation of layers or strata of variable composition that give the appearance of profiles, but actually represent distinct alluvial deposits laid down over time (Mitchell, Moss and Clayton 1944: 175). Much of the study area characterized by alluvium deposits has been inundated due to reservoir development and erosion continues to occur particularly along the eastern shoreline and in backflooded tributary channels.

Dune sands, undifferentiated sands, and gravel deposits dominate the western shoreline and Douglas Park region. These areas are characterized by weakly developed soils with little or no profile development (Mitchell, Moss and Clayton 1944:179). Site recoveries in dune areas are often limited to artifact scatters with no *in situ* analysis of provenience or chronological sequence.

Depression or bluff podzols are also present within the local microenvironment. Bluff podzols form in small upland depressions or under the cover of aspen and willow trees common to coulees along the river valley (Mitchell, Moss and Clayton 1944:180). The podzols vary in profile according to their differing parent materials and stages of development (Mitchell, Moss and Clayton 1944:181). Detailed analyses of upland soils

under cultivation in surrounding areas is available through the Riverhurst Water Users Association.

2.5 Modern Climate and Biota

Lake Diefenbaker is situated in the heart of the Canadian prairies. It is centered in the transitional area between the semi-arid and sub-humid continental climatic regions as defined by the Koeppen classification system. Extremes in mean daily temperatures range from -14.7 degrees Celsius for the month of January to 18.3 degrees Celsius for the month of July (Agriculture Canada 1975:55). Fifty to seventy percent of the precipitation in the region falls during the growing season, from May to September, with average precipitation reaching 38.0 cm per annum (Agriculture Canada 1975:55).

A central characteristic of the regional climate is the prevalence of westerly winds which average approximately 20 to 30 km an hour throughout the year (Chakravarti 1969:60). The winds are generally strongest in April and May, with slightly more variable conditions throughout the summer months. Winter blizzards and warm chinooks are experienced as the westerlies descend the eastern slopes of the Rockies in winter and early spring (Chakravarti 1969:60).

The limited growing season, relatively scarce precipitation and drying winds are favourable to the mixed and mid-grass prairie species which dominate the natural vegetation of the region (table 2.1). A brief description of the floral species common to the region is offered in the table below. The table summarizes the detailed information in Brown (1985), Abouguendia et al. (1981) and Richards and Fung (1969).

Table 2.1: Floral Resources in the Lake Diefenbaker Region

Classification	Common Name	Species Name	Common Name	Species Name
Grasses	porcupine grass	*Stipa spartea*	spear grass	*Stipa comata*
	wheatgrass	*Agropyron dasystachyum*	wheatgrass	*Agropyron smithii*
	foxtail barley	*Hordeum jubatum*	blue gramma	*Bouteloua gracilis*
Forbs	sage	*Artemisia frigida*	sarsaparilla	*Aralia nudicaulis*
	Canada anemone	*Anemone canadensis*	skeleton weed	*Lygodesmia juncea*
	dotted blazingstar	*Liatris punctata*	northern bedstraw	*Galium boreale*
Shrubs	creeping juniper	*Juniperus horizontalis*	chokecherry	*Prunus virginiana*
	saskatoonberry	*Amelanchier alnifolia*	snowberry	*Symphoricarpos occidentalis*
	gooseberry	*Ribes oxyacanthoides*	rose	*Rosa woodsii*
Trees	Manitoba Maple	*Acer negundo*	green ash	*Fraxinus pennsylvanica*
	willow	*Salix interior*	common juniper	*Juniperus communis*

The unique resources of a valley environment are also reflected in the diverse fauna found throughout the region of study. The South Saskatchewan River valley provides one of the few remaining refuge areas for both large and small mammals, amphibians and waterfowl. Modern cultivation practices have condensed a cross-section of native fauna into the narrow corridor of natural vegetation provided by the valley, an area diminished further by the development of the Lake Diefenbaker reservoir. Table 2.2 provides a description of the mammals, birds, fish and reptiles common to the region.

Table 2.2: Fauna in the Lake Diefenbaker Region

Classification	Common Name	Species Name	Common Name	Species Name
Mammal	white-tailed deer	*Odocoileus virginianus*	mule deer	*Odocoileus hemionus*
	coyote	*Canis latrans*	red fox	*Vulpes vulpes*
	badger	*Taxidea taxus*	striped skunk	*Mephitis mephitis*
	gopher	*Spermophilus richardsonii*	porcupine	*Erethizon dorsatum*
Bird	red-tailed hawk	*Buteo jamaicensis*	killdeer	*Charadrius vociferus*
	Canada goose	*Branta canadensis*	Mallard	*Anas platyrhyncos*
	cliff swallow	*Hirundo pyrrhonota*	turkey vulture	*Cathartes aura*
Fish	jackfish	*Esox linnaeus*	walleye	*Stizostedion vitreum vitreum*
	rainbow trout	*Salmo gairdneri*	yellow perch	*Perca flavescens*
	lake whitefish	*Coregonus clupeaformis*	channel catfish	*Ictalurus punctatus*
Reptile	plains spadefoot	*Scaphiopus bombifrons*	western garter snake	*Thamnophis elegans*
	tiger salamander	*Ambystoma tigrinum*	bull snake	*Pituophis melanoleucus sayi*
Insect	field cricket	*Gryllus pennsylvanicus*	house mosquito	*Culex pipiens*
	Ladybug beetle	*Coccinella novemnotata*	honey bee	*Apis mellifera*

after Renaud and Renaud 1975; Conant 1958; Paetz and Nelson 1970

A number of native species have either been displaced or driven to extinction since the onset of European settlement in the region. The bison *(Bison bison)*, wolf *(Canis lupus)*, Swift Fox (*Vulpes velox*), Black Bear (*Ursus americanus)*, Grizzly Bear (*Ursus arctos)*, Fisher (*Martes pennanti)*, Mink (*Mustela vision)*, Wolverine (*Gulo gulo)*, and River Otter (*Lutra canadensis*) have all been documented by Dyck and Morlan as former inhabitants of the area now absent from the biotic community (1995:11). Wapiti (*Cervus elaphus)* and Moose (*Alces alces)* are uncommon in the region, although both species have been known to travel the modern valley between the parklands of the north and the Cypress Hills in the southwest. For species such as the cougar (*Felis concolor)* the South Saskatchewan valley allows not only travel, but semi-permanent residence among valley and grassland resources.

Chapter Three: Previous Archaeological Fieldwork

3.1 South Saskatchewan River Project

3.1.1 Introduction

The South Saskatchewan River Project (SSRP) was undertaken over a three-year period, from 1958 to 1960, under mandates from the National Museum of Canada and the Saskatchewan Museum of Natural History. In general, the SSRP sought to "help provide a basic record and interpretation of the prehistory of the South Saskatchewan region" (Mayer-Oakes and Pohorecky 1969:162) The project focused on recording archaeological sites which were to be affected, and in many cases destroyed, by the flooding the Missouri Coteau escarpment (Stevenson 1989:5).

Interim reports were submitted both to the National Museum and the Saskatchewan Museum as the field work progressed and a comprehensive monograph on the project's findings was initiated by Zenon S. Pohorecky and William J. Mayer-Oakes in 1961. Unfortunately the monograph never reached publication, although an initial draft was completed in 1969. The following summary of SSRP activity is taken from the introductory section of the 1969 report:

> Discussion and negotiations regarding the agreement of the Saskatchewan and federal governments to build dams on the South Saskatchewan River, were carried out for a number of years. The actual agreement between the two governments was consummated in July of 1958, at which time a party of archaeologists was already in the field in Saskatchewan. William J. Mayer-Oakes (then of the University of Toronto) was under contract with the National Museum of Canada to carry out a preliminary archaeological survey of the South Saskatchewan Reservoir. Zenon S. Pohorecky assisted in this field work, and details of the season's activities have been included in a report to the National Museum (Mayer-Oakes:1958).
>
> Laboratory studies of materials collected during the 1958 season were carried out by Pohorecky and Mayer-Oakes in the archeological laboratory of the Department of Anthropology at the University of Toronto. The preliminary studies indicated a need for continued survey work in the reservoir. Consequently, a joint federal-provincial program of field work was planned and carried out during the summer

of 1959. Pohorecky led the Saskatchewan Museum of Natural History party, while Mayer-Oakes was responsible for the party from the National Museum. Parts of the season's activities were carried out by a joint effort of both parties working from one base camp; other parts were independent, as the teams moved camps to cover additional portions of the reservoir. A preliminary report on the 1959 season was submitted to the National Museum. (Pohorecky1959).

Laboratory studies of the 1959 materials were carried out by Pohorecky at the University of California, Berkeley. A preliminary manuscript describing this work was submitted to the Saskatchewan Museum of Natural History in April, 1960 (Pohorecky 1960a). Joint federal-provincial field work was again planned and conducted during 1960. This time, Pohorecky was consultant for the National Museum of Canada, and Thomas H. Koehler was consultant for the Saskatchewan Museum of Natural History. Three preliminary reports on this season were prepared (Pohorecky1960b; Pohorecky 1960c; Pohorecky 1960d).

Mayer-Oakes was not able to participate actively in the subsequent laboratory study and report preparation because of his transfer from Toronto to the University of Oklahoma Museum in 1959. The two authors met in March of 1961 at Berkeley, California. Here, details of the organization and content of the final report were discussed and decided upon. On this occasion and in subsequent weeks Mayer-Oakes undertook preparation of the manuscript and a continued study of the projectile points which Pohorecky had initiated in 1959.

The writing was accomplished in 1964, aside from the study of projectile points and conclusions. These last two sections were completed in January, 1969. By then, almost a decade had elapsed since the field work had been done. Consequently, it was agreed that Pohorecky in consultation with Mayer-Oakes should expand the original report, enriching it with more detailed descriptions in view of the archaeological advances made in our knowledge of Saskatchewan prehistory since 1960.

Advances in Saskatchewan archaeology in subsequent years proved to be so numerous as to render much of the original report obsolete in terms of its classifications and terminology. The following summary attempts to address this concern and to put many of the SSRP findings into a contemporary context. As the initial project involved air photo analysis, archaeological survey, as well as subsurface testing and excavation, a complete examination of SSRP materials can not be put forward here. Instead, the current effort attempts to analyze SSRP data as documented by Mayer-Oakes and Pohorecky in 1969 and to relate their findings to other archaeological projects

subsequently carried out within the region of study. As in the original document, the results of each field season are first established and then followed by the authors' discussions and recommendations. A final discussion of SSRP materials relevant to the current project is undertaken in section 3.1.5.

3.1.2 The 1958 Field Season

The preliminary investigation of the South Saskatchewan reservoir impact area began as a cooperative effort. National Museum project supervisor William J. Mayer-Oakes requested and received the aid of the Saskatchewan Museum of Natural History director Fred Bard. Bard supplied the SSRP with two additional field survey crews, as well as access to equipment, regional maps, and library facilities (Mayer-Oakes and Pohorecky1969:47). Concurrent to the archeological survey of the proposed reservoir, Bruce McCorquodale and Albert Swanson carried out a two week paleoontological survey of the region, while Fred Larhman and Dr. Robert New conducted an independent study of local natural history (Mayer-Oakes and Pohorecky 1969:47). Together, their data provided an extended frame of reference for the SSRP.

The 1958 archaeological field survey was carried out over a period of three and one-half weeks and concentrated largely on an 80 kilometer area south of the proposed Gardiner Dam location (Mayer-Oakes and Pohorecky 1969:48). Survey areas were established on a judgmental basis, and field parties were assigned to conduct archaeological reconnaissance within the region of the proposed reservoir (figure 3.1). As described by the authors, the survey procedure "was to drive to a prearranged spot and simply 'walk out' the area to be flooded, searching the ground surface and eroded areas for signs of prehistoric occupation" (Mayer-Oakes and Pohorecky1969:48). Due to the nature of the study, which encompassed numerous Borden block designations and centered upon the proposed reservoir area, Mayer-Oakes adopted a secondary site designation system that documented the archaeological resources of the region in

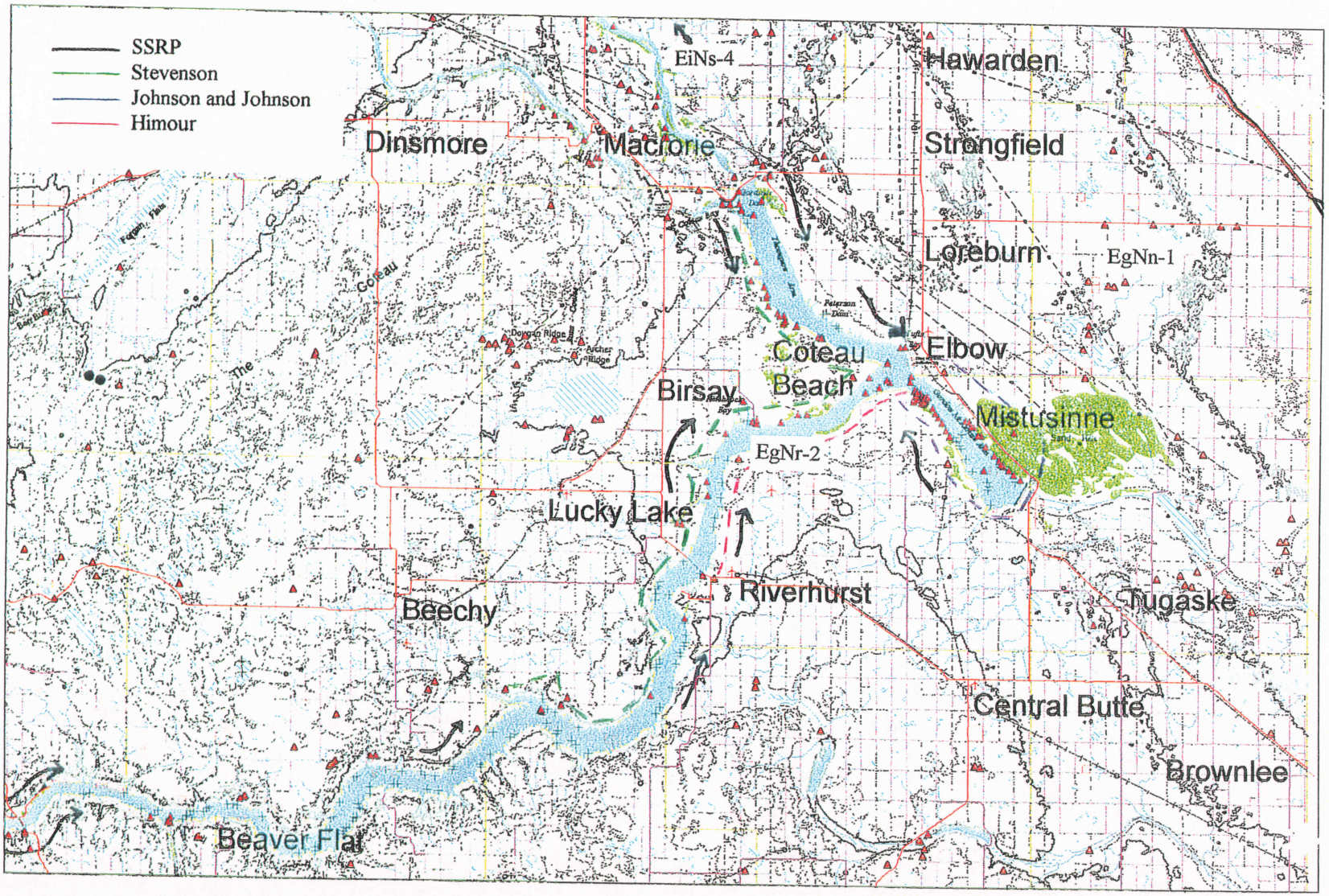


Figure 3.1: Archaeological Research in the Lake Diefenbaker Region

the order of their discovery (Mayer-Oakes and Pohorecky 1969:49). The first site discovered thus became SSR #1, with each subsequent recovery numbered consecutively (Mayer-Oakes and Pohorecky 1969:49). The sites have since been assigned Borden designations by the Saskatchewan Heritage Branch and whenever possible are referred to by the latter designation in the current report.

In all, twenty-two archaeological sites were located during the course of the 1958 survey. Appendix #1 provides a brief description of the character and location of each site as well as recognized cultural affiliations and current resource conditions. Of the twenty-two sites documented in 1958, four were classified as bone debris, three as stone circles, one as a stone cairn, two remained unclassified, and twelve were recognized as 'lithic' due to the presence of stone projectile points, worked flakes, and/or debitage (Mayer-Oakes and Pohorecky1969:56-57).

Four localities within the 1958 survey produced diagnostic artifacts. EgNp-3 and EgNp-10 both produced single McKean projectile points, with the latter discovered in an area of cultivation on a local terrace. EgNp-4 and EgNp-11 represent Pelican Lake cultural occupations. Diagnostic projectile points, worked pieces (end-scrapers, side-scrapers, etc.), and lithic debitage were associated with each site. A "leaf-shaped blade" was also catalogued at EgNp-11 suggesting perhaps a multiple occupation of the locale. Time and funding constraints, however, precluded intensive subsurface testing during the 1958 field season.

EfOf-1, EfOf-2, and EeNu-1 were comprised of stone circle concentrations bordering the reservoir. EfOf-1 was estimated to have included at least fifty stone circles on a low terrace approximately 10 meters above the 1958 water level. The locale may have been inundated following the completion of Gardiner dam. Today, the condition of elevated terrace sites is uncertain due to riverbank undercutting and slumping. The discovery of EgNo-19, a huge granite erratic documented independently in the journals of Hind and Palliser, was a major aspect of the 1958 field season. The site was excavated

two years later and a description of the procedure and its results are included in Section 3.1.5.

By the close of the 1958 field survey, Mayer-Oakes and Pohorecky concluded that there had been a limited prehistoric occupation of the reservoir area with three broad zones of cultural specialization represented. The immediate region of Gardiner Dam had produced the highest percentage of sites comprised of faunal materials, but these were recognized as "thin and scattered, and probably not in all cases due to human agency" (Mayer-Oakes and Pohorecky 1969:51). Upstream portions of the South Saskatchewan River within the reservoir were seen as temporary settlement areas characterized by the presence of stone circles. In contrast, the Aiktow Creek valley seemed to be an area of more intensive and prolonged occupation due to the prevalence of various scrapers, lithic debitage, and diagnostic artifacts. (Mayer-Oakes and Pohorecky 1969:51) As a result, further reconnaissance of upstream portions of the South Saskatchewan River and subsurface testing of the Aiktow Creek Valley became critical components of the 1959 and 1960 survey efforts. Because the damsite locality faced the most immediate threat of disturbance due to the activity of draglines, bulldozers, and other heavy equipment, it was chosen for intensive study during phase one of the 1959 survey.

3.1.3. The 1959 Field Season

3.1.3.1 Introduction

The 1959 archaeological investigation actually began in advance of the first ground survey efforts. In May and June of that year Zenon Pohorecky, John H. Rick, and David Humphries conducted an extensive study of over 1500 aerial photographs of the region provided by Spartan Air Services Limited (Pohorecky 1959:171). The study attempted to determine the utility of air photo analysis in locating prehistoric occupations within a Plains environment and met with limited success. While large-scale features such as bison trails, stone circle concentrations, and extensive terraces suitable for

occupation could be isolated on low-level (225 m above surface) aerial photographs, virtually the same information could be gathered from detailed topographic maps (Mayer-Oakes and Pohorecky 1969:174-175). Differential growth of natural vegetation resulting from prehistoric occupations was not intensive enough to be determined nor were single or small-scale encampments marked by stone circles (Mayer-Oakes and Pohorecky 1969:174-175). A beneficial aspect of air photo analysis of the region, however, was determining areas that had been subject to cultivation or other forms of major disturbance. For this reason, air photo analysis has been included as part of the background preparation for the current report.

The first phase of ground reconnaissance was carried out over a two-month period beginning in June of 1959. Both the National Museum and Saskatchewan Museum parties operated from a common base camp at the P.F.R.A. dam site location (Mayer-Oakes and Pohorecky 1969:54). The common objective of both field crews was to conduct "an exhaustive exam of the dam site area and adjacent regions scheduled for 1959 and 1960 destruction by the formation of both waste and borrow zones" (Mayer-Oakes and Pohorecky 1969:54). With the exception of the east bank of the South Saskatchewan, which had been entirely stripped by contractors before the field season began, the crews searched the 10 square kilometer area of the damsite for approximately one week (Pohorecky 1959:9).

Twenty-four previously unrecorded archaeological sites were documented, including a ceremonial offering stone (EiNs-1), a bison kill (EhNq-4), and (EhNq-2) a concentration of 38 stone circles (Mayer-Oakes and Pohorecky 1969:94). Appendix #1 provides a summary of the sites recorded during the 1959 field season.

3.1.3.2 The Coteau Creek Site

Test excavations on the Coteau Creek site (EhNr-18) were carried out over a three week period in late June and early July of 1959. The National Museum field crew,

which consisted of Morgan Tamplin and director William Mayer-Oakes, coordinated their efforts with the Saskatchewan Museum party of David Humphries, Ian Rodgers, and supervisor Zenon Pohorecky. Together with Saskatchewan Archaeological Society volunteers, the two crews exposed a 10' x 35' (3 m x 9 m) excavation area to a depth of approximately seven feet (2 m) in a waste area scheduled for heavy construction later that summer (Mayer-Oakes and Pohorecky 1969: 61-62). Five adjacent test units varying in size from 2.5 x 5 feet (0.8 m x 1.5 m) to 10 square feet (3 m x 3 m) were opened by shovels in one foot (0.30 m) arbitrary levels until the occupation zone was encountered (Mayer-Oakes and Pohorecky 1969:61-62). Testing then proceeded with trowels and hand tools to a terminal depth of seven feet, or approximately two meters, below surface.

The site was located in a cutbank of the South Saskatchewan River in the northeast quarter of section 2, township 27, range 7, west of the third meridian (Mayer-Oakes and Pohorecky 1969:61). At least one half of the potential site area had been destroyed by fluvial erosion prior to the time of excavation, and the remaining terrace tread was heavily wooded and littered with bone debris (Mayer-Oakes and Pohorecky 1969:61). The *in situ* discovery of a bison rib awl and an oval-shaped fire pit in the north bank of the terrace prompted the excavation effort which eventually encompassed one quarter of the site area (Mayer-Oakes and Pohorecky 1969:62). Appendix #2 provides illustrations of the stratigraphic profiles of the Coteau Creek excavations and the *in situ* location of some of the artifacts and features recorded.

Five adjacent test pits of varying dimensions were opened in sequence through a combination of shovel-shaving and trowelling techniques. Test pit #1 revealed two hearths with associated artifacts and bone debris in the lowest level of a paleosol positioned four to four and one-half feet (1.2 m) below surface (Mayer-Oakes and Pohorecky 1969:63). The six foot by five foot (1.8 m x 1.5 m north-south, east west dimensions respectively) square was excavated in one foot (0.3 m) arbitrary levels with all artifacts pedestalled *in situ* (Mayer-Oakes and Pohorecky 1969:63). Twenty-seven

pieces of burned bison bone were recovered along with four worked rib fragments. The vast majority of fire-cracked rock was composed of granite and subsequent refitting identified the fragments as part of a ground and pecked metate. More than fifty percent of the worked lithic materials recovered from the Coteau Creek excavation were located in the first test pit, with quartzite and chalcedony artifacts dominating the assemblage. Appendix #2 provides a summary of the 528 artifacts recovered during the excavation and was the primary source for the current summary.

Test Pit #2 encompassed the largest single excavation area, a ten foot by ten foot (3 m x 3 m) square, but surprisingly accounted for only one-fifth of the total number of artifacts recovered from the site. The bulk of the test excavation extended beyond the immediate area of the hearth features and thus likely exceeded the zones of artifact concentration (Mayer-Oakes and Pohorecky 1969:64). Test Pit #3 contained worked bison rib and scapula fragments, some of which may have been used as pressure flakers in the manufacture of lithic tools (Mayer-Oakes and Pohorecky 1969:64-65). Large fragments of a fire-cracked metate were also unearthed and were subsequently refitted to those recovered from Test Pit #1. The original size of the artifact was estimated to be approximately ten inches (0.25 m) in length, eight inches (0.2 m) in width and four inches (0.1 m) in thickness. The artifact weighed approximately thirteen pounds (5.6 kg) and may have been used in the grinding of berries, dried bison flesh, and bone grease into pemmican (Mayer-Oakes and Pohorecky 1969:65).

Test Pit #4, which measured five feet north-south by three feet east-west, was undercut to expose a hearth feature (Mayer-Oakes and Pohorecky 1969:67). Although charcoal samples were taken, no documentation is available to indicate they were processed. The few unidentified bone fragments taken from the pit were also not documented. Test Pit #5 undercut the four feet of sterile soil above the paleosol and measured 2.5 feet north-south by five feet east-west. The pit produced the majority of calcined bone (90%) in the Coteau Creek excavation . In addition, the final test pit

produced 94 metate fragments, one ground phyllite mano, and thirty-two chert pieces (Mayer-Oakes and Pohorecky 1969:66). A second projectile point (no specific information exists on the first) was recovered from the occupation layer approximately four feet below the contemporary surface.

The recovery of two shallow-notched points, in the same occupation layer, provided the basis for the SSRP recognition of a single cultural affiliation for the site. Both points resembled those of Besant assemblages located elsewhere in the province and it was suggested that the site may have represented a brief habitation, or series of habitations, near a bison kill (Mayer-Oakes and Pohorecky 1969:67). The authors concluded the presence of a ground and pecked stone and grinding stone were indicative of pemmican preparation and represented the efforts of a nuclear family rather than a large hunting party (Mayer-Oakes and Pohorecky 1969:67).This may or may not have been the case as the absence of numerous projectile points expected of a larger hunting party could be attributed to problems of preservation in such a heavily disturbed area. The site did contain numerous characteristics not witnessed in the Besant levels at the Mortlach and Long Creek sites (Appendix #2).

3.1.3.3 The Derr-Drews Burial

Over the final two weeks of July, both survey crews engaged in the salvage excavation of a historic Cree burial. The Derr-Drews site was named after landowner Herman Drews and his neighbor John Derr, who located the grave beyond the immediate area of the reservoir at NW/NW/SE of section 7, township 37, range 3, west of the third meridian. The burial was comprised of the flexed interment of a female, aged approximately twenty-four years, in a shallow depression covered by poplar saplings and overlying stone. The cairn was oriented north-south and measured 7.5 feet (2.31 m) by 3.7 feet (1.15 m) east-west. Excavation revealed the burial pit measured four feet ten inches (1.49 m) by two feet two inches (0.67 m), and rested upon a layer of gravel

approximately fourteen inches (0.36 m) below the former surface. Documentation for the present summary can be found in Mayer-Oakes and Pohorecky's 1969 report, pages 140-155. The original analysis is attached as Appendix #3.

Analyses of the physical remains of the inhumation were carried out by the Saskatchewan Museum of Natural History (SMNH), and the Royal Canadian Mounted Police (RCMP) Crime Detection Laboratory in Regina. Appendix #3 documents the preliminary study of the skull and upper eight vertebrae conducted by the SMNH in August of 1959, as well as the *in situ* locations of many of the artifacts discussed in the following paragraphs. The recognition of relatively small mastoid processes, unerupted wisdom teeth, closed endocranial sutures, and cup-shaped vertebrae led to the conclusion that the individual was a female aged between twenty-three and twenty-five years. The study also revealed the deceased had a circular depression on the surface of the left parietal near the midsaggital line. The depression was characterized by rough osseous matter within an inner circle and a smooth bevelled outer ring. An in-depth discussion of the anomaly which may have indirectly contributed to the death of the individual is included in Appendix #3.

Hair and fibre analysis of three samples taken from the inhumation were provided by the RCMP Crime Detection Laboratory in Regina (file number 806-59) and its analysis is included in Appendix #3. Exhibit A consisted of a lock of human hair, established as Mongolian, that was attached to a decorative copper jangler. Exhibit B consisted of a sample of wool hair from a bison resulting from the interment of the individual on top of a bison hide mat or robe. This would suggest a terminal date for the site of approximately A.D. 1880-1890. Exhibit C was identified as a sample of hair from the Mustelidae family. Two mustelidae crania were also located within the burial and an explanation of their occurrence is offered below.

A wealth of associated articles was recovered from the inhumation and provided the evidence for a contact period classification of the site. Among the most notable of the

associated grave goods was a copper bottle lid with the embossed inscription "J. Scwab-New York Perfume", a copper earring, and a brass wrist bracelet. A copper ring was found on the fourth finger of the individual's left hand and her funerary dress was made of cotton. Porcelain and glass trade beads in various colours and sizes were also recovered during the SMNH examination.

A small bundle containing several artifacts was located under the skull of the deceased. In addition to the inscribed perfume bottle cap already discussed, the bundle contained red ochre, a bone-handled metal scraper, an unidentified button, a comb, and a metal blade hafted to a hide-covered stone. As mentioned, two small animal crania were found to the right of her upper vertebrae, and were the subject of an independent study by Bruce McCorquodale (Curator of Paleontology, Saskatchewan Museum of Natural History). A reproduction of McCorquodale's report to the SSRP is included in Appendix #3, along with Mayer-Oakes and Pohorecky's summary interpretation of the site.

3.1.3.4 Saskatchewan Landing to Riverhurst

The second phase of the 1959 field season was carried out during the month of August, and focused upon the completion of an extensive assessment of the upper portions of the South Saskatchewan River. In order to more fully examine both banks of the river valley in the few remaining weeks of the field season, the two field parties conducted independent surveys within the region. The National Museum party, based at Perrin's Ranch south of Beechy, Saskatchewan, searched the north bank of the reservoir from the Saskatchewan Landing bridge to the mouth of Snakebite Creek (Mayer-Oakes and Pohorecky 1969:56). More than forty new sites were located in the attempt to document the number, character, and extent of archaeological resources in the western portions of the proposed reservoir (Mayer-Oakes and Pohorecky 1969:56).

An identical objective was shared by the Saskatchewan Museum investigation of the southern portion of the river, which extended from the localities of Cabri to

Riverhurst (Mayer-Oakes and Pohorecky 1969:56). Unlike the National Museum survey, however, Pohorecky's crew sampled portions of the region based on earlier findings of air photo analysis (Mayer-Oakes and Pohorecky 1969:56). The result of this effort was favourable, as fifty archaeological sites were documented by the Saskatchewan Museum party during the month of August. Appendix #1 provides a description of all the archaeological sites documented during the 1959 field season through the efforts of both field parties. Figure 3.1 illustrates the regions surveyed by the field crews during the summer of that year.

Although it is impractical to discuss the findings of the 1959 field season on a site by site basis, a few general comments may be presented. By the end of the 1959 field season approximately one-half of the proposed reservoir, or an area of approximately 150 square kilometers, had been surveyed over a period of approximately nine weeks. One hundred and twenty five archaeological sites had been located and documented, with test excavations completed at EhNr-18. (Test excavations were also initiated at the Swift Current Site, EdNw-5, but as the activity continued through the 1960 season the results are presented in section 3.1.4.5)

Of the 101 archaeological sites recorded during the 1959 field season, only five produced diagnostic artifacts. EhNr-18 represents a Besant occupation that was located in a cutbank five feet blow the surface of an eroded terrace. EgNp-23 and EgNp-25 both have been classified as McKean components by the Saskatchewan Heritage Branch since the time of the survey. Both sites were located within blowout areas along the edge of the prairie upland and consisted largely of lithic debitage and worked pieces. EeNt-3 consisted of an Agate Basin projectile point associated with a concentration of lithic debitage on the prairie upland overlooking Snakebite Creek. At the time of the survey, R.P. Fyfe recovered Agate Basin and Pelican Lake projectile points from an adjacent locale which was designated as EdNt-1. No other visible remains were associated with the latter site, however, and the locality was not visited by the SSRP survey crews.

In total, 66 of the 101 sites recorded during the 1959 field season, or approximately 65 %, were identified by the presence of worked lithic materials. Stone projectile points, end and sidecrapers, worked flakes and debitage are all included within this category. Twenty-four sites, or 24% of the total, consisted of stone circles and cairns. Twenty-three sites contained faunal materials exclusively or in association with cultural materials.

3.1.4 The 1960 Field Season

3.1.4.1 The Aiktow District

The final summer of SSRP field activity concentrated on the investigation of the heritage resources of the Elbow, or Aiktow Creek, district of the South Saskatchewan River. By the end of the previous field season, Mayer-Oakes had concluded that the junction between the Qu' Appelle and the South Saskatchewan rivers provided the best opportunity for "the establishment of cultural sequences dependent upon the horizontal segregation and distribution of distinctive projectile point styles" (Mayer-Oakes and Pohorecky 1969:60). The 1960 field season was thus dedicated to an intensive study of this potentially significant area, in addition to the continued survey of the western portions of the reservoir. Through the utilization of field survey, test excavations, and ethnological sources, the SSRP sought to provide a comprehensive assessment of the Aiktow district by gathering "ecological and cultural data in an extended frame of reference" (Mayer-Oakes and Pohorecky 1969:62).

Forty-one archaeological sites had been identified within the Aiktow district during the previous two seasons of SSRP activity and 29 of these sites produced a total of 161 projectile points (Mayer-Oakes and Pohorecky 1969:75). Pohorecky conducted a preliminary analysis of these materials in the spring of 1960 as a precursor to the subsurface sampling of the region. Sixteen of the 29 sites were documented as single component sites while 13 sites were classified as multicomponent due to the presence of

two or more distinctive projectile point styles. Recognized cultural affiliations ranged from McKean to Plains and Prairie Side-Notched styles of the Late Prehistoric period. Table 3.1 provides an inventory of projectile point typologies gathered from the Aiktow district prior to 1960 and serves as the main reference for the following discussion.

One locale, EgNp-23, contained five distinct projectile point types. McKean, Pelican Lake, and Besant occupations were all represented within the site collection as well as an unidentified side-notched and an unidentified corner-notched point. An anomaly of the site, and the Aiktow inventory in general, was the documentation of small unnotched projectile points. The artifacts were compared to the Winnipeg Ovoid, Nutimik Concave, Sturgeon Triangular, and Lockport Stemmed projectile point varieties classified by R.S. MacNeish in 1958 (Mayer-Oakes and Pohorecky 1969:79-80). As the artifacts are not available for analysis, no attempt can be made to provide a contemporary classification.

EgNp-3, EgNp-25, and site locality EgNp-15 (not to be confused with the generalized sampling area discussed in the following paragraphs) also produced McKean projectile points as part of multicomponent assemblages. EgNp-5 consisted of three Pelican Lake points, a Besant point, two unclassified side-notched points, and two ambiguous corner-notched artifacts. A second anomaly was uncovered at EgNp-13, where two heart-shaped points were classified as "Aiktow Valentine" (Mayer-Oakes and Pohorecky 1969:85). The points were found in association with eighteen scrapers, twenty-five worked pieces and over fifty lithic flakes (Mayer-Oakes and Pohorecky 1969:85). Unfortunately, the description of the Valentine type is limited and the artifacts are not available for further study.

Table 3.1: Aiktow Creek Surface Recoveries (1960)

SITE NUMBERS			LITHIC MATERIALS				NUMBER	POINT TYPES								OTHER MATERIA	
A	EgNp	SSR	Flakes	Worked	Scrapers END	Scrapers SIDE	OF POINTS	A	B	C	D	E	F	G	H	Shell	Sherd
	1	3	xx	-	-	-	-										
	2	4	xx	-	-	-	-										
	3	5	xx	4	7	2	9		2		1	1	3	2			
	4	6	xx	4	2	-	2	1							1		
	5	7	xx	12	19	6	13	1			3	2	1	2	4		
	6	8	xx	5	7	3	6	2				1	2	1			
	7	9	xx	8	4	1	2					2					
	8	14	-	-	-	-	(1)							(1)			
180	2-8	4-9,14	xx	6	12	10	22	7	4			4		3	4		
181	2-8	4-9,14	xx	7	16	9	27	4	5			5	5		8		
178	3	5	-	-	-	-	-										1
179	3	5	-	3	1	-	-										
	9	15	xx	5	1	4	8		1			1		1	5		
	10	16	6	-	-	-	-										
	11	17	xx	2	1	1	1				1						
	12	18	-	-	-	(1)	-										
	13	59	xx	25	4	14	3			2					1		
	14	60	8	-	-	-	1				1						
	15	61	xx	20	3	2	9	1	2			2	3	1		2	
	16	62	xx	-	-	-	(1)	(1)									
	17	63	xx	2	-	5	4					1	1	1	1		
	18	64	xx	8	1	8	7	1	1			4		1		1	
	19	65	xx	6	5	3	9	1	1			1	4		2		1
	20	66	xx	1	1	6	1					1					
	21	67	xx	2	2	-	1						1				
	22	68	xx	6	1	3	2						1		1		
	23	69	xx	25	13	13	8	1	1		1	1	2	1	1		
	24	70	xx	2	1	-	3		1						2		6
	25	71	xx	22	4	8	4		2				1		1		
	26	72	14	1	1	3	1						1				
	27	73	3	1	-	-	1	1									
	28	74	xx	3	-	-	2	1				1					
	29	75	xx	-	-	-	-										
	30	76	8	-	-	-	-										
	31	77	xx	3	3	1	2	1					1			1	
	32	78	14	-	-	-	1				1						
	33	79	14	3	-	4	3						3				
	34	29	-	1	-	-	-										
	35	30	2	10	-	-	-										
	36	31	3	10	-	-	-										
	37	32	-	1	-	-	-										
	38	43	xx	16	5	6	6	2				4					
	39	46	10	-	3	-	-										1
	40	47	8	11	10	-	-										
	41	48	3	5	-	-	1	1									

TOTAL NUMBER OF PROJECTILE PTS.: 161: 26 20 2 8 31 29 14 31

POTTERY SITES: 4

xx means over 20 flakes.

POINT TYPES: A: unnotched; B: McKean; C: heart-shape; D: Pelican Lake; E: corner-notch; F: Besant; G: side-notch; H: fragmentary.

As mentioned in the introduction to this section, Mayer-Oakes conducted a second analysis of the surface collection of Aiktow Creek projectile points in 1969. This second investigation examined 103 projectile points, of which 34 were recognized as complete forms, 34 were categorized as nearly complete, and 35 consisted of fragments (Mayer-Oakes and Pohorecky 1969:86). Nine named types were recognized within the collection, including Plainview, Agate Basin, McKean Lanceolate, Oxbow, Pelican Lake, Besant Corner-Notched, Besant Notched, Plains Side-Notched and Prairie Side-Notched (Mayer-Oakes and Pohorecky 1969:86).

The recognition of Plainview and Agate Basin projectile point styles lengthened the known cultural occupation of the region by five millennia to over 9000 years BP. It is interesting to note that no Avonlea projectile points were recorded as a result of the SSRP investigation of the Aiktow region. This would seem to be an absence particular to the SSRP data as the Douglas Park survey, the 1995-1996 survey and numerous private collections within the region all contain Avonlea artifacts.

3.1.4.2 Test Excavations at the Elbow (EgNp-15)

Subsurface sampling of the Aiktow district began in June of 1960, as Pohorecky's National Museum field crew conducted three archaeological excavations within the immediate vicinity of the elbow. The first of these, an extensive investigation of the 300 acre (122 hectare) area arbitrarily designated EgNp-15, subsumed thirty-two discrete sites in the western half of section 26 and the eastern half of section 26, in township 24, range 5, west of the third meridian (Mayer-Oakes and Pohorecky 1969:118). The area was a section of Crown Land purchased by the Prairie Farm Rehabilitation Administration (PFRA) that was subsequently leased to local farmer John Schinold (Mayer-Oakes and Pohorecky 1969:118-119). Hundreds of projectile points, lithic scrapers and worked pieces had been located in the area by collector Oliver Johnson during the previous two seasons of SSRP activity (Mayer-Oakes and Pohorecky 1969:119). Appendix #4 provides

a definition of the EgNp-15 test area and the EgNp series of archaeological sites subsumed within the SSRP designation.

Thirty-five test auger pits were drilled to an average depth of ten feet, or approximately three meters, along the upper, middle and lower terraces of the Gordon McKenzie Arm of the South Saskatchewan River (Mayer-Oakes and Pohorecky 1969:118). Appendix #4 includes partial documentation of the 27 auger tests and illustrates relative locations of bone, charcoal, and worked lithic material. The area was then subdivided according to the location of 21 excavation units. The units were grouped into five areas of concentration and designated as project areas A through E.

Project A consisted of 14 five-foot (1.5 m) square pits that were spaced 15 feet (4.5 m) apart and excavated to a depth of five feet (1.5 m) below surface. The units were aligned in an L-shaped formation along an upper terrace of the river and encompassed the individual site designations of EgNp-5, 6, 7, 15, and 16. Project area B, also located on an upper terrace, consisted of two five foot square excavation units (depth undocumented) in the vicinity of EgNp-25. Project C consisted of two five foot square excavation units, and was located upon a lower terrace in the vicinity of EgNp-4 and EgNp-11. Project D consisted of two ten foot (3 m) square excavation units along a lower terrace, and encompassed site designations EgNp-18, 19, 20, and 21. The final test unit, referred to as Project E, consisted of a single five foot square excavation along the lower terrace containing site designations EgNp-13 and EgNp-33. No test units were placed in the blowout areas where surface collections were gathered. A detailed illustration of the excavation locales was not recorded.

Project A, which as stated comprised 14 of the 21 test excavations, yielded the vast majority of archaeological materials. A finely worked blade, two scrapers, a lithic core, a grinding stone, and an incised limestone slab were among the 1029 artifacts documented in the 1969 report. The remainder of the artifact collection was composed of ceramic sherds gathered from test pits 123L12 and 124L12. Two distinctive ceramic

types were present within the collection: a rough cord-marked ware and a finely embossed ware which remained unclassified by the SSRP. Both ceramic types may been have fashioned out of the blue clay found in a shallow quarry at the western periphery of the site (Pohorecky 1960d:9). Appendix #4 provides a preliminary description of the ceramic sherds recovered from Project A test excavations and represent the only ceramic analysis of the SSRP survey materials. The sherds were evaluated on the basis of temper content, texture, color, hardness, surface treatment, and form. The 'finely embossed' artifacts have since been re-examined by Dr. David Meyer at the University of Saskatchewan who has identified the majority of the remaining EgNp-15 sherds as Avonlea parallel-grooved (David Meyer personal communication 1997). Examples of the cord-marked ware were not available for further study.

Project B produced 606 'specimens' comprised mainly of charcoal samples, bone, fire-cracked rock, lithic debitage and cores (Pohorecky 1960d, 9). Project C uncovered a single identifiable artifact, a lithic scraper, and 84 unidentified specimens. Project D, the second of the test excavations opened on a lower terrace, revealed five *in situ* projectile points (unidentified), nine scrapers, and six worked flakes. Test pit #2 in Project D also produced the most clearly defined hearth feature exposed during the SSRP investigation. Project E may not have been completely excavated due to time constraints and produced only a single lithic scraper in association with fourteen unidentified specimens. Appendix #4 provides a complete listing of the artifacts and specimens associated with each test pit of the Aiktow district.

3.1.4.3 Mistaseni: An Aiktow Erratic (EgNo-19)

A second excavation of the 1960 field season centered on a massive granite erratic located in the northeast quarter of section 34, township 24, west of the third meridian. The erratic measured approximately 80 feet (25 m) in circumference, 26 feet (8 m) in length, 26 feet in width and 14 feet (4 m) in height. It was calculated to have

weighed in excess of 400 tons (360 tonnes), based on an average weight for granite of 167 pounds per cubic foot. (Mayer-Oakes and Pohorecky 1969:130)

The erratic, or Mistaseni rock, was situated on a floodplain approximately 100 yards (91 m) southwest of Aiktow Creek. The area was dominated by short grass vegetation and shrubs, and bordered by reworked sand deposits. Several outlying stone formations occupied the southern, eastern, and western peripheries of the site, and a series of small springs were located on the opposite creek bank. The peculiarity of the feature was reflected in its significance to precontact ceremonial activity. The Plains Cree worshipped the spirit of the Manitou embodied by the grandeur and placement of the rock, as witnessed by accounts such as those by Henry Youle Hind who documented the native practice of giving offerings at the site (Mayer-Oakes and Pohorecky 1969:130). Appendix #5 provides a summary of ethnographic information concerning the Mistaseni erratic gathered by Ray Tulloch for the SSRP in 1961.

Archaeological testing was undertaken in an attempt to determine the nature of ceremonial activity at Mistaseni. A circular trench eighty feet (24 m) long, two feet (0.6 m) deep, and three feet (0.9 m) wide was excavated around the perimeter of the erratic. The trench was subdivided into 16 five-foot (1.5 m) long pits that were numbered relative to a southeast datum marked on the stone. Test Pit #1 thus comprised the first five-foot section west of the datum, with each subsequent section numbered consecutively according to its clockwise position. (Mayer-Oakes and Pohorecky 1969:100). Appendix #7 provides an inventory of artifacts located within the EgNo-19 excavation as well as items recovered in areas disturbed by amateur activity.

Many of the artifacts recovered date to the contact period, or at least the era of influence of European trade goods. Seven fragments of European ceramics, a copper disc, a copper ring, a blue bead, and a fragment of manufactured glass were found among the artifacts of Pit #2 (Mayer-Oakes and Pohorecky 1969:133). A musketball was recovered from Pit #4 and may be indicative of the Plains Cree and Assiniboine trading

relationship with the main European arms supplier of the region, namely the Hudson Bay Company. The recovery of twenty-seven ceramic fragments of Hudson's Bay ceramics in Pit #5 further supports the proposed association.

The recovery of worked potash glass (Pit #9) would seem to indicate native assimilation of European manufactured materials into traditional lifeways. Numerous lithic artifacts including flakes, worked pieces, and unidentified projectile points were also present within the area of excavation. Thus the time period in question may encompass the early contact period when indigenous assimilation of European trade goods was balanced by an adherence to traditional technologies and materials. A second, and equally valid interpretation may be that precontact and contact assemblages were mixed in the archaeological record. No definition of excavation levels is put forward in the 1969 report nor was vertical provenience established for individual artifacts within the area of excavation. The worked potash glass provides the best indication that ceremonial activity at Mistaseni encompassed the early Historic period, as well activities later documented by Hind and in ethnographic sources.

The number of foreign materials and luxury items located within the excavation provide a unique insight into the nature of offerings made at Mistaseni. The presence of ochre (Pit #11,13/14), an unidentified flint chip (Pit #15), and an obsidian projectile point (located in a crevice in the erratic), indicate that items of scarce supply and luxury were among those favoured in ceremonial activity. European trade goods, such as a metal earring (Pit #6) and numerous trade beads, may be included in this category and comprise a large percentage of the Mistaseni collection. Fragments of bison bone and teeth were also scattered throughout the excavation, and may be representative of the predominant subsistence strategy of bison hunting carried out by indigenous cultures throughout the region.

Three distinct types of vegetation were recorded in areas to the east, west, and north of the boulder. The largest of these was over 80 feet (25 m) in diameter, with the

remaining two areas averaging 20 foot (6 m) diameters (Mayer-Oakes and Pohorecky 1969:131). The authors hypothesized that the growth of 'buffalo bushes' within the circular areas resulted from the formation of rich humic soils due to the decomposition of organic materials; areas outside the circles were typically dominated by speargrass in sandy soils; and 'scrub grass' occurred in soils containing humic acid, possibly as a result of human habitation (Mayer-Oakes and Pohorecky 1969:132). A test in the center of the largest area revealed no evidence of a center post used to support a large structure (Mayer-Oakes and Pohorecky 1969:131) and soil analyses of the locales are not available for reference in this report.

Despite the limited archaeological testing of the areas, the authors concluded that

> "vegetal changes indicate that there were structures made of perishable organic materials (likely wood) located to the west, north, and east of the [Mistaseni] boulder. All of the structures appear to have had openings that suggest entranceways. These doorways were invariably oriented to the southwest in all three instances. This seems too regular a phenomenon to be attributed to chance, and, coupled with the fact that most stone circles in the vicinity have entranceways facing southwest, the vegetal changes assume a degree of significance." (Mayer-Oakes and Pohorecky 1969:131)

Further testing of the areas was precluded by the continuation of construction activities within the area of the reservoir. Because of its massive size, the Mistaseni erratic was considered a hazard to marine navigation and was dynamited prior to the completion of Gardiner Dam in 1968. Several fragments of the erratic were cemented together to form the present monument at the Elbow Provincial Recreation Site while others were used to mark the relocated grave of Chief Poundmaker in Cutknife, Saskatchewan. The decision to destroy Mistaseni followed an extensive campaign by Zenon Pohorecky and others to have the boulder moved intact beyond the region of the reservoir. Appendix #7 documents the efforts of "Operation Mistaseni' and provides an overview of public opinion regarding the effort.

3.1.4.4 The Proud Burial (EfNm-3)

The first of the 1960 excavations conducted beyond the Aiktow district was a salvage operation in the southeast quarter of section nine, township twenty-two, range one, west of the third meridian. The Proud burial was named after former Elbow school teacher George Proud who discovered the site along the lower terrace of a severely eroded coulee approximately 1.5 miles (2.5 km) south of the Qu'Appelle Valley (Mayer-Oakes and Pohorecky 1969:156-157). The grave was located on a south-facing terrace slope, approximately ten feet (3 m) north of an overhanging a cutbank (Mayer-Oakes and Pohorecky 1969:157). An eight-foot (2.5 m) line of stones was located about two hundred yards (182 m) directly south of the grave, and may have served as a burial marker (Mayer-Oakes and Pohorecky 1969:157).

The burial was excavated by the National Museum field crew directed by Pohorecky. The excavation procedures were described as "routine" and were conducted according to the general pattern used during the 1959 Derr-Drews excavation (Mayer-Oakes and Pohorecky 1969:158). Like the Derr-Drews burial, the grave was oriented north-south with surface dimensions of 7.9 feet (2.4 m) and 3.6 feet (1.1 m) (Mayer-Oakes and Pohorecky 1969:157). A cairn, composed of seventy-two large stones, had been placed over the surface of the interment (Mayer-Oakes and Pohorecky 1969:157). The grave itself measured 6.0 feet (1.8 m) in length, 2.3 feet (0.7 m) in width and extended 1.5 feet (0.4 m) below the surface (Mayer-Oakes and Pohorecky 1969:158). Appendix #6 provides an overhead view of the burial and the *in situ* positions of some of the artifacts discussed in the following paragraphs.

The Proud burial was unique in that it contained traits common to both scaffold and cairn burials. Sharpened stakes had been driven into the four corners of the pit and the position of logs recovered just below the stone cairn suggested a platform had been constructed over the interment (Mayer-Oakes and Pohorecky 1969:157). A second

platform may have been positioned beneath the individual, as logs were also recovered under the skeletal remains (Mayer-Oakes and Pohorecky 1969:159).

The intrusion of a large animal burrow in the south wall of the site profile accounted for the high degree of disturbance witnessed during excavation (Mayer-Oakes and Pohorecky 1969:158). Vertebrae, molar teeth, and rib fragments were found scattered throughout the grave. No long bones were present within the assemblage. An artifact inventory of the Proud burial can be found in the 1969 discussion attached to this report as Appendix #6.

The presence of three copper buttons, numerous trade beads, and a copper jangler leave little question the internment took place during the historic period and may suggest an explanation for the unusual combination of burial practices. Mayer-Oakes and Pohorecky suggested that while native traditions may have demanded a scaffold type of inhumation, the R.C.M.P. may have imposed a subsurface internment. The authors also recognized the unusual inhumation may have been the result of a compromise between two indigenous traditions (Mayer-Oakes and Pohorecky 1969:159-160).

3.1.4.5 The Swift Current Creek Sites (EdNw-5, 28, 30)

As previously mentioned, the Swift Current Creek site was initially discovered during the 1959 field season by the Saskatchewan Museum of Natural History survey crew. The site consisted of a Plainview projectile point recovered in section 33, township 19, range 3, west of the third meridian (Mayer-Oakes and Pohorecky 1969:115). Five individual five foot (1.5 m) squares were excavated in a single day in the immediate vicinity of the surface find, each of which produced large quantities of lithic flakes, cores, and worked pieces (Mayer-Oakes and Pohorecky 1969:115). All of the cultural materials were recovered in a six inch (0.15 m) stratum approximately six inches below the surface. A preliminary examination of neighbouring cutbanks indicated that the site was located on an ancient floodplain that had undergone periods of intense erosion, thus

compacting several culturally distinct components into a single layer (Mayer-Oakes and Pohorecky 1969:115-116).

Archaeological testing was renewed the following year (Appendix #6) in an attempt to locate a "clearer geologic context, where stratification might be less compacted and more extended" (Mayer-Oakes and Pohorecky 1969:116). An unspecified number of auger tests were drilled within the vicinity of EdNw-5 and produced evidence that the shallow layer of lithic material may have encompassed as much as ten acres (4 hectares) of contemporary surface area (Mayer-Oakes and Pohorecky 1969:116). Moreover, the tests resulted in the discovery of EdNw-30 which contained over thirty distinct soil layers within a cutbank along the South Saskatchewan River (Mayer-Oakes and Pohorecky 1969:68). Hearths and associated charcoal, calcined bone, and fire-cracked rock were located throughout various levels of the site to a depth of 8.5 feet (2.6 m) below surface (Mayer-Oakes and Pohorecky 1969:68). A bison scapula was exposed 14.7 feet (4.5 m) below surface, although no cultural materials were recorded in association with the specimen.

A silicified wood quarry (EdNw-28) was located in close proximity to the other Swift Current Creek sites and provides a plausible explanation for the abundance of worked silicified wood materials recovered by the SSRP throughout the reservoir (Mayer-Oakes and Pohorecky 1969:68). The Plainview projectile point was manufactured from white quartzite, a material which is commonly found throughout the study area. Approximately 25 percent of worked lithic materials at the Swift Current Creek Site were composed of red quartzite (Pohorecky1960c:115).

3.1.5. Summary and Analysis of the SSRP

Although this section has focused on the presentation of data resulting from SSRP activity, a brief summary of the project's findings and significance to the region might prove useful. The South Saskatchewan River Project marked the first and most

comprehensive attempt to locate and document the archaeological resources of the South Saskatchewan River within the area of impact of the Gardiner and Qu'Appelle dams. One hundred and eighty-one archaeological sites were recorded over three successive field seasons by the SSRP survey crews (1958-1960). In addition, two salvage operations were conducted beyond the immediate area of the reservoir. Over 500 square kilometers were encompassed within the SSRP study area. This obviously placed severe limitations on the intensity of the archaeological survey and the sub-surface sampling of the region, a fact which adds to the impetus for the present effort.

By the end of the 1960 field season nine distinct Prehistoric and Historic period cultural occupations had been recognized within the study region. Temporally, the Prehistoric period occupations ranged from Plainview and Agate Basin cultural assemblages (dating approximately 9000 BP) to a late nineteenth century inhumation. The composition of lithic materials most often utilized by these groups for tool making had been established. Over 70 percent of the SSRP collection of worked lithic material was silicified wood with the majority of the remainder fashioned from white and red quartzite (Mayer-Oakes and Pohorecky 1969:69). The character and importance of native ceremonial activity had been investigated through the excavation of the Mistaseni erratic. Moreover, through the efforts of 'Project Mistaseni' the archaeologists had become active participants in the effort to promote cultural understanding through the preservation of heritage materials.

The SSRP also comprised the first multi-disciplinary approach to the study of the research area. Cooperation between the National Museum and Saskatchewan Museum field crews was successful and supplemented by independent studies carried out at the Saskatchewan Museum of Natural History and the forensic analysis provided by the RCMP. A search of historical references led to the hypothesis that human occupation patterns may have been determined by the seasonal relocation pattern of bison throughout the region, a topic which has been subsequently investigated in greater detail

by researchers such as Arthur (1975), Morgan (1980), Richards (1984), Epp (1988), and Germann (1989). Together with the data gathered by subsequent archaeological investigations in the region, the SSRP data allows a comprehensive interpretation of the models presented above, as well as an analysis of the land-use patterns within regional microenvironments and the effects of large-scale development.

In specific cases, the SSRP also documented a number of sites that were potentially suitable for further study. The site locale of EgNp-50 represents a possible bison kill site in the northwest quarter of the southeast quarter of section 16, township 24, range 4, west of the third meridian. The site has produced diagnostic projectile points ranging from Agate Basin, to Scottsbluff, Bitterroot, Pelican Lake, and Besant occupations. EgNp-57 has produced Agate Basin, Hell Gap and Besant projectile points along the eastern shore of the Gordon McKenzie arm of the reservoir. The site is discussed further in the following section which summarizes the survey activities of Eldon Johnson in the vicinity of Douglas Park. EgNp-23 and EgNp-25 includes McKean components that may be worthy of further testing. The site contained abundant lithic debitage and diagnostic projectile points which dated back over 4000 years of occupation. The site condition remains unknown at the present time and further documentation would benefit the regional site inventory.

The investigation of SSRP site locales during the 1995-1996 field seasons was precluded by a number of factors. Although all the sites specifically mentioned above lie beyond the area of inundation resulting from the creation of Lake Diefenbaker, thirty-five years have elapsed since the time of the SSRP survey. Numerous cultural and taphonomic processes have considerably altered the archaeological record, including modern cultivation practices. As well, inconsistencies in the initial SSRP documentation of site locales prevented the revisitation of particular sites. As an example, EgNp sites 42-50 were assigned designation by the SSRP survey, but "insufficient locational information" prevents their inclusion in the current provincial inventory. The lack of

detailed survey and site maps remaining from the project further complicates contemporary interpretation, as does the absence of artifacts. In particular, all of the projectile points which were originally catalogued over the course of the SSRP are missing. Finally, the amount of survey and subsurface testing required by the current project consumed the resources of time and funding necessary to mount a second field investigation of SSRP site locales.

3.2 The Douglas Park Survey

Fourteen years after the completion of the South Saskatchewan River Project, Eldon and Kim Johnson of Kindersley, Saskatchewan began a second archaeological survey of the Lake Diefenbaker region. They concentrated their efforts along the eastern shoreline of the South Saskatchewan River within the immediate vicinity of the elbow and along both shores of the Gordon McKenzie Arm to the Qu'Appelle Dam (Germann 1989:92-94). In 1973, a provincial order-in-council (# 947) recognized the eastern portion of the Gordon McKenzie Arm as a Provincial Park and named it in honour of former Saskatchewan Premier Thomas Douglas (Johnson and Johnson 1978:1). The subsequent archaeological survey documented the heritage resources of the Douglas Park region, which is centered approximately eight kilometers south of the junction of the South Saskatchewan and Qu'Appelle rivers.

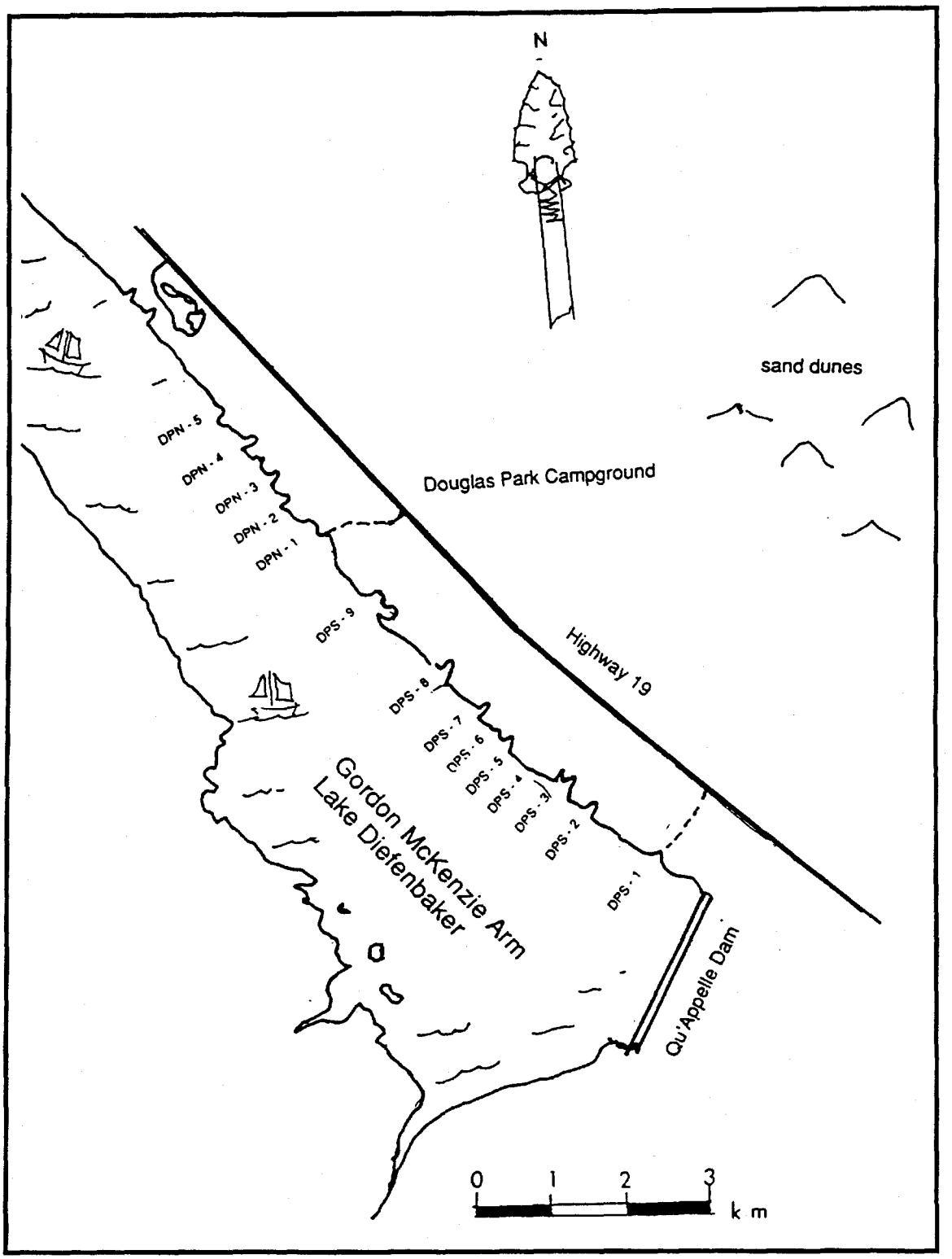
To a large degree, Eldon and Kim Johnson's investigation was carried out in response to shoreline erosion caused by the heightened water levels of Lake Diefenbaker. Fluvial erosion destroyed the original context of numerous sites within the region and exposed diagnostic projectile points, scrapers, knives, hammerstones and lithic debitage throughout the Qu'Appelle Arm of the reservoir (Johnson and Johnson 1978:2). The central objective of the Douglas Park survey was thus "to collect and record as much of the ephemeral record as possible before these artifacts were washed into the reservoir or

removed by casual collectors and beachcombing tourists who may not have been aware of existing regulations" (Johnson and Johnson 1978:2).

Survey procedures of the Douglas Park investigation were established according to the demands of a unique local environment. Beach areas and cutbanks were intensively searched each spring and at one month intervals throughout the summer (Johnson and Johnson 1978:4). The search coincided with the lowest water levels of the reservoir which reaches a late summer maximum of approximately 557 m above sea level (Johnson and Johnson 1978:2). A survey boundary of approximately fifty to one hundred meters from the water's edge was maintained over the 48 kilometers of shoreline encompassed within the study area (Germann 1989:94). Areas dominated by long grass, aspen bluffs, fresh water springs and stabilized sand dunes were also included within the archaeological reconnaissance of the region.

Fourteen site areas were identified during the 20 field seasons of Douglas Park survey activity from 1974 to 1994. Figure 3.2 illustrates the site locales which were encountered within the 8.8 kilometer beach area from the northern boundary of Douglas Park to the Qu'Appelle Dam (Johnson and Johnson 1978:1). The sites were assigned designations in sequence from southeast to northwest and were plotted through the use of aerial photographs (Johnson and Johnson 1978:4). Although no evidence of stratification was apparent at any of the site areas, 550 artifacts were recovered during the course of the investigation (Johnson and Johnson 1978:11). Each artifact was analyzed in terms of composition and form, inscribed with an identification number, and subsequently curated at the Royal Saskatchewan Museum.

Thirteen distinct projectile point types were recovered within the area of the initial survey with cultural affiliations extending over at least the last nine millennia. The recovery of Plainview, Agate Basin, Eden, and Scottsbluff points leaves little question the region had been utilized extensively by Paleoindian cultures. Oxbow, McKean,



after Johnson 1997

Figure 3.2: Archaeological Sites of the Douglas Park Survey

Duncan, Hanna, Besant, Pelican Lake, and Plains and Prairie Side-Notched occupations were also well represented in the survey assemblage (Johnson and Johnson 1978:13). Of special interest, Bitterroot projectile points, which have previously been located in components radiocarbon dated at 6000 to 6400 years B.P. in the Hawken sites of Wyoming (Frison 1991:86) were also recovered during the Douglas Park survey. Their discovery gives clear evidence that the South Saskatchewan River valley was inhabited throughout even the drought-like conditions of the Altithermal, as also evidenced at the Gowen and Norby sites in Saskatoon (Zurburg 1991, Walker 1992).

3.3 Cultural Resource Management Archaeology in the Region

Over the past two decades, several minor resource management studies have been conducted in areas neighboring the current project. In 1980, Lifeways Ltd. carried out a Heritage Resource Impact Assessment (HRIA) of the Chaplin district natural gas right-of-way for TransCanada Pipelines. The survey area was located approximately 45 kilometers south of the current study area, and was comprised of a 25 meter wide corridor which extended 23.0 kilometers in an east-west direction. The HRIA resulted in the documentation of two twentieth century homesteads, 23 isolated lithic find spots and three stone circle concentrations (Ronaghan 1981:2). Only three of the sites were classified as significant by the initial survey. As no further excavation was carried out at these locales it is assumed the areas were avoided during pipeline construction.

In 1981, a second HRIA was conducted along the TransCanada Pipelines natural gas right-of-way, this time by ARESCO Limited consultants (Anderson 1983). The study encompassed 22.6 linear kilometers of pasture and cultivated fields approximately forty kilometers south of the town of Riverhurst. Ten archaeological sites were recorded over the course of the survey and lithic find spots again dominated the survey inventory. The sites included EdNr-3, however, which was comprised of a single stone circle and a "light

to moderately dense" scatter of quartzite flakes and cores (Richards, Thomas, and Germann 1987:6).

EdNr-3 was reexamined in 1986 by Thomas Richards, Marvin Thomas and Carlos Germann on behalf of the Archaeological Resource Management section of Saskatchewan Parks, Recreation and Culture. Their investigation was carried out in response to the proposed sale of SW1/4 of Sec.17, Twp.18, Rge.7, W3M. (Richards, Thomas, and Germann 1987:6). Unfortunately, the A.R.M.S. researchers discovered that a significant portion of the site had been disturbed by pipeline construction and no further attempts to test and document the site were carried out. The 1986 field crew did, however, map, test, and excavate six sites (EdNr-7,8, 11,12,13,14) which included a small rock cairn and several stone circles (Richards, Thomas, and Germann 1987:1). They concluded the sites were attributable to the 18th and 19th century occupations of the Assiniboine and Plains Cree, which positioned themselves in direct relation to the migrating bison herds found seasonally in the Missouri Coteau and Touchwood Hills from summer to winter respectively (Richards, Thomas, and Germann 1987:4).

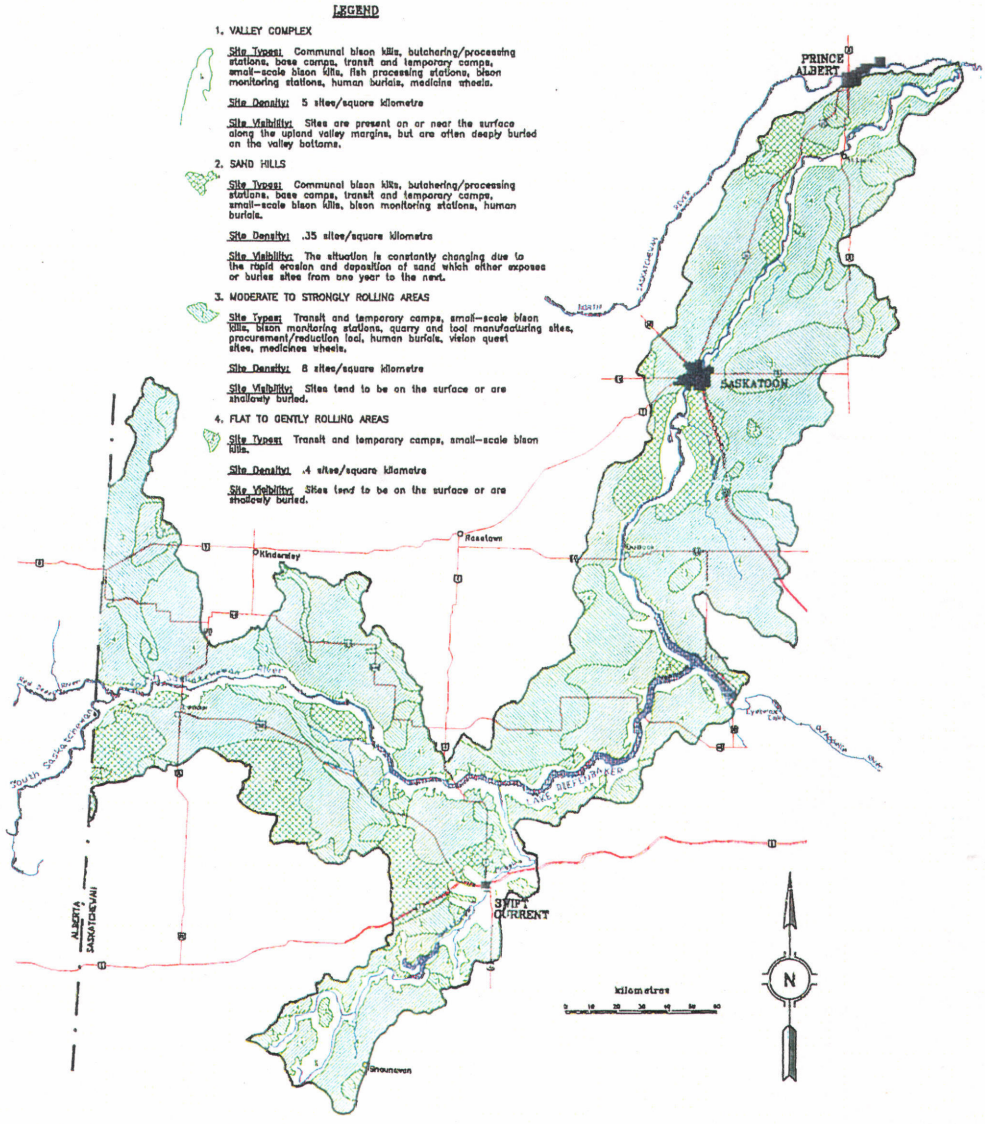
In July of 1986, Millenium Heritage Resource Consultants Ltd. carried out a two-day field survey of a 50 hectare area at Saskatchewan Landing Provincial Park (figure 3.1). The research was conducted in response to the proposed development of a cottage subdivision and seasonal trailer park along the northwestern portion of Lake Diefenbaker (Amundson and Kelly 1986:7). Although no archaeological materials were located within the proposed development area, three stone cairns and a site previously recorded by the S.S.R.P. in 1959 were examined. A rectangular stone alignment originally recorded on a knoll east of a dry gully (EeNx-17) now overlooks what is known as House Boat Bay (Amundson and Kelly 1986: 16). The bay is a feature associated with the much higher water levels of the Lake Diefenbaker reservoir. Although it is possible to speculate the post-development river course may in fact reflect the river morphology at the time of

initial occupation, the absence of temporally diagnostic artifacts precludes such an interpretation at this time.

3.4 South Saskatchewan River Basin Study

In 1989, the Heritage Resources branch of the Saskatchewan government submitted a heritage resource study to the South Saskatchewan River Basin Water Use Technical Committee (Technical Report E.16). The report attempted to identify "where heritage sites are reasonably expected to occur within the South Saskatchewan River Basin (SSRB) and to what extent they may be adversely affected by future water resource developments" (Germann 1989: ii). The report included detailed summaries of documented archaeological and paleontological resources within the SSRB as well as predictive models of archaeological resource sensitivity throughout the region (figure 3.3).

In addition to the above, the report also provided an overview of current water management practices and future water resource development, environmental analysis for the SSRB and prehistoric settlement patterns. A summary of past models concerning bison seasonal migration patterns and a current model provided by Germann et. al. are also presented. While it is unnecessary to summarize the various elements of the SSRB publication here, the study is referenced throughout future sections of this report as relevant topics are discussed. Copies of the report are available through the Saskatchewan Water Corporation, the Saskatchewan Heritage Branch, and the Saskatchewan Archaeological Society office in Saskatoon.



after Germann 1989

Figure 3.3: Resource Sensitivity Zones in the Lake Diefenbaker Region

3.5 Camp Rayner Excavation

The Camp Rayner archaeological site (EgNr-2), now in its 13th season of excavation and operation as an archaeological field school, is located at the 4-H camp on Lake Diefenbaker southeast of Birsay, Saskatchewan (figure 3.1). The Saskatchewan Archaeological Society (SAS) investigation has provided professional and amateur archaeologists the opportunity to investigate the extent of cultural occupations of the Lake Diefenbaker region over at least the past seven millennia.

As of 1993, 51 one meter excavation units were opened. Oxbow, McKean, Duncan, Pelican Lake, Avonlea, Besant, Prairie and Plains Side-Notched materials have all been found in stratified components at the site. Folsom, Plainview and Agate Basin projectile points have also been recovered on the beach area adjacent to EgNr-2. In 1996, the SAS program of sampling the site area with one meter by one meter test excavations also revealed an *in situ* cultural assemblage directly beneath an Oxbow occupation in a stratified context (Tom Stevenson personal communication 1997). Unfortunately, no documentation of the assemblages or the site stratigraphy is available at this time.

A brief examination of the cultural materials and a discussion of the Camp Rayner site location are included in the overview of regional archaeological sites presented in Chapter 6. At present, the Saskatchewan Archaeological Society is continuing its program of test excavation at the site in addition to developing a detailed artifact catalogue and interim report of the project's findings to date.

3.6 Canaan and Coteau: 1989-1993

A fourth major field investigation of the heritage resources of the South Saskatchewan River within the study area has been undertaken by Tom Stevenson, a Regional Archeological Volunteer for the Saskatchewan Archeological Society. Over a period of five field seasons, Stevenson located and documented 29 precontact archaeological sites along the west bank of the South Saskatchewan River extending

from Gardiner Dam south to Snakebite Bay (figure 3.1). In his own words, Stevenson's methodology consisted of:

> walking along the deflated beach areas until sites were discovered, measuring the site's visible parameters, mapping collecting, and cataloguing representative artifacts. As the amount of cultural material collected from some sites became considerable, there was a need to establish permanent data points. Due to a lack of permanent recognizable landmarks at many sites, data were established by compass readings to selected distant landmarks.
>
> Stevenson 1993:10

By plotting the location of artifacts on maps with a scale of 1cm = 30m, Stevenson created an initial grid system for sites located on the western shore of the river.

The result of Stevenson's efforts is one of the most comprehensive and well-documented amateur surveys of the South Saskatchewan River district. Virtually every known cultural occupation common to the Northern Plains region is represented in the surface collections gathered to date. Among the sites recommended for further investigation are EhNq-7, which may represent the first Oxbow kill site located on the Northern Plains; EgNs-4,or the Lucky Lake Paint Pot site; EgNs-5, the Lucky Lake Boulder Effigy; and the multicomponent Coteau Beach sites of EgNq 14 to 19 which have produced two Clovis projectile points (Stevenson 1993).

3.7 The Melhagen Site

In 1991, University of Saskatchewan graduate student Allyson Ramsay completed her M.A. thesis of a Besant site (EgNn-1) located approximately 18 linear kilometers southeast of the elbow. The site had first been investigated by the Saskatchewan Archaeological Society from 1967 to 1972, although a final report of the Society's findings was never completed (Ramsay 1991:2). As a result, Ramsay's analysis coalesced the data from the 1967-1972 excavations with that retrieved from the excavation, survey and trenching procedures conducted in 1986 and 1987. In all, over 203,000 artifacts were

studied and catalogued from excavations of both kill and processing areas within the site (Ramsay 1991:230).

A major portion of the Melhagen research centered on the analysis of Besant and Sonota projectile point types found throughout the excavations (Ramsay 1991:95-145). Both metric and non-metric attributes of each projectile point were carried out to determine if cultural distinctions could be supported using statistically valid quantitative methods or on the basis of qualitative characteristics (Ramsay 1991:96-97). The analysis found that variation in projectile point types occured not only as a result of cultural differences, but also because of differences in the raw materials used, the occurence of resharpening/ reworking and differences in the intended use of the tools (Ramsay 1991:223). Ramsey suggested Knife River Flint artifacts, for example, may be expected to occur in greater numbers in kill sites than in habitation sites during the era of Besant occupations (1991:223).

Ramsay's investigation also included an examination of the frequency and seasonality of the occupations based on site stratigraphy and detailed faunal analysis. She concluded the Beasant pound and associated processing areas represented multiple events at the site which took place from fall to late spring (Ramsay 1991:229). Chapter 6 summarizes data gathered by the SSRP, the Douglas Park survey and the Melhagen site investigations regarding the locations of archaeological sites in the sand hills throughout the region of the Aiktow Creek valley. A copy of Ramsay's thesis is held on file at the Department of Anthropology and Archaeology at the University of Saskatchewan.

3.8 The Sjovold Site

In 1995, Ian Dyck and Richard E. Morlan published an extensive analysis of the Sjovold site (EiNs-4), which was located on the west bank of the South Saskatchewan River 35 kilometers below Gardiner Dam (figure 3.1). The Sjovold monograph documented excavations that were carried out over a two year period, from 1979 to 1980,

and included analyses of a series of cultural occupations dating over approximately the last four millennia (Dyck and Morlan 1995:1). Twenty distinct cultural occupations were identified in 22 distinct stratigraphic components of the site.

The site was first recognized by Ralph and Leslie Sjovold in 1965 and an initial test pit was dug at the south end of a small ridge adjacent to the mouth of Sjovold Creek (Dyck and Morlan 1995: 58). The 1979-1980 excavation units enveloped the initial test pit within a six meter by four meter block and extended just over four meters below the surface (Dyck and Morlan 1995: 61). Features, rocks, pottery, stone tools, lithic debris, bone tools and faunal remains were recorded for each stratigraphic component of the site. These were combined with commissioned studies of the past and present environmental settings of the region (Dyck and Morlan 1995:70).

Although the Sjovold site was located approximately 60 kilometers north of the 1995-1996 survey area, an abundance of relevant information is contained within the authors' analysis. The exacting descriptions of the geography, climate, and natural resources of the region have been referenced throughout the current report and their comprehensive review of relevant historical sources (Dyck and Morlan 1995:13-37) made the duplication of this information unnecessary for the current project. In addition, the authors' identification of two new projectile point types, the Bratton and Outlook Side-Notched types, may add significantly to the cultural interpretation of the Lake Diefenbaker region if complementary data is recovered in the future.

While it is unnecessary to attempt a summary or critique of the entire publication for the purposes here, it should be recognized that the authors' analysis went far beyond the traditional contributions of cultural-historical data, cultural resource management or even native settlement patterns. Instead, the authors sought to achieve the promise of archaeological inference by combining "multiple lines of evidence into interpretations of cultural context" (Dyck and Morlan 1995:4). Information from ethnographic and historical documentation was applied to physical data obtained from the excavation in

order to define the specific cultural behavior responsible for each of the twenty major occupation layers (Dyck and Morlan 1995:4). The authors' identification of these layers which included titles such as "A Flintknapper's Sweatlodge", "Outlook Points and the Arrival of Besant", "A Roasting Trough" and "A Pelican Lake Summer Camp" illustrates the degree of detail sought by the practitioners of a modern conjunctive approach. The research design of the 1995-1996 survey is considerably less ambitious and is outlined in the following chapter.

3.9 EkNv-2, EgNr-7 and EhNr-45

As discussed in Chapter 7, the ongoing erosion of the Lake Diefenbaker shoreline has resulted in the exposure and destruction of numerous archaeological components within the South Saskatchewan River valley. Among these are three human burials which have been documented by Dr. Ernest G. Walker of the Department of Anthropology and Archaeology at the University of Saskatchewan.

EkNv-2, or the Carroll site, consisted of a single Late Prehistoric period bundle burial exposed along the western shoreline of the South Saskatchewan approximately 65 kilometers north of Gardiner Dam. Remains from the burial, dated to 1570±100 BP, were first discovered as a result of slumping of the embankment which formerly represented a prominent knoll in stabilized dune field (Walker 1984:37). Walker determined that the remains were those of an adult female, approximately 50 years of age at the time of death, that had been interred in the base of an elliptical pit approximately 92 cm in depth prior to infilling (Walker 1984:37). Red ochre and a fetal bison metacarpal were the only associated grave materials with the Late Prehistoric period remains (Walker 1984:37).

Human skeletal remains were also recovered at EgNr-7 near Birsay, Saskatchewan in 1988. The Late Prehistoric bundle burial was found along the western shoreline of the Lake Diefenbaker reservoir approximately one kilometer north of the Hitchcock Bay boat launch (Walker 1988:2). Although the skull and mandible were

retrieved out of context, the remainder of the burial was located by Dr. Walker *et. al.* in a shallow (16 cm deep) area of the beach matrix which at the time of use would have been comprised of an upland area of rolling sand hills (Walker 1988:2). The bundle represented the remains of an adult male, aged approximately 45-55 years at the time of death (Walker 1988:2). An unpublished forensic report detailing the condition of the remains is on file with the Royal Canadian Mounted Police in Outlook, Saskatchewan (File #88-1095).

An Historic Period burial was discovered eroding out of an eastern embankment of the Lake Diefenbaker reservoir in 1995. The burial represented an extended internment of a male aged 22-28 years of Native American ancestry (Walker 1995:5). In contrast to the burial style recorded at the Derr-Drews site and the Proud burial by the SSRP, the individual at the Yotin site, or EhNr-45, had been placed in a wooden coffin with relatively few associated cultural materials representing a horse harness apparatus (Walker 1995:5). Together with the number of sites discussed in Chapter 5 which have been disturbed or destroyed by fluvial processes associated with reservoir development, the location and condition of the sites in this section support the need for ongoing monitoring and salvage excavation activity within the immediate area of the reservoir as recommended in Chapter 8.

Chapter Four

4. 1995 Lake Diefenbaker Archaeological Survey

4.1 Research Design

Numerous researchers have examined sampling methods for regional archaeological surveys. These include Redman (1974), Mueller (1975), Schiffer *et. al.* (1978), Nance (1983), Dunnell and Dancey (1983), and Ebert *et. al.* (1987). The 1995-1996 archaeological survey of Lake Diefenbaker followed the guidelines put forward by E. Leigh Syms in his article entitled "Survey Sampling: Is Anyone Getting An Adequate Record?" (Syms 1982:115-144). Syms supported the coordinated use of three separate regional sources of information- the Land Owner/Operator Survey, the Regional Collector Survey, and the Personal Reconnaissance Survey- as essential to establishing a data base capable of providing useful inferences for analysis and further research. Syms argued the Regional Collector Survey, which focuses on private and public artifact collections that encompass several parcels of land in the area, should be carried out first to make use of one of the best sources of local heritage materials and prevent unnecessary repetition of survey activity in the region. The Land Owner/Operator Survey, which is limited to private collections gathered from specific parcels of land, and the Personal Reconnaissance Survey were then to be conducted simultaneously while the available resources are in the region and could be used most efficiently.

Preliminary efforts at conducting the Regional Collector Survey were carried out prior to the 1995 field season. Two regional collections, the private collection of Chris Campbell and the Fred T. Hill Museum collection, were examined. The photographic catalogue of the artifacts was completed following the 1996 field season. Included in the museum collection are over sixty grooved mauls, three hundred projectile points and several early contact period flintlock rifles. Of particular note, a lithic hammer hafted with rawhide and an Agate Basin projectile point collected from EfNo-2 are currently on display. Unfortunately, proveniences for the vast majority of the museum's lithic

collection were never recorded. Thus the artifacts may only be discussed in terms of their regional, rather than site specific, importance. The Land Owner/ Operator Survey did not result in any additions to the collections described above.

4.2 Personal Reconnaissance Survey

Establishing a representative study area for the 1995-96 Lake Diefenbaker archaeological survey was aided by the scope of previous archaeological investigations carried out within the region. The final study area excluded the Gordon McKenzie Arm of the reservoir which has been well-documented by Eldon and Kim Johnson. Likewise, the entire western shoreline of the reservoir from Gardiner Dam in the north to Snakebite Bay in the south has been investigated for over a decade by S.A.S. volunteer Tom Stevenson. This narrowed the focus of the present effort to a seventy linear kilometer area along the eastern margin of the reservoir from Gardiner Dam in the north to the Riverhurst Ferry crossing.

Unfortunately, the occurrence of a high magnitude flood and the logistical concerns of crew size, time, and funding precluded the complete assessment of the entire 70 linear kilometer area. As a result the 1995/1996 survey encompassed the east bank of the South Saskatchewan River from its juncture with the Qu'Appelle Arm in the north to the Riverhurst Ferry crossing in the south (figure 4.1). The 35 kilometer linear area was surface surveyed from the water's edge to the riverbank or high water mark, and continued 200m on to the surrounding uplands. By maintaining a survey boundary 200 meters from the eastern shoreline, the 1995 effort provided a sample of beach deposits, areas of cliff erosion, valley terrace formations, valley slope, prairie uplands and several minor tributary channels within the study area. A total of 18 archaeological sites were documented as a result of the 1995-1996 survey.

By maintaining a survey boundary 200 meters from the eastern shoreline, the 1995 effort provided a 100% sample of approximately half of the entire length of the area designated for further study. The survey corridor included vast areas of beach deposits, areas of cliff erosion, valley terrace formations, valley slope, prairie uplands and several minor tributary channels.

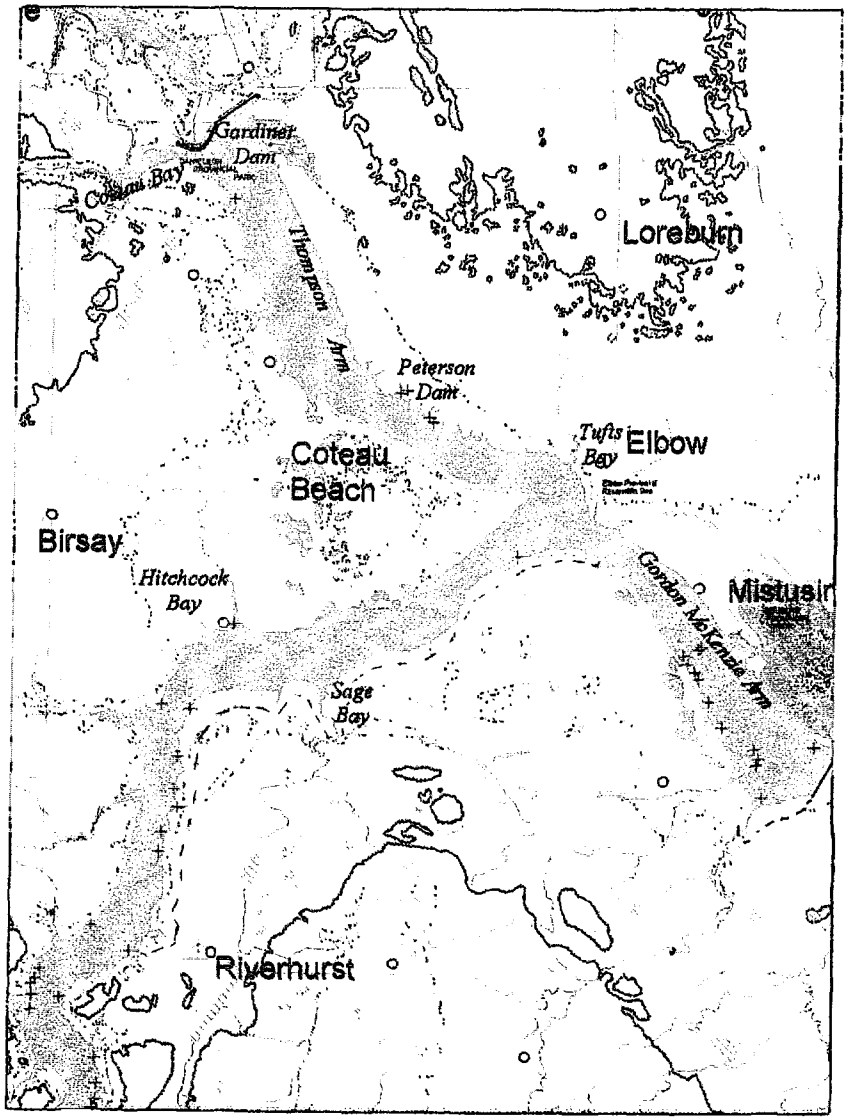


Figure 4.1: 1995-1996 Archaeological Survey of the Lake Diefenbaker Region

Because of the scale of the 1995 Lake Diefenbaker survey, the advantages of tight surveyor spacing had to be balanced with the objective of a complete reconnaissance of the study area. Two full-time surveyors were joined by several local volunteers as well as graduate and undergraduate students from the University of Saskatchewan. On average, three to four field crew members per day were spaced at twenty meter intervals within the survey boundary. In areas of dense vegetation or cultivation, surveyor spacing was tightened to reduce the discovery bias associated with varying terrains. This allowed total coverage of the proposed 200m survey corridor over an average linear distance of 1.5 km per day (or four passes of the four-person survey crew encompassing 60m per pass). In this manner, an intensive survey of the entire study area was achieved from May 23 to July 5, 1995. It should be noted that the cultivation of upland prairies adjacent to the South Saskatchewan valley extended in many cases to within 25 m to75 m of the high water mark. These areas, in addition to cultivated fields and waterfowl lure crops, were not included in the survey due to the lack of visibility in seeded fields and respect for the land operators of the region.

4.3 Sub-Surface Sampling

Although considerations of time and funding precluded major excavation of individual archaeological sites within the proposed study area, an attempt was made to determine the horizontal and vertical extent of each heritage locale through the use of auger testing and test excavations. In addition, subsurface data was gathered to provide evidence of the cultural affiliation(s) of a given site and the type of activity represented by the assemblage. Test auger holes were established at two meter intervals along both the north-south and the east-west axis of several sites. A 15 cm auger bit was drilled to a terminal depth of 75 cm (except where stated otherwise in the individual site descriptions in Chapter five). The tests were extended until three consecutive auger holes proved sterile. In this manner, a preliminary assessment of the extent of each site was attained.

At the same time, by establishing both an east-west and north-south baseline for each site it was possible to calculate the rate of erosion of various shoreline features following the 1996 field season. The excavation of one meter by one meter test units was initiated on a judgmental basis in five locales (#1,#2,#8,#12,#17) during the 1995 field season. The data gathered adds significantly to the analyses contained within the final report. Approximately three to five weeks of subsurface testing was carried out in 1996, with sites #3, #6 and #13 test excavated in addition to the completion of the five sites mentioned above.

Several sites were not included in the subsurface testing procedures due to the individual character of the site, the degree of disturbance associated with the cultural remains, or the prevalence of surficial remains which were used to identify the nature of activity and the cultural association of the occupants. Site #4, a single stone circle with a large central depression, may be the result of ceremonial activity and thus was not excavated in accordance with the guidelines for sites of a special nature. Site #5 was destroyed during the 1995 field season by slumping resulting from high magnitude flooding of the South Saskatchewan River. The immediate area of site #7, which was dominated by small trees and brush, was bulldozed in conjunction with the construction of the dam (the trees were seen as a hazard to marine navigation following inundation) and later impacted by the removal of topsoil associated with a chemical disposal site on the property. As a result, nearly one meter of overburden covers the deposits of bone and burned bone associated with lower stratigraphic layers. The current project budget did not allow for the rental of heavy equipment needed to expose the site but testing and/or excavation of the locale is recommended. Sites#10, #11 and #15 are historic occupations with ample surficial materials for cultural identification without the need for subsurface testing. Site#12 is a single stone circle with no associated surficial features and was not tested due to restraints of available time and funding. Finally, sites #14, #16 and #18 represent shoreline artifact scatters impacted by severe fluvial mixing and erosion. The

lack of stratification in open shoreline or beach areas precluded the need for extensive subsurface testing in such locales.

Although systematic subsurface testing of every site encountered during the 1995-1996 survey was not implemented, survey goals and objectives were achieved through attention to surficial remains and careful provenience. The greatest concern arising from procedures executed to date is the lack of *in situ* cultural remains due to fluvial erosion of valley landforms. It is hoped that the geoarchaeological analysis for the region recommended in Chapter 7 may assist in the identification of such components in the future.

4.4 Collection Strategy

In terms of collection strategy, the use of 'grab samples' has often led to selection bias and a loss of provenience. As a result the implementation of a systemic or stratified sample has been suggested (Plog *et. al.* 1978:395-396). For the purposes of the current survey, however, only culturally and temporally diagnostic artifacts, those with complete forms or identifiable functions, and faunal remains were collected for laboratory analysis and curation. In this way, cultural identification and activity patterns were represented and a number of artifacts suitable for education through interpretation were made available. At the same time, the disturbance of *in situ* cultural materials was kept at a minimum. Each artifact and ecofact collected during the 1995 and 1996 field season was provenienced from a main datum established at each site. The elevations of site locales, features and artifacts was extrapolated from 1:50,000 topographic maps, Geographical Positioning System (GPS) readouts and daily elevations of Lake Diefenbaker recorded by the Saskatchewan Water Corporation pumphouse in Riverhurst. The water level was tied to a main site datum, by transit or physical measurement, and surface collections and/or arbitrary levels below surface were then provenienced. A catalogue of the artifacts recovered at each site is presented in the following chapter.

4.5 Laboratory Analysis

All archaeological materials collected during the 1995 and 1996 field seasons were washed and measured; identified in terms of composition, type and function; photographed; and catalogued at the University of Saskatchewan. Faunal materials were seperated into identifiable and non-identifiable elements on a site by site basis as described in Chapter 5. In addition, microscopic examinations of several artifacts were carried out in order to determine material types and possible use-wear. Due to funding constraints, samples of bone and charcoal collected at several locales were not submitted for absolute dating. The artifacts were then prepared for curation and display at the Fred T. Hill museum in Riverhurst, Saskatchewan.

Chapter Five

5. Site Descriptions of the 1995-1996 Survey

5.1 Introduction

A total of eighteen archaeological sites were documented as a result of the 1995-1996 Personal Reconnaissance Survey along the southeastern shoreline of Lake Diefenbaker (figure 5.1). A Saskatchewan Archaeological Resource Record (SARR) for each site was filed with the Saskatchewan Heritage Branch in 1995 and updated following the 1996 field season. Both Historic and Prehistoric period occupations were mapped, photographed and subsurface tested in an attempt to define their cultural affiliations and physical dimensions.

At the same time, a Regional Collector Survey and Land Owner/Operator Survey were carried out to supplement the data gathered by the 1995-1996 field season and the information summarized in Chapter 3. The majority of information presented in the Regional Collector Survey was gathered by the Saskatchewan Archaeological Society's Collections Recording Project which was carried out from 1988 to1990. The project documented a total of four private collections gathered from sites within the immediate area of the Lake Diefenbaker reservoir. Two other collections, one private and one public, were catalogued as part of the current effort (section 5.4). The Land Owner/ Operator Survey was initiated during preliminary visits to the area in 1994 and completed prior to the 1996 field season. Results of the Land Owner/ Operator Survey are included in the individual site descriptions contained within the following pages.

5.2 Prehistoric Period Sites

5.2.1 EfNr-9

Although the 1995-1996 survey employed only minimal subsurface testing procedures, careful attention was given to areas of river bank erosion. EfNr-9 was located

Figure 5.1: Archaeological Sites Documented by the 1995-1996 Survey

Site #	Borden #	North Latitude	West Longitude	Sect., Twnshp..Range	UTM
1	EfNr-9	50 54' 32"	106 54' 15"	SW/SW 34-22-7	13U CG 6624145
2	EfNr-10	50 54' 56"	106 54' 20"	NW/SW 34-22-7	13U CG 662421
3	EfNr-11	50 55' 02"	106 54' 18"	SW/NW 34-22-7	13U CG 663422
4	EfNr-12	50 55' 15"	106 54' 13"	NW/NW 34-22-7	13U CG 6635425
5	EfNr-13	50 57' 18"	106 53' 42"	NW/SE 15-23-7	13U CG 669465
6	EfNr-14	50 57' 48"	106 53' 12"	SW/SW 23-23-7	13U CG 675475
7	EfNr-15	50 58' 35"	106 53' 10"	NW/NW 23-23-7	13U CG 676490
8	EfNr-16	50 58' 54"	106 52' 58"	SE/SW 26-23-7	13U CG 679493
9	EfNr-17	50 59' 01"	106 52' 30"	NW/SE 26-23-7	13U CG 684497
10	EfNr-18	50 59' 29"	106 52' 14"	NE/ NW 26-23-7	13U CG 681503
11	EfNr-19	50 59' 29"	106 52' 29"	NE/NW 26-23-7	13U CG 680503
12	EgNq-23	51 02' 02"	106 44' 55"	NE/NE 10-24-6	13U CG 773553
13	EgNq-24	51 02' 24"	106 43' 48"	NE/NE 11-24-6	13U CG 788552
14	EgNq-25	51 02' 45"	106 42' 59"	NE/SW 13-24-6	13U CG 797558
15	EgNq-26	51 02 24"	106 41' 45"	SW/NW 18-24-5	13U CG 809565
16	EgNq-27	51 02' 48"	106 41' 48"	NW/NW 18-24-5	13U CG 8105665
17	EgNp-78	51 04' 37"	106 39' 06"	SW/NW 28-24-5	13U CG 842595
18	EgNp-79	51 04' 43"	106 37' 51"	NW/NW 27-24-5	13U CG 857598

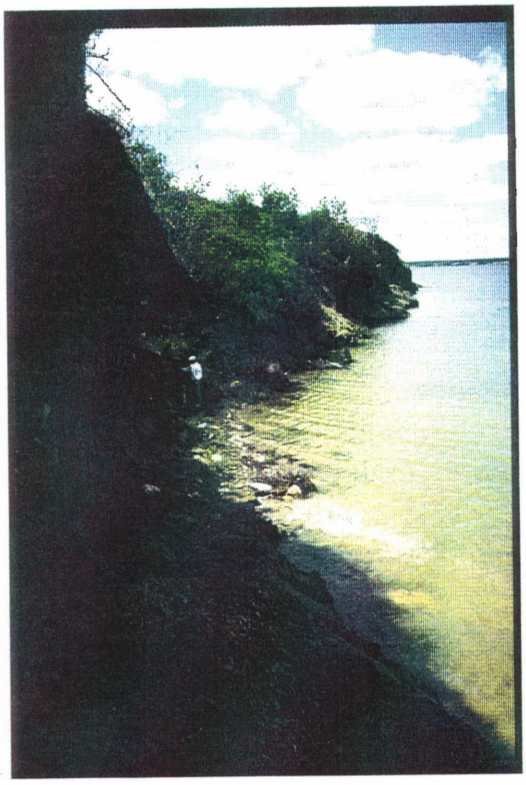
Key to Figure 5.1: Site Locations of the 1995-1996 Survey

during the first week of the 1995 Personal Reconnaissance survey and was comprised of raw and calcined bone fragments eroding out of a backflooded gully approximately one kilometer north of the Riverhurst Ferry crossing. The site was located in the toe of a steep slope on the southern shoreline of the bay. At the time the site was first investigated, the water's edge was approximately 35 meters north of the bank. Four wave-cut steps (at 19.7, 14.9, 6.9 and 1.9 meters north of the high water mark) indicated seasonal drawdown stages of the shoreline (figure 5.2).

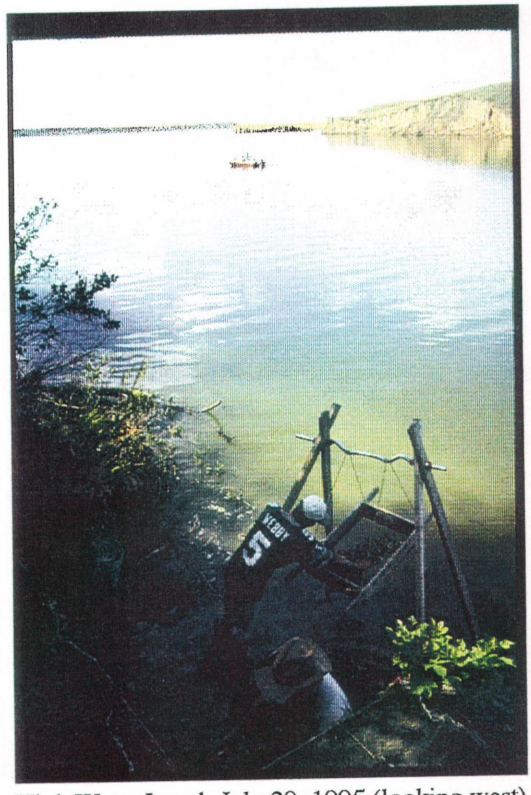
The stratigraphy of the site was complex and was partially disturbed two meters east of the artifacts by a deer trail which led down to the water from the adjacent uplands. The exposed profile consisted of a 5-10cm sod layer underlain by a thin aeolian sand deposit, gray clay, an apparent paleosol and finally light brown clay (figure 5.3). Burned bone was recovered in association with the paleosol 85-110cm below surface. To rule out natural occurrences, such as a prairie fire or root decay, as the source of the blackened soil feature two 1m x1m test pits were initiated at the site. East-west and north-south baselines were established by compass readings from datum and the adjacent excavation units were positioned on the face of the bank where the artifacts were located. The close proximity of the test units to the north-south baseline was necessitated by the severe slope of the adjacent terrain, a cultivated field and access road to the south of the site area and water to the north. By the end of the 1995 field season, a total of five 1m x 1m test units were excavated to a depth of 1.50 meters below surface. The units were numbered according to their position from datum and the artifacts recovered from each unit were recorded *in situ* and processed in the field. Table 5.1 provides a catalogue of the artifacts recovered in each test unit.

Low Water at EfNr-9 (looking south)

Water at 14.9 m from Test Units (looking east)

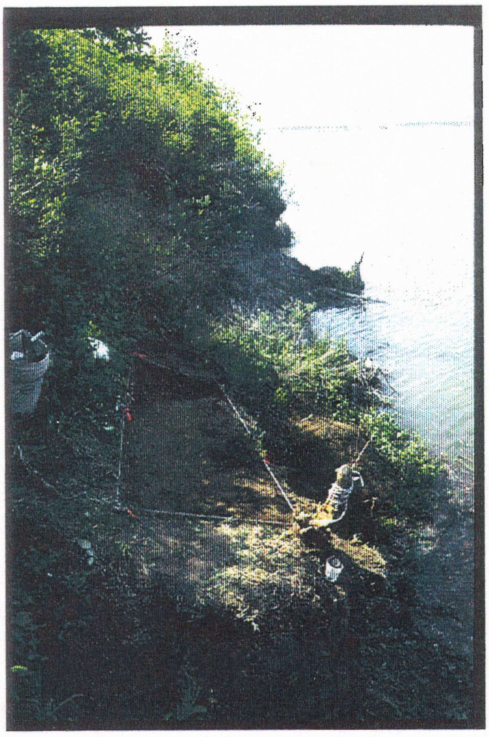


Water at 1.9 m from Test Units (looking west)



High Water Level, July 29, 1995 (looking west)

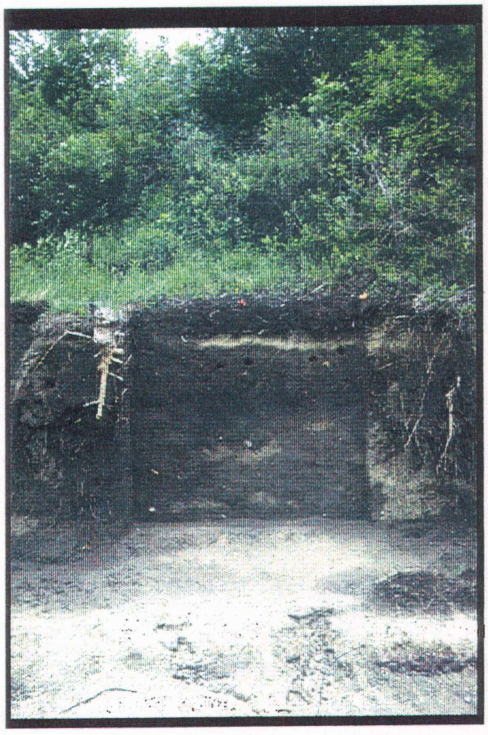
Figure 5.2: Fluvial Erosion at EfNr-9



Units 2N 55W and 2N 56W (looking west)

Avonlea Point in Unit 1N 56W (looking north)

Units 2N 55W and 2N 56W, July 29, 1995 (looking southeast)



South Wall Profile of Units 2N 55W and 2N 56W, September 8, 1996

Figure 5.3: Sub-Surface Testing at EfNr-9

Table 5.1: EfNr-9 Catalogue

Unit #	Catal. #	Description/ Element	Number of items	Size (cm)	Weight (grams)	Material/ Assoc.	Northing (cm)	Easting (cm)	Depth (b.s.)	Comments
2N 56W	1	red ochre	1	1.2 - 2.5	2.0	dolomite	6	18	49	pebble
	2	calcined bone fragment	1	1.2 - 2.5	0.7	bovid	33	67	72	indeterminate
	3	tooth enamel	15	0.6 - 1.2	1.1	bovid	33	50	80	fragments
	4	left ichium	1	5.0 - 10	24.8	bison	17.5	68	87	incomplete
2N 55W	1	alveolar bone/ left maxilla**	1	10+	199.0	bovid	17	53	18	molars intact
	2	long bone fragment	1	5.0 - 10	9.1	bovid	5	58	19	indeterminate
	3	proximal right scapula*	2	1.2 - 2.5	1.3	bovid	1	58	39	indeterminate
	4	proximal right scapula*	1	10+	133.7	bovid	11	19	40	indeterminate
	5	calcined bone fragment	1	1.2 - 2.5	1.5	bovid	8	45	94	indeterminate
	6	calcined bone fragment	1	1.2 - 2.5	1.1	bovid	34	18	95.5	indeterminate
	7	proximal left scapula	4	5.0 -10	74.1	bovid	26	11	97	indeterminate
	8	bone fragment	1	5.0 - 10	7.5	bovid	34	3.5	98	indeterminate
	9	tooth enamel	19	1.2 - 2.5	10.4	bovid	34	1	98	fragments
	10	upper canine	1	1.2 - 2.5	3.4	Canis sp.	N/A	N/A	beach	complete
	11	upper right PM2	1	1.2 - 2.5	0.8	Canis sp.	N/A	N/A	beach	complete
2N 57W	1	Castor canadensis rib	1	2.5 - 5.0	0.9	beaver	74	88	32	complete
	2	distal right tibia	1	10+	209.5	bovid	13	22	53	broken sub-condyles
	3	right 2nd phalanx	1	5.0 -10	5.1	bovid	28	42	54	incomplete
	4	cancellous bone	3	2.5 - 5.0	13.5	bovid	28	42	54	indeterminate
	5	Riparia riparia shell frags	9	0.6 - 1.2	0.2	swallow	12	22	55	intrusive
	6	left scapula fragment (prox.)	7	5.0 - 10	284.9	bovid	62	65	55.5	incomplete
	7	distal metacarpal fragment	1	10+	160.5	bovid	48	57	56.5	incomplete
	8	right 1st phalanx	1	5.0 - 10	30.6	bovid	28.5	44	56.5	incomplete
	9	alveolar bone/ right maxilla**	1	10+	209.3	bison	68	71	58	molars intact
	10	charcoal sample	1	5.0 - 10	15	floral	30	95	98 - 101	feature # 1
	11	fire-cracked rock	1	5.0 - 10	266.5	quartz	80	50	134	crystalline quartz
	12	calcined bone fragment	1	2.5 - 5.0	2.2	bovid	87.5	50	141	indeterminate

* conjoinable fragments

all three units were located 558.50 m/asl as measured from the water level of Lake Diefenbaker July 29, 1995

Table 5.1: EfNr-9 Catalogue

Unit #	Catal. #	Description/ Element	Number of items	Size (cm)	Weight (grams)	Material/ Assoc.	Northing (cm)	Easting (cm)	Depth (b.s.)	Comments
1N 55W	1	lumbar vetebrae fragment	1	5.0 - 10	7.5	bovid	86.5	11	190	incomplete
1N 56W	1	secondary flake	1	2.5 - 5.0	2.8	shale	12	50	94	no cortex
	2	right unciform carpal	1	2.5 - 5.0	11.3	bison	9	92	99.5	incomplete
	3	projectile point	1	1.2 - 2.5	0.4	SRC	37.5	58	101	Avonlea
	4	bone fragment	1	1.2 - 2.5	2.1	bovid	36	78	101	indeterminate
	5	calcined bone fragment	1	1.2 - 2.5	2.1	bovid	43	81.5	101	indeterminate
	6	calcined bone fragment	1	0.6 - 1.2	0.4	bovid	78	92	102	indeterminate
	7	calcined bone fragment	1	5.0 - 10	15.3	bovid	42	87	106	longbone fragment
	8	calcined bone fragment	1	1.2 - 2.5	1.0	bovid	36	87	120	indeterminate
	9	fire-cracked rock	1	2.5 - 5.0	64.4	granite	96	51	120	granite
	10	calcined bone fragment	1	2.5 - 5.0	6.7	bovid	40	94	123	indeterminate
	11	tooth enamel	1	1.2 - 2.5	0.5	bovid	N/A	N/A	90 - 120	screen
	12	fire-cracked rock	4	1.2- 2.5	20.2	granite	N/A	N/A	90 - 120	screen
	13	charcoal sample	1	1.2 - 2.5	2.5	floral	5	80	175	feature # 2

elevation of surfaces:

Unit 35 558.53 m/asl
Unit 36 558.53 m/asl
Unit 44 558.53 m/asl
Unit 45 558.53 m/asl
Unit 46 558.88 m/asl

elevation was measured from the Lake Diefenbaker water level July 29,1995 (Appendix #8)

G.P.S. reading of site datum location:

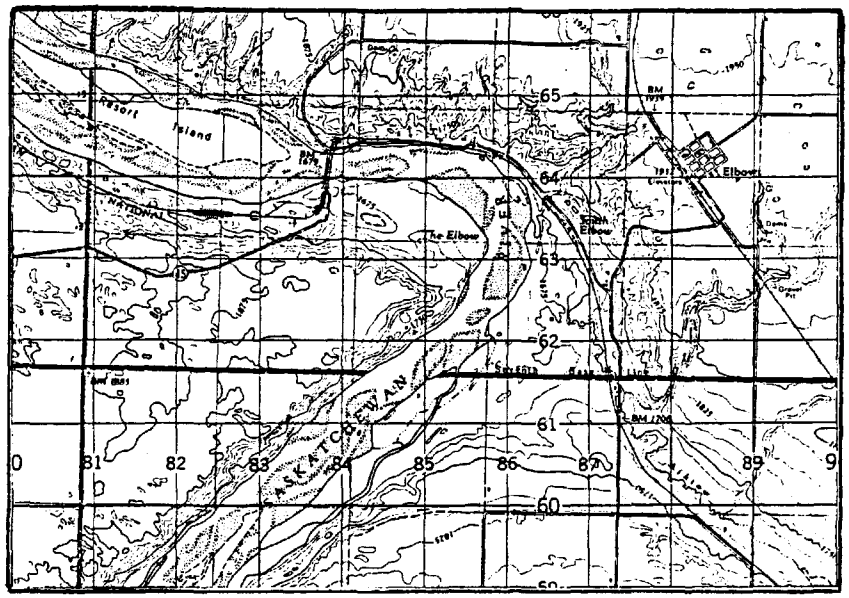
N 50° 54.650'
W106° 54.197'
PDOP 2.8
5 satellites

Raw bone, including a Castor canadensis rib, Bison bison proximal right scapula fragments and a Bison bison distal right tibia fragment, were recovered from 32 cm to 53 cm below surface in units 2N 55W and 2N 57W. A number of bovid remains were also recovered from 94 cm to 106 cm below surface in units 2N 55W and 1N 56W in association with the paleosol. An Avonlea projectile point was found *in situ* 101cm below surface in 1N 56W. In the same unit a secondary flake knapped from a gray shale, a right unciform carpal and several calcined bone fragments were found immediately above and below the depth of the projectile point. As calcined bone was recovered in unit 2N 57W as low as 141 cm below surface (table 5.1) the test pits were extended to 2.0 meters below surface in 1996. No additional culturally diagnostic artifacts were recovered.

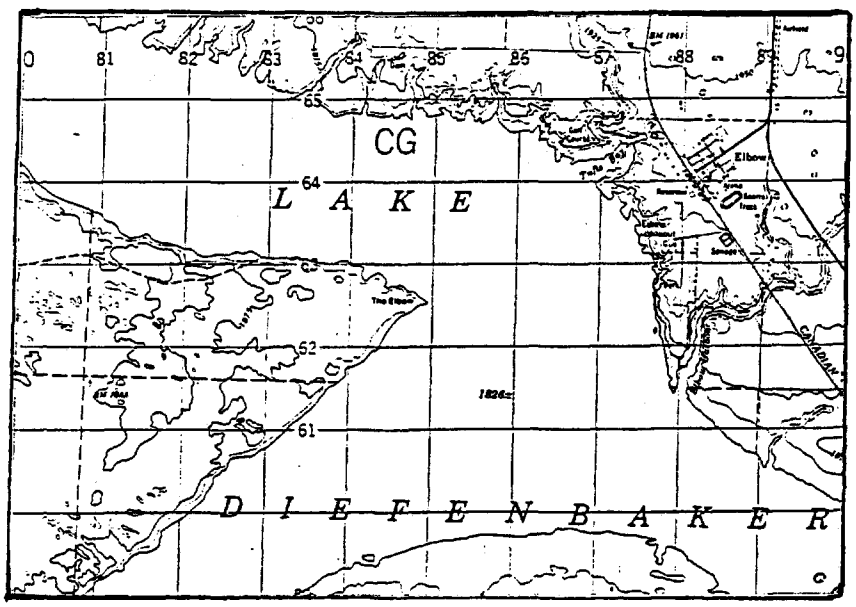
The high degree of fluvial erosion and other natural disturbances at the site make interpretation of the artifacts and the activities they may have represented tentative at best. Obviously, the level of the paleosol from 85 cm to 110 cm below surface can be associated with an Avonlea occupation or event. The presence of calcined bison bone may indicate processing of the faunal elements for bone grease, although the number of identifiable elements and relatively large fragments suggest primary processing for immediate consumption. The partial left maxilla (Bison bison) found 18 cm below surface in unit 2N 56W likely represents a separate event, as does the concentration of artifacts from 39-58 cm below surface in 2N 57W. Of interest, a single pebble of red ochre was recovered at 49 cm below surface in unit 2N 56W. The fire-cracked rock and calcined bone fragment recovered from unit 2N 57W, at 134 cm and 141 cm below surface respectively, likely represent a third occupation level. A blackened soil feature was encountered 175 cm below surface in unit 1N 56W but contained no evidence of cultural activity. The staining may have been the result of root decay as illustrated in figure 5.2. The site therefore would seem to represent a multicomponent occupation of a

seasonal stream channel that formerly fed into the South Saskatchewan River approximately 130 meters west of its current location.

As discussed in Chapter 6, the location of the site is not out of character with other Avonlea components recorded to date. The site has been severely eroded, however, by the higher water levels associated with reservoir development. A review of topographic information available for the locale prior to reservoir development indicates that the current water levels of Lake Diefenbaker have reached nearly 10 vertical meters above the former level of the South Saskatchewan River (figure 5.4). The exposed bank tested in 1995 and 1996 appears to have been part of a relatively flat tread between the uplands to the south of the site and a small local runoff channel. Fluvial erosion, sloughing and slumping have since eliminated all but the remnants of the tread and its cultural components. As fluvial erosion is ongoing, salvage excavation of the site is recommended.



Pre-Reservoir Topography of the Elbow Region (Copied from the 1:50 000 map Elbow 72 O/2 East, Surveys and Mapping Branch, Department of Energy, Mines and Technical Surveys, 1959).



Post Reservoir Topography of the Elbow Region (Copied from the 1:50 000 map Elbow 72 O/2, Surveys and Mapping Branch, Department of Energy, Mines and Resources, 1974)

Figure 5.4: Pre-Reservoir and Post-Reservoir Topography of the Elbow Region

5.2.2 EfNr-10

EfNr-10 was located on a broad plain in the southwest quarter of Section 34, Township 22, Range 7, west of the 3rd meridian (W3M). The site was located on what was formerly an upland area approximately 650 meters east of the Saskatchewan River channel and only 30 meters north of the seasonal stream channel discussed in the previous section. A total of nine complete stone circles, four stone concentrations (possibly disturbed circles) and two hearth features were documented at the site.

Each feature located at the site was mapped according to its size, distance and direction from a main site datum and its elevation. Elevations were determined by physical measurement of the features relative to the water levels of Lake Diefenbaker, which were recorded daily by the Saskatchewan Water Corporation (Appendix #8). This was accomplished by measuring by tape measure from the water's surface to the surface of the embankment and then tying the main site datum by transit to the water level. Figure 5.5 illustrates the location of the features and their dimensions. No attempt was made to count or weigh the individual stones of each feature.

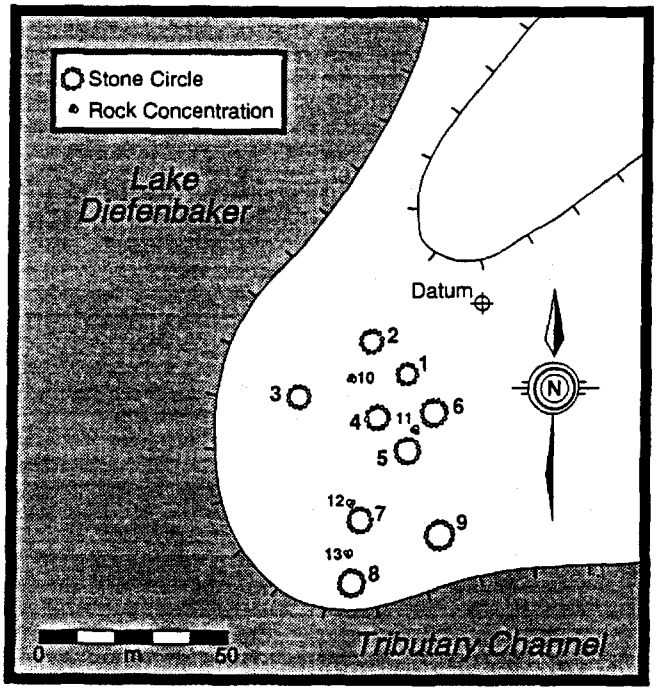


Figure 5.4: Site Map of EfNr-10

Sub-surface testing was initiated on a judgmental basis at three features on July 25,1995. Individual 1 m x 1m test excavations were placed at 17S 20W, 20S 35W and 62S 12W. The test units were positioned to sample two apparent hearth features associated with stone circles (#1 and #9) and to provide sub-surface data for one of the four stone concentrations (#10). The test at 17S 20W revealed slight oxidation of the soil in the extreme southwest corner of the unit from 18-21 cm below surface. Slight staining was also noted 18.5 cm below surface at 45-55 cm south and 70-82 cm west (figure 5.6). The test excavation was ended 30cm below surface as no further features or artifacts were found. Auger tests were placed at two meter intervals on all four sides of the test excavation, to a depth of 30cm, and again no further recoveries were made.

The test unit 62S 12W produced a total of 19 artifacts, ranging from raw and calcined bone fragments to secondary and tertiary flakes. Table 5.2 provides a description of each artifact recovered within the test unit. Slight oxidation of the soil was noted at 14.5 cm below surface from 33S 100W to 85S 100W. Two pieces of fire-cracked rock were found at 53S 88W and 13.5 cm below surface and a soil sample was taken from the feature. Auger tests were placed at two meter intervals in all four cardinal directions from the test pit to a distance of six meters, but no further artifacts or features were encountered. As with the test unit at 17S 20W, the location of a hearth feature within the boundaries of a stone circle strongly suggests a late fall or winter occupation of the site area. The flat open terrain of the site provided an excellent habitation area close to the resources of the South Saskatchewan River valley (figure 5.6).

Sub-surface tests of the stone concentration at 20S 35W revealed no artifacts, ecofacts or associated features. The lack of cultural material in the area of the test excavation and adjacent auger tests (again placed at two meter intervals to a distance of six meters in each direction) suggests the feature may have simply represented collection areas for stones suitable for use in tipi ring construction at the site.

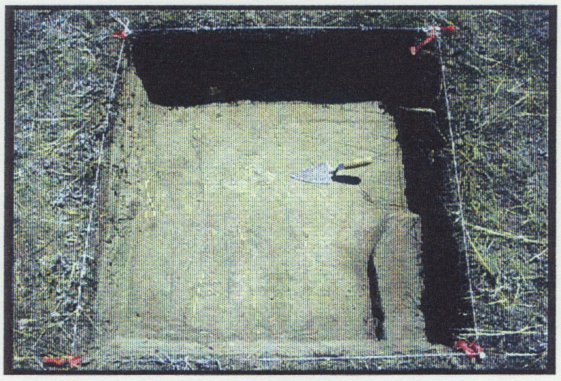
Table 5.2: Artifact Catalogue for 62S 12W (EfNr-10)

Unit #	Catal. #	Description/ Element	Number of Items	Size (cm)	Weight (grams)	Material/ Assoc.	Northing (cm)	Easting (cm)	Depth (b.s.)
62S 12W	1	raw bone fragments	2	2.5 - 5.0	2.3	indeterminate	N/A	N/A	10 -20 cm
	2	raw bone fragments	5	0.6 - 1.2	1.4	indeterminate	N/A	N/A	10 -20 cm
	3	calcined bone fragments	3	1.2 - 2.5	1.9	indeterminate	N/A	N/A	10 -20 cm
	4	secondary flakes	3	1.2 - 2.5	2.3	chert	N/A	N/A	10 -20 cm
	5	secondary flake	1	1.2 - 2.5	0.8	jasper	N/A	N/A	10 -20 cm
	6	secondary flake	1	1.2 - 2.5	0.6	silicified peat	N/A	N/A	10 -20 cm
	7	secondary flakes	3	1.2 - 2.5	1.1	quartzite	N/A	N/A	10 -20 cm
	8	tertiary flake	1	0.6 - 1.2	0.1	Swan River Chert	N/A	N/A	10 -20 cm

Site Area of EfNr-10 (looking north)

Site Area of EfNr-10 (looking south)

Recording Features at EfNr-10 (looking south)



Test Excavation at 17S 20W (looking east)

Figure 5.5: Site Location and Test Excavation at EfNr-10

5.2.3 EfNr-12 and EfNr-19

EfNr-12 and EfNr-19 represent individual stone circles located along eastern valley crests overlooking the South Saskatchewan River. EfNr-11 was found in the northwest quarter of Section 34, Township 22, Range 7, W3M. The site was located on the extreme western margin of an upland ridge approximately 120 meters west of the Riverhurst Catholic cemetery. The circle measured 2.8m in diameter and was comprised of 46 stones averaging 15 cm diameters with the largest stone measuring 53 cm in length and 26 cm in width. The central area of the circle was depressed 24.5 cm below the base of the stones and adjacent ground surface. Figure 5.7 provides an overview of the feature and its location overlooking the South Saskatchewan River valley.

Several occupation activities and/or subsequent disturbances may be responsible for the unique character of the site. Although there is no indication of vandalism, the site may have been subject to unauthorized testing procedures. Eldon Johnson *et. al.* have suggested that stone circles with central depressions are the result of eagle trapping activities which are most often found on a prominent hill or near a scarp (Johnson 1991:5; Hughes 1986; Wilson 1928). In the case of EfNr-12, however, it is suggested that the feature may represent the remains of a vision quest structure. The location of the site offers a panoramic view of the South Saskatchewan River valley and closely resembles the locale of a vision quest feature identified by Margaret Hanna at "The Towns" site in Chamberly Coulee in southern Saskatchewan (Margaret Hanna, personal communication 1997).

EfNr-19 was comprised of a single stone circle in the northwest quarter of Section 26, Township 23, Range 7, W3M. The feature was located on a relatively level tread next to an east-facing slope which would have protected the area from the prevailing westerly winds of the region. Eighteen individual stones were used in the construction of the 5.60 meter diameter ring which likely represents a short-term habitation structure (figure 5.7).

Vision Quest Feature at EfNr-12 (looking northwest)

Stone Circle at EfNr-19 (looking west)

Figure 5.7: EfNr-12 and EfNr-19

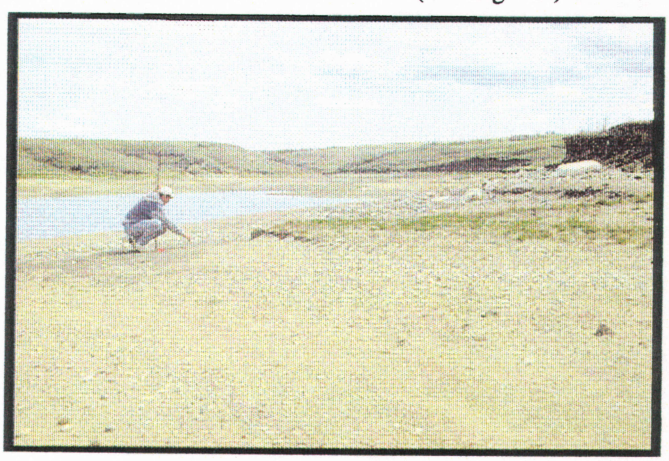
5.2.4 EfNr-13, EfNr-14 and EgNq-25

As discussed briefly in the description of EfNr-9, fluvial erosion due to wave action continues to expose, and simultaneously destroy, heritage sites along the eastern shoreline of the reservoir. The locales of EfNr-13, EfNr-14 and EgNq-25 serve to illustrate the impact of fluvial erosion within the reservoir and the short time frame in which heritage sites are being lost.

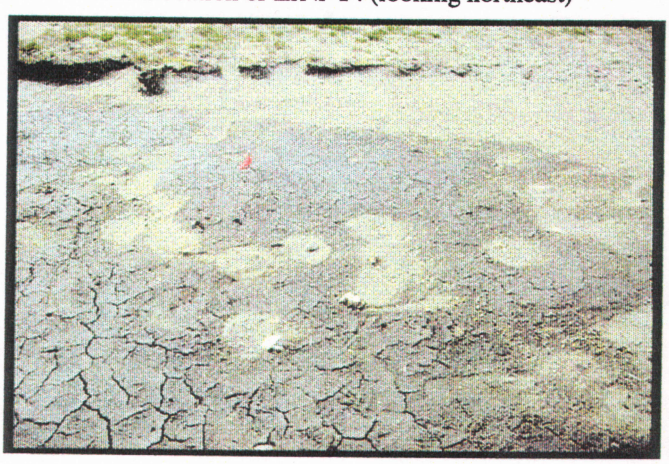
On May 24, 1995 a charcoal concentration was found eroding out of the riverbank 0.51cm to 0.65 cm below surface in the southwest quarter of Section 23, Township 23, Range 7, West of 3rd Meridian. The feature was photographed (figure 5.8) and examined for any associated artifacts or ecofacts. The surface of the site area was checked and no other signs of occupation were recorded. A survey pin was placed on the surface of the site 0.5 meters east of the feature to allow for subsurface testing following completion of the survey.On the morning of May 25 a partially eroded hearth feature was found in the beach area between the high and low water marks in the same quarter section. The feature and associated bone fragments were photographed (figure 5.8) but not collected. A search of the surrounding beach area and adjacent areas above the high water mark revealed no further artifacts or features. The survey moved forward to record EfNr-15, EfNr-16, EfNr-17, EfNr-18, EgNq-23, EgNq-24, EgNq-25 and EgNq-26 over the next ten days. EgNq-25 consisted of a faunal scatter located on the beach approximately 30 m west of the existing high water mark in the southwest quarter of Section 13, Township 24, Range 6, W3M.

On June 7, 1995 extensive flooding was reported along the South Saskatchewan and its tributaries due to above average snowmelt and intensive rains in Alberta and Montana. Gardiner Dam was opened in advance of flood waters from the Oldman and St. Mary rivers which were expected to reach their peak June 10. Based on information obtained from local informant Jim Travis, the survey crew moved in advance of the

Charcoal Feature at EfNr-13 (looking east)



Site Location of EfNr-14 (looking northeast)



Faunal Scatter at EfNr-14 (looking east)

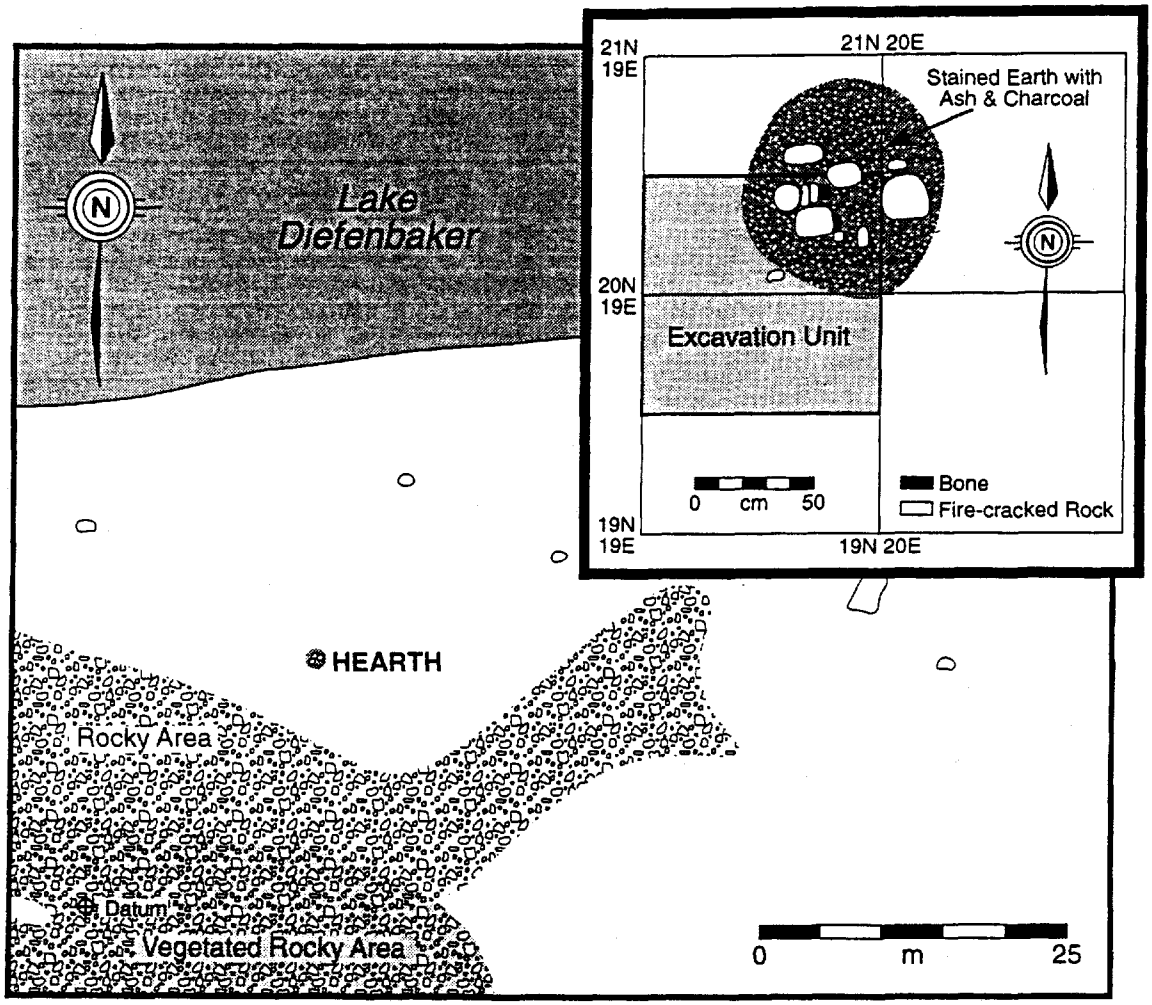
Figure 5.8: EfNr-13, EfNr-14 and EgNq-25

floodwaters to record EgNp-78 and EgNp-79 (contained in the following section). On our return June 14, all three sites were inundated. Further, the extremely high levels of the reservoir had essentially excavated the matrix of EfNr-14 and EgNq-25 and slumping due to intensive undercutting had destroyed EfNr-13. None of the sites could be relocated in 1996. The loss of three heritage sites within a two week period along the eastern shoreline of the reservoir illustrates the importance of establishing a monitoring program for the region as recommended in Chapter 7.

5.2.5 EgNp-78

As mentioned, the investigation of EgNp-78 and EgNp-79 was carried out as a result of information provided by local collector and survey volunteer Jim Travis. Travis located the sites in the spring of 1995 and left the artifacts *in situ* until they could be recorded as part of the 1995 survey. EgNp-78 was located along the southeastern shoreline of Lake Diefenbaker in the northwest quarter of Section 28, Township 24, Range 5, W3M. The site area covered 100 square meters of shoreline at low water and was situated in an area of low beach slope with long and short grasses dominant beyond the high water mark. Immediately south of the site lure crops had been planted by Environment Canada to help keep waterfowl from foraging and nesting in the cereal crops of surrounding fields.

EgNp-78 was first documented on June 9 and June 10, 1995. A site datum was established 15 meters south of, or approximately one meter above, the high water mark. East-west and north-south baselines were established by compass from the datum. A 50cm x 50 cm excavation unit was measured for an exposed hearth feature at 19m east and 19m north of the site datum. The unit was excavated in 5cm arbitrary levels, by trowel due to the sand matrix, and dark organic staining of the sand was noted to a depth of 10 cm (figure 5.9). Charcoal, three fire-cracked rocks and two bone fragments were recorded in the 0-5 cm level. Two bone fragments and two fire-cracked rocks



Key to Figure 5.9

Artifact #	Description	Material	West (cm)	North (cm)	E-W (cm)	N-S (cm)	DBS (cm)
1	fire-cracked rock	granite	55	57	7	5	surface
2	fire-cracked rock	granite	72	80	16	12	8
3	calcined bone	bone	80	78	1	4	surface
4	fire-cracked rock	granite	92	73	4	8	10
5	fire-cracked rock	granite	60	90	10	13	7
6	fire-cracked rock	granite	72	91	2	9	8
7	fire-cracked rock	granite	76	93	6	5	surface
8	fire-cracked rock	granite	83	99	16	11	9.5
9	fire-cracked rock	granite	67	109	16	19	9.5
10	fire-cracked rock	granite	109	90	18	20	9
11	fire-cracked rock	granite	106	104	7	5	surface
12	raw bone	bone	104	64	3	1	surface
13	raw bone	bone	85	74	5	4	7.5
14	raw bone	bone	71	90	2	11	8
N/A	N/A	charcoal	53	66	N/A	N/A	0 - 10
N/A	N/A	charcoal	58	130	N/A	N/A	0 - 10
N/A	N/A	charcoal	110	132	N/A	N/A	0 - 10
N/A	N/A	charcoal	125	100	N/A	N/A	0 - 10

Figure 5.9: Hearth Feature at EgNp-78

were recorded in the 5-10 cm level. Below 10cm the sand revealed no evidence of staining or of artifacts indicative of cultural activity. The remainder of the feature was mapped and photographed.

Although no diagnostic artifacts were recovered from the feature, primary and secondary flakes, lithic shatter and projectile points were exposed on the surface throughout the 100 square meter area of the site. As the original context of the artifacts had obviously been disturbed by fluvial processes, the provenience of each artifact was not measured but rather documented as part of the general site area. A total of thirteen projectile points, two preforms, one drill, fourteen endscrapers, one sidescraper and 178 flakes were collected from the surface of EgNp-78 (Table 5.3). Projectile point types ranged from Hanna and Pelican Lake of the Middle Prehistoric Period to Besant and Prairie and Plains side-notched from the Late Prehistoric period (figure 5.10). Chapter 6 discusses the significance of the artifacts in relation to other sites throughout the Northern Plains region and, in particular, the Lake Diefenbaker region.

Table 5.3: EgNp-78 Artifact Catalogue

Borden #	Cat. #	Description	# of Items	Material	Cult. Affil.	Matrix	Condition
EgNp-78	1	projectile point	1	Knife River Flint	Pelican Lake	beach	tip missing
	2	projectile point	1	Silicified Peat	Pelican Lake	beach	partial base
	3	projectile point	1	Knife River Flint	Pelican Lake	beach	complete
	4	projectile point	1	Generic Chert	Prairie S-N	beach	complete
	5	projectile point	1	Generic Chert	Plains S-N	beach	partial base
	6	projectile point	1	Knife River Flint	Hanna	beach	tip missing
	7	projectile point	1	Brown Chalcedony	Hanna	beach	partial base
	8	projectile point	1	White Chalcedony	indeterminate	beach	base missing
	9	projectile point	1	Feldspathic Siltstone	Besant	beach	partial base
	10	projectile point	1	Fused Shale	Avonlea	beach	complete
	11	projectile point	1	Fused Shale	indeterminate	beach	partial base
	12	projectile point	1	Fused Shale	indeterminate	beach	midsection
	13	projectile point	1	Obsidian	indeterminate	beach	midsection
	14	projectile point preform	1	Silicified Peat	indeterminate	beach	complete
	15	projectile point preform	1	Silicified Wood	indeterminate	beach	base missing
	16	drill	1	Knife River Flint	indeterminate	beach	complete
	17	endscrapers	7	Knife River Flint	indeterminate	beach	complete
	18	endscraper	1	Silicified Wood	indeterminate	beach	complete
	19	endscraper	1	Jasper	indeterminate	beach	complete
	20	endscraper	1	Silicified Peat	indeterminate	beach	complete
	21	endscraper	1	Feldspathic Siltstone	indeterminate	beach	complete
	22	endscraper	1	Fused Shale	indeterminate	beach	complete
	23	endscraper	1	Jasper	indeterminate	beach	complete
	24	endscraper	1	Generic Siltstone	indeterminate	beach	complete
	25	sidescraper	1	Swan River Chert	indeterminate	beach	complete
	26	long bone fragments	4	Faunal	indeterminate	beach	incomplete
	27	primary flakes	2	Black Chert Pebble	indeterminate	beach	cortex
	28	secondary flakes	16	Obsidian	indeterminate	beach	no cortex
	29	secondary flakes	85	Knife River flint	indeterminate	beach	no cortex
	30	secondary flakes	25	Generic Cherts	indeterminate	beach	no cortex
	31	secondary flakes	11	Generic Siltstones	indeterminate	beach	no cortex
	32	secondary flakes	4	Jasper	indeterminate	beach	no cortex
	33	secondary flakes	8	Silicified Peat	indeterminate	beach	no cortex
	34	secondary flakes	9	Quartzite	indeterminate	beach	no cortex
	35	shell fragments	2	Faunal	indeterminate	beach	N/A

Figure 5.10: Selected Projectile Points from EgNp-78

5.2.6 EgNp-79

A second artifact scatter was recorded on June 11 and 12, 1995 in the northwest quarter of Section 27, Township 24, Range 5, W3M. Although no features were associated with the site, nine projectile points, three preforms, one knife, two bifaces, eight unifacial scrapers, fifty lithic flakes and four lithic cores were recovered (table 5.4). Pelican Lake, Besant, Avonlea, and Prairie and Plains side-notched types were found throughout the site area which extended 110m east to west and at least 90m north to south. By the morning of June 12 the site area had been inundated within 40m of the high water mark and only 10m of beach area remained by the end of the day.

The site, along with EgNp-78, was revisited in the fall of 1995 and again in the spring of 1996. Only a few artifacts were recorded at each locale and added to the site catalogues. The site areas were severely eroded compared to the summer of 1995, as floodwaters had excavated the non-cohesive beach sand and redeposited it some 15 to 20 meters south of the former high water mark. As a result, only large gravels and cobble were exposed in the former site areas while the shoreline had been severely undercut in many areas (figure 5.11). This included the area of the datum for EgNp-79, which was undercut a total of 84 cm from 1995 to 1996. Chapter 7 provides a detailed analysis of the rates of erosion of steep and moderate slopes along the eastern shoreline of the reservoir where the processes of undercutting and slumping were most intensive.

Table 5.4: EgNp-79 Artifact Catalogue

Borden #	Cat. #	Description	# of Items	Material	Cult. Affil.	Matrix	Condition
EgNp-79	1	projectile point	1	Swan River Chert	indeterminate	beach	base missing
	2	projectile point	1	Knife River Flint	indeterminate	beach	midsection
	3	projectile point	1	Knife River Flint	Prairie S-N	beach	tip missing
	4	projectile point	1	Fused Shale	Plains S-N	beach	tip missing
	5	projectile point	1	Knife River Flint	Pelican Lake (?)	beach	base missing
	6	projectile point	1	Swan River Chert	indeterminate	beach	midsection
	7	projectile point	1	Knife River Flint	Avonlea	beach	complete
	8	projectile point	1	Gronlid Siltstone	Besant	beach	complete
	9	projectile point	1	Swan River Chert	indeterminate	beach	midsection
	10	projectile point preform	1	Knife River Flint	indeterminate	beach	incomplete
	11	projectile point preform	1	Swan River Chert	indeterminate	beach	incomplete
	12	projectile point preform	1	Silicified Peat	indeterminate	beach	incomplete
	13	bifacial knife	1	Silicified Wood	indeterminate	beach	incomplete
	14	biface	1	Knife River Flint	indeterminate	beach	incomplete
	15	biface	1	Silicified Peat	indeterminate	beach	complete
	16	endscraper	1	Jasper	indeterminate	beach	complete
	17	endscrapers	5	Knife River Flint	indeterminate	beach	complete
	18	sidescraper	1	Knife River Flint	indeterminate	beach	complete
	19	sidescraper	1	Silicified Peat	indeterminate	beach	complete
	20	retouched primary flake	1	Knife River Flint	indeterminate	beach	cortex
	21	primary flakes	7	Knife River Flint	indeterminate	beach	cortex
	22	primary flakes	2	Black Chert Pebble	indeterminate	beach	cortex
	23	primary flake	1	Generic Siltstone	indeterminate	beach	cortex
	24	primary flakes	3	Swan River Chert	indeterminate	beach	cortex
	25	retouched secondary flake	1	Knife River Flint	indeterminate	beach	no cortex
	26	secondary flakes	17	Knife River Flint	indeterminate	beach	no cortex
	27	secondary flakes	4	Swan River Chert	indeterminate	beach	no cortex
	28	secondary flakes	3	Jasper	indeterminate	beach	no cortex
	29	secondary flakes	2	Obsidian	indeterminate	beach	no cortex
	30	secondary flake	1	Generic Chert	indeterminate	beach	no cortex
	31	secondary flake	1	Quartzite	indeterminate	beach	no cortex
	32	secondary flake	1	Fused Shale	indeterminate	beach	no cortex
	33	secondary flake	1	Agate	indeterminate	beach	no cortex
	34	secondary flake	1	Silicified Peat	indeterminate	beach	no cortex
	35	cores	2	Swan River Chert	indeterminate	beach	N/A
	36	core	1	Generic Chert	indeterminate	beach	N/A
	37	core	1	Agate	indeterminate	beach	N/A

Beach Area at EgNp-79, June 12, 1995 (looking east)

Site Area at EgNp-79, September 11, 1996 (looking east)

Site Datum at EgNp-79, September 11, 2996 (looking east)

Figure 5.11: Site Area and Fluvial Erosion at EgNp- 79

Figure 5.12: Projectile Points Catalogued at EgNp-79

5.2.7 EfNr-15

The processes of fluvial erosion and slumping also dramatically affected EfNr-15 in the northwest quarter of Section 23, Township 23, Range 7,W3M. Initially the site appeared to be at least partially intact as bone fragments were recorded eroding out of the bank from approximately 0.75 m to 3.0 m below surface. An incomplete left metacarpal (proximal end) was collected 1.36 meters below surface and a thoracic vertebrae was recorded *in situ* at 2.24 m below surface. A total of 35 indeterminate bone fragments were photographed throughout the slump zone at the base of a tree filled depression (figure 5.13). A left immature tibia, representing a bison approximately three to four weeks old, and a distal right tibia of an adult bison were collected from the beach area west of the site (table 5.5).

The lack of stratigraphy and faunal material in the first 75 cm below the site surface was the result of construction activity associated with reservoir development. Areas of willows, poplars or other trees along the predicted shoreline were deemed as possible hazards to marine navigation following reservoir completion. As a result, areas such as EfNr-15 were bulldozed prior to 1968. The upland area east of the site was also impacted by heavy equipment as a farm chemical dump has recently been removed from the property. Without question, however, bank erosion and slumping due to wave action has caused the most sustained negative impact on site integrity. Figure 5.14 illustrates the severe erosion witnessed at the site from 1995 to 1996.

The ongoing erosion of the site is particularly alarming in light of the lithic artifacts recovered within 200 meters of the bone deposits by regional volunteer Chris Campbell. Campbell's collection from the beach area west of the site includes one Oxbow, one Duncan and one Pelican Lake type projectile point in addition to a Hell Gap projectile point fashioned from Swan River Chert. The diagnostic Hell Gap artifact shows definite basal thinning as well as grinding along both lateral edges below the shoulder. While it is possible for the artifacts to have been fluvially transported by

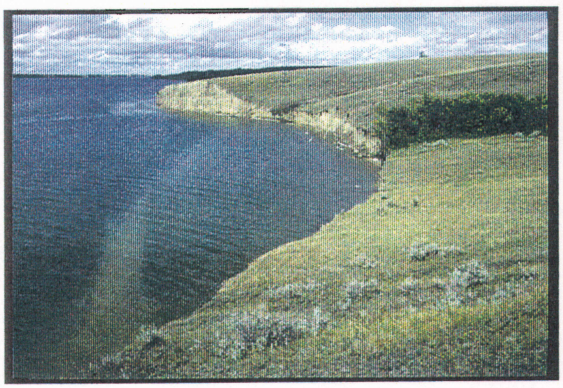
longshore currents to the site area from separate locations upstream, it is not probable in that the straight face of the bank does not offer relief in the current's velocity necessary for deposition. More likely, the artifacts were washed out of context by fluvial undercutting and slumping and redeposited within the general area of the site as water levels fell during the winter months. Obviously, deep subsurface testing and salvage excavation at EfNr-15 is recommended for 1997 to prevent the undocumented loss of artifacts which may yet remain in context.

Table 5.5: EfNr-15 Artifact Catalogue

Borden #	Catal. #	Description/ Element	Number of Items	Size (cm)	Weight (grams)	Material/ Assoc.	Matrix	Comments
EfNr-15	1	distal right tibia	1	10+	364.5	bison	beach	prox. end broken sub-condyles
	2	left proximal metecarpal	1	5.0 - 10	51.3	bison	beach	proximal end/ broken shaft
	3	rib fragment	1	5.0 - 10	12.9	bovid	beach	no epiphysial surfaces
	4	immature left tibia	1	10+	82.1	bison	beach	missing epiphysis
	5	left scapula	1	10+	129.2	bison	beach	distal fragment
	6	bifacial thinning flake	1	1.2 - 2.5	0.7	SRC	hill	disturbed area (bladed)

Figure 5.13: The Site Area of EfNr-15

Site Area at Low Water Level, June 6, 1995 (looking east)



Water Level, June 12, 1995 (looking north)

Artifacts *insitu*, June 6, 1995 (looking east)

Site Area, May 11, 1996 (looking northeast)

Figure 5.14: Fluvial Erosion and Disturbance at EfNr-15

5.2.8 EgNq-27

EgNq-27 consisted of an artifact find in the northwestern quarter of Section 18, Township 24, Range 5, W3M. Two artifacts were collected from the site, a Besant projectile point crafted from Knife River Flint and a large chopper made from Feldspathic siltstone. The projectile point was located on the beach approximately 4.50 m from the high water mark and 19.65 m east of a datum established in the northwest quarter of Section 18, Township 24, Range 5, W3M. The chopper was found 29.50 m east of the projectile point in a large slump at the base of the riverbank.

The position of the projectile point next to a large cobble may suggest fluvial deposition in a spot where water velocity was slowed as shallow currents were deflected. The location of the large chopper, or scraper, in the midst of a recent slump zone suggests no direct fluvial transport although certainly fluvial processes were responsible for the destruction of its context. The upland immediately above the find spot consists of gently rolling topography covered by shortgrasses and shrubs. Several large erratics were located directly south of the find spot on a very small ridge. These appear to be naturally situated. The main feature in the area during the time of occupation may have been an internal slough, now partially eroded by the reservoir, which is located approximately sixty meters southeast of the finds (figure 5.15). The beach area, bank and uplands within 200 m of the artifact finds were searched intensively again in 1996 but no further artifacts or features were recorded. Continued monitoring is recommended for the site.

Table 5.6: EgNq-27 Artifact Catalogue

Location	Cat. #	Description	# of Items	Material	Cult. Affil.	Terrain	Condition
EgNq-27	1	projectile point	1	Knife River flint	Besant	beach	complete
	2	biface (chopper)	1	Feldspathic siltstone	indeterminate	slump	incomplete

Site Area of EgNq-27 (looking west)

Projectile Point at 11.50N 19.65E
(looking south)

Slough 60 m Southeast of Datum
(looking north)

Figure 5.15: Site Area and Artifacts of EgNq-27

5.2.9 EfNr-16

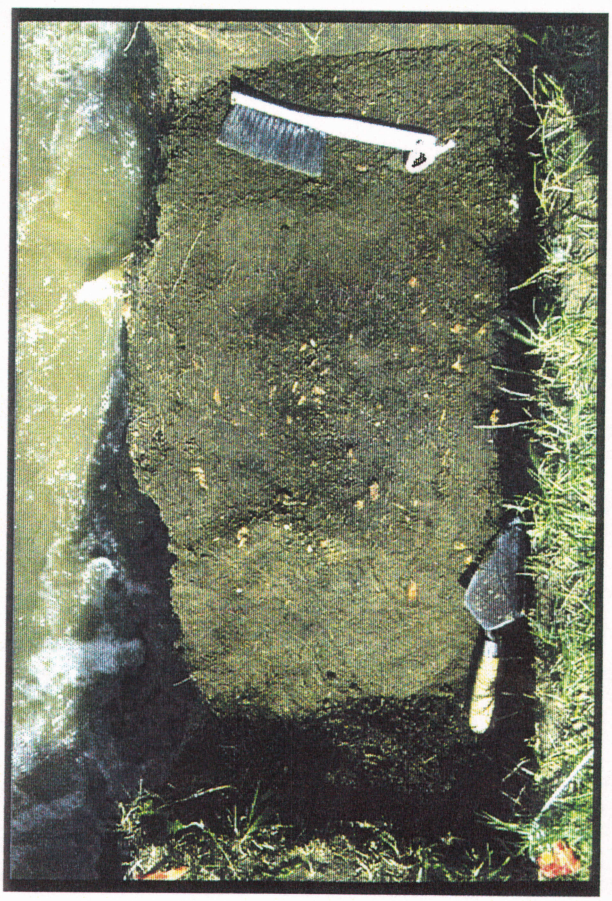
Subsurface sampling was initiated on a judgmental basis in the southwest quarter of Section 26, Township 23, Range 7 W3M. Bone fragments were observed eroding out of the river bank 55cm below surface on August 18,1995. A site datum was established 30 meters north and 30 meters east of the most concentrated bone deposit and a baseline was established to allow for auger tests to be conducted. The tests were spaced at one meter intervals eastward from the river bank (30S 23W to 30S 30W). Processed bone fragments were found at a depth of 55cm to 63 cm below surface for four meters. The north-south dimensions of the site were estimated to have been approximately 110 meters on the basis of isolated exposures of bone fragments observed in the bank.

A one meter (north-south) by fifty centimeter (east-west) test pit was opened along the edge of the bank at 30S 30W (figure 5.16). A cultural layer not indicated by the auger tests was encountered 15-19 cm below surface. The layer contained numerous bone fragments and a total of nine primary and secondary flakes (table 5.7). Only five artifacts were recovered in the 20-30 cm level. Processed bone fragments were lightly scattered throughout the unit in the next two 10 cm arbitrary levels. A chert sidescraper was recovered from the screen for the level 30-40 cm below surface. Only one identifiable element was recovered from the unit at 30-40 cm below surface, a proximal left metacarpal fragment recovered at 62 cm north, 14 cm west and 34 cm below surface (table 5.7). The element is best identified as bovid, although the species is likely *Bison bison* given the context of the artifact.

A dense concentration of bone debris was found in the 50-60 cm level below surface. Figure 5.17 illustrates the *in situ* position of raw and calcined bone fragments, fire-cracked rock and secondary flakes recovered 55-59 cm below surface. The artifacts are catalogued in table 5.7. Two Swan River Chert cores and secondary flakes made from Knife River Flint, silicified wood and silicified peat were found association with the

Site Area of EfNr-16 (looking north)

Bone Deposit at 30S 30W (looking south)



Planview of 30S 30W, 15 cm BS (looking north)

Planview and East Wall Profile of
30S 30W, 55 cm BS (looking east)

Figure 5.16: 1995 Test Excavation at EfNr-16 (30S 30W)

heavily processed bone fragments. Testing during the 1995 field season was ended 75 cm below surface within the layer of sterile clay that extended to the water level of the lake.

A second test excavation was opened at 31S 30W in 1996. The 50cm x 50cm pit was located in the northern half of the unit adjacent to the unit excavated in 1995. No culturally diagnostic artifacts were located in the 1996 excavation. A polished antler fragment was found at 15 cm below surface (table 5.7). A Knife River Flint endscraper was found 20 cm below surface, the terminal depth of the upper occupation. Eight secondary flakes were recovered in the 50-60 cm level along with numerous bone fragments. Two identifiable elements were recovered from the lower occupation, an innominate fragment and a spinous process fragment.

Although cultural affiliations cannot be established for the site, a few comments can be presented. EfNr-16 would seem to represent a bison processing site situated on level terrain within the South Saskatchewan River valley. Prior to reservoir development, the site would have been located at least 10 meters above the flood stage of the river. The rolling topography of the surrounding valley would have provided suitable terrain for bison jump and/or pound activities within a short distance of upland collection areas. The high degree of processing of faunal elements and the recovery of hide scraping tools suggests that bone grease manufacture, hide preparation and flintknapping activities were carried out at the site.

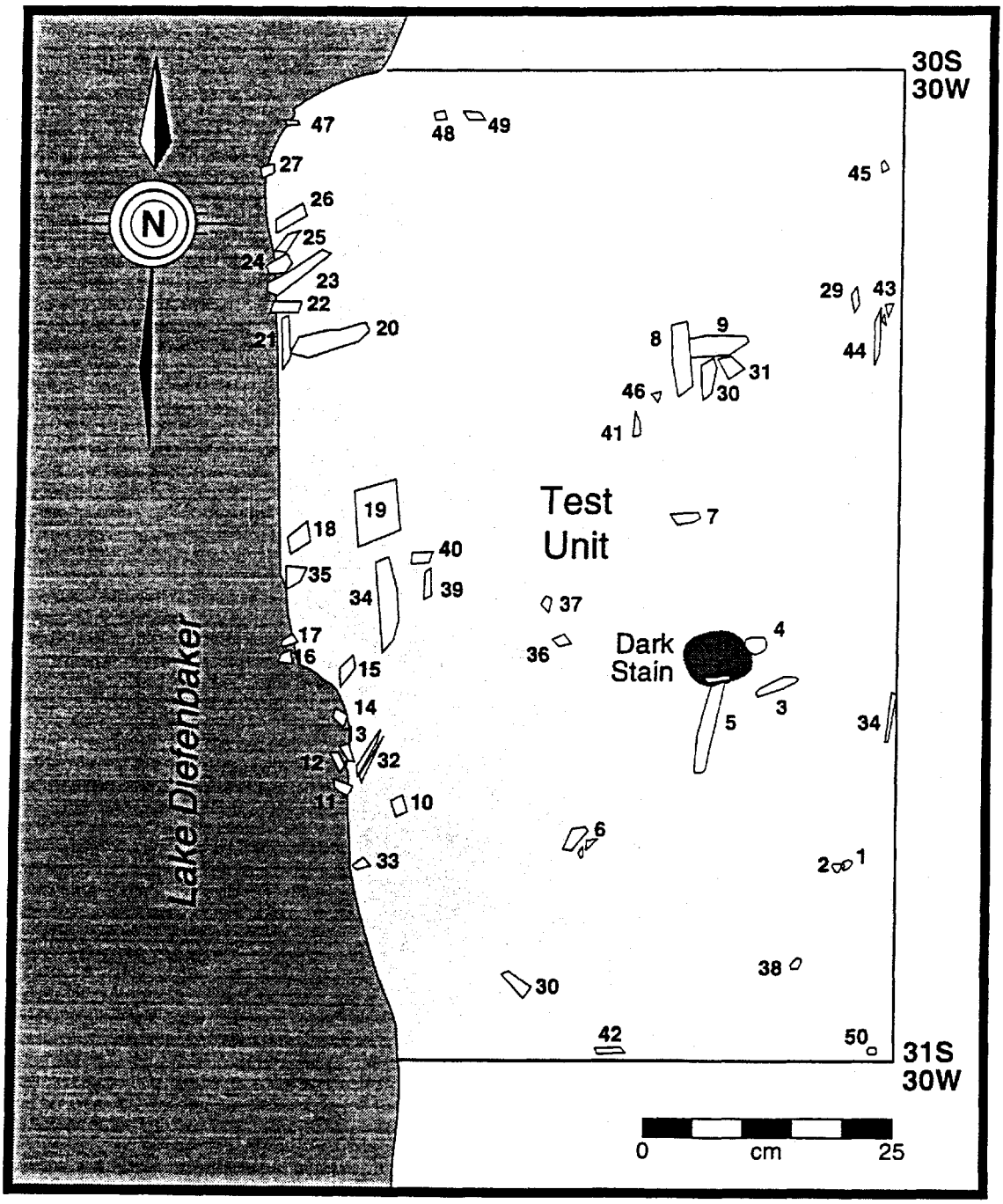
The site contains two distinct levels of cultural occupation as interpreted from the cultural remains found to date. This interpretation is supported by the separation of sediments and bone concentrations in both test units and along the adjacent river bank. The first occupation level is judged to have extended from approximately 15-20 cm below surface while the second occupation extended from approximately 35-61 cm below the present surface (figure 5.17). As no diagnostic artifacts have been recovered from either occupation level, and as fluvial erosion of the site is ongoing, salvage excavation is recommended.

Table 5. 7 Artifact Catalogue for EfNr-16

Unit #	Catal. #	Description/ Element	Number of Items	Size (cm)	Weight (grams)	Material/ Assoc.	Depth (b.s.)	Comments
30S 24W	1	bone fragments	22	0.6 - 1.2	2.3	indeterminate	58 - 63	N/A
	2	bone fragments	3	1.2 - 2.5	1.2	indeterminate	58 - 63	N/A
	3	bone fragments	4	2.5 - 5.0	1.7	indeterminate	58 - 63	N/A
	4	calcined bone fragment	1	1.2 - 2.5	3.5	indeterminate	58 - 63	N/A
30S 26W	5	bone fragments	5	0.6 - 1.2	0.8	indeterminate	57 - 61	N/A
	6	bone fragments	3	1.2 - 2.5	0.4	indeterminate	57 - 61	N/A
	7	bone fragments	4	2.5 - 5.0	3	indeterminate	57 - 61	N/A
30S 28W	8	bone fragments	4	0.6 - 1.2	0.4	indeterminate	57 - 61	N/A
	9	bone fragments	3	1.2 - 2.5	1.4	indeterminate	57 - 61	N/A
	10	bone fragments	1	2.5 - 5.0	3.7	indeterminate	57 - 61	N/A
30S 30W	11	primary flake	1	0.6 - 1.2	0.1	KRF	10 - 20	cortex
	12	primary flake	1	1.2 - 5.0	9.6	quartzite	10 - 20	cortex
	13	secondary flake	1	0.6 - 1.2	0.1	KRF	10 - 20	no cortex
	14	secondary flake	1	0.6 - 1.2	0.3	sil. peat	10 - 20	no cortex
	15	secondary flake	4	0.6 - 1.2	1.4	quartzite	10 - 20	no cortex
	16	secondary flake	1	1.2 - 2.5	1.9	quartzite	10 - 20	no cortex
	17	calcined fragments	29	0.6 - 1.2	6.2	indeterminate	10 - 20	N/A
	18	calcined fragment	1	1.2 - 2.5	1.2	indeterminate	10 - 20	N/A
	19	bone fragments	670	0.6 - 1.2	130.1	indeterminate	10 - 20	N/A
	20	bone fragments	128	1.2 - 2.5	93.8	indeterminate	10 - 20	N/A
	21	bone fragments	18	2.5 - 5.0	40.2	indeterminate	10 - 20	N/A
	22	bone fragments	6	5.0- 10	44.3	indeterminate	10 - 20	N/A
	23	bone fragments	1	5.0- 10	12.0	indeterminate	10 - 20	N/A
	24	bone fragments	1	5.0- 10	10.4	indeterminate	10 - 20	N/A
	25	bone fragments	5	1.2 - 2.5	1.5	indeterminate	20 - 30	N/A
	26	sidescraper	1	2.5 - 5.0	22.1	chert	30 - 40	complete
	27	fire-cracked rock	3	2.5 - 5.0	81.6	quartzite	30 - 40	6.5N 19.5W 37 b.s.
	28	bone fragments	9	0.6 - 1.2	1.4	indeterminate	30 - 40	N/A
	29	bone fragments	13	1.2 - 2.5	8.7	indeterminate	30 - 40	N/A
	30	left proximal metacarpal	1	5.0 - 10	47.4	bone	30 - 40	62N 14W 34b.s.
	31	bone fragments	3	1.2 - 2.5	1.9	bone	40 - 50	N/A

Table 5.7: Artifact Catalogue for EfNr-16

30S 30W	32	retouched flake	1	1.2 - 2.5	4.4	SRC	50 -60	unifacial retouch
(cont'd.)	33	secondary flakes	10	0.6 - 1.2	1.9	sil. peat	50 -60	no cortex
	34	secondary flakes	5	0.6 - 1.2	0.9	chert	50 -60	no cortex
	35	secondary flakes	1	0.6 - 1.2	0.1	sil. wood	50 -60	no cortex
	36	secondary flakes	1	0.6 - 1.2	0.1	KRF	50 -60	no cortex
	37	secondary flakes	6	1.2 - 2.5	4.1	sil. peat	50 -60	no cortex
	38	secondary flakes	3	1.2 - 2.5	1.1	chert	50 -60	no cortex
	39	secondary flakes	2	1.2 - 2.5	0.5	KRF	50 -60	no cortex
	40	secondary flakes	2	1.2 - 2.5	0.8	quartzite	50 -60	no cortex
	41	secondary flake	1	1.2 - 2.5	0.2	sil. wood	50 -60	no cortex
	42	calcined fragments	37	0.6 - 1.2	5.1	indeterminate	50 -60	N/A
	43	calcined fragment	1	1.2 - 2.5	1.8	indeterminate	50 -60	N/A
	44	bone fragments	1045	0.6 - 1.2	180.1	indeterminate	50 -60	N/A
	45	bone fragments	185	1.2 - 2.5	101.9	indeterminate	50 -60	N/A
	46	bone fragments	58	2.5 - 5.0	243.9	indeterminate	50 - 60	N/A
	47-96	see table 5.7						
31S 30 W	97	polished antler fragment	1	1.2 - 2.5	0.4	indeterminate	15	incomplete
	98	lateral carpal	1	2.5 - 5.0	23.2	bovid	15	complete
	99	endscraper	1	1.2 - 2.5	2.4	Knife River Flint	20	complete (70N 28W)
	100	calcined bone fragments	2	0.6 - 1.2	0.1	bovid	Oct-20	screen
	101	bone fragments	9	0.6 - 1.2	0.9	bovid	Oct-20	screen
	102	bone fragments	6	1.2 - 2.5	5.3	bovid	Oct-20	screen
	103	bone fragments	4	2.5 - 5.0	16.6	bovid	Oct-20	screen
	104	tertiary flakes	2	0.1 - 0.6	0.1	Knife River Flint	50 - 60	screen
	105	secondary flakes	3	0.6 - 1.2	0.2	Knife River Flint	50 - 60	screen
	106	secondary flakes	2	0.6 - 1.2	0.1	Swan River Chert	50 - 60	screen
	107	secondary flake	1	0.6 - 1.2	0.3	silicified peat	50 - 60	screen
	108	secondary flakes	2	1.2 - 2.5	2.1	Swan River Chert	50 - 60	screen
	109	bone fragments	12	0.6 - 1.2	1.4	bovid	50 - 60	screen
	110	bone fragments	21	1.2 - 2.5	9.1	bovid	50 - 60	screen
	111	bone fragments	9	2.5 - 5.0	12.3	bovid	50 - 60	screen
	112	bone fragments	4	5.0 - 10	25.4	bovid	50 - 60	screen
	113	innominate fragment	3	5.0 - 10	110.6	bovid	59	92N 25.5W
	114	spinous process fragment	1	5.0 - 10	11.1	bovid	50 - 60	screen



Courtesy of Shelley McConnell

Figure 5.17: Planview of 30S 30W (55-59 Below Surface)

Table 5.8: Key to Planview 30S 30W (EfNr-16)

Unit #	Catal. #	Planview #	Description/ Element	Number of Items	Size (cm)	Weight (grams)	Depth (cm/ b.s.)	Assoc./ Condition
30S 30W	47	1	fire-cracked rock	1	2.5 - 5.0	13.2	55 - 59	granite
	48	2	bone fragment	1	2.5 - 5.0	2.8	55 - 59	indeterminate
	49	3	long bone fragments	9	2.5 - 5.0	20.4	55 - 59	incomplete
	50	4	calcined bone fragments	4	0.6 - 1.2	0.5	55 - 59	indeterminate
	51	5	rib fragments	8	5.0 - 10	25.3	55 - 59	incomplete
	52	6	rib fragments	17	2.5 - 5.0	18.2	55 - 59	incomplete
	53	7	rib fragments	8	2.5 - 5.0	10	55 - 59	incomplete
	54	8	rib fragment	1	5.0 - 10	20.5	55 - 59	incomplete
	55	9	bone fragment	1	5.0 - 10	7.4	55 - 59	indeterminate
	56	10	long bone fragments	5	2.5 - 5.0	11.2	55 - 59	indeterminate
	57	11	bone fragments	9	0.6 - 1.2	4.1	55 - 59	indeterminate
	58	12	rib fragments	8	1.2 - 2.5	8.1	55 - 59	incomplete
	59	13	bone fragments	2	2.5 - 5.0	5.1	55 - 59	indeterminate
	60	14	bone fragments	10	2.5 - 5.0	8.5	55 - 59	indeterminate
	61	15	bone fragment	1	2.5 - 5.0	2.4	55 - 59	indeterminate
	62	16	bone fragments	7	1.2 - 2.5	6.8	55 - 59	indeterminate
	63	17	bone fragments	2	2.5 - 5.0	6.1	55 - 59	indeterminate
	64	18	long bone fragments	7	5.0 - 10	29.1	55 - 59	incomplete
	65	19	fire-cracked rock	1	5.0 - 10	186.9	55 - 59	granite
	66	20	long bone fragments	28	5.0 - 10	66.5	55 - 59	incomplete
	67	21	rib fragments	7	2.5 - 5.0	8.8	55 - 59	incomplete
	68	22	rib fragment	1	2.5 - 5.0	3.3	55 - 59	incomplete
	69	23	rib fragments	2	5.0 - 10	43.7	55 - 59	incomplete
	70	24	long bone fragment	1	5.0 - 10	6.5	55 - 59	incomplete
	71	25	rib fragment	1	5.0 - 10	13.2	55 - 59	incomplete
	72	26	rib fragments	13	5.0 - 10	47.0	55 - 59	incomplete
	73	27	fire-cracked rock	1	2.5 - 5.0	37.4	55 - 59	granite
	74	28	lithic core	1	2.5 - 5.0	14.4	55 - 59	SRC
	75	29	secondary flake	1	0.6 - 1.2	0.6	55 - 59	KRF
	76	30	long bone fragments	2	2.5 - 5.0	12.4	55 - 59	incomplete
	77	31	long bone frags	6	5.0 - 10	22.0	55 - 59	incomplete
	78	32	long bone frags	5	5.0 - 10	8.4	55 - 59	incomplete
	79	33	secondary flake	1	0.6 - 1.2	0.1	55 - 59	sil. wood
	80	34	bone fragment	1	1.2 - 2.5	1.1	55 - 59	incomplete
	81	35	rib fragment	1	10+	25.7	55 - 59	incomplete
	82	36	left fused 2nd & 3rd tarsal	1	2.5 - 5.0	9.3	55 - 59	complete
	83	37	calcined bone	1	0.6 - 1.2	0.6	55 - 59	incomplete
	84	38	fire-cracked rock	5	2.5 - 5.0	46.2	55 - 59	granite
	85	39	rib fragment	4	1.2 - 2.5	1.7	55 - 59	incomplete
	86	40	long bone fragment	1	2.5 - 5.0	10.4	55 - 59	incomplete
	87	41	bone fragments	6	1.2 - 2.5	6.3	55 - 59	indeterminate
	88	42	bone fragments	1	5.0 - 10	in situ	55 - 59	indeterminate
	89	43	secondary flakes	2	2.5 - 5.0	5.9	55 - 59	quartzite
	90	44	right scapula fragments	2	10+	42.8	55 - 59	incomplete
	91	45	secondary flake	1	1.2 - 2.5	2.2	55 - 59	SRC
	92	46	shell fragment	1	1.2 - 2.5	0.3	55 - 59	M. of Pearl
	93	47	rib fragment	1	5.0 - 10	5.5	55 - 59	incomplete
	94	48	core	1	2.5 - 5.0	45.2	55 - 59	SRC
	95	49	long bone fragment	1	5.0 - 10	19.6	55 - 59	incomplete
	96	50	secondary flake	1	2.5 - 5.0	1.6	55 - 59	sil. peat

5.3 Historic Period Sites

5.3.1 EfNr-11

As discussed in Chapter 4, the Riverhurst Ferry Crossing was chosen as the starting point for the 1995-1996 survey effort. The modern location of the crossing along Highway #42, however, has only been in operation since 1965 (Golden Jubilee Committee 1965:97). From 1908 to 1911 the ferry crossing was located north of the Town Line, or grid road immediately north of Riverhurst (figure 5.18). The ferry was established to give farmers on the west side of the river access to the hamlets of Bridgeford and Tugaske. In 1911, the ferry was moved south and later served to help transport materials for the construction of the Canadian Northern Railway line from Dunblane to Lucky Lake in 1919 (Golden Jubilee Committee 1965:97). The ferry was repositioned on higher ground along Highway #42 in 1965 due to reservoir development (Golden Jubilee Committee 1965:97).

The location of the crossing from 1908-1911, then known as the Riverside Ferry, included a trail through a coulee in the northwest quarter of Section 34, Township 22, Range 7, W3M (Figure 5.18). In 1995 and 1996, the trail could still be accessed despite the overgrowth of shortgrass vegetation. The remains of a small structure measuring approximately 4.75 meters east to west and 3.40 meters north to south were found adjacent to the south edge of the trail midway between Lake Diefenbaker and the uplands east of the site. Landowner Annie Grasley lived less than a kilometer from the trail when at the time the crossing was in use and remembered the structure to be a small shelter constructed for farmers and passengers awaiting the arrival of the ferry. A round trip to deliver grain to Tugaske or Bridgeford from the western side of the river during the early years of ferry operation had taken two full days and "feed for the horses, a roll of bedding for the man and a lunch box topped every load of grain" (Golden Jubilee Committee 1965:97). As the shelter was not sufficient to accommodate more than one or

two occupants, open camps were made along the coulee to the west of the shelter nearer the river.

The coulee bottom provided adequate shelter, wood for fuel and level ground suitable for camping with an unobstructed view of the ferry crossing. Numerous surface disturbances encountered in the valley in 1995 and 1996 immediately west of the shelter location indicate several areas may suitable for subsurface testing. Unfortunately, the coulee has been reused as an unofficial recreation and camping area by local residents over the past three decades and thus site disturbance of near-surface deposits is expected to be high. Both east-west and north-south baselines for the site were established in 1995 to assist future research. Auger testing and/or test excavation at the site is recommended.

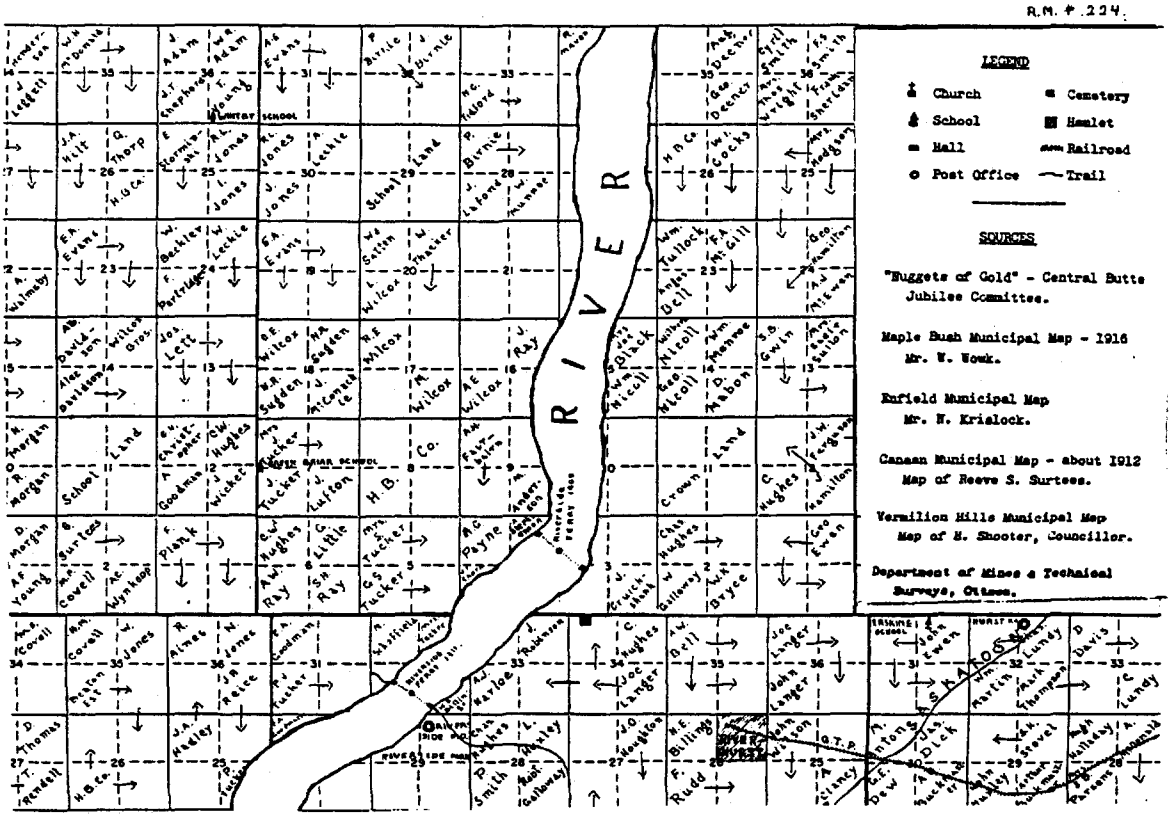


Figure 5.18: Riverside Ferry Crossing (EfNr-11)

after Golden Jubilee Committee 1969

5.3.2 EfNr-17

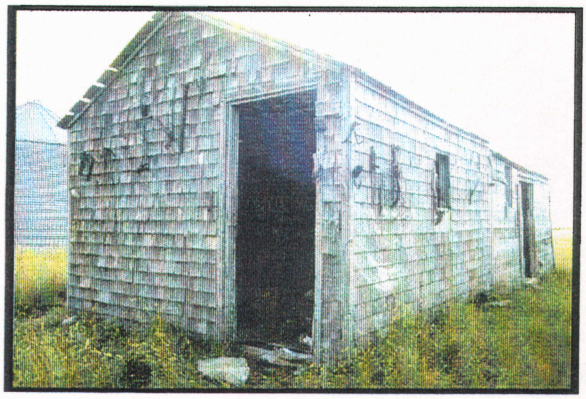
Although the 1995-1996 survey did not include areas more than 200m above the high water mark of Lake Diefenbaker, EfNr-17 is the result of farmstead activity just beyond the survey boundary in the southeast quarter of Section 26 Township 23, Range 7, West of the 3rd Meridian. In 1995, a Euro-Canadian midden was encountered on a south-facing slope of a coulee in the southwest quarter of the property. The midden contained various glass, metal and ceramic artifacts dating from the early homestead era to the mid 1950s. Two artifacts were collected from the site: a cobalt blue bottle with the base inscribed "Vick's Va-Tro-Nol" and a colourless round bottle with sloped shoulders, 12 decorative flutes and a metal screw-top lid. Both artifacts date from 1940 to 1955 (Chopping 1978: 58).

The midden is associated with the Nicholls farmstead located on the extreme southeastern quarter of the property. The farm buildings were constructed by Wilbert Nicholls, who first moved to the Riverhurst area as a farm labourer in 1908. In 1909, he homesteaded the property and began construction of the structures found at the site (Golden Jubilee Committee 1965:37). The Nicholls family maintained residence at the farm until the late 1970's. The land is currently farmed by Hiebert Brothers Farms of Riverhurst, Saskatchewan.

Four structures remained partially intact in 1996, including the farm house, barn, workshop and a small wooden granary. The barn appears to have been constructed from the roof of a larger structure which was moved to the property and set on a stone and mortar foundation (figure 5.19). The workshop was created by pulling together two small wooden granaries on the southern edge of the yard. One unidentified building west of the farm house has collapsed in recent years. Figure 5.19 illustrates the condition of the buildings as recorded in 1996. A S.A.R.R. Update of the site was filed with the Saskatchewan municipal government following the 1996 field season. No Further testing is recommended for the site.

Nicholl's Farm House (looking east)

Workshop (looking south)



Foundation, Workshop and Grainery
(looking southeast)

Barn (looking north)

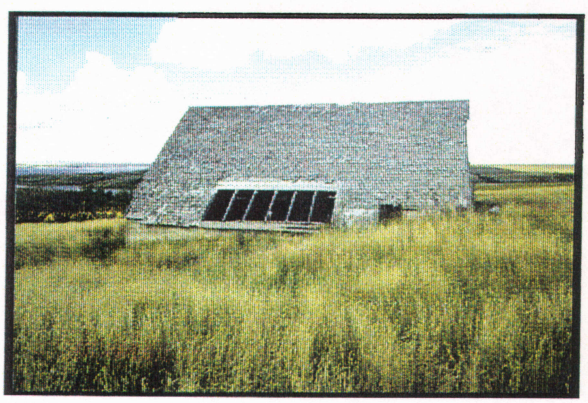


Figure 5.19: Wilbert Nicholl's Farm (EfNr-17)

5.3.3 EfNr-18

EfNr-18 is a second Euro-Canadian midden found along the western margin of the reservoir in the northwest quarter of section 26, Township 23, Range 7, W3M. The site is associated with the homestead of Donald Thompson and family, who first moved to the area in 1906 from Cass City, Michigan (Golden Jubilee Committee 1965:77). Don's eldest son William, born in the Riverhurst district in 1910, continued farming on in the region until the mid 1970's. Reservoir development inundated much of the quarter section containing the site area after 1965. The land is currently leased by Peter Hiebert of Riverhurst, Saskatchewan.

Glass, metal and ceramic artifacts with *terminus post quem* dates ranging from the homestead era to the late 1950's were observed and photographed along the slope and base of a steep coulee approximately 150m east of the lake's high water mark. One complete blue glass Milk of Magnesia bottle with a metal screw-top lid was collected from the site (figure 5.20). The artifact dates to the first two decades of occupation of the Thompson family. A wood-burning stove, numerous metal cans, broken glass fragments and ceramic sherds were left in secondary context. Figure 5.21 provides an overview of the site area as it was found and the artifacts it contained during the 1995-1996 field seasons. No further testing is recommended.

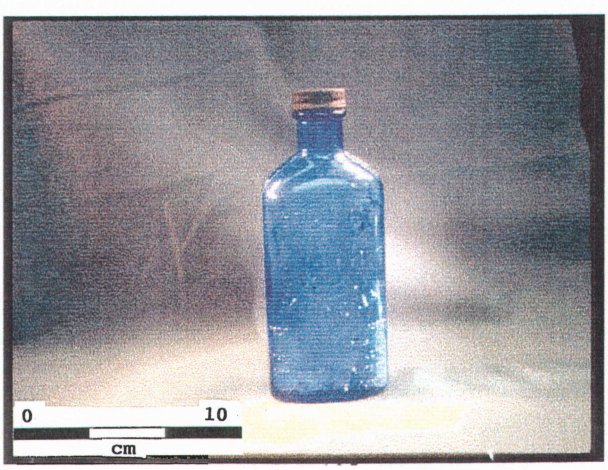


Figure 5.20: Milk of Magnesia Bottle Collected at EfNr-18

Site Area (looking south)

Midden (looking east)

Figure 5.21: EfNr-18 (Euro-Canadian Midden)

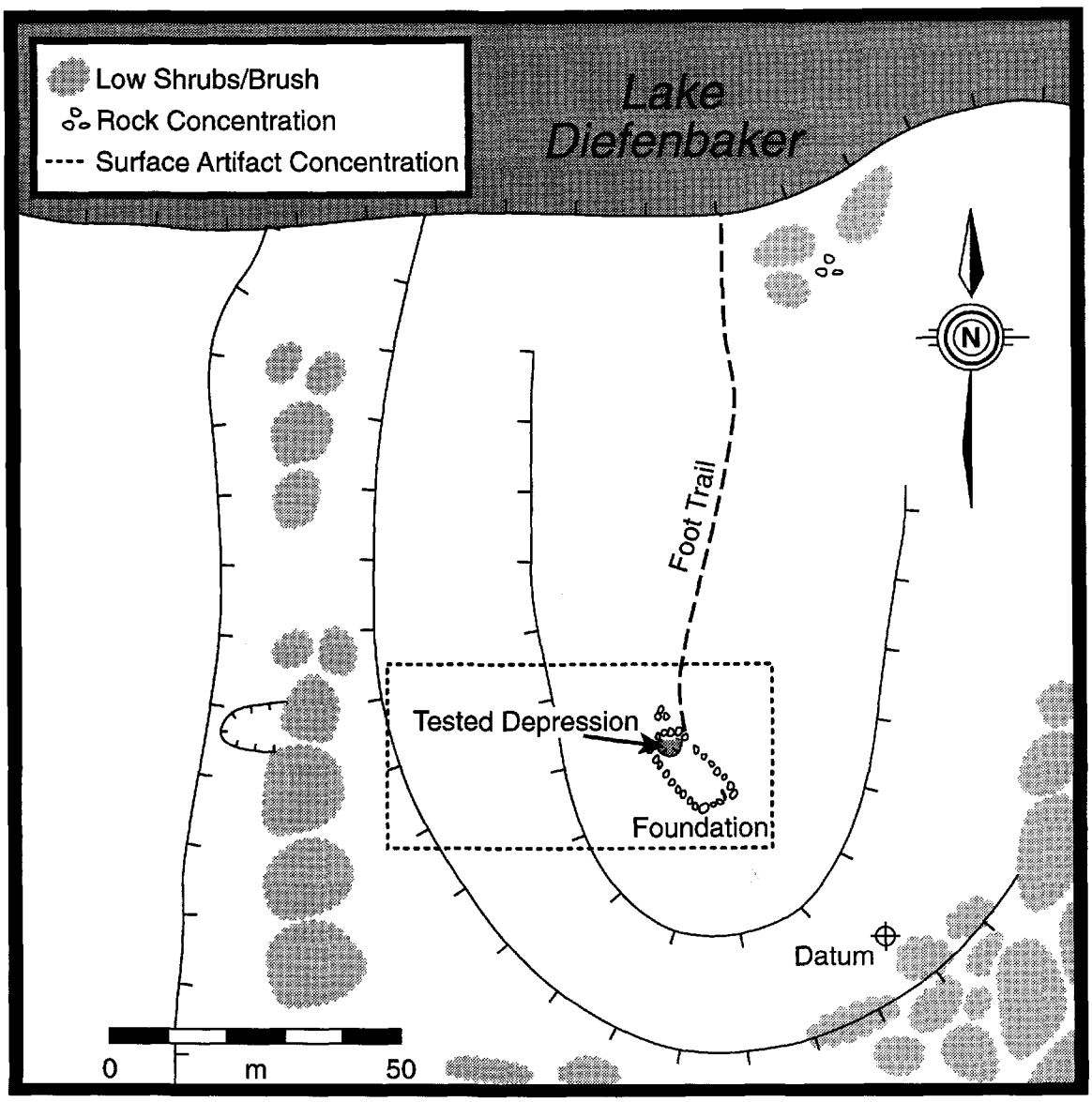
5.3.4 EgNq-23

EgNq-23 consisted of a multiple feature/ artifact scatter in the northeast quarter of Section 10, Township 24, Range 6, W3M. An Historic period stone foundation and cellar depression, along with numerous glass, ceramic and metal artifacts, were located on the crest of a small ridge approximately 110m south of the high water mark (figure 5.22). The dimensions and elevations of the foundation and associated features were recorded in 1995, as were the *in situ* locations of the artifacts found on the surface immediately west of the structure (table 5.9). Two historic trails were also documented approximately 65 meters northeast of the foundation.

The site was the result of farmstead activity by the F.E. South family who homesteaded the property in 1907 (Golden Jubilee Committee 1965:62). The family maintained residence on the farm until the land was sold to the P.F.R.A. in anticipation of reservoir development in the early 1960's. The higher water levels of Lake Diefenbaker reached the location of the barn near the center of the property in 1965. Today, only the foundation of the house remains above the modern shoreline. This small area is currently leased out by the P.F.R.A. as pasture land to local residents.

The site was chosen for subsurface testing on a judgmental basis due to the number of associated artifacts found on the surface, the visibility of the foundation and associated features, and the availability of historic source material. As such, the site provided the opportunity to gather sufficient material data to serve as a reference for other homestead era occupations (and perhaps future excavations) throughout the region. A 1m x1m test unit was opened in the southeastern portion of the cellar depression at 14S 16W on August 15, 1995. Twenty centimeter arbitrary levels were employed as the depth of the feature was expected to be considerable, although the majority of artifacts were recorded *in situ.* A very thin, almost non-existent, A horizon was recorded to a depth of four centimeters below the short grass which had overgrown the feature. Silty-clay was

then found from 5 to 35 cm below datum. This was underlain by sandy clay from 35 to 75 cm below datum where excavation procedures were terminated.



courtesy of Shelley McConnell

Figure 5.22: Site Map of EgNq-23

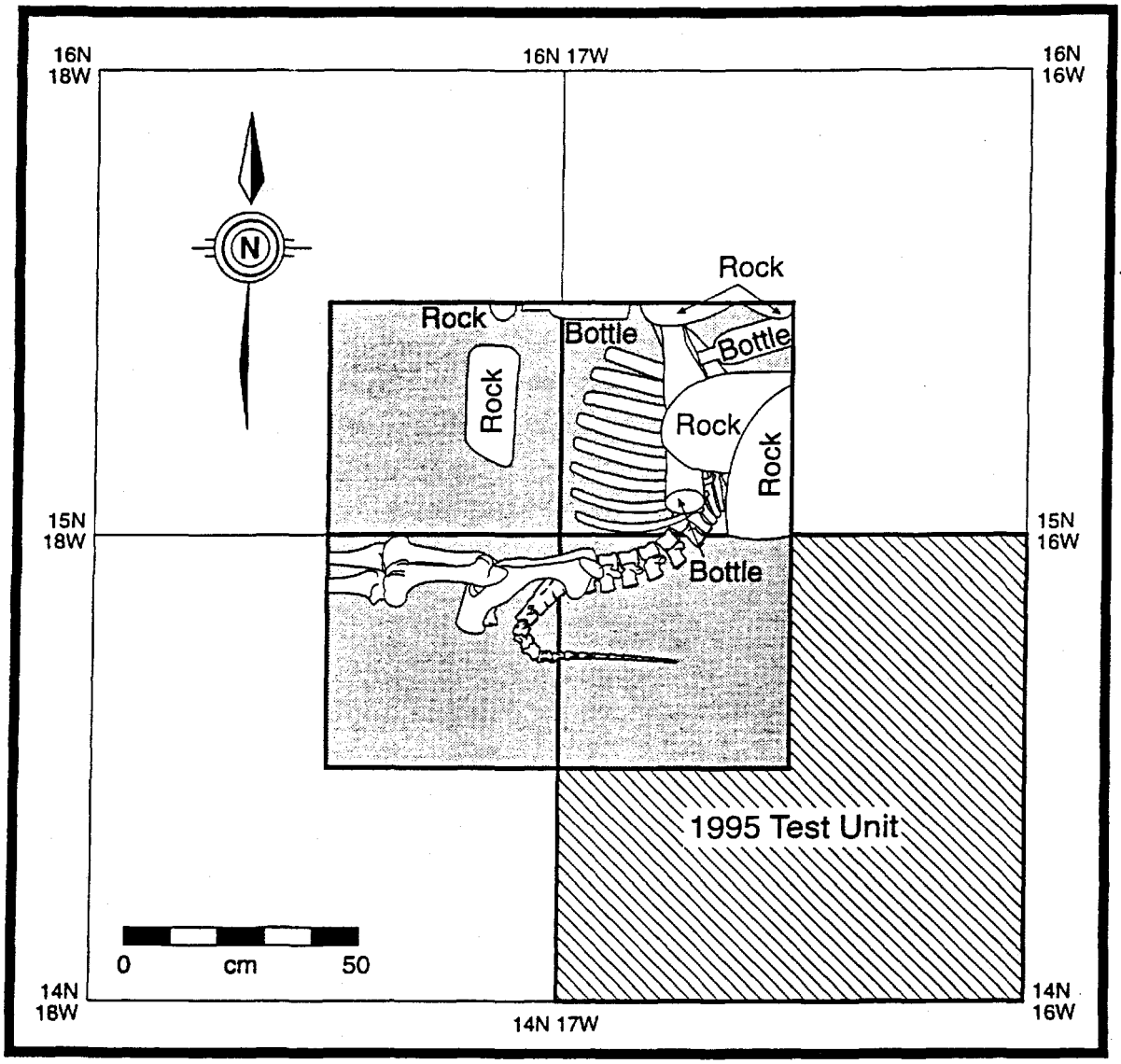
Table 5.9: EgNq-23 Surface Collection

Borden #	Cat. #	Description	Material	# of Items	Type	Finish	North (m)	West (m)	Classification
EgNq-23	1	plain white shard	ceramic	1	earthenware	transfer/ underglaze	28.22	45.74	household
	2	blue floral pattern shard	ceramic	1	earthenware	transfer/ underglaze	29.84	41.28	household
	3	plain white shard	ceramic	1	earthenware	transfer/ underglaze	29.78	36.65	household
	4	plain white sherds	ceramic	2	earthenware	transfer/ underglaze	28.80	49.55	household
	5	green on white shard	ceramic	1	earthenware	transfer/ underglaze	27.08	39.27	household
	6	blue floral pattern rim shard	ceramic	1	earthenware	transfer/ underglaze	30.96	35.02	household
	7	green on white sherds	ceramic	2	earthenware	transfer/ underglaze	24.53	36.97	household
	8	plain white shard	ceramic	1	earthenware	transfer/ underglaze	28.80	41.43	household
	9	red on white/ plain white	ceramic	3	earthenware	transfer/ underglaze	27.17	37.92	household
	10	wood fragment w/ chinking	wood	1	N/A	N/A	27.12	37.92	structural
	11	blue on white shard	ceramic	1	earthenware	transfer/ underglaze	13.17	49.36	household
	12	red & beige sherds	ceramic	14	earthenware	transfer/ underglaze	13.30	35.64	household
	13	plain white sherds	ceramic	2	earthenware	transfer/ underglaze	13.38	36.20	household
	14	blue on white/ plain white	ceramic	3	earthenware	transfer/ underglaze	29.01	42.82	household
	15	clear glass fragments	glass	4	N/A	N/A	21.53	37.88	household
	16	plain white sherds	ceramic	2	earthenware	transfer/ underglaze	23.27	34.97	household
	17	patterned torquoise rim shard	ceramic	1	earthenware	transfer/ underglaze	28.23	28.63	household
	18	plain white shard	ceramic	1	earthenware	transfer/ underglaze	22.01	36.29	household
	19	pink & green floral pattern	ceramic	1	earthenware	transfer/ underglaze	16.60	38.50	household
	20	wood fragment w/ chinking	wood	1	N/A	N/A	26.60	36.30	structural
	21	blue on white/ plain white	ceramic	4	earthenware	transfer/ underglaze	28.44	43.40	household
	22	orange & green shard	ceramic	1	china	transfer/ underglaze	27.79	40.19	household
	23	brown glass fragment	glass	1	N/A	N/A	28.07	35.00	household
	24	clear glass fragment	glass	1	N/A	N/A	19.47	39.41	household
	25	solder-top can	metal	1	N/A	N/A	28.78	39.37	household
	26	lipped metal fragment	metal	1	N/A	N/A	28.77	44.07	unknown
	27	curved metal fragment	metal	1	N/A	N/A	15.12	45.54	unknown
	28	purple glass fragments	glass	2	N/A	N/A	17.09	35.57	household
	29	patterned metal cover	metal	1	N/A	N/A	15.11	43.90	unknown
	30	metal fragment	metal	1	N/A	N/A	18.00	52.36	unknown
	31	clear glass fragment	glass	1	N/A	N/A	30.36	34.45	household
	32	clear glass fragments	glass	13	N/A	N/A	26.37	33.55	household
	33	base of metal can	metal	1	N/A	N/A	25.84	41.60	household
	34	clear glass fragment	glass	1	N/A	N/A	30.14	34.45	household
	35	brown glass fragment	glass	2	N/A	N/A	18.21	49.55	household
	36	riveted metal band w/ buckle	metal	1	N/A	N/A	34.32	56.05	personal
	37	4mm wire handle	metal	1	N/A	N/A	21.78	46.36	unknown
	38	metal can fragments	metal	1	N/A	N/A	15.73	38.53	household
	39	purple glass fragment	glass	1	N/A	N/A	18.81	42.64	household
	40	secondary flake	sil. peat	1	N/A	N/A	25.40	33.75	unknown
	41	plain white sherds	ceramic	3	earthenware	transfer/ underglaze	24.83	35.11	household
	42	plain white/ blue on white	ceramic	6	earthenware	transfer/ underglaze	24.55	33.38	household
	43	plain white sherds	ceramic	2	earthenware	transfer/ underglaze	24.52	33.82	household
	44	blue on white shard	ceramic	1	earthenware	transfer/ underglaze	24.84	33.48	household
	45	blue on white/ plain white	ceramic	1	earthenware	transfer/ underglaze	24.90	33.13	household
	46	patterned turquoise sherds	ceramic	2	earthenware	transfer/ underglaze	25.25	33.25	household

Small bone and metal fragments were recorded in the first excavation level of 14N 16W. A thick brown glass bottle fragment and clear glass bottle fragment were recorded in the next two respective levels. A green glass fragment and part of an articulated calf skeleton were recorded in the fourth arbitrary level. Caudal and lumbar vertebrae were mapped and left *in situ* in the extreme northeast corner of the test unit until adjacent units could be tested in 1996 (table 5.10).

Three 50 cm x 50 cm test units were opened at 14N 17W, 15N 16W and 15N 17W in September of the following year. Approximately 75% of the immature bovid remains were recorded *in situ*. Four complete glass bottles were found in direct association with the faunal elements and were identified following the 1996 field season. Two colourless soda bottles with applied lips (circa 1890-1919) were found at 15N 16W in level four. A green glass bottle with a rounded neck and push-up base also found in 15N 16W is generally dated to the same era (Stacy Kozakavich, personal communication 1997). A two-piece mold bottle recovered from level four in the 15N 17W test pit was made from about 1920 to 1930 (Stacy Kozakavich, personal communication 1997). The artifacts complement the era of manufacture for the ceramic sherds collected from the surface of the site (table 5.9). Figure 5.23 illustrates the *in situ* location of the artifacts and features discussed in this section. Table 5.10 provides a catalogue of the artifacts recovered during the 1995-1996 test excavations.

In all, EgNq-23 holds considerable potential for further investigation. Excavation and detailed mapping of the site could provide documentation of a cultural era that is under-represented in the archaeological literature from the region to date.



courtesy of Shelley McConnell

Figure 5.23: Features and Artifacts at EgNq-23

Table 5.10: EgNq-23 Test Excavation

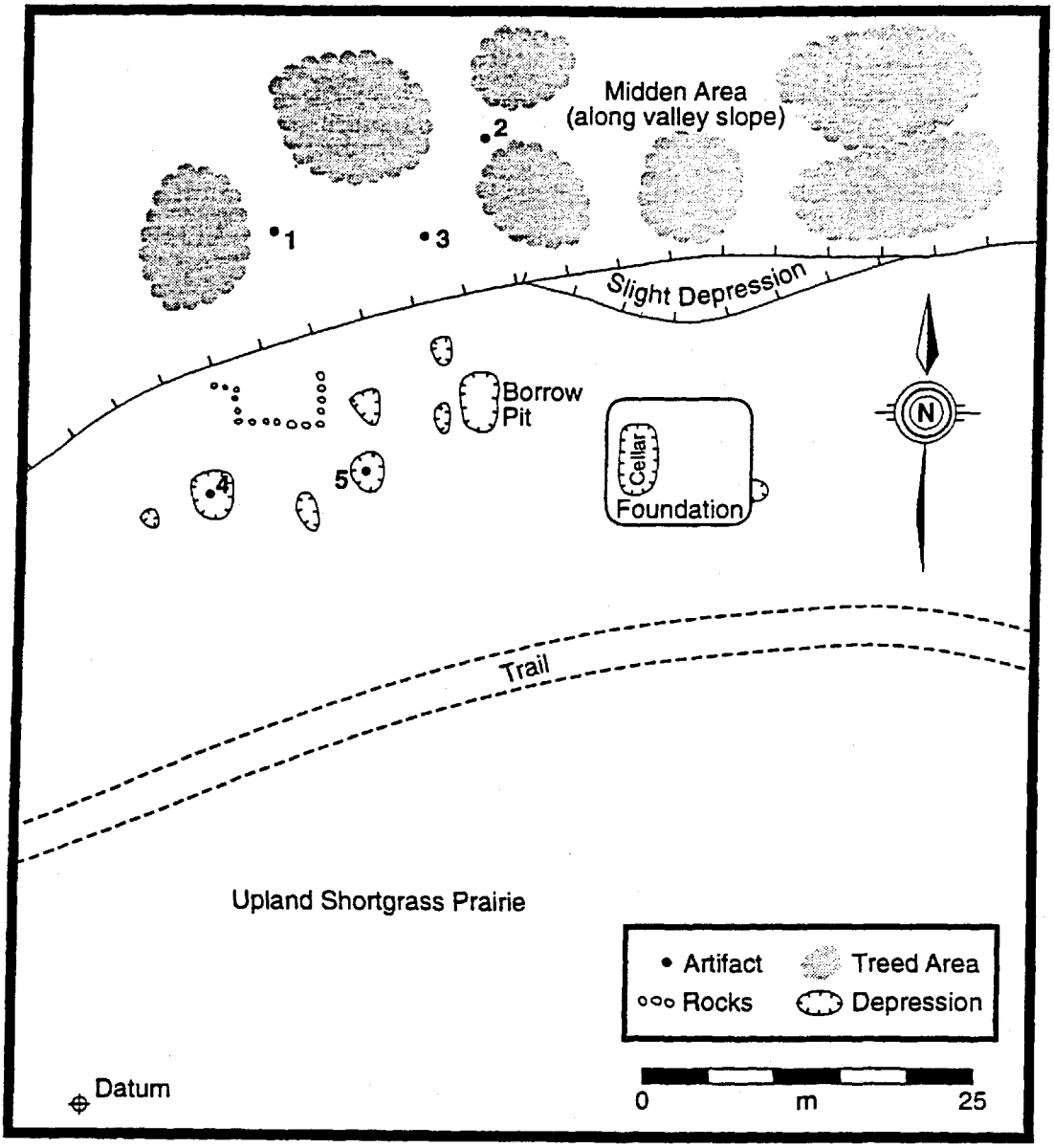
Unit #	Catal. #	Description/ Element	Number of Items	Size (cm)	Weight (grams)	Material/ Assoc.	North (cm)	West (cm)	Depth (b.d.)	Comments
14N 16W	47	raw bone fragment	1	1.2 - 2.5	0.14	bone	N/A	N/A	0 - 20	screen
	48	metal fragments	1	1.2 - 2.5	0.99	metal	N/A	N/A	0 - 20	screen
	49	brown glass fragment	1	2.5 - 5.0	12.96	glass	N/A	N/A	20 - 40	screen
	50	clear glass bottle fragment	1	5.0 - 10	26.67	glass	53	85	48	neck fragment
	51	green glass fragment	1	1.2 - 2.5	1.36	glass	N/A	N/A	60 - 62	screen
	52	caudal vertebrae\ epiph.	10 \ 10	2.5 - 5.0	4.73	bone	73	79 - 100	68	articulated
	53	lumbar vertebrae\ epiph.	5 \ 9	10+	147.21	bone	80-100	69.5-100	63.5 - 74	articulated
	54	conjoinable lumbar frags	17	2.5 - 5.0	9.73	bone	80-100	69.5-100	63.5 - 74	shovel trauma
14N 17W	55	wire handle	1	10+	23.67	metal	92	67	43	N/A
	56	tibia (unfused)	2	10+	281.51	bone	38 - 46	82-100	65	distal epiph. in situ
	57	femur (unfused)	2	10+	415.16	bone	40 - 50	80- 95	65	1 greater troch. miss.
	58	innominate (unfused)	6	10+	263.65	bone	40 - 30	60 - 80	65	articulated
	59	sacral vertebrae	5	5.0 - 10	61.18	bone	35 - 25	71 - 100	56 - 60	incomplete
15N 16W	60	wood stove door hinge	1	10+	113.83	cast iron	9	22	25	complete
	61	olive bottle neck	1	5.0 - 10	39.52	glass	30	29	30	incomplete
	62	metal fragments	2	5.0 - 10	23.25	metal	19	7	40	incomplete
	63	brown bottle base	1	5.0 - 10	63.62	glass	13	17	44	incomplete
	64	clear glass bottle	1	10+	513.81	glass	10 - 25	20 - 26	59 - 63.5	complete
	65	clear glass bottle	1	10+	580.44	glass	39 - 50	0 - 25	67	complete
	66	thoracic vertebrae\ epiph	14 \ 28	10+ \2.5	307.62	bone	0 - 35	20 - 30	64 - 69	articulated
	67	ribs (& rib fragments)	24	10+	432.41	bone	5 - 35	20 - 30	65 - 69	articulated
	68	scapula	2	10+	170.43	bone	35 - 50	20 - 30	69	articulated
	69	green bottle	1	10+	515.83	glass	20 - 30	40 - 50	70	pushup base
15N 17W	70	olive bottle fragments	11	2.5 - 5.0	44.25	glass	21	27	45	assoc. w/ # 61
	71	clear bottle neck	1	5.0 - 10	55.29	glass	23	18	46	incomplete
	72	green bottle	1	10+	431.6	glass	40 - 50	0 - 10	70	rounded neck

5.3.5 EgNq-24

The remains of another small foundation, cellar depression and associated midden were found in the northeast quarter of Section 11, Township 24, Range 6, W3M. The site is likely the result of the farmstead activity of H. Zacharias who moved to the property sometime after 1920 and left the region during the depression years of the 1930's (Cummins Map:1920; Cummins Map:1930; Jim Travis, personal communication 1995).

The foundation is located on a relatively level upland area adjacent to a steep north-facing slope of the South Saskatchewan River valley. An Historic period trail is visible from 7.20 meters to 10.0 meters south of the foundation (figure 5.24). Small surface depressions immediately west of the foundation may be the result of borrow pits related to the construction of the main building at the site. Two manufactured clay bricks were found on the surface of the depressions at 46N 9E and 49N21E. Both artifacts appear to be in secondary context. The foundation itself measures approximately 10.0 meters east-west by 10.5 meters north-south. The southeast corner of the feature measured 45m north and 42m east of datum (figure 5.24). An apparent cellar depression is visible in the western half of the foundation. Due to time and funding constraints of the 1995-1996 survey, no subsurface testing of site features was conducted.

The steep slope to the north of the site was surface inspected for cultural remains and several artifacts were recovered. A manganese lamp base, a basal fragment of a stoneware jug and a catlinite pipe fragment were collected from the 50m x 50m area immediately north of the foundation. The recovery of the pipe fragment is somewhat puzzling given the perceived age of the site, although it may well represent remains from an earlier occupation whose assemblage was later mixed with Historic refuse. Figure 5.25 provides an illustration of the artifact next to a complete specimen from the F.O. Gilbert collection curated at the University of Saskatchewan.

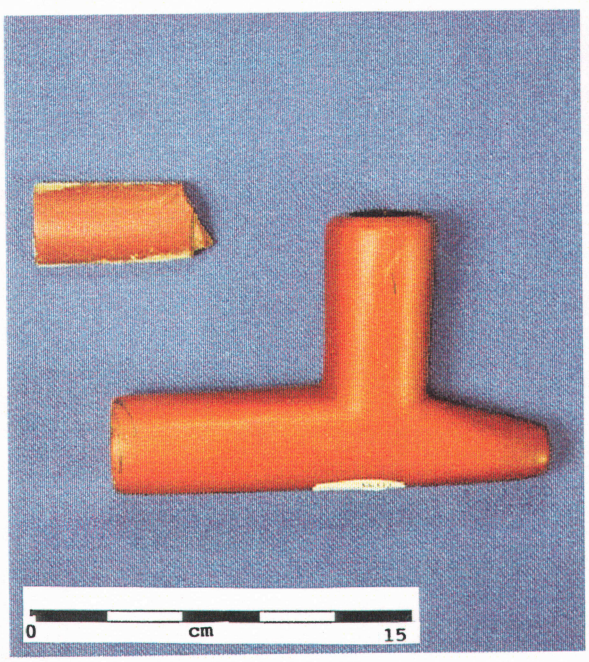


Borden #	Catal. #	Description	Number of Items	Size (cm)	Weight (grams)	Material	Location (surface)	Comments
EgNq-24	1	pipe fragment	1	2.5 - 5.0	37.10	catlinite	midden	incomplete
	2	manganese lamp base	1	10+	632.30	glass	midden	incomplete
	3	ceramic basal fragment	1	10+	1036.20	stoneware	midden	incomplete
	4	manufactured brick	1	10+	903.20	clay	46N 9E	incomplete
	5	manufactured brick	1	10+	1995.10	clay	49N 21E	incomplete

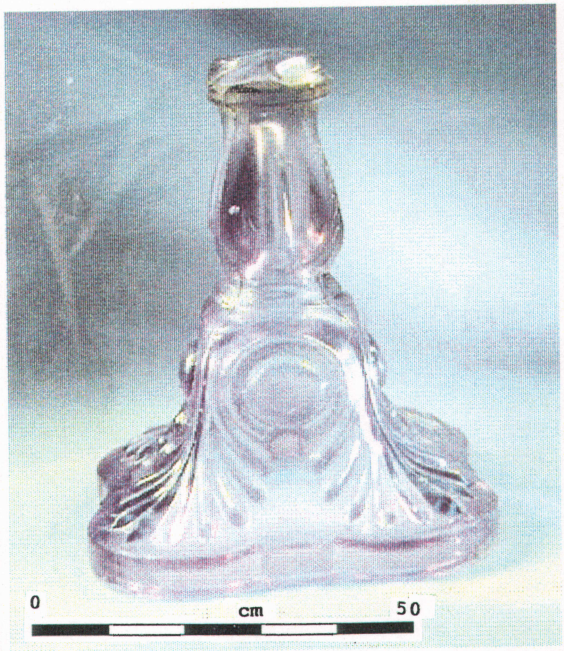
Figure 5.24: Site Map of EgNq-24

Foundation and Historic Trail (looking west)

Borrow Pits West of Foundation (looking west)



Pipe Fragment (left) and Comparative Specimen from the F.O. Gilbart Collection



Lamp Base from Midden

Figure 5.25: Features and Artifacts at EgNq-24

5.3.6 EgNq-26

EgNq-26 consisted of a standing structure in the northwest quarter of Section 18, Township 24, Range 5, W3M. The small shelter, which measures approximately five meters east-west by three meters north-south and stands three meters high, was thought to represent an early farmstead house that had been renovated in recent years for recreational activity. A total of five modern windows and spaces for two new doors had been cut into the structure and modern siding was found stacked against the west wall of the building.

Local informant and current landowner Art Sadler had initiated the renovations, but later found that current legislation prohibited the construction of even a temporary residence along the reservoir shoreline. As a result, he abandoned the project and the structure has remained unused over the past twenty years. Sadler believes the building was first moved onto the property prior to 1950 and was used extensively by local residents as a hunting and fishing shack from the 1940's to the 1970's. As such, the structure was included in the 1995-1996 survey data although no further testing is required at the site. A baseline for the measurement of shoreline erosion was established at the site in 1995-1996 and the results are included in the data presented in Chapter 7. Figure 5.26 provides an overview of the site location, the condition of the structure and the location of the erosion baseline.

Figure 5.26: Structure at EgNq-26

5.4 Regional Collector Survey

As mentioned, the 1995-1996 Regional Collector Survey relied heavily on the data provided by the 1989-1990 Collections Recording Project (Langeman and Froese 1988). The two year project was sponsored by the Saskatchewan Archaeological Society and conducted by Cottonwood Heritage Services of Regina, Saskatchewan. A total of four private collections from the Lake Diefenbaker region were catalogued as a result of the project and data from each is included in the cultural-historical analysis of regional sites in Chapter 6. The present survey was also aided by the Saskatchewan Museum of Natural History's (SMNH) Collection Registration Program which inventoried approximately 130 collections representing 870 sites throughout the province (Conaty et. al. 1988:15-42). The SMNH's program is perhaps the most comprehensive undertaking of its type in Western Canada.

Two additional collections were documented as part of the 1995-1996 survey due to their relevance to sites within the immediate area of Lake Diefenbaker. Chris Campbell's private collection includes artifacts from two sites identified in this chapter as well as a small collection gathered from EfNq-2 (table 5.11). As the significance of the artifacts have been discussed in relation to individual sites previously in this chapter, they will not be repeated here. The public collection curated at the Fred T. Hill Museum in Riverhurst is comprised mainly of artifacts gathered from EfNq-2 prior to 1970, although definite proveniences for all but a few artifacts are not available. As no formal study of the Fred T. Hill collection had been made prior to the 1995-1996 survey, a metric analysis of each artifact was included for education and interpretive purposes. The results of the study are included in the following pages (table 5.12). Figure 5.26 provides an illustration of artifacts from each collection. The regional significance of the artifacts are discussed in the following chapter.

Table 5.11: Artifact Catalogue for the Chris Campbell Collection (Riverhurst)

Location	Cat. #	Description	# of Items	Material	Cult. Affil.	Terrain	Condition
EfNq-2	1	projectile point	1	Swan River Chert	Besant	upland	tip missing
	2	projectile point	1	Swan River Chert	Prairie S-N	upland	tip missing
	3	corner-notched proj. point	1	Silicified Peat	indeterminate	upland	shoulder & tip missing
	4	corner-notched proj. point	1	Swan River Chert	indeterminate	upland	basal portion
	5	preform	1	Silicified Peat	indeterminate	upland	tip missing
	6	projectile point midsection	1	KRF	lanceolate	upland	base & tip missing
	7	biface	1	Feldspathic Siltstone	indeterminate	upland	base missing
	8	perforator	1	Feldspathic Siltstone	indeterminate	upland	working edge missing
	9	endscraper	1	Swan River Chert	indeterminate	upland	complete
EfNr-11	1	projectile point	1	Silicified Wood	Oxbow	beach	medial fracture
	2	large biface	1	Swan River Chert	Oxbow	beach	basal portion
EfNr-15	1	projectile point	1	Swan River Chert	Hell Gap	beach	basally thinned/ground
	2	projectile point	1	Silicified Peat	Oxbow	beach	basal portion
	3	projectile point	1	Silicified Peat	Pelican Lake	upland	base missing
	4	projectile point	1	Swan River Chert	Duncan	upland	tip missing
	5	biface	1	Jasper	indeterminate	upland	complete
	6	biface	1	Silicified Peat	indeterminate	upland	complete
	7	grooved maul	1	Granite	indeterminate	upland	complete
	8	grooved maul	1	Granite	indeterminate	upland	complete
	9	grooved maul	1	Granite	indeterminate	upland	complete
	10	grooved maul	1	Granite	indeterminate	upland	complete
	11	grooved maul	1	Granite	indeterminate	upland	complete
	12	grooved maul	1	Granite	indeterminate	upland	complete

Table 5.12: Artifact Catalogue for the Fred T. Hill Museum Collection (Riverhurst)

Dsplay #	Shape of Base	Notch Type	Lithic Type	Maximum Length	Maximum Width	Base Width	Left Notch	Right Notch	Stem Length	Stem Width	Cultural Affiliation	Comments
C19 - 1	Straight	9 - A	KRF	4.40	2.60	1.94	0.46	0.39	0.84	1.64	P. Lake	Tip Missing
C19 - 4	Straight	9 - A	KRF	4.38	2.59	2.23	0.40	0.30	0.91	1.94	P. Lake	Complete
C19 - 5	N/A	7 - D	KRF	5.48	3.00	N/A	N/A	N/A	2.60	2.12	preform	Base Broken
C19 - 6	Concave	10 - B	Chert	5.32	2.26	1.70	N/A	N/A	N/A	N/A	Clovis	Complete
C19 - 7	Straight	7 - A	KRF	4.41	2.25	1.66	N/A	N/A	1.38	1.60	Alberta	Complete
C19 - 8	Concave	9 - A	SRC	4.45	2.24	1.59	0.36	0.40	0.95	1.30	Hanna	Complete
C19 - 9	Convex	7 - A	SRC	6.01	2.83	1.75	N/A	N/A	2.55	2.10	Alberta	Complete
C19 - 10	Concave	8 - B	Jasper	4.40	2.70	2.57	0.20	0.27	1.07	2.14	indeterminate	Complete
C19 - 11	Concave	9 - A	S. Wood	4.87	2.16	1.96	0.23	0.14	0.98	1.76	P. Lake	Complete
C19 - 12	Concave	11 - A	KRF	4.44	2.40	2.26	0.10	0.20	1.14	2.07	Oxbow	Complete
C19 - 13	Straight	9 - A	Jasper	4.00	2.56	2.19	0.20	0.30	0.40	1.96	P. Lake	Complete
C19 - 16	Concave	7 - 0	Shale	5.36	2.47	1.65	N/A	N/A	1.20	1.77	Duncan	Lateral Edge Missing
C19 - 17	Straight	7 - A	KRF	5.20	2.30	N/A	N/A	N/A	0.87	1.80	Alberta	Base Broken
C19 - 18	Straight	9 - B	Shale	5.42	2.62	2.62	0.53	0.50	0.82	1.70	indeterminate	Complete
C19 - 19	Straight	9 - A	Shale	4.82	2.56	1.82	0.42	0.34	0.74	1.76	Hanna	Complete
C19 - 20	Concave	9 - A	Basalt	5.22	2.20	1.73	0.18	0.36	1.14	1.48	Hanna	Complete
C19 - 21	Straight	9 - A	S. Wood	5.33	1.95	N/A	N/A	0.12	0.54	1.23	Besant	Base Broken
C19 - 22	Straight	7 - B	Rhyolite	5.68	2.78	1.60	N/A	N/A	0.97	1.71	Alberta	Base & Tip Broken
C19 - 23	Straight	9 - A	Chert	5.52	2.39	N/A	0.23	0.39	0.86	1.51	Besant	Base Broken
C19 - 24	Straight	9 - A	S. Peat	5.37	2.16	1.49	0.23	0.31	0.63	1.31	Besant	Complete
C19 - 25	Concave	9 - A	KRF	5.52	2.54	1.74	0.40	0.53	1.00	1.40	Hanna	Complete
C19 - 26	Convex	9 - A	KRF	5.61	2.76	2.12	0.50	0.44	0.71	1.70	P. Lake	Complete
C19 - 27	Concave	9 - A	Chert	3.54	2.05	1.62	0.18	0.24	0.69	1.47	indeterminate	Tip Missing
C19 - 28	Straight	9 - A	KRF	4.26	2.70	1.43	0.73	0.52	0.94	1.25	P.Lake	Complete
C19 - 29	Straight	9 - B	KRF	2.95	1.80	1.80	0.18	0.10	0.79	1.50	indeterminate	Complete
C19 - 30	Straight	9 - A	KRF	5.01	2.17	1.36	0.54	0.60	1.02	1.06	Besant	Complete
C19 - 31	Concave	7 - D	SRC	3.45	1.73	1.43	N/A	N/A	1.08	1.45	Duncan	Complete
C19 - 32	Straight	9 - A	KRF	4.15	1.93	1.62	0.15	0.24	0.85	1.44	Besant	Complete
C19 - 33	Concave	11 - A	Jasper	3.50	2.14	1.93	0.28	0.37	0.76	1.50	Hanna	Complete
C19 - 34	Concave	9 - A	KRF	4.08	2.08	1.59	0.37	0.39	1.04	1.37	Besant	Complete
C19 - 35	Concave	9 - A	KRF	4.03	1.87	1.73	0.26	0.39	0.82	1.27	Besant	Tip Missing
C19 - 36	N/A	9 - A	Jasper	4.05	1.83	N/A	0.32	0.46	0.80	1.09	P. Lake	Broken Base
C19 - 37	Straight	9 - A	KRF	4.83	2.58	2.54	0.33	0.25	0.95	2.07	Besant	Complete
C19 - 38	Straight	9 - A	Chert	3.50	1.77	1.23	0.39	0.32	0.72	0.99	P. Lake	Complete
C19 - 39	Straight	9 - A	KRF	4.06	2.25	1.73	0.33	0.36	0.70	1.59	P. Lake	Complete
C19 - 40	N/A	9 - A	Shale	3.67	2.09	N/A	0.63	0.55	0.64	0.78	P. Lake	Base Broken
C19 - 41	Straight	8 - A	SRC	1.71	1.49	1.40	0.15	0.26	0.62	2.13	Prairie S-N	Complete
C19 - 42	Straight	7 - E	KRF	10.23	2.87	2.07	N/A	N/A	3.70	2.44	Agate Basin	Complete
C19 - 43	Straight	9 - B	Chert	1.71	1.13	1.04	0.13	0.31	0.56	0.75	Prairie S-N	Complete

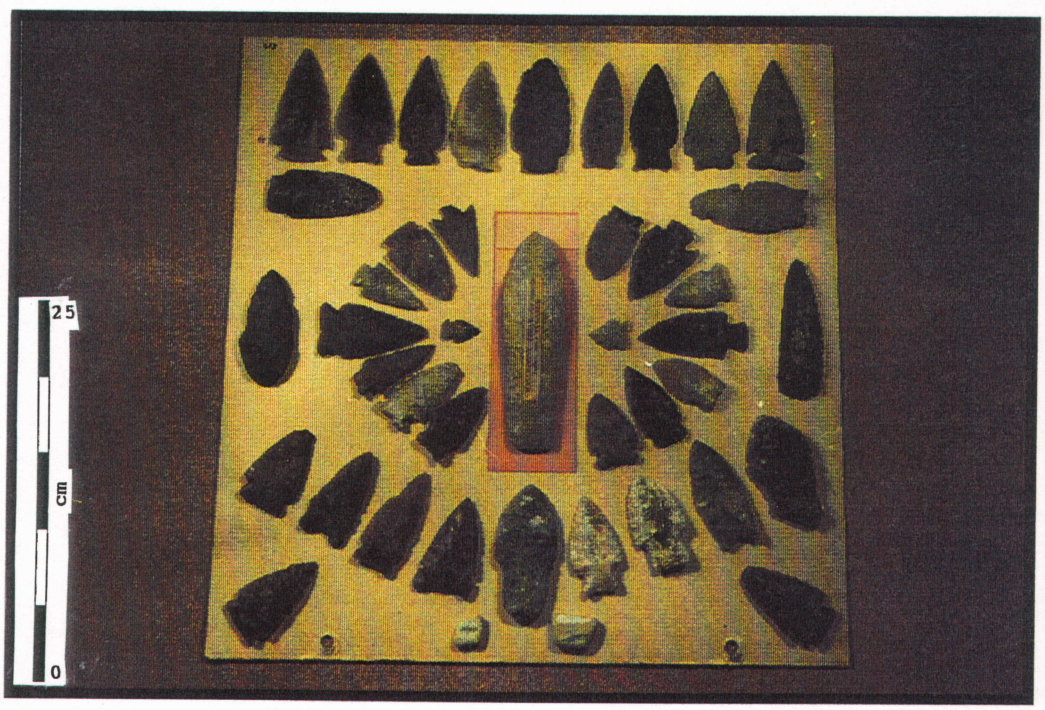
Table 5.12: Artifact Catalogue for the Fred T. Hill Museum Collection (Riverhurst)

Display #	Shape of Base	Notch Type	Lithic Type	Maximum Length	Maximum Width	Base Width	Left Notch	Right Notch	Stem Length	Stem Width	Cultural Affiliation	Comments
C20 - 4	Concave	10 - B	Quartz	3.86	1.72	1.70	N/A	N/A	1.62	1.70	McKean	Complete
C20 - 5	Straight	8 - A	Chert	3.05	1.64	1.64	0.20	0.26	0.77	1.60	Plains S-N	Complete
C20 - 6	Convex	8 - B	Chert	3.25	1.66	1.54	0.37	0.33	0.80	1.41	P. Lake	Complete
C20 - 7	Straight	9 - A	Chert	3.37	1.98	1.54	0.36	0.44	0.64	1.14	P. Lake	Complete
C20 - 8	Concave	8 - A	Chert	1.87	1.50	1.41	0.08	0.13	0.44	1.23	Avonlea	Complete
C20 - 9	Straight	9 - A	Chert	2.70	1.63	1.00	0.47	0.45	0.85	0.67	P. Lake	Complete
C20 - 10	Straight	8 - A	S. Wood	2.32	1.74	1.69	0.24	0.20	0.54	1.36	Avonlea	Complete
C20 - 11	Straight	8 - A	SRC	2.31	1.33	1.33	0.22	0.21	0.69	0.85	Plains S-N	Complete
C20 - 33	Straight	7 - A	Shale	5.80	1.85	1.75	N/A	N/A	1.35	1.75	Scottsbluff	Tip Missing
C20 - 45	Straight	8 - B	Quartz	2.45	1.65	1.42	0.30	0.28	0.65	1.00	Prairie S-N	Complete
C20 - 46	Concave	7 - D	Shale	2.63	1.49	1.49	0.15	0.20	1.08	1.13	Hanna	Complete
C20 - 47	Straight	8 - A	KRF	1.95	1.60	1.56	0.14	0.13	0.33	1.23	Avonlea	Complete
C20 - 55	Straight	9 - B	Quartz	3.23	1.82	1.82	0.20	0.18	0.69	1.38	Prairie S-N	Complete
C20 - 56	Straight	7 - D	Chert	3.18	1.82	1.43	0.30	0.28	0.94	1.18	Hanna	Complete
C20 - 57	Straight	8 - A	SRC	2.95	1.54	1.46	0.15	0.23	0.60	1.04	Plains S-N	Complete
C20 - 58	Straight	8 - A	S. Wood	3.04	1.60	1.54	0.28	0.30	0.71	0.98	Plains S-N	Complete
C20 - 60	Straight	8 - A	Quartz	1.40	1.07	0.99	0.05	0.10	0.60	0.89	Avonlea	Complete
C20 - 61	Concave	11 - A	Jasper	2.52	1.11	1.11	0.09	0.11	0.33	0.85	Oxbow	Complete
C20 - 62	Straight	8 - B	Chert	1.70	1.06	N/A	0.18	0.23	0.45	0.63	Prairie S-N	Base Broken
C20 - 63	Straight	8 - A	Chert	2.00	1.43	1.43	0.22	0.25	0.63	0.96	Plains S- N	Complete
C21- 1	Straight	7 - A	Metal	6.90	1.90	0.88	0.54	0.62	1.16	0.78	Contact	Complete
C21- 2	Straight	7 - C	Metal	5.44	1.75	0.80	0.62	0.55	0.95	0.67	Contact	Complete
C21- 3	Convex	7 - D	KRF	5.26	2.50	1.46	0.62	0.45	2.09	1.28	Preform	Complete
C21- 4	Concave	11 - A	KRF	3.73	2.37	1.97	0.37	0.24	1.16	1.80	Hanna	Complete
C21- 6	Straight	9 - A	KRF	4.63	2.44	2.35	0.32	0.21	1.10	1.99	P. Lake	Complete
C21- 7	Straight	9 - A	Quartzite	3.89	2.10	1.20	0.50	0.40	0.73	1.17	P. Lake	Complete
C21- 8	Straight	7 - A	Metal	5.10	1.67	0.87	0.54	0.35	1.16	0.82	Contact	Complete
C21- 9	Straight	7 - C	Metal	6.11	2.12	0.96	0.67	0.71	1.24	0.86	Contact	Complete
C21- 10	Concave	7 - C	Chert	3.47	2.04	1.45	0.31	0.38	0.99	1.26	Hanna	Complete
C21- 11	Straight	9 - A	KRF	3.70	1.33	1.87	0.49	0.44	0.67	1.32	P. Lake	Tip Missing
C21- 12	Straight	9 - A	KRF	3.59	2.17	1.30	0.54	0.54	0.88	1.09	P. Lake	Complete
C21- 13	Straight	9 - A	KRF	3.64	1.62	1.06	0.41	0.30	0.69	0.92	P. Lake	Complete
C21- 14	Straight	9 - A	KRF	2.47	1.72	1.12	0.32	0.26	0.48	1.13	P. Lake	Complete
C21- 15	Concave	11 - A	KRF	2.58	1.69	1.69	0.10	0.17	0.88	1.33	Oxbow	Complete
C21- 16	Concave	11 - A	Chert	3.13	1.63	1.46	0.10	0.04	0.77	1.40	Oxbow	Complete
C21- 17	Straight	8 - A	Jasper	3.06	1.45	1.35	0.23	0.19	0.67	0.96	Plains S-N	Complete
C21- 18	Concave	11 - A	Chert	1.77	1.83	1.83	0.10	0.07	0.76	1.57	Oxbow	Complete
C21- 19	Straight	9 - A	Jasper	3.00	2.28	1.31	0.61	0.55	0.73	1.10	P. Lake	Tip Missing
C21- 20	Concave	9 - A	KRF	3.07	1.84	1.62	0.35	0.25	0.85	1.3	P.Lake	Complete

Table 5.12: Artifact Catalogue for the Fred T. Hill Museum Collection (Riverhurst)

Display #	Shape of Base	Notch Type	Lithic Type	Maximum Length	Maximum Width	Base Width	Left Notch	Right Notch	Stem Length	Stem Width	Cultural Affiliation	Comments
C21-21	Concave	11 - A	KRF	3.64	2.22	1.60	0.57	0.49	1.20	1.12	Hanna	Complete
C21-22	Straight	9 - B	Shale	3.77	2.23	1.98	0.30	0.25	0.93	1.68	indeterminate	Tip Missing
C21 - 23	Concave	9 - B	KRF	3.60	2.30	1.96	0.32	0.21	0.65	1.68	indeterminate	Tip Missing
C21-24	Concave	11 - A	KRF	4.43	2.21	1.92	0.36	0.28	1.32	1.50	Hanna	Complete
C21-25	Straight	9 - B	Shale	3.72	1.48	1.34	0.14	0.13	0.74	1.16	Avonlea	Complete
C21-26	Concave	11 - A	Quartzite	3.13	2.28	2.12	0.26	0.19	0.78	1.83	Oxbow	Complete
C21-27	Straight	9 - A	KRF	3.64	2.09	1.54	0.46	0.47	0.86	1.14	P. Lake	Complete
C21-28	Straight	9 - A	SRC	3.52	1.65	0.96	0.30	0.28	0.78	0.95	P. Lake	Complete
C21-29	Straight	9 - A	KRF	3.52	2.21	1.88	0.30	0.25	0.89	1.60	P. Lake	Complete
C21-30	Straight	7 - O	KRF	3.93	2.15	1.46	0.46	0.36	1.06	1.23	Hanna	Complete
C21-31	Concave	9 - A	SRC	3.75	2.14	1.74	0.29	0.20	0.94	1.64	Hanna	Complete
C21-32	Concave	11 - A	Shale	3.31	1.65	1.62	0.05	0.06	0.90	1.50	Oxbow	Complete
C21-33	Concave	11 - A	Chert	3.28	1.74	1.43	0.41	0.31	0.80	1.05	McKean	Complete
C21-34	Concave	11 - A	KRF	2.73	2.10	1.62	0.29	0.38	1.10	1.44	Hanna	Complete
C21-35	Concave	11 - A	KRF	3.37	2.13	2.13	0.15	0.20	1.12	1.71	Oxbow	Complete
C21-36	Straight	9 - A	KRF	2.96	2.05	1.54	0.40	0.31	0.64	1.32	P. Lake	Complete
C21-37	Convex	9 - A	Chert	3.42	1.99	1.51	0.24	0.25	0.49	1.32	P. Lake	Complete
C21-38	Straight	9 - A	S. Peat	3.69	2.27	1.86	0.36	0.24	0.71	1.60	P. Lake	Complete
C21-39	Concave	9 - A	Chalcedony	4.18	2.34	2.00	0.26	0.20	0.67	1.78	P. Lake	Complete
C21-40	Concave	11 - A	Chert	3.72	2.01	1.55	0.13	0.28	0.93	1.4	Hanna	Complete
C21-41	Straight	9 - B	S. Peat	3.75	2.08	1.86	0.29	0.38	0.74	1.37	P. Lake	Complete
C21-42	Straight	9 - A	Shale	3.29	2.27	N/A	0.35	0.27	0.67	1.62	P. Lake	Base Broken
C21-43	Straight	9 - A	Quartzite	3.09	2.27	2.01	0.29	0.36	0.97	1.61	P. Lake	Tip Missing
C21-44	Straight	9 - A	Chert	3.58	1.5	1.05	0.3	0.21	0.6	0.82	P. Lake	Complete
C21-45	Straight	9 - A	Quartzite	3.59	1.59	0.9	0.36	0.32	0.65	0.75	P.Lake	Complete
C21-46	Concave	10 - B	Quartzite	3.78	2.08	1.99	N/A	N/A	N/A	N/A	McKean	Complete
C21-47	Straight	9 - A	Jasper	2.68	1.62	1.05	0.45	0.3	0.64	0.75	P. Lake	Complete
C21-48	Straight	8 - A	Chalcedony	2.02	1.53	1.37	0.23	N/A	0.77	1.53	Prairie S-N	Complete
C21-49	Straight	8 - A	SRC	1.94	1.14	1.14	0.14	0.23	0.6	0.7	Prairie S-N	Complete
C21-50	Straight	8 - A	KRF	2.14	1.57	1.57	0.19	0.18	0.7	1.19	Prairie	Complete
C21-51	Concave	9 - A	Quartzite	2.46	2.04	1.68	0.13	0.18	0.56	1.57	Oxbow	Complete
C21-52	Straight	8 - A	KRF	2.02	1.31	1.31	0.19	0.2	0.64	0.82	Prairie	Complete
C21-53	Concave	11 - A	Shale	2.87	1.99	1.99	0.14	0.18	0.41	1.55	Oxbow	Complete
C21-54	Straight	N/A	KRF	2.56	1.56	N/A	0.41	0.46	0.61	0.6	P. Lake	Base Broken
C21-55	Concave	10 - B	Quartzite	2.07	1.54	1.5	N/A	N/A	N/A	N/A	McKean	Complete
C21-56	Concave	1 - A	KRF	2.96	1.69	1.4	0.24	0.16	0.96	1.15	Hanna	Complete
C21-57	Straight	8 - B	Shale	2.83	1.54	1.39	0.23	0.32	0.77	0.99	Prairie S-N	Complete
C21-58	Straight	7 - C	Metal	5.3	1.93	0.96	0.63	0.63	0.87	0.62	Contact	Complete
C21-59	Straight	7 - C	Metal	3.62	1.95	0.7	0.63	0.7	1	0.63	Contact	Complete
C21-60	Straight	8 - A	S. Peat	4.27	1.9	1.9	0.25	0.28	0.75	1.26	indeterminate	complete
C21-61	Straight	9 - A	Quartz	4.41	2.02	1.27	N/A	0.47	0.57	1.06	P. Lake	Left Notch Broken
C21-63	Straight	8 - B	Jasper	3.62	1.8	1.57	0.3	0.25	0.54	1.1	Prairie S-N	Complete
C21-64	Concave	11 - A	Obsidian	4.24	2.28	1.76	0.34	0.27	1.23	1.5	Hanna	Complete
C21-65	Straight	7 - C	Metal	3.68	1.59	0.71	0.44	0.45	0.59	0.64	Contact	Complete
C21-66	Straight	7 - C	Metal	5.81	1.77	0.79	0.55	0.51	0.72	0.66	Contact	Complete
C21-67	Convex	7 - B	Rhyolite	12.91	6.33	N/A	1.19	2.46	2.5	2.3	indeterminate	Complete

Selected Artifacts from the Chris Campbell Collection (Riverhurst, Saskatchewan)



Selected Artifacts from the Fred T. Hill Museum (Riverhurst, Saskatchewan)

Figure 5.27: Private and Public Collections Documented by the 1995-1996 Survey

Chapter Six

6.0 Cultural-Historical Overview

6.1 Introduction

Historically, the development of regional cultural chronologies has been a primary activity of archaeologists. Researchers have sought to examine not only the identities and behaviors of past cultural groups, but how their characteristics changed over time in response to a dynamic physical and social environment. While the focus of archaeology has shifted to problem-oriented inquiries over the past three decades, the development of regional and even micro-regional chronologies remains necessary in order to direct contemporary research and to provide the foundation for higher-level analysis.

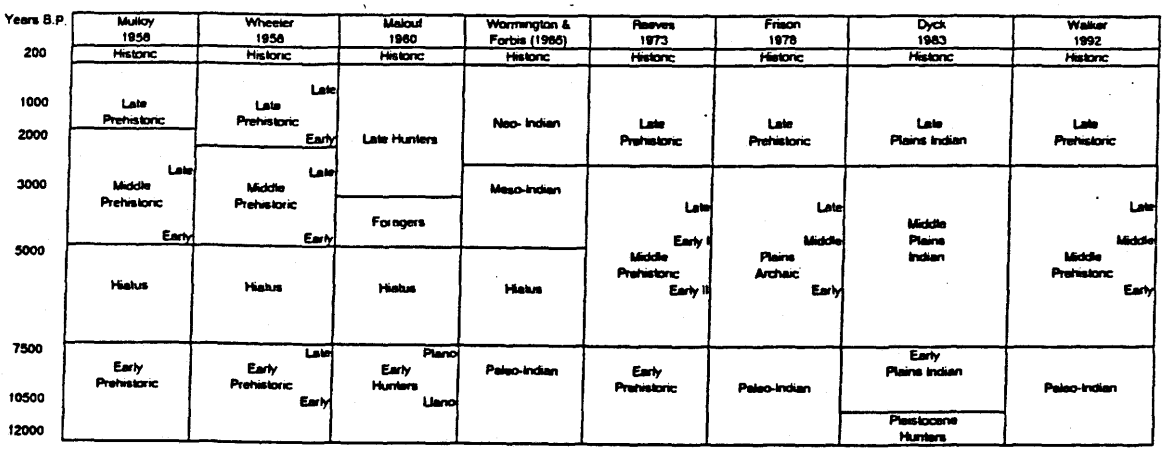
The following chapter attempts to examine the archaeological resources of the Lake Diefenbaker region within the larger context of the Northern Plains. Its primary goal is to synthesize data gathered by the independent studies summarized in chapters three and five in order to provide meaningful interpretations of the presence or absence of Northern Plains cultural assemblages within the region of study. A brief review of established cultural classification systems is presented, followed by an analysis of each cultural complex discovered to date. The problems of archaeological visibility unique to the region are then introduced as the major limitation to further interpretation.

6.2 Cultural Classification of the Northern Plains

It should be noted that a definitive cultural classification system for the Northern Plains remains elusive. A review of Mulloy, Wheeler, Malouf, Wormington and Forbis, Reeves, Frison, Dyck, and Walker (table 6.1) illustrates that classification systems to date have struggled with the responsibilities of providing broad enough classes for the inclusion of identified, and other as yet unidentified cultural groups, while still providing specific sub-classes to differentiate between occupations of a similar period. At the same

time archaeologists have sought to eliminate biased terminology in their definitions, a process which continues at the present time. It is hoped that as individual cultural groups become more clearly defined in the archaeological record, a broader and more representative classification of Northern Plains occupations may be established. For the moment, this thesis will utilize the archaeological classification constructs of cultural 'complexes' and 'series' as defined by Dyck (1983:69). It is important to note that such classifications may, or more often may not, be equivalent to the cultures and tribes which have occupied the region over the past 11000 years.

Table 6.1: Cultural Classifications for the Northern Plains (1958-1992)



after Walker 1992

With respect to terminology, this report follows Walker's classification system in *The Gowen Sites: Cultural Responses to Climatic Warming on the Northern Plains* (1992: 121). Classification systems designed prior to 1973 were rejected then, as they are now, due to the concept of a 'cultural hiatus' on the Northern Plains during the Altithermal. Frison's model (1978) was rejected due to his use of the term 'archaic', as was Ian Dyck's (1983) system which did not allow for secondary chronological distinctions within the Middle Plains Indian period. Although both Reeves (1973) and

Walker (1992) include redundant terminology in their definitions (Walker 1992:121), it may be said that Walker's use of the term 'Paleo-Indian' in place of 'Early Prehistoric' is generally accepted. Thus, as with the author in 1992, Walker's classification is considered "simple and recognizable and...serves the purpose of this study" (1992:121).

6.3 Cultural Complexes on the Northern Plains

6.3.1 Paleoindian Period

The Paleoindian period extends from the retreat of the Laurentide Ice Sheet to the onset of the Altithermal climatic episode. Temporally, it encompasses four millennia from approximately 11500 BP to 7500 BP (table 6.2). Clovis materials represent the earliest conclusive evidence of human occupation in the Paleoindian period, while Lusk materials are currently identified as the latest. The following table attempts to illustrate the relative chronological sequence of these groups through a review of radiocarbon dates obtained from excavated components. The Clovis and Folsom dates were obtained from sites reanalyzed by Haynes *et.al.* in 1993. These sites provide a mean date of approximately 10900 BP for Clovis occupations throughout the Great Plains (Haynes 1993:221-222).

Table 6.2: Chronological Sequence of Paleoindian Complexes in the Northern Plains

Complex	Radiocarbon	Site Name	Source
Lusk	7950-7450 BP	Hell Gap	Vickers 1986
Cody	8750-8350 BP	Hell Gap	Vickers 1986
Alberta	9820-8990 BP	Hudson-Meng	Frison 1991
Hell Gap	10060-9600 BP	Casper, Sister's Hill	Frison 1991
Agate Basin	10430-9350 BP	Agate Basin, Brewster	Frison 1991
Midland	10700-10400BP	Hell Gap	Frison 1991
Folsom	10730-10550 BP	Folsom, Agate Basin	Haynes 1993
Plainview	11570-10760 BP	Mill Iron	Frison 1991
Clovis	11650-10690 BP	Agate Basin, Dent, etc.	Haynes 1993

The latter date for Clovis occupations nearly overlaps Folsom occupations in some locales and coincides with the onset of the Holocene at 10750 ± 150 years BP (Haynes 1993:232-233). Folsom has traditionally been accepted as the successor to Clovis on the Great Plains, although recent investigations at the Mill Iron site in southeastern Montana may support the existence of an intermediary, at least in terms of morphology. Goshen projectile points exhibit morphological characteristics of both Clovis and Folsom, and have been found underlying Folsom components at both the Mill Iron and Hell Gap sites (Irwin-Williams *et. al.* 1973; Frison 1988). To complicate matters further, Goshen projectile points closely resemble Plainview artifacts previously held to be more recent than Folsom (Frison 1991:46).

Plainview projectile points have been documented in artifact scatters within the study region and, as the term Plainview predates Goshen, they are referred to as Plainview in the current report. Because of their scarcity and lack of context, Plainview materials do not require further explanation here. Similarly, Midland type projectile points closely resemble unfluted Folsom projectile points and indeed may simply represent differing hafting or functional variations within an established assemblage (Frison 1991:50-51).

In general, early Paleoindian tool assemblages are characterized by bifacially reduced, fluted and non-fluted lanceolate projectile points; large bifaces; blades and blade cores; knives, gravers and end scrapers; as well as tools crafted from bone and antler (Haynes 1993:219). The exquisite craftsmanship of these artifacts illustrates refined pressure flaking techniques applied to high quality raw materials, possibly using bone or antler punches (Frison 1991:55). Of note, the sophisticated knapping technology was accompanied by the use of lithic and food caches as well as ceremonial interments (Frison 1990:102-103).

Agate Basin projectile points are the first Paleoindian artifacts to appear frequently in the Northern Plains cultural record. Within the Canadian Plains, the Agate

Basin complex has been divided into northern and southern entities as diagnostic artifacts have been recovered throughout the Boreal Forest, Parkland and Plains ecological zones (Meyer 1983:146-147). Agate Basin projectile points were fashioned by percussion reduction of a biface followed by pressure shaping (Frison 1991:382). Hell Gap points were fashioned in an identical manner with slight lateral thinning toward the base. Although Hell Gap projectile point morphology and technology would seem to be derived directly from Agate Basin (Frison 1991:62) it is interesting to note that relatively few artifacts of the Hell Gap type have been recovered in the Canadian Plains region.

The Alberta cultural complex, which includes Alberta and Alberta-Cody projectile point typologies, is well-represented in private collections throughout Saskatchewan particularly in the southeast corner of the province and in the Prince Albert area (Conaty *et.al.* 1988:17). The Fletcher site in south-central Alberta, first investigated by Richard Forbis in 1968, is a bison kill located in an area of low topographic relief (Wilson and MacWilliams 1987:12). The cultural assemblage includes Alberta and Cody complex Scottsbluff projectile points, likely the result of mixing due to modern disturbance of the site. Two spokeshaves with graver tips; one split-pebble end scraper; two sidescrapers; and several bifaces, hammerstones and flakes were also included in the assemblage (Vickers 1986:41).

A characteristic feature of the Alberta complex is the development of a shouldered projectile point. As described by Frison (1991:179):

> The Alberta projectile point introduced a different idea into paleoindian weaponry. The hafting part is a large, parallel-stem with a definite shoulder... that required some technological changes from that of Agate Basin-Hell Gap to haft properly. Upon impact, pressure is delivered to the base and shoulders. A nocked foreshaft with sinew bindings properly applied to prevent the point from being driven backward and splitting the shaft upon impact was necessary.... The technological solution to these hafting problems was not difficult using only pitch and sinew. Alberta points are relatively large and quite heavy and the hafting part or stem is also quite large but not out of proportion to the rest of the projectile point (1991:179).

The Cody cultural complex is named for the unique Cody knives first recovered in association with Scottsbluff and Eden projectile points at the Horner site in northwestern Wyoming (Frison 1991:66). While morphological characteristics of diagnostics vary within the complex, other artifacts of the Cody tool kit retain attributes of the Paleoindian Tradition. The Heron Eden assemblage, EeOi-11, serves as one illustration of the diversity represented within the complex. From 1989 to 1992 excavations were conducted at the site located approximately 15 kilometers south of Prelate, Saskatchewan (Linnamae and Johnson 1993:3). The materials represent the earliest *in situ* artifacts located to date in the province, with radiocarbon dates from the site averaging 9086 $\pm$ 120 years BP (Corbeil 1995:125). The assemblage included eight complete Scottsbluff and Eden projectile points, nine endscrapers, three unifaces, two burin spalls, one burin and one bifacial chopper (Linnamae and Johnson 1993:3-6). Lithic materials used for the points varied from Knife River Flint to Montana Agate to several local materials as in other Cody complex sites (Linnamae and Johnson 1993:4). On the basis of lithic and faunal analysis Linnamae and Johnson concluded that Heron Eden was "a small, special purpose site, temporarily used by a small group of people who were butchering and processing bison carcasses and hides" (1993:11).

Terminal Paleoindian cultural complexes are as yet poorly defined due to their relative scarcity and the lack of context associated with the majority of known sites. The Frederick complex was first identified at the Hell Gap site, where projectile point technology shifted from transverse pressure flaking of the former complexes to parallel-oblique flaking of the following period (Frison 1991:66). Lusk points from the Betty Greene site were described as "degenerate" Frederick in appearance (Frison 1991:67). Of note, the lanceolate shape of the projectile points, the use of blade technology and the presence of scrapers and gravers is consistent with other complexes within the Paleoindian Tradition (Frison 1991:67). To date, the majority of Lusk projectile points

recovered within this province occur along the Saskatchewan River east of Prince Albert (Conaty *et.al.* 1988:30).

A brief discussion of paleoindian subsistence strategies should be presented in relation to their technology. As suggested by the revised temporal distribution of Clovis, and the faunal remains recovered in association with artifacts of the complex, it seems likely that people of the Clovis complex procured both late Pleistocene mammoth and early Holocene megafauna such as *Bison antiquus* as at least part of their adaptive strategy. Mammoth remains have been recovered only in Clovis sites while succeeding complexes focus on bison with increasing regularity and scale (Frison 1990:102).

Most early Paleoindian sites have been located near springs, river or stream terraces and along the shores of ponds and lakes (Stanford 1991:5). This is not to say, however, that procurement strategies remained unchanged during a time of extreme environmental fluctuation. Differences in the utilization of the landscape can be illustrated through analysis of the Blackwater Draw site, where at approximately 11000 BP Clovis hunters utilized a dry, formerly spring-fed lake bottom to harvest mammoth and *Bison antiquus* (Haynes 1993:226). A short time later, as spring discharges increased in response to the onset of the Holocene, Folsom hunters killed bison along the margins of the rejuvenated lake (Haynes 1993:226).

By the time of Agate Basin and Hell Gap occupations, bison trapping in intermittent stream channels, parabolic sand dunes and simple structures appears to have been well established (Frison 1991:164-173). The Agate Basin site represents an arroyo trap in the Cheyenne River basin while the Casper site is located in a dune field in east central Wyoming (Frison and Stanford 1982; Frison 1974). The combined Alberta/Cody bison kill of the Fletcher site is located in a former meltwater channel, where surface flow and ponds likely occurred at the time of occupation in conjunction with a low esker to the north and east (Wilson and MacWilliams 1985:12). In each case, the local landscape provided a resource rich collection area in combination with the natural

features needed to control the movements of small bison herds or groups. The Finley (Moss *et. al.* 1951), Horner (Frison and Todd 1987) and the Carter/Kerr-McGee site (Frison 1984) in Wyoming provide ample evidence that paleoindian cultures were harvesting large numbers of bison by the end of the period.

6.3.2 Early Middle Prehistoric (EMP)

Approximately 7500 years ago, projectile point morphologies on the Northern Plains changed from the lanceolate types of the Paleoindian period to side and corner-notched types that were often crafted from local materials. The modification is generally attributed to the introduction of the atlal, or dart-thrower, which added leverage to the hunters' motion and greatly increased a projectile's distance and velocity (Speidel 1994:5). To date, it can not be determined from the archaeological record whether the sudden appearance of large side and corner-notched projectile points represented a simple diffusion of new technology or a physical immigration of new cultures into the region.

At about the same time, the Altithermal Climatic Episode was reaching its peak from approximately 7500 to 5000 BP (Vance 1991:154-155). This era of low precipitation, increased temperatures and strong winds reduced the carrying capacity of the Northern Plains, although periods of intense drought were relieved by "short term rebound intervals creating a fluctuating resource base which...may have been sufficient to maintain low human population densities" (Walker 1992:14). As inland sloughs and streams disappeared, the resource advantages of major waterways such as that located in the study area undoubtedly took on increasing importance for plains cultures and the species they depended upon.

The initial cultural occupations of this period, often referred to collectively as Early Side-Notched, are as yet poorly documented in the archaeological record of the Northern Plains. One exception is Walker's 1992 monograph on the Gowen sites, which

were located on an alluvial terrace along the South Saskatchewan River near Saskatoon, Saskatchewan. Walker has documented five statistically valid projectile point types within the general classification of the Mummy Cave Series as defined by Dyck (1983). Table able 6.3 identifies each type and gives an approximate date for their occurrence.

Table 6.3: Early Middle Period Projectile Point Types

Projectile Point Style	Site Name	Approximate Age (BP)	Reference
Mount Albion Corner-Notched	Hungry Whistler	5700	Benedict and Olson (1978:48)
Gowen Side-Notched (Salmon River)	Gowen 1	5900	Walker (1992:134)
Hawken Side-Notched	Hawken	6400	Frison (1978:198-199)
Northern Side-Notched (Bitterroot)	Mummy Cave	7100	McCracken et.al. (1978:124-125)
Blackwater Side-Notched	Mummy Cave; Stampede	7600-7200	McCracken et.al. (1978:124-125) Gryba (1976:105)

after Walker 1992

Walker's definition of distinct projectile point types is the first step toward the identification of individual cultural complexes within the Early Middle Prehistoric period. Unfortunately, the problems of interpretation arising from the relative scarcity of the materials has been compounded by misidentification in private and public collections which until very recently had no available reference material. Walker has postulated that the Gowen materials may be representative of a culture ancestral to Oxbow (Walker 1992:131-132), a cultural complex which may have developed *in situ* across the Northern Plains as discussed in the next section.

In terms of subsistence strategies, it would seem reasonable to suggest that Early Middle Prehistoric groups may have developed a more generalized adaptation due to resource shortages resulting from variable environmental conditions. Both Head-Smashed-In and the Hawken site, which produced the largest known sample of EMP projectile points from a single component, were large-scale kills of *Bison bison occidentalis* (Frison 1991:86). The Norby site, located along the South Saskatchewan River valley, is another example of an Early Middle Prehistoric bison kill within the Northern Plains (Zurburg 1991). More common, however, are small to very small assemblages comprised of bison, elk and small mammal remains. Walker's study of 115 EMP sites revealed that habitation sites were limited both in terms of extent and cultural materials present, an indication that small short-term occupations were the norm throughout the period. The clustering of EMP sites along alluvial terraces further suggested that "bison hunting, although continuous, may have involved the procurement of smaller groups of animals along floodplain margins or oxbow lakes where animals came to water" (Walker 1992:129-130).

The shift in settlement patterns to exploit perennial streams and river valleys may have also actuated the procurement and consumption of aquatic species. The Boss Hill site in south-central Alberta was a Late Paleoindian/ EMP site which contained the faunal remains representing one beaver, one muskrat, two ducks, two geese and one fish in association with lanceolate and large corner-notched projectile points (Vickers 1986:46-47). Remains of a muskrat were recovered in the Gowen II faunal assemblage (Walker 1992:105) and the Narrows site may represent a terminal EMP fishing station located between two lakes in southwestern Alberta. The concern of fluvial mixing of cultural assemblages has been raised for the Narrows site (Walker 1992:193). In general, however, the appearance of secondary faunal resources within EMP assemblages would seem to support a diversified subsistence strategy throughout the period with small-scale bison hunting still comprising the primary subsistence adaptation.

6.3.3 Middle Middle Prehistoric (MMP)

While hot dry climatic conditions characterized the Early Middle Prehistoric period, the intensity of the Altithermal likely reached its peak from 6000 to 4000 years BP within the study region (Vance1991:154-155). At the start of this period a new projectile point type, referred to as Oxbow, following its initial archaeological identification at the Oxbow Dam site in southeastern Saskatchewan (Nero and McCorquodale 1958), was in use along the South Saskatchewan River. Culturally, the Oxbow complex may represent a continuation of Mummy Cave series occupations in the region. It does not seem unreasonable to suggest that the cultural adaptations made during the first 1500 years of the Altithermal may have been largely responsible for Oxbow's later success in populating the full extent of the Northern Plains region.

Archaeological data suggests that the Oxbow cultural complex was focussed in the Saskatchewan River Basin and surrounding area for at least 2000 years. Radiocarbon dates from the Gowen 2 and Moon Lake sites suggest a timeline from approximately 6000 to 4100 BP (Walker 1992:131). The Southridge site near Medicine Hat has Oxbow components dated from 4160 to 4260 years BP (Vickers 1986:66), while the Gray Burial site near Swift Current Saskatchewan has produced dates from 5100 to about 3500 BP (Dyck 1983:89).

McKean projectile points first occur in the South Saskatchewan Basin approximately 4000 BP. Radiocarbon dates from McKean levels range from 4130 to 3620 BP in the Cactus Flower site near Medicine Hat and from 4280 to 3480 BP at the Redtail site near Saskatoon (Vickers 1986:69; Ramsay 1993:421). On average, McKean dates within the Canadian Plains are approximately 500 to 700 years younger than those documented in the Black Hills and Wyoming Basin (Frison 1991:78). The association of McKean projectile points, which mark a brief return to a lanceolate morphology, with pit houses reminiscent of Early Middle period cultures in intermontagne regions of the United States, strongly suggests a northward physical movement of cultural groups rather

than technological diffusion into the Canadian Plains. The movement may have been partially in response to increased bison populations resulting from the relatively moist conditions of the Sub-Boreal climatic episode.

The occurrence of two other projectile point types, Duncan and Hanna, in the same stratigraphic components as McKean may be indicative of coeval cultural migrations or merely the changing technology of one group adapting to a plains environment. In either case, it would appear the subsistence practices of the McKean series centered on small-scale bison procurement. Evidence of the use of a bison pound, or corral, has been documented at the Scoggin site in Wyoming, although to date this is the only example of such activity within the MMP (Frison 1991:193). The McKean series lithic assemblage includes the aforementioned projectile points, bifaces, scrapers, gravers, spokeshaves, grinding stones and hammerstones (Vickers 1986:69). Thus, by at least 3600 BP, McKean cultures appear plains-adapted both in terms of bison procurement as a main subsistence strategy and in their lithic technology.

6.3.4 The Late Middle Prehistoric

The final cultural series identified within the Middle Prehistoric period is the Pelican Lake Series. Pelican Lake projectile points were first documented in the lower levels of the Mortlach site in south central Saskatchewan by Boyd Wettlaufer (1955) and have subsequently been identified throughout the Northern Plains. The projectile points are triangular in shape and are characterized by "wide, open corner notches that form sharp points or barbs as they intersect blade edges and bases" (Frison 1991:102-103). Considerable size and morphological variation is present within Pelican Lake diagnostics.

The Pelican Lake lithic assemblage from the Bow Bottom site, which was situated on terrace of the Bow River in Alberta, was comprised of artifacts ranging from ovate, oblique base bifaces, convex base bifaces, projectile points, t-butt and flake butt

drills, gravers, scrapers, unifacial spokeshaves, pieces esqillees, abraders, mauls and grinding stones common to plains-adapted cultures (Vickers 1986:79-80). Biface knives and projectile points made of Knife River Flint and silicified wood, along with bone tools and four bone gaming pieces, were recovered in the Pelican Lake components of the Sjovold site (Dyck and Morlan 1995:505-506).

Within the time frame of Pelican Lake occupations there is extensive archaeological evidence of large-scale bison procurement as the primary subsistence strategy. Three Pelican Lake components have been documented at the Head-Smashed-In bison jump in southern Alberta, as well as several bison pound kill sites in the northern United States. In Saskatchewan, radiocarbon dates on Pelican Lake components range from about 2500 BP at the Bracken Cairn site (DhOb-3) to 3900-3600 BP in level twenty at the Sjovold site (Walker 1983:8; Dyck and Morlan 1995:95). Pelican Lake projectile points have been documented in collections throughout the prairie and parkland zones, with concentrations found in the Prince Albert, Yorkton, Moose Mountain Creek, Lake Diefenbaker and Great Sand Hills regions (Conaty et. al. 1988:17-18). Unfortunately, with the exception of the Sjovold components discussed in section 6.4.2, there has been limited excavation of Pelican Lake components within the South Saskatchewan Basin or surrounding areas.

6.3.5 Late Prehistoric Period

Until recently, the start of the Late Prehistoric period has been synonymous with two major innovations in plains-adapted cultures: the initial use of bow and arrow weaponry and the manufacture of pottery (Germann 1989:42). As discussed in following sections, however, recent data indicates that bow and arrow technology was in use in the Canadian Plains well in advance of the 2000 BP date assigned to the start of the period.

Evidence of the first ceramic vessels used by plains cultures is found in various components of the Besant series. Concoidal vessels with smooth or cord-wrapped

surface impressions and decorative punctates have been recovered in numerous Besant Series assemblages as discussed in Ramsay (1991:82-83) and Meyer and Rollans (1990). The appearance of pottery in Besant Series assemblages may represent culture change indicative of new Plains immigrants, the diffusion of technology through trading relations with other cultural groups and/or an adaptive response to increased demands on portability and food storage resulting from intensive communal hunting practices.

Besant series kill sites such as the Fitzgerald and Melhagen sites, radiocarbon dated from approximately 1460 to1220 BP and 1920 to 1420 respectively, demonstrate the unmatched efficiency and complexity of communal hunting practices at the onset of the Late Prehistoric period (Hjermstad 1995:25-26; Ramsay 1991:287). Besant lithic technology includes a wide-ranging point morphology which for the purposes of this summary may be said to include the Sandy Creek, Samantha, Besant, Sonota and Bratton (Dyck and Morlan 1995) projectile point types. As the documentation referenced above provides detailed analyses of Besant subsistence practices and lithic technology I will not attempt to replicate their findings here.

The Avonlea series, ranging in temporal distribution from approximately 1750 to 1150 BP follows the Besant series on the Northern Plains (Vickers 1986:90). The Avonlea series includes a number of projectile point types- including Classic Avonlea, Carmichael Wide-Eared, Timber Ridge or Sharp-Eared, and Head-Smashed-In Corner Notched (Kehoe 1988:8 and Vickers 1986:90). Avonlea projectile points are generally small, exquisitely crafted artifacts with true side-notches just above the basal edge.

The Avonlea type site (EaNg-1) was initially documented by McCorquodale, Swanston and Hudson in 1956, followed by Kehoe and McCorquodale in 1961 and finally by members of the Saskatchewan Research Council in 1984 and 1985 (Klimko and Hanna 1988:25). An uncorrected radiocarbon date of about 1500 BP was obtained from the 1961 excavations (Klimko and Hanna 1988:25). The site is characteristic of Avonlea in a number of respects. First, the location of the site along an abandoned stream

meander cut into the west valley wall of the Avonlea Creek valley is similar to that of the Lost Terrace site (Davis and Fisher 1988:103-105), the Larson site (Milne 1988:43) and the Fantasy, Beaver Bend and TRJ sites in northeastern Montana (Tratebas and Johnson 1988:89). In each case, valley bottoms and ridges were used as habitation areas while steep valley escarpments contained evidence of kill activities. The locales were ideal to exploit the diverse Avonlea subsistence activities from bison and antelope procurement to a wide range of fish, waterfowl and small mammals as documented at the Lebret site (Smith and Walker 1988:81).

The lithic assemblage at the Avonlea type site was dominated by locally available cherts and chalcedonies, although Knife River Flint was utilized in the manufacture of numerous tools and seems to have been highly regarded as a raw material (Klimko and Hanna 1988:26). Projectile points, bifaces, unifacial scrapers, polymorphic and bipolar cores, retouched flakes and *pieces esquillees* would appear to be common throughout Avonlea assemblages.

Finally, the recovery of ceramic sherds *in situ* during the 1984-1985 Avonlea type site excavations is characteristic of like components throughout the Northern Plains. Both parallel-grooved pottery and net-impressed ceramic sherds are common in Avonlea assemblages. Johnson (1988:141), however, has noted that these artifacts are rarely found together in archaeological components. While it is beyond the scope of the present summary to address the taxonomic classifications of Avonlea ceramics, detailed discussions of various aspects of the Avonlea series may be found in Davis and Fisher (1988).

After approximately 1150 BP, Avonlea technology is replaced in the archaeological record by small, sometimes crudely made, side-notched projectile points. The Late Side-Notched Series includes the Prairie and Plains Side-Notched projectile points which are widely distributed throughout the Canadian Plains and are often associated with the Old Women's, Mortlach, Blackduck and Selkirk ceramics in

Saskatchewan and Alberta (Dyck and Epp 1983:127-129). Prairie Side-Notched projectile points have been part of dated components in Saskatchewan ranging from about 1200 to 700 BP, with later occupations of about 350 BP occurring in Montana, while Plains Side-Notched points appear to occur from about 500 BP to the end of the Late Prehistoric period at approximately 170 BP (Dyck and Epp 1983:129).

Culturally, neither projectile point style can be identified with a single complex within the Canadian Plains region. Rather it would appear that Late Series projectile point styles were utilized by several Plains groups which can best be identified by analyses of their ceramic materials and geographic distributions. The study of how Late Side-Notched Series cultures may have been related to ancestral Avonlea, Besant, or Pelican Lake cultures or to descendant tribes of the historic period is beyond the scope of this summary and is best pursued through a review of Dyck and Epp (1983), Meyer (1983) and Meyer (1993).

6.3.4. The Historic Period

At approximately 300 BP the influence of European trade induced major cultural adaptations within indigenous groups of the Canadian Plains. The opening of York Factory in Hudson Bay in 1681 intensified the distribution of European trade goods that had entered the region years before through existing native trade patterns. Soon after, the introduction of the Spanish horse from tribes to the south forever altered the pedestrian lifeways of native Plains cultures. Over the next century and a half European explorers, fur traders and government agents penetrated the heart of the Canadian Plains. They would introduce the technology, epidemic diseases, and hunting practices that eventually ended traditional cultural adaptations in the region. An excellent summary of historical sources relevant to the Central South Branch Region can be found in the Sjovold site monograph (Dyck and Morlan 1995:13-37).

6.4 Cultural Occupations of the Lake Diefenbaker Region

6.4.1 Paleoindian Occupations

As illustrated in table 6.4, numerous Paleoindian materials have been recovered to date within the study area. The majority of the materials were located as isolated finds, which are comprised of less than five artifacts, or as part of larger artifact scatters which contained artifacts of various temporal affiliations. Although the lack of provenience associated with Paleoindian artifact recoveries prohibits analysis of associated artifacts within the assemblages, the recoveries are significant in terms of their regional occurrence and in the evaluation of development induced erosion presented in Chapter 7. Figure 6.1 on the following page illustrates the geographic distribution of Paleoindian artifact scatters and isolated finds in the region. By discussing the cultural affiliations of the materials located to date, and examining possible explanations for those not represented in the regional record, it is hoped that the recommendations presented in Chapter 8 may be supported.

Table 6.4: Paleoindian Sites in the Lake Diefenbaker Region

BORDEN	TIME	QUARTER	DESCRIPTION	AFFILIATION
EfNq-002	Early Prehistoric	NE27T23R06W3M	artifact scatter	Agate Basin/ Cody
EgNo-001	Early Prehistoric	SW36T23R04W3M	artifact scatter	Agate B./ Bitterroot
EgNo-028	Early Prehistoric	SW10T24R04W3M	artifact/feature combined	Agate B./Bitterroot
EgNo-031	Early Prehistoric	SW02T24R04W3M	artifact scatter	lanceolate
EgNo-032	Early Prehistoric	NE35T23R04W3M	artifact scatter	Cody
EgNo-041	Early Prehistoric	NE09T24R04W3M	artifact scatter	Agate Basin
EgNp-004	Early Prehistoric	NE26T24R05W3M	artifact scatter	Agate Basin
EgNp-005	Early Prehistoric	NE26T24R05W3M	artifact scatter	Agate Basin
EgNp-009	Early Prehistoric	SW25T24R05W3M	artifact scatter	lanceolate
EgNp-016	Early Prehistoric	SE26T24R05W3M	artifact scatter	Agate Basin
EgNp-027	Early Prehistoric	NW28T24R05W3M	artifact scatter	unknown
EgNp-050	Early Prehistoric	SE16T24R04W3M	artifact scatter	Ag. Bas./Scotts/Bitt.
EgNp-057	Early Prehistoric	SE16T24R04W3M	artifact scatter	Agate Basin/Hell Gap
EgNp-063	Early Prehistoric	SE18T24R04W3M	artifact scatter	Agate Basin
EgNq-006	Early Prehistoric	SW29T25R06W3M	artifact scatter	lanceolate
EgNq-007	Early Prehistoric	SE14T25R06W3M	artifact scatter	Agate Basin
EgNq-011	Early Prehistoric	SE22T24R06W3M	artifact scatter	lanceolate
EgNq-016	Early Prehistoric	NE20T25R06W3M	artifact scatter	Clovis
EgNq-018	Early Prehistoric	SW21T25R06W3M	artifact scatter	Lanceolate
EgNr-002	Early Prehistoric	NE17T24R06W3M	artifact scatter	Plainview/Lanceolate
EgNr-003	Early Prehistoric	NW18T24R06W3M	artifact scatter	Lanceolate
EhNr-004	Early Prehistoric	NE02T27R07W3M	artifact scatter	Scottsbluff
EgNr-008	Early Prehistoric	NW18T24R06W3M	artifact scatter	Ag.Bas./ Lanceolate

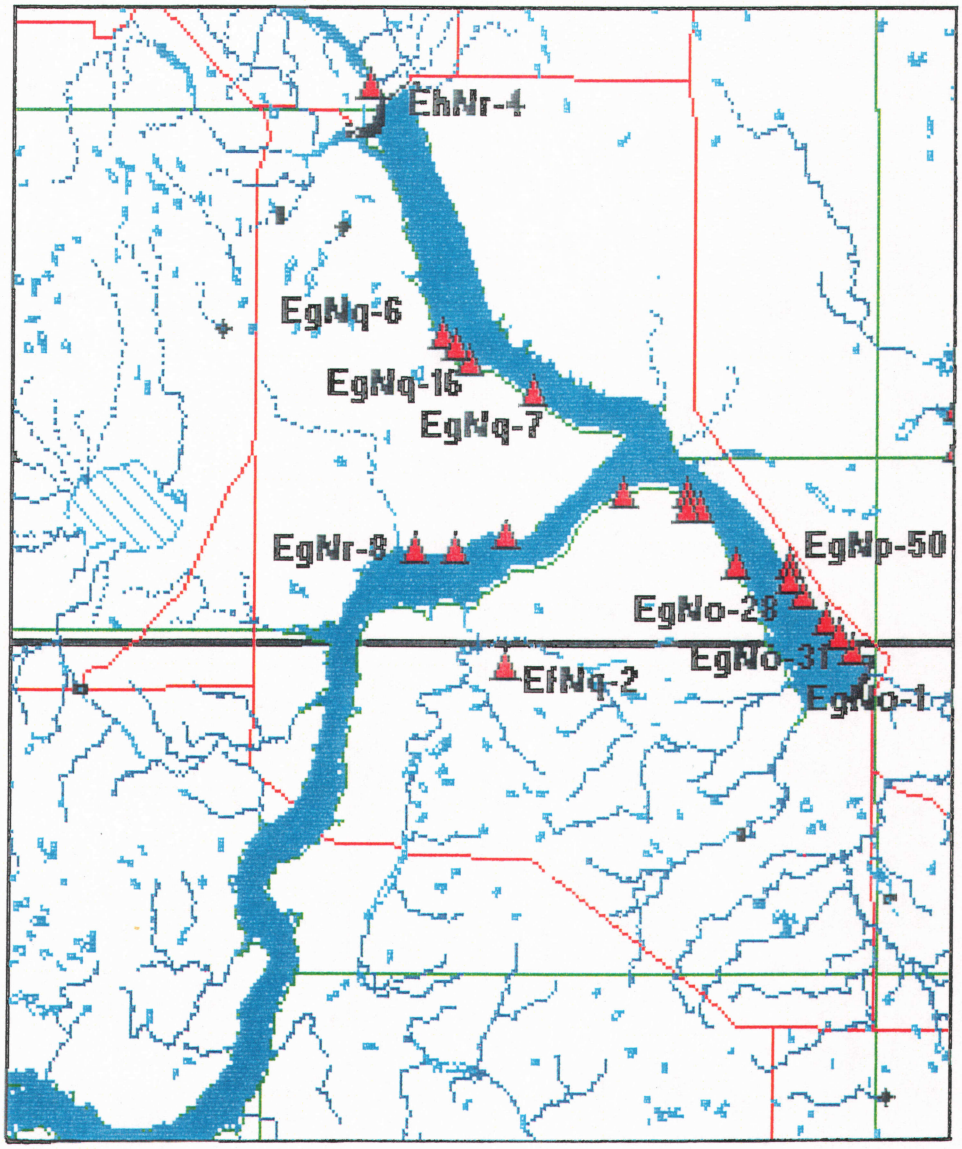


Figure 6.1: Paleoindian Occupations in the Lake Diefenbaker Region

Clovis, Plainview (Goshen), Folsom and Midland projectile point recoveries have been extremely rare within the Lake Diefenbaker study area. Tom Stevenson has documented two Clovis projectile points at EgNq-16, an artifact scatter located along the western shoreline of Diefenbaker Lake approximately 11 kilometers below the elbow. The site is located on the margin of a stabilized dune field originally deposited as glacial outwash along the South Saskatchewan Spillway. Like the Camp Rayner site (EgNr-2), which occurs at the southern periphery of the dune deposits, EgNq-16 was located on a relatively flat upland area which overlooked the South Saskatchewan River. Natural springs are abundant at both locales and would have provided a resource rich microenvironment within approximately 700 meters of the main river channel (Stevenson 1993:12). The artifacts were crafted from Swan River Chert and silicified peat, a local material commonly found along the Saskatchewan River valley and surrounding uplands.

Four Clovis projectile points have been documented in the private collection of Norm and Ida MacDonald who reside in Outlook, Saskatchewan. The artifacts were gathered from the vicinity of Coteau Beach approximately one kilometer north of EgNq-16. All of the artifacts in the MacDonald collection were fashioned from Swan River Chert. Three of the artifacts were complete and ranged in length from 2.5 cm to 5.5 cm. One Clovis projectile point crafted from miscellaneous chert was recorded in the Fred T. Hill Museum collection although the lack of provenience data does not rule out the possibility that the artifact may have been collected elsewhere. Metric data for this artifact is included in the museum catalog provided in Chapter 5.

The SSRP recovered a Plainview projectile point at EdNw-5 in 1959, but unfortunately test excavations the following year failed to produce any further evidence of a Paleoindian assemblage (Mayer-Oakes and Pohorecky 1969:36). Several other Plainview finds have been reported by private collectors along the South Saskatchewan River west of the study area (Conaty *et. al.* 1988 :23).

One Plainview and two Folsom projectile points have also been recovered to date within the immediate vicinity of the Camp Rayner excavations. The area of EgNr-2, which for the purposes of this study includes the adjacent EgNr-3 locale, is one of six artifact scatters that include Folsom projectile points within the South Saskatchewan River drainage area (Germann 1989:61). One Midland type projectile point has also been located at EgNr-2, although the relative scarcity of these artifacts and their equally scarce documentation within the Northern Plains precludes further interpretation of the artifact's occurrence at the present time.

In contrast, Agate Basin materials are frequently represented in both private and public collections from the Lake Diefenbaker region. The Fred T. Hill Museum in Riverhurst currently displays an Agate Basin projectile point made of Knife River Flint that was collected from Big Horse Butte (EfNq-2). Eldon Johnson and Tom Stevenson have recorded three Agate Basin Swan River Chert projectile points in surface finds at the Coteau Pasture site, EgNq-7. The site was located along the western shoreline of Lake Diefenbaker approximately 15 kilometers below the elbow. One of these projectile points, artifact #79-2, could be classified as a Hell Gap type as lateral thinning toward the base of the point is apparent. As discussed in Chapter 5 an incomplete Hell Gap projectile point may have been collected from the beach area immediately adjacent to EfNr-15.

A series of sites documented by Tom Stevenson, including EgNq-6, EgNq-17, EgNq-18, EgNr-2 and EgNr-8, contained "Lanceolate Straight" projectile points which may be categorized as the Agate Basin type. The sites are located on the eastern and southern edge of a stabilized dune field and are often associated with seasonal streams and/or natural springs. EgNq-6 contained two Agate Basin projectile point bases, one of Swan River chert and one of white quartzite, while the EgNq-17 and EgNq-18 artifacts were made from silicified peat (Stevenson 1992:10-21). Like EgNr-2, Stevenson has noted that the EgNq sites have been heavily impacted by private collectors who have

gathered artifacts at these sites due to their proximity to modern resorts and campgrounds (1992 S.A.R.R. Update: EgNq-6).

Another series of Agate Basin recoveries were made along a narrow strip of exposed beach on the eastern shoreline of Douglas Park. During the time of occupation, the sites would have been situated in the midst of a series of small springs and parabolic sand dunes overlooking Aiktow Creek. Figure 6.2 provides an overview of the site locations relative to the average water level of Lake Diefenbaker.

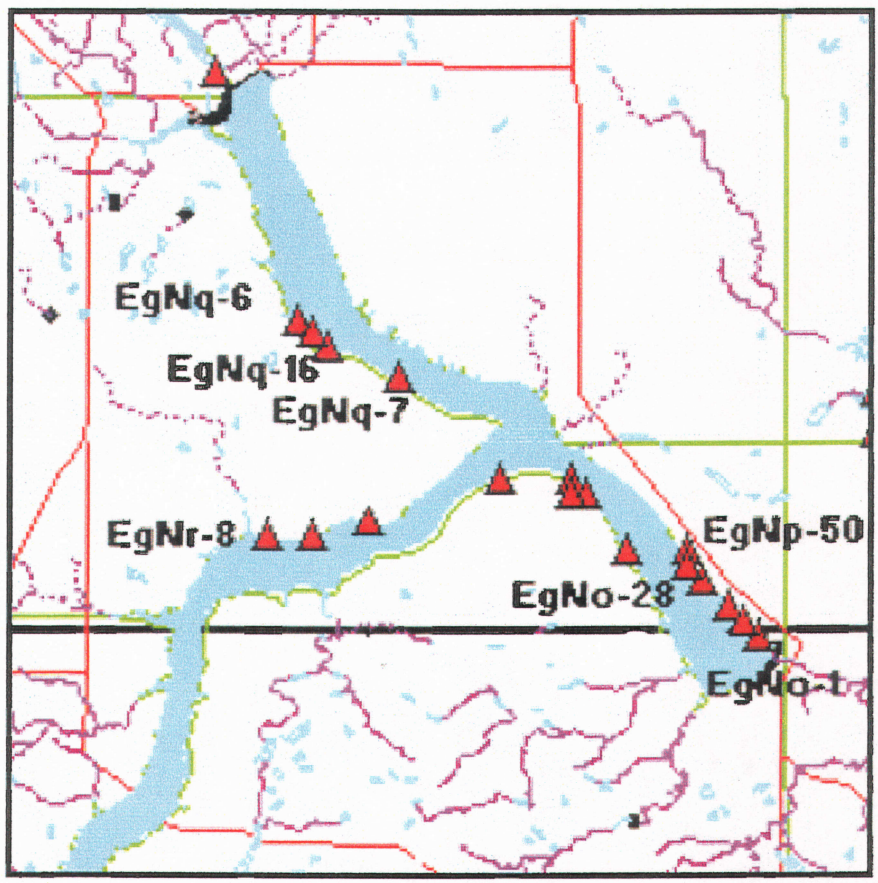


Figure 6.2: Agate Basin Sites in the Qu' Appelle Arm of the Reservoir

Three of the sites contained Agate Basin diagnostics within large artifact scatters representing several thousand years of cultural occupation. EgNp-50 contained Agate Basin, Scottsbluff, Bitterroot, Pelican Lake and Besant projectile point types. EgNp-59 contained both Agate Basin and Hell Gap types, as well as Besant and Plains Side-Notched diagnostics. EgNp-63 produced one Agate Basin, three Oxbow, ten Besant, two Pelican Lake, four Late Side-Notched projectile points and ten indeterminate points, knives and scrapers. In addition the Johnson's recovered a cache of 35 quartzite unifaces, or choppers, from a small area within the artifact scatter. Nearby, an area of concentrated flake debitage was associated with four unidentified Early Side-Notched projectile points.

EgNp-4, EgNp-5 and Egnp-16 were reported by the SSRP as containing Agate Basin artifacts within lithic scatters along the western shoreline of the Gordon MacKenzie Arm of the reservoir. At the time of occupation the sites would have been located on the crest of the Aiktow Creek Valley overlooking its juncture with the South Saskatchewan. Unfortunately the artifacts are not available for metric or lithic analysis.

In all, materials from the Agate Basin complex are well-represented within the study area and are noticeably more abundant than earlier Paleoindian complexes. Twelve artifact scatters which include Agate Basin diagnostics occur along the western and eastern shorelines of Lake Diefenbaker. The sites are located on what were formerly valley crests overlooking the South Saskatchewan River and Aiktow Creek and occur most often in association with nearby parabolic dunes and natural springs.

Alberta projectile points, although easily identifiable, do not appear frequently in archaeological collections in the Lake Diefenbaker region. Two Alberta points were catalogued in the Fred T. Hill Museum collection from Riverhurst. The points were made from Knife River Flint and rhyolite, a coarse-grained igneous rock that occurs naturally along the South Saskatchewan River valley. One Alberta diagnostic made From Swan River chert appears in the MacDonald collection. The most compelling evidence of an *in*

situ deposit of Alberta materials in the region unfortunately mirrors the circumstances of the Fletcher site discovery in Alberta. EhNq-7, or the Road Jog Site II, was discovered in the northwest quarter of Section 36, Township 25, Range 3, west of the 3rd Meridian. Backdirt from a modern dugout was used to build a grid road across a permanent slough. Three Alberta projectile points, two flakes and two bone fragments were subsequently recovered in the fill of the roadway immediately north of the dugout (SARR:1983). Test excavations in the area of the dugout would determine if a portion of the Alberta component remains intact or if recent disturbance has completely destroyed the site.

In comparison to the Alberta complex, Cody complex sites are relatively well represented in the study region. EgNq-16, EgNr-2 and EhNq-6 have all contained Cody materials within artifact scatters along the western shoreline of Lake Diefenbaker. EgNq-16 and EgNr-2 diagnostics were made of Swan River Chert and unidentified chert, respectively, while an Eden projectile point crafted from chalcedony was recovered from EhNq-16. Two Scottsbluff projectile points were found at Big Horse Butte, or EfNq-2. A lithic scatter at EhNr-44, located immediately north of Gardiner Dam, contained a Scottsbluff projectile point of unidentified material. One Knife River Flint Eden projectile point and a Cody biface made from silicified peat are recorded in the MacDonald collection from Coteau Beach. A silicified peat Cody knife was catalogued as part of the Carl Johnson collection.

Artifact scatters in the vicinity of Douglas Park have yielded several Cody materials. The large artifact scatter EgNo-32 contained the midsection of a chalcedony Eden projectile point in addition to diagnostic artifacts of several other cultural complexes. Four crudely made knives crafted from unspecified materials also appear in the assemblage, although the degree of fluvial mixing at the site precludes speculation concerning their cultural affiliation. Four asymmetrical knives also appear in the artifact catalogue from EgNo-1, although it is suggested here that the artifacts more closely resemble those defined by Frison as Middle Plains Archaic or Middle Middle Prehistoric

(Frison 1991:129). Projectile points recovered at EgNp-50 included one complete Scottsbluff diagnostic made of Knife River Flint and one incomplete Scottsbluff point made from quartzite.

In terms of site distribution, it would appear that artifact scatters which contain Cody materials frequently contain older, particularly Agate Basin, materials as well as diagnostics from several later Plains complexes. Unquestionably, this reflects a bias toward multicomponent site areas that have been particularly attractive for cultural occupations over the past ten thousand years and the subsequent reuse of these areas by modern developers and collectors. As discussed in Chapter 7, erosion due to reservoir development has heightened the visibility of Paleoindian artifacts while destroying the context necessary for their analysis.

Artifacts from Late Paleoindian complexes are among the least understood and most poorly documented assemblages within the study region. The lack of stratified components from this era and the difficulty in properly identifying Late Paleoindian diagnostics in private collections makes an analysis of their attributes and distribution speculative at best. Twelve unidentified lanceolate projectile points have been recorded in the MacDonald collection and two unidentified lanceolate diagnostics were recovered by Rev. Kenneth Dean at EgNr-2. Tom Stevenson has recorded a total of two "Late Lanceolate" projectile points at EgNq-16 and independently at EgNr-2 (Stevenson 1993: Table 1). Similarly, a number of artifact scatters within the Douglas Park region contain projectile points thought to be of the Terminal Paleoindian origin. Clearly, however, the artifacts represent a very small sample of Paleoindian period diagnostics in the study area and a great deal of further research is required prior to any evaluation of cultural complexes of the period.

6.4.2 Early Middle Prehistoric Period

The problems associated with assigning cultural affiliations to Late Paleoindian artifacts are even more pronounced in the Early Middle Prehistoric period. Eighty-two Early Side-Notched projectile points remain unidentified in the MacDonald collection alone. Similar finds are recorded in lesser numbers in the Dean, Johnson, Stevenson and SSRP collections. Moreover, until very recently, the identification of a projectile point as Early Side-Notched has been problematic. The Gowen and Bitteroot types are probably the most recognized of those included in Walker's classification, although even these may require metric analysis to be distinguished from their Late Prehistoric counterparts.

Bitterroot projectile points have been recovered in artifact scatters at EgNp-50, EgNo-1 and EgNo-28 but as the site locations have been discussed in detail in previous sections they will not be repeated here. In 1979, Eldon Johnson recovered a large corner-notched projectile point within the immediate area of EgNq-8 that seems very likely to belong to the Early Middle Prehistoric period (SARR 1979). The Knife River Flint artifact does not, however, conform to any of the morphologies discussed by Walker in 1992 and remains unidentified at present.

Recent excavations at the Camp Rayner site may soon provide considerable insight into the technological and morphological attributes of diagnostic artifacts from the Early Middle Prehistoric. A cultural level was found immediately below an Oxbow level in an apparently undisturbed context. It would seem certain that, together with the information gathered at the Gowen (Walker 1992) and Norby (Zurburg 1991) sites, the Camp Rayner materials will allow much more detailed classifications of existing collections and new materials found in the region.

6.4.3 Middle Middle Prehistoric Period

Artifacts of the Middle Middle Prehistoric Period are numerous in the Lake Diefenbaker region, as they are throughout much of the Canadian Plains. Oxbow

projectile points have been recovered in all of the surface collections discussed so far, with the MacDonald collection alone containing 218 diagnostic artifacts. The large number of Oxbow materials recovered to date is likely the result of two main factors: the extended length of time (at least 2000 years) the Oxbow complex maintained occupations within the region and the clustering of Oxbow sites along major waterways. Areas of numerous surface finds such as the Saskatchewan River near Prince Albert and the South Saskatchewan, Arm and Moose Mountain waterways in the southern half of the province (Conaty *et. al.* 1988:17) suggest that peoples of the Oxbow complex intensively utilized riverine ecosystems, perhaps initially in response to the harsh environmental conditions associated with the Altithermal.

A wide variety of local raw materials were used in the manufacture of Oxbow artifacts. In the MacDonald collection, for example, these include 77 projectile points made of silicified peat, 55 of Swan River chert, 19 of generic cherts, 19 of silicified wood, 11 of generic siltstone, 10 of generic chalcedonies, eight of Gronlid siltstone, seven of jasper, five of quartzite, four of fused shale and three of Feldspathic siltstone. The use of locally available lithic materials is in contrast to recognized Cody occupations where many of the artifacts recovered were manufactured of Knife River Flint. Once again, further research and a much larger database from the Late Paleoindian/ Early Middle Prehistoric period is necessary for substantive analysis.

Several artifact scatters along the reservoir are worthy of discussion in relation to their Oxbow components. Figure 6.3 and Table 6.5 provide an overview of Middle Prehistoric site locations and cultural affiliations referenced in the following paragraphs. Collectively, 19 artifact scatters in the Lake Diefenbaker region contain Oxbow materials. Of these, 16 scatters represent multiple cultural affiliations with seven sites bearing Paleoindian, Oxbow and/or McKean and Pelican Lake series artifacts in combination. The three site areas which contain Oxbow as the only materials from the Middle Prehistoric are EgNo-29, EgNp-55 and EgNp-62. In every case the

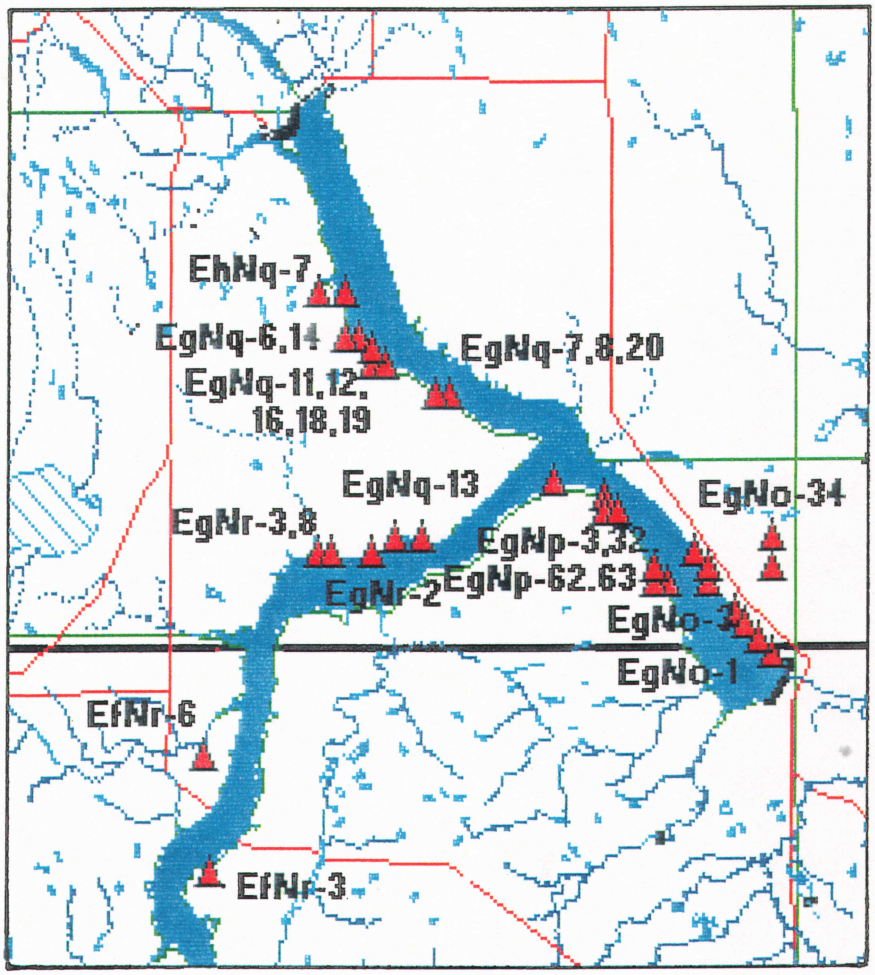


Figure 6.3: Middle Prehistoric Occupations in the Study Region

Table 6.5: Middle Prehistoric Sites in the Lake Diefenbaker Region

BORDEN_	TIME	QUARTER	DESCRIPTION	AFFILIATION
EfNr-003	Middle Prehistoric	NW20T22R07W3M	artifact find	Pelican Lake
EfNr-006	Middle Prehistoric	NW08T23R07W3M	artifact scatter	Pelican Lake
EgNo-001	Middle Prehistoric	SW36T23R04W3M	artifact scatter	Pelican Lake
EgNo-003	Middle Prehistoric	SW02T24R04W3M	artifact scatter	Oxbow/ P.Lake
EgNo-027	Middle Prehistoric	NE09T24R04W3M	artifact scatter	Oxbow/ P.Lake
EgNo-029	Middle Prehistoric	NE03T24R04W3M	artifact scatter	Pelican Lake
EgNo-031	Middle Prehistoric	SW02T24R04W3M	artifact scatter	McKean/ P.Lake
EgNo-032	Middle Prehistoric	NE35T23R04W3M	artifact scatter	Oxb./McK/ P.Lake
EgNo-034	Middle Prehistoric	SW24T24R04W3M	artifact scatter	Pelican Lake
EgNo-035	Middle Prehistoric	SW13T24R04W3M	artifact scatter	Pelican Lake
EgNp-003	Middle Prehistoric	NE26T24R05W3M	artifact scatter	McKean
EgNp-005	Middle Prehistoric	NE26T24R05W3M	artifact scatter	Pelican lake
EgNp-011	Middle Prehistoric	NE26T24R05W3M	artifact scatter	Pelican Lake
EgNp-014	Middle Prehistoric	SW25T24R05W3M	artifact scatter	Pelican Lake
EgNp-015	Middle Prehistoric	SE26T24R05W3M	artifact scatter	McKean/ P. Lake
EgNp-017	Middle Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-018	Middle Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-019	Middle Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-020	Middle Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-023	Middle Prehistoric	SW25T24R05W3M	artifact scatter	McKean
EgNp-025	Middle Prehistoric	SW25T24R05W3M	artifact scatter	McKean
EgNp-028	Middle Prehistoric	SE33T24R05W3M	artifact scatter	unknown
EgNp-032	Middle Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-050	Middle Prehistoric	SE16T24R04W3M	artifact scatter	McKean/ P.Lake
EgNp-055	Middle Prehistoric	NW16T24R04W3M	artifact scatter	Oxbow
EgNp-056	Middle Prehistoric	NW16T24R04W3M	artifact scatter	Oxb./McK./P.Lake
EgNp-057	Middle Prehistoric	SE16T24R04W3M	artifact scatter	Pelican Lake
EgNp-061	Middle Prehistoric	NW08T24R04W3M	artifact scatter	unknown
EgNp-062	Middle Prehistoric	NE07T24R04W3M	artifact scatter	Oxbow
EgNp-063	Middle Prehistoric	SE18T24R04W3M	artifact scatter	Oxbow/ P. Lake
EgNq-006	Middle Prehistoric	SW29T25R06W3M	artifact scatter	Oxbow/ P. Lake
EgNq-007	Middle Prehistoric	SE14T25R06W3M	artifact scatter	Oxb./McK./P.Lake
EgNq-008	Middle Prehistoric	SW14T25R06W3M	artifact scatter	McKean
EgNq-011	Middle Prehistoric	SE22T24R06W3M	artifact scatter	Pelican Lake
EgNq-012	Middle Prehistoric	SE21T24R06W3M	artifact scatter	Pelican Lake
EgNq-013	Middle Prehistoric	NE17T24R06W3M	artifact scatter	Pelican Lake
EgNq-014	Middle Prehistoric	SE30T25R06W3M	artifact scatter	Oxbow/ McKean
EgNq-015	Middle Prehistoric	NE20T25R06W3M	artifact scatter	Ox./McK./P. Lake
EgNq-016	Middle Prehistoric	NE20T25R06W3M	artifact scatter	Ox./McK./P. Lake
EgNq-017	Middle Prehistoric	SE20T25R06W3M	artifact scatter	Ox./McK./P. Lake
EgNq-018	Middle Prehistoric	SW21T25R06W3M	artifact scatter	McK/Pelican Lake
EgNq-019	Middle Prehistoric	NE20T25R06W3M	artifact scatter	Oxbow/McKean
EgNq-020	Middle Prehistoric	SW14T25R06W3M	artifact scatter	McKean
EgNr-002	Middle Prehistoric	NE17T24R06W3M	artifact scatter	Ox./McK./P. Lake
EgNr-003	Middle Prehistoric	NW18T24R06W3M	artifact scatter	Ox./McK./P. Lake
EgNr-004	Middle Prehistoric	NE13T24R07W3M	artifact scatter	subsumed EgNr-2
EgNr-008	Middle Prehistoric	NW18T24R06W3M	artifact scatter	Oxbow/McKean
EhNq-007	Middle Prehistoric	NE31T25R06W3M	artifact/ feature	Oxbow/McKean
EhNr-039	Middle Prehistoric	NE36T25R07W3M	artifact scatter	McKean/P. Lake

sites were formerly located on valley uplands and terraces within 500-700 meters of the South Saskatchewan River or Aiktow Creek and have since been exposed by high water levels associated with reservoir development.

EhNq-7 has the greatest potential to contribute to our current understanding of the Oxbow complex. The site was first interpreted by Norm MacDonald as a Besant kill site with Oxbow artifacts occurring in a mixed assemblage as a result of shoreline erosion. The 'Besant' projectile points from the site were later reexamined by Tom Stevenson who concluded they could in fact represent an Oxbow morphology. All subsequent diagnostics collected at the site were identified as Oxbow. The presence of faunal remains, including two bison skulls and a perforator fashioned from a bison rib shaft, in addition to numerous scrapers and quartzite reduction debitage strongly suggests a kill and/ or processing event (Stevenson 1993:37). As noted by Stevenson (1993:37), the site may thus represent the first Oxbow kill site suitable for excavation, as a thick dark lens is apparent in the adjacent embankment where stratified components may remain undisturbed. Subsurface testing is strongly recommended at the site prior to further disturbance by active shoreline erosion.

The general area of Coteau Beach would seem to be an excellent area to test for *in situ* components of subsequent cultural occupations as well. In addition to the Oxbow artifacts gathered from the vicinity, Norm and Ida MacDonald also recovered 184 projectile points from the McKean series. Of these, 129 are morphologically the McKean type, 43 are the Hanna type and 12 are Duncan. Tom Stevenson has documented seven artifact scatters along the western shoreline from Snakebite Bay to Gardiner Dam which produced over 20 McKean series diagnostics. Table 6.6 provides an overview of artifact scatter cultural affiliations as they relate to the Middle and Late Prehistoric periods, including those with McKean series components.

Table 6.6: Coteau Beach and Camp Rayner Affiliations

Borden#	Plains	Prairie	Avonlea	Besant	Pel. Lake	Dun/Ha/McK	Oxbow	Early S-N
EgNq-6	x	x		x	x		x	
EgNq-11					x			
EgNq-12		x			x			
EgNq-13					x			
EgNq-15		x		x	x	x	x	
EgNq-16	x	x	x	x	x	x	x	x
EgNq-17	x	x	x	x	x	x	x	
EgNq-18	x	x	x		x	x		
EgNq-19		x		x		x	x	
EgNr-2	x	x	x	x	x	x	x	x
EgNr-8	x	x				x	x	
EhNq-6		x						
EhNq-7				x			x	

after Stevenson 1993

Sites in the Douglas Park region have also produced McKean Series materials, particularly at EgNo-32 and EgNp-50. One Hanna projectile point made of Knife River Flint and one McKean point of white chalcedony were recovered at EgNo-32, while one Hanna type made from agate and one McKean type made from chalcedony were found at EgNp-50. EgNo-29 and EgNo-31 each contained a single McKean projectile point.

The SSRP documented several McKean series diagnostics in artifact scatters located prior to reservoir development. However, as mentioned previously, the artifacts are not catalogued in terms of their material types or numbers. In 1995, the EgNp-78 and EgNp-79 sites along the southeastern shoreline of Lake Diefenbaker produced three Hanna projectile points.

The use of locally available lithic materials is consistent throughout the era of the McKean series as shown by an analysis of material types in the MacDonald collection. The predominant raw materials of McKean type projectile points included 43 silicified peat, 35 Swan River chert, nine unspecified cherts, nine siltstone, three Gronlid siltstone, seven chalcedony, seven Knife River Flint, six silicified wood, six jasper, three quartzite and one fused shale. Duncan and Hanna artifacts were made from the same raw materials with the same preferences apparent in the utilization of locally available cherts,

chalcedonies and siltstones. The presence of Knife River Flint in the McKean series lithic assemblage is consistent with plains groups of both earlier and later periods.

To date, there have been very few scientific excavations of McKean components within the study area. Currently, information is being gathered at the Camp Rayner site and sites along the South Saskatchewan River at Wanuskewin Heritage Park (Jones 1997 personal communication; Walker 1997 personal communication). In 1995, Ian Dyck and Richard Morlan documented a McKean series component from the Sjovold site excavation which was situated midway between those mentioned above. The investigators identified Layer XXI, located 402-413 cm below surface, as indicative of a Hanna campsite at a river crossing along the South Saskatchewan. One Knife River Flint projectile point, a Knife River Flint biface preform, a Knife River Flint biface knife and a chipping hammer were found in association with a faunal assemblage comprised mainly of bison (Dyck and Morlan 1995:535). Fire-cracked rock and ash deposits indicative of two hearths were also found. The researchers concluded that all the remains were the result of disposal activities at the time of occupation rather than the primary activity areas (Dyck and Morlan 1995:534). Further recovery of McKean series artifacts, and those of earlier occupations, was precluded by the fact that the Sjovold locale was not available for occupation due to in-channel fluvial processes prior to approximately 4000 BP (Dyck and Morlan 1995:535).

6.4.4 Late Middle Prehistoric Period

Until recently, the Pelican Lake series was thought to extend from about 3100 to 1900 BP (Frison 1991:104). Two Pelican Lake components were identified at the Sjovold site with upper and lower components identified as a Pelican Lake summer camp and a Pelican Lake bivouac, respectively. Radiocarbon dates of 3900 to 3600 BP for the lower component are among the oldest for the Northern Plains and extend the era of Pelican Lake occupations to nearly two millennia on the Northern Plains. Unfortunately, the

identification was made on the basis of a single projectile point in association with "two hearths and sparse amounts of bone, coarse rock [and] chipped stone debris" (Dyck and Morlan 1995:513). Due to poor stratigraphic separation of the components the intrusion of materials from the upper Pelican Lake level dated from 2700-2400 BP could not be ruled out (Dyck and Morlan 1995:485).

Of further interest, Dyck and Morlan (1995:518) noted that the projectile point morphology of the bivouac level point falls within discriminant classification equations for an arrowhead. As a result, the researchers contended "that bows and arrows were not only a part of the Pelican Lake tool kit, but part of the tool kit from the beginning of Pelican Lake" estimated to be approximately at least 3600 BP (Dyck and Morlan 1995:537). Although it is beyond the scope of the current effort to include a detailed metric analysis of all the Pelican Lake projectile points documented in the region, such analysis is recommended for future research. Pelican Lake diagnostics are present in all of the private and public collections discussed so far and in the catalogues of every survey effort in the region. Either on their own or as part of a broader analysis of Pelican Lake point morphology, diagnostics from the Lake Diefenbaker could provide a large enough sample to help support or refute Dyck and Morlan's hypothesis and provide insight into a definition of regional complexes.

Once again, the largest data base available for the classification of lithic raw materials used to manufacture stone tools is found in the MacDonald collection. One hundred and forty-one projectile points were recorded as artifacts of the Pelican Lake series. Relatively few artifacts are made from Knife River Flint and a majority are crafted from silicified peat, Swan River chert, siltstones and local chalcedonies. In terms of numbers, 54 of the points were made of silicified peat while 43 were crafted from Swan River and other cherts, 16 of Gronlid and other siltstones, 14 of unspecified chalcedonies, three of Knife River Flint, four of silicified wood, three of fused shale, two of jasper and one each of quartzite and obsidian.

Artifact scatters containing Pelican Lake projectile points are numerous along both shorelines of the reservoir. As illustrated in table 6.6, eleven of these sites have been documented by Tom Stevenson in the Coteau Beach area. EgNq-11 and EgNq-13 contain only Pelican Lake diagnostics while EgNq-6, 7, 8, 12, 15, 16, 17, 18, and 19 represent multiple occupations over long periods of time. EgNo-1, 3, 27, 31, 32, 34 and 35 all contained Pelican Lake materials within artifact scatters in the vicinity of Douglas Park. The SSRP recorded six sites, EgNp-3,5,11,50,56 and 57, containing corner-notched projectile points. EgNp-15 was sub-surface tested and recorded as an "uninterrupted four thousand year sequence of occupation" (SARR:1959). The tests, however, did not produce clear evidence of a stratified Pelican Lake component. Clearly, supporting evidence gathered by continuing excavation of Pelican Lake materials would add substantially to our understanding of this sparsely documented cultural series and its relationship to the Late Prehistoric occupations of the Lake Diefenbaker region (figure 6.4, table 6.7).

Table 6.7: Late Prehistoric Sites in the Study Region

BORDEN#	TIME	QUARTER	DESCRIPTION	AFFILIATION
EfNo-005	Late Prehistoric	NE19T23R03W3M	artifact find	unknown
EfNo-009	Late Prehistoric	SE22T23R04W3M	artifact find	unknown
EfNr-007	Late Prehistoric	NW08T22R07W3M	artifact find	unknown
EgNn-001	Late Prehistoric	NE22T24R03W3M	scatter/feature	Besant
EgNo-001	Late Prehistoric	SW36T23R04W3M	artifact scatter	Prairie
EgNo-003	Late Prehistoric	SW02T24R04W3M	artifact scatter	Besant/Plains
EgNo-004	Late Prehistoric	SW02T24R04W3M	artifact scatter	Prairie
EgNo-027	Late Prehistoric	NE09T24R04W3M	artifact scatter	Besant/Plains
EgNo-028	Late Prehistoric	SW10T24R04W3M	scatter/feature	Besant
EgNo-031	Late Prehistoric	SW02T24R04W3M	artifact scatter	Besant
EgNo-032	Late Prehistoric	NE35T23R04W3M	artifact scatter	Besant
EgNo-034	Late Prehistoric	SW24T24R04W3M	artifact scatter	Besant
EgNo-035	Late Prehistoric	SW13T24R04W3M	artifact scatter	Besant
EgNp-001	Late Prehistoric	NW35T24R05W3M	scatter/feature	unknown
EgNp-003	Late Prehistoric	NE26T24R05W3M	artifact scatter	unknown
EgNp-004	Late Prehistoric	NE26T24R05W3M	artifact scatter	unknown
EgNp-005	Late Prehistoric	NE26T24R05W3M	artifact scatter	unknown
EgNp-006	Late Prehistoric	NE26T24R05W3M	artifact scatter	unknown
EgNp-007	Late Prehistoric	SE26T24R05W3M	scatter/feature	unknown
EgNp-009	Late Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-010	Late Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-015	Late Prehistoric	SE26T24R05W3M	artifact scatter	unknown
EgNp-017	Late Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-018	Late Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-019	Late Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-021	Late Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-022	Late Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-023	Late Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-024	Late Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-026	Late Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-031	Late Prehistoric	SW25T24R05W3M	artifact scatter	unknown
EgNp-039	Late Prehistoric	SE26T24R05W3M	artifact scatter	unknown
EgNp-050	Late Prehistoric	SE16T24R04W3M	artifact scatter	Besant

Table 6.7: Late Prehistoric Sites in the Study Region

EgNp-055	Late Prehistoric	NW16T24R04W3M	artifact scatter	Besant
EgNp-056	Late Prehistoric	NW16T24R04W3M	artifact scatter	Besant/Avonlea
EgNp-057	Late Prehistoric	SE16T24R04W3M	artifact scatter	Besant/ Plains
EgNp-058	Late Prehistoric	NW18T24R04W3M	artifact scatter	Besant
EgNp-059	Late Prehistoric	SW19T24R04W3M	artifact scatter	Besant
EgNp-060	Late Prehistoric	NE24T24R05W3M	artifact scatter	Besant/ Prairie
EgNp-061	Late Prehistoric	NW08T24R04W3M	artifact scatter	unknown
EgNp-063	Late Prehistoric	SE18T24R04W3M	artifact scatter	Besant/Prairie
EgNp-075	Late Prehistoric	SE24T24R05W3M	artifact find	Besant
EgNp-076	Late Prehistoric	SW24T24R05W3M	artifact scatter	unknown
EgNq-006	Late Prehistoric	SW29T25R06W3M	artifact scatter	Bes/Pra/Plains
EgNq-007	Late Prehistoric	SE14T25R06W3M	artifact scatter	Besant/Avonlea
EgNq-008	Late Prehistoric	SW14T25R06W3M	artifact scatter	Besant
EgNq-010	Late Prehistoric	SE20T25R06W3M	artifact scatter	unknown
EgNq-012	Late Prehistoric	SE21T24R06W3M	artifact scatter	Prairie
EgNq-014	Late Prehistoric	SE30T25R06W3M	artifact scatter	Besant
EgNq-015	Late Prehistoric	NE20T25R06W3M	artifact scatter	Besant/Prairie
EgNq-016	Late Prehistoric	NE20T25R06W3M	artifact scatter	Bes/Avo/Pra/Pla
EgNq-017	Late Prehistoric	SE20T25R06W3M	artifact scatter	Bes/Avo/Pra/Pla
EgNq-018	Late Prehistoric	SW21T25R06W3M	artifact scatter	Avo/Pra/Pla
EgNq-019	Late Prehistoric	NE20T25R06W3M	artifact scatter	Besant/Prairie
EgNq-020	Late Prehistoric	SW14T25R06W3M	artifact scatter	Prairie
EgNq-021	Late Prehistoric	NE30T25R06W3M	artifact scatter	Prairie
EgNq-022	Late Prehistoric	SE21T25R06W3M	artifact scatter	Plains
EgNr-002	Late Prehistoric	NE17T24R06W3M	multiple features	Bes/Avo/Pra/Plains
EgNr-003	Late Prehistoric	NW18T24R06W3M	artifact scatter	Bes/Pra/Plains
EgNr-004	Late Prehistoric	NE13T24R07W3M	artifact scatter	Prairie
EgNr-008	Late Prehistoric	NW18T24R06W3M	artifact scatter	unknown
EhNq-005	Late Prehistoric	SE31T26R06W3M	artifact scatter	unknown
EhNq-006	Late Prehistoric	SE31T25R06W3M	artifact scatter	Prairie
EhNq-007	Late Prehistoric	NE31T25R06W3M	artifact scatter	Besant/Prairie
EhNr-018	Late Prehistoric	NE02T27R07W3M	multiple features	Besant
EhNr-039	Late Prehistoric	NE36T25R07W3M	artifact scatter	Bes/Avo/Pra/Plains

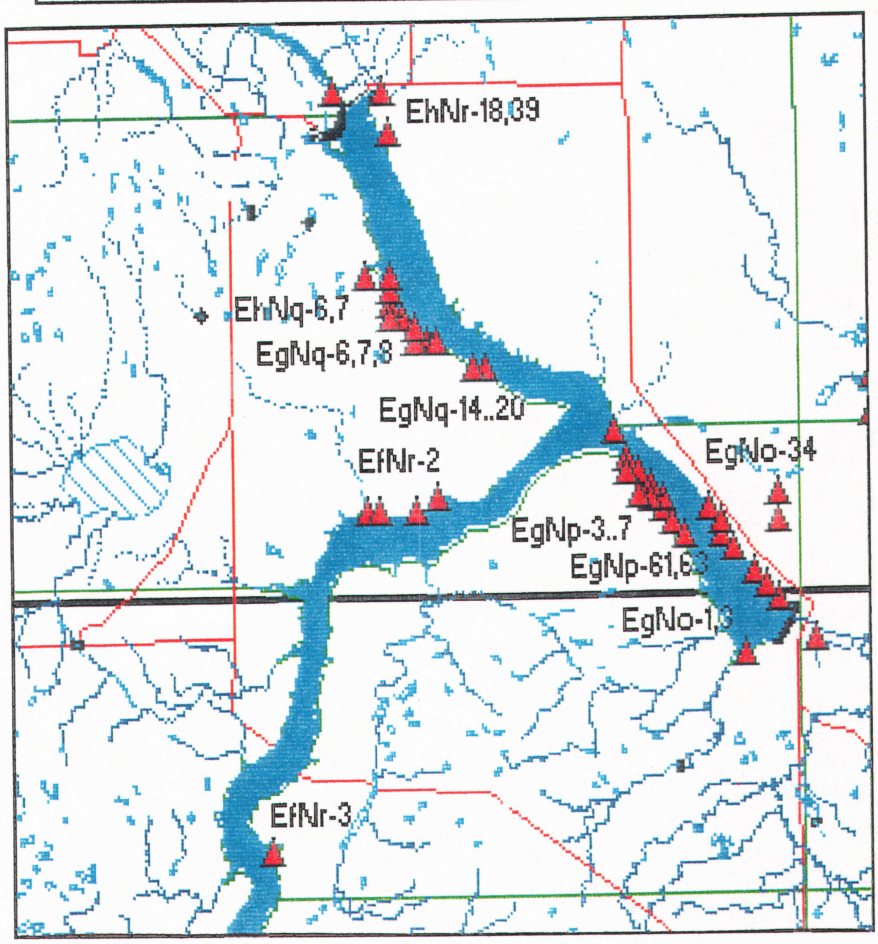


Figure 6.7: Late Prehistoric Period Sites in the Lake Diefenbaker Region

6.4.5 Late Prehistoric Occupations of the Lake Diefenbaker Region

The juncture of the South Saskatchewan River and Aiktow Creek appears to have been used extensively during the era of Besant series occupations. Over the past decade and a half Eldon Johnson has identified four artifact scatters as the 'Aiktow Besant sites' along the western shoreline of the Qu'Appelle Arm of the reservoir (Johnson 1987:1-16). EgNp-58, 59, 63 and 75 each contain large numbers of Besant projectile points in beach areas eroded by fluvial processes. Figure 6.5 provides an overview of the topography of the site areas prior to reservoir development.

A total of 52 Besant projectile points, 20 endscrapers and 17 unifacially flaked knives have been collected from EgNp-58. In addition, one Oxbow, one Hanna, one Pelican Lake and thirteen incomplete or unidentified projectile points were recovered within the site. A total of 56 Besant points have been collected at EgNp-59. In addition to the Agate Basin point discussed in previous sections, 10 endscrapers and 7 unifacial knives were also recovered. The collection from EgNp-63 includes 16 Besant points, five Early Side-notched points, six Late Side-Notched points, 10 endscrapers, eight unifacial knives, one sidescraper, one drill and one lead musketball. EgNp-75 appears to contain predominantly Besant materials, as the 20 Besant projectile points were the only type recovered. Five endscrapers and three unifacial knives complete the prehistoric assemblage. Like EgNp-63, a single lead musketball was found within the site area.

Although the intrusion of other diagnostic artifacts prevents a concrete association of the scrapers and unifacial knives with the Besant projectile points, a few general observations can be made. First, the raw materials used in the manufacture of Besant diagnostics were primarily silicified peat, Swan River chert, silicified wood, and the shales and siltstones noted in earlier assemblages from the region. This characteristic is supported by data from the MacDonald collection from Coteau Beach where of the 147 points recorded 72 were made of Swan River chert, 38 of silicified peat, nine of Gronlid

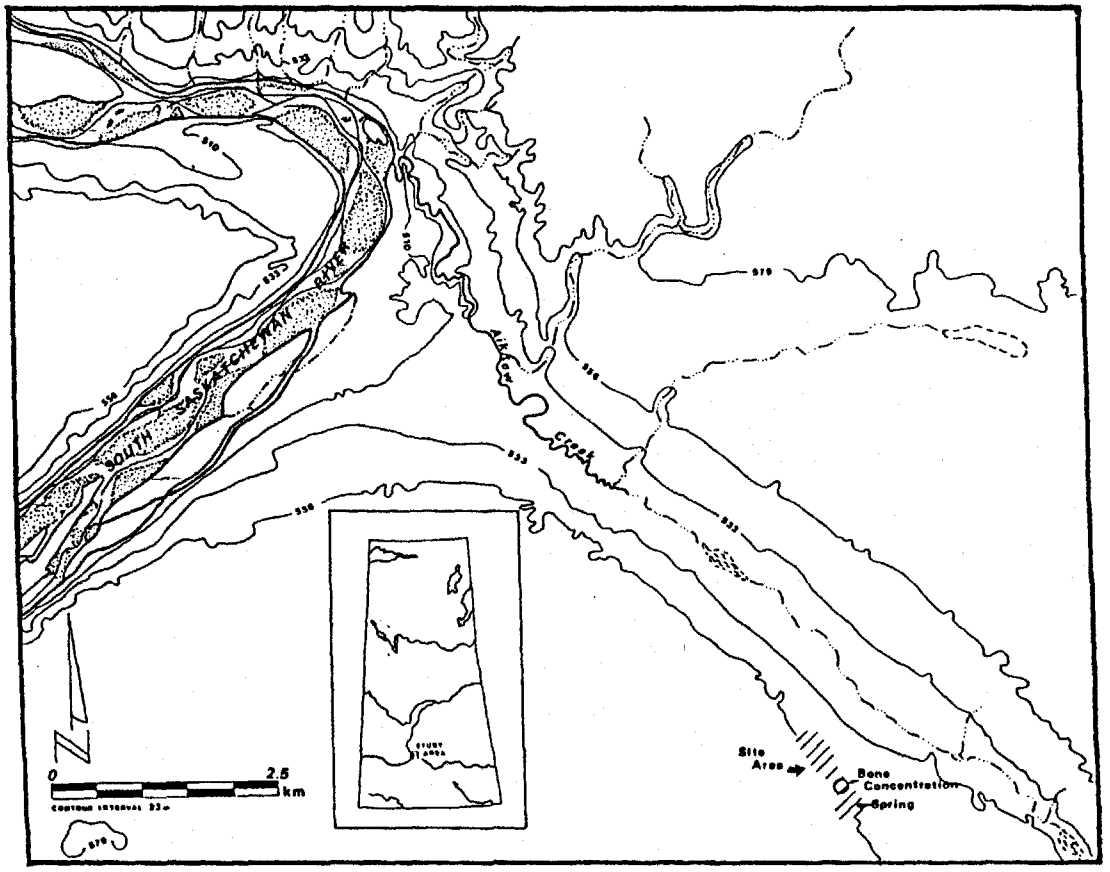


Figure 6.5: Aiktow Besant Sites

siltstone, five of silicified wood, four of Knife River Flint, six of generic chalcedonies, six of generic cherts, two of Feldspathic siltstone, three of generic siltstones, two of quartzite, one of jasper and one of fused shale.

A majority of endscrapers and unifacial knives in the Aiktow Besant sites are made from Knife River Flint, a result which is more compatible with the raw material utilization patterns found in Besant sites outside the study area. Johnson has suggested that the higher numbers of endscrapers and knives fashioned from Knife River Flint may reflect careful curation and preferential functional utilization of foreign raw materials (1987:1). While this may be true in part it can not wholly explain the near absence of Besant points made from Knife Rvier Flint in the area of the reservoir. Heat-treated silicified peat and Swan River chert may have provided suitable alternatives to Knife River Flint but shortages of supply, cultural preferences and/or site function may have also contributed to the anomaly. The importance of site function may be reflected in the recoveries from the only excavated kill site of the vicinity, the Melhagen site (EgNn-1), where approximately 70% of the projectile points were fashioned from Knife River Flint (Ramsay 1991:111).

The broken topography of the South Saskatchewan and Aiktow Creek valleys was well suited to the intensive communal bison hunting activities commonly associated with Besant cultures. In addition to the natural features suitable for collecting and maneuvering bison herds, the juncture also provided abundant fuel, water, shelter and floral resources for extended occupations of large human groups. The locale would have been particularly well-suited for winter occupations as snow and high winds swept across the open plains.

Besant series projectile points have also been recorded in artifact scatters located along the eastern shoreline of the MacKenzie Arm in Douglas Park, in the vicinity of Coteau beach and at Camp Rayner (table 6.7). Each of these locales offers resources comparable to the juncture, although unquestionably they also reflect discovery bias in

areas where collectors have been most active. The location of the Melhagen kill site (EgNn-1) and EfNr-16, the suspected Besant kill site described in Chapter 5, suggests Besant series cultures carried on subsistence and habitation practices across a variety of landforms in the region. Differences in site distribution from uplands to sand hills to valleys was likely the result of seasonal variations in Besant series adaptive strategies.

In contrast to Besant series assemblages, Avonlea complex artifacts are not well represented in either surface collections or in stratified components throughout the Lake Diefenbaker region. In general, Avonlea sites have most often been discovered north of the elbow in the vicinity of Coteau Beach. A total of 18 Avonlea projectile points from EhNr-39 and EgNq-6 are included in the MacDonald collection, a marked decrease in numbers from earlier cultural series. Five Avonlea points are included in the Thompson collection from EkNt-2 and only one has been reported at EgNr-2. Likewise, only EgNp-56 was reported to contain Avonlea diagnostics during Eldon Johnson's extensive survey of the Douglas Park region.

Tom Stevenson has documented three artifact scatters containing Avonlea type projectile points along the western shoreline of Lake Diefenbaker approximately six kilometers north of the elbow. EgNq-16 contained one Swan River chert projectile point diagnostic of the Avonlea complex in a mixed assemblage between the reservoir's high and low water marks. Similarly, EgNq-17 and EgNq-18 produced very few Avonlea artifacts and it is unlikely that non-diagnostic artifacts found in the assemblages, such as 74 'gouge' scrapers reported by Stevenson at EgNq-18 (1992: Appendix B), could be attributed to an Avonlea occupation.

The sites are of interest, however, due to their proximity to natural springs and a seasonal tributary channel that was approximately 500 meters from the South Saskatchewan River at the time of occupation. EgNq-16 and EgNq-17 are located immediately west of the stream channel, now swollen by reservoir development, while EgNq-18 and was exposed on the eastern margin of the channel. An Avonlea projectile

point was recovered *in situ* in a very similar locale, EfNr-9, during the 1995-1996 field season as well as at the Sjovold site located on the Bratton tributary channel. In fact, most excavated Avonlea sites to date have been located immediately adjacent to tributary channels or abandoned Oxbow features as described previously in this chapter. This may be one factor which has contributed to the minimal discovery of Avonlea components in the region. Low terraces and tributary channels are subject to severe backflooding following reservoir development and thus landforms with the greatest potential for Avonlea recoveries are the first to be inundated or destroyed. The delicate nature of Avonlea diagnostics also makes them particularly susceptible to fluvial entrainment and redeposition. The impact of reservoir development on all of the archaeological resources of the region is discussed in detail in Chapter 7.

Although the data base for raw materials used in Avonlea stone tool manufacture is extremely small, it should be summarized as a part of this discussion. The five diagnostic artifacts from the Thompson collection were made from Swan River chert (2), unspecified cherts (2) and Knife River Flint. Projectile points in the MacDonald collection numbered seven of Swan River chert, five silicified peat, two unspecified chalcedony, one unspecified chert, one Gronlid siltstone, one generic siltstone, and one fused shale. The Avonlea point recovered during the 1995-1996 survey was made from a generic chert, while the only classic Avonlea type point recovered at the Sjovold excavation was made from Swan River chert (Dyck and Morlan 1995:266).

Sherds from three ceramic vessels were found in Layer VI of the Sjovold site in association with the diagnostic Avonlea projectile point. One of the vessels was of the parallel grooved type, a second may have been parallel grooved or plain, and the third was knotted cord impressed (Dyck and Morlan 1995:262). Sherds from one additional parallel grooved and one knotted cord impressed vessel were found in Layer VII in association with two Samantha, or intermediate between Besant and Avonlea, projectile points (Dyck and Morlan 1995:266). Parallel-grooved and net impressed ceramic sherds

are often found in Avonlea components, although artifacts of this type are rarely found in the artifact scatters of Lake Diefenbaker.

The SSRP reported a total of four sites which contained ceramic materials within the surface scatters and test excavations carried out from 1958 to 1960 (Mayer-Oakes and Pohorecky 1969:49). Unfortunately, only the artifacts from the EgNp-15 test excavations are available for analysis. Sherds from two test units, EgNp-15-PA (project A)-124L12 and EgNp-15-PA-123L12, were initially analyzed in terms of their composition, surface treatment and method of manufacture. The artifacts have since been examined by Dr. David Meyer at the University of Saskatchewan and classified as Avonlea parallel-grooved. This supports the occurrence of an Avonlea component within EgNp-15, although no Avonlea projectile points were recovered as a result of the excavation (Mayer-Oakes and Pohorecky 1969:49).

Artifacts associated with the Prairie Side-notched complex are prevalent throughout the study area and are widespread across the Northern Plains. Prairie Side-notched projectile points are found in every major collection and in numerous artifact scatters along both shores of the reservoir. One hundred and twenty three diagnostics from the complex are recorded in the MacDonald collection and a total of 28 are recorded in the Thompson, Johnson and Fred T. Hill museum collections. Local materials of the same varieties as discussed previously were used almost exclusively in the manufacture of stone tools. One projectile point fashioned from obsidian and two of Knife River Flint represent the only use of foreign raw materials.

Unfortunately, of the 90 known Prairie Side-notched components in the South Saskatchewan Basin, only five have been excavated and only one in the immediate vicinity of the Lake Diefenbaker reservoir has been documented (Dyck and Morlan 1995:43). Level IV-V at the Sjovold site produced three Prairie Side-notched projectile points in association with two small hearth features interpreted by the researchers as possibly indicative of a sweat lodge or of shield making activities (Dyck and Morlan

1995:235-239). The integrity of the component had been disturbed by a rodent burrow, however, and thus a discussion of specific activities represented at the site is limited by both a partially mixed assemblage and the small area subject to scientific testing.

The shortcomings of the regional data base in terms of the final Late Prehistoric occupants, or Plains Side-notched complex, are no less severe. Plains Side-notched projectile points have been catalogued in eleven artifact scatters along the reservoir and in all of the major collections discussed so far. No excavated components have been published to date. It is expected that the Camp Rayner site report, which included excavation of both Prairie and Plains Side-notched materials, will make an important regional contribution toward the *in situ* analyses of Late Prehistoric complexes.

6.4.4 Historic Occupations of the Lake Diefenbaker Region

The accounts of fur traders such as Peter Fiddler, Anthony Hendry, Mathew Cocking and later by government representatives such as John Palliser and Henry Youle Hind are among the most informative sources of past occupations in the Lake Diefenbaker region. Through their journals we are offered insight into the lifeways of indigenous cultures at the time of European arrival, the influence of European trade goods upon traditional rivalries and alliances, and the interaction between New and Old World cultures. The mutual acculturation of the two groups is a part of the region's heritage and the beginning of our shared cultural history. Several archaeological sites within the Lake Diefenbaker region may be provisionally attributed to the Historic, or contact, period. Unfortunately, in the majority of cases a detailed scientific study of individual components has not yet been carried out and so definite affiliations for the locales await further research.

The South Saskatchewan River Project documented seven sites on the basis of ethnographic and/or historical sources. EgNp-77 was identified as Hind's Buffalo Pound in reference to a bison kill site documented by Henry Youle Hind during his 1857-1858

expedition through the Red River and Saskatchewan regions. In July of 1958, Hind's party had reached the elbow of the South Saskatchewan via the Qu'Appelle valley. They had encountered numerous Plains Cree encampments throughout the Qu'Appelle region and were informed that a large camp could be expected near the juncture of the South Saskatchewan. As described by Hind:

> On the morning of Thursday, 29th, we prepared to visit the main body of Crees at the Sandy Hills, and, with a view to secure a favourable reception, sent a messenger to announce our arrival, and to express a wish to see Shortstick, the chief of the Sandy Hills. Soon after breakfast we crossed the valley and entered the sand dunes; one which we measured was seventy feet high, quite steep on one side, beautifully ripple marked by the wind, and crescent-shaped. Sand dunes are on both sides of the valley. From the summit we saw the woods and hills beyond the south branch of the Saskatchewan, and, what was more delightful to us, traced with the eye the Qu'Appelle valley with undiminished depth and breadth through the Sandy Hills, until it was lost as it dipped toward the south branch.
>
> At 8 o'clock, a.m., we came in sight of the Cree camp, and soon afterwards messengers arrived from Shortstick, in reply to the announcement of our arrival, expressing a hope that we would delay our approach until they had moved their camp half-a-mile further west, where the odour of the putrid buffalo would be less annoying. We employed the time in ascertaining the exact position of the height of land, and soon found a pond from which we observed water flowing to the Saskatchewan and Assiniboine. The pond was fed by a number of small springs and small streams a foot or two broad, issuing from the Sandy Hills, on both sides, at right angles to the valley. We selected this spot to level across the valley, and found its depth to be 110 feet below the first plateau; its breadth, although partially invaded by sand dunes, seventy three chains, or nearly one mile. Here we commenced taking the levels to the South Branch, twelve miles distant from us, an operation we sound found necessary to close for the present, in consequence of the arrival of about sixty Cree horsemen, many of them naked, with the exception of the breech-cloth and belt. They were accompanied by the chief's son, who informed us that in an hour's time they would escort us to the camp. They were about constructing a new pound, having literally filled an old one with buffalo, and being compelled to abandon it on account of the stench which arose from the putrifying bodies. We sat on the ground and smoked until they thought it time for us to accompany them to their encampment. Shortstick had hurried away to make preparations for bringing in the buffalo, the new pound being nearly ready. He expressed through his son a wish that we should see them entrap the buffalo in this pound, a rare opportunity few would be willing to lose. (Hind 1971 [1860]: 63)

The region described as the 'Sandy Hills' by Hind undoubtedly refers to region of Douglas Park, where today it is still possible to overlook both the South Saskatchewan and Qu'Appelle valleys from atop stabilized dunes. EgNp-77 in the SE quarter of Section 6 Township 24 Range 4 West of 3rd lies along the eastern border of the park and was located by Thomas Kehoe on July 14, 1962 as the pound's location as marked on Hind's

map. Kehoe's SARR also stated that EgNo-22 was a suspected location of the pound(s) at NE 34-23-4 W3rd. Unfortunately, this location is now completely submerged by the Qu'Appelle Arm of the reservoir. Further reconnaissance is recommended for EgNp-77.

EfNo-1, or the "Jamboree Buffalo Pound", was first documented on July 24, 1958 by Zenon Pohorecky. The site was located in the extreme NE corner of 18-23-3 W3rd in a deep coulee on the south slope of the Qu'Appelle valley. In 1955, local informant George Kitely of Tugaske, Saskatchewan visited the site during what he termed a native "jamboree". Kitely was told that the site had been used as late as the 1880's as a bison pound and that artifacts had been collected from the area during the 1930's (SARR 1960). At the time of Pohorecky's visit the site was heavily overgrown with brush although he did record a small spring approximately 100 meters west of the pound location. The site area was located on a broad flat terrace between the spring and a steep coulee. A portion of the terrace may have been subject to cultivation in recent years but the area of the pound may yet remain intact. Reconnaissance and shovel testing of the site is recommended.

EeNr-3 was recorded by the SSRP as the 1866 Massacre site reported in Isaac Cowie's *Company of Adventurers* (1913: 313-315). Cowie served as Hudson Bay Company Factor at Fort Qu'Appelle from 1869 to 1874. The description of the events that led to the formation of the site were based on a first-hand account given by a Metis interpreter named La Pierre who had taken part in the battle:

> La Pierre was a man of experience, and he had taken part in the big battle between our Indians [predominantly the Cree] and the Blackfeet in March, 1866, at Red Ochre Hills, on the South Saskatchewan when no less than six hundred Blackfeet were slain. He had been in the Cree camp at the time it was attacked, and had supplied them with fresh arms and ammunition, besides taking a leading part in the fight. On that occasion a very large war party of Blackfeet had set forth to repel the invasion of their hunting-grounds by an inferior force of the Cree and other Swan River Indians. The Blackfeet, who generally fought on horseback, came down the South Saskatchewan valley on foot on this occasion. The snow had already melted, except in the shelter of the ravines, and they had no snowshoes. From the valley they descried two Cree lodges on the skyline of the hills, and they heard the chopping of axes in a ravine which led down from the hills to the valley. They at once knew the

> Cree women were getting firewood in the ravine, and had no idea that the two solitary on the top of the bank were outliers of a big camp beyond and out of sight. Accordingly they proceeded up the snow-filled ravine and shot the two old Cree women who were chopping wood there. Then, following up the woodchopper's trail, they proceeded up the ravine to attack the two lodges seen from the valley. All were eager to get there, and they crowded into the deep and melting snow on each side of the track in their eagerness. Stumbling and falling in the wet snow the powder in the pans of their flintlocks got wet also.
>
> Meanwhile the Crees in camp behind the brow of the Red Ochre hills, hearing the volley echoing through the ravine, had taken alarm, and the warriors rushed to the brink commanding a full view of the ravine, now filled with a helpless crowd of enemies who had failed to keep their powder dry and were expecting an easy victory over the people in the two lodges to be attacked. That was a black morning for the Blackfeet, as, floundering in the deep, rapidly thawing snowdrifts of the ravine, and unable to use their guns, the well-armed Crees lined its brink on each side, and, firing in front, on left and right of them, slaughtered them as they were wont to slay unarmed herds of impounded buffalo.
>
> In the fall of 1871 I camped for some time , when on a trading trip, along side of this ravine. It was still full of the grim skeletons of those who fell in March 1866; and I followed, from the mouth of that deathtrap of the Blackfeet, for miles up the flat bottomlands of the South Saskatchewan valley a trail of bleached bones of the Blackfeet who had fallen, in the panic-stricken retreat, to the fury of the pursuing Crees. The ravine was a perfect Golgotha, and that trail of dead bones could be plainly seen, from a height, stretching for miles along the burnt surface of the bottomlands of the valley. (Cowie 1871 [1913]:313-315)

Cowie's description is suprisingly consistent with observations made by Pohorecky in the Vermilion (Red Ochre) Hills nearly a century later. At some point in the interim, a three meter line of stones had been placed in the shape of an arrow on the summit of a ravine that formerly drained into the South Saskatchewan River valley. Local resident Fred T. Hill said the monument had been positioned in memory of the battle scene and pointed to the mouth of the coulee where he had recovered a flintlock musket (Golden Jubilee Committee 1965:7). In addition, the original homestead on the property was referred to as 'The Ghost Ranch" owing to the large number of human crania excavated during the clearing of a garden in the ravine bottomland during the early part of the century (Golden Jubilee Committee 1965:7). A human cranium was later discovered during the construction of a grid road through the western edge of the property. These last remains were reintered by the Saskatchewan Heritage Branch in 1996.

A second battle site was documented at EeNt-2 on the northeast side of Two Man Butte which reportedly predated the site of 1866. The site was impacted by colluvial deposits at the time of the SSRP survey and as at EeNr-3 the recent backflooding of tributary channels may have partially inundated the site area. Because of the special nature of these sites no further investigation is recommended prior to consultation with first nations' representatives and the Saskatchewan Heritage Branch. The sites are mentioned as a part of the database gathered by the SSRP investigation and because of their relevance to the cultural history of the region. No definite cultural affiliation for either site can made in advance of new data.

As a discussion of the Mistaseni site, EgNo-19, has been presented in Chapter 3 and in Appendix #5 it will not be repeated here. EgNo-17 was given the site name "Old Trading Post" from the identification found on a map of the elbow region prepared by surveyor J.P.B. Casgrain in September of 1883 (S.A.R.R. 1960). Natural springs flowed to the east of the site which was located north of the Elbow- Fort Qu'Appelle trail (SARR 1960). At the time of the SSRP survey the site was obscurred by grass and sand dunes. Magnetometry and shovel testing are recommended to determine the exact location of the structure and associated features.

Canadian settlement was initiated by the establishment of several large ranches. These included the Matador, Foster, Ironsides, Ferris, and Hitchcock and Ferguson outfits within the immediate vicinity of the South Saskatchewan (Philpott 1988:16). The original headquarters of the Hitchcock and Ferguson ranch was destroyed by fire in about 1906 and the stone house which replaced it was sold to Stanley and Viola Tovell following the dissolution of the ranch in 1912 (Golden Jubilee Committee 1965:87-88). The house remains intact to the present day on the property of Paul Berger in the Vermilion Hills south of Riverhurst.

The Turkey Track ranch, based in Vanguard, Saskatchewan was established in 1902 by an American outfit which moved north with 25 000 head of cattle and 600

horses (Philpott 1988:16). A particularly severe winter in 1906-1907 resulted in the loss of over 10 000 cattle, however, and the ranching operation closed the following year. The remaining horses and cattle were purchased by other outfits in the region or driven back across the border (Philpott 1988:16). The experience illustrates the importance of American contact and trade during the early settlement period to the development of rural plains culture. As the findings of subsequent contact period occupations in the region were discussed in Chapter 5, they need not be repeated here.

6.5 Analysis and Conclusions

A major goal of the current research was to combine the many sources of past occupations in the immediate vicinity of Lake Diefenbaker in order to provide a comprehensive analysis of the region's cultural heritage. Naturally, in the attempt to summarize nearly 11 000 years of cultural history many sources suffered considerably from abbreviated summations of their content. As a result, the conclusions forwarded in the following sections tend to focus upon broad observations which may be supported using the regional archaeological database as it is presently understood. It is my hope that as archaeological research continues in the region the broad strokes outlined at present will be replaced by the fine brush of detailed investigations. Any one of the cultural series or complexes from Paleoindian to Historic period occupations is in need of attention.

Although the reasons for the limited representation of Paleoindian occupations within the region are undoubtedly complex, a few general arguments may be presented. First, although artifacts diagnostic of Clovis, Plainview, Folsom and Midland confirm that the earliest cultures of the Northern Plains were present in the region, it is likely that their occupations were short in duration and consisted of relatively small groups of individuals. Fluctuations in climatic conditions necessitated adaptations in subsistence

strategies which may have resulted in very different utilization of the landscape in all but the most favourable of locales, such as EgNr-2.

Second, at the time of the initial occupations in the region meltwater channels were still subject to periods of outburst flooding and vast fluctuations likely occurred in local water tables. As seen in Chapter 7, the remaining areas most suitable for occupation were then subject to episodes of fluvial and aeolian deposition thus obscuring their archaeological visibility. A majority of the Paleoindian sites reported to date are located in areas which combine upland valley topography, natural springs and dune deposits.

The information gathered from archaeological sites in the Lake Diefenbaker region has considerable potential to add to our current state of knowledge of the Middle Prehistoric period. The recovery of Bitterroot projectile points in the Douglas Park region gives clear evidence of the occurrence of at least one other early Middle Prehistoric projectile point type, along with Gowen artifacts, in use along the South Saskatchewan basin at the start of the period. An Early Middle Prehistoric component has been excavated at EgNr-2 and upon publication the data is also expected to add considerable insight into diagnostic types and possibly technological traditions of late Paleoindian and early Middle Prehistoric cultures.

Tom Stevenson's identification of possibly the first Oxbow kill site on the Northern Plains is of obvious interest, as is the potential for a detailed metric study of the artifacts in the MacDonald collection. Individual analyses of projectile point morphology for Oxbow, McKean and Pelican Lake types would allow for a better understanding of change within the complexes over time as well as furthering the effort to correlate morphological change and cultural affiliation. Finally, evidence is necessary to support or refute the use of bow and arrow technology and the extended time frame of Pelican Lake occupations as suggested by the Sjovold excavation. The findings of the Sjovold excavation, if supported, may in fact alter the current definition of the Late Prehistoric period.

It should not be suprising that throughout eras of fundamental technological change, from spear to atlatl during the Late Paleoindian and Early Middle Prehistoric cultures and from atlatl to bow during Pelican Lake and Besant series occupations for example, there would be wide variation in projectile morphologies. New hafting techniques and experiments in flight dynamics were no doubt tested and tested again. Moreover, various cultural origins of the region's inhabitants over time and their corresponding technological traditions are considered as primary catalysts for change in the archaeological record. Clearly, much more *in situ* analyses of specific cultural components is necessary to advance our understanding of the area's cultural history.

This is certainly true of Besant series cultures which are well-represented in surface collections from the Lake Diefenbaker region. This summary has been extremely cursory in clumping Samantha, Sonota, Besant and Bratton projectile point types under the veil of a widely defined cultural series without adequate discussion. An adequate discussion would form the basis of another thesis, however, and so I will simply recommend that a detailed metric study of all Besant series diagnostics found in the region be carried out. Such a study would help to differentiate what has been a 'catch-all' classification of both projectile point types and possibly cultural occupations.

Because of the scarcity of Avonlea materials in the region almost any contribution toward the analysis of the complex would be welcome. This study has attempted to show that Avonlea occupations were present within the study area and that *in situ* components like those found at EiNs-4 and EfNr-9 may be available for detailed research. It has also been recognized that Avonlea occupations may have been situated in locales that were heavily impacted by reservoir development, as was discussed in the site description of EfNr-9 in the previous chapter.

Comprehensive analysis of Prairie and Plains Side-Notched components excavated in the Northern Plains region is recommended to provide a framework of data on which to construct meaningful interpretations of individual regional components. To

date, the documentation of Prairie and Plains occupations near Lake Diefenbaker has been limited to chance exposures of diagnostic artifacts in areas of erosion or in level records of site reports examining multicomponent excavations. This haphazard method of data collection has not been conducive to advanced analysis of either ascendant/descendant cultural affiliations or specific behaviors within a given occupation. It is hoped that a subsurface testing program such as that outlined in the following chapter may allow for the identification of *in situ* Late Prehistoric components to assist in this effort.

Analysis of the occupations from the contact period have only just begun but show remarkable potential for future research. Ethnographic and historic sources may be successfully utilized in the identification of archaeological remains and where the various forms of research are combined high level analysis is possible. Detailed study of sites such as the Matador ranch, the Berger stone house, the "Old Trading Post" and those from the homestead era would provide fascinating glimpses into some of the most significant regional occupations of the contact period.

In sum, the recovery of at least one diagnostic artifact from each indigenous cultural series or complex recognized in the Northern Plains, and the abundance of significant contact period sites, suggests the Lake Diefenbaker region is particularly well-suited to scientific research of past cultures. The resources of the South Saskatchewan and Aiktow Creek valleys, in association with numerous springs and areas of open plains, have supported occupation for at least the past 11000 years. Reservoir development has dramatically impacted the archaeological integrity and visibility of sites in the study area, however, and the ongoing destruction of *in situ* components poses a major threat to our understanding of past occupations in the region and how they may have related to others across the Northern Plains.

Chapter Seven

7. The Impact of Lake Diefenbaker on the Heritage Sites of the South Saskatchewan River Valley

7.1 Introduction

The creation of Lake Diefenbaker has dramatically affected heritage resources in the study region. High water levels and shoreline erosion have adversely impacted archaeological sites within the reservoir. Sites below the Gardiner and Qu'Appelle Arm dams may have been both positively and negatively affected. Channelbed degradation has preserved low-lying landforms within these areas while disturbance due to cultivation practices on uplands has simultaneously increased. This chapter attempts to summarize the major characteristics of reservoir development on the heritage resources of Lake Diefenbaker and to provide recommendations for the future management of archaeological sites in the region.

7.2 Pre-Reservoir Characteristics of the South Saskatchewan River

Prior to reservoir development, the South Saskatchewan River was a perennial water course that flowed in a generally southwest-to-northeast direction. It was contained within a braided stream channel and carried coarse clastic sediments of gravel and sand (Waters 1992:124-125). The valley floor was flat-bottomed and lined with valley train materials (Kupsch 1969:41). Colluvial debris, or talus slopes, were present along many sections of the river and both banks were relatively non-cohesive and easily worked (Rasid 1974:37; Waters 1992:124). Because the river was unable to transport its entire sediment load, longitudinal and lateral bars formed within the channel and along convex channel banks. Maximum discharge formerly occurred in June and July of each year, underscoring the importance of mountain headwaters to the total catchment (Kupsch 1969:41).

Valley walls extended from one to several kilometers in width, and were characterized in some locales by large floodplains and oxbow lakes (Germann 1989:5). As described by Germann (1989:5):

> The valley walls are sometimes gently sloped, but are usually more steeply sloped and often deeply incised by run-off channels. Tributary streams often form steep to gently walled coulees, some with extensive flat or gently sloping bottoms. Coulees cut deeply into the main valley walls and often extend a considerable distance into the upland plain.

A central feature of the South Saskatchewan in the study region was the abrupt turn from a southeastern flow to a northwestern direction at its junction with the Qu'Appelle River. The general consequent direction was deflected by "stream piracy during a complex deglaciation history involving a series of meltwater channels, proglacial lakes, and isostatic rebound" (Christiansen 1995:5). The feature has served as a landmark throughout contact and precontact periods of occupation and is the namesake for the present town of Elbow, Saskatchewan. Over fifty archaeological sites were located in the immediate vicinity of the elbow during the South Saskatchewan River Project of 1958-1960.

7.3 Post-Reservoir Characteristics of the South Saskatchewan

The creation of Lake Diefenbaker by the construction of the Gardiner and Qu'Appelle Arm dams greatly modified the modern regime of the South Saskatchewan River. Downstream from Gradiner dam, the controlled release of relatively clear water has resulted in moderate channelbed degradation along the South Saskatchewan (Rasid 1974:119). The settling out of suspended sediment in the reservoir led to an 83 % decrease in the sediment load measured in Saskatoon ten years after the completion of Gardiner Dam (Rasid 1974:114-119). As a result, a coarsening of bed materials is prevalent. Maximum discharges below the dam are now dramatically reduced and occur

during the winter months due to large emissions for the production of hydro-electric energy.

Upstream from Gardiner dam, in the area occupied by Lake Diefenbaker, higher water levels have inundated over ten vertical meters of land within the South Saskatchewan and Aiktow Creek valleys. The reservoir has also severely backflooded tributary channels and gullies. Wind-induced wave action has become the principle geomorphic agent responsible for shoreline erosion (Rasid 1974:138). From 1971-1972, Harunur Rasid measured an average rate of cliff erosion along Lake Diefenbaker from Riverhurst to Outlook of nearly three meters per year with extremes of 0.3 m and 6.0 m recorded for moderate and steep slopes, respectively (Rasid 1974:157). He noted that shoreline erosion would be eliminated once water levels of the reservoir reached stability approximately thirty ($\pm$ 5) years after the reservoir was completed (Rasid 1974:241-242).

An identical study was conducted as part of the 1995-1996 survey effort that essentially duplicates Rasid's timetable for shoreline stability. The 1995-1996 study illustrates that shoreline erosion is continuing at a rate far exceeding the expectations of the 1974 analysis (figure 7.1). Table 7.1 illustrates the findings of the 1995-1996 study, which resulted in an average rate of erosion along the eastern shoreline of the reservoir of approximately 1.75 meters per year. The data was gathered using Rasid's methodology of placing survey pins at one or two meter intervals perpendicular to the cliff face or high water mark. Relative measurements of cliff erosion could then be calculated from the datum pin farthest from the shoreline (Rasid 1974:17-19).

The higher than expected rates of erosion along the eastern shoreline can be attributed to a number of factors. Most obvious, the above average amounts of precipitation throughout the South Saskatchewan catchment area over the past two years resulted in large mountain discharges and increased tributary run-off. This in turn brought water levels in the lake to their maximum and exposed the entire shoreline to intense wave action throughout the summer months. Longer periods of high water also

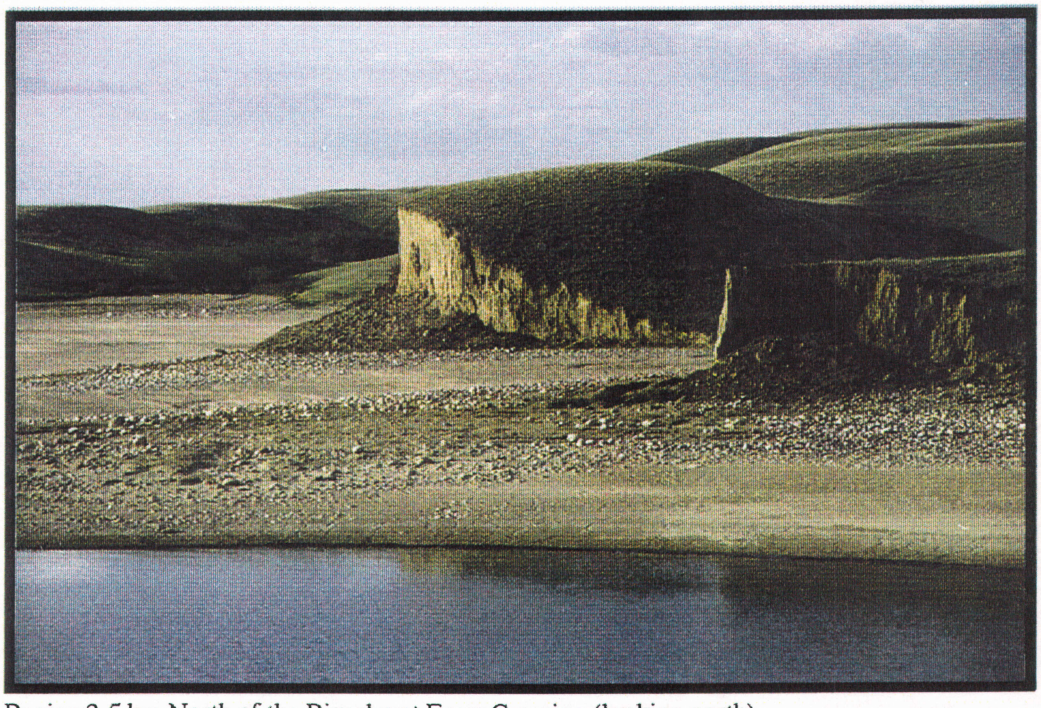
made the cliffs more susceptible to failure and slide due to saturation (Rasid 1974:150). In addition, wide variations in the degree of slope of preexisting landforms in the area of the reservoir also made generalized estimates of erosion rates subject to numerous local exceptions. As the locations of Rasid's test areas were not recorded, the 1995-1996 study focused on seven archaeological site locations that included moderate and steep degrees of slope. These may or may not have been representative of Rasid's sample.

Table 7.1: Cliff Erosion Along the Eastern Shoreline of Lake Diefenbaker

Test #	Borden #	Legal Description	Degree of Slope	Cliff from Datum:1995	Cliff from Datum:1996	Rate of Erosion
1	EfNr-9	SW-SW-34-22-7-3	steep	4.0 m	2.13 m	1.87 m/ year
2	EfNr-10	SW-SW-34-22-7-3	steep	58.0 m	56.80 m	1.20 m/year
3	EfNr-14	SW-SW-23-23-7-3	moderate	10.0 m	9.44 m	0.56 m/year
4	EfNr-16	SE-SW-26-23-7-3	steep	29.0 m	26.35 m	2.65 m/year
5	EfNr-19	NE-NW-26-23-7-3	steep	10.0 m	5.31 m	4.69 m/year
6	EgNq-26	SW-NW-18-24-5-3	moderate	10.0 m	9.41 m	0.59 m/year
7	EgNq-27	NW-NW-18-24-5-3	moderate	13.0 m	12.32 m	0.68 m/year
					average:	1.75 m/year

Depositional activity in the reservoir includes the formation of berms and bars fed by freshly eroded cliffs in shallower zones, the deposition of suspended sediments in deeper water in the upper zone of the reservoir and sedimentation along gully mouths and bays as a result of deflected longshore currents (Rasid 1974:185-188). The deposition of sands and silts has reached 20 to 30 meters onto adjacent low-lying areas in locales such as EgNp-78 and EgNp-79 (this volume, Chapter 5).

Region 7.5 km North of the Riverhurst Ferry Crossing (looking west)



Region 3.5 km North of the Riverhurst Ferry Crossing (looking north)

Figure 7.1: Fluvial Erosion along the Eastern Shoreline of Lake Diefenbaker

7.4 Archaeological Visibility and Context

The number of heritage sites impacted by inundation and erosion within the reservoir is difficult to estimate. In general, braided channels are not conducive to the preservation or detection of archaeological sites. Continual undercutting of cliff faces, beach expansion and the redeposition of sediments by fluvial processes destroys the original temporal and spacial associations of cultural components. Such processes are particularly damaging in vicinities like the elbow and the Aiktow Creek valley above the Qu'Appelle Arm dam which have witnessed the greatest increase in water levels. Low terraces just beyond the current high water mark are subject to varying degrees of sedimentation due to periodic flooding, sloughing and soil creep. As a result, sites that were buried by alluvium or aeolian sediments soon after abandonment may remain intact but require deep subsurface testing to be located (Waters 1992:126).

The preservation of primary contexts in dune areas such as Douglas Park "occurs only if an occupation surface is rapidly buried by shifting sands after site abandonment and the dune is stabilized" (Waters 1992:196). The development of vegetation, and the subsequent deposition of sediment, serves as a natural cover for archaeological components. The parabolic dune fields of Douglas Park and surrounding areas may be said to be marginally stabilized at present, although local residents have stated the dunes were active during the 1930's and again during the early 1980's.

Lithic artifacts have been located as a result of deflation throughout the region although the sites may have been impacted by previous exposures and subsequent redeposition. Over time, the repetition of such processes can severely mix archaeological components. The Ake site, located on the San Augustin Plains of New Mexico, is a classic illustration of such disturbance. Folsom projectile points were found in association with a hearth radiocarbon dated to 3400 years BP (Waters 1992:196). In addition, ceramic period Mogollon and Spanish artifacts were also found within the same aeolian stratum as the Paleoindian materials. The mixing occurred as a result of the

deflation of underlying playa lake clays and subsequent reburial of all artifacts within a thin bed of eolian sand (Waters 1992:196).

Loess and dust deposits are devoid of stratification, thus complicating archaeological interpretation of late prehistoric and early contact period sites in even relatively stable environments along the reservoir. In addition, erosion and deposition resulting from moderate to strong westerly winds across the study area have been punctuated by infrequent, but highly intensive, events such as dust storms. The sediment load of a single dust storm has been estimated to be as high as 100 million metric tons, or enough to construct a hill 30 km high and 3 km across (Strahler and Strahler 1983:321). Such conditions make it impossible to interpret standardized rates for aeolian erosion and deposition, either temporally or by geographic area.

Several other factors have impacted archaeological components in the region and should be mentioned briefly as part of this discussion. Localized wind erosion is heightened throughout the study area by generally low relief and the cultivation of adjacent plains (Summerfield 1991:235). Small scale irrigation practices have disturbed limited areas of shoreline and expanded cultivation areas. In grazing lands, animals have trampled the margins of blowouts and thus expanded areas of deflation. Finally, bioturbation and cryoturbation have both disturbed the thin veneer of the contemporary soil matrix and are especially destructive of archaeological contexts in fine-grained aeolian deposits such as EfNr-10 (Waters 1992:293-294).

Thus while the South Saskatchewan and Aiktow Creek valleys have provided resource rich occupation areas to virtually every cultural group recognized on the Northern Plains, the recovery of *in situ* archaeological components in the region is a challenging enterprise. The general lack of stratigraphy, the recurrence of erosional and depositional activities over time and the susceptibility of archaeological components to post-reservoir disturbances have created a complex material record.

Moreover, the vast majority of fieldwork carried out within the region has consisted of surficial reconnaissance. Detailed excavations have been carried out at only three sites, Melhagen (EgNn-1), Sjovold (EiNs-4) and Camp Rayner (EgNr-2), and minimal subsurface testing was employed as part of the 1995-1996 survey. If high level analysis of the heritage resources in the region are to be pursued, then large-scale excavation of *in situ* components, geoarchaeological research and timely reporting procedures are needed. For these reasons, a preliminary examination of areas suitable for the deep subsurface testing of archaeological components is included in the following discussion of future resource management in the region.

7.5 Recommendations and Analysis

Because shoreline erosion is ongoing along the full extent of the Lake Diefenbaker reservoir, continued monitoring and mitigation is necessary to prevent the undocumented loss of the region's heritage resources. By combining the efforts of regional collectors, local archaeological chapter members and local historical society members, an adequate data base of sites impacted by reservoir development could be maintained. The effort could be coordinated by the Saskatchewan Heritage Branch and funded, at least in part, by the Saskatchewan Water Corporation, municipal agencies and local water users. The continuation of educational programs such as the S.A.S. Archaeological Caravan and the Camp Rayner archaeological field school will help to provide the general public with the information necessary to support research activities in the region.

Testing and/or salvage excavation of a number of archaeological sites along the periphery of the reservoir is recommended. EhNq-7 may represent the first Oxbow kill site located on the Northern Plains. EgNo-17, EgNp-77, EeNr-3 and EfNo-1 were all documented as contact period sites by the SSRP and need further investigation to assure specific event or cultural associations. EfNr-15 and EfNr-16 were located during the

1995-1996 survey and would appear to represent *in situ* components currently being destroyed by wave action. As well, subsurface testing of areas adjacent to Coteau Beach and EgNp-58,59,63 and 75 could produce archaeological materials dating to the Paleoindian period in their original contexts. Because each of these non-renewable resources holds the potential to advance our knowledge of past occupations in the region, and because all are subject to the same processes of disturbance, no attempt will be made to determine their relative significance in the current summary.

Perhaps most importantly, the establishment of an organized monitoring program for the area of the reservoir should be complemented by a geoarchaeological study of site distributions on landforms common to the region. The information gathered in the current report may best serve as a baseline of data for such analysis and our understanding of the recent and distant past cannot be advanced without it.

At first glance, selected areas within the margins of the reservoir seem suitable for this type of analysis. Local tributary junctures along the South Saskatchewan River have produced considerable evidence of multicomponent occupations within the study region. Prehistoric and contact period sites have been located at the mouth of the Swift Current Creek, the Bratten channel and the Opimihaw Creek valley near Saskatoon. Unfortunately, the high water levels of Lake Difenbaker have inundated or severely disturbed low-lying terraces and alluvial deposits particularly along the eastern shoreline of the reservoir. Cultivation practices have also disturbed upland areas adjacent to the South Saskatchewan both above and below Gardiner Dam.

For these reasons it is recommended that the region of the Qu'Appelle valley immediately below the Qu'Appelle Arm Dam be selected for geoarchaeological study. Valley and upland landforms, and associated cultural deposits, are easily accessible and relatively undisturbed by modern development. Although cultivation practices have impacted the former river bottom and isolated areas of uplands along the valley crest, the majority of the valley is used as pasture land with few modern encroachments. The

cultural-historical documentation gathered as a part of the current effort would be applicable as a regional database and as an initial source for local site distributions. Moreover, the information gathered by a geoarchaeological study of the Qu'Appelle would contibute to our understanding of the taphonomy of prehistoric and historic settlement in valley environments, a topic which has received little attention on the Northern Plains (Johnson and Logan 1990:293). As the only institution in the province capable of providing the interdisciplinary instruction and resources needed for such a project at a graduate student level, the University of Saskatchewan would have to be the primary sponsor of this activity.

In summary, the recommendations for future archaeological research in the Lake Diefenbaker region may be said to include three basic objectives. First, continued monitoring of the reservoir shorelines is essential to document the impact of reservoir development on heritage resources in the region. Second, salvage excavation of archaeological components should be carried out where surface inspection and subsurface testing indicate at least part of the geomorphic integrity of the sites remains intact. Third, a geoarchaeological testing program is recommeded for the region in the near future. Such a study would complement the cultural-historical information gathered as part of the current research and would surpass this effort in terms of its contribution to our understanding of dynamic valley settlement patterns in the Northern Plains.

Chapter Eight

8. Summary and Conclusions

The focus of this thesis has been to examine the archaeological resources of the Lake Diefenbaker region in south central Saskatchewan. The research has attempted to fulfill three major project objectives:

1) to provide a comprehensive cultural history analysis for the region
2) to assess the impact of the development of Lake Diefenbaker on the archaeological resources of the South Saskatchewan River Valley
3) to provide data and analysis for the future management of heritage resources affected by the reservoir

Throughout the various topics of discussion included within the 1995-1996 investigation, an attempt has been made to illustrate and describe the major environmental resources which have affected cultural development in the study region. Glacial activity, fluvial erosion and deposition, and the creation of the reservoir have been defined as the major processes responsible for geomorphic development. Prairie uplands, valley formations and areas of parabolic sand dunes are seen to have provided the various resources necessary for sustained cultural development.

Other major archaeological projects carried out in the region, such as Tom Stevenson's survey of the western shoreline of the reservoir, Eldon Johnson's investigation of Douglas Park, and the Melhagen (EgNn-1), Sjovold (EiNs-4) and Camp Rayner (EgNr-2) excavations, have been referenced to ensure the largest possible sample of the region's documented heritage resources. The efforts of the 1995-1996 Land Owner/ Operator Survey and particularly the Regional Collector survey have been augmented by past studies carried out by the Saskatchewan Archaeological Society and the Saskatchewan Museum of Natural History whose reference material proved invaluable to the current project.

The Personal Reconnaissance Survey was designed to complement the existing archaeological database for the region by examining a thirty-five linear kilometer area along the southeastern shoreline of the reservoir. The survey included sub-surface sampling of both Historic and Prehistoric components. Eighteen heritage sites were recorded as a result of the 1995-1996 Personal Reconnaissance Survey. The sites were comprised of twelve Prehistoric and six Historic occupation areas. Temporally, the occupations ranged from approximately 10 000 years before present to the Historic settlement era. Culturally, the combined surveys produced diagnostic artifacts from Hell Gap, Hanna, Pelican Lake, Besant, Avonlea and Prairie and Plains Side-Notched complexes/series to twentieth century Euro-Canadian farmsteads.

In all, the cultural history of the Lake Diefenbaker region appears to be a microcosm of the major cultural occupations documented throughout the Northern Plains. At least one diagnostic artifact from every identified cultural group, complex or series, has been found within immediate area of the reservoir. Several complete but culturally indeterminate artifacts are in need of classification. The single greatest obstacle to high level analysis of heritage resources in the region has been the lack of excavation and/or sub-surface sampling procedures to provide context for the data gathered by surficial surveys and collections. In this regard, the current effort has attempted to establish at least preliminary recommendations for each site in order that more detailed investigations may be carried out in the future.

The impetus for quick action is obvious. Erosion of the Lake Diefenbaker shoreline is still active. In contrast to Rasid's predictions of shoreline stability approximately 30 years after the completion of the reservoir, the 1995-1996 study found that areas of high and moderate slopes along the southeastern shoreline are being eroded at an average rate of 1.75 meters per year. No fewer than 10 heritage sites were found to be partially or completely destroyed by wave action during the two years of this study. Four additional sites will be disturbed within the next one to two years. The examples of

EfNr-13, EfNr-14and EgNq-25 illustrate that heritage sites within the reservoir may be lost within a matter of days from their initial exposure. It is impossible to estimate the number of heritage sites affected by the last 30 years of reservoir operation. Artifact finds and scatters located to date indicate that adversely affected sites have ranged from Paleoindian to Historic period occupations.

This survey has recognized several ways in which the adverse impacts of reservoir development on archaeological resources in the region may be minimized through future monitoring and mitigation practices. An organized monitoring program combining the resources of water users, archaeological society chapter members and local volunteers could identify sites along the reservoir shoreline on an annual basis to help prevent the undocumented loss of heritage resources. In individual site locales, such as those discussed in section 7.4, testing and salvage excavation should be employed where the destruction of a heritage resource is imminent and where site significance has been determined according to provincial guidelines. The database would be further aided by a geoarchaeological study of the landforms and sites located in the nearby Qu'Appelle valley or in regions of the South Saskatchewan River below Gardiner Dam. Such a study would contribute much needed *in situ* analysis of regional components and add significantly to the interpretation of affected or destroyed contexts along the reservoir. Together, such programs could further an understanding of the cultural occupations in the Lake Diefenbaker region and the factors which affected their development.

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Appendix 1: Site Descriptions of the S.S.R.P. (1958-1960)

William Mayer-Oakes and Zenon Pohorecky (1969)

note: all insertions, deletions and comments are by Mayer-Oakes and Pohorecky (1969)

Appendix 1: Site Designations of the 1958 Field Survey

Borden #	SSR #	description	location (W of 3rd)	cultural affil.	features	art. coll.	site condition
EgNp-1	1	hearth, scraper, worked flakes	NE/NW 35-24-5	unknown	yes	yes	innundated
EgNp-1*	2	bone debris	NE/NW 35-24-5	unknown	yes	yes	innundated
EgNp-1*	3	ceramic sherd (A178)	NE/NW 35-24-5	unknown	yes	yes	innundated
EgNp-2	4	3 cores, 1 scraper, 2wkd. pieces	W/NE 26-24-5	unknown	no	yes	innundated
EgNp-3	5	proj. pt., 3 scrapers, wkd. flakes	NW/NE 26-24-5	McKean	no	yes	innundated
EgNp-4	6	1 drill(?), 4 scrapers,wkd. flakes	SE/NE 26-24-5	Pelican Lake	no	yes	innundated
EgNp-4*	7	(2 end scrapers,1 sidescraper)	SE/NE 26-25-5	Pelican Lake	no	yes	innundated
EgNp-6	8	partial proj. pt., 9 scrapers, flakes	SE/NE 26-24-5	unknown	no	yes	innundated
EgNp-7	9	3 proj. pts., 9 scrapers, wkd. flake	NE/SE 26-24-5	unknown	yes	yes	poor
EfOf-1	10	50 stone circles	S/NE/NE of EfOf rect.	unknown	yes	no	unknown
Efof-2	11	12 stone circles	S/NE/NE of EfOf rect.	unknown	yes	no	innundated
EeNu-1	12	'several large stone circles'	NW/NE/SW26-20-11	unknown	yes	yes	unknown
EeNu-2	13	oval-shaped stone cairn	SE/SW 26-20-11	unknown	yes	no	unknown
EgNp-8	14	4 partial proj. pts, scrapers, flake	NE/SE 26-24-5	unknown	no	yes	poor
EgNp-9	15	obsidian proj. pt., basal frag p.p.	SW/SW 25-24-5	side-notched	no	yes	poor
EgNp-10	16	1proj. pt., bone debris	SE/SW 25-24-5	McKean	no	yes	innundated
EgNp-11	17	1'leaf-shaped blade', 1p.p.,flakes	SE/NE 26-24-5	Pelican Lake	no	yes	innundated
EgNp-12	18	2 end scrapers, wkd flakes	NE/NE 17-24-4	unknown	no	yes	innundated
EhNr-3	19	bone debris	NE/NE 35-26-7	unknown	no	no	innundated
EfNo-1	20	'Jamboree Buffalo Pound'	NE/NE/NE 18-23-3	historic (?)	yes	no	poor
EgNo-19	21	'Mistaseni' Ceremonial Centre	NE/ 34-24-4	unknown	yes	yes	destroyed
EgN0-2	22	bison pound	? 23--4-3	historic (?)	no	yes	innundated
EgNp-1	23	scraper, worked flakes	NE/NW 35-24-5	unknown	no	yes	innundated

*SSRP #1,2,3,23 were reclassified as a single site (EgNp-1) by the Saskatchewan Heritage Branch

*SSRP #6,7 were reclassified as a single site (EgNp-4)

Three additional sites were located by the McCorquodale and Swanston survey in 1958.
These were added to the 1959 SSRP archaeological site inventory.

Appendix 1: Site Designations of the 1959 Survey

Borden #	SSR #	description	location (W3rd M.)	affiliation	features	art. collect.	condition
?	24	pet. wood&quartz art.,flakes	NE 1/4 of 7-21-9	unknown	no	yes	unknown
?	25	faunal and lithic debris	SE 4-20-7	"	no	no	unknown
?	26	flakes, ceramic shards	SE 4-20-13	"	no	yes	innundated
EhNr-12	27	3 stone circles,trade bead	NE 34-26-7	"	yes	no	"
EhNr-13	28	6 stones on slight mound	NE 34-26-7	"	yes	no	"
EgNp-34	29	stone circle, faunal debris	NE 4-25-5	"	yes	no	"
EgNp-35	30	hammerstone, faunal deb.	NE 4-25-5	"	no	yes	"
EgNp-37	32	poss. bison kill	SW/NE 32-24-5	"	no	yes	"
EhNr-14	33	faunal and lithic debris	SW 2-27-7	"	no	yes	"
EhNr-15	34	fire-cracked rock	NW 35-26-7	"	no	yes	"
EhNr-17	36	faunal (large,complete)	NE 2-27-7	"	no	no	"
EhNr-18	37	2 hearths,bone awl, proj.pt	NE 2-27-7	Besant	yes	yes	"
EhNr-19	38	ungulate mandible (right)	NE 2-27-7	unknown	no	yes	"
EhNr-20	39	faunal material (unident.)	NW 36-26-7	"	no	no	"
EhNr-21	40	calcined bone, charcoal	SW 36-26-7	"	no	no	"
EhNr-22	41	faunal debris	NW 35-26-7	"	no	no	"
EgNp-38*	43	10 proj.pts, 13scrapers,...	NE 26-24-5	"	no	yes	"
EhNr-24	44	bison bones (13' B.S.)	NE 27-26-7	"	no	yes	"
EhNr-25	45	articulated bone (cow?)	SW 11-27-7	"	no	no	"
EgNp-39	46	1 porsherd, flakes, scraper	SE 26-24-5	"	no	yes	"
EgNp-40	47	unident. artifact scatter	SE 26-24-5	"	no	no	"
EgNp-41	48	6 worked pieces, flakes	NE 26-24-5	"	no	yes	"
EdNt-1*	49	2 proj. points	SW 19-21-9	Agate B./ P.Lake	no	yes	unknown
EfNs-1	50	bison jump	NE 11-22-8	unknown	no	no	unknown
EhNr-27	51	3 stone circles	NE/NW 26-26-7	"	yes	no	innundated
EhNr-28	52	1stone circle	NE/NE 27-26-7	"	yes	no	innundated
EhNr-29	53	lithic scrapers/debitage	SW 25-26-7	"	no	yes	unknown
EhNr-30	54	proj. pt. 'blank'/ lithic deb.	NE 26-26-7	"	no	yes	unknown
EhNr-31	55	unident. bison bone	SE 25-26-7	"	no	no	innundated
EhNr-32	56	faunal/ lithic debris	SE 25-26-7	"	no	yes	"
EhNr-33	57	hearth, frag. bone, flakes	SE 1-26-7	"	yes	yes	"
EhNr-11	58	bone fragments (reported)	dam axis east of river	"	no	no	"
EgNp-13	59	faunal//lithic debris	NW-25-24-5	"	no	yes	"
EgNp-14	60	flakes, worked pieces	NW 25-24-5	"	no	yes	unknown

Appendix 1: Site Designations of the 1959 Survey

Borden #	SSR #	description	location (W 3rd M.)	affiliation	features	art. collect.	condition
EgNp-15*	61	flakes,wkd. pcs.,pestle	NE/SE 26-24-5	unknown	no	yes	unknown
EgNp-16	62	flakes, worked pieces	NE/SE 26-24-5	"	no	yes	unknown
EgNp-17	63	flakes, worked pieces	NW/SW 25-24-5	"	no	yes	innundated
EgNp-18	64	flakes, worked pieces	NW/SW 25-24-5	"	no	yes	innundated
EgNp-19	65	1 pot sherd, flakes, wd. pcs	NW/SW 25-24-5	"	no	yes	innundated
EgNp-20	66	flakes, worked pieces	NW/SW 25-24-5	"	no	yes	poor
EgNp-21	67	flakes, worked pieces	NW/SW 25-24-5	"	no	yes	poor
EgNp-22	68	flakes, worked pieces	SE/SW 25-24-5	"	no	yes	innundated
EgNp-23*	69	flakes, worked pieces	SE/SW 25-24-5	McKean	no	yes	poor
EgNp-24	70	5 pot sherds, flakes, w.p.	SW/SW 25-24-5	unknown	no	yes	unknown
EgNp-25	71	flakes, worked pieces	SW/SW 25-24-5	McKean	no	yes	unknown
EgNp-26	72	faunal remains	SW/SW 25-24-5	unknown	no	yes	innundated
EgNp-27	73	flakes, worked pieces	NW/NW 28-24-5	"	no	yes	"
EgNp-28	74	proj. points, worked pieces	NE/SE 33-24-5	"	no	yes	"
EgNp-29	75	possible cairn	SE/NE 33-24-5	"	yes	no	"
EgNp-30	76	flakes, worked pieces	NW/SW 25-24-5	"	no	yes	"
EgNp-31	77	flakes, worked pieces	NW/SW 25-24-5	"	no	yes	"
EgNp-32	78	flakes, worked pieces	NW/SW 25-24-5	"	no	yes	"
EgNp-33	79	proj. points, flakes, w.p.	NW/SW 25-24-5	unknown (?)	no	yes	"
EeNu-3	80	proj. point, 1 pot sherd, flks	NW/SE 23-20-11	unknown	no	yes	"
EeNu-4	81	lithic debitage (flakes)	NW/SE 23-20-11	"	no	yes	"
EeNu-5	82	lithic debitage (flakes)	SE/NE 23-20-11	"	no	yes	"
EeNu-6	83	2 stone circles (disturbed)	SW/NW 24-20-11	"	yes	no	"
EeNu-7	84	3 stone circles	SE/NE 24-20-11	"	yes	no	"
EeNu-8	85	2 stone circles	SE/SE 24-20-11	"	yes	no	"
EeNu-9	86	lithic debitage	SW/NE 23-20-11	"	no	yes	"
EeNu-10	87	unident. scraper, flakes	SW/SE 22-20-11	"	no	yes	"
EeNu-11	88	unident. scraper, flakes	NW/SW 15-20-11	"	no	yes	"
EeNu-12	89	lithic debitage	unidentified	"	no	yes	unknown
EeNu-6*	90	3 stone circles, 1 cairn (?)	SW 6-20-11	"	yes	no	unknown
EeNu-13	91	stone circles, cairn (distur.)	SW/NE 29-20-10	"	yes	yes	unknown
EeNu-14	92	flakes, worked pieces	SW/NW 29-20-10	"	no	yes	unknown
EeNu-15	93	lithic debitage	SW/NW 29-20-10	"	no	yes	unknown
EeNu-16	94	partial stone circle	SW/NW 29-20-10	"	yes	no	unknown
EeNt-2	95	stone alignments (distur.)	NE 21-21-10	"	yes	no	poor
EeNs-8	96	stone circle	SE/NE 10-21-9	"	yes	no	unknown

Appendix 1: Site Designations of the 1959 Survey

Borden #	SSR #	description	location (W 3rd M.)	affiliation	features	art. collect.	condition
EeNs-9	97	flakes, worked pieces	SW/NE 10-21-9	unknown	no	yes	innundated
EeNs-10	98	lithic debitage	SW/NE 10-21-9	"	no	yes	innundated
EeNs-11	99	proj. point, flakes	SW/NE 10-21-9	"	no	yes	innundated
EeNs-12	100	hearth, worked piece	SW/NE 10-21-9	"	yes	yes	innundated
EeNt-3	101	proj. point, flakes	SW 19-21-9	Agate Basin	no	yes	unknown
EeNv-1	102	3 stone circles	NE 3-20-12	unknown	yes	no	unknown
EeNv-2	103	flakes, worked pieces	? 31-20-12	"	no	yes	unknown
EeNx-18	104	f.c.r., faunal & lithic debris	NW/SW 28-21-14	"	yes	yes	poor
EfNx-1	105	lithic debitage	SW/NE 18-22-14	"	no	yes	unknown
EfNx-2	106	2 sone circles, cairns	NE 22-22-14	"	yes	no	unknown
EeNv-3	107	stone circles, 2 cairns	NE/SW 10-20-12	"	yes	no	unknown
EeNx-1	108	flakes, worked pieces	SE/SE 15-20-14	"	no	yes	unknown
EeNx-2	109	flakes, worked pieces	SE/SE 15-20-14	"	no	yes	unknown
EeNx-3	110	lithic debitage	SE/SE 15-20-14	"	no	yes	unknown
EeNw-1	111	stone circle, flakes	SW/NW 29-20-13	"	yes	yes	unknown
EeNx-4	112	lithic debitage	SW/SW 14-20-14	"	no	yes	innundated
EeNx-5	113	lithic debitage	SW/SW 14-20-14	"	no	yes	innundated
EeNx-6	114	lithic debitage	SE/SW 14-20-14	"	no	yes	innundated
EeNx-7	115	stone circle	SE/SW 14-20-14	"	yes	no	innundated
EeNx-8	116	stone circle, flakes	SW/SE 14-20-14	"	yes	yes	innundated
EeNx-9	117	flakes, worked pieces	NE/NE 11-20-14	"	no	yes	unknown
EeNx-10	118	stone circles (disturbed)	NE/NE 11-20-14	"	yes	no	innundated
EeNw-2	119	stone circle	NE/NW 12-20-14	"	yes	no	innundated
EeNx-11	120	flakes, worked pieces	SW/SW 16-20-14	"	no	yes	innundated
EeNx-12	121	lithic debitage	SE/SE 17-20-14	"	no	yes	innundated
EeNx-13	122	lithic debitage	SW/SE 17-20-14	"	no	yes	innundated
EeNx-14	123	stone circle	NE/SE 17-20-14	"	yes	no	unknown
EeNx-15	124	flakes	SE/SW 17-20-14	"	no	yes	innundated
EeNx-16	125	rectangular stone align.	SE/SE 17-20-14	"	yes	no	innundated

Appendix 2: The Couteau Creek Site Excavations (1959)

William Mayer-Oakes and Zenon Pohorecky (1969)

note: all insertions, deletions and comments are by Mayer-Oakes and Pohorecky (1969)

H. Ken Cronk graciously brought several members of the Saskatoon Archaeological Society to the site in order to break the sod. Within three weeks, over one hundred tons of earth were moved. Much of this excavation was done with trowels, meticulously, with interruptions for photographing, recording, and the usual archaeological control techniques. Figure 2 ~~Map 3~~ shows the sequence of adjoining test-pits. These have irregular dimensions. This sequence proceeded ad hoc; it was decided to dig test-pit 2 only after test-pit 1 had been completely excavated, and so forth. At the outset, the archaeologists contemplated the use of bulldozers to clear the five foot overburden. This alternative, however, was abandoned when it was realized that the first three test-pits afforded an adequately representative sample of the site. The archaeologists had enough evidence to interpret the site adequately.

The aim of the excavation was to get a good sample of the entire site by digging one-quarter of its presumed area. One half of this site was gone, due to river erosion, so the northwestern quarter of this site, centered around the hearth, was selected for excavation. (See Plate 19)

Excavation

Five test-pits were excavated in the following order, and with the following observations.

(a) Test-pit #1 (6 feet north-south by 5 feet east-west) was excavated in one-foot levels until the occupation zone was neared five feet below datum (southwest stake). The oblique slopes of this zone were followed, after a preview of these slopes was secured by sinking a moat 1 foot deep and 1 foot wide around the walled floor. This block was sectioned, and trowelling continued in 3 inch levels.

A standard control check mechanism was provided by pedestalling the specimens in situ. Despite the suggestive presence of 3 nearly adjacent and parallel sod lines around the occupation zone, specimens were recovered only from the lowest layer, so this is a single component site, rather than a stratified one.

This initial test-pit had over half of all the chert specimens that were recovered at the site. It alone produced all the bison rib awls, over half of all the small triangular bison scapula burins (?) and grinding pebbles. It also produced about one-quarter of all the fire-cracked rocks, which were later reconstructed, and proved to be parts of a grinding stone (metate). This pit also had almost half of the unworked bone recovered at this site. In all, 201 specimens were recovered from this occupation zone of the first test-pit.

COTEAU CREEK SITE EXCAVATIONS

For three weeks during June and July, both the National Museum of Canada and the Saskatchewan Museum of Natural History archaeological teams excavated a site near the mouth of the Coteau Creek, within the damsite district. The designations for this site were: SSR#37 and EhNr-18. Its location is in the northeast quarter of section 2, township 27, range 7, west of the third meridian. It was in a cutbank at the river edge overlain by a heavily wooded terrace that was cluttered with bone scrap.

The site had a thick charcoal layer set in an old humus line five feet below the surface, and five feet above the water table, which is 1,645 feet above sea level here. A bison rib awl was found in situ at the northern edge of an oval-shaped fire-pit that was oriented east-west. Several more sites were found within a fifty-yard radius in the bank facing a channel and an island in the Saskatchewan River.

Richard MacNeish, Yukon-bound, visited the site, and regarded the awl's context as teasing enough to warrant test-trenching. This was recommended, especially since the site was in the middle of a proposed waste area (3B, on the contractors' charts). This area was threatened by destruction from adjacent bulldozer operations. Piggott Construction was setting up its large camp just above the archaeological site, and sewer-trenching operations were proposed to pass in the vicinity of the site.

Sections of two oval-shaped hearths were exposed here. Great pains were taken to correlate these in terms of stratification. Both had their upper limits in the same occupation zone. Carbon samples were collected from both sunken hearths, but stratification strongly suggests that these were likely contemporaneous. (See Figures 3, 4 and 5

(b) Test-pit #2 (10 feet square) had a surface area four times as large as the first, but only thirty-five specimens were recovered. This pit was excavated with long-handled shovels through the sterile overburden. The floor was sectioned into four parts at five feet below datum. Each section was meticulously trowelled well below the occupation zone. This test-pit's area (and volume) exceeded that of the other four pits combined, but produced only one-fifth of all the specimens that were recovered at this site. It had less than any other single test-pit.

This negative evidence was valuable in defining the outer limits of the site. Occupation was apparently restricted to just a few square feet immediately around the hearths.

(c) Test-pit #3 (6 feet north-south and 5 feet east-west) produced eighty-seven specimens. This pit was excavated in a way similar to that used in excavating test-pit #2. This pit had the most bone artifacts - over half of all found at the site. These were bison ribs, which may have been used as flakers, and bison ribs, which, by association, suggested that they were flanks for awls. There were many triangular bits of bison scapula, some of which looked honed enough to resemble

burins, but this interpretation remains speculative, even after examination of the specimens under a microscope. There is no evidence that they were not used as burins, but the evidence for this interpretation of triangular bison scapula burins is not yet convincing.

This pit produced a fire-cracked milling stone (metate), which was fractured by fire, as evidenced by blackened, and powdery granules in the granite. This large fragment was subsequently reconstructed in the laboratory; most of the fire-cracked rocks in test-pit #1 fit this large fragment. About one-quarter of the milling-stone is intact, according to the weight ratio between this piece and smaller fragments. The surface has been pecked around all sides of the oval-shaped milling-surface. Dimensions would be about 10 inches long, 8 inches wide, and 4 inches thick. It weighs about 13 pounds. The slab's surface is ground through use, and has a shallow depression. The polished area covers about thirty-five square inches; it is about 7 inches long and about 5 inches wide -- forming a rather squarish-oval.

Several grinding pebbles were associated with this milling stone. The size of the pebbles suggests that the milling-stone may have been used to grind berries and flesh for pemmican. The extent of the grinding on the slab's surface suggests minimal use.

About one-quarter of all the chert at the site was found in this pit. Almost nothing was found in the westernmost extreme of this pit. Again, this helps to define the limits of this occupation site.

(d) Test-pit #5 (2 1/2 feet north-south and 5 feet east-west) was undercut. This departs from standard archaeological procedure, but was justified in this case on several criteria. The soil was adequately hard-packed to preclude the danger of cave-ins, and possible injury to excavators. The excavators were adequately experienced and cognizant of engineering principles to utilize cross-cutting triangular arches for additional support. The six-feet of overburden was known to be sterile. Time and manpower were limited. The archaeologists required only one more distinctive artifact to clinch a proposed cross-dating technique.

A further undercut into the south wall exposed another two square feet of the occupation level. This area was shaped like an equilateral triangle pointing south. The soundness of the undercutting procedures utilized here was evidenced, in terms of engineering principles, when the site was revisited during 1960, after the site had been exposed to a harsh winter and the raking by ice-flows. The earth above the undercut area was still intact, despite the tendency for cutbanks to slump, split and cave-in in this region.

This pit had the most burnt bone -- about two-thirds of all that were found at the site. It also had almost 90% of the bone that had a chalky white cortex -- indicating a subjection to the greatest heat. There were no bone artifacts or unburnt bone. About three-quarters of all the fire-cracked rocks at the site were in this small pit. This suggests that the center of one of the hearths was here.

This pit also produced artifacts of chert and stone. A finely-polished grinding-stone (mano) and milky quartz fragments occurred only here. The other distinctive artifact was found here -- a match for the other Besant point found in this site. Oliver Johnson reports having extended this pit during 1960, and he has yet a third Besant point from here.

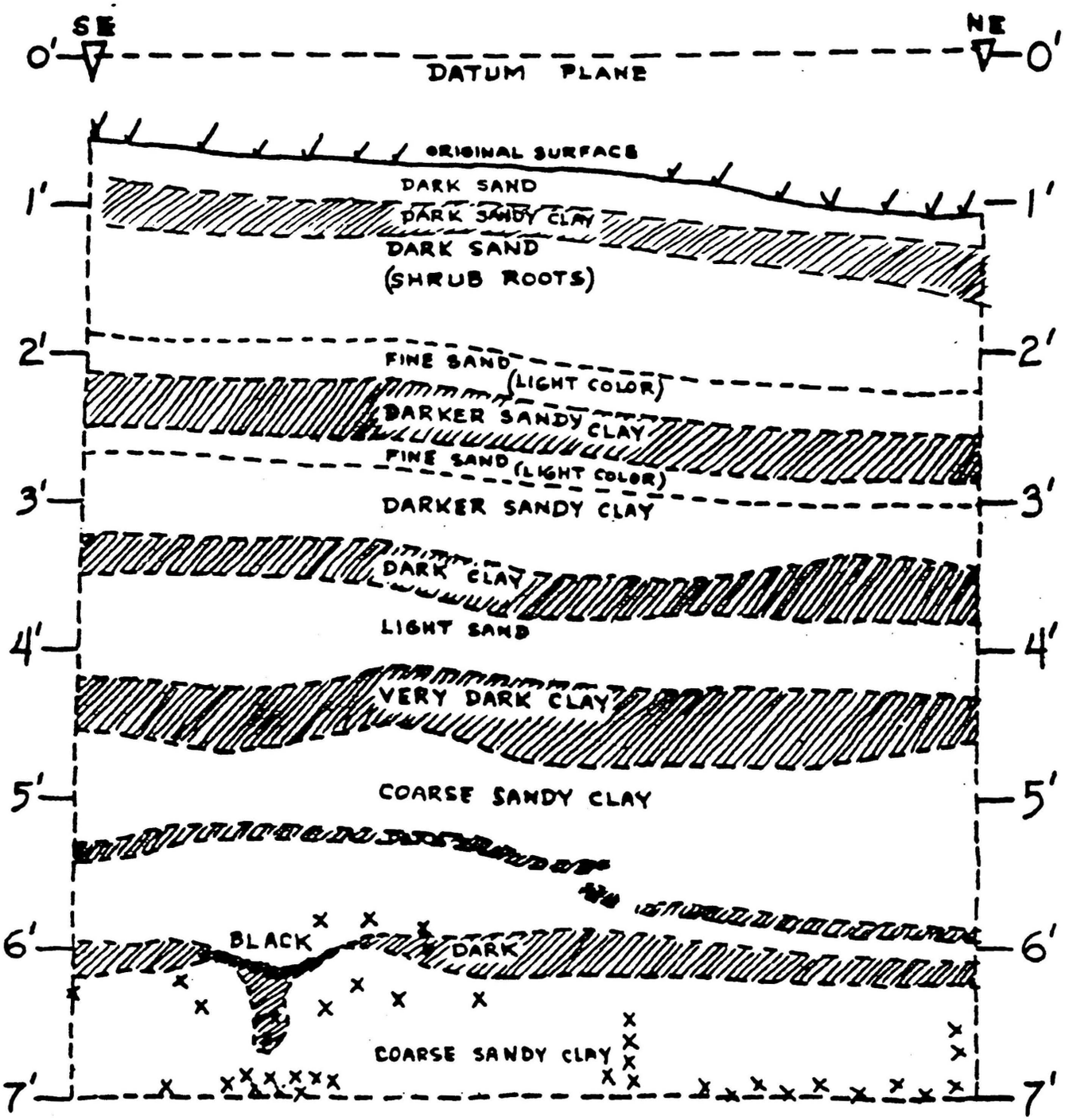
(e) Test-pit #4 (5 feet north-south by 3 feet east-west) was 10 yards south of the major series of test-pits. It was also undercut to expose a fire-pit. Only a few bone specimens were recovered here. Charcoal samples were taken.

Summary

The three excavated fire-pits were likely relatively contemporaneous, because all correlate with the lowest of the three thin sod-lines that seem to fuse in spots. The site probably represents an ancient campsite that was revisited. The hearths are too close to suggest a single visit. This site was likely revisited, because it is near a bison trap or bison jump located just upwind from the prevailing Westerlies. The scarcity of specimens suggests a brief occupation, and a small camp unit consisting of a single nuclear family, rather than of a men's hunting party. This is suggested by the presence of grinding-stones and milling-stones, as well as scrapers, which, even in historic times, were primarily women's tools. The presence of men is indicated by the

presence of projectile points. The absence of ceramics suggests a pre-ceramic date for the site. The projectile point types suggest a date of about A. D. 300.

PROFILE #1 Test-pit #1 SSR#37; NMC#EhNr-18

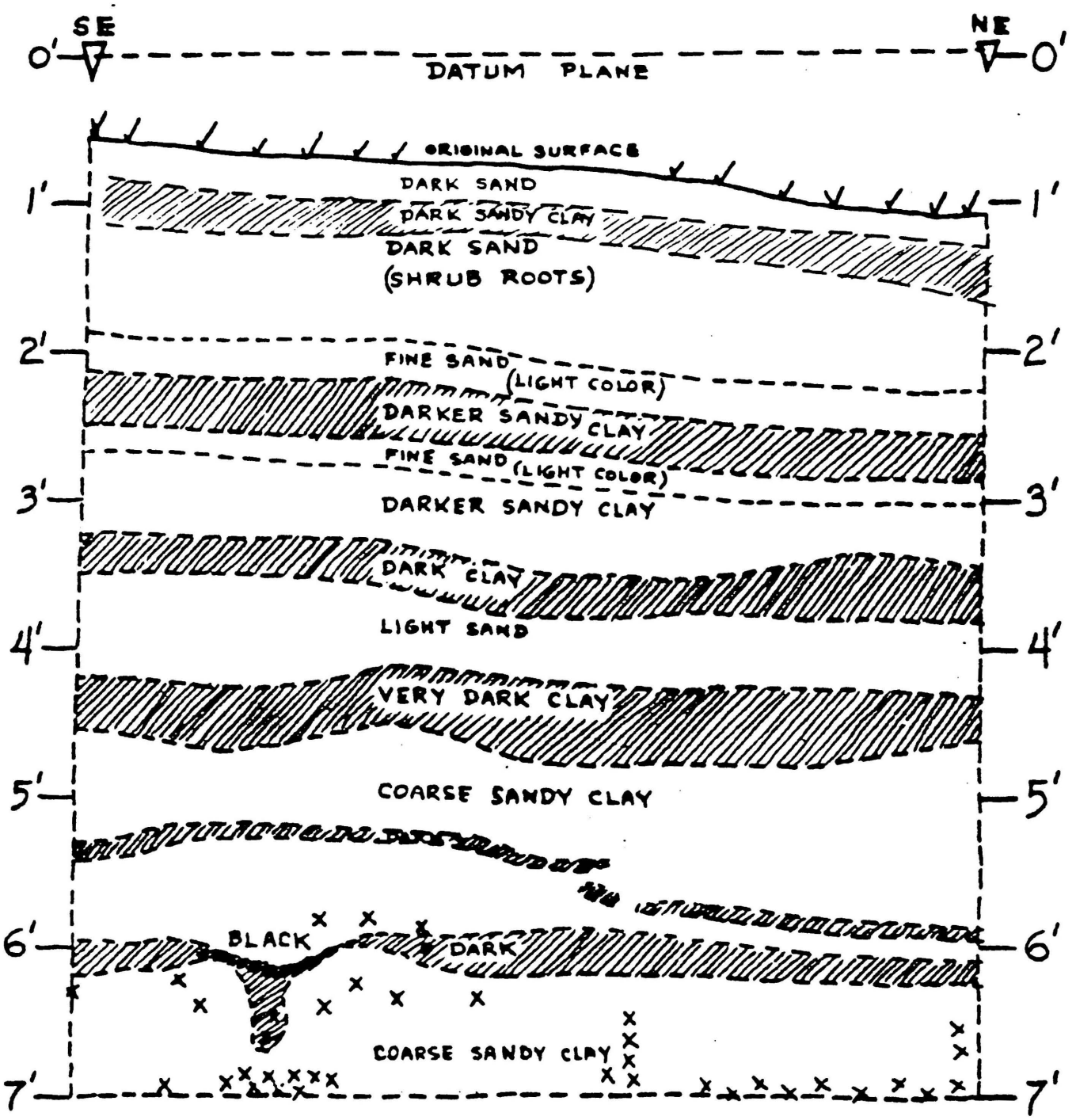


SCALE

6"

PROFILE ELEVATION OF EAST FACE - LOOKING WEST

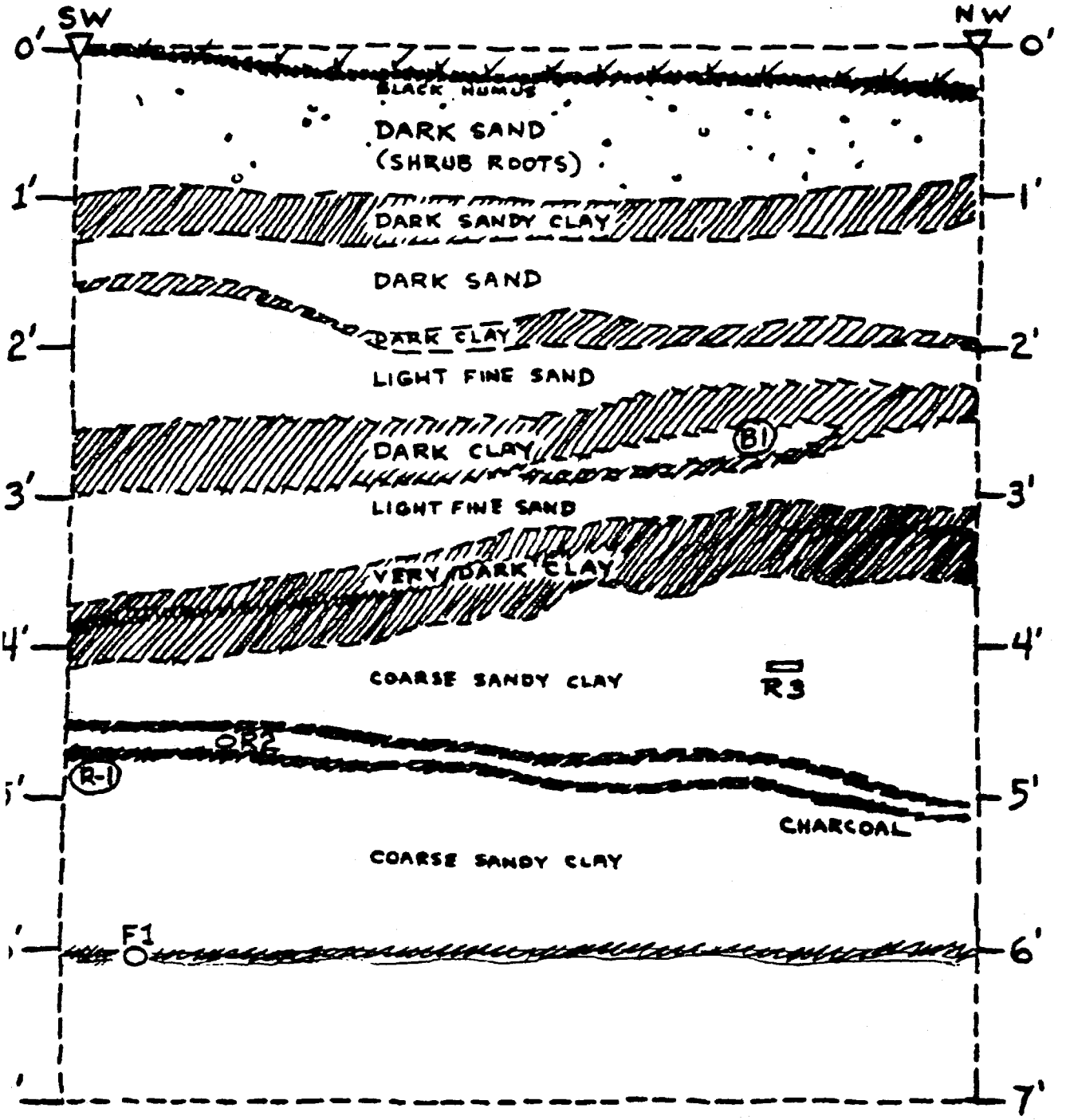
PROFILE #1 Test-pit #1 SSR#37; NMC#EhNr-18



SCALE
6"

PROFILE ELEVATION OF EAST FACE - LOOKING WEST

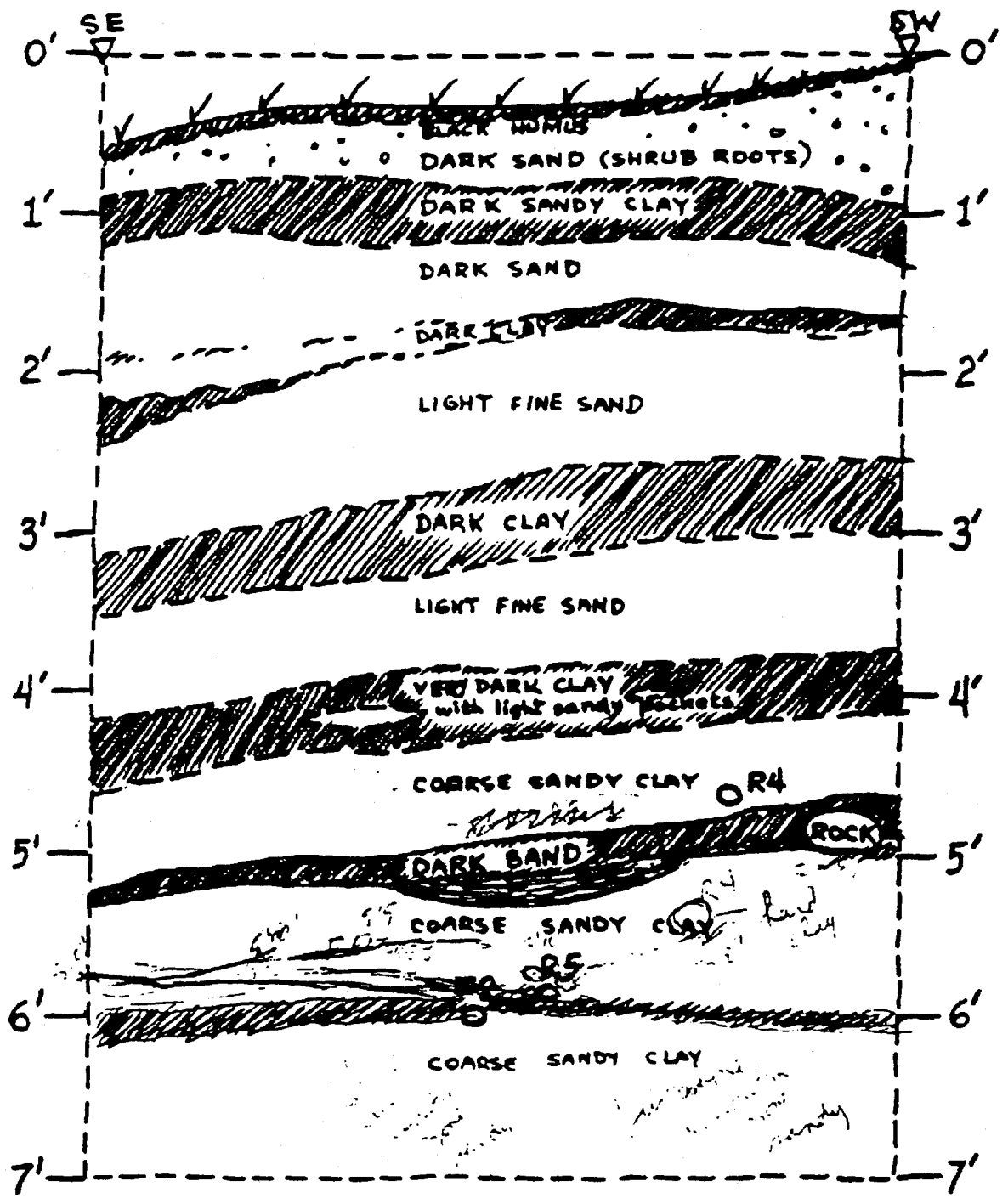
PROFILE #2 Test-pit #1 SSR #37; NMC #EhNr-18



SCALE
6"

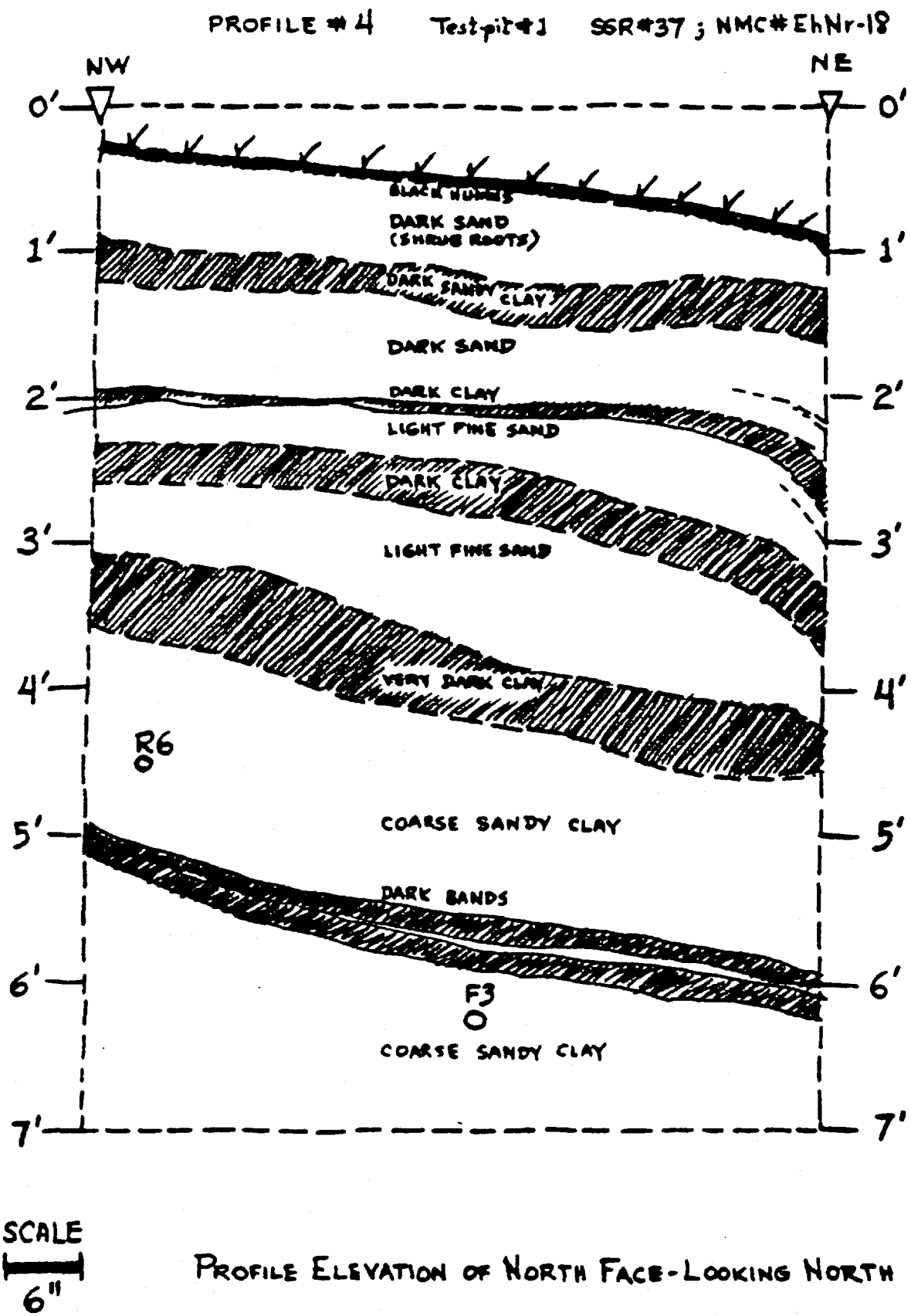
PROFILE ELEVATION OF WEST FACE - LOOKING WEST

PROFILE #3 Test-pit #1 SSR#37; NMC # Eh



SCALE
6"

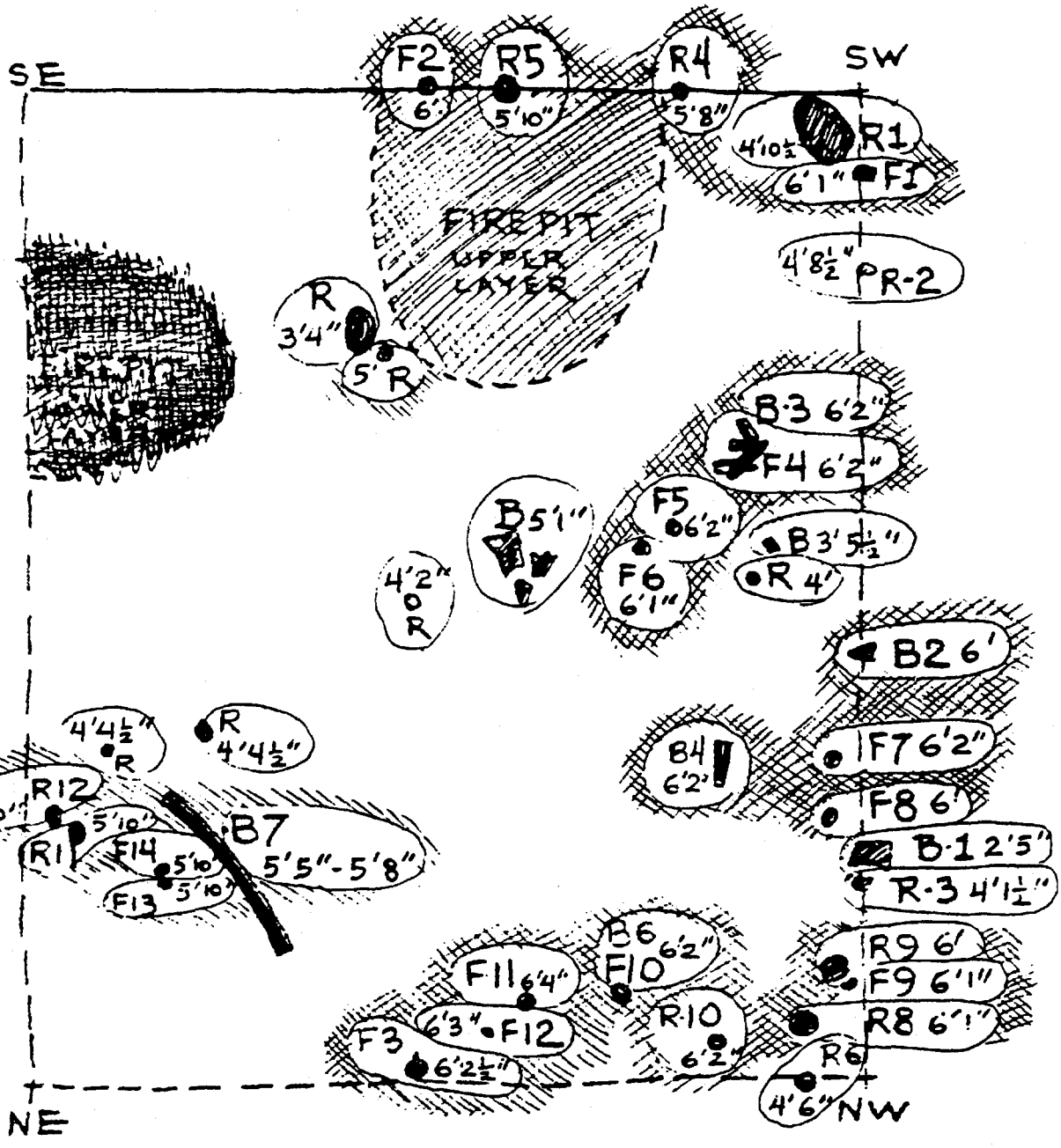
PROFILE ELEVATION OF SOUTH FACE - LOOKING SOUTH



PROFILE ELEVATION OF NORTH FACE - LOOKING NORTH

Test Pit #1 SSR #37, NMC#ELNr-18

COMPOSITE FLOOR PLAN 1
(2'5" – 6' B.D.)



(Key to Notations: pp. 17-20)

Table

528 specimens recovered from Coteau Creek Site (45 artifacts)

		T-P #5	T-P #1	T-P #3	T-P #2
207 BISON BONE					
106 Burnt:	62 white	51	10	1	-
	40 black	15	13	4	8
	4 charred	--	4	-	-
70 Unworked:	38 fragments	8	13	8	9
	8 cranial	-	8	-	-
	7 leg joints	-	3	2	2
	5 tail	-	-	-	5
	4 vertebrae	-	1	1	2
	3 ribs	-	2	-	1
	3 scapulae	-	-	-	3
	2 teeth	1	-	-	1
8 Worked:	4 ribs	-	4	-	-
	3 leg joints	-	-	2	1
	1 long bone	-	-	-	1
23 artifacts:	11 rib blades*	-	-	11	-
	9 scapula burins*	-	5	4	-
	3 rib awls	-	3	-	-
155 INTRUSIVE IGNEOUS ROCK					
134 fire-cracked granite (metate fragments)		94	33	7	-
20 gabbro pebbles:	11 tiny	1	7	3	-
	9 big	-	5	3	1
1 phyllite mano		1	-	-	-
166 SILICATE DIOXIDE (CHERT) (includes 20 artifacts)					
111 quartzite		16	58	36	1
50 chalcedony group		13	32	5	-
5 milky quartz		5	-	-	-
TOTALS		205	201	87	35

* These bone fragments, not unlike Dart's Osteodontokeratic, may not have all been shaped or used, but several show definite traces of grinding or wear. The others resemble these worked pieces in form.

Table

Besant assemblages at Mortlach, Coteau Creek and Long Creek sites

TRAIT	MORTLACH 4A	MORTLACH 4B	MORTLACH 4C	MORTLACH 4D	COTEAU CREEK	LONG CREEK
DIAGNOSTIC						
1. Besant projectile points	x	x	x	x	x	x
2. Plano-convex scrapers	x	x	x	x	x	x
EVIDENCED AT ALL THREE SITES						
1. Ovoid blades		x	x	x	x	x
2. Flake-scrapers	x	x		x	x	x
3. Flat-end-scrapers	x	x		x	x	x
4. Drills	x				x	x
EVIDENCED AT MORTLACH & COTEAU CREEK						
1. Choppers	x				x	
2. Worked bone	x				x	
3. Scored bone		x				
EVIDENCED ONLY AT MORTLACH						
1. Roundhouse (25' diameter)	x					
2. Narrow blades	x					
3. Bone pendant	x	x				
4. Semilunar blades		x				
5. Hammerstone				x		
6. Square-based blades				x		
7. Curved scrapers						
NOTED ONLY AT COTEAU CREEK						
1. Oval-shaped fire-pits					x	
2. Milling stones (metate)					x	
3. Grinding stones (mano)					x	
4. Bison rib awls					x	
5. Bison scapula burins*					x	
6. Dominance of quartzite flakes					x	
7. Dominance of petrified wood tools					x	
8. Chert burins					x	
NOTED ONLY AT LONG CREEK						
1. Triangular projectile point						x
2. Shell artifacts						x

* Although several of these at Coteau Creek may be challenged, at least one is definitely worked, and resembles the triangular 'projectile point' at Long Creek, which "may have been used as a small blade" (Wettlaufer and Mayer-Oakes, 1960:41-42).

Appendix 3: The Derr-Drews Burial (1959)

William Mayer-Oakes and Zenon Pohorecky (1969)

note: all insertions, deletions and comments are by Mayer-Oakes and Pohorecky (1969)

SALVAGE WORK OUTSIDE THE RESERVOIR

Derr-Drews Grave

For two weeks during July, 1959, both teams from the National Museum of Canada and from the Saskatchewan Museum of Natural History salvaged an Indian grave. This burial was located in a hollow of a farm eight miles east of Saskatoon -- NW 1/4, NW 1/4, SE 1/4, section 7, township 37, range 3, west of the third meridian. Herman Drews, the farm's owner, and his neighbor, John Derr, discovered the grave while clearing brush. They immediately notified Professor F. H. Edmunds at the University of Saskatchewan, who cleared with the Royal Canadian Mounted Police, and advised Robert H. Nero, acting director, Saskatchewan Museum of Natural History. In Mr. Bard's absence, Robert Nero advised the archaeological field parties to investigate the site. Summer fallowing threatened to destroy the site, whose relevance to similar cairn graves within the reservoir seemed obvious.

Over nine-hundred Indian graves are known by the professional people at the Saskatchewan Museum of Natural History to have been disturbed by amateurs. One is on exhibit in Regina and another in Swift Current. However, there were very few excavations of graves conducted under strict control within the province. Therefore, aided by the Saskatoon Archaeological Society, work began, enlisting the services of many individuals. The excavation involved eight major stages:

1. The work area was staked out and the overlying stones were recorded. After all the stones under the sod were exposed, the cairn's dimensions (7.5 feet north-south by 3.75 feet east-west) indicated the orientation and the surface area of the grave. This suggested surface area was then enclosed within a ten-foot-square work area. Stakes were driven in at two-foot intervals along the perimeter in order to serve as fixed points for the series of string-grids that were to be set up as guide-lines for the plotting of the data at various stages of excavation. This time-saving technique was first devised by Ritchie of New York. The positions of the undisturbed stones were plotted before the stones were removed.

2. The work area was trowelled until the grave outline was evident. Many stumps and roots were cleared before the rectangular outline of the grave-pit could be discerned. It measured 4 feet 10 inches north-south and 2 feet 2 inches east-west. It was also about one foot below the current soil surface (range of about two inches). The internal grid was restrung, and the pit data were plotted.

3. The grave-pit was trowelled. Eight poplar saplings were found aligned north-south within the grave-pit. These were exposed and left in situ for plotting with the aid of the string-grid. Profiles of the disturbed area showed that the grave was just fourteen inches deep, and lying atop a gravel layer.

4. The skeleton was exposed in situ. The excavation techniques employed during this stage were necessarily very precise. The specimens were so delicate that the excavators had to use surgical tools, dental picks, and ulcer syringes. The bones and the artifacts were triangulated, recorded, and drawn. The decision to remove the entire grave in situ was prompted by the wealth of associated goods, whose exact location was just as vital as the nature of these items. A crating technique, rather than a plaster-casing one, was selected.

5. The stretcher and crate were custom-made in order to fit the grave. The archaeologists constructed the 'coffin' with the assistance of visiting journeyman carpenters and cabinet-makers, who volunteered their advice, services, and tools without charge.

6. The grave was pedestalled. Ten tons of soil were moved in order to pedestal the grave. The bottomless crate was slipped around the grave from above. This was packed tightly with excelsior, wood-shavings and polyethelene. An ice-saw was used to slice the soil nine inches below the grave's base. Then, a twenty-two gauge copper bearing galvanized iron sheet was slid into this cut from the south end.

7. The grave was slid onto a stretcher. A stretcher was laid alongside the crated grave, levelling its surface with that of the ice-saw cut. Then this seven hundred pound block was slid west onto the stretcher. The crate

was bolted and strapped to this stretcher, so that the only problem remaining was to move the crate out of the pit without disturbing the contents.

8. The crate was lifted gently out of the pit and set within the rear of a panel truck. An eleven ton Diamond T Wrecker Medium Brakedown was used. Captain Gordon Lyon authorised Sergeant-Major Don Gibson and Sergeant Paul Ramsay of the Saskatoon Militia, Thirty-seventh Technical Squadron, R. C. E. M. E., to operate this crane-rig for this purpose. Walter Romanow, public relations officer for the militia, also assisted in this stage of the project. The crew's experience in bomb-detonation ensured the gentle transfer of this crate from the pit into the truck. The subsequent trip to the Saskatchewan Museum of Natural History in Regina was uneventful, and this crate was stored in its laboratory.

Preliminary analysis in Regina

The entire skull and the eight upper vertebrae were extracted from the crate in the laboratory. These and the artifacts associated with the skull region were catalogued and analyzed. The following table summarizes findings:

Catalog Numbers	Specimens: Teeth	Specimens: Artifacts	Locations
DDS-1		1 copper earring	beneath left ramus
DDS-2		1 copper bottle lid with inscription embossed: "J. SCHWAB - NEW YORK PERFUME"	taken out of situ, due to drying soil tending to crack
		2 beads	
		2 pebbles	
DDS-3		1 comb fragment	beneath DDS-2
DDS-4	left upper second premolar		beneath right jaw, between ramus and chin. Roots proximal and cusps distal to midsaggital
	left upper third premolar		
DDS-5	left upper second incisor		on chest: field catalogued during excavation
DDS-6		Many beads	in mouth
DDS-7	left upper first premolar		beneath third vertebra, under left jaw near chin. Roots distal to midline
DDS-8	right lower second incisor		beneath seventh vertebra, under right alae
DDS-9	left lower first incisor		above vertebra in mouth; near bottom of lower edge of jaw by the chin
	right lower first incisor		

Catalog Numbers	Specimens		Locations
	Teeth	Artifacts	
DDS-10		Large beads	above vertebra in mouth
DDS-11 DDS-29	Left open, as two men were cataloguing		
DDS-30		large beads	below right side of neck
DDS-31	left lower second incisor		beneath nuchal plane
DDS-32	left lower first premolar		beneath nuchal plane, near the Atlas: roots are proximal
DDS-33a		2 large white beads 1 medium-sized pony turquoise bead 3 small blue beads 2 pea-pod white beads Hundreds of other beads	under jaw
DDS-33b	left lower second premolar		under head
DDS-34	left lower second premolar		beneath fifth vertebra, under right jaw, beneath third molar (right lower)

All the teeth above were catalogued and then reinserted into the mouth. Only the left lower canine is missing. An examination of the cavity reveals no growing over, so this tooth is probably still somewhere within the crate.

A few preliminary notes were made on suture closures, epiphesial unions, vertebrae, teeth, and mastoid processes. Pathology is yet uncertain, even following examination of anomalous depression in left parietal. Results follow:

Suture closures:

All sutures are closed within the interior of the cranium. The occipital suture is partially open on the exterior surface of the cranium. Indicated age from this evidence: 23 to 25 years.

Epiphesial unions:

The first eight vertebrae, that is, the Atlas and the cervical ones, were examined carefully. These were articulated, and the articulating surfaces were cup-shaped. Measurements for these were to be submitted to the Anatomy Department at the University of Saskatchewan, but general appearance indicated an age of about 24, possibly younger, which confirmed suture closure data. The measurements here were not crucial, especially since wear on teeth indicated an age under 25, too. The cumulative evidence indicated an adequately exact age of the deceased at time of death.

Vertebra:

All the vertebrae were examined in situ. None were damaged. None had arthritic lipping. No pathological evidence was uncovered.

Teeth:

Both upper second incisors were very definitely shovel-shaped. Thi indicates a genetic trait, and has traditionally been regarded as indicative of a Mongoloid strain, which, in this case, may be Indian. All the teeth, except for the lower left canine, were present. This lower left canine's cavity is not healed over, so it must be somewhere in the crate, in view of the careful excavation that was done. There is no evidence of dental caries, and dental attrition is minimal. The wisdom teeth are unerupted. Only the incisors show heavier wear, indicating heavy chewing, although the relatively slight wear on these incisors also indicates the youthfulness of the deceased. The evidence here indicates that the deceased was under 25 years of age at time of death.

Mastoid processes:

An assymetrical development of the mastoid processes indicates a pronounced tendency to tilt the head to the right on the part of the deceased, during her lifetime. The left mastoid is thinner, more elongated, and the groove is deeper. The small size of the mastoid processes indicates an unquestionable female trait. This is corroborated by an examination of the pelvis, which is female, and by associated artifacts.

Pathology - cranium study:

Several thin spots are evident in the left pariental near the midsaggital. This was observed by the use of electric lighting directed at the exterior

surface; light showed through into the interior darkness at those places where the skull was thinnest. There is a circular depression, with smooth bevelled outer ring and rough osseous matter within the inner circle, on the surface of the left parietal. This anomaly was presumed to have been a likely cause of death, but, if it was a wound, caused by a blow, then it had completely healed over. The blow, even if the deceased did live on for several years, may have resulted in ill health, and contributed to death. The depression in the left parietal may be functionally related to the assymetry noted in the mastoid processes; one may visualize her walking around with head tilted to the right, stretching the muscles on the left side of the neck (and the mastoid process), and thus keeping the depression in her left parietal directed upward as far as possible. However, consultations with a brain specialist in Saskatoon have suggested an alternative interpretation of the anomaly. The depression may have been a soft-spot in the skull. These usually occur symmetrically, that is, on both sides of the cranium in left and right parietals. Yet the examination of this depression indicates that it was as thick and even thicker than the surrounding bone. This may support the hypothesis that this individual had suffered a blow to the left side of the head a few years prior to death, and that this blow had affected the posture of the head, and possibly even contributed to the death of the individual.

"The fur-piece"

Bruce McCorquodale, Curator of Paleontology, Saskatchewan Museum of Natural History, carefully examined the two small skulls that were located near the right side of the neck of the skeleton. He reports his conclusions as follows:

> The larger skull is that of a mink (Mustela vison). The occipital region and basicranium have been removed, presumably to permit removal of brains. This section was probably cut off with a knife but definite evidence of this is lacking because the cut edges of the cranial bones have been smoothly rounded by wear or abrasion. Other surfaces and corners of the skull show no sign of abrasion or wear. The above evidence clearly suggests that the skull had been protected by its own skin and that it had been worn or handled considerably, the smoothing of the cut edges being produced by friction with its enclosing pelt or with the garment or article to which it had been attached.
>
> The smaller skull is that of a large weasel, probably the Long Tailed Weasel (Mustela frenata). The supracranium and occipital region of this skull have been removed. The shape of the edges suggests that the method of removal was by crushing rather than by cutting. The edges of the break and the other surfaces of the skull display no sign of wear or abrasion. The above evidence suggests that the skull was protected by its own skin and that it had not been worn or used extensively or there had been no movement or friction within its pelt to cause smoothing of the cranium edges.

This personal communication from Bruce McCorquodale (January 26, 1960) suggests two alternative functions of the 'fur-piece' -- as an attachment to a garment or as an attachment to an article. The garment may have been either a scarf or the upper part of the dress. The dress was a cotton print, so it is unlikely that it was worn attached

to this garment. The position of the skulls in situ strongly suggested the interpretation that these two skulls were the terminal ends of a fur-piece that had been wrapped around the deceased's neck. Yet, as McCorquodale suggests in his cautious conclusions, they may have been attached to some 'article.' Likely articles to which these skulls may have been attached are: a head-piece, or the pillow-bag under the deceased's head, or possibly even the bison-hide rug that had been placed under her. The R. C. M. P. Laboratory Report (October 9, 1959) supports the view that this was a neck-piece, because sample #2 (exhibit C), which came from the front of the neck, preserved by copper associations, is hair that belongs to the Mustelidae family.

W. R. Picton, Constable, Royal Canadian Mounted Police, with the approval of J. Robinson, for Senior Inspector C. R. Eves, Officer-in-charge of the Crime Detection Laboratory in Regina, received three samples from A. Swanston, Saskatchewan Museum of Natural History, on September 30, 1959. The hair and fibre analysis (file number 806-59) was done for the archaeologists through the agency of Bruce McCorquodale. The findings follow:

Royal Canadian Mounted Police Crime Detection Laboratory Report

1. GENERAL: . . .

Exhibit A - One plastic vial containing hair labelled "Janglers from left jaw (neck)."

Exhibit B - One piece of hide labelled "sample number one." A sample of hair was removed and placed into an envelope.

Exhibit C - One piece of hide labelled "sample number two." A sample of hair was removed and placed into an envelope.

2. PURPOSE: To examine the hair samples A, B, and C, in order to determine their origin.

3. DATA: Exhibit A - One lock of hair containing approximately 50 hairs, 1 1/2 inches in length. This hair is of human scalp origin. The hair belonged to a Mongolian. (Mongolian includes the North American Indian.)

Exhibit B - One sample of animal hair. This sample is wool hair similar to that of bison.

Exhibit C - One sample of animal hair. The medulla of this hair has deteriorated. It is similar in other respects to hair from the Musteledae family. Musteledae includes martens, weasels, minks, otters, skunks, badgers, and wolverines.

4. CONCLUSIONS: (1) Exhibit A is human scalp hair.

(2) Exhibit B is wool hair from a Bison.

(3) Exhibit C is likely from a member of the Musteledae family.

5. REMARKS: Exhibits A, B, and C held at this point pending instructions as to their disposal.

Interpretation of R. C. M. P. Report

Exhibit A came from within a conical copper 'jangler' near the neck. It was human hair, probably that belonging to the deceased. The trait is common on the plains, and is known as far south as among the Navaho. Indians used kettles which they received from the trader, sliced these into strips, and bent them into conical shapes. These metal objects were then attached to a line of tassels. The hide tassel was threaded through the copper cone, and knotted with human hair. Aside from the decorative effect of long hair emanating from the bright copper cones, the metal objects 'jangled' against each other as the wearer of the garment moved.

Exhibit B came from the rug that lay underneath the deceased. As suspected, it was a bison hide rug. This suggests that the burial occurred well over a century ago, because bison were virtually unknown in this region as early as the 1880's; their virtual extinction was threatened even then. The bison rug helps to set an upper limit on the possible date of this burial. It was at least 80 years ago, and unlikely to have been more recent. The nature of the trade goods sets a lower limit on the burial. It is unlikely to have been earlier than 1800 A. D.

Exhibit C came from the neck region in association with copper, which served as a preservative factor. The identification of this hair and hide as Mustelodae is positive. This supports the view that this person wore a fur neck-piece made of mink and weasel.

Blood type:

Both Dr. J. Anderson, Department of Anatomy, University of Toronto, and specialists at the Cook Laboratory at Berkeley, California, have facilities and new techniques for deriving blood type from bone. However, none of the techniques are yet able to give data on Rh or other factors, apart from the usual A, B, and O. Furthermore, the blood-type ratios are based on populations, rather than directed toward identifying discrete individuals, so such testing for blood-type was postponed pending further technical developments in these laboratories. The teeth, the nature of the burial, and associated artifacts confirm that this was an Indian burial. It was hoped that blood-typing might enable the archaeologist to learn if the deceased had any admixture of Caucasoid blood, that is, whether she might not have been Metis. However, current techniques are not able to detect such fine distinctions.

Further analysis

The skeleton remains in Regina, and lower portions of it still have to be extracted and analyzed. However, significant materials have been transported to the United States, where they are still being examined for

clues that might aid in the correct interpretation of this burial. For example, attempts have been made to submit the copper, brass and ferrous material to chemical analysis, assuming that these three metals have a differential rate of corrosion. An exact date would be possible if experiments are successful. At present, however, chemists have no such ratios formulated, and must rely on original work. Consultations are being conducted at Berkeley, California, where university facilities are good.

Attempts are still being made to trace the origin of the lid which has the name J. Schwab embossed on it. There is no such firm in the city of New York, and leads are being sought in the state through a search of archives and correspondence with historical societies. This lead may also cast some light on the date of this burial.

Interpretation

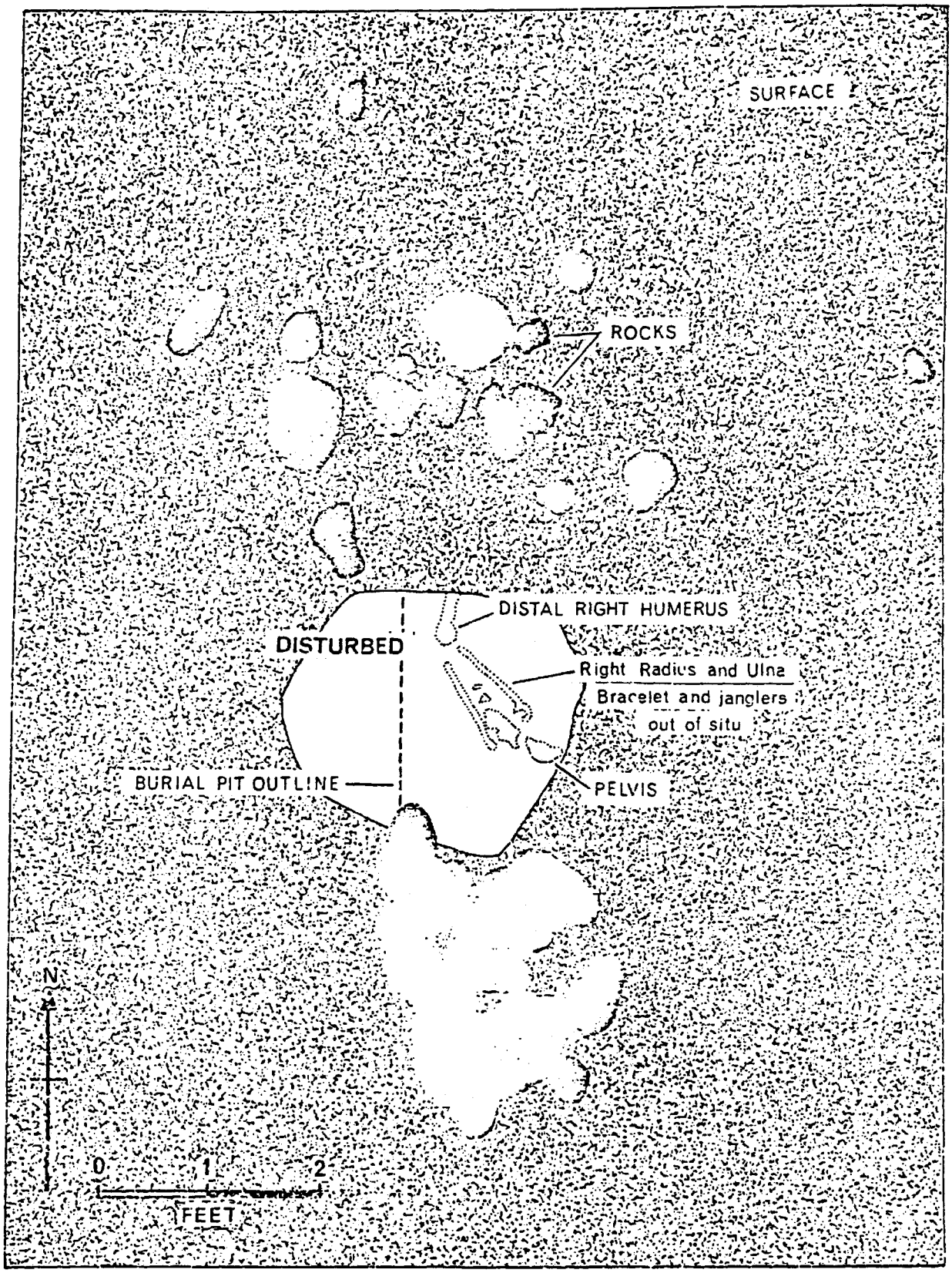
Over a century ago, a twenty-four year old Indian woman died in central Saskatchewan. The region was hilly, being the old beach around Lake Saskatoon. This is the aspen belt, so that the region was characterized even then by scattered concentrations of woods in the grassy setting. This woman was well regarded, as evidenced by the richness of the grave goods. She was married -- a copper ring banded her left hand fourth finger. Her build was sturdy, and she was quite tall -- about five feet six inches. However, she probably walked with

her head tilted to the right for several years prior to her death, due to a blow to the left side of her head. Possibly this contributed to her death. Otherwise, she enjoyed excellent health, and suffered no arthritic pains, nor did her teeth trouble her.

Her funerary garb was a cotton dress. A beaded head-band ringed her forehead, and two copper-button pendants hung like earrings from this head-band. She wore a mink and weasel stole wrapped around her neck. An elaborate necklace of porcelain beads hung around her neck. This necklace had a shell and birchbark pendant, as well as cut glass beads. A wooden handled and iron bladed knife was placed across her chest. The conical copper janglers that decorated her outfit had long tassels of black human hair inserted in them. A brass bracelet was on her right wrist. She was barefoot.

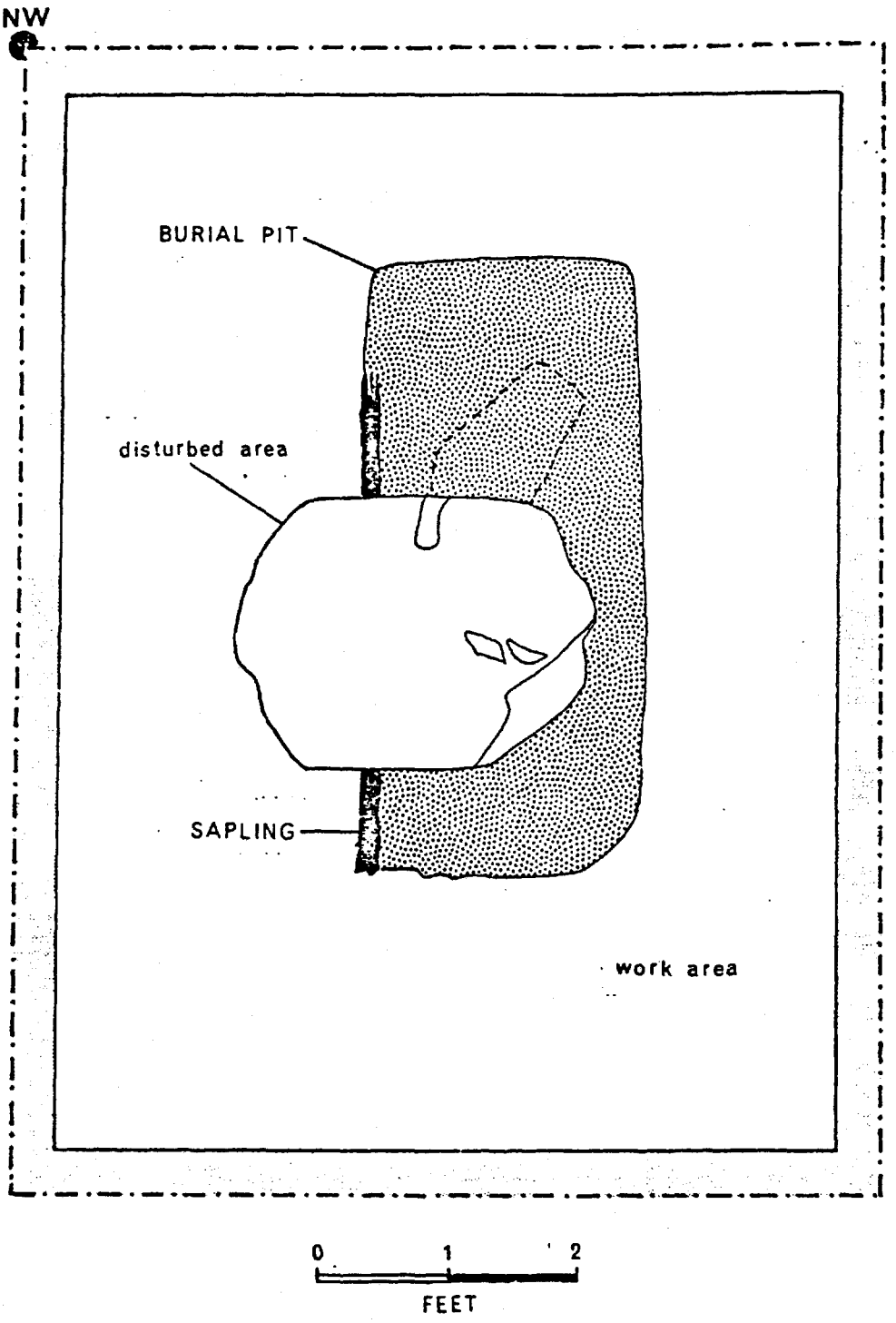
Under her head was a bag filled with red ochre. There were other items in this pillow: a bone-handled metal-scraper, a metal blade hafted to a hide-covered stone, a button, a copper perfume bottle cap, a comb, and other trifles of some particular value to the deceased.

She was wrapped in a blanket, and slid sideways onto a rug of bison hide that was set within a shallow grave. In this north-south oriented pit, she faced south, into the noon-day sun. Her legs were flexed under her. Eight poplar saplings were gently placed over her, in order to further distribute the weight of the boulders that were cautiously placed over her -- in order to keep coyotes out.

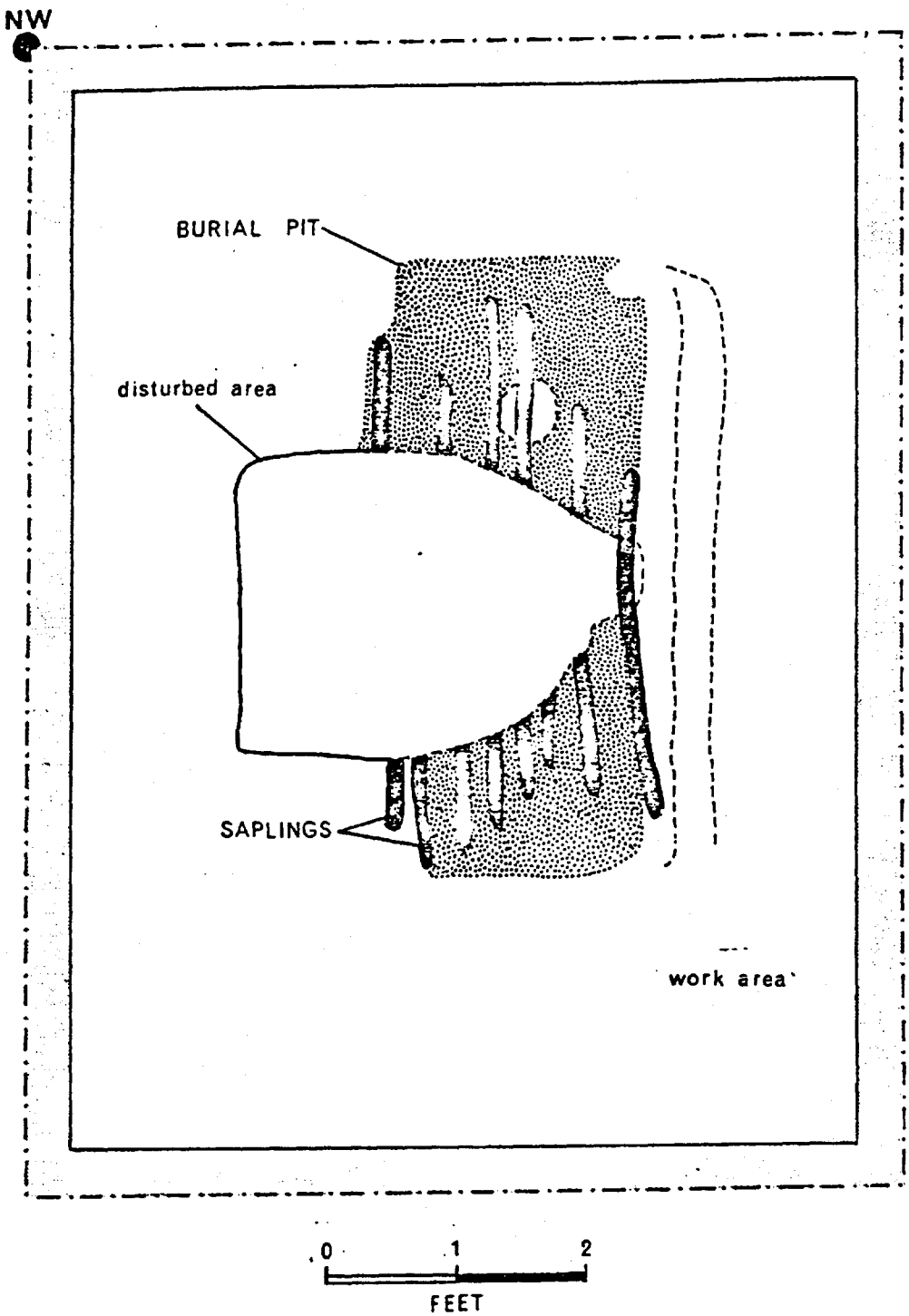


Derr Drews Burial

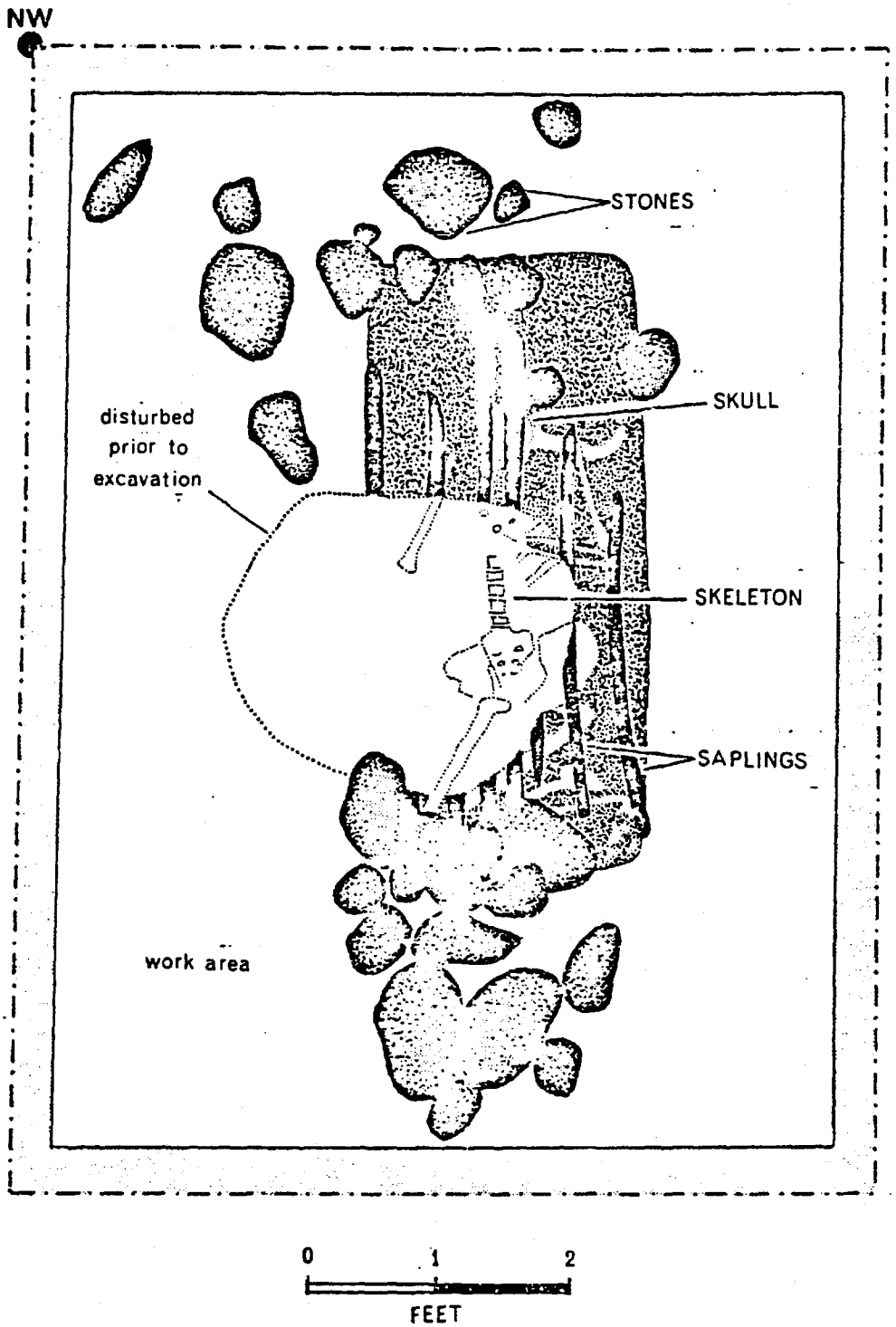
#1



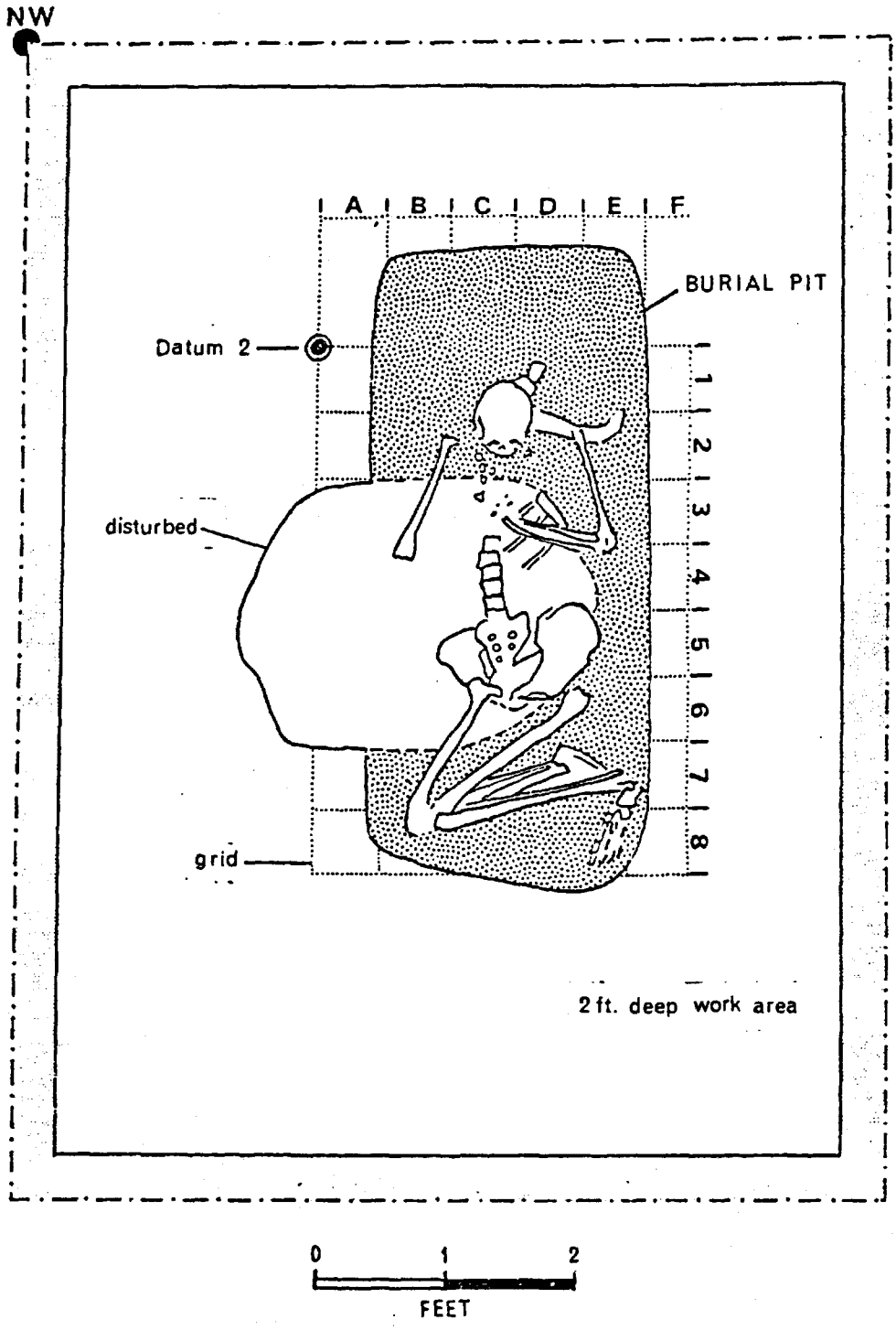
DERR-DREWS BURIAL - #2



DERR DREWS BURIAL — #3



DERR- DREWS BURIAL — #4



DERR-DREWS BURIAL - #5

1. GENERAL: . . .

Exhibit A - One plastic vial containing hair labelled "Janglers from left jaw (neck)."

Exhibit B - One piece of hide labelled "sample number one." A sample of hair was removed and placed into an envelope.

Exhibit C - One piece of hide labelled "sample number two." A sample of hair was removed and placed into an envelope.

2. PURPOSE: To examine the hair samples A, B, and C, in order to determine their origin.

3. DATA: Exhibit A - One lock of hair containing approximately 50 hairs, 1 1/2 inches in length. This hair is of human scalp origin. The hair belonged to a Mongolian. (Mongolian includes the North American Indian.)

Exhibit B - One sample of animal hair. This sample is wool hair similar to that of bison.

Exhibit C - One sample of animal hair. The medulla of this hair has deteriorated. It is similar in other respects to hair from the Musteledae family. Musteledae includes martens, weasels, minks, otters, skunks, badgers, and wolverines.

4. CONCLUSIONS: (1) Exhibit A is human scalp hair.

(2) Exhibit B is wool hair from a Bison.

(3) Exhibit C is likely from a member of the Musteledae family.

Catalog Numbers	Specimens		Locations
	Teeth	Artifacts	
DDS-10		Large beads	above vertebra in mouth
DDS-11 DDS-29	Left open, as two men were cataloguing		
DDS-30		large beads	below right side of neck
DDS-31	left lower second incisor		beneath nuchal plane
DDS-32	left lower first premolar		beneath nuchal plane, near the Atlas: roots are proximal
DDS-33a		2 large white beads 1 medium-sized pony turquoise bead 3 small blue beads 2 pea-pod white beads Hundreds of other beads	under jaw
DDS-33b	left lower second premolar		under head
DDS-34	left lower second premolar		beneath fifth vertebra, under right jaw, beneath third molar (right lower)

All the teeth above were catalogued and then reinserted into the mouth. Only the left lower canine is missing. An examination of the cavity reveals no growing over, so this tooth is probably still somewhere within the crate.

TABLE 12

Catalog Numbers	Specimens: Teeth	Specimens: Artifacts	Locations
DDS-1		1 copper earring	beneath left ramus
DDS-2		1 copper bottle lid with inscription embossed: "J. SCHWAB - NEW YORK PERFUME"	taken out of situ, due to drying soil tending to crack
		2 beads	
		2 pebbles	
DDS-3		1 comb fragment	beneath DDS-2
DDS-4	left upper second premolar		beneath right jaw, between ramus and chin. Roots proximal
	left upper third premolar		and cusps distal to midsaggital
DDS-5	left upper second incisor		on chest: field catalogued durir excavation
DDS-6		Many beads	in mouth
DDS-7	left upper first premolar		beneath third vertebra, under left jaw near chin. Roots distal to midlin
DDS-8	right lower second incisor		beneath seventh vertebra, under right alae
DDS-9	left lower first incisor		above vertebra in mouth; near bottom of lower
	right lower first incisor		edge of jaw by the chin

Appendix 4: The Aiktow Creek District (1960)

William Mayer-Oakes and Zenon Pohorecky (1969)

note: all insertions, deletions and comments are by Mayer-Oakes and Pohorecky (1969)

AIKTOW AREA EXCAVATIONS

Elbow Region

The main area of investigation was the Elbow region. Here the Qu'Appelle valley system merges with the main South Saskatchewan waterway. Three excavations were conducted in this region. One tested a three hundred acre site (designated EgNp-15) on whose surface hundreds of projectile points had been found. The two other excavations were salvage operations, because the sites were in immediate danger. The two salvaged sites included one historic Cree burial (EfNm-3) and one huge ceremonial center (EgNo-19).

Test Excavations in Aiktow Creek District (EgNp-15)

Forty-two auger holes were sunk to an average depth of ten feet within the Aiktow Creek district. Seven of these were drilled to test a buffalo pound (EgNp-45). About a dozen other test auger pits (TAP) were dug at two other locations in order to test for evidence of buffalo drives; one was in John Schinold's backyard, and the other was across the river near the large spring on the P.F.R.A. pasture managed by James Petrie. Both proved sterile, so they were not recorded. Thus, thirty-five TAPs were sunk within a section of land that encompasses the eastern half of section 26 and the western half of section 25, in township 24, range 5, west of the third meridian. This is now Crown land that has been purchased from the original homesteader, William Lennox, through the

Prairie Farm Rehabilitation Administration (PFRA). It is now leased by a local farmer, John Schinold. The Aiktow Creek runs through these sections. (See Map 3 and Figure 6.)

Twenty-one test pits were excavated on the basis of the findings derived from the auger tests. (See Map 3.) L. S. Russell, director, National Museum of Canada, examined the complicated terrace structures here, and recommended a search for terrace crests that might be buried under the slope wash. Such crests were difficult to locate, because terraces slope diagonally and crosscut each other, due to the creek's tendency to reverse its flow during the spring flood, when the South Saskatchewan River's excess water volume backs up into the Aiktow Creek valley. 'Aiktow' is the Cree word for 'turns.'

The tested area actually subsumed thirty-two discrete sites (EgNp series 2 to 11, 13 to 26, 30 to 33, and 38 to 41). These are the sites that yielded one hundred and sixty-one projectile points, over two hundred scrapers, and hundreds of worked pieces during the prior two seasons of the survey. This is also where Oliver Johnson, Outlook, collected hundreds of artifacts. For purposes of a single site-designation for the entire site area, EgNp-15 was selected. EgNp-15 is itself a discrete unit (SE 1/4, NE 1/4, SE 1/4-26-24-5-W3). EgNp-15 indicates an uninterrupted four thousand year sequence of occupation, based on an analysis of projectile point types. There were nine projectile points in this discrete unit alone. Procedural considerations prompted

this consolidation of thirty-two sites into a single larger unit, and the site designation is arbitrary.

This larger grouping was subsequently sub-divided according to the locations of the test-pits. This manipulation of sites and reclassification of site clusters was aimed to facilitate field operations, and may be correlated with the original site designations in the laboratory if necessary. Thus, Project A consisted of fourteen five-foot square pits that were spaced fifteen feet apart. These were lined up in an L-shape along the slope of the upper terrace. (See Map 3.) Project A correlates with the original site designations 5, 6, 7, 15 and 16 (EgNp series). Projects B, C, and D consisted of two pits each. Project E had one pit. Both pits in Project D were ten feet square. The remainder were five feet square. Projects A and B were on the upper terraces, and the rest were along the lower terraces. Project B correlates with original site designation EgNp 25. Project C correlates with original site designations 4 and 11. Project D correlates with original site designations EgNp 18, 19, 20, and 21. Project E correlates with original site designations 13 and 33. The correlations are approximate, because at no time did the archaeologists sink a test pit in the blow area where the surface collections were gathered.

The intensive testing of this area produced evidence of culture zone stratification. Note particularly the chert and charcoal that was found ten feet below the surface in TAP#4 (See Figure 7). The deepest pit was excavated to a depth of five feet below the surface (Project A: 124L24). A clay quarry (EgNp-48) was found on a middle terrace. It is oblong in shape,

oriented east-west, and about 75 by 150 feet in surface dimensions. This is the source of the blue clay from which local pottery was made. Artifacts were found around this clay quarry, in the blown areas (EgNp 2 and 3).

Catalogue of specimens recovered from the test-pits:

EgNp15-PA-CA100: 30 specimens, 3 artifacts (blade, scraper, worked piece).

EgNp15-PA-CA104: sterile.

EgNp15-PA-CA108: 1 fireburnt rock.

EgNp15-PA-CA112: 1 core.

EgNp15-PA-CA116: 13 lithic specimens.

EgNp15-PA-CA120: sterile.

EgNp15-PA-CA124: 11 specimens, 1 thumbnail scraper.

EgNp15-PA-124L4: 2 artifacts (inscribed limestone, large scraper).

EgNp15-PA-124L8: 3 specimens, 1 artifact (pecked-ground granite).

EgNp15-PA-124L12: 155 specimens, 139 artifacts (mano and potsherds).

EgNp15-PA-123L12: 975 specimens, 886 artifacts (potsherds).

EgNp15-PA-124L16: 3 specimens.

EgNp15-PA-124L20: sterile.

EgNp15-PA-124L24: 9 specimens.

TOTAL: PROJECT A: 14 TP: 1203 specimens, 1029 artifacts.

EgNp15-PB-TP1: 15 specimens.

EgNp15-PB-TP2: 591 specimens.

TOTAL: PROJECT B: 2 TP: 606 specimens.

EgNp15-PC-TP1: 64 specimens, 1 scraper.

EgNp15-PC-TP2: 20 specimens.

TOTAL: PROJECT C: 2 TP: 84 specimens, 1 artifact.

EgNp15-PD-TP1: 200 specimens, 17 artifacts (scraper, blade, worked).

EgNp15-PD-TP2: 402 specimens, 18 artifacts (5 projectile points, 8 scrapers, 5 worked pieces).

TOTAL: PROJECT D: 2 TP: 602 specimens, 35 artifacts.

TOTAL: PROJECT E: 1TP: 14 specimens, 1 artifact (scraper).

GRAND TOTAL: EgNp15: 2509 specimens, 1066 artifacts.

Analysis

About forty percent of all specimens recovered from the twenty-one test pits were artifacts. The remainder consists mainly of charcoal samples, bone, burnt stones, flakes and cores. One iron fragment was found imbedded in a potsherd (EgNp15-PA-123L12-level 1). Several hearths were found. The most clearly defined hearth was found in Project D (TP 2). All pottery seemed to be concentrated in one small part of Project A (124L12 and 123L12). Two distinct types of pottery were discerned at two levels. (Figure 8) ~~See Illustration #1.~~ Both were made from the blue clay in the nearby quarry (EgNp-48).

General

Tests seem to confirm prior interpretations of this district, namely, that this region was one where many small camps were repeatedly

pitched for thousands of years. Further excavations on the upper terrace, which is buried, and where the pottery was found, may reveal a permanent camp of large proportions. The tests already cast further light on our understanding of this strategically located district in terms of the early inhabitants of southern Saskatchewan. The location of the sites is extremely logical, and potentially very fruitful for archaeological study, because it is so close to the confluence of the two major waterways in southern Saskatchewan: the South Saskatchewan River and the Qu'Appelle River.

The abundance of artifacts recovered within this restricted locale, both from surface collecting and from excavating, indicate that there were early inhabitants in the region. Yet the odd geology of this valley makes it very difficult to locate a stratified site in the region. The diagonally crosscutting terraces, formed by the seasonal reversal of the Aiktow Creek and by the slope wash from several eroding coulees, make predictions from studies of topography very unreliable. The situation is geologically anomalous. Furthermore, the heavy surface erosion that has already exposed so many artifacts complicates matters even more. Yet even if the sites in this locale yield only two levels of cultural occupation, a series of such sites could be correlated to afford a sequence based on seriation. It is not necessary to find one site that has six levels of occupation. Such an ideal discovery in this valley is unlikely. It would do as well to find four or five that have two or more occupation zones.

For all practical purposes, it may be as well to dig even unicomponent sites with charcoal samples.

Thus, a reasonable recommendation seems to be to one which suggests that the region should be augered more thoroughly for evidence of stratification. This will be differentially distributed within this district. Then, the next logical step would be to select several locations where some soil stratification is evident, and begin test excavations. This, in fact, was the strategy followed during 1960. In subsequent seasons, even unicomponent sites need not be neglected, although, in such cases, it may be likely that several occupation levels may have been compacted. Generally, the region presents many difficult technical problems to the excavator. Extreme caution and sound judgment are needed, not just in selecting and digging the site, but also in interpreting it in a ~~queer~~ specific geological context. A reliance on charcoal samples (C-14) may be necessary. Despite these intricate archaeological problems, the region is very promising. To date, only the surface has been scratched in this district. There is at least one solid season of work to be done in this district before any more definite interpretations may be hazarded.

Appendix 5: The Proud Burial (1960)

William Mayer-Oakes and Zenon Pohorecky (1969)

note: all insertions, deletions and comments by Mayer-Oakes and Pohorecky (1969)

Proud Burial

The Proud burial was excavated as a salvage operation by the 1960 National Museum field party, directed by Pohorecky. The site is named after George Proud, schoolteacher at Elbow, who led the archaeologists to this site. The grave is set on the lower terrace of a badly eroding coulee. The property belongs to one Keith Lougheed, who purchased it several years ago from a neighbor, Mr. Alexander. The grave has been known for many years, and has been threatened by curious amateur collectors in the past. However, it was undisturbed when examined by the archaeologists. The exact legal description of the site is: the south-east quarter of section nine, township twenty-two, range one, west of the third meridian.

The eroding coulee on which the grave was located is about one and a half miles south of the Qu'Appelle Valley. The site is about one mile east and two and a half miles south of Eyebrow Lake, and about fifteen miles east of the Summit. The grave was about ten feet north of a deep cutbank that was slumping badly, so that a cliff about fifty feet deep was dangerously near the edge of the grave. The site is on the south-facing terrace-slope of the coulee.

A line of stones about eight feet long, resembling a coup staff, was located about two hundred yards directly south of the grave. It was on the flats that lay across the deep coulee from the grave. The staff of rocks pointed directly north towards the grave. It probably served as a grave marker.

The grave itself was in a depression. It was oriented north-south. Dimensions measured 7.9 feet north-south and 3.6 feet east-west. Seventy-two large stones were spread in cobble-stone fashion over the grave. There were three distinct levels of these stones. Gooseberries grew atop the grave, sprouting from crevices between the stones. The surrounding vegetation was invariably either scrub grass or spear grass. Bushes grew only from the grave, perhaps because the soil was enriched by the decomposition of organic materials, but also because there was such a depression here that the grave served as a receptacle for water. The grave was very easy to distinguish from surface evidence.

Excavation procedures were routine, and followed generally the pattern used during 1959 on the Derr-Drews grave. It was suspected that there would be general affinities noted between the Proud Burial and the Derr-Drews grave, because both were in comparable settings, and both had very similar dimensions, surface evidence, and directional orientation. Yet the similarities ended at the surface. The Proud burial combined in a very unusual way traits common to both scaffold and cairn burials. (See Figure 12)

Sharpened stakes had been embedded in the four corners of the pit, which was 1.5 feet deep, 2.3 feet wide, and 6 feet long. These dimensions differ markedly from those of the Derr-Drews grave (one foot deep, 2.2 feet wide, 4.9 feet long), especially in length. Furthermore, there were no stakes in the Derr-Drews burial.

The stake in the south-west corner was found lying horizontally. A large animal burrow, which had filled in with light sand, was exposed on the south wall profile. The position of the logs within the pit indicated that a platform had been erected. Stones had been placed on this platform. Underneath this platform, the body had been disturbed by a burrowing animal -- probably a wolf. There had been an air-space beneath the cairn platform, and the animal had managed to disarticulate the body and to remove most of the long bones. These long bones provide the most nourishment, so it is perhaps no wonder that they were selected by the intruder. The deceased's molar teeth were scattered throughout

the entire length of the pit. The skull itself was in the southeast corner, near the feet. Logs were found both atop and under the bones. This suggests a double platform.

~~It must be admitted, in the interests of clarification, that the archaeologists were quite confused about~~ the disturbed situation within the grave, especially inasmuch as the top had been undisturbed. It was a puzzle which did not make sense until the burrow in the south profile had been exposed. Then it was easy to reconstruct the events that had led to this rather anomalous situation. The deceased had been placed on a scaffold that was erected a few inches above the base of a pit that was one and a half feet deep. Then, a platform had been erected above the deceased, in order to support three layers of stones. The resultant grave marked an odd combination of cairn and scaffold burial traits, and defeated the purposes of both, because it made it possible for a scavenger to get into the grave. A simple cairn burial is adequate protection against wolves, and a simple scaffold burial is enough protection against intruders, but a combination of these -- in the form of an underground scaffold -- was no protection at all. The reason for this type of burial must remain conjectural, but it seems reasonable to assume, in view of the recency of the burial, that the Indians had preferred a scaffold type of inhumation, whereas the R. C. M. P. were on hand to impose certain laws, which required that persons be buried in the ground. The result was this queer, and ineffective sort of burial,

which apparently satisfied Indian ritual and white man's law, but which overlooked the practicality of choosing between two 'pure' forms of burial. Another possible explanation might run along similar lines, and regard this type of burial as a compromise between two Indian sorts of burial practices.

Whatever the reason, the burial remains a unique type, which obviously involved some sort of compromise between two traditions regarding the disposition of the dead. It is this feature which sets this burial apart as an important archaeological discovery. Preservation of organic materials within the grave were not so good as that which was evidenced in the Derr-Drews grave (which, ~~incidentally,~~ was ~~the feature which~~ what made the Derr-Drews grave so valuable). Neither was the grave so richly supplied with artifactual grave goods as was the Derr-Drews grave, but there were many items associated with the skeleton.

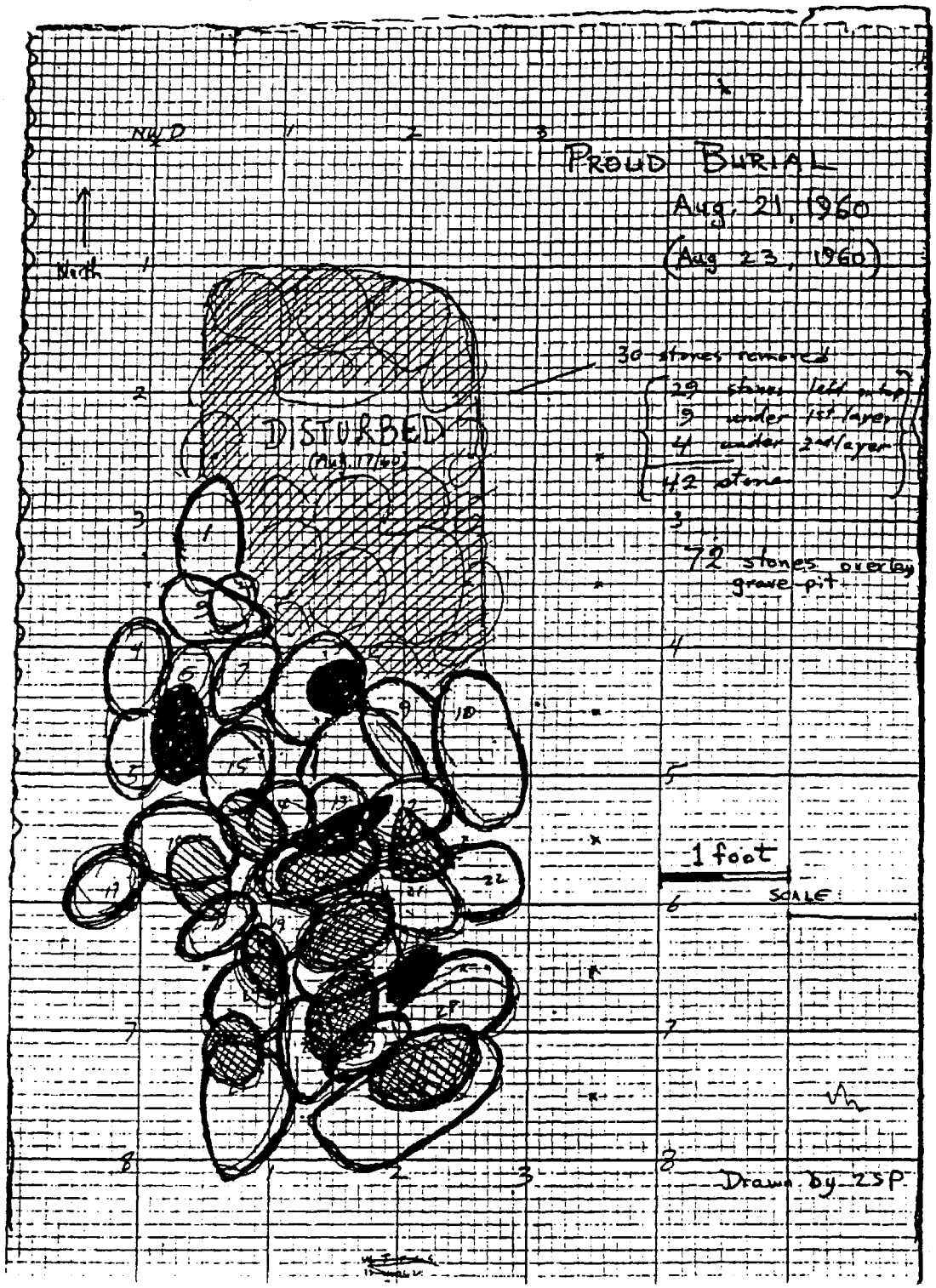
Inventory

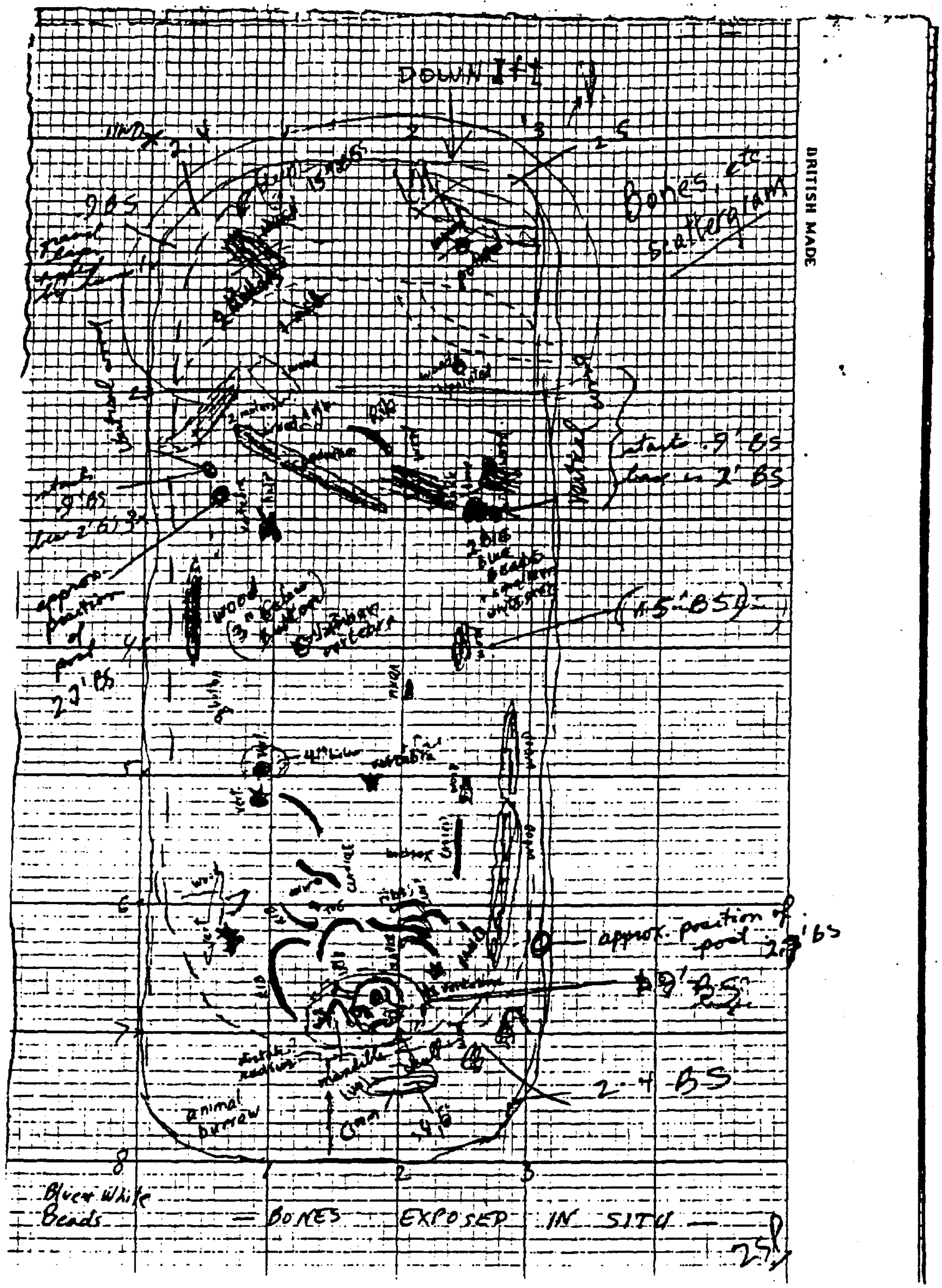
4 bags of wood fragments (logs, stakes, etc.), 1 grinder (?), 2 3/4 inch beads, 16 white and blue horse beads, 2 shell beads, 1 entire sack full of pea pod beads, 2 dentalium shell barter beads, 3 copper buttons attached to cloth, 1 piece of cloth, 1 piece of leather, 2 pieces of buck-skin which is beaded, 1 piece of fabric (?) that is glued to a bead, 3 copper rings, 1 copper jangler, 1 iron ring, 1 hank of hair, 1 piece of

human flesh, 3 flakes of stone, 4 pieces of yellow ochre, 9 mammal bones, 108 human bones, 1 skull (human), 1 human mandible (with teeth).

General

An inventory of the goods associated with the grave include white and blue trade beads, whose size ranged from one-thirty-secondth of an inch to three-quarter of an inch in diameter. Human skin had been preserved by contact with a copper ring. Beaded buckskin was an interesting find, as was the hank of human hair, which probably fell from inside a jangler during the excavation. There were also bead designs glued into a matrix, as well as chains, buttons, earrings, spiral rings, and so forth. As evidenced by the drawings (maps 5 and 6), associations ~~could not be used to determine very much~~ were indeterminate, because the interior of the grave had been disturbed. Earrings were found near the feet, for example, although it is evident that they must have been around the head region during inhumation.


PROUD BURIAL
Aug. 21, 1960
(Aug 23, 1960)
North
DISTURBED
30 stones removed
29 stones left on top
9 under 1st layer
4 under 2nd layer
42 stones
72 stones overlay grave pit
1 foot
SCALE
Drawn by ZSP


DOWN 1ft
Bones etc.
Scattergram
BRITISH MADE
approx. position of post
2 4 BS
animal burrow
mandible
Blue & White Beads
— BONES EXPOSED IN SITU —

Appendix 6: The Swift Current Creek Site (1960)

William Mayer-Oakes and Zenon Pohorecky (1969)

note: all insertions, deletions and comments are by Mayer-Oakes and Pohorecky (1969)

SWIFT CURRENT CREEK SITE TEST EXCAVATION

During one weekend of August, 1959, the crew of the Saskatchewan Museum of Natural History's archaeological field expedition relinquished their day of rest in order to explore the site at which a Plainview projectile point had been discovered. The site designation is SSR-129, or EdNw-5. It is located on property belonging to the government, but leased by W. G. Knight, the descendent of the original homesteader, who settled here during 1885. The exact legal location is section 33, township 19, range 3, west of the third meridian. The region is heavily eroded, resembling the Grand Canyon at this particular place. The site is located along the east bank of the Swift Current Creek, about six hundred yards from the mouth. This is a virtually treeless locale. Vegetation consists primarily of scrub grass and cactus.

The soil here is sandy, but an examination of the gravel profiles evident in the cutbanks here, and the observation of differential vegetation here strongly suggests that the site is located on an ancient flood plain, and that a more recent flood plain begins on a lower terrace about one hundred yards north of the site.

Excavation

The test was conducted by five individuals, each taking an adjoining five-foot square, as mapped below. Participants included: Albert Cowie, ~~Jack~~ John Rick, Dave Humphries, Ian Rodger, and Zenon Pohorecky.

The evidence gathered from all five pits was virtually identical. All pits bore a mass of lithic materials: flakes, cores, and worked pieces. No bone or distinctive artifacts were recovered from either of the pits. All the material was compacted into a stratum about six inches below the surface. Subsequent auger tests during 1960 indicated that this shallow layer of lithic material extended over an area of ten acres around the five test pits that were sunk during 1959.

Observations and Conclusions

The geological context indicates the possibility that at least once in the past, the surface of this site had undergone heavy erosion, and that perhaps several cultural levels may now be compacted about six inches below the surface. The discovery of a Plainview projectile point in this context is significant in directing attention to this general area as one in which Early Man materials might be found. However, the search for a clearer geological context, where stratification might be less compacted and more extended, led the 1960 expedition to a discovery of 'The Layer-cake site' (EdNw-30), which is close to the Plainview site, and which has a far more promising geological separation of culture sequences.

The materials recovered from EdNw-5 consist of lithics that may represent several culture levels that are compacted into a single shallow layer. A careful examination of the composition of the silicates indicates that the inhabitants here used chalcedonized wood extensively in tool-knapping. The Plainview point, however, is of white quartzitic material,

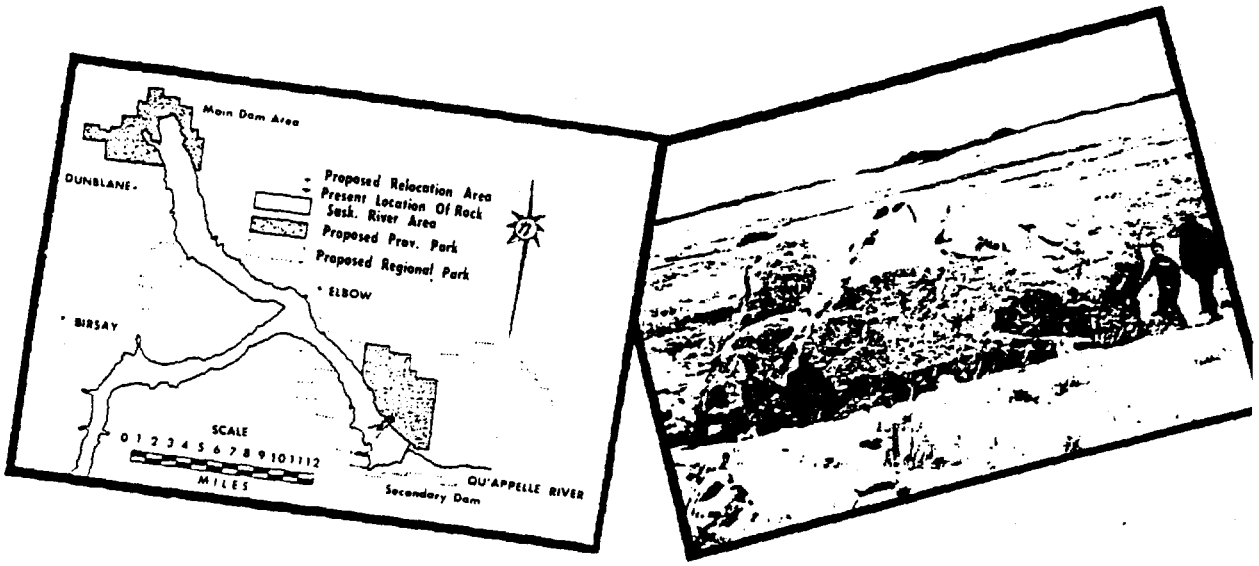
and there is a relatively high percentage (about 25%) of red quartzite. The test-excavation has served to define several problems. These problems acted as guides for the exploratory work that was done during the 1960 season.

Appendix 7: The Mistaseni Project (1960-1966)

William Mayer-Oakes and Zenon Pohorecky (1969)

note: all insertions, deletions and comments are by Mayer-Oakes and Pohorecky (1969)

OPERATION MISTASENI



OPERATION MISTASENI, a big project to move a very big rock. Your donation will help to prevent the inundation of this historically and archaeologically significant object by the South Saskatchewan Reservoir Project. Mistaseni is not only the centre of an entire ceremonial complex - composed of many stones and a 100 seat amphitheatre - but is also a unique geological find. Now, some facts at a glance:

LOCATION: 90 miles south of Saskatoon; 10 miles S.E. of Elbow.

SIZE: Approximately 26 feet long, 26 feet wide and 14 feet high above ground.

WEIGHT: Estimated at 400 tons. COMPOSITION: Granite

ORIGIN: Scientists estimate Mistaseni was transported from 200 miles N.E. to its present site between 500,000 and 10,000 years ago by glacial movement. Cree legend has it that the rock is really a buffalo which was dropped on the site by a giant eagle. Indian ceremonies were first noted and recorded in 1858.

FUTURE LOCATION AND SIGNIFICANCE: Mistaseni will be moved 3/4 mile N.E. to the site of a proposed provincial park (see map) where it will be available for Indian ceremonies, as a tourist attraction and for further scientific study.

OFFICIAL RECEIPT - OPERATION MISTASENI

Received from _____

the sum of _____

Date _____ *19* _____ *Signed* _____

BIG ROCK COMMMITTEE

Focus of Indian Culture **$10,000 Needed**

Mistaseni Project Under Way

—by Lynne Seavy

Operation Mistaseni is a project to move a large granite rock which is the centre of a ceremonial complex. Scientists estimate that this unique geological find was transported to its present site—about 90 miles south of Saskatoon and 10 miles southeast of Elbow—from 200 miles northeast by glacial movement 500,000 to 10,000 years ago. Mistaseni is approximately 26 feet long, 26 feet wide by 14 feet above ground, and weighs approximately 400 tons.

Co-ordinator of the Big Rock Committee is Mr. Fred Kerman, who has requested that all donations be mailed to: Operation Mistaseni, P.O. Box 400, Sub-Post Office 6, Saskatoon.

Professor Zenon Pohorecky, head of the Department of Anthropology and and Archaeology at the UofS, is one of the organizers of Operation Mistaseni.

In an interview this week, he told the Sheaf the importance of moving the sacred rock. The Indians were once about 100% of the population of Saskatchewan. They are now less than 2½%. Because they are so economically disadvantaged, Professor Pohorecky said, many are ashamed of their past. "They have been made to believe that their various cultural traditions are what has undermined them."

Mistaseni could provide a focus for regrouping and reorganizing the social foundation of Indian society into a natural, traditional pattern. "Even the National Indian Council is patterned after the white man's blueprint." A tribal council meeting has not been held for over 80 years. Professor Pohorecky and Indian leaders feel that the new site of Mistaseni would be an ideal place to hold annual ones.

He pointed out that the Indians did not worship the rock. It is not in their traditions to worship material objects. "If anything," he said, "they worship the power that brought it to them. We go to a church or a grotto to worship in the same way as the Indians went to Mistaseni."

There are two legends about the rock which make it sacred for the Indians. Briefly, the story of how the rock assumed its shape begins with Manitou thinking that the people needed guidance, so he created a son to live among them. The son taught them many things, but didn't practice what he preached. He became "naughty" and the people appealed to Manitou. Manitou could not bring himself to kill his son, so he changed him into a buffalo, but he was a very "naughty buffalo too, so Manitou changed him into this huge rock.

The second legend explains how the rock came to its present location. Manitou could not forget his son, so he changed himself into a giant eagle, lifted his son, and placed him in an important place at the crossroads of rivers. Plains Cree hunters, seeing the eagle drop the rock, realized that it was something special.

The estimated cost of moving Mistaseni is $10,000. Already just over $1,000 has been collected, and $3,500 has been pledged by the Saskatchewan Government. The money which is raised is being held in a special trust account by the Saskatoon Archaeological Society. The town of Elbow will serve as the legal bargaining agent and will receive tenders.

Professor Pohorecky

Honorable John Cuelenaere,, Saskatchewan Minister of Natural Resources, and a number of members in the Legislature, regardless of political affiliation, have sent in personal donations.

There are various fund raising projects for Mistaseni cropping up across Canada. For example, there is one now with the possibility of another in Calgary, and several others in Saskatoon. In Saskatoon, Operation Mistaseni was started by CFQC, but within a week CKOM, CFNS, and CJUS-FM were participating in the project. The Star-Phoenix has given the project editorial support. Receipts for donations received for Operation Mistaseni are being sent out by one shift of firemen in Saskatoon, organized by fireman Tom Dunlap.

The job of moving the rock must be started and finished between the end of February to the middle of March, because no contractor will handle the job after that time. The rock is sitting on sand and it must be moved before the frost leaves the ground. Water will begin flooding the area when the ice breaks at the end of April.

In answer to people who say, "If the Indians want to move the rock, let them do it themselves," Professor Pohorecky said that the Indians are among the most economically depressed group in Canada. "If they did donate, it would be in the form of pennies out of their poverty." Many are already contributing in a non-monetary way. For instance, Indians of the Native Brotherhood in the Prince Albert Penitentiary are making plaster cast models of the rock and its surrounding area for use in schools. These will be sold at cost, but if there is any income above that, it will go toward rehabilitating Indians in the Penitentiary.

This ties in with a new curriculum revision in Saskatchewan schools. It has been recommended by the centennial subcommittee of the Saskatchewan Teacher's Federation that Division 2, which is grades 4 to 6, includes Saskatchewan Archaeology as one of its subjects. The plaster models will act as visual aids.

Various other means are being tried to raise funds for this project. Marion Meadmore, secretary of the National Indian Council, is approaching John Fisher of the Centennial Commission in Ottawa to make up any difference between the money collected and the actual cost of the project.

A number of Saskatchewan Members of Parliament, such as Dr. Lewis Brand and McLellan, are supporting Operation Mistaseni. Professor Pohorecky said that they could help by having a law passed which would prevent such a thing happening again. "The passage of National Antiquities Act would be suitable for the Centennial Year," he said.

The new site of Mistaseni is to be 11 miles from its present one to a new Provincial Park, for which the plans have just been finalized. The rock will sit on a peninsula all by itself, with one of the most majestic views in the province.

Some Documentary and Ethnographic Data on The Buffalo Shrine (EgNo-19

Mr. Ray Tulloch, Winnipeg, spent five months, between July and November, 1961, collecting information about the Buffalo Shrine (EgNo-1 from Cree and Assiniboine informants in Saskatchewan. Here is a summar of his findings, which have convinced him that the shrine should be preserved. Evidence from archives, cited elsewhere, is excluded here.

1) Rev. Fred Wilkes (personal communication, 1961): "I interviewed two old timers from Elbow (both now dead) who mentioned that Indians had followed the Qu'Appelle Valley between 1906 and the early 1920's, stopping at the rock for worship and to visit other landmarks along the valley familiar to them. On one occasion a couple of wagon loads of natives were found camping near the Aiktow Lake; some of the men appeared to be in a trance or meditative mood, as though they had just recovered from some kind of ceremony."

2) Ochankeegahe (Dan Kennedy, Assiniboine, Reserve near Montmartre, Saskatchewan) states flatly that the Elbow boulder is a Cree Shrine "The devotees invoked the presiding Manitou of the shrine by offering the smoke from a pipe and made sacrificial offerings of strouds (very expensive H.B.C. cloth), tobacco and other prized possessions which they placed at the base of the shrine."

3) Pat Cappo (Muscowpetung Reserve, born around 1884) recalls that his grandfather's band of 600 wintered there in 1868 "the year they took peace with Sitting Bull." Until 1901, when the missionaries clamped down, smaller parties visited the rock often, to place tobacco, old clocks and specially purchased cloth in the cracks. "No young girls could come close to the rock, just the old ladies. The boulder was

. . . more

too well respected."

4) Pat Cappo's grandfather, on the origin of the rock: "Once a band of Indians were hunting buffalo when they saw an eagle approach from the north. It appeared to drop behind a shiny buffalo. They discovered it was a rock. They couldn't find the eagle anywhere. They decided the stone must have magical powers and they worshipped it ever after."

5) Abel Watech, Piapot Reserve, near Regina, Saskatchewan, claims: "We, the People South, had one such rock on the side of the hill between Labret and Fort Qu'Appelle; but when the construction of the C.N.R. came along, it was pushed down to form a roadbed for the railway."

6) Chief John Skeeboss, Quinton Poorman Band, Saskatchewan, recalls that Chief Poorman visited this buffalo-shaped rock before his death in 1931, and that other members of his tribe fasted and went without water at this site. Here is his story about how the rock got there: "Long ago, Indians used big dogs to pull their goods. One time, a big camp of Indians travelled west after the buffalo. A four-year-old boy was pulled by dogs. The Indians didn't pay too much attention, for the dogs usually followed them. This time, they followed a different scent, and disappeared with the baby. The Indians camped and they found out the boy had disappeared. During the night, the dogs came back. They had slipped their collars and left the boy. Then it happened - the story, whether you believe it or not. The boy had been crying, crying in the wilderness for a few days, with nothing to eat. Finally, an old

buffalo said to a young buffalo, 'Did you hear the baby crying there For my part, I'll take care of the child, and let him live, and give him some of my spiritual powers.' But the young buffalo said, 'No, I'd rather see him put to death, and then he will be through with his crying.' So they decided they would have a race to decide the boy's fate. If the young buffalo won, he would put the child to death. If the old buffalo won, he would protect the boy. Finally, they race, and the old buffalo prays for the young buffalo to trip. He did, and the old buffalo protected the boy. They boy grew up clever, strong, a powerful guy. When the boy was a young man, he was able to change into the form of a buffalo. One spring, the young man got into a fight, because he fooled around with a young cow buffalo's tits, He had to fight with the cow's husband, one of the strongest buffalos there was living. But old buffalo, and the other buffalos, gave him the power to overcome this beast, and he won. Old buffalo was very annoyed, because the young man had done this bad thing to the cow buffalo. But he loved him too much to hurt him. The old buffalo couldn't make the young man live forever, so he said,'I'm going to put you where you will be seen for generations,' and he turned him into the stone at Elbow."

7) Henry Youle Hind (1858) records in his journal: "The Indians place on it offerings to Manitou, and at the time of our visit it contained beads, bits of tobacco, fragments of cloth and other trifles."

8) S. S. Porterfield, Grainland, retrieved a complete necklace from this rock, and 'Ollie' Johnson, PFRA surveyor, pried out an arrowhe made of volcanic glass which may have come from Yellowstone National Park in the States.

1966 Reprint from the
Royal Canadian Geographical Society's
Canadian Geographical Journal
Ottawa

THE GREAT CREE STONE

The Legend of Mistaseni (Cree for Great Stone) is a ballad that opens wit this stanza:

Where once the thunder of the buffalo
Swelled wildly 'cross Qu'Appelle,
And the prairie wool and spear grass waves
Before the North Wind's swell,
There's a stone there and a legend
That all may come and see,
And the Plains Cree and Assiniboine -
They call it, "Mistaseni."

A thousand people did come to see Mistaseni this year on a single Sunday afternoon in mid-February. Their hundreds of cars were snarled in a traffic jam on the bald white prairie around this solitary stone shrine.

For hours, a thousand spectators swarmed around this monumental 400-ton erratic. They knew that this mottled granite boulder, squatting like a giant buffalo in a natural amphitheatre, was as old as the earth itself.

The ancient boulder, 26 feet across and 14 feet high, was over 4 billion years old. It had been moved in one block by glacial ice during the past mill years across 300 miles from the Precambrian Shield north of Flin Flon in Manit

The Plains Cree had their own origin legends. In sum, it was a gift from Munito. They could approach their God through the spirit in the great stone. That is why they fasted, made offerings, and sang prayers around the stone.

The throngs that had braved snow drifts and hazardous trails to see the g stone and the final Plains Cree pilgrimage to their greatest shrine did not kno yet whether the rock was really doomed by the 140-mile long South Saskatchewan reservoir. Its fate was still being debated in the House of Commons at Ottawa, while concerned citizens across Canada sent donations for its preservation.

As the sun turned west, the eldest Cree slowly walked to the great stone from the east. He was the maker of the sacred annual ceremony at Piapot Reser and 70 years old.

Standing alone in a blue beaded costume and black quill headgear at the ed of a holy circle marked by cairns, he served as spiritual leader for the occas The hushed multitude formed a gigantic horseshoe along a ridge behind him, straining to hear his Cree prayer.

With quiet dignity, he raised his outstretched arms and bowed from the wa invoking the spirit messenger to Munito from the great stone. Then, in the presence of the invoked spirit but beyond the holy circle, a young brave beat upon his round hand-drum to call the Cree dancers around him.

Fitted from neck to ankles in beaded white tights, and topped with a flari white eagle headdress, this energetic young singer boomed forth in a voice that thundered across the valley: "We are Plains Cree. We are proud people. We be to no man. We bow here only to our God - Munito - and his spirit messenger in the great stone - Mistaseni."

With his black braids tossing with his words, and with his teeth and eye gleaming white, the young warrior announced: "White men call this our War Dance. It is not a War Dance. It is not intended to arouse hate against anybody. It is for the warriors of our past. It is a farewell to warriors before battle, and a welcome for warriors after battle."

How distant this past seemed, drowned out by the shots of a few muskets the Plains of Abraham in 1759. It was just 200 years ago that the Cree dominated most of Canada. They occupied more territory than any other tribe in North America.

Their bands had stretched from the home of the Mistassini Cree around Lake Mistassini in Quebec through Ontario, Manitoba, Saskatchewan, and Alberta to the Rockies. They had also probed to the Mackenzie delta at the Arctic Ocean and to the trading posts along the Missouri.

Now, a couple of dozen Plains Cree performed their ancient worship around a shrine where only a century before over a third of the entire Plains Cree population had gathered. This much was witnessed and recorded by an intrepid professor from Toronto, Henry Hind, who visited here during July of 1858.

The valley was filled with history, and now it was filled with music as the young singer burst into the warrior's song. The rhythms led his people in the first of two dances within that enormous horseshoe of spectators.

When the dance ended, an endless moment of silence grew until the applause and cheers mounted in a crescendo that echoed for miles. Then the man in white announced: "Our last dance is called the Circle Dance. We all join hands in brotherhood, and follow the path of the sun."

After this last dance, the crowd was invited to a free feast at the Civic Center in Elbow, leaving the Plains Cree to finish their worship in privacy. Where only minutes before hundreds had stood, the old Cree now stood alone - the lonely separated man - reverently bowed, addressing Mistaseni: "The white man is moving you. You will be put in a good place where you will be respected. It is a wonderful thing."

Soft fluffy snow flakes began to float down from the white sky as the old man knelt before the majestic monument and placed a small offering of tobacco in a crevice. Within an hour, a blinding blizzard swept from the north, as if to close the curtain on the scene, and an old woman marvelled: "The trampled snow around Mistaseni is purified."

* * *

Zenon S. Pohorecky

Appendix 8: Lake Diefenbaker Water Levels (1995-1996)

Courtesy of the Saskatchewan Water Corporation (1996)

SASKATCHEWAN WATER CORPORATION
HYDROLOGY SERVICE
OPERATION PLANNING SECTION

Provisional Data
Subject To Revision

RECORDED STREAMFLOW AND WATER ELEVATIONS
SOUTH SASKATCHEWAN RIVER

MONTH OF May 1995

	RED DEER RIVER			SOUTH SASKATCHEWAN RIVER							
	GLENIFFER	RED	BINDLOSS	MEDICINE	LAKE DIEFENBAKER			QU'APPELLE	SASKATOON	ST. LOUIS	
DATE	LAKE	DEER		HAT	INFLOW	ELEVATION	OUTFLOW	RELEASES			DATE
1		26.1	30.6	50.8	77.0	550.87	61.9	5.0	63.0	78.8	1
2	940.08	22.9	30.2	53.4	76.0	550.86	55.6	5.0	56.0	84.4	2
3		22.5	30.2	49.1	78.0	550.84	55.6	5.0	58.0	71.6	3
4		22.6	32.0	50.7	80.0	550.86	55.3	5.0	59.0	77.8	4
5		22.7	31.1	48.1	83.0	550.86	55.4	5.0	56.0	80.9	5
6		22.2	29.3	48.6	82.0	550.86	55.0	5.0	55.0	74.1	6
7		26.1	29.3	50.7	801.0	550.87	54.8	5.0	55.0	73.3	7
8		38.8	29.3	55.4	79.0	550.84	58.6	5.5	55.0	74.4	8
9	940.64	60.9	29.3	68.4	78.0	550.84	71.7	6.0	55.0	73.9	9
10		74.7	28.5	174.0	79.0	550.84	60.9	6.0	57.0	72.9	10
11		69.8	29.3	376.0	83.0	550.82	55.1	6.0	65.0	63.1	11
12		74.1	30.2	270.0	117.0	550.84	55.2	6.0	66.0	75.0	12
13		105.0	30.8	183.0	315.0	550.87	59.6	6.0	58.0	81.5	13
14		129.0	47.9	177.0	330.0	550.92	58.2	6.0	55.0	73.3	14
15		117.0	58.6	176.0	262.0	551.02	67.7	6.0	57.0	60.1	15
16	941.35	78.0	58.6	303.0	235.0	551.03	56.8	6.0	59.0	67.0	16
17		88.3	62.4	314.0	237.0	551.05	56.7	6.0	63.0	73.3	17
18		88.0	102.0	297.0	315.0	551.09	55.1	6.0	62.0	69.5	18
19		106.0	93.0	303.0	406.0	551.13	55.3	6.0	57.0	80.9	19
20		89.3	96.0	360.0	398.0	551.20	55.9	6.0	56.0	73.3	20
21		78.0	78.0	507.0	397.0	551.31	61.4	6.0	55.0	68.1	21
22		92.3	87.0	685.0	442.0	551.39	55.2	6.0	55.0	66.0	22
23	941.75	76.8	94.5	598.0	584.0	551.50	54.8	6.0	58.0	78.0	23
24		80.4	115.0	599.0	747.0	551.62	80.1	6.0	58.0	53.6	24
25		103.0	79.5	528.0	728.0	551.71	98.0	6.0	55.0	71.7	25
26		103.0	93.0	436.0	673.0	551.86	120.0	6.0	67.0	68.3	26
27		101.0	82.0	496.0	612.0	551.96	107.0	6.0	89.0	60.1	27
28		97.8	84.0	560.0	532.0	552.08	100.0	6.0	109.0	84.2	28
29		105.0	97.0	563.0	531.0	552.15	149.0	6.0	114.0	117.0	29
30	942.32	155.0	105.0	539.0	637.0	552.24	156.0	6.0	104.0	124.0	30
31		155.0	110.0	512.0				6.0		131.0	31
MEAN	941.23	78.4	62.4	304.2	336.5	551.21	71.4	5.8	64.4	77.5	MEAN
TOTAL		310064	167053	814855	872294		185164	15422	166838	207555	TOTAL
PERCENT		94	71	81	89		46	366	17	38	PERCENT

NOTE: 1. FSL Lake Diefenbaker 556.87

STREAMFLOW = Cubic Metres Per Second
ELEVATION = Metres

MEAN = Mean Monthly Flow To Date
TOTAL = Cubic Decametres To Date
PERCENT = Mean Monthly Flow To Date Over Historical Mean Monthly Flow

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NOTE : DATA PROVIDED UNDER THE COST SHARE AGREEMENT WITH THE
WATER RESOURCES BRANCH, ENVIRONMENT CANADA.

SASKATCHEWAN WATER CORPORATION
HYDROLOGY SERVICE
OPERATION PLANNING SECTION

Provisional Data
Subject To Revision

RECORDED STREAMFLOW AND WATER ELEVATIONS
SOUTH SASKATCHEWAN RIVER

MONTH OF June 1995

	RED DEER RIVER			SOUTH SASKATCHEWAN RIVER							
	GLENIFFER	RED	BINDLOSS	MEDICINE	LAKE DIEFENBAKER			QU'APPELLE	SASKATOON	ST. LOUIS	
DATE	LAKE	DEER		HAT	INFLOW	ELEVATION	OUTFLOW	RELEASES			DATE
1		161.0	101.0	478.0	647.0	552.43	175.0	6.0	165.0	122.0	1
2		121.0	99.0	709.0	610.0	552.50	174.0	6.0	174.0	154.0	2
3		73.2	131.0	821.0	633.0	552.56	174.0	6.0	201.0	174.0	3
4		108.0	160.0	848.0	872.0	552.65	175.0	6.0	205.0	193.0	4
5		163.0	179.0	847.0	999.0	552.76	198.0	6.0	195.0	211.0	5
6	943.77	182.0	131.0	857.0	1020.0	552.90	194.0	6.0	179.0	215.0	6
7		350.0	123.0	866.0	987.0	553.02	459.0	6.0	219.0	219.0	7
8		417.0	111.0	933.0	972.0	553.00	1027.0	6.0	261.0	223.0	8
9		368.0	179.0	4200.0	1010.0	552.93	1125.0	7.0	896.0	560.0	9
10		289.0	247.0	5250.0	3350.0	553.05	1123.0	8.0	1175.0	898.0	10
11		199.0	361.0	2850.0	4870.0	553.52	1125.0	8.0	1210.0	1174.0	11
12		182.0	344.0	1878.0	3330.0	554.02	1126.0	8.0	1205.0	1166.0	12
13	944.73	167.0	333.0	1620.0	2560.0	554.32	330.0	8.7	1180.0	1154.0	13
14		120.0	260.0	1300.0	2050.0	554.56	335.0	9.5	1054.0	1195.0	14
15		114.0	205.0	1090.0	1620.0	554.80	335.0	9.5	940.0	1072.0	15
16		115.0	191.0	1020.0	1370.0	555.01	323.0	9.5	659.0	370.0	16
17		114.0	181.0	924.0	1230.0	555.17	321.0	9.5	469.0	401.0	17
18		113.0	138.0	855.0	1130.0	555.34	299.0	9.5	417.0	432.0	18
19		117.0	126.0	804.0	1010.0	555.40	336.0	9.5	397.0	355.0	19
20	944.89	205.0	124.0	754.0	934.0	555.52	331.0	9.5	435.0	373.0	20
21		204.0	121.0	767.0	886.0	555.62	334.0	9.5	418.0	376.0	21
22		217.0	121.0	788.0	868.0	555.68	335.0	9.5	414.0	376.0	22
23		220.0	145.0	847.0	904.0	555.78	338.0	9.5	424.0	365.0	23
24		157.0	205.0	819.0	978.0	555.84	319.0	9.5	421.0	381.0	24
25		154.0	205.0	827.0	1040.0	555.96	333.0	9.5	418.0	380.0	25
26		149.0	215.0	800.0	1040.0	556.05	343.0	9.5	401.0	376.0	26
27	944.99	135.0	203.0	766.0	1020.0	556.15	344.0	9.5	433.0	347.0	27
28		117.0	186.0	734.0	976.0	556.25	345.0	9.5	446.0	377.0	28
29		100.0	169.0	702.0	918.0	556.32	344.0	9.2	453.0	393.0	29
30		75.6	157.0	709.0	905.0	556.36	343.0	8.7	548.0	390.0	30
MEAN	944.60	173.6	181.4	1221.4	1358	554.51	435.4	8.3	533.7	481.7	MEAN
TOTAL		449867	470102	3165955	3519849		1128649	21444	1383436	1248661	TOTAL
PERCENT		134	142	190	208		168	419	81	138	PERCENT

NOTE: 1. FSL Lake Diefenbaker 556.87

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SASKATCHEWAN WATER CORPORATION
HYDROLOGY SERVICE
OPERATION PLANNING SECTION
RECORDED STREAMFLOW AND WATER ELEVATIONS
SOUTH SASKATCHEWAN RIVER

rovisional Data
ubject To Revision

MONTH OF July 1995

	RED DEER RIVER			SOUTH SASKATCHEWAN RIVER							
	GLENIFFER	RED	BINDLOSS	MEDICINE	LAKE DIEFENBAKER			QU'APPELLE	SASKATOON	ST. LOUIS	
ATE	LAKE	DEER		HAT	INFLOW	ELEVATION	OUTFLOW	RELEASES			DATE
1		88.9	151.0	701.0	903.0	556.40	520.0	8.0	557.0	441.0	1
2		99.5	140.0	694.0	875.0	556.48	520.0	8.0	550.0	533.0	2
3		261.0	124.0	686.0	785.0	556.50	342.0	8.0	549.0	527.0	3
4	944.75	245.0	107.0	679.0	705.0	556.55	345.0	8.0	551.0	527.0	4
5		290.0	107.0	671.0	648.0	556.53	347.0	8.0	561.0	529.0	5
6		298.0	145.0	664.0	634.0	556.56	393.0	8.0	581.0	533.0	6
7		226.0	252.0	656.0	720.0	556.53	391.0	8.0	670.0	557.0	7
8		233.0	278.0	649.0	1100.0	556.58	391.0	8.0	781.0	726.0	8
9		242.0	292.0	641.0	1240.0	556.64	391.0	8.0	788.0	759.0	9
10		185.0	292.0	634.0	1120.0	556.70	390.0	8.0	837.0	754.0	10
11	945.79	166.0	343.0	627.0	1010.0	556.75	388.0	8.0	841.0	791.0	11
12		151.0	262.0	557.0	908.0	556.75	390.0	8.0	838.0	827.0	12
13		138.0	246.0	559.0	857.0	556.75	391.0	8.0	841.0	797.0	13
14		129.0	205.0	500.0	796.0	556.77	390.0	8.0	807.0	767.0	14
15		114.0	187.0	431.0	738.0	556.82	391.0	8.0	719.0	737.0	15
16		124.0	166.0	404.0	673.0	556.80	391.0	8.0	717.0	706.0	16
17		121.0	158.0	377.0	619.0	556.78	391.0	7.4	716.0	709.0	17
18		121.0	147.0	351.0	562.0	556.78	391.0	6.0	694.0	644.0	18
19		122.0	138.0	319.0	518.0	556.78	391.0	4.0	586.0	560.0	19
20		121.0	136.0	287.0	494.0	556.75	391.0	1.3	569.0	542.0	20
21		120.0	140.0	255.0	487.0	556.77	391.0	2.0	571.0	543.0	21
22		118.0	149.0	223.0	471.0	556.75	391.0	6.0	564.0	543.0	22
23		119.0	133.0	191.0	433.0	556.71	391.0	6.0	490.0	484.0	23
24		117.0	131.0	160.0	392.0	556.71	392.0	6.0	482.0	486.0	24
25	946.22	117.0	133.0	293.0	378.0	556.71	378.0	6.0	470.0	476.0	25
26		116.0	126.0	306.0	283.0	556.71	341.0	6.0	424.0	472.0	26
27		114.0	127.0	287.0	338.0	556.71	319.0	6.0	372.0	418.0	27
28		91.0	128.0	310.0	397.0	556.71	341.0	6.0	367.0	389.0	28
29		92.0	124.0	329.0	392.0	556.75	317.0	6.0	362.0	336.0	29
30		92.0	123.0	288.0	398.0	556.71	336.0	6.0	349.0	356.0	30
31		72.0	121.0	284.0	413.0	556.71	339.0	6.0	335.0	354.0	31
EAN	945.98	149.6	158	452	654.4	556.68	382.9	6.7	597.9	574.4	MEAN
OTAL		400671	443884	1210731	1752796		1025663	18031	1601510	1538539	TOTAL
ERCENT		150	137	126	191		161	257	116	178	PERCENT

OTE: 1. FSL Lake Diefenbaker 556.87

STREAMFLOW = Cubic Metres Per Second
ELEVATION = Metres

MEAN = Mean Monthly Flow To Date
TOTAL = Cubic Decametres To Date
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YD100 September 1986
AGE #2

SASKATCHEWAN WATER CORPORATION
HYDROLOGY SERVICE
OPERATION PLANNING SECTION

Provisional Data
Subject To Revision

RECORDED STREAMFLOW AND WATER ELEVATIONS
SOUTH SASKATCHEWAN RIVER

MONTH OF August 1995

	RED DEER RIVER			SOUTH SASKATCHEWAN RIVER							
	GLENIFFER	RED	BINDLOSS	MEDICINE	LAKE DIEFENBAKER			QU'APPELLE	SASKATOON	ST. LOUIS	
DATE	LAKE	DEER		HAT	INFLOW	ELEVATION	OUTFLOW	RELEASES			DATE
1	946.02	69.1	113.0	270.0	384.0	556.73	323.0	6.0	362.0	330.0	1
2		69.7	104.0	258.0	359.0	556.77	347.0	6.0	340.0	361.0	2
3		70.8	102.0	242.0	329.0	556.78	338.0	6.0	370.0	350.0	3
4		72.5	96.0	227.0	307.0	556.82	297.0	6.0	367.0	360.0	4
5		68.0	87.0	233.0	317.0	556.74	303.0	6.0	347.0	376.0	5
6		68.1	75.0	191.0	304.0	556.76	266.0	6.0	324.0	369.0	6
7		79.3	75.0	200.0	288.0	556.69	268.0	6.0	330.0	332.0	7
8	946.00	141.0	75.0	184.0	299.0	556.78	295.0	6.0	290.0	353.0	8
9		134.0	91.5	191.0	249.0	556.78	305.0	6.0	333.0	300.0	9
10		101.0	88.5	176.0	245.0	556.74	300.0	6.0	338.0	340.0	10
11		81.6	96.0	191.0	239.0	556.71	300.0	6.0	374.0	345.0	11
12		102.0	121.0	236.0	278.0	556.70	300.0	6.0	320.0	357.0	12
13		107.0	128.0	266.0	305.0	556.78	299.0	6.0	325.0	338.0	13
14		134.0	126.0	230.0	344.0	556.75	302.0	6.0	326.0	335.0	14
15	946.25	123.0	113.0	260.0	375.0	556.76	301.0	6.0	323.0	337.0	15
16		115.0	124.0	254.0	361.0	556.78	301.0	6.0	319.0	337.0	16
17		96.2	119.0	242.0	367.0	556.80	299.0	6.0	312.0	333.0	17
18		88.1	121.0	239.0	375.0	556.78	300.0	5.0	322.0	347.0	18
19		107.0	142.0	201.0	371.0	556.78	299.0	4.0	308.0	345.0	19
20		104.0	138.0	200.0	378.0	556.78	298.0	4.0	308.0	342.0	20
21		117.0	123.0	195.0	354.0	556.82	307.0	4.0	306.0	338.0	21
22	947.29	118.0	108.0	171.0	322.0	556.78	308.0	4.0	318.0	334.0	22
23		119.0	108.0	178.0	323.0	556.78	297.0	4.0	326.0	329.0	23
24		107.0	121.0	155.0	293.0	556.77	300.0	4.0	306.0	358.0	24
25		95.7	123.0	173.0	294.0	556.76	300.0	4.0	311.0	337.0	25
26		73.9	124.0	154.0	289.0	556.75	302.0	4.0	322.0	326.0	26
27		71.5	124.0	155.0	288.0	556.74	302.0	4.0	322.0	343.0	27
28		62.7	119.0	151.0	288.0	556.73	303.0	4.0	328.0	336.0	28
29		61.0	107.0	168.0	274.0	556.70	303.0	3.0		336.0	29
30		61.6	97.5	139.0	262.0	556.74		2.0		344.0	30
31											31
MEAN	946.39	94	109.7	204.3	316	556.76	302.2	5.1	327.8	342.3	MEAN
TOTAL		243544	284212	529632	813974		757149	13132	792892	887175	TOTAL
PERCENT		146	145	126	198		173	180	128	197	PERCENT

NOTE: 1. FSL Lake Diefenbaker 556.87

STREAMFLOW = Cubic Metres Per Second
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HYD100 September 1986
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NOTE : DATA PROVIDED UNDER THE COST SHARE AGREEMENT WITH THE
WATER RESOURCES BRANCH, ENVIRONMENT CANADA.

SASKATCHEWAN WATER CORPORATION
HYDROLOGY SERVICE
OPERATION PLANNING SECTION

Provisional Data
Subject To Revision

RECORDED STREAMFLOW AND WATER ELEVATIONS
SOUTH SASKATCHEWAN RIVER

MONTH OF September 1995

	RED DEER RIVER			SOUTH SASKATCHEWAN RIVER							
	GLENIFFER	RED	BINDLOSS	MEDICINE	LAKE DIEFENBAKER			QU'APPELLE	SASKATOON	ST. LOUIS	
DATE	LAKE	DEER		HAT	INFLOW	ELEVATION	OUTFLOW	RELEASES			DATE
1		59.6	73.3	145.0	235.0	556.75	199.0	2.0	240.0	311.0	1
2		46.1	67.7	126.0	186.0	556.75	235.0	2.0	241.0	257.0	2
3		45.8	66.3	152.0	150.0	556.74	203.0	2.0	226.0	231.0	3
4		45.2	63.5	124.0	129.0	556.71	247.0	2.0	241.0	204.0	4
5	947.20	42.5	62.1	138.0	127.0	556.71	194.0	2.0	218.0	211.0	5
6		57.4	63.8	133.0	168.0	556.71	215.0	2.0	269.0	209.0	6
7		44.3	58.6	136.0	191.0	556.71	181.0	2.0	200.0	216.0	7
8		49.0	53.8	137.0	235.0	556.74	181.0	2.0	221.0	214.0	8
9		69.7	53.8	141.0	239.0	556.73	181.0	2.0	181.0	193.0	9
10		61.0	55.0	244.0	223.0	556.71	190.0	2.0	192.0	176.0	10
11		59.2	53.8	243.0	204.0	556.71	251.0	2.0	193.0	159.0	11
12	947.99	64.4	51.4	191.0	214.0	556.68	267.0	2.0	222.0	153.0	12
13		63.5	50.2	173.0	283.0	556.71	249.0	2.0	260.0	153.0	13
14		61.3	58.6	161.0	265.0	556.68	241.0	2.0	267.0	203.0	14
15		54.8	61.0	149.0	240.0	556.68	241.0	2.0	251.0	252.0	15
16		54.2	57.4	138.0	230.0	556.68	182.0	2.0	252.0	247.0	16
17		54.8	58.6	155.0	215.0	556.67	192.0	2.0	219.0	242.0	17
18		55.6	61.0	152.0	203.0	556.67	240.0	2.0	190.0	212.0	18
19	947.81	61.3	58.6	162.0	205.0	556.65	243.0	0.8	205.0	174.0	19
20		61.3	58.6	160.0	212.0	556.65	248.0	0.8	252.0	154.0	20
21		45.4	57.4	162.0	215.0	556.63	263.0	1.5	235.0	220.0	21
22		45.4	58.6	159.0	218.0	556.58	263.0	1.5	254.0	235.0	22
23		44.9	57.4	159.0	219.0	556.59	191.0	1.5	273.0	227.0	23
24		44.5	56.2	152.0	218.0	556.59	180.0	1.5	235.0	249.0	24
25		39.9	58.6	141.0	216.0	556.59	251.0	2.5	192.0	262.0	25
26	947.74	33.2	55.0	146.0	213.0			3.5	189.0	185.0	26
27										144.0	27
28											28
29											29
30											30
MEAN	947.68	52.5	58.9	156.9	209.7	556.68	221.1	1.9	227.6	210.9	MEAN
TOTAL		117875	132217	352425	471139		477622	4285	511315	491875	TOTAL
PERCENT		107	119	128	174		141	84	109	153	PERCENT

NOTE: 1. FSL Lake Diefenbaker 556.87

STREAMFLOW = Cubic Metres Per Second
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HYD100 September 1986
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NOTE : DATA PROVIDED UNDER THE COST SHARE AGREEMENT WITH THE
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SASKATCHEWAN WATER CORPORATION
HYDROLOGY SERVICE
OPERATION PLANNING SECTION
RECORDED STREAMFLOW AND WATER ELEVATIONS
SOUTH SASKATCHEWAN RIVER

Provisional Data
Subject To Revision

MONTH Of October 1995

	RED DEER RIVER			SOUTH SASKATCHEWAN RIVER							
	GLENIFFER	RED	BINDLOSS	MEDICINE	LAKE DIEFENBAKER			QU'APPELLE	SASKATOON	ST. LOUIS	
DATE	LAKE	DEER		HAT	INFLOW	ELEVATION	OUTFLOW	RELEASES			DATE
1		38.8	47.9	109.0	176.0	556.45	385.0	1.5	307.0	265.0	1
2		53.0	45.7	114.0	170.0	556.44	290.0	1.5	317.0	254.0	2
3	947.86	44.3	43.5	129.0	159.0	556.40	311.0	1.5	288.0	305.0	3
4		40.3	42.4	137.0	156.0	556.39	306.0	1.5	298.0	264.0	4
5		39.4	42.4	134.0	165.0	556.36	256.0	1.5	307.0	280.0	5
6		36.8	47.9	136.0	176.0	556.33	273.0	1.5	275.0	294.0	6
7		34.8	51.4	137.0	183.0	556.30	201.0	1.5	281.0	278.0	7
8		33.6	55.0	135.0	187.0	556.34	212.0	1.5	233.0	264.0	8
9		33.2	50.2	130.0	191.0	556.32	200.0	1.5	224.0	260.0	9
10	947.99	34.6	50.2	139.0	186.0	556.30	230.0	1.5	209.0	184.0	10
11		34.6	49.0	136.0	182.0	556.27	284.0	1.5	191.0	212.0	11
12		36.0	46.8	124.0	184.0	556.25	297.0	1.5	254.0	184.0	12
13		33.2	45.7	114.0	184.0	556.23	296.0	1.5	294.0	206.0	13
14		31.3	45.7	123.0	175.0	556.21	251.0	1.5	307.0	278.0	14
15		32.0	44.6	172.0	165.0	556.17	238.0	1.5	268.0	265.0	15
16		31.3	44.6	143.0	167.0	556.21	286.0	1.5	300.0	279.0	16
17	947.98	31.5	45.7	169.0	191.0	556.22	234.0	1.5	222.0	246.0	17
18		31.8	44.6	173.0	201.0	556.14	208.0	1.5	258.0	234.0	18
19		31.5	44.3	172.0	206.0	556.13	199.0	1.5	232.0	240.0	19
20		28.9	43.5	160.0	216.0	556.13	205.0	1.5	209.0	245.0	20
21		28.4	42.4	165.0	225.0	556.13	200.0	1.5	209.0	199.0	21
22		28.4	41.3	176.0	204.0	556.12	199.0	1.5	194.0	202.0	22
23		28.0	40.2	189.0	200.0	556.09	267.0	1.5	205.0	202.0	23
24	948.00	27.9	40.2	174.0	212.0	556.07	268.0	1.5	222.0	172.0	24
25		27.9	40.2	177.0	226.0	556.07	210.0	1.5	278.0	189.0	25
26		27.9	39.1	174.0	222.0	556.06	260.0	1.5	245.0	255.0	26
27		24.5	38.0	167.0	215.0	556.03	227.0	1.5	231.0	264.0	27
28		24.3	37.1	153.0	213.0	556.03	211.0	1.5	252.0	205.0	28
29		24.0	37.1	147.0	208.0	556.05	242.0	1.5	222.0	252.0	29
30		23.2	37.1	159.0	198.0	556.02	267.0	1.5	229.0	240.0	30
31	947.98	21.7	37.1	168.0		555.98	228.0	1.5	263.0	201.0	31
MEAN	947.96	32.2	43.9	149.5	191.1	556.19	246.5	1.5	252.4	239.3	MEAN
TOTAL		86153	117581	400464	495331		660203	4017	675993	640930	TOTAL
PERCENT		103	115	134	160		136	120	149	160	PERCENT

NOTE: 1. FSL Lake Diefenbaker 556.87

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HYD100 September 1986
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SASKATCHEWAN WATER CORPORATION
HYDROLOGY SERVICE
OPERATION PLANNING SECTION
RECORDED STREAMFLOW AND WATER ELEVATIONS
SOUTH SASKATCHEWAN RIVER

MONTH OF June 1986

	RED DEER RIVER			SOUTH SASKATCHEWAN RIVER							
	GLENIFFER	RED	BINDLOSS	MEDICINE	LAKE DIEFENBAKER			QU'APPELLE	SASKATOON	ST. LOUIS	
DATE	LAKE	DEER		HAT	INFLOW	ELEVATION	OUTFLOW	RELEASES			DATE
1		164.0	98.7	558.0	516.0	553.75	376.0	0.0	389.0	400.0	1
2		150.0	98.8	622.0	539.0	553.80	376.0	0.0	388.0	412.0	2
3		152.0	99.0	579.0	646.0	553.84	367.0	0.0	389.0	411.0	3
4	941.25	143.0	154.0	554.0	715.0	553.89	306.0	0.0	383.0	404.0	4
5		142.0	158.0	544.0	729.0	553.99	371.0	0.0	332.0	401.0	5
6		135.0	171.0	521.0	717.0	554.03	373.0	0.0	371.0	365.0	6
7		143.0	185.0	720.0	711.0	554.09	377.0	2.0	375.0	378.0	7
8		130.0	172.0	779.0	736.0	554.14	380.0	3.0	378.0	389.0	8
9		107.0	159.0	744.0	886.0	554.23	370.0	3.0	375.0	400.0	9
10		75.1	134.0	650.0	929.0	554.32	377.0	3.0	374.0	404.0	10
11	942.49	73.6	131.0	755.0	863.0	554.40	381.0	3.0	378.0	404.0	11
12		62.7	124.0	755.0	810.0	554.48	315.0	3.0	348.0	384.0	12
13		62.7	110.0	714.0	869.0	554.58	295.0	3.0	305.0	405.0	13
14		59.3	84.0	650.0	851.0	554.71	196.0	3.0	246.0	372.0	14
15		58.2	74.0	576.0	791.0	554.78	196.0	3.0	210.0	352.0	15
16		57.2	71.0	511.0	716.0	554.89	198.0	3.0	196.0	300.0	16
17		57.2	65.4	444.0	645.0	555.02	200.0	3.0	197.0	246.0	17
18	943.75	59.3	59.9	399.0	578.0	555.09	200.0	3.0	199.0	237.0	18
19		62.4	58.6	340.0	511.0	555.18	199.0	3.0	200.0	248.0	19
20		63.0	61.0	324.0	459.0	555.19	198.0	3.0	200.0	238.0	20
21		65.2	68.7	442.0	412.0	555.19	240.0	1.5	197.0	214.0	21
22		77.8	76.5	412.0	405.0	555.21	191.0	0.0	221.0	206.0	22
23		84.9	72.2	369.0	485.0	555.30	179.0	0.0	215.0	219.0	23
24		83.5	68.0	336.0	488.0	555.34	229.0	0.0	185.0	256.0	24
25	944.80	77.8	94.6	359.0	449.0	555.40	245.0	0.0	204.0	210.0	25
26		75.1	107.0	465.0	437.0	555.45	252.0	0.0	237.0	202.0	26
27		73.5	107.0	591.0	464.0	555.48	250.0	0.0	248.0	224.0	27
28		78.4	106.0	622.0	565.0	555.52	250.0	0.0	251.0	248.0	28
29		77.2	102.0	554.0	686.0	555.63	200.0	0.0	250.0	258.0	29
30		82.7	99.0	473.0	714.0	555.71	188.0	0.0	225.0	252.0	30
MEAN	943.07	91.1	105.7	545.4	644.1	554.75	275.8	1.4	282.2	314.6	MEAN
TOTAL		236113	273844	1413676	1669420		714972	3673	731462	815536	TOTAL
PERCENT		70	83	84	98		106	71	42	90	PERCENT

NOTE: 1. FSL Lake Diefenbaker 556.87

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HYD100 September 1986
PAGE #2

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SASKATCHEWAN WATER CORPORATION
HYDROLOGY SERVICE
OPERATION PLANNING SECTION
RECORDED STREAMFLOW AND WATER ELEVATIONS
SOUTH SASKATCHEWAN RIVER

MONTH OF July 1996

DATE	RED DEER RIVER GLENIFFER LAKE	RED DEER	BINDLOSS	MEDICINE HAT	SOUTH SASKATCHEWAN RIVER LAKE DIEFENBAKER INFLOW	ELEVATION	OUTFLOW	QU'APPELLE RELEASES	SASKATOON	ST. LOUIS	DATE
1		77.0	95.5	447.0	649.0	555.78	238.0	0.0	194.0	265.0	1
2	945.95	78.0	92.0	404.0	577.0	555.84	238.0	1.5	213.0	224.0	2
3		78.7	84.5	377.0	537.0	555.89	250.0	3.0	238.0	186.0	3
4		77.2	84.2	368.0	496.0	555.96	246.0	3.0	244.0	206.0	4
5		78.1	84.0	335.0	466.0	555.96	243.0	3.0	248.0	235.0	5
6		118.0	83.0	329.0	452.0	555.96	251.0	3.0	244.0	259.0	6
7		121.0	78.5	369.0	425.0	555.98	250.0	3.0	247.0	263.0	7
8		98.3	78.5	446.0	412.0	556.00	260.0	3.0	250.0	231.0	8
9	946.11	77.8	80.0	416.0	444.0	556.00	293.0	3.0	255.0	255.0	9
10		76.3	102.0	361.0	509.0	556.06	255.0	3.5	276.0	262.0	10
11		73.9	120.0	328.0	518.0	556.09	250.0	4.0	274.0	252.0	11
12		73.6	112.0	248.0	487.0	556.14	249.0	4.0	252.0	305.0	12
13		80.2	91.5	242.0	441.0	556.15	249.0	4.0	249.0	274.0	13
14		76.3	85.5	228.0	367.0	556.20	250.0	4.0	249.0	273.0	14
15		73.9	85.5	265.0	328.0	556.19	278.0	4.0	250.0	253.0	15
16	946.14	73.3	85.5	248.0	320.0	556.20	291.0	4.5	264.0	246.0	16
17		72.8	89.9	209.0	335.0	556.18	301.0	5.0	284.0	243.0	17
18		72.8	90.0	197.0	343.0	556.21	298.0	5.0	296.0	288.0	18
19		72.5	92.1	188.0	315.0	556.21	273.0	5.0	299.0	310.0	19
20		71.9	92.6	216.0	293.0	556.19	247.0	5.0	299.0	316.0	20
21		76.3	92.3	159.0	284.0	556.19	254.0	5.0	280.0	315.0	21
22		78.1	92.4	184.0	294.0	556.18	294.0	5.0	260.0	281.0	22
23	946.12	77.5	92.1	218.0	278.0	556.18	277.0	5.0	250.0	247.0	23
24		71.9	92.3	213.0	266.0	556.15	250.0	5.0	274.0	247.0	24
25		66.0	91.1	180.0	283.0	556.18	230.0	5.0	286.0	306.0	25
26		68.6	92.1	169.0	306.0	556.19	227.0	3.0	264.0	286.0	26
27		66.9	90.9	140.0	288.0	556.21	179.0	0.0	240.0	270.0	27
28		68.3	91.2	128.0	266.0	556.21	206.0	0.0	229.0	246.0	28
29		70.0	91.1	131.0	243.0	556.21	234.0	2.0	203.0	221.0	29
30		68.0	90.6	127.0	221.0	556.20	223.0	4.0	192.0	197.0	30
31		64.4	74.4	128.0	220.0	556.18	230.0	4.0	220.0	171.0	31
MEAN	946.08	77.3	90.2	258	376.5	556.1	252.1	3.5	252.4	255.8	MEAN
TOTAL		207152	241691	691027	1008547		675142	9374	675907	685248	TOTAL
PERCENT		78	73	72	110		106	134	49	79	PERCENT

NOTE: 1. FSL Lake Diefenbaker 556.87

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SASKATCHEWAN WATER CORPORATION
HYDROLOGY SERVICES
OPERATION PLANNING SECTION
RECORDED STREAMFLOW AND WATER ELEVATIONS
SOUTH SASKATCHEWAN RIVER

MONTH OF August 1996

	RED DEER RIVER			SOUTH SASKATCHEWAN RIVER							
	GLENIFFER	RED	BINDLOSS	MEDICINE	LAKE DIEFENBAKER			QU'APPELLE	SASKATOON	ST. LOUIS	
DATE	LAKE	DEER		HAT	INFLOW	ELEVATION	OUTFLOW	RELEASES			DATE
1		61.8	73.9	120.0	208.0	556.17	227.0	4.0	229.0	255.0	1
2		59.0	73.5	114.0	202.0	556.15	204.0	4.0	222.0	214.0	2
3		71.4	73.3	111.0	198.0	556.21	189.0	4.0	215.0	234.0	3
4		97.3	73.2	116.0	192.0	556.17	160.0	4.0	181.0	262.0	4
5		63.8	73.1	114.0	187.0	556.20	122.0	4.0	150.0	228.0	5
6	946.00	90.1	73.0	135.0	186.0	556.15	120.0	4.0	131.0	137.0	6
7		101.0	72.9	164.0	187.0	556.15	119.0	4.0	121.0	145.0	7
8		101.0	90.0	161.0	196.0	556.15	121.0	4.0	119.0	134.0	8
9		87.5	105.0	122.0	233.0	556.17	120.0	4.0	120.0	124.0	9
10		72.8	151.0	131.0	266.0	556.20	121.0	4.0	120.0	118.0	10
11		56.1	132.0	118.0	285.0	556.21	120.0	4.0	120.0	119.0	11
12		52.0	128.0	109.0	265.0	556.25	147.0	4.0	120.0	121.0	12
13	946.07	39.7	118.0	99.9	254.0	556.21	162.0	4.0	133.0	118.0	13
14		36.8	99.9	85.6	234.0	556.25	149.0	4.0	154.0	121.0	14
15		35.3	89.7	80.4	211.0	556.25	151.0	4.0	155.0	124.0	15
16		32.6	75.6	74.2	188.0	556.25	150.0	4.0	150.0	159.0	16
17		30.7	67.9	80.1	165.0	556.21	165.0	4.0	150.0	146.0	17
18		30.6	60.0	79.2	149.0	556.24	118.0	4.0	157.0	166.0	18
19		28.4	56.9	82.2	139.0	556.24	139.0	4.0	141.0	143.0	19
20	946.35	28.2	55.5	90.5	136.0	556.21	146.0	4.0	128.0	169.0	20
21		27.2	53.3	94.6	135.0	556.21	149.0	4.0	142.0	144.0	21
22		26.9	51.3	72.8	138.0	556.21	152.0	4.0	147.0	130.0	22
23		26.7	48.6	84.0	142.0	556.21	179.0	4.0	150.0	141.0	23
24		26.4	47.6	73.9	138.0	556.19	130.0	4.0	165.0	145.0	24
25		25.9	46.0	71.1	128.0	556.21	105.0	4.0	154.0	152.0	25
26		25.6	45.8	66.6	126.0	556.19	155.0	4.0	117.0	169.0	26
27		27.9	42.3	66.6	122.0	556.17	172.0	4.0	130.0	153.0	27
28	946.34	28.0	41.1	64.9	115.0	556.12	195.0	4.0	163.0	121.0	28
29		26.4	40.5	57.1	109.0	556.12	197.0	4.0	183.0	125.0	29
30		30.0	40.3	66.5	107.0	556.09	199.0	4.0	196.0	145.0	30
31		30.6	39.5	57.8	106.0	556.09	200.0	4.0	198.0	166.0	31
MEAN	946.19	47.7	72.2	95.9	175.7	556.19	152.7	4	153.6	155.8	MEAN
TOTAL		127673	193445	256867	470620		408940	10713	411350	417162	TOTAL
PERCENT		74	95	59	111		87	142	59	90	PERCENT

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