

**A Survey Reconnaissance of Eagle Creek:
Identifying Place Through the Archaeological Record**

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By

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ABSTRACT

The Stranraer Terrace is a large geographical landmark located along Eagle Creek in mid-western Saskatchewan. After the identification of the Herschel Petroglyphs (EjOc-3) in the 1960s, the area has undergone numerous small scale archaeological surveys and three excavations. To understand the use and significance of this landmark, a judgmental survey was conducted and the cultural history was established through artifact collections. From the survey 54 new sites were identified bringing the total number of sites within the region to 118. The artifacts identified through collections, excavations, and surface finds show the region has been utilized for several millennia; spanning a time period from at least the Middle Period to post-contact.

Understanding the significance of a locale and its role within the cultural landscape first requires a discussion on the formation processes of place. Both wayfinding theory and ecological concepts of patch selection are the building blocks of this type of analysis. If a spot satisfies some biological or cultural need, then there is incentive to return and use the space. It is through this repetition of use, that the locale becomes more than a location on the landscape. It takes on the attributes of memory, meaning, and experience. It is a transformation from space to place. The presence of petroglyphs, alignments, Medicine Wheels, and other sites of special significance indicate the Stranraer Terrace to be one of these places.

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CHAPTER 1. INTRODUCTION

1.1 Introduction

Eagle Creek is a major drainage system in mid-western Saskatchewan between the South and North Saskatchewan Rivers. At the most southern portion of the creek, between the hamlet of Herschel and the hamlet of Stranraer, is a large topographical landmark: Stranraer Terrace. This landmark is an uplifted terrace formed by the last glaciation and considered part of the northern extremity of the Missouri Coteau. Since the identification of the Herschel Petroglyphs (EjOc-3) in the 1960s, the area has undergone numerous archaeological investigations that hint at the significance of this landmark in the Northern Plains. In addition to the petroglyphs, the sites found here include two Medicine Wheels, a Vision Quest site, and numerous cairns and stone rings. Even with the high site inventory and multiple investigations within the area, the landmark and surrounding area has not been systematically surveyed. Consequently, each of these investigations tend to focus on site specific analyses without considering them in a regional context.

1.2 Thesis Objectives

By undergoing a large-scale survey of the Herschel and Stranraer areas including Stranraer Terrace, several objectives will be addressed. These include the following:

1. Increase site inventory of the area
2. Determine the cultural history of the region through artifact collections
3. Examine cognitive theories of spatial navigation and biological theories of patch selection
4. Apply the geographical concept of place
5. Determine whether Stranraer Terrace is a meaningful place

1.3 Thesis Organization

The thesis is organized starting with a description of the biophysical setting in Chapter 2. A discussion of the geology, hydrology, soil, and ecology will be presented within this section with a focus on the topography of the major landmark, the Stranraer Terrace. Chapter 3 is a brief introduction to the culture history of the Northern Plains. Chapter 4 provides all available research that was performed in the area up to the year 2020 and includes surveys, excavations, and Heritage Resource Impact Assessments. Methodologies for the 2020 survey are discussed in

Chapter 5, and Chapter 6 reports the results of the survey. Chapter 6 also includes the artifact analysis. In Chapter 7, a discussion of the survey results is provided in relation to several theories. It covers the behavioural choices in settlement placement using cognitive mapping and ecological models with a discussion of the concept of place. Lastly, Chapter 8 is the conclusion and provides a summary of the research.

CHAPTER 2. BIOPHYSICAL SETTING

2.1 Introduction

The study area is located at the southern end of the Eagle Creek drainage system in western Saskatchewan (Figure 2.1), between the hamlet of Herschel and Opuntia Lake (Figure 2.2). It is situated in the Rural Municipality of Mountain View where it spans three National Topographic System map numbers: 72N9, 72N10, and 72N15. The topography is primarily a valley system within the mixed and moist-mixed grassland ecoregions. At the southern portion of the study area is a large complex topographical feature known as the Stranraer Terrace. This feature is a large, uplifted terrace that rises above the surrounding plains by approximately 150 m. Simpson (1999) considers it a part of the northern extent of the Missouri Coteau.

Running directly through the area is Eagle Creek. This creek is the primary drainage channel in western Saskatchewan. It begins in Tramping Lake at a latitude of 52°19' to 51°58' and a longitude of 108°49' and flows in a southeasterly direction for approximately 16.5 km to Opuntia Lake. It then flows down through the hamlet of Herschel to a latitude of 51°33' and a longitude of 108°13', then changes direction just north of Rosetown and follows Highway 7 in a northeasterly direction until it drains into the North Saskatchewan River at a latitude of 52°21' and a longitude of 107°24'. The elevation drop is a 100 m decline from the source (Tramping Lake) to where the creek merges with the North Saskatchewan River. In total, the entire drainage system spans a length of 189 km from beginning to end.

2.2 Physical Setting

2.2.1 Hydrology

Generally, the land slopes from the Rocky Mountains down towards the Canadian Shield in the east. “The preglacial drainage system developed on this slope, with rivers carrying debris northeastward from the mountains” (Klassen 1989:141). It is through the continued movement of the advancing and retreating glaciers that the underlying landscape became sculpted. New valley systems were carved out and old ones filled in. The North Saskatchewan River and the valley portions of Eagle Creek are the direct result of glacial spillways and/or meltwater channels from the last glaciation (Klassen 1989).

Eagle Creek is the primary drainage channel in the middle west portion of the province. Ground water from the surrounding expansive plains eventually drains into the creek; although,

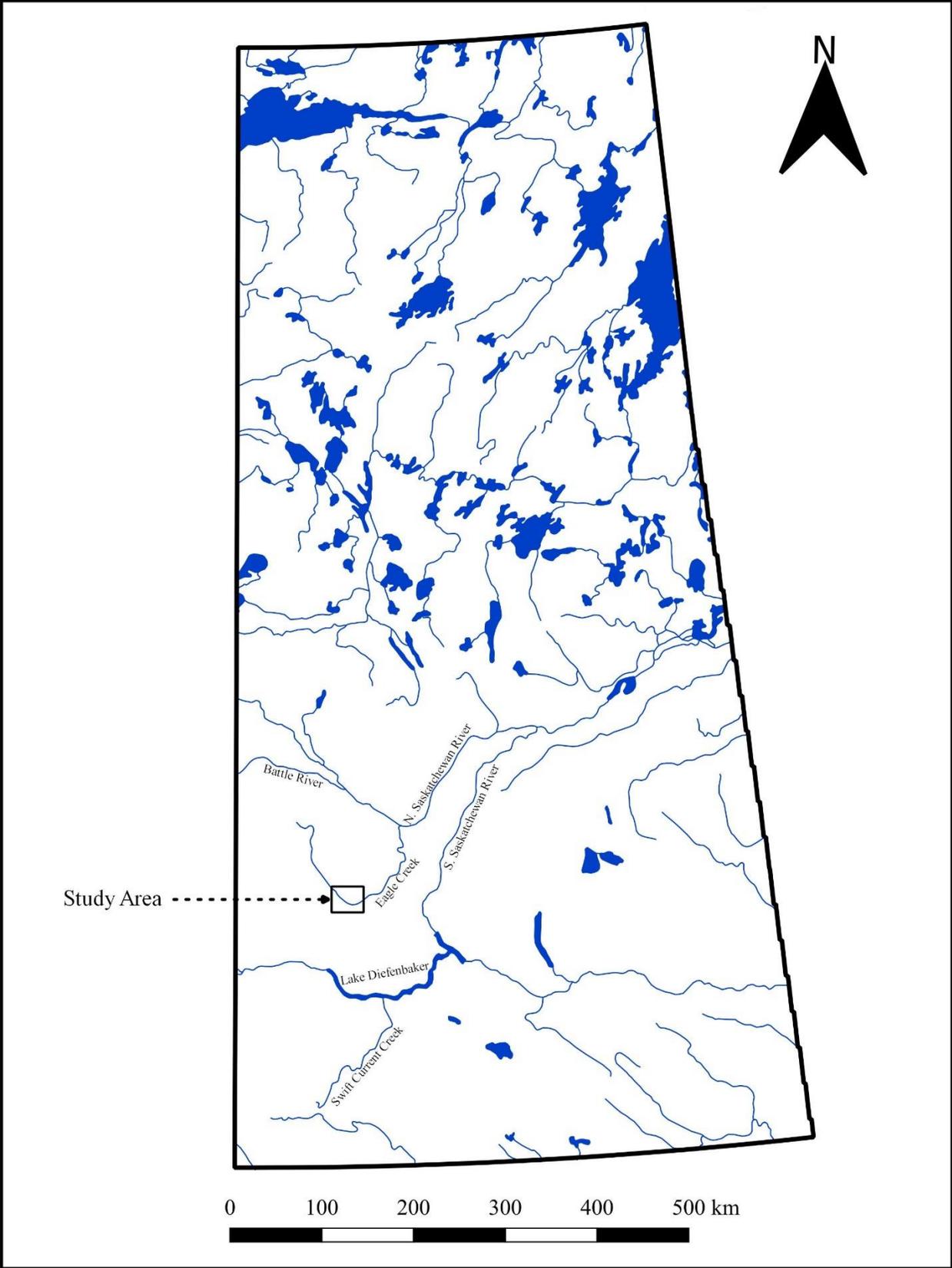


Figure 2.1. Map of Saskatchewan denoting study area.

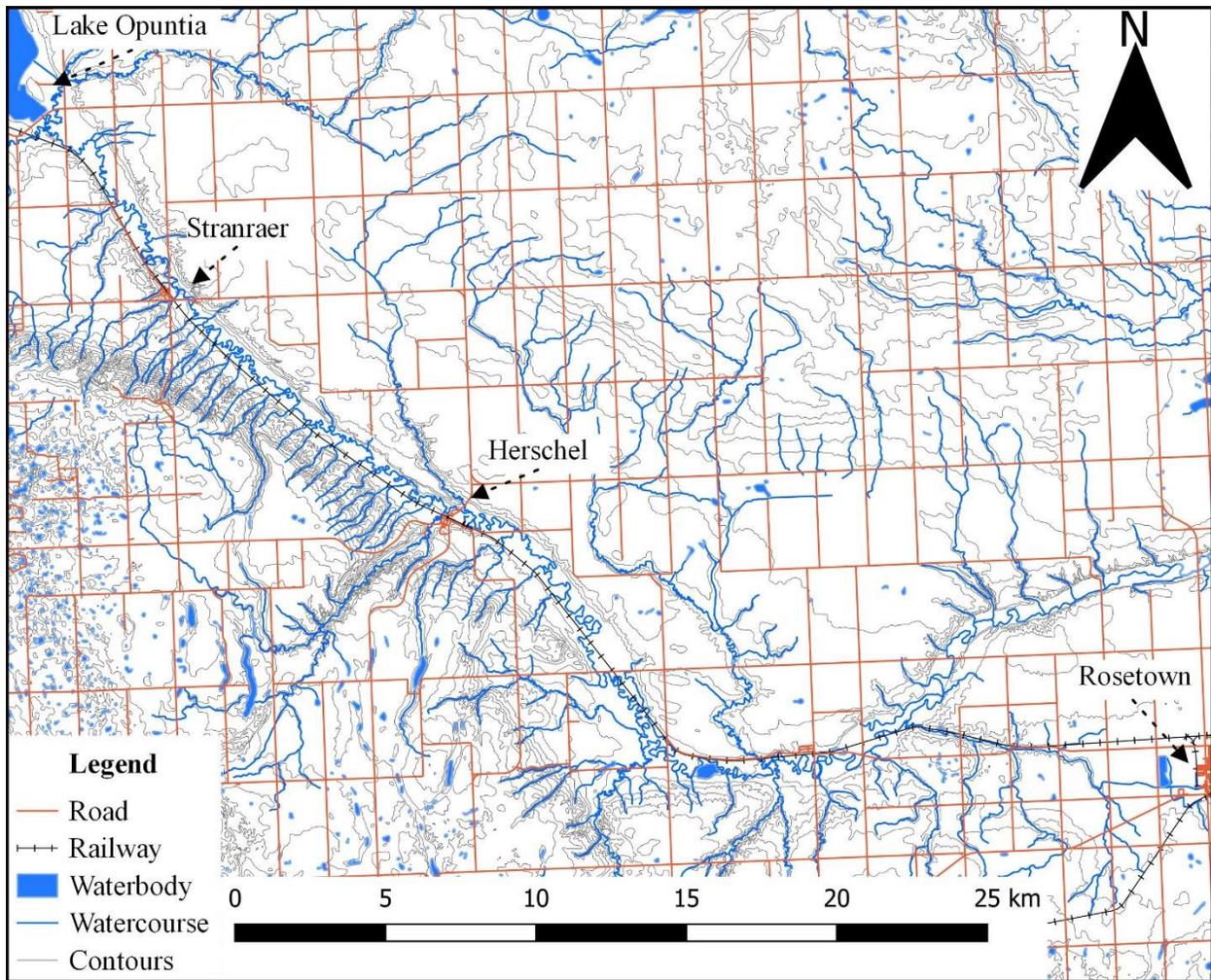


Figure 2.2. Map of study area and surrounding region.

the main source of water comes from Tramping Lake. This lake is fed from a constant aquifer discharge located in the underlying bedrock formations (Acton et al. 1998). In addition, major tributaries fed from small water bodies supply the creek. A notable one is Coal Mine Creek which is fed by the small Shrimp Lake. During most of the year, the creek feeds the North Saskatchewan River about one cubic meter of water per second, which increases twofold in the month of April (Sask Water 1999:126).

Water bearing horizons under and near the creek can be divided into drift aquifers and bedrock aquifers. Drift aquifers are located just north of the creek at a depth of 12 to 30 m in which they gently slope down towards the creek (Mackay et al. 1936). The major bedrock aquifer is the Judith River Formation which primarily supplies the creek (Maathuis 1999:128). Both types of aquifers have been tapped since the first settlers arrived within the area and continue to supply the local population with water to this day.

2.2.2 Geology

2.2.2.1 Bedrock Geology

The area is situated in the Phanerozoic Basin of the interior plains where it is overlain with Cretaceous period deposits. Rocks from this period “consist typically of shales and siltstones, laid down in shallow seas that interfinger westward with deltaic and fluvial siltstone and sandstone which include some coal” (Klassen 1989:138). The late Cretaceous layer consists of several formations known as the Montana Group. From the lowest layer to the uppermost layer, the formations are the Lea Park, Milk River, Belly River, and finally the Bearpaw Formation. Through time, these formations show a general “transition from a marine to a continental environment” (Kupsch 1999:80).

The Lea Park and Milk River Formations consist of marine shale and are characterized by a dark grey to dark brownish grey colour. Next, the Belly River Formation (the only non-marine layer) consists of sand, shale, and coal. This formation can be seen outcropping in the valley bottoms at an elevation of approximately 597 m asl (Mackay et al. 1936). Finally, the Bearpaw Formation consists of marine silts and clay muds which are dark grey to dark brownish grey as well as weathered light grey in colour. Near the end of the Bear Paw Formation’s lifespan, sand was deposited in certain areas across this landscape (Kupsch 1999; Mackay et al. 1936).

2.2.2.2 Quaternary Geology

The Quaternary period spans a time depth of two million years. It is characterized by several glacial advancements and subsequent retreats (Simpson 1999). This period is divided into the Pleistocene (2,500,000 – 11,500 BP) and the Holocene Epoch (11,500 BP – present), during which the Pleistocene had several glacial events. They include, from oldest to youngest, the Nebraskan, Kansan, Illinoian, and Wisconsinan. This discussion focuses on the Late Wisconsinan, as it will help to understand the makeup of the glacial drift that covers the landscape.

During the glacial events, the underlying bedrock was slowly covered by a layer of aggregated materials caused by the glaciers eroding the underlying bedrock. As glaciers moved across the landscape, they picked up the underlying bedrock, transported it within the ice, and eventually deposited it. This material is known as glacial drift and is composed of till, glaciofluvial deposits, and glacial lake deposits (Klassen 1989). The primary materials within this layer consist of clay, silt, and sand from the underlying Cretaceous bedrock alongside material

from the Tertiary period. Metamorphic and igneous rocks within this layer derive from the Precambrian Shield, quartzites from the Cordillera, and carbonates and quartzites from the Rocky Mountains. Ironstone concretions and petrified wood that erode from the underlying bedrock are present as well (Klassen 1989).

The Wisconsin glacial event was the last event that took place before the Holocene. It began around 55,000 BP, reached its maximum around 22,000 BP, and ended around 11,500 BP. The Holocene immediately succeeds it. During this time there were two glaciers with different points of origin and distinct characteristics. These were the Cordilleran Glacial Complex covering the Rocky Mountains and the Laurentide Ice Sheet that covered the eastern and central portions of Canada (Flint 1971). There is some debate as to the exact extent of the Laurentide Ice Sheet during its maximum, but Saskatchewan would have been completely covered with the exception of the Cypress Hills (Klassen 1989). According to Flint (1971), during the glacial maximum, ice thickness would have been at minimum 360 m in Montana, and up to 500 m in eastern North Dakota. When the glacier retreated to Eagle Creek, ice thickness would have been between 150-200 m (Simpson 1999).

Over the next few millennia, as the glacier retreated it began to carve the land into its present form. Around 12,000 BP, the area of the Eagle Creek valley was completely ice free; although, sections would have been underwater. As the ice melted and slowly retreated to its origin, glacial lakes formed around its margins. Several lakes formed around the present-day Eagle Creek. These are Glacial Lake Red Willow to the northwest, Glacial Lake Unity directly north, and to the east, Glacial Lake Saskatchewan (Klassen 1989). Spillways during this time were the North Saskatchewan River and Eagle Creek, both which were important for draining what is the present-day province of Alberta (Gordon 1979). These spillways deposited large amount of glaciolacustrine plain deposits in and around Eagle Creek (Simpson 1999). By 9,000 BP the drainage systems and geomorphology in western Saskatchewan would have resembled what they look like presently (Klassen 1989).

2.2.2.3 Geomorphology

As Eagle Creek was helping to drain the west during glacial times, the morphology of the spillway channel underwent changes. The influx of water caused the sides of the channel to be cut very steep (Gordon 1979:36). This caused the valley walls to be very unstable and during postglacial times slumped down to create hummocky terrain (Gordon 1979). Hummocky terrain

and rolling moraines can be seen through out, however, certain sections still maintain steep squarish terraces.

South of the hamlet of Stranraer and extending to Herschel is the northern section of the Missouri Coteau (Simpson 1999). This portion of the Coteau, known as the Stranraer Terrace (Figure 2.3), was formed at a time when the Laurentide Ice Sheet margin was directly on top of the present-day Stranraer. The Coteau “cut between the deglaciated upland to the southwest of Stranraer and the ice front” (Christiansen 1965: Plate 7). This formed a two-step terrace that has a staircase appearance (Figure 2.4). The bottom terrace (terrace 2) resembles the terrace across the valley in both height and general shape whereas the uplifted portion (terrace 1) protrudes from the surrounding area. Drainage channels that originate at the top of the terrace have carved out deep coulees perpendicular to the slope. These channels have the affect of dividing the hillside into narrow sections. Certain sections contain what is referred to here as a shelf while others do not. The highest elevated portion is around 150 m above the surrounding plains around the hamlet of Stranraer. It then generally slopes down towards Herschel.

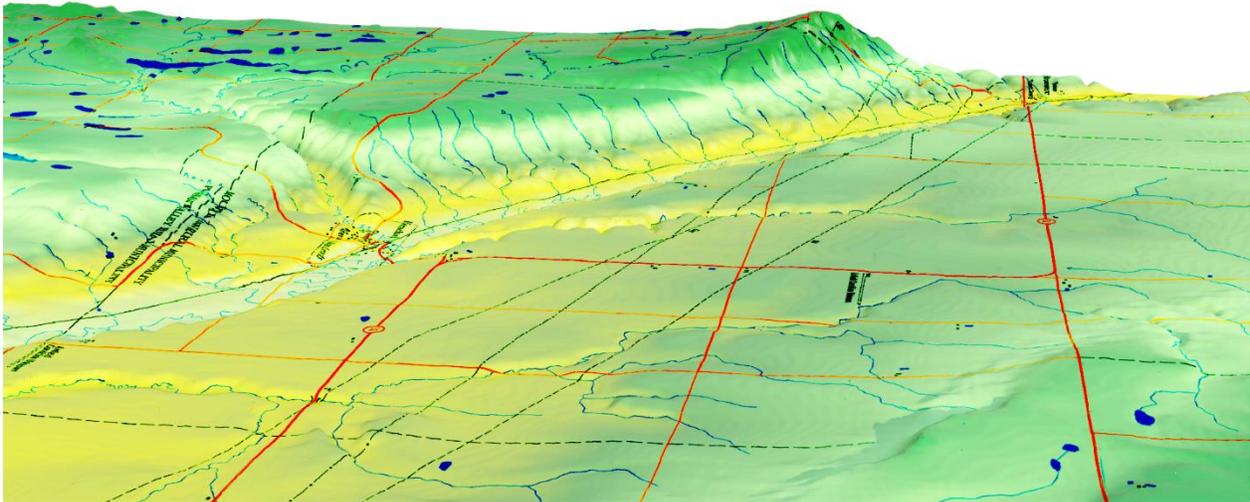


Figure 2.3. Digital elevation model of NTS 72N/9 facing southwest and focused of the Stranraer Terrace.

2.2.3 Sedimentology and Soils

Several soil types exist within the study region and correspond to the ecoregions discussed in more detail below, the exception being the alkali soils which are found only in the valley bottom. These soil types include brown soils associated with the mixed grasslands and dark brown soils of the moist mixed grassland ecoregion. Each soil type is then separated into

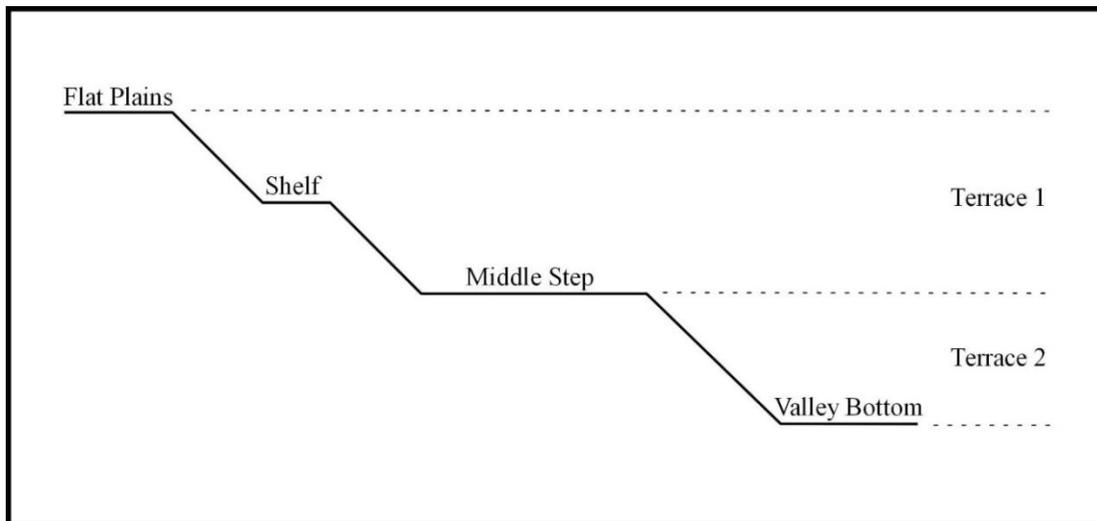


Figure 2.4. General profile of the Stranraer Terrace.

soil texture and association. The association is “a group of closely associated Soil Series found in a recurring pattern within a natural soil landform and developed on a specific parent material (geological deposit)” (Christiansen 1965:11). Within the study area are the Haverhill Association of the brown soil region and the Regina/Weyburn Association of the dark brown region. Located on the northern side of the creek between Herschel and Stranraer is the Weyburn Association with a loam soil texture. This soil type is the most common on the prairies because it overlays glacial till. In Saskatchewan, it covers more than seven and three-quarter million acres (Mitchell et al. 1977:82). The top layer, or horizon A, is characterized by a dark brown colour and a hard cloddy structure. Under horizon A is the B horizon which is broken down into three sections. These sections change from a heavier texture and rusty brown to dark brown colour, to a yellow-brown, and finally to a light greyish colour with a high content of lime carbonate. The bottom layer that lies above the glacial till and below horizon B is known as horizon C. It consists of dark grey sand to clay that usually contains some glacial till (Mitchell et al. 1977:82).

From Stranraer to Opuntia Lake, on both sides of the valley, is the Regina Association which has a heavy clay soil texture. These soils overlay clay which at one point were former glacial lake beds. Horizon A consists of a dark greyish-brown to dark brown colour which has a granular structure. Since layers within this association are not well defined, a Horizon A-B is needed. This layer is more compact and is characterized by a dark greyish-brown colour. The B horizon has a dark grey colour with little difference from the overlaying horizon A-B, while the C horizon is dark grey, heavy, and slightly laminated (Mitchell et al. 1977:98-99).

On the south side of the valley from Herschel to Stranraer and including the Stranraer Terrace is the Haverhill Association: characterized by a loam soil texture. The Horizon A here is hard and cloddy with a grey brown to light brown colour. Horizon B can be divided into two sublayers that change from a bright brown to darker brown to a brownish-grey to grey colour. The Horizon C which lies above the glacial till is a dark grey and heavily laminated. This layer has glacial stones in addition to specks of iron oxide (Mitchell et al. 1977:55).

Finally, within the Eagle Creek valley is an alkali soil which covers the floodplain of this creek. It is known as a regosolic soil due to the absence of an A or B Horizon (Mitchell et al. 1977). The soil here contains a high amount of salts such as sodium sulphate, magnesium sulphate, and sodium chloride. “From the surface downwards the more usual colour arrangement is dark grey over light grey to bluish-grey, over mottled brown, yellow and bluish-grey” (Mitchell et al. 1977:177). This soil usually overlays recent alluvial and lacustrine deposits.

2.2.4 Climate

The entirety of the Eagle Creek drainage basin is located within the Continental Climate region. This region is characterised by long cold winters and cool summers. Mean annual temperatures vary between 2 to 3°C with an annual precipitation of between 350 and 400 mm. July receives the highest amount of rainfall (60 mm) and is the warmest month of the year with a mean temperature of 18°C, whereas January is the coldest month at a mean temperature of -18°C. Snow falls primarily between October and April; however, it can snow low amounts between May and September. Mean annual snowfall is around 100 cm where November and December have the highest volume (Lundqvist 1999).

Several major paleoclimate events took place prior to the arrival of human populations to North America. The melting of the ice sheets was brought about by a warming period that ended approximately 11,000 BP. During this period, the ecology changed dramatically with the extinction of megafauna and various plant species. By 11,000 BP the climate shifted to colder and wetter conditions that lasted for roughly 1,000 years known as the Younger Dryas (Kornfeld et al. 2010). The next paleoclimatic event, the Hypsithermal, began approximately 8,500 BP. This period is marked by increased temperatures causing “widespread drought, soil erosion, and wind drifting with the burial of extensive areas under loess and windblown sand” (Klassen 1989: 163). By 6,000 to 5,000 BP, cooler and moister conditions returned. During the Medieval Warming period (2,200 and 1,500 BP), temperatures increased and precipitation declined

(Kornfeld et al. 2010). Lastly, the Little Ice Age which began by 600 BP and lasted until the mid-nineteenth century was marked by much lower temperatures (Grove 1988).

2.3 Biological Setting

2.3.1 Ecozones and Ecoregions

“Ecological land classification is a process of classifying and delineating ecologically distinctive areas of land so that we can better understand their similarities and relationships (Acton et al. 1998:1). Classification is based on a hierarchical system using attributes such as climate, elevation, vegetation, geology, and geomorphology among others. At the top of hierarchy is the ecozone which can be subdivided into ecoregions and further into landscape areas (Acton et al. 1998). Each step narrows down the aforementioned attributes, dividing the landscape into specific ecological regions.

Covering the southern portion of Saskatchewan is the prairie ecozone. This ecozone spans an area “from the Rocky Mountains on the west to the deciduous forests on the east, and from the boreal forests in the north to the Gulf of Mexico” (Acton et al. 1998:119). In Saskatchewan it covers 24 million hectares alone. The province is further divided into several ecoregions (Figure 2.5). Eagle Creek lies primarily in the moist mixed grassland region. A region that spans a distance from the middle of the Alberta-Saskatchewan border to the southern portion of the Saskatchewan-Manitoba border. The physiography is characterised by “gently undulating glaciolacustrine and glacial till...but hummocky morainal uplands, sand dunes, and local “badlands” provide some diversity” (Acton et al. 1998:142). The most southern edge of Eagle Creek lies 1 km north from the border of the mixed grasslands ecoregion. This region consists of “undulating glaciofluvial, glaciolacustrine, and glacial till plains [that] are frequently interrupted by hummocky morainal uplands, sand dunes, benchlands, and numerous creeks and valleys” (Action et al. 1998: 158). Any location on or near a border of another ecoregion will show characteristics from both. At the end of the hierarchical system is the landscape area. According to Acton et al. (1998), the area of study is specifically located in the Rosetown Plain. An area that is a nearly level glacial lake plain that provides surface drainage from the northwest (Acton et al. 1998).

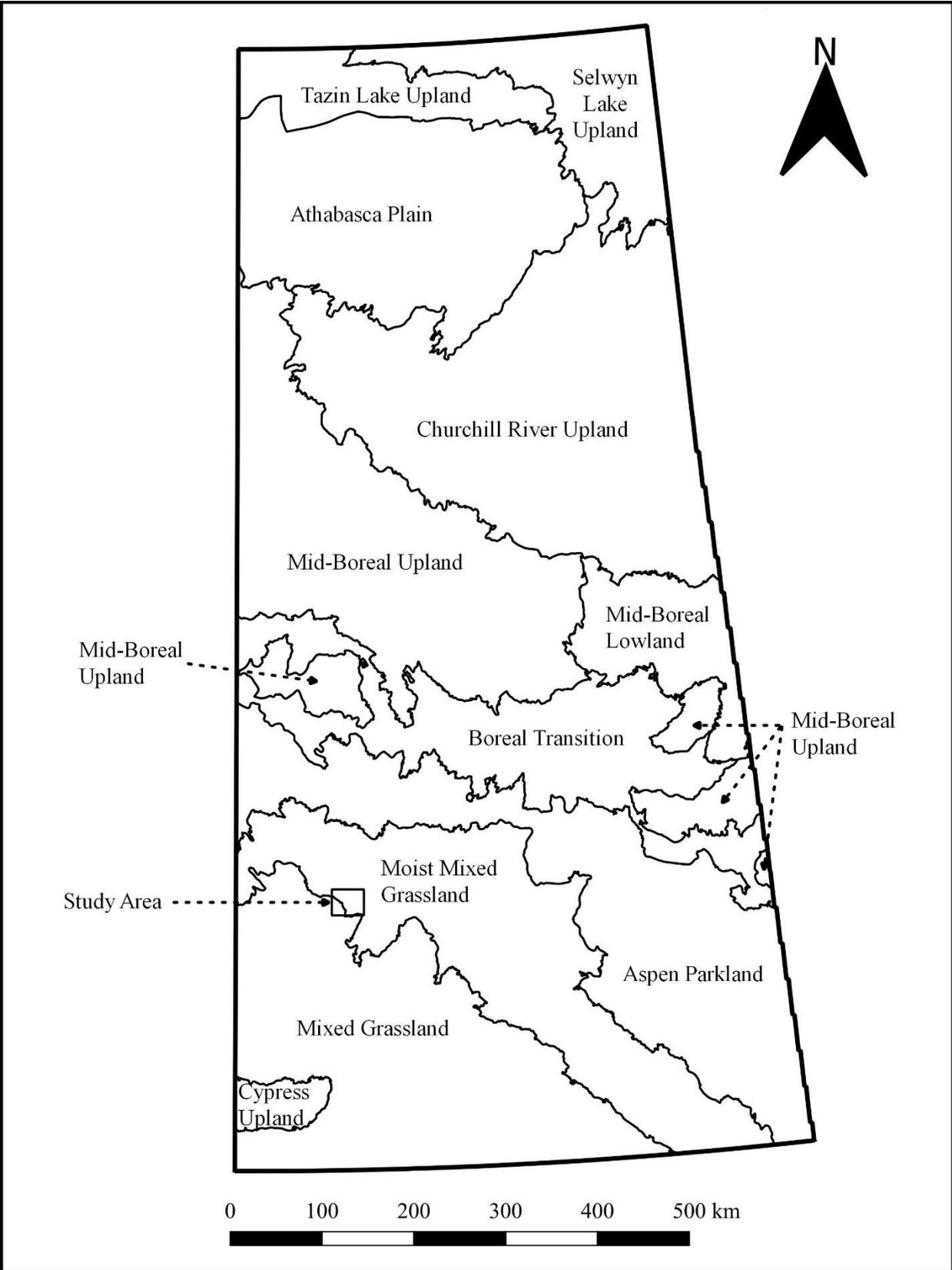


Figure 2.5. Ecoregions of Saskatchewan (Adapted from Acton et al. (1998))

2.3.2 Flora

As stated above, the study area lies within the moist mixed grassland and mixed grassland regions. In these regions grasses make up the bulk of the overall biomass. The moist mixed grasslands are dominated by mid-grasses such as wheatgrass (*Agropyron* spp.) and needle-and-thread grass (*Stipa comata*). This is due to a subhumid continental climate which has a low precipitation and a high evaporation rate making the area semi-arid. The mixed grassland region to the south has even lower evaporation rates with more aridity. Since the mixed grass region has a “moisture defect” the dominate grasses include both short and mid grasses. They include blue gramma (*Bouteloua gracilis*) and June grass (*Koeleria macrantha*). Other grasses found within the area include porcupine grass (*Stipa curtiseta*), sweetgrass (*Hierochloe ordodata*), green needle grass (*Stipa viridula*), and Plains reed grass (*Calamagrostis montanensis*; Acton et al. 1998).

Flowering plants are numerous and add colour to the sea of grass. These include moss phlox (*Phlox hoodia*), fleabane (*Erigeron* spp.), gaillardia (*Gaillardia aristata*), thistles (*Carduus* spp.), common plantain (*Plantago major*), scarlet mallow (*Sphaeralcea coccinea*), prairie crocus (*Anemone patens*), golden-bean (*Thermopsis rhombifolia*), wild mint (*Mentha arvensis*), prairie onion (*Allium textile*), and milkvetches (*Astragalus* spp.) In the upland gullies and depressions are western snowberry (*Symphoricarpos occidentalis*), chokecherry (*Prunus virginiana*), Saskatoon (*Amelanchier alnifolia*), hawthorn (*Crataegus* spp.), buffalo berry (*Shepherdia argentea*), and pussy willow (*Salix discolor*), while the valley bottom includes Manitoba maple (*Acer negundo*) and the valley slopes: prickly-pear cactus (*Opuntia polyacantha*). Three types of sage: sagebrush (*Artemisia cana*), prairie sage (*Artemisia ludoviciana*), and pasture sage (*Artemisia frigida*) are abundant throughout the area (Vance et al. 1984; Thorpe 1999).

Lichen are comprised of two groups: soils lichens and rock lichens. Soil lichens create a mat under the grass that include tumbleweed shield lichen (*Xanthoparmelia chlorochroa*), blushing scale (*Psora decipiens*), and tundra sulphur lichen (*Fulgensia bracteate*). While the rock lichens include hooded sunburst lichen (*Xanthomendoza fallax*), hoary cobblestone lichen (*Acarospora strigata*), and elegant sunburst lichen (*Xanthoria elegans*). Additionally, dominate sedges include low sedge (*Carex eleocharis*), sun-loving sedge (*Carex pennsylvanica*), and needle-leaved sedge (*Carex filifolia*; De Vries 2011; Thorpe 1999:137).

2.3.3 Fauna

Several mammals call this area home. These include white tail deer (*Odocoileus virginianus*), mule deer (*Odocoileus hemionus*), raccoon (*Procyon lotor*), river otter (*Lontra canadensis*), American badger (*Taxidae taxus*), red fox (*Vulpes vulpes*), and coyote (*Canis latrans*). Rodents within the area include beaver (*Castor canadensis*), porcupine (*Erethizon dorsatum*), and several types of mice and squirrels. The snowshoe hare (*Lepus americanus*) and white-tail jackrabbit (*Lepus townsendii*) frequent the area as well as several types of shrews. Prior to European contact the North American bison (*Bison bison*) and plains grizzly bear (*Ursus* spp.) were prominent within the region.

There are well over a hundred different species of birds that visit this area. Preying birds include Swainson's hawk (*Buteo swainsoni*), red tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), golden eagle (*Aquila chrysaetos*), bald eagle (*Haliaeetus leucocephalus*), and the prairie falcon (*Falco mexicanus*). Several gulls, shorebirds, and alcids can be seen in the uplands. They include Franklin's gull (*Larus pipixcan*), American avocet (*Recurvirostra americana*), and killdeer (*Charadrius vociferus*). Waterfowl include Canada goose (*Branta canadensis*), mallard (*Anus platyrhynchos*), common goldeneye (*Bucephala clangula*), and the common merganser (*Mergus merganser*). Perching birds are prominent and make up the largest group of birds in the area. These include the barn swallow (*Hirundo rustica*), western meadowlark (*Sturnella neglecta*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), and the common raven (*Corvus corax*). Additionally, great horned owl (*Bubo virginianus*), sharp tailed grouse (*Dendragapus canadensis*), and great blue heron (*Ardea herodias*) are frequently sighted (Robbins 1983).

2.4 Summary

The current topographical setting of the study area is a direct result of the last glaciation. While the Stranraer Terrace uplift was formed due to push and pull of the glaciers, the valley system below was developed through constant erosion from when the valley acted as the major meltwater channel. This has provided an ideal environment for both the flora and fauna to flourish. Features such as the Stranraer Terrace provide a substantial view of the surrounding area, topographical shelter, and protection from prevailing winds. In addition, Eagle Creek provides a year-round water source and rich riparian zone. The result is an environment well suited for human use.

CHAPTER 3. CULTURAL HISTORY

3.1 Introduction

Cultural chronologies vary from region to region. In the Northwestern Plains, Mulloy (1958) was the first to propose a chronology from the earliest inhabitants of North America up to and including European contact. His chronology included Early, Middle, and Late “prehistoric” periods, a cultural hiatus between 7,000 BP and 5,000 BP, and a “historic period” that denoted European contact. Mulloy’s chronology is no longer in use as the cultural hiatus has been disproven. Both Reeves (1983) and Dyck (1997) use similar chronologies that exclude a hiatus and are more relevant to the Northern Plains; however, their terminologies are dated by today’s standards as they are considered outmoded. Considering this, Dyck’s (1997) chronology with minor changes is preferred. The changes include dropping his “Pleistocene Hunter period” and changing the wording for the rest of his periods. Instead of Mulloy’s Early, Middle, and Late Plains Indian periods, the wording here will be changed to Early, Middle, and Late period respectively with contact denoting European contact.

3.2 Early Period

3.2.1 Clovis Complex 11,500 – 10,900 BP

Clovis were widespread across North America. Their projectile points are described as “large lanceolate spear points with flutes or channel flake scars extending from the base up one quarter to one half the length of the point” (Dyck 1997:71). They exhibit lenticular cross-sections, convex lateral edges that taper towards the proximal end, and a concave base. Fluting is often on both the dorsal and ventral sides. According to Hall (2009), the majority of points measure between 1.1 and 7.5 cm in length, 2.5 and 5.0 cm in width, and 0.5 and 1.0 cm in thickness.

Subsistence revolved around the megafauna such as mammoth and bison. Their material culture has been found associated with mammoth kills, arroyo traps, caches, and rock shelters (Kornfeld et al. 2010). In Montana, a burial of two infants with numerous tools, ochre, and decorated bone foreshafts suggests an early belief in the afterlife (Morrow 2006). Within Saskatchewan, several Clovis points have been identified with the majority being concentrated in the southwest of the province as well as between the North and South Saskatchewan Rivers. These projectile points have all been surface finds.

3.2.2 Folsom/Midland Complex 10,900 – 10,000 BP

Folsom projectile points have been found across the plains from Canada down into Texas, where they always chronologically follow Clovis. Folsom points are described as lanceolate in shape where they “are widest near the tip and have concave bases bordered by earlike projections, and which often have a small ‘nipple-like’ projection in the middle of the concavity” (Hall 2009:53). They vary in length from between 2.5 cm and 7.5 cm, with a flute that extends the whole length of the point (Hall 2009). Midland points are often found in association with Folsom and appear to be unfluted Folsom points (Dyck 1997).

Folsom tended to focus on bison; although deer, rabbit, fox, and wolves were also hunted (Dyck 1997). Alongside kill sites, site types include campsites, quarries, and lookouts among others (Peck 2011). These specialized activity areas in addition to lithic conservation techniques (i.e., the use of cores, bifaces, and multifunction tools) suggests a greater familiarity with the land than the preceding Clovis peoples (Peck 2011). Within Saskatchewan, Folsom points have been found as surface finds south of the South Saskatchewan and Qu’Appelle Rivers (Dyck 1997).

3.2.3 Goshen Complex 10,450 – 10,170 BP

There is much debate around the Goshen points as a distinct complex. They share similarities from both Clovis and Folsom; however, rather than being fluted, they are basally thinned (Kornfeld et al. 2010). Due to this distinction, Frison (Kornfeld et al. 2010) suggested they are technologically and morphologically distinct enough to be classified as its own complex. Goshen’s strong similarity to Plainview found on the Southern Plains may indicate a north and south variant of the same complex (Kornfeld et al. 2010; Peck 2011).

3.2.4 Agate Basin/Hell Gap Complex 10,500 – 9,500 BP

Agate Basin and Hell Gap are both lanceolate points with Agate Basin developing into Hell Gap (Peck 2011). “Agate Basin points are typically relatively long and slender, lanceolate, and with convex edges reaching maximum width somewhat above the midpoint” (Irwin-Williams et al. 1973:47). Points from this complex date between 10,500 and 10,000 BP (Irwin-Williams et al. 1973). Hell Gap differs from Agate Basin in that the maximum width, two-thirds up from the distal portion is much wider (Irwin-Williams et al. 1973). The postulated date for Hell Gap point styles lies between 10,000 and 9,000 BP (Kornfeld et al. 2010). The people who used these lanceolates seem to have focused on bison and the Agate Basin site in Wyoming may indicate the

use of an arroyo trap (Peck 2011). There is not much else known about these people; however, the brief overlap with Folsom may indicate similar lifeways. In Saskatchewan, Agate Basin and Hell Gap points have been found as surface finds with the majority located in the southwest part of the province (Dyck 1997).

3.2.5 Cody Complex 9,600 – 8,600 BP

The Cody complex is composed of three projectile point styles found in association with the distinct asymmetrical bifacial Cody knife. These include Alberta, Scottsbluff, and Eden points. Each of these styles are characterized by a stemmed base. Cody knives are described as “knives with transverse blades that are usually shouldered on one side but are characterised by a parallel-sided base without an inset” (Wormington 1957:267). Eden points are long and narrow with a pronounced median ridge produced by parallel flaking; thus, resulting in a diamond cross section (Wormington 1957). Scottsbluff is divided into two types: type I and type II. Type I resembles an Eden point in shape only. The Scottsbluff point is wider, longer and does not exhibit the parallel flaking pattern or diamond cross section that the Eden point is known for. Type I Scottsbluff points have “somewhat triangular or parallel-sided blades, small shoulders and broad stems” (Wormington 1957:267). Lastly, Alberta points resemble type I Scottsbluff points, though they “are larger, the stem is longer, the base is slightly convex, and the tip is somewhat blunted” (Wormington 1957:134). The available evidence suggests that there is cultural continuity from the older Alberta lanceolate to Scottsbluff and Eden with Cody knives overlapping between the two (Peck 2011). The Cody complex has been found across the plains of North America, from Alberta and Saskatchewan to Texas. Within Saskatchewan the Cody Complex is represented by a number of sites. They tend to cluster in the southern portion of the province, the middle eastern portion, and along the North Saskatchewan River (Dyck 1997).

3.2.6 Fredrick/James Allen Complex 9,000 – 8,000 BP

Cultural chronologies from this time period are represented by mountain, inter-montane, and prairie-woodland regional adapted peoples. These include Fredrick Points, James Allen, Lusk and others. Only Frederick points have been found within Saskatchewan and only as surface finds (Dyck 1997). Frederick points are obliquely flaked lanceolate with concave bases (Hofman and Graham 1998). They bear a strong similarity to James Allen. However, James Allen points

have a slightly different outline and a larger basal concavity (Hofman and Graham 1998). This has led researchers such as Irwin-Williams (1973) to conclude that they are distinct styles.

3.3 Middle Period

3.3.1 Mummy Cave/Gowen Complex 7,500 – 5,000 BP

The Early Middle period coincides with the Hypsithermal where temperatures rose and precipitation decreased. This period also marks a shift from large lanceolate spear points to smaller side-notched atlatl points. It was previously thought that the Plains were abandoned during this time due to the little evidence of occupation; however, there was always speculation of some occupation within the region. Reeves (1973) suggests that since interactions between the Plains and the Rocky Mountains took place both before and after the Early Middle period, then the dated excavations from this period within the Rocky Mountains should have some comparison to the surface finds found on the Plains. The cultural material used for this comparison is what Reeves (1973) refers to as the Mummy Cave complex. This complex includes Bitterroot and Salmon River Side-notched points. Since then, distinct side-notched points have since been found on the Canadian Plains and Rockies at the Stampede, Gap, and Gowen sites which further sheds light on this period (Frison 1998; Walker 1992).

3.3.2 Oxbow Complex 5,200 – 3,000 BP

Oxbow projectile points are characterised as side-notched with a basal indentation and distinctive round ears. Their distribution can be seen across the Northern Plains with the majority being found within Alberta, Saskatchewan, and Montana. Due to their morphology and temporal span, they may have developed from the preceding Mummy Cave Series (Dyck 1997). Comparisons between Oxbow and Gowen subsistence patterns have also been observed (Walker 1992). Subsistence strategies involved small or isolated kills in which bison was preferred (Green 1998). However, Green (1998) has shown evidence for a diverse diet. Additionally, Oxbow peoples have been associated with a Medicine Wheel, domestic dog burials, and a mass grave (Dyck 1997). Shells from the Atlantic Coast and copper from the Great Lakes observed within the mass grave (the Gray Burial site) suggests large trading networks (Miller 1978). A wide social network such as this also allows for an influx of new ideas and may explain how the conical tipi was first introduced during this time.

3.3.3 McKean/Duncan/Hanna Complex 4,200 – 3,000 BP

The plethora of projectile point morphologies found at the McKean site in Wyoming and other similar assemblages sparked debate as to whether the points found all relate to each other. Three distinct styles and are now grouped together as the McKean complex. These are the McKean lanceolates, Duncan, and Hanna points (Mulloy 1954; Wheeler 1954). McKean lanceolates have sharp concave bases with blade edges that taper towards the tip from about halfway up the lanceolate and occasionally have parallel edges from the midpoint down towards the proximal end (Mulloy 1954). “The Duncan point is a chipped stone projectile point characterized by a straight converging or bilaterally convex blade; insloping, non-barbed shoulders; and a straight parallel-sided or slightly expanding stem with [a] shallowly notched base” (Wheeler 1954:7). Hanna points are “characterized by a straight converging and incurving blade; straight or insloping and slightly barded shoulders; and an expanding stem with [a] shallowly notched or straight, thinned base” (Wheeler 1954:8).

The McKean were widespread, covering an area from the mountains of Wyoming and Colorado to the prairie provinces of Canada. Some have speculated that the complex has its origins in the Great Basin in which a large migration towards the north took place at some point (Dyck 1997). With the migration, McKean took on a specialization in bison hunting in addition to their heavy reliance on plant foods (Dyck 1997; Webster 2004). Grinding stones and seeds found at the Redtail site in Saskatchewan show plant foods were still being processed (Webster 2004). Habitation structures from this time period are not well known. The complex has not yet been directly associated with any tipi rings; however, evidence does point towards the use of pit houses as several sites may contain the remains of them (Ramsay 1993).

3.3.4 Pelican Lake Complex 3,200 – 1,850 BP

Pelican Lake points are found throughout eastern Alberta, Saskatchewan, and Manitoba (Dyck 1997). The points are characterised by straight edges that form a triangular blade with corner notches (Dyck 1997). Over the temporal span of the Pelican Lakes complex, the point morphology slightly changes, specifically at the base. The oldest points have a narrow base making a stemmed appearance which over time widens to the full width of the shoulder (Dyck 1997). A separate variety, seen halfway through the postulate date range of the complex, has a convex base rather than the straight base found in the former variety (Dyck 1997).

Pelican Lake used a variety of hunting techniques such as bison jumps and pounds and are the first peoples on the Northern Plains to organize mass bison kills (Dyck 1997). Sites such as the Walter Felt site in Saskatchewan and Old Women's Buffalo Jump and Head-Smashed-In Buffalo Jump in Alberta, show repeated and intensive use (Dyck 1997; Reeves 1978). Adams (1978) and Hovde (1983) have shown that the Pelican Lake people used the conical tipi and exotic materials such as shells and copper indicate large social networks (Dyck 1997). Several burials have been associated with Pelican Lake. The excavations of these burials revealed several similarities. They were secondary bundle burials, placed at a high elevation in a shallow pit overlooking water, sometimes covered by a cairn, have red ocher, and include elaborate grave goods (Brink and Baldwin 1988). The grave goods included points, bifaces, endscapers, copper, shells, and animal bones that were sometimes modified into beads or tools (Brink and Baldwin 1988).

3.4 Late Period

3.4.1 Besant/Sonata Complex 2,000 – 1,150 BP

The Late period coincides with the introduction of pottery and side-notched points (Dyck 1997). It is believed that during the early portion of the Besant complex, atlatl technology was still being used; however, points found with smaller neck widths, suggests there was some use of the bow and arrow technology first introduced around this time (Dyck 1997). Some researchers (Reeves 1983) place Besant at the end of the Middle period whereas others (Dyck 1997; Walde et al. 1995) include Besant in the Late period. Walde et al. (1995), however, recognizes that Besant is better represented as a transitional between the Middle and Late Periods. There is also debate whether Sonata and Besant should be classified as separate complexes. Both share the same point style and time period (Scribe 1997). Dyck (1997:114) believes their tool kits are 'nearly identical' and agrees with Reeves (1983) that the only difference is that Sonata is associated with burial mounds. However, the use of woodland pottery, a preference for brown chalcedonies, and the use of burial mounds show that Sonata is at least a regional variant (Scribe 1997). For the purposes here, Sonata will be included in with Besant.

Overall, Besant points are described as lanceolates with a slightly convex base. "Notches are generally twice as broad as they are deep and are situated so that one edge of the notch is slightly above or even touching the basal edge" (Dyck 1997:115). Their ceramics are identified as having a conoidal shape that are vertically or horizontally corded, bossed or punctated,

shoulderless, grit and sand tempered, and shaped using the paddle and anvil method (Reeves 1983:96; Dyck 1997).

Besant were widespread on the Northern Plains. They can be found from Alberta to Manitoba and down to South Dakota and Wyoming (Walde et al. 1995). They utilized two types of habitation structures: the conical tipi and a post-in-ground structure that aligns to what eastern woodland cultures were using at the time (Scribe 1997). Their mastery of hunting bison can be seen through the construction of corrals, pounds, traps, and jumps (Scribe 1997). In addition, a variety of mammals and plant foods made for a diverse diet (Gregg 1987). Excavations of a few Sonota burial mounds revealed bundles burials of 8 to 50 individuals with various ocher pigments, graves goods, and bison bones included (Scribe 1997).

3.4.2 Avonlea Complex 1,750 – 1,150 BP

Unlike Besant, Avonlea took full advantage of the new bow and arrow technology. Their points are “triangular and very thin with small shallow side-notches which are very close to the base” and often have concave bases (Dyck 1997:122). “Average length of the point type is about twenty-one millimeters, width averages about thirteen millimeters and internotch width averages about ten millimeters” (Vickers 1991:15). Unnotched triangular points are also present during this time (Vickers 1991). Alongside these points, ceramics were in wide use that had several regional variances. They are generally conoidal in shape, may have punctates near the rim, and bear exterior impressions (Dyck 1997; Walde et al. 1995). Two distinctive types have been identified based on whether the exterior is net-impressed or parallel grooved (Johnson 1988).

The Avonlea people were primarily a Plains adapted culture and can be found throughout Montana, Alberta, Saskatchewan and into North Dakota (Meyer and Walde 2009). These sites are usually associated with bison kills and are “predicatively located on and around buttes, locations that suggest either defensive activity or a desire to be able to see great distances or both” (Kornfeld et al. 2010:130). They utilized buffalo jumps, winter camps, and conical tipi structures (Vickers 1991). The Avonlea people have been associated with the Herschel Petroglyphs (Buchner and Steinbring 1995a), and a burial in Montana (Davis et al. 2017). The burial was under an elevated outcrop of rocks, covered by sand, and included several grave goods. The grave goods included shells, projectile points, ground stone disc beads, and bone tools (Davis et al. 2017).

3.4.3 Prairie/Plains Complex 1,150 – 170 BP

This complex is represented by two projectile point types that are similar, yet distinct enough to be classified as separate types (Kehoe 1966). The difference comes down to the basal edge. Both are small and triangular; however, the flaking on the Plains type gives a distinctive square base, whereas the Prairie type has a rounded base due to the location of the notches (Dyck 1997:129). Pottery is varied during this time as well. Two ceramic complexes bear relation to the Prairie and Plains Side-notched points. These are Old Women's and Mortlach complexes. Old Women's vessels are described as thick-walled globular vessels commonly found with pronounced shoulder, decorated with punctate, and a cord impressed surface (Bryne 1973; Walde et al. 1995). Old Women's pottery have been found from Alberta to Saskatchewan and down into Montana; however, around 650 BP, Mortlach displaced Old Women's in most of Saskatchewan (Walde et al. 1995). Mortlach seems to share characteristics from Selkirk in the Woodlands, Middle Missouri cultures, and assemblages found in North Dakota (Walde et al. 1995). These vessels are characterised by being thin and compact with an exterior surface impressed "from paddles wrapped with cord or fabric, or incised with diamond shapes or square shapes", or the surface may be smooth (Walde et al. 1995:41).

3.5 Contact

Contact between Indigenous people, Europeans, and Americans created vast sociocultural changes that had lasting effects on the Indigenous populations. Initially, contact began with the reciprocal exchange of goods. The Hudson Bay Company and the North-West Company among others established fur trading forts in the east, eventually arriving in the prairies by the mid 17th century (Ray 1976). In exchange for furs, the Indigenous people traded for metal objects and guns, among other things. At the same time the horse, which was introduced by the Spanish, made its way up to the Northern Prairies through trading or by raiding (Secoy 1992). Both the gun and the horse gave a great advantage by easing the hunt and aiding in battle. The increased demand for furs and a deliberate campaign to eradicate the bison eventually led to the near extinction of the main subsistence for the Indigenous peoples. In addition, Europeans brought diseases that the Indigenous never encountered, leading to mass deaths. European accounts during this time give some idea to what Indigenous life was like; however, their writing should be looked at with a critical view due to their Eurocentric beliefs. Focus should be paid to the oral storytelling of the Indigenous people who still hold their cultural beliefs and traditions.

3.7 Summary

The Northern Plains has been utilized for several millennia by many different groups. It is a land that has provided hunter-gathers the resources necessary to thrive in this environment. In Saskatchewan, this is evidenced by the identification of nearly all the aforementioned complexes. It is not until after the Hypsithermal climatic event that a cultural explosion took place. The number of sites identified after this event increased and new inventions such as the tipi ring, and later, the bow and arrow, and pottery develop. With European contact, the millennia of plains living ended and a new way of life emerged.

CHAPTER 4. PREVIOUS ARCHAEOLOGICAL RESEARCH

4.1 Introduction

After the identification of the Herschel Petroglyphs (EjOc-3) in the early 1960s, the areas around Herschel and Stranraer have had several archaeological investigations. Since Eagle Creek and the surrounding valley has never been broken by agricultural equipment, the area has high potential for undisturbed archaeological sites. The sites located within Coal Mine Ravine to the southwest of Herschel (Figure 4.1) have all been recorded as part of academic-based investigations while the area around Stranraer (Figure 4.2) has been investigated through cultural resource management work. The following is a review of all the available literature and reports associated with the area of study up to 2020.

Several people are prominent in furthered research within this region. David Neufeld and several locals established the Ancient Echoes Interpretive Centre located in Herschel in the early 1990s. Since then, the Ancient Echoes Interpretive Centre has helped draw attention to the petroglyphs and share the history of the area. The early 1990s was when Dr. Tony Buchner and Dr. Jack Steinbring of the University of Winnipeg also began excavations at the petroglyphs. Both the museum and The Bear Hills Chapter/Eagle Creek Historical Society Chapter (previously led by Marvel Houston) of the Saskatchewan Archaeological Society helped fund two other excavations led by Western Heritage Services Incorporated as well as record and update several sites. In addition, avocational archaeologists Muriel Carlson and the late Doug Richards have been active within the region. Recording sites have been aided by the Archaeological Resource Management Section team at the Heritage Conservation Branch of the Government of Saskatchewan and early survey endeavours were conducted by the Royal Saskatchewan Museum.

Cultural resource management work has also been persistent within the region. Beginning in the late 1980s, it has largely focused on the construction of two major pipelines that crosscut the creek. These pipelines have been actively maintained and expanded since the initial construction resulting in several additional sites being recorded. Smaller scale developments have also added to the regional archaeological site inventory.

4.2 The Herschel Petroglyph Site

4.2.1 Introduction

Located on a high terrace overlooking Coal Mine Ravine is the Herschel Petroglyph site. The site consists of three petroglyphs all within 100 m of each other. Back in the 1960s, Henry

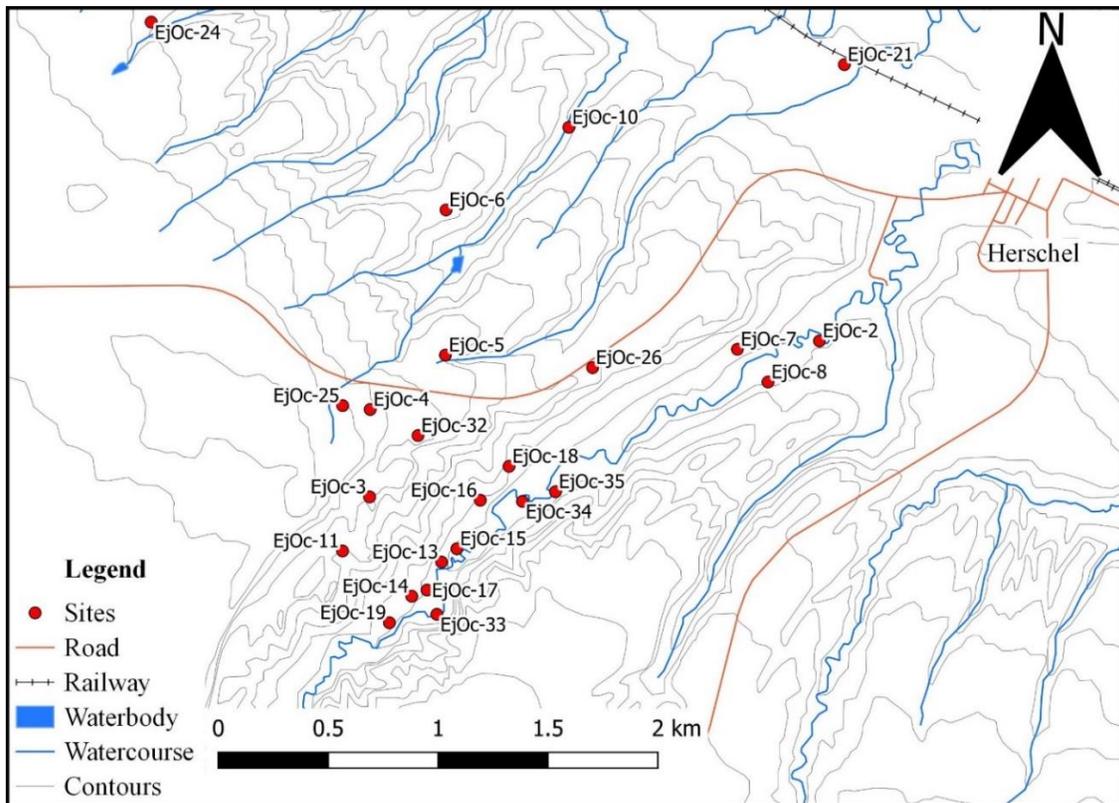


Figure 4.1. Site locations around Herschel and in Coal Mine Ravine.

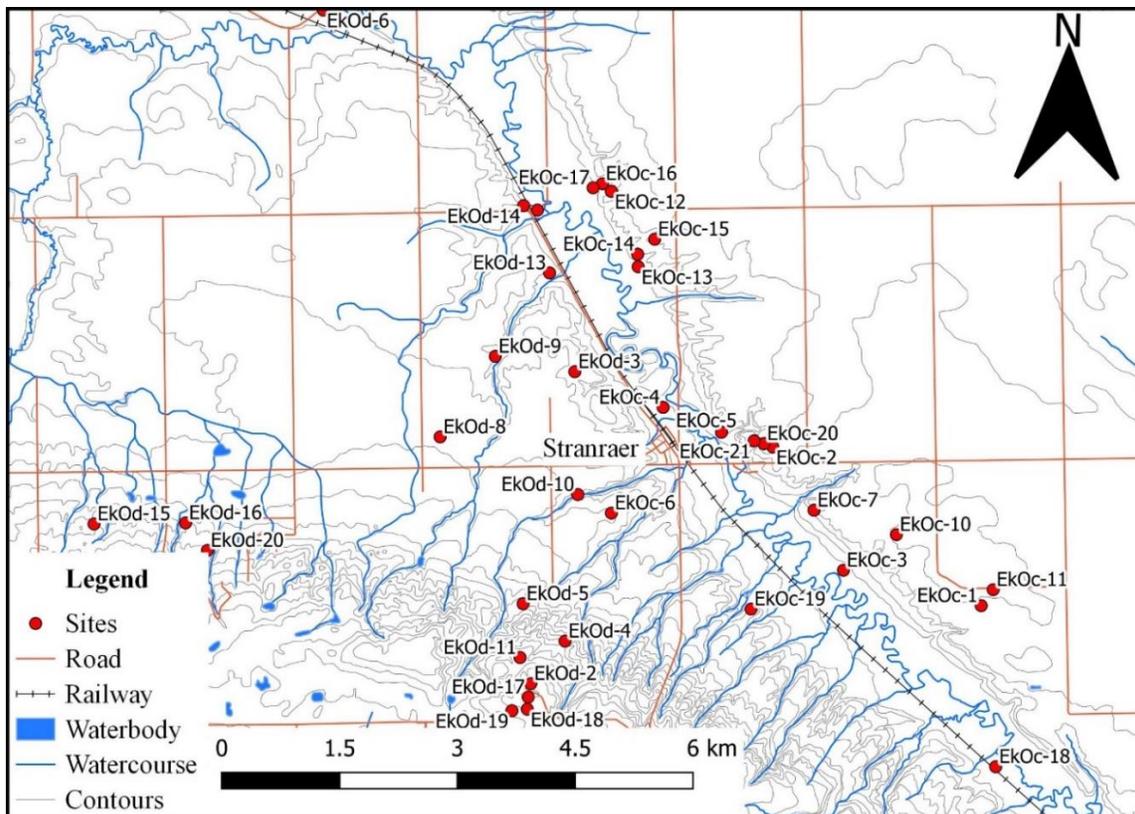


Figure 4.2. Site locations in the Stranraer area.

Kosloski (a local farmer) happened to come across the first petroglyph, known as Monolith 1 (Figure 4.3). It was not until the 1970s that the petroglyph was brought to the attention of the Royal Saskatchewan Museum. Monolith 1 was initially designated EjOc-9. In subsequent years, Monolith 2 (Figure 4.4) and Monolith 3 (Figure 4.5) were identified and given a separate designation (EjOc-12). Recording and mapping of the site began with Dr. Ian Dyck in 1981 and later with Tim Jones, the Executive Director of the Saskatchewan Archeological Society. Due to the site's significance, it was designated a Municipal Heritage Site in 1988 under the *Heritage Property Act*. In 1993, the two sites were combined and designated EjOc-3 (Buchner and Steinbring 1995a; Houston 1993).

Dr. Jack Steinbring became interested in the site, and in 1991 arranged for several specialists to visit and examine the petroglyphs. Dr. Watchman from Laval University in Australia, who at the time was developing FLAC-AMS; a dating method that requires the patina to be removed, inspected the site to see if he could use his new method. However, due to prior efforts to record the carvings using wax, the surface was too contaminated (Houston 1993). Mr. Norman Williamson, a historical archivist and anthropologist, was contacted regarding the ribstone (Monolith 2). He provided valuable background research based on the ribstones which led to the idea that Monolith has some relation to bison. Dr. David Grisafe of the University of Kansas was consulted to undertake protective experiments using X-ray diffraction and absorption



Figure 4.3. EjOc-3 Monolith 1 (Photograph courtesy of David Neufeld).



Figure 4.4. EjOc-3 Monolith 2 (Photograph courtesy of David Neufeld).



Figure 4.5. EjOc-3 Monolith 3 (Photograph courtesy of David Neufeld).

and Dr. John Sheard was consulted to examine the surface lichens in hopes of understanding the age of the carvings. Excavations subsequently began in 1992 and lasted three field seasons from 1992 to 1994 (Buchner and Steinbring 1995a).

4.2.2 The Carvings

Covering the east face of Monolith 1 are carvings that have been interpreted to be bison imagery. However, when only looking at the cupules, the carvings take on an ambiguous interpretation (Figure 4.3). When viewing the east face, the most apparent feature is the incised line running perpendicular to the ground with horizontal lines radiating away from it. Alongside the lines are two circles near the tip of the rock. Two more circles were revealed under the surface of the ground by the excavation. Vertical lines are apparent in all four circles. The excavation also revealed that the line underneath the surface was done with a blunt object, forming a “U” shape groove. Whereas the line that extends above the surface has a “V” shaped groove, suggesting the use of a sharp metal object and continued maintenance of the carvings overtime.

It has been suggested that the mid-line represents a vertebral column and the lines radiating away represent ribs. The four circles with vertical line and their general position on the east face may represent hoofs. Buchner and Steinbring (1995b) explained that “grooving around the pinnacle of Monolith 1 suggests the secondary function of sculpting”. When viewing the dolomite stone from the side, it looks as if a bison is emerging from the ground. The sculpting may have been done intentionally to provoke this imagery. There are other features that have been observed on the petroglyph that have not been written about. These include a long line that wraps around the pinnacle that connects two larger cupules and a diamond shape with one central cupule located on the south side of the rock (David Neufeld, personal communication 2017). In addition to the bison imagery at Monolith 1 is the ribstone (Monolith 2) found a short distance away. Monolith 3 is a more ambiguous carving. Buchner and Steinbring (1995b:16) suggested that this carving was etched through a ‘rhythmic pattern’ and that it “may reflect a need for carving rituals at loci not providing appropriate media for the dimensional imagery”. All three petroglyphs exhibit dots and/or lines in the pit-and-groove style and align with the Hoofprint tradition.

4.2.3 Hoofprint Tradition

This tradition of rock art is characterized by carvings of human and animal designs. It includes glyphstones (known as ribstones) and petroglyphs representing animal tracks, bison, human faces and hands, or geometric designs such as circles, bisecting lines, and dots (Keyser and Klassen 2001). The tradition was first recorded in the early 1900s but was not recognized as a regional distribution until the 1960s (Keyser and Klassen 2001). The distribution extends from southern Alberta/Saskatchewan to Wyoming and east to the Missouri River in South Dakota and are predominantly located on sandstone bluffs or large glacial erratics. The technique used to produce these carvings are pecking, incising, and abrading (Keyser and Klassen 2001). Several sites depicting bison imagery are often found near large bison kills such as at Saddle Butte and the Big Bend region of the Milk River (Keyser and Klassen 2001). Using both archaeological and ethnographic evidence, Keyser (1984) has shown that these petroglyphs are correlated with hunting magic and are of supernatural power. As Keyser and Klassen (2001:36) put it “although aboriginal cultures viewed nature as being charged with spiritual energy, this energy was often concentrated in specific natural features”. It is believed the Hoofprint tradition is associated with Siouan-speaking people. This idea is based on the on the relation between the site distribution and the expansion of the Siouan speakers from the Mississippi River westward (Keyser and Klassen 2001). Additionally, ethnographic evidence shows similarities between Siouan mythologies and the representations of the rock art (Keyser and Klassen 2001).

4.2.4 The Excavation

The excavation, led by Dr. Tony Buchner, Donalee Deck, and Dr. Jack Steinbring began in 1991. Units were primarily situated at and around Monolith 1; however, units were also placed at the base of Monolith 2, Monolith 3, and 140 m south of Monolith 1 in the ravine. At Monolith 1 several layers representing separate occupations were encountered. Units 1 and 2 were placed at the base of the east face, directly under the carvings. The excavation of these units revealed that the carvings extended below the surface of the ground. The most striking find was the discovery of a stone platform which was recorded in levels 5 through 10. This platform was made of small cobbles that tightly fit together. “It is in direct contact with the monolith and the centre of the feature is in line with the central engraved line which bisects the monolith” (Buchner and Steinbring 1995a:37-38). Additional units that were placed around units 1 and 2 revealed that the platform extended about 2 m away from the petroglyph, becoming thinner with distance.

In general, bison bone fragments increased in number progressing towards the bottom levels of the units placed on the east side of the monolith. Beneath the stone platform, bison skull fragments were found at the base of the mid-line carving and long bones were found on both the right and left sides. A triangular and Avonlea point were also found beneath the platform at levels 11 and 12 respectively. Within the platform, a radiocarbon sample was taken from a bison metapodial returning a date of 1200 ± 55 BP (GX-20351-G; bone; Buchner and Steinbring 1995a). In level 3, a projectile point base was identified and in level 6 a triangular point was recovered. Triangular points can be found in a few Late period complexes; however, the radiocarbon dates taken in levels 5 and 8, yielded dates of 1270 ± 75 BP (GX-18515-G; bone) and 1370 ± 70 BP (GX-18514-G; bone) which align more with Avonlea (Buchner and Steinbring 1995a). Above the platform was a mixture of Indigenous and Euro-Canadian artifacts. They include seed and glass beads, a brass button, China fragments, a lithic fragment, quartzite scraper, a pottery sherd with fabric impressions, and a Plains or Prairie Side-notched point. The mixture of artifacts has been attributed to disturbance from possible looting that took place well before the excavations were performed (Buchner and Steinbring 1995a).

Additional units were placed on the other sides of Monolith 1. These too produced a number of Euro-Canadian artifacts, including brass objects, China, and beads. Of note is a brass disc or lid with an engraving on top. "The symbol consists of a central circle with three radiating lines of which, only the central one reaches the edge of the disc" (Buchner and Steinbring 1995a:49). Brass clasps and a brass bracelet were also among the assemblage. The brass clasp may have been attached to a perishable object (Buchner and Steinbring 1995a). Beneath the Euro-Canadian artifacts, faunal material increased. In level 2, a side-notched point was found resembling either Plains or Prairie Side-notched. Other units that were placed around the monolith, but not in contact with it had far less artifacts.

The additional units placed at Monolith 2, 3, and in the ravine produced only a few artifacts. One unit placed at the base of Monolith 2 revealed an endscraper and an undiagnostic triangular point. At Monolith 3, ten flakes of various lithic materials and one endscraper were found. Based on a positive test in the ravine performed at the beginning of the project, two units were excavated. The artifact assemblage found here represented a place of habitation. Buchner and Steinbring (1995a) suggest that inhabitants of the younger occupation layers may have visited and utilized the monoliths; however, the oldest level suggests an occupation before the monoliths were constructed.

Given the radiocarbon dates, people were visiting and/or carving Monolith 1 by at least 1,300 BP. Artifacts found at several layers as well as the buried carvings suggest the construction of the petroglyph was not a single event. “Throughout the remainder of the prehistoric [precontact] period and well into the historic [contact] times, people continued to visit the monolith, added new details to it, and modified and emphasized old ones” (Buchner and Steinbring 1995a:47). When looking at the entire assemblage and the position in which they were found, it becomes obvious that important items were purposely placed. Coupling this with the construction of the stone platform and the vast number of cupules seen on the east face, the idea of this being a place of ceremony becomes apparent (Buchner and Steinbring 1995a).

4.3 Western Heritage Services Incorporated Excavations

4.3.1 Introduction

Two archaeological excavations were done by Western Heritage Services Incorporated: a multi-component site (EjOc-13) in Coal Mine Ravine and the Woods Opuntia site (EkOd-6) located on the south side of Opuntia Lake. Both excavations were organized by the Eagle Creek Historical Society and the community of Herschel. Both Maureen Rollans and Peggy McKeand of Western Heritage Services Incorporated supervised several volunteers on both projects and reported the results. The goals of each project were to identify the nature, content, and significance of each site and to provide the public the opportunity to participate in an excavation (Rollans 1997).

4.3.2 EjOc-13

At the base of Coal Mine Ravine and adjacent to an active stream is EjOc-13, a multi-component site (Figure 4.1). The site was identified by David Neufeld when he observed bone eroding out of the stream bank. He noted multiple layers of bone extending 2.5 m below the ground surface. Carlos Germann and Diane Cockle from ARMS came to record the site and recommended it be excavated due to potential loss from the continued erosion of the stream (Rollans 1997). The necessary funding was raised and in 1996 excavations began with the help of 29 volunteers.

Eleven units were placed on the slumping cutbank next to where the initial bones were identified. Units were placed one after another in a single row and excavated to a depth of 0.5 m. Further into the bank a 2 m by 2 m block was chosen and was planned to be excavated to a maximum depth of 2 m. This depth matched the exposed layers of bone initially found in the

cutbank. However, only the eastern quadrants reached a depth of 2 m. The western blocks only went down 0.7 m (Rollans 1997).

Seven occupation levels were observed based on artifact densities and subtle colour changes in the soil. A total of 3,455 artifacts were recovered that mostly consisted of fragmented bone. The lithic artifacts identified included eight cores, a retouched flake, a preform, two hammerstones, and a projectile point. To Rollans (1997:18), the point “does not fit into any of the established point styles on the northern plains”. Two pottery sherds with a cord-roughened surface were also documented. A hearth feature was identified at level 5 that contained bone, pottery, debitage, and fire-cracked rock. The other levels produced large amounts of debitage. All lithic material types can be found locally (Rollans 1997).

Rollans (1997) suggests that the site was used for secondary butchering based on the nature of the fragmented bone. The debitage, however, may have reflected tool production rather than tool use (Rollans 1997). An addendum to the initial report which came out a year later ascertained a radiocarbon date of 2060 ± 80 BP (S-3647; horn core) from level 7 (Rollans 1998). Rollans (1998) suggests that the age of this layer coincides with the Besant complex, though Pelican Lake and Avonlea could also be considered.

Alongside the 1997 excavation, five other sites located along the Coal Mine Creek were documented and briefly examined (Figure 4.1). At EjOc-15 an Oxbow point was identified and at EjOc-17 a Besant point base, both found on the surface. Several retouched flakes and pottery sherds are among the assemblages that possibly represent more multi-component sites. At EjOc-14 a rim sherd was found with fabric impressions (Rollans 1997). Table 4.1 shows the distribution of artifacts for each site. No subsurface testing was carried out at these sites.

Table 4.1. The Additional Sites Found Near EjOc-13.

Borden	Artifacts
EjOc-14	Oxbow Point, 4 Expedient Tools, 14 Pottery Sherds, 2 Pieces of Debitage, Preform
EjOc-15	One Pottery Sherd, Several Fragmented Bone
EjOc-16	3 Expedient Tools, Two Pieces of Debitage
EjOc-17	Besant Style Base, Endscraper, Scraper
EjOc-18	Mid-Section of a Point
EjOc-19	2 Flakes, Debitage, Several Bone Fragments

4.3.3 The Woods Opuntia Site

On the south bank of Opuntia Lake is a precontact camp (EkOd-6; Figure 4.2). The site was found during the maintenance of Plenty Road after 1 m of a sandhill was bladed off. “While driving by Doug Richards noted rock exposed on the bladed surface and in the fall of 1992 investigated the exposure” (Rollans and McKeand 1993:1). Richards observed numerous lithic artifacts mixed with bone on both the north and south side of the gravel road along with pieces of fire-cracked rock. He collected several artifacts including a few lithic tools. The Eagle Creek Historical Society was subsequently contacted to document the site and recommended the site be excavated. Fieldwork began in 1993 with the help of 20 volunteers. The surface finds that Doug Richards initially collected were transferred to Western Heritage Services Incorporated to aid in their final analysis.

The excavations consisted of five blocks covering a total of 14 m². Of the five blocks, one was excavated to understand the stratigraphy of the site as it was not disturbed from the blading. It was excavated 134 cm below the datum revealing four layers of paleosols at 36 cm, 68 cm, 75 cm, and 82 cm. The rest of the blocks produced large amounts of artifacts. Rollans and McKeand (1993) determined that the site was primarily a lithic reduction site. Other activities included cooking and tool manufacturing. Two complete expedient lithic tools as well as seven points were recovered. According to Rollans and McKeand (1993), none of the points were clearly diagnostic but based on the general size and shape they were most likely manufactured in the Late period. Swan River chert seems to be a favoured material as it makes up a total of 65% of the total assemblage (Rollans and McKeand 1993).

4.4 Bear Hills Chapter/Eagle Creek Historical Society

4.4.1 Introduction

The Bear Hills Chapter/Eagle Creek Historical Society is a now defunct chapter of the SAS. During their active years, the chapter was associated with the Harris/Perdue/Rosetown areas. Member of the chapter organized several events related to the archaeology of the area including surveying expeditions to locate and record sites. These surveys were primarily led by Marvel Houston and Doug Richards. Within the study area, the chapter identified and recorded several sites including two Medicine Wheels and a possible thunder bird effigy. The thunder bird effigy along with four cairns (EkOd-5) were mapped; however, the drawing could not be located.

4.4.2 Doug Richards Medicine Wheel

The Medicine Wheel (EjOc-20) is located in the Herschel Grazing Co-op Pasture close to the edge of terrace 2, allowing for an expansive view of Eagle Creek. It was surveyed by Doug Richards and Char Weins in 1997 (Richards 1998), with a later update by Kim Weinbender of ARMS in 2012 (Weinbender 2012). The main ring has a diameter of 5 m with several lines radiating from it and an ambiguous pattern in the centre (Figure 4.6). To the immediate northwest of the wheel are six cairns that parallel the edge of the terrace. Fifty meters to the northeast is a stone ring and a cairn and 70 m to the west of the wheel is single stone ring. Both rings measure 5 m in diameter (Weinbender 2012).

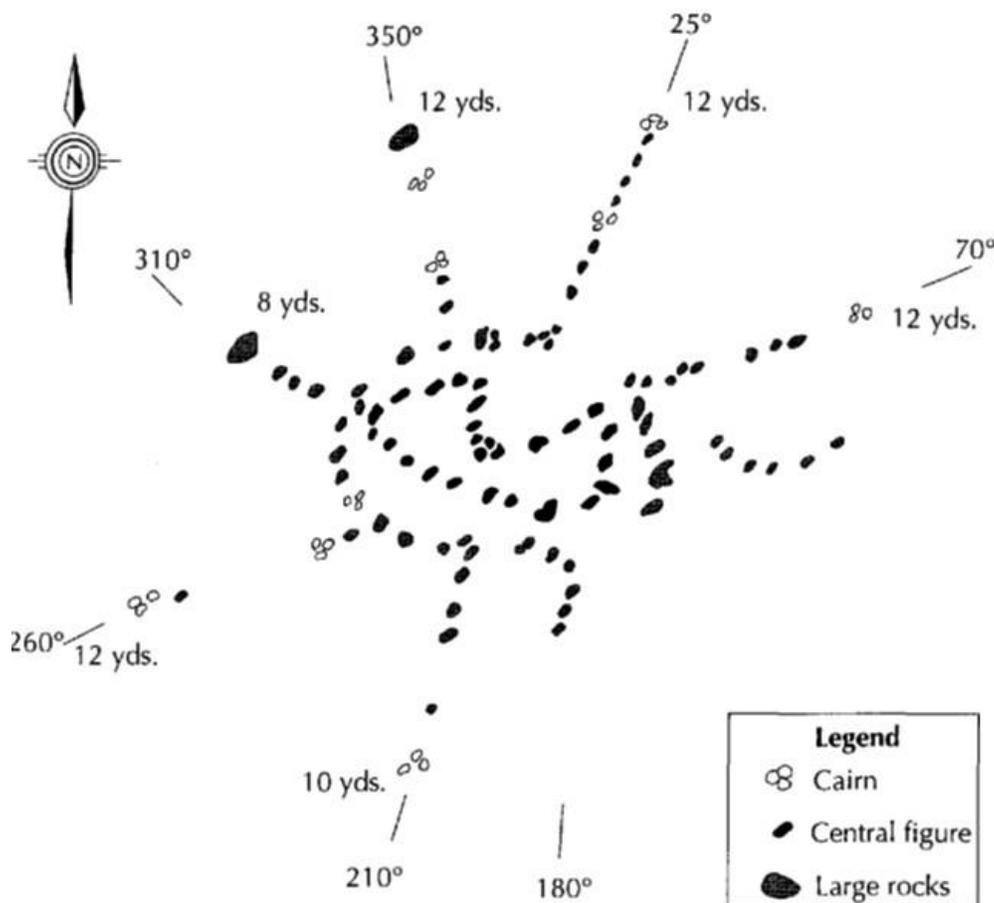


Figure 4.6. Medicine Wheel at EjOc-20. Illustration by Doug Richards and used with permission from the Saskatchewan Archaeological Society (Richards 1998).

4.4.3 Channel 3 T.V. Site

Located on a shelf of terrace 1 near Stranraer, is the Channel 3 T.V. site (EkOd-2). This name is a reference to current presence of a tall television tower. Unfortunately, the tower was

constructed where the central cairn of the Medicine Wheel used to be. The construction of this tower took place in 1962, prior to when reporting heritage sites was required. The wheel was brought to the attention of Joyce Farrel from the Bear Hills Chapter in 1977 by local landowner Mr. A.J. McGill, after he had read a National Geographic article called “Probing the Mystery of the Medicine Wheel” by John A. Eddy. He recalled that in 1906, when he first came to the area, he found such a feature and subsequently wrote down a description in his personal journal. The description in his journal reads: “I came on a pile of stones about 6 ft. high, with fist sized stones about 18 inches apart in rows about 30 ft. long extending like the spokes of a wheel in about 8 directions with piles about two feet wide at outer ends of rows” (Farrel 1983). Marvel Houston took this description and drew what it may have looked like (Figure 4.7). Later, five tipi rings, three cairns, a stone arc, and pieces of debitage were identified on the east side of the tower (Houston 1988; Farrel 1983).

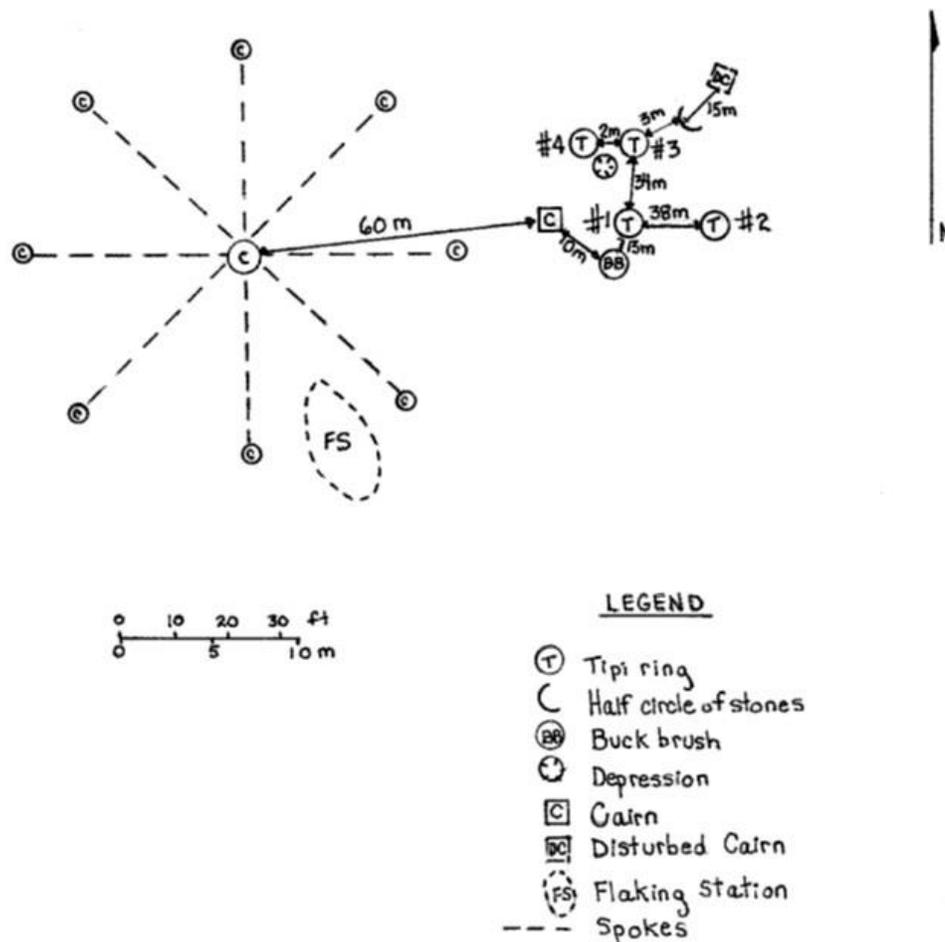


Figure 4.7. EkOd-2 Drawing of Channel 3 T.V. site Medicine Wheel (Farrel 1983:3).

4.5 Saskatchewan Museum of Natural History 1981-1982 Field Seasons

During the field seasons of 1981 and 1982, the Saskatchewan Museum of Natural History staff visited several different areas of Saskatchewan to “check on old and newly reported sites” (Dyck et al. 1981:122). At the time the Herschel Petroglyphs were known to the museum and had a Borden designation. However, they had not been documented to government standards. Ian Dyck and Anne Tasker, accompanied by Marvel Houston, recorded the petroglyphs and five additional sites within the vicinity. The sites recorded in 1981 were EjOc-3 to EjOc-9. The 1982 season led by Ian Brace recorded an additional two new sites: EjOc-10 and EjOc-11 as well as EjOc-12 (Monolith 2 and 3), later being redesignated as EjOc-3 (Steinbring 1995b). Just north of the petroglyphs is EjOc-4. The site contained a number of rings that are protected by geographical shelter. Hills to both the east and west block harsh winds and conceal the site’s location from the surrounding area. In total, there are 11 stone rings in a single file line in which one is a partial ring. At the southern portion of the line are two stone rings positioned side by side in an east and west fashion. EjOc-5 lies on top of the south terrace of Eagle Creek and contains two rings and two cairns. The initial recording shows a long line that Ian Dyck thought might be a drive line, though the 2012 update on this site could not locate it. Across a small coulee, west of EjOc-5 is an ambiguous petroglyph (EjOc-6). Ian Dyck mentioned it as a possible carving though no further description or discussion was made. The carvings were later confirmed by Muriel Carlson in 2013 (Figure 4.8). These carvings are only present on the east face. They show vertical lines and a few cupules though no obvious patterns are discernable. This may resemble the suggested rhythmic carvings done at EjOc-3 on Monolith 3. Located at the bottom of Coal Mine Ravine are two campsites. EjOc-7, located on the west side of the creek is composed of three rings, a chert uniface, numerous flakes, and bison bone fragments. EjOc-8, located on the east side is composed of four rings in a single file line.

The next field season (1982), Ian Brace recorded two more sites within Coal Mine Ravine. EjOc-10 is next to a small coulee and may represent a kill site. This interpretation is based on two small stone lines that lead to a focal point (Tasker 1982). However, no bones or lithic tools were found here. Along with the identification of Monolith 1 and 2 (EjOc-12), Brace also documented a tipi ring (EjOc-11) located 200 m south of the petroglyphs on top of a small mound (Dyck 1981).



Figure 4.8. EjOc-6 Carvings found on the east side of a boulder (Photograph courtesy of Muriel Carlson).

4.6 Heritage Conservation Branch 2012-2013 Survey

In 2012, Muriel Carlson invited Archaeological Resource Management Section to help record sites located around Herschel. Heritage Conservation Branch employees, Kim Weinbender and Nathan Friesen, visited the west terrace of Coal Mine Ravine, along the Coal Mine Creek, and a few quarter sections about 3 km southeast of Herschel. In two field seasons they recorded 12 new sites and updated several others.

To the southwest of Doug Richards' Medicine Wheel (EjOc-20), a grouping of five cairns were documented. This site was designated EjOc-24. EjOc-20 was updated during this survey as multiple cairns were identified on the west side of the Medicine Wheel. Two depressions located just north of the petroglyphs were also identified (EjOc-25). According to David Neufeld of the Ancient Echoes Interpretive Centre, Blackfoot Elders who have visited the site have reported that the depressions were used for Vision Quests. Along the bank of the Coal Mine Creek, three artifact scatters were documented. EjOc-33, EjOc-34, and EjOc-35 all produced fire-cracked rock and bone (some of which were burned). In addition, EjOc-35 produced a single quartzite flake (Weinbender 2012).

The small section surveyed 3 km southeast of Herschel produced six new sites. They were all located on a high point with an advantageous viewshed of the area. The sites, EjOc-26 through EjOc-32 are a combination of cairns and stone rings. EjOc-26 is composed of two stone rings, EjOc-27 has one ring, EjOc-28 is a collection of four cairns, EjOc-29 is the largest in this area with three stone rings and a cairn, EjOc-30 contains one cairn, and EjOc-31 contains one ring. Further south from the cluster of sites is an additional cairn (EjOc-32; Friesen 2013).

4.7 Cultural Resource Management

Since 1987, CRM work has been persistent within the area. Prior to 2000, work was focused on expansion projects of two major pipelines that crosscut Eagle Creek: the Interprovincial/Enbridge Pipeline and the Alliance Pipeline. After 2000, projects were much smaller in scale. They include an expansion of the Alaska Gas Producer pipeline, installation of a fiber-optic cable, a flowline installation, and a maintenance project to the existing Enbridge Pipeline. All the Heritage Resource Impact Assessments (HRIA) were conducted in accordance with the *Heritage Property Act*.

In 1987, Fedirchuk McCullough and Associates Limited were contracted to perform a HRIA on a pipeline replacement project for the Interprovincial Pipeline. The pipeline crosses the Eagle Creek Valley about 400 m north of Stranraer in an east to west direction. Eight shovel tests were conducted on the floodplain. The tests were sterile. On the west terrace about 500 m from the creek, a single flat cairn composed of six rocks was identified. The site (EkOd-3) was mapped in detail before being dismantled due to the proposed construction (McCullough et al. 1987). Subsurface testing was done where the cairn used to be; however, no artifacts were identified. Fedirchuk McCullough and Associates Limited returned in 1994 to mitigate and monitor the ongoing construction of this project. An artifact scatter of two bifaces and five flakes was designated EkOc-2. All artifacts were made from locally available material (McCullough et al. 1994). Another expansion of the Interprovincial Pipeline, now known as the Enbridge Pipeline took place in 1998. One Euro-Canadian site and two precontact sites were documented. EkOd-9 is a stone ring feature found on top of a terrace. The ring is composed of 62 rocks with a diameter of 5.1 m. Five rocks were located within the ring and may suggest a hearth. Near the edge of the valley several flakes were identified. They were made from red jasper, quartzite, and chert. The site was designated EkOc-5. Lastly, a Euro-Canadian midden (EkOc-4) that contained several

pieces of metal farm equipment, cans, and wooden structural components was identified near the floodplain (Gorham et al. 1998).

The Alliance Pipeline runs nearly parallel to the Enridge Pipeline. They are separated by about 1.5 km. Where the Enridge crosses the valley just north of Stranraer, the Alliance crosses just south. The new pipeline was proposed to closely parallel the existing Cochin Pipeline built back in the 1970s. In 1996 and 1997, Fedirchuk McCullough and Associates Limited identified three precontact sites. EkOc-1, initially found back in 1976 by Ian Brace during the construction of the Cochin Pipeline, was revisited (Reeves and Calder 1976). One Swan River chert flake was documented and added to the sites inventory which previously included a bifacial chopper. Near the creek at the bottom of the valley, an incomplete point was documented (EkOc-3). The point was determined to be Pelican Lake and made from siltstone. No other artifacts in the area were found. An additional site located further inland to the west was also recorded. EkOd-8 was designated on the grounds of a single split stone pebble core found on the surface (Fedirchuk et al. 1998). Field work during 2000 on the pipeline was done to build upon to the studies from the previous years. During the monitoring of trenching work an artifact scatter was identified (EkOc-6). Two thoracic vertebrae from the genus *Bison* and two unidentified pieces of bone were recovered. Alongside the bone were pieces of fire-cracked rock, one large bipolar quartzite flake, and an Oxbow point. The projectile point was made from a light tan coloured piece of petrified wood (Malasiuk et al. 2002).

In 2001, Golder Associates Limited was hired to complete an HRIA of the proposed Alaska Gas Producers pipeline. The pipeline is situated between the Alliance Pipeline and the Enridge Pipeline. Six new sites were identified which included two Euro-Canadian occupations: EkOc-7, EkOc-8, EkOc-9, EkOc-10, EkOc-11, and EkOd-10. Each site produced between one and two non-diagnostic artifacts: three flakes and a quartzite core were among them. The flakes were made of either quartzite or siltstone. The Euro-Canadian site, EkOc-8, contained over 100 artifacts of glass, earthenware, stoneware, metal farm equipment, and various building materials. The site was determined to be a post-World War I farmyard which was occupied for approximately 40 years. During the 1990s the farm was destroyed by a fire (Hjermstad and Paquin 2002). EkOd-10 contained a well, a dugout, and a fence. The well was constructed from wood and held together with nails and metal strappings.

In 2004, Western Heritage Services Incorporated was hired to perform a HRIA on behalf of Husky Oil Operations Limited for a proposed flowline. The impact assessment was focused on

the valley bottom of Eagle Creek at the south side of Opuntia Lake. Upon inspection, one artifact scatter was encountered. EkOd-12 consisted of two quartzite flakes and one retouched flake. Shovel tests were conducted near the artifact scatter, but all were sterile (McKeand 2004).

In the same area as Western Heritage Services Incorporated, Stantec undertook a survey in 2005. The target locations were areas immediately south of Opuntia Lake, on both the east and west terraces. A total of seven sites were identified during this survey. EkOc-12 and EkOc-16 both consist of a single cairn and EkOd-14 consists of two. EkOc-13 is a slightly larger site, consisting of four cairns that range from between 16 and 19 stones. Unfortunately, the orientation of the cairns was not documented. EkOc-14, EkOc-15, EkOc-17, and EkOd-13 are all Euro-Canadian midden sites yielding small amounts of wood, metal, glass, and ceramic fragments. Additionally, EkOd-13 contained a large barn foundation and a cellar depression. The Saskatchewan Archaeological Resource Record forms held by the Heritage Conservation Branch for these sites have not been properly uploaded to their database as they have missing pages.

During 2009, SaskTel installed an underground fibre-optic cable between Herschel and Plenty. From Herschel to Stranraer, it parallels the railroad at the bottom of the valley. Golder Associates Limited were contracted to carry out the HRIA. This resulted in three new sites being recorded. An artifact scatter (EjOc-21) was identified near Herschel consisting of a retouched flake and an amorphous quartzite core. An additional artifact scatter was identified halfway between Herschel and Stranraer. The site (EkOc-18) consisted of a flake and a biface. The biface appears to have a notch on one edge. Both artifacts were made from Swan River chert. On top of the terrace 2 overlooking Eagle Creek is EkOc-19. This site consisted of four stone rings, a stone arc, a single cairn, and a depression in the ground. According to the authors the site is a small group camp (Young and Zdunich 2009).

Near the Channel 3 T.V. site (EkOd-2), Arrow Archaeology Limited conducted a HRIA for NAL Resources Limited for the installation of a flowline. During this project the ground was covered with snow. In addition to monitoring snow removal to get access to the site, the construction and removal of topsoil was also monitored. Two sites were reported during this field season. EkOd-15 consisted of two cairns situated on a north facing terrace and EkOd-16 consisted of two stone circles and three cairns. These cairns were located near the edge of a west facing coulee. The stone circles were located near the incline of terrace 1 (Wood 2013).

The most recent CRM work was conducted in 2014. The project was for the Enbridge Line 3 Replacement program in which CH2M Hill Energy Canada Limited performed the HRIA.

The replacement pipeline parallels the existing Enridge Pipeline at the location just north of Stranraer. Two sites were documented during this field season: EkOc-20 and EkOc-21. Both were located on a terrace within a short distance of each other. Two Swan River chert flakes were documented. One flake appeared to have been retouched (Malasiuk et al. 2015).

4.8 Summary

Previous archaeological research within the region has documented a number of sites, showing the extensive use by past peoples. A large percent of sites found have been features present on the surface; however, the three excavations, test-pits, and numerous surface finds give a broader understanding of past activities. Site types range from habitation and processing sites to Medicine Wheels and petroglyphs. For a summary of the sites mentioned in this chapter, refer to Table 4.2. Although several individuals and organizations have been present within the area, work has been mainly restricted to Coal Mine Ravine and areas around Stranraer. This has left a large area unexplored between the two locations.

Table 4.2. Summary of Chapter 4 Sites.

Borden	Type	Features	Artifacts	Description
EjOc-3	Petroglyph	3 Petroglyphs	Besant Pottery, Avonlea Point, Prairie SN, Plains SN, Euro-Canadian, Bone Fragments	Excavated
EjOc-4	Multiple Features	11 Stone Rings, 1 Partial Ring		Large Camp
EjOc-5	Drive Lanes?	2 Stone Rings, 2 Cairns		
EjOc-6	Petroglyph	1 Petroglyph		Incised on East Side
EjOc-7	Artifact/Feature Combo	2 Stone Rings	Chert Flakes, Bone Fragments	
EjOc-8	Recurrent Features	4 Stone Rings		
EjOc-10	Recurrent Features	2 Stone Lines		Drive Lanes?
EjOc-11	Multiple Features	1 Stone Ring		
EjOc-13	Artifact Scatter	Hearth	Pottery, Lithic Tools, Fire-cracked Rock, Points, Bone Fragments	Excavated
EjOc-14	Artifact Scatter		Oxbow Point, Pottery, Expedient Tools, Debitage	
EjOc-15	Artifact Scatter		Pottery, Bone Fragments	
EjOc-16	Artifact Scatter		Lithic Tools, Debitage	
EjOc-17	Artifact Scatter		Besant Base, Endscaper, Scraper	
EjOc-18	Artifact Find		Mid-Section of Point	
EjOc-19	Artifact Scatter		Flakes, Debitage, Bone Fragments	
EjOc-20	Medicine Wheel	1 Medicine Wheel, 2 Stone Rings, 7 Cairns		Dougs Medicine
EjOc-21	Artifact Find		1 Core, Retouched Flake	
EjOc-24	Multiple Feature	5 Cairns		
EjOc-25	Alignment/Configuration	2 Depressions Surround by Stone		Vision Quest
EjOc-26	Recurrent Feature	2 Stone Rings		
EjOc-27	Single feature	1 Stone Ring		

EjOc-28	Recurrent Feature	4 Cairns		
EjOc-29	Multiple Feature	3 Stone Rings, 1 Cairn		
EjOc-30	Single Feature	1 Cairn		
EjOc-31	Single Feature	1 Stone Ring		
EjOc-32	Single Feature	1 Cairn		
EjOc-33	Artifact/Feature Combo	Hearth?	Bone Fragments, Fire-cracked Rock	
EjOc-34	Artifact Scatter		Bone Fragments, Fire-cracked Rock	
EjOc-35	Artifact Find		1 Flake, Bone Fragments, Fire-cracked Rock	
EkOc-1	Artifact Find		Bifacial Chopper, Flake	
EkOc-2	Artifact Scatter		2 Bifaces, 5 Flakes,	
EkOc-3	Artifact Find		Pelican Lake Point	
EkOc-4	Midden		Metal Farm Equipment, Cans, Wood	1920s era
EkOc-5	Artifact Scatter		3 Flakes	
EkOc-6	Artifact Find		Oxbow Point, Flake, Fire-cracked Rock, Bone Fragments	
EkOc-7	Artifact Find		Flake	
EkOc-8	Artifact Scatter		Maganese Glass, Bottles, Brick, Bone	post WW1
EkOc-9	Artifact Scatter		2 Flakes	
EkOc-10	Artifact Find		1 Core	
EkOc-11	Artifact Find		1 Retouched Flake	
EkOc-12	Single Feature	1 Cairn		
EkOc-13	Recurrent Feature	4 Cairns		
EkOc-14	Artifact Scatter		Wagon, Springs, Cans, Bottles	Euro-Canadian
EkOc-15	Artifact/Feature Combo	Barn, Workshop	Metal Scraps	Euro-Canadian
EkOc-16	Single Feature	1 Cairn		
EkOc-17	Artifact Scatter		Cans, Bottles, Stove	
EkOc-18	Artifact Find		2 Flakes	
EkOc-19	Multiple features	2 Stone Rings, 1 Stone Arc, 1 Cairn, Depression		Small Camp

EkOc-20	Artifact Find		1 Retouched Flake, 1 Flake	
EkOc-21	Artifact Find		1 Flake	
EkOd-2	Medicine Wheel	Medicine Wheel, 5 Stone Rings, 3 Cairns, 1 Arc	Debitage	Channel 3 T.V.
EkOd-3	Single Feature	1 Cairn		
EkOd-5	Multiple Features	Effigy?, 4 Cairns		
EkOd-6	Artifact Scatter	Lithic Tools, Debitage, Bone Fragments, Uniface		Excavated
EkOd-8	Artifact Find		Pebble Core	
EkOd-9	Artifact/Feature Combo	1 Stone Ring		
EkOd-10	Multiple Features	Well	Wood, Metal, Nails	
EkOd-11	Artifact/Feature Combo		7 Flakes	
EkOd-12	Artifact Find		2 Flakes, 1 Retouched Flake	
EkOd-13	Artifact/Feature Combo		Glass Bottles	Euro-Canadian
EkOd-14	Single Feature	2 Cairns		
EkOd-15	Recurrent Feature	2 Cairns		
EkOd-16	Multiple Features	2 Stone Rings, 3 Cairns		Small Camp

CHAPTER 5. METHODOLOGIES

5.1 Introduction

Archaeological surveys are often the first step in analyzing regional landscape use and interaction. Methods and techniques to carry out regional surveys have been developed over the years and are chosen based on the goals of each individual project. Several researchers (Banning 2002; Mueller 1974; Orton 2000) have discussed the ways of undertaking regional surveys and the successes from these techniques can be found in large-scale projects within Saskatchewan such as the Nipawin Reservoir Heritage Study (Burley and Quigg 1982) and the Archaeological Reconnaissance of Grasslands National Park (Adams 1986).

The 2020 survey area was chosen based on the high archaeological activity around Herschel and Stranraer and the largely unexplored Stranraer Terrace lying in between the two hamlets. To fully understand the Eagle Creek valley, the study area incorporated Coal Mine Ravine and the uncultivated sections of land from the hamlet of Herschel to the southern end of Opuntia Lake. This encompasses a diverse landscape that includes a tributary, the valley bottom with the creek, the paralleling terraces of the valley system, the Stranraer Terrace, as well as the southern shoreline of a lake (Opuntia Lake). The inclusion of different landforms was a way to avoid bias in landform use; however, not including sub-surface testing introduced a bias in the site types found. The boundaries of the study area are based on quarter-sections. Some of the perimeter quarter-sections include cultivated land but those areas were not surveyed due to farming activity. In total, 78 quarter-sections made up the 2020 survey area (Figure 5.1).

A pedestrian survey using judgement was chosen to cover the entire valley system. A judgmental survey uses arbitrary transects that are based on pre-existing knowledge of site locations. This technique is inheritably bias. To reduce bias, locations within the study area were divided based on high and low potential spots. The survey technique was chosen due to time limitations and to increase site recovery. Since the survey is primarily focused on surface features and artifacts, no sub-surface testing was done, and all artifacts found in the field were documented but not collected. In addition to the foot survey, artifact collections were analysed to understand the culture history. These included the Ancient Echoes Interpretive Centre's own collection and a collection amassed by Doug Richards. The two collections together total over 640 artifacts. Only diagnostic artifacts were considered relevant for the research goal; however, every artifact was examined and catalogued. In addition, landowners' collections were to be included. When requesting land access, landowners were asked if they had collections. Emphasis

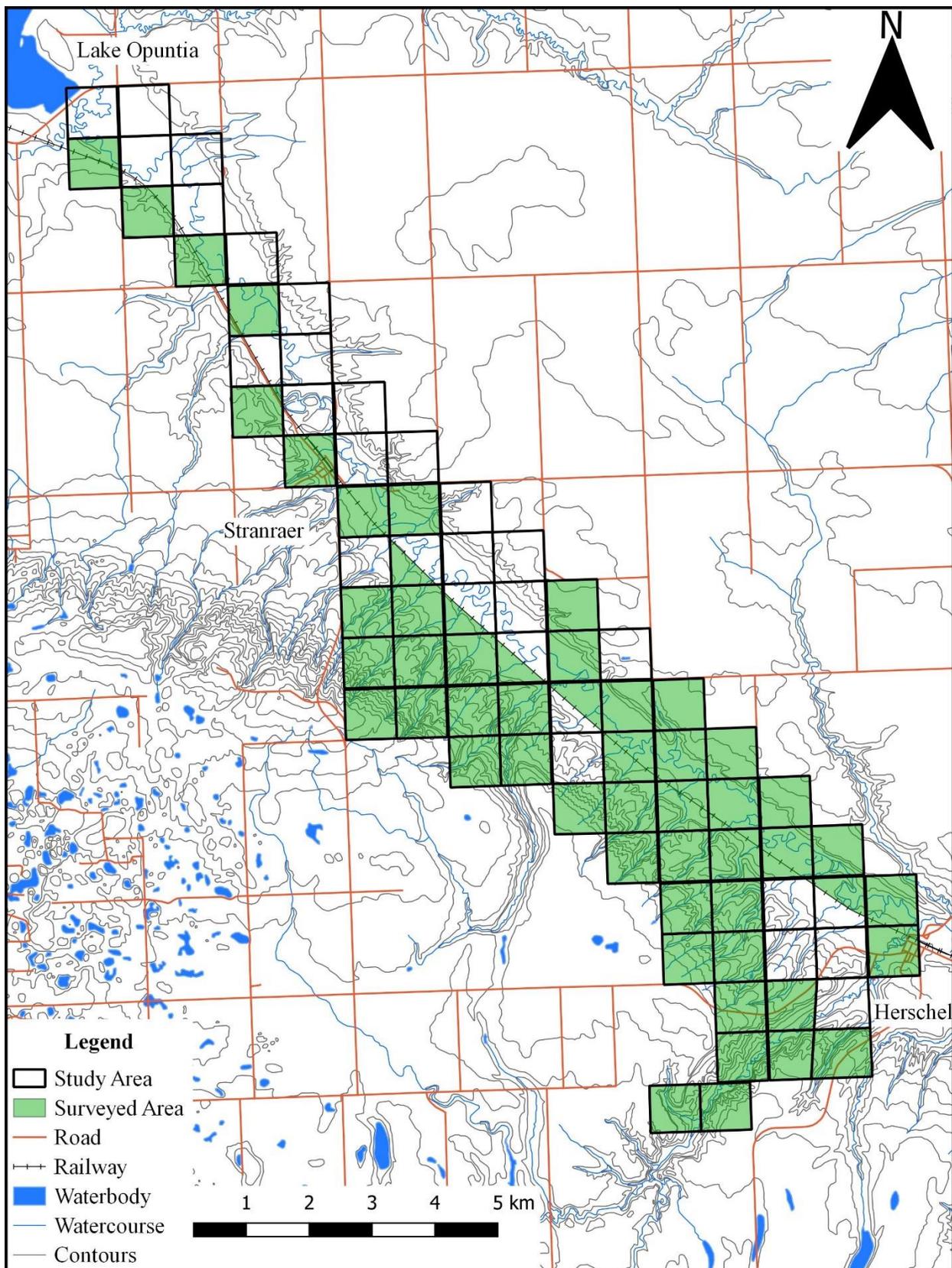


Figure 5.1. The 2020 study area denoting surveyed quarter-sections.

was made to assure them their collections would not be taken; however, no collections were identified. An artifact identification workshop was a way for landowners outside the survey area to come in and share what they have collected over the years. This event took place on August 1, 2020. Three groups came in with several mauls: 12 in total.

5.2 Judgmental Survey

The necessary research permit was granted by ARMS before field work began (Permit # 20-027). The fieldwork was assisted by volunteers; however, due to the 2020 pandemic only one volunteer could assist at a time. Volunteers were chosen to assist in areas of complex terrain. These areas include the southern portion of Coal Mine Ravine and localities within the Herschel Co-op Pasture and Toft Hill Co-op Pasture. In total, nine days were assisted by volunteers. Fieldwork took place between the months of April and May with 38 total days spent in the field.

Before fieldwork began, high potential areas for the location of sites were identified. This was assisted by looking at previous archaeological sites within the area and looking into how they are positioned on the land. Areas of high potential include the creek banks, terrace edges, geographically sheltered areas, and plateaus. The creek banks were initially listed as an area of high potential but due to a particularly wet season the water table rose to a high level, making the ability to find sites in this location nearly impossible. With the lack of sites found here at the beginning of summer and the nature of the meandering stream it was decided to focus attention on the pastures. In total, around 7 km of the creek banks and surrounding area were fully surveyed.

The foot survey was completed one quarter-section at a time. A Global Positioning System (GPS) was used to stake out the perimeter of each quarter-section making coverage of the area more manageable. The device was also used in recording sites and viewing transect spacing. Once land access was permitted, high potential areas were given precedence and surveyed following geographical features. On average one quarter-section was completed in a day, with more complex terrain taking longer and sections with cultivated fields taking less time.

Transect spacing varied depending on the time of summer due to vegetation affecting visibility. Mid-summer is when visibility was poorest due to the growth of vegetation. When visibility was poor transect spacing was closer; however, on average 20 m transects was sufficient to look for sites. When a feature was identified transects were positioned at 5 m to look for surface finds in the immediate area. Eroded areas were analyzed more closely.

Recording sites followed the Saskatchewan Archaeology Resource Record guide from Archaeological Resource Management S. In addition, specific definitions of certain stone features provided by several researchers were used. Cairn types follow Reeves and Kennedy (2017) definitions. These types are defined on their form and construction. They include the typical piled cairn, and several variants: hollow cairns (walled circles, often exhibiting depressed centres), platform cairns (single layer of rocks forming a platform), bar cairns (line of rocks), transverse cairns (multi-rowed bar cairns), cairns with triangular boulders in centre, erratic cairns (cairns that use a large erratic), and apron cairns (cairns attached to a stone ring or semi-circle). Sites that contain stone rings followed Malouf's (1961) classifications. He described four types of rings: partial ring, simple ring, and the multi-course ring. Partial rings have rocks that are missing from the circumference. Simple rings are complete circles with a single row of rocks forming the ring while multi-course rings are similar although they have far more rocks. This can be either be a thickly lined ring or two or more circles surrounding one another. In addition, Reeves and Kennedy (2017), also describe various stone ring types that will be used here. They include conjoined circles where two or more circles intersect as well as variations on a circle: arcs, the oval-elliptical circle and the D-shaped circle.

The determinant of settlement location has been discussed as important factors in how people position themselves on the landscape (Jochim 1976; Adams 1978). These include the use of topography to have natural shelter from the elements and/or an advantageous view of the surrounding area, distance to resources (lithic resources, food, water, etc.), and soil suitability. Seasonality has also been discussed as a determinate in the location of sites based on elevation (Davis 1963). Based on these factors several characteristics were documented when recording a site:

1. What landform type is the site located on?
 - a. Stranraer Terrace (Figure 2.3)
 - i. Flats Plains
 - ii. Shelf
 - iii. Middle Step
 - iv. Valley Bottom
 - b. North Facing Terrace
 - i. Flat Plains
 - ii. Valley Bottom

- c. Eagle Creek Bank
 - d. Coal Mine Ravine
 - i. Flat Plains
 - ii. Base
 - iii. Creek Bank
2. Proximity to an available water source
 3. Is the site geographically sheltered?
 4. Does the site have a view?
 5. What is the suitability of the ground surface?

Of the 78 quarter-sections included in the study area, 51.5 were analysed (Figure 5.1). The rest of the area could not be analysed due to several reasons: 10 quarter-sections could not be looked at due to three landowners denying access, within one of the pastures one and a half quarter-sections were off limits due to a request that the cattle be avoided, and 16 and a half quarter-sections were not completed due to time restrictions. In total, 66% of the quarter-sections were analyzed. This resulted in 55 new sites being recorded with 56 artifacts being identified in the field. Two previously recorded sites were revisited and updated. Each site was plotted in QGIS 10.3, a Geographic Information System software for further analysis. Additionally, three sites were photographed with the assistance of a drone.

5.3 Collections

5.3.1 Doug Richards Collection

Doug Richards, who lived near Plenty, was an avocational archaeologist and member of the SAS. Over the years he amassed a large collection of surface finds. The collection houses more than 450 artifacts and several paleontological specimens. Locations where he collected include NW-11-34-18-3 (Ruthilda Cemetery), SW 35-34-18-3 (Porter Lands), SE 36-35-18-3 (Ruth Archdekin), and less specific areas near Plenty, Stranraer, Herschel, and in and around Doug Richards' own property (Figure 5.2). The rest of the artifacts have no provenience at all. Artifacts include points, flakes, stone tools, pottery sherds, and debitage. One hundred and six artifacts are diagnostic projectile points. After Doug Richards passed away, his family donated his entire collection to the Ancient Echoes Interpretive Centre in 2015.

5.3.2 Ancient Echoes Interpretive Centre Collection

The Ancient Echoes Interpretive Centre's collection of over 190 artifacts has come from local collectors since the museum started in 1991. Most of these artifacts are on display in the main gallery and have been catalogued by previous museum summer students. Information included donor and date of donation. Several uncatalogued artifacts came from surface finds collected during tours of Coal Mine Ravine in the early days of the Museum. The collecting of artifacts during tours no longer takes place and is not condoned. The collection includes several large mauls, pottery sherds, points, bone tools preforms/bifaces, and stone tools. Forty-two artifacts from this collection are diagnostic points and will be included in the analysis for their regional significance.

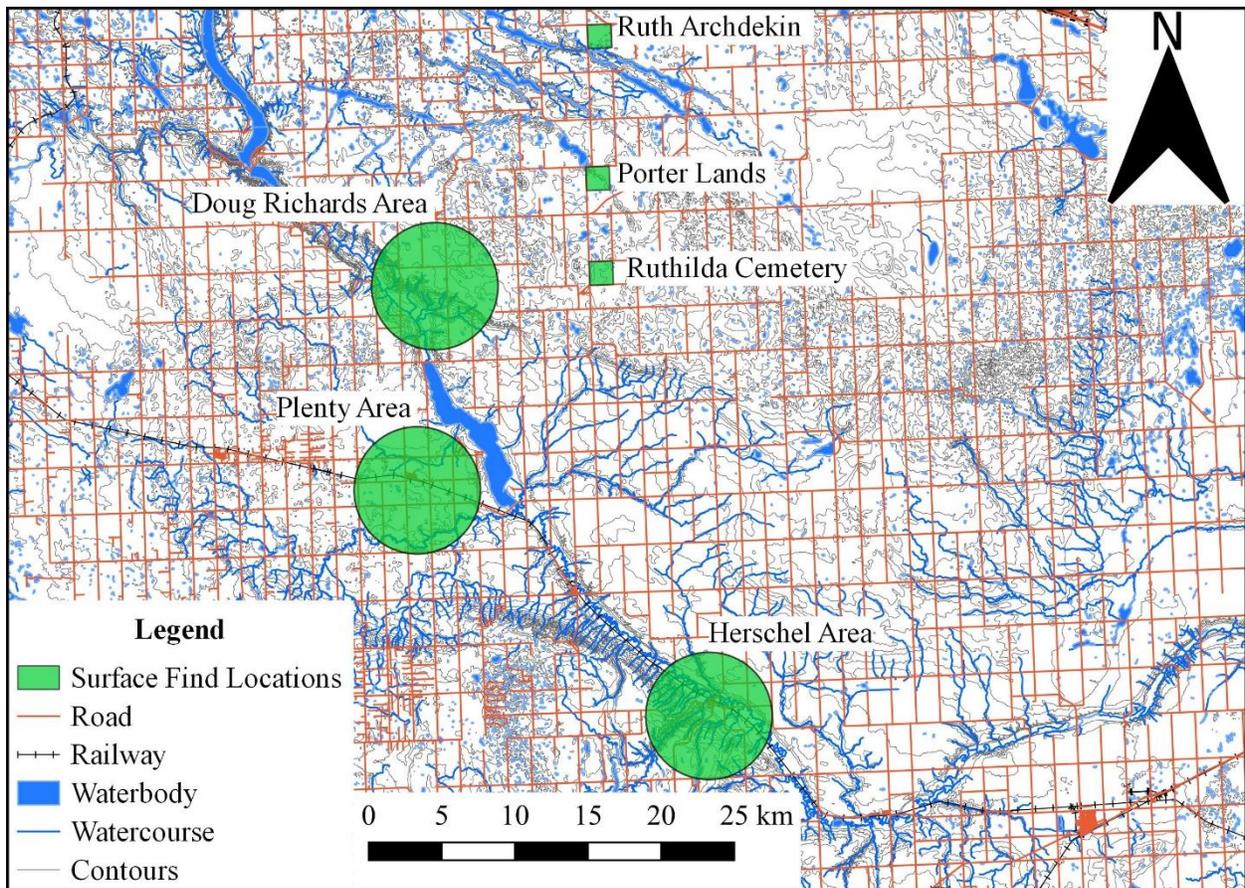


Figure 5.2. Locations of Doug Richards surface finds (Circles denote general location).

5.4 Collections Analysis

All artifacts in the collections were analyzed with several attributes being recorded. These include the artifact type (point, flake, tool, etc.), material, provenience, and archaeological

complex if known. Points were measured and photographed. Several point types are noted with the oldest being a speculated Early period lanceolate based on the thickness of the cross-section and the most recent being the Plains Side-notched point. Pottery sherds were also examined; however, none had any diagnostic attributes with only cord wrapping surface treatment being present.

The Doug Richards collection was catalogued for the museum as part of this research. The collection had been spread across multiple boxes and Doug Richards' notes on the collection were in multiple rooms. Through the cataloging process all artifacts and documentation were amalgamated. This process revealed two missing bags: bags 5 and 18. Guidelines were put in place in order to document if artifacts are to be removed and displayed. An excel spread sheet with catalogued information as well as photographs of the points were placed in the box. The uncatalogued artifacts from the Ancient Echoes Interpretive Centre collection were given a similar treatment by organizing them into a single box while the rest were kept on display in the main gallery.

5.5 Summary

The methodologies chosen aimed to maximize the area surveyed while considering time and financial restraints. In order to understand regional variability in the concentration of sites, a study area between Herschel and Opuntia Lake was chosen. Specific characteristics of each site were noted when recording sites. Of the 78 quarter-sections chosen to cover the area 51.5 quarter-sections were fully surveyed. To understand the cultural history of the area, two local artifact collections were analysed. In total, the two collections combined contain 640 artifacts in which 147 were diagnostic.

CHAPTER 6. SURVEY RESULTS

6.1 Introduction

The 2020 survey results are organized here into separate sections based on their site type as defined by Archaeological Resource Management Section (ARMS). These include artifact finds, artifact scatters, artifact/feature combinations, alignment/configurations, multiple features, recurrent features, and single features. In total, 55 new sites were recorded and two sites were updated (Figure 6.1; Figure 6.2). Each site has a brief description that includes the necessary attributes as outlined in the previous chapter. In addition, an overview of the diagnostic points in the two collections are included here. Measurements and photos of each diagnostic point can be found in Appendix 1.

6.2 Artifact Finds

6.2.1 EjOc-43

Located 120 m west of the Herschel Petroglyphs (EjOc-3) and 80 m north of two stone rings is a single artifact find. The artifact was found on an eroded slope, surrounded by small shrubs. At the base of the slope is a dried-up slough. The slope mostly consists of a light brown loam with small pebbles scattered about; however, the loam turns darker when approaching the slough. The recorded artifact is a secondary flake made from a tan Athabasca quartzite. It measures 3.5 cm long, 3.0 cm wide, and has a thickness of 1.4 cm. A striking platform is present and has terminated in a step fracture. No other artifacts were found in the vicinity. The location of the deposit on a slope suggests the artifact was either discarded or displaced.

6.2.2 EkOc-25

On the Stranraer Terrace and in the drainage coulee of terrace 1 is a single artifact find. The artifact was found on a small mound located between two large valley slopes giving the site an ample amount of geographical shelter. The mound is raised high enough for the water to drain on both sides. Lying on the east side of the mound, at an elevation of 696 m asl, was a bifacial knife made from a fine-grained tan quartzite (Figure 6.3). It has been broken at the proximal end and part of the distal end. The measurements are 3.81 cm long, 2.54 cm wide, with a thickness of 0.25 cm. The artifact has a leaf-shaped appearance and may be part of a broken lanceolate point. One of the worked edges has been bifacially worked while the opposite edge has been unifacially worked. The unifacially flaked side suggests the artifact may have been discarded after the

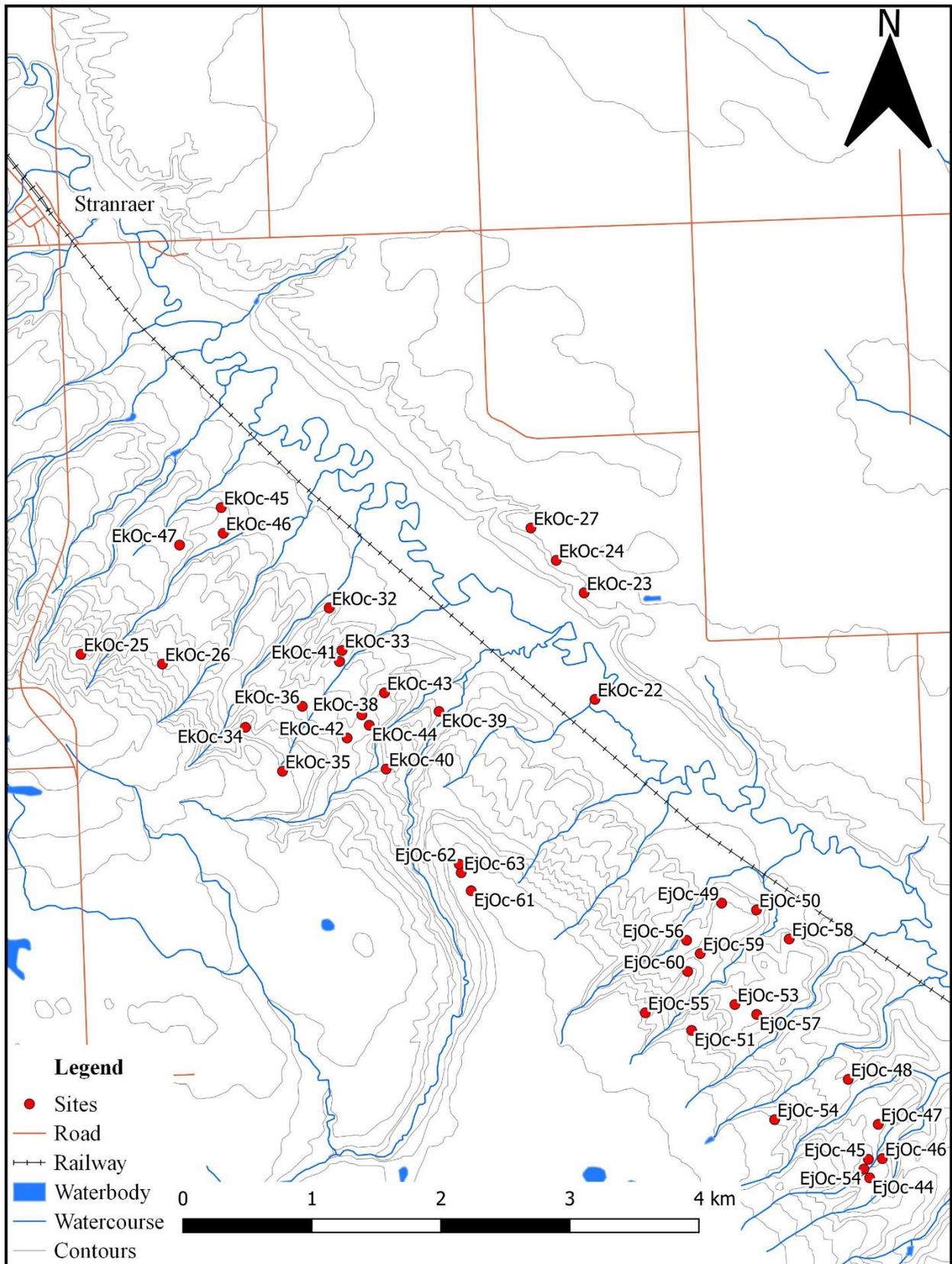


Figure 6.1. Sites recorded during the 2020 survey in reference to Stranraer.

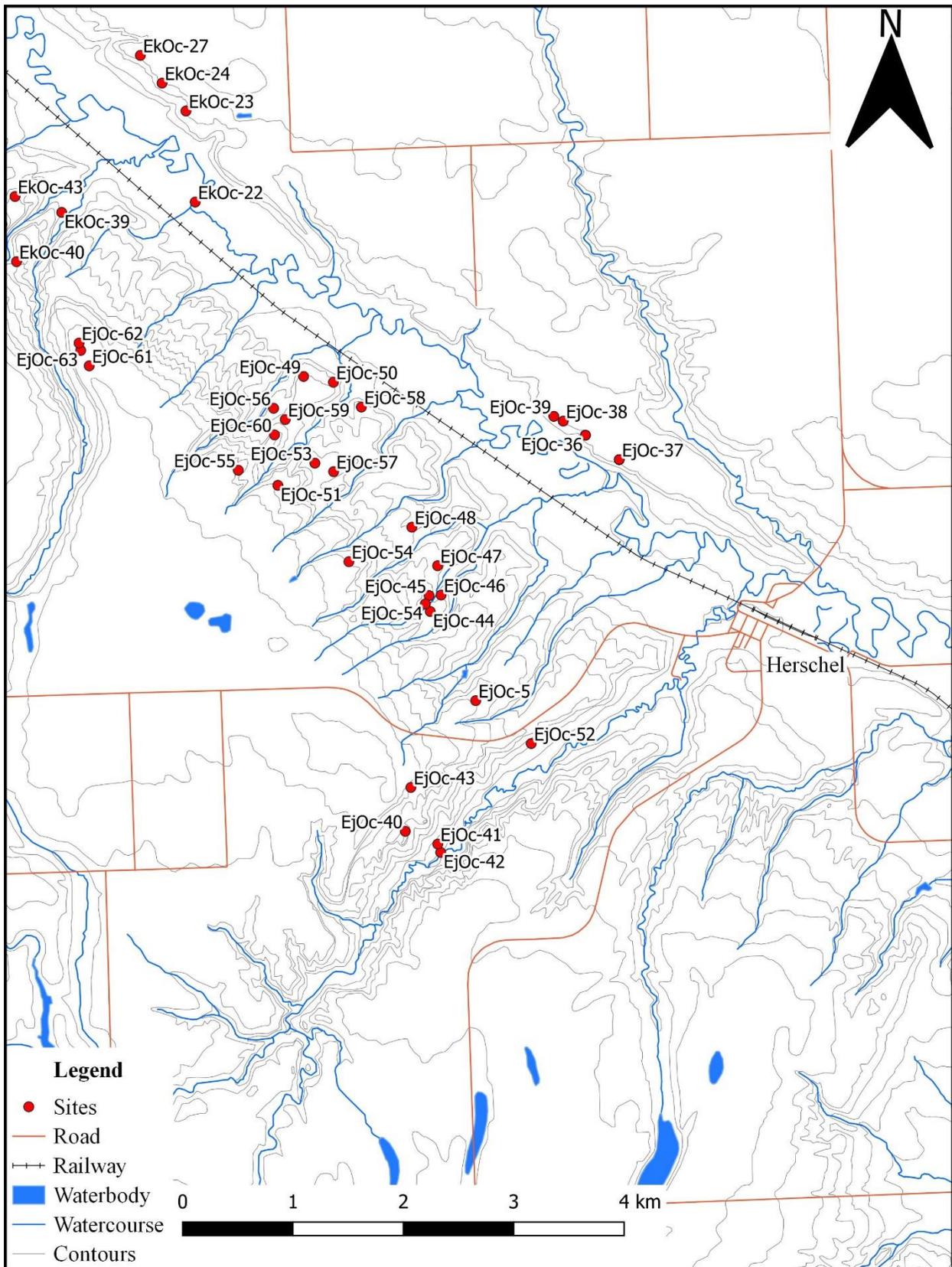


Figure 6.2. Sites recorded during the 2020 survey in reference to Herschel.

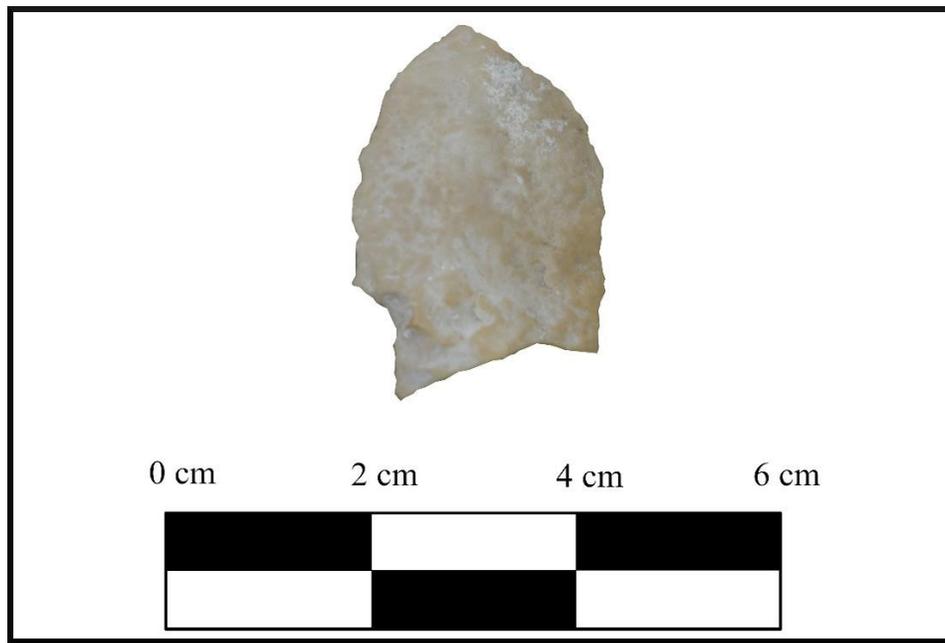


Figure 6.3. EkOc-25 Bifacial knife.

break occurred. Pressure flaking is present throughout. No other artifacts were found in the vicinity.

6.3 Artifact Scatters

6.3.1 EjOc-41

Adjacent to the Coal Mine Creek's bank and at the base of a large incline is a small artifact scatter. The site is situated on a gentle slope that has been heavily eroded due to water runoff. The erosion has created a large patch devoid of grass. This exposed patch of land is composed of a light brown loam with a small amount of tertiary gravel. The artifacts recorded include five secondary flakes. Two are made from a pink fine-grained quartzite and the remaining flakes were made from black siltstone. The length of each flake is approximately 5 cm with flake terminations of either feathered or stepped. Each flake appears to be secondary except for one that has a large portion of cortex present on the dorsal side. The function of the site may represent a lithic tool production site. There may be some correlation to the excavated multi-component site (EjOc-13) and the additional surface find sites found during the 1996 field season (refer to section 4.3.2) due to their proximity.

6.3.2 EjOc-42

On a cutbank sloping towards Eagle Creek is an artifact scatter of two lithic tools and several bone fragments. The slope is quite steep, heavily eroded, and is crosscut by a cattle trail. The base of the slope has a thick cover of brush while the top of the slope is covered with dense grass. In total, 20 pieces of fragmented bone was observed. A large portion of the fragments are from long bones elements; however, none had any diagnostic features to specify the species. Within the scattering of bone were two lithic tools. One is an incomplete point made from siltstone. Both the tip and part of the shoulders are missing. The siltstone used for the point has a darker band near the distal end. The greatest length measures 3.0 cm, the greatest width is 2.0 cm, and the thickness is 0.7 cm. Based on the morphology and general size of the specimen, it can be classified as a Pelican Lake point (Figure 6.4). The other tool found is a pinkish grey quartzite chopper. It measures 9.5 cm long, 8.0 cm wide, and 4.0 cm thick. When viewing the dorsal or ventral side, it has a triangular shape. The working edge clearly shows striations.

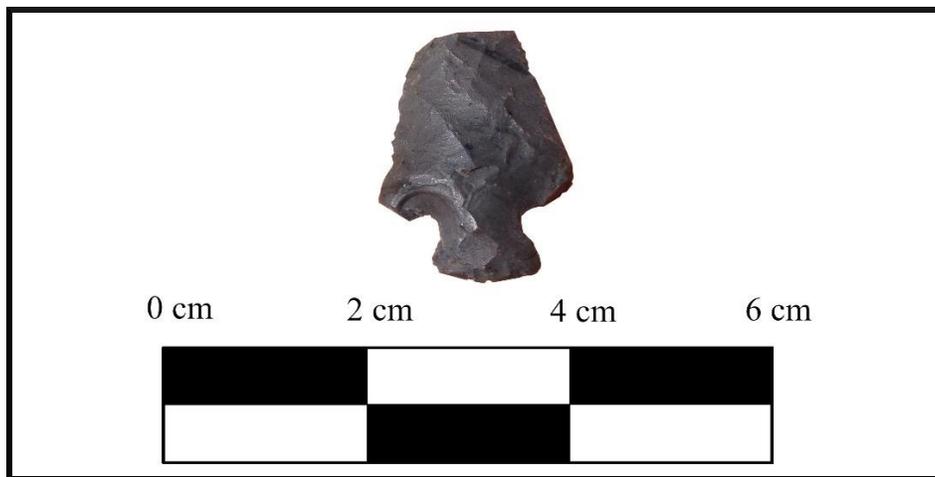


Figure 6.4. EjOc-42 Pelican Lake point.

6.3.3 EkOc-22

Along Eagle Creek, halfway from Herschel to Stranraer, is a collection of flakes, bones and a single tool found within the water and an adjacent sand bar. The creek at the time of recording the site was only 15 cm deep in this section. Several sandbars were visible and walkable. In total six artifacts were observed. All the flakes were made of a dark siltstone with one being retouched. The tool found is a unifacial knife made from a fine dark grey quartzite. When viewing the ventral/dorsal surface, the shape takes on a lunar appearance. Along the convex side, bifacial flaking is observed. Overall, the tool is poorly made and may represent an

expedient tool. The scatter of bone fragments can be found from the location of the flakes to a distance of 600 m up the stream. The bone was most likely transported along the creek at a time when the water table was much higher. The bone consists of long bones elements, scapulae, and pieces of the cranial vault and mandible. The cranium and mandible found represent the genus *Bison*.

6.3.4 EjOc-16 (Update)

The site is located in Coal Mine Ravine in a heavy eroded drainage coulee and on a trail caused by the continued movement of cattle and people. On both the east and west sides of the trail are small, eroded inclines. Within this area several fragmented pieces of bone were identified. This supports the original site description done in 1996 by Rollans and McKeand (1997) where a substantial amount of bone was observed. The uncollected flakes and tools found in the initial recording could not be located. One new artifact was documented during the visit. It is a single incomplete point that measures 1.6 cm long, 1.7 cm wide, and 0.5 cm thick. The point is made from feldspathic siltstone and has step fractures visible throughout. Missing is half of the distal portion and one ear. The proximity of the notch to the base and the slightly concave basal area indicates Avonlea (Figure 6.5).

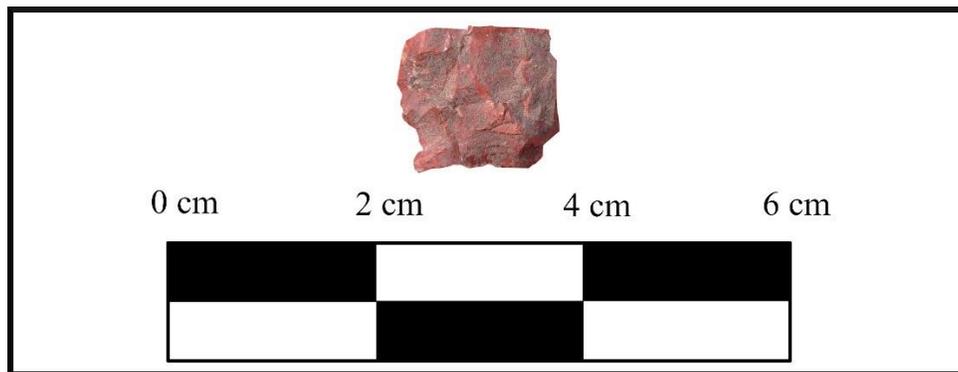


Figure 6.5. EjOc-16 Avonlea point.

6.4 Artifact/Feature Combinations

6.4.1 EkOc-28

The site is composed of five stone rings, a piled cairn, and a single flake. It is located on the shelf of terrace 1 at an elevation of 680 m asl. Eagle Creek is approximately 2 km northeast. The kettles to the south may have been utilized as a water source also. To the immediate south is a large incline whereas the other cardinal directions give an unobstructed view of the valley. Both

the east and west sides drop down into drainage coulees. The first and second rings begin in a single file line from south to north, diverging after the second ring. Overall, this orientation forms a 'Y' shape. The line that diverges to the northwest ends with one stone ring whereas the northeastern line has one stone ring, then an elliptical ring, and at the end: a cairn. Rocks that make up the rings range between 47 and 124 rocks with diameters of either 4 m or 5 m. The elliptical ring is composed of 63 rocks with a length of 4 m and a width of 3 m. The piled cairn located near the north terrace edge is composed of 13 rocks. One single flake was found next to most southern ring. It was made from feldspathic siltstone and has been bifacially worked on one edge. The overall shape is less than 0.5 cm and has been broken at the distal end.

6.4.2 EkOc-34

The site consists of 13 stone rings, one line feature, and a triangular rock configuration. All of the stone rings are oriented in a circular pattern. This site is located on the shelf of terrace 1 near the top of the Stranraer Terrace at an elevation of 684 m asl. From this location the entire valley system can be seen in all directions except for the south due to a small incline. However, the incline is quite easy to traverse, allowing for access to a 360° view. Eagle Creek is located 1.8 km to the northeast which would make it a distance to reach the resources offered there; however, resources could have been accessed to the south from the numerous sloughs. Generally, all the stone rings form a circular pattern, although there are outliers specifically to the south (Figure 6.6). All the stone rings in the main circle have diameters of 5 m. Rocks range from between 24 and 30 rocks in the smaller rings and between 47 and 94 rocks in the large ones. Within one of the west rings was one flake made of feldspathic siltstone.

6.4.3 EkOc-39

Between two terraces within a drainage valley is a small camp/lithic reduction site. The site contains a simple stone ring which is elevated up from the paralleling seasonal drainage stream. To the north is Eagle Creek at a distance of 950 m. The stone ring is made up of 57 rocks and has diameter of 6 m. To the south, east, and north of the ring are three sperate lithic reduction areas characterized by a concentration of flakes and debitage. In total, 28 pieces of debitage and flakes were recorded. While white quartzite appears to be favoured, chert and brown chalcedonies are also present. Within the south concentration of debitage is a single thumbnail scraper. It was made from a split siltstone pebble and shows a clear unifacially worked edge. Just



Figure 6.6. EkOc-34 Layout of stone features.

east of the ring, inside the eastern reduction area, is a single incomplete point. The point found does not clearly fit into any pre-established complex. It is missing both the tip and one ear and does not have a distinct basal edge. The measurements are 2.8 cm long, 2.6 cm wide, and 0.6 cm thick (Figure 6.7). Surrounding the site are tall terraces which give an ample amount of shelter from the elements. However, since it is tucked back from the valley's edge it completely restricts the view of the surrounding area.



Figure 6.7. EkOc-39 Incomplete point.

6.4.4 EkOc-40

The site is situated on the middle step, closer to the base of terrace 1 and at an elevation of 631 m asl. To the north is a small mound which gives the location some shelter. Further to the north is Eagle Creek at a distance of 1.67 km. Both the east and west sides gently roll down into complex terrain. The site consists of a simple stone ring and one secondary flake. The stone ring consists of 82 rocks and has a diameter of 6 m. More rocks are present on the east side of the ring. This could represent the inhabitants compensating for a strong wind (Finnigan 1983). Within the centre of the rings are three rocks which may indicate a hearth. Ten meters to the west, on an eroded slope was a single flake. The flake was made from a grey quartzite and had a clear striking platform, flake scar, and feather termination.

6.4.5 EjOc-53

The site consists of an odd formation of rocks, a simple stone ring, and one quartzite flake. It is located on the middle step of the Stranraer Terrace in a geographically sheltered area. On both the north and west sides are large inclines. The odd formation is circular with a line of rocks extending away from the ring on the east and west sides, each composed of four rocks. The

ring in this formation has a diameter of 5 m. Several rocks lay scattered around the feature and may have been part of it. Within the ring is a line that reaches across the perimeter from east to west although it is situated off centre. On the northern outer edge and in contact with the larger feature is a smaller circle of rocks with a diameter of 0.75 m. Overall, the formation of rock may represent more than just a tipi ring; however, there is no clear pattern to make any speculations. Twenty meters south of the first feature is a multi-course stone ring. This feature appears to be a double ring. It has a diameter of 7 m and is composed of 122 rocks. There is a larger concentration of rocks on the east side. The flake was found on an eroded cow trail that runs parallel to the rings. It was made of white quartzite and does not have any cortex.

6.4.6 EjOc-57

The site is situated on the topmost portion of a flat hill on terrace 1 at an elevation of 633 m asl. Here there is no geographical shelter, but the location does offer an advantageous view of the area. Both the east and west side decline into drainage coulees while the north gently slopes down towards Eagle Creek valley. The site consists of one simple stone ring and a small scraper. The ring has a diameter of 3.5 m and is composed of 57 rocks. Rocks are all evenly spaced out and have roughly the same dimensions. The scraper was found 5 m to the northeast of the ring. It was made with a feldspathic siltstone pebble, where the maker utilized the bipolar method to split open the rock. Only one end has been pressure flaked to form the working end of the tool. The measurements are 6 cm long and 2 cm wide.

6.4.7 EjOc-60

On a narrow peak on the flat plains of the Stranraer Terrace is an artifact scatter and feature combination. At an elevation of 652 m asl, the entire region can be viewed as the geography does not obstruct it. In total, 10 flakes, two unidirectional cores, and three piled cairns were observed. There was a larger concentration of flakes near the northern edge of the narrow terrace. Here all but two of the total finds were located. Materials being used vary from siltstones, quartzites and feldspathic siltstones; however, white quartzite is the most common. The two unidirectional cores were made from a mid-quality quartzite and have both been expended. Forty meters south of this activity area are three piled cairns. They were lined up in a row and were perpendicular to the contours of the narrow terrace. The middle cairn is the largest of the group. It has diameter of 3 m and is composed of 57 rocks. The west cairn has a diameter of 0.5 m with 14

rocks and the east cairn has a diameter of 0.3 m and composed of 10 rocks. The eastern cairn has rocks that are deeply buried, compared to the other cairns within this site. Directly south of the cairns is where two flakes were identified. They were both made of a greyish quartzite. This site may be apart of the large campsite located near the base of this terrace (EjOc-56), due to its proximity.

6.5 Alignment/Configurations

6.5.1 EkOc-41

The site is situated on the middle step of the Stranraer Terrace at an elevation of 630 m asl. It is far back from the valleys edge and is surrounded on both the east and west sides by drainage coulees. In total, the site contains 23 piled cairns. All cairns are approximately the same size with dimensions of 1 m by 1 m. Each cairn is composed of between 23 and 29 stones and all rocks are roughly uniform in size. The cairns stand about 30 cm above the grass line, making them visible from the surrounding area. Each one is approximately 5 m apart, except for two larger gaps along the southwest and northeast directions. These gaps are about 10 m in length. The orientation of all the rocks appears intentional (Figure 6.8), although no obvious pattern is discernable. Two stone rings are 40 m north of the site and may be associated.

6.5.2 EjOc-63

The site consists of two simple stone circles and a possible stone configuration. It is situated on the flat plains of the Stranraer Terrace on a large plateau. The two simple stone rings are just north of the configuration. One ring has 55 rocks and a diameter of 6 m while the other has a diameter of 4 m with 45 rocks. There is no indication of a hearth in either. The alignment/configuration is a circle with 6 to 7 radiating lines (Figure 6.9). Each line is made with three or four rocks in which the length alternates between the two. In between alternating lines is either a rock to form the main circle or the absence of one. The diameter of the main ring is 4.3 m. The lines on the west and north sides are well defined whereas the southeast sides are not. The lines on the west side come to a point forming a triangular shape.

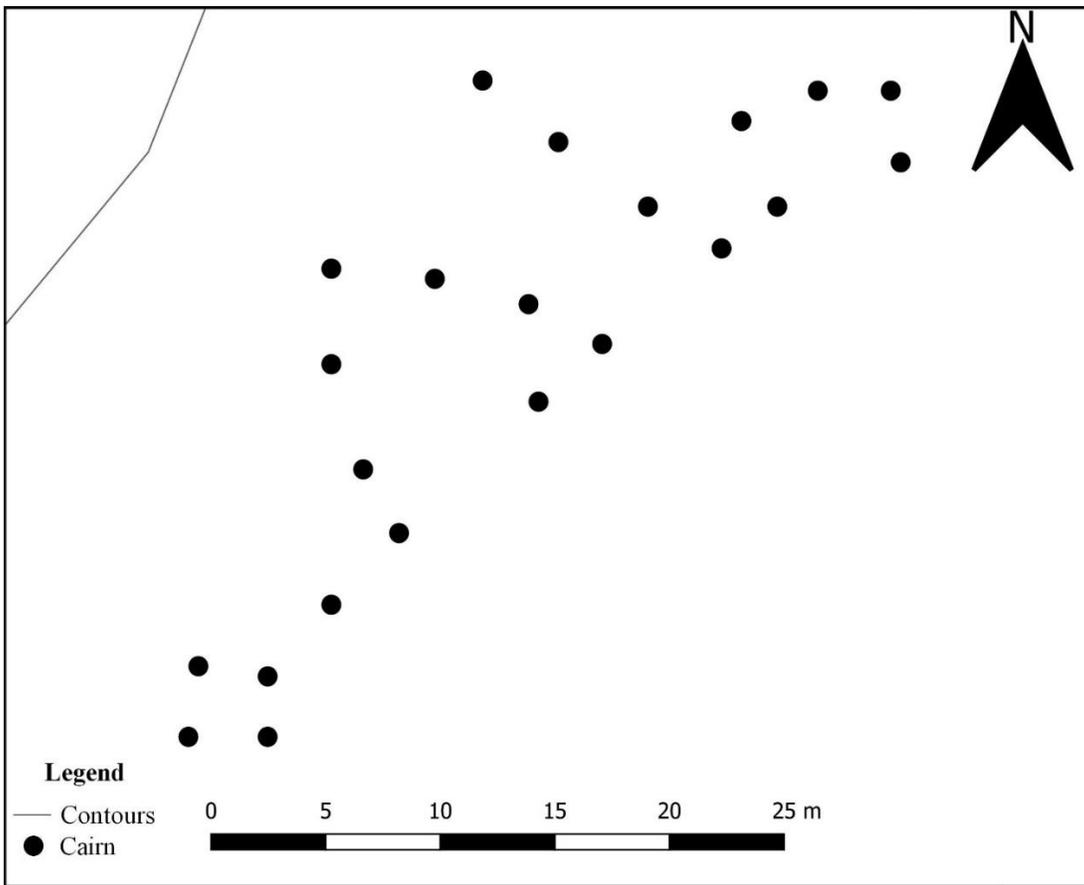


Figure 6.8. EkOc-41 Piled cairn formation.

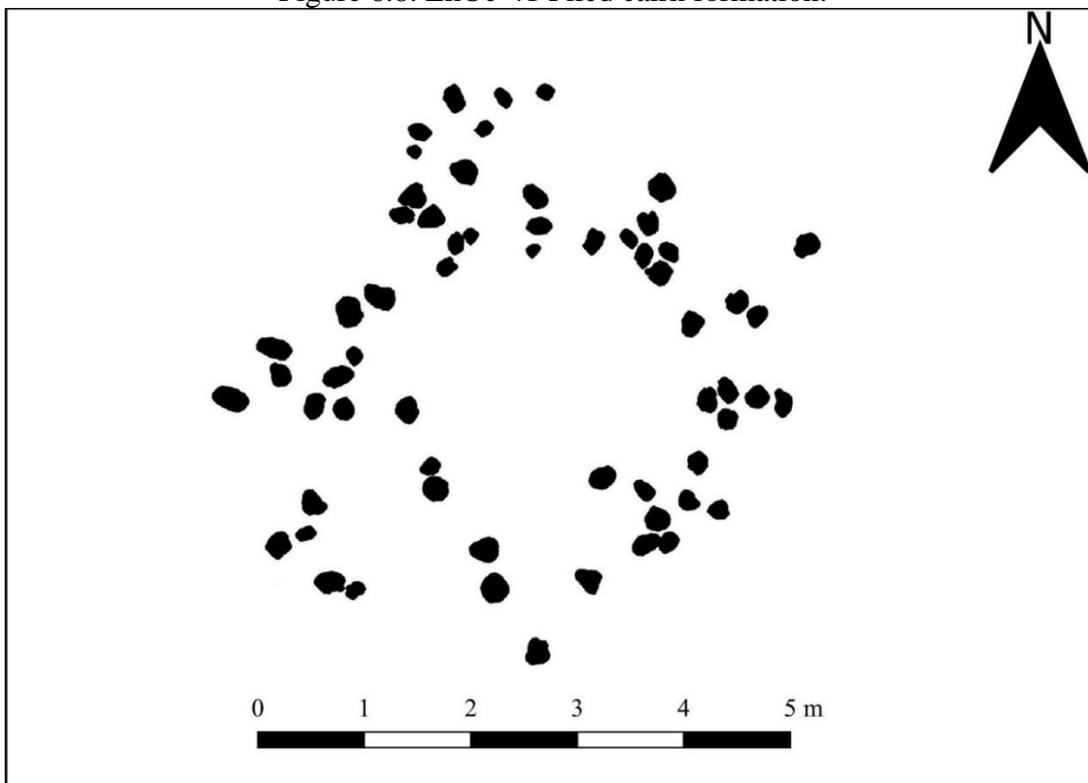


Figure 6.9. EjOc-63 Stone configuration.

6.6 Multiple Features

6.6.1 EkOc-29

On the shelf of terrace 1 at an elevation of 647 m asl is a small camp site. Directly south is the base of terrace 1 and to the north is a large flat expanse. The area here looks like a tendril that flows out due to drainage coulees that parallel the flat expanse. The site consists of three simple stone rings and one bar cairn. The three stone rings range from 45, 46, and 54 rocks with diameters that vary from 3 m, 4 m, and 7 m respectively. A bar cairn lies in between two of the stone rings and has been laid out in an east/west direction. It has a length of 5 m and is composed of 11 rocks all in a single file line. All the features are partially buried and there is no indication of any hearths. Eagle Creek lies 1.4 km to the northeast.

6.6.2 EkOc-35

At the top of the Stranraer Terrace at 702 m asl is a site consisting of a petroglyph and a platform cairn. It is situated about 30 m from terrace 1's edge on the flat plain. To the south is a small mound. In all other directions one can see the entire region including the Opuntia Lake and the Bad Hills in the far distance. On the small southern mound, a view of the entire southern region is available. Eagle Creek lies approximately 2.1 km north. The petroglyph is a deeply buried dolomite erratic with a small, curved groove (Figure 6.10). The curved groove has a 'U' shape to it implying it was not done with a metal object. There is no obvious pattern to the carvings. The grooves may represent what Buchner and Steinbring (1995b) termed 'rhythmic patterns' that have been observed on Monolith 3 at EjOc-3. The second feature is a platform cairn in an oval shape. It measures 3 m east to west and 2 m north to south. The platform is composed of over 300 fist sized rocks. In the centre of the oval is a slight depression measuring 2.5 m in length and 1.5 m wide. This cairn is about 10 m south of the petroglyph. To Reeves and Kennedy (2017), these platform cairns may represent burials and they note they are often placed near other sacred sites.

6.6.3 EkOc-36

Ten piled cairns and one bar cairn make up EkOc-36. The site is situated on the middle step of the Stranraer Terrace near a steep incline. There is no shelter here from the elements; however, one can see the entirety of Eagle Creek valley. The site consists of two clusters of features which are connected by a line. The line measures 20 m and consists of 15 rocks and is



Figure 6.10. EkOc-35 Petroglyph (Facing south) with arrows denoting location of groove.

oriented in a southeast to northwest direction. The first cluster is located on the south side of the site. It has two large rock piles and three smaller ones. The eastern most cairn of cluster one is the largest mound. It is composed of 100 rocks, has a diameter of 1.75 m, and forms a pear shape. The middle cairn of cluster one is made up of 80 rocks and forms a circular shape although it is slightly smaller and more circular than the eastern cairn. It has a diameter of 1.5 m. Three cairns are placed around the middle cairn. One to the west which has 50 rocks and is much flatter than the others. The two other cairns have 10 rocks each and are placed northeast and southeast from the middle cairn. These cairns all have diameters of about 0.75 m. Between the two clusters is a bar cairn with a piled cairn on both ends. The cairn at the end of the line on the edge of cluster 1 has a diameter of 0.5 m. The second cluster consists of two large cairns and two smaller ones. The first large cairn is located at the north end of the rock line. It is composed of 47 rocks and has a diameter of 1.5 m. One meter to the west is another piled cairn. It is made up of 39 rocks and has a diameter of 1 m. Further to the west, by 1 meter, is a smaller cairn, which is much flatter and consists of 40 rocks with a diameter of 0.5 m. These three mounds resemble the first cluster in orientation and diminishing height/size. Finally, the last cairn is situated on the most western

portion of the site, 5 m west of the second cluster. It is near the edge of the terrace and is composed of 50 rocks with a diameter of 0.5 m.

6.6.4 EkOc-38

Four piled cairns and one stone ring make up EkOc-38. The site is located on the middle step about halfway between the edge of the valley and the base of terrace 1. There is no geographical protection here other than from the south due to the steep incline on terrace 1. To the east and west are large drainage coulees and to the north is Eagle Creek which lies 640 m from the site. Near the edge of the west drainage coulee is a grouping of four cairns. They are positioned as if they were in the four corners of a box, each separated by 7 m. The number of rocks that make them up vary from between 7 and 15. They stand above the grass line and can be seen from some distance away. To the east of the cairns, by 30 m is a single complete stone ring. It has a diameter of 6 m and is made up of 74 rocks.

6.6.5 EkOc-43

EkOc-43 is a mid-sized camp composed of four simple rings and three piled cairns. It is situated near the valley edge on the middle step at an elevation 630 m asl. From here the entire Eagle Creek is visible and suitable drinking water is only 1.2 km to the northeast. The site can be split into two sections. The first, closer to the west facing drainage coulee, contains three cairns and a stone circle. All are evenly spaced from each other and are positioned as if they are in the corners of a square. Cairns vary from between 10 and 23 rocks and have a diameter of 1 m. The stone circle is complete and contains 90 rocks and has a diameter of 5 m. Six meters separates each cairn from this stone circle. Twenty meters to the east is a cluster of three rings. They are positioned in a way that forms a triangle with each ring spaced out by 20 m. Rocks vary from between 88 and 100. Each ring has a diameter of 5 m.

6.6.6 EkOc-44

EkOc-44 consists of a bar cairn, two simple rings, and a conjoined circle. It is situated on the middle step, halfway between the edge of terrace 2 and the base of terrace 1 at an elevation of 664 m asl. On both the east and west sides are large drainage coulees. Eagle Creek lies 1.15 km to the north from the site boundaries. There is no geographical shelter at this location; however, the entire Eagle Creek valley system can be seen from this spot. The most southern ring is

composed of 97 rocks and has a diameter of 6 m. Sixty-five meters to the northeast is the conjoined circle. There are rocks in the middle of the circle that form a 'u' shape and two curved lines coming out on the south and east sides. It may represent three circles that are conjoined although the overall dimension is small at 7 m in length and 7 m in width. Thirty-five meters to the northwest of the conjoined circle is the second ring. The feature is complete, composed of 76 rocks, and has a diameter of 5 m. This feature has rocks in the centre indicating the presence of a hearth. Eighteen meters to the north is a bar cairn. This feature is 5 m long and aligned in an east to west direction. It is composed of 38 rocks and is slightly curved.

6.6.7 EjOc-55

On the flat plains of the Stranraer Terrace is a small campsite with an ambiguous rock formation. The site is located 1.8 km from Eagle Creek at an elevation of 675 m asl. At this spot one has a 360° view of the surrounding area. The most southern feature is a complete ring. It has 35 rocks and a diameter of 5 m. All the rocks are evenly spaced out. Within the circle are three rocks that may represent a hearth. Directly north of this ring by 20 m is a possible rock configuration. It is composed of 53 rocks. Within the ring is a smaller circle. It is off centre in which the perimeter is in contact with the perimeter of the main ring. Coming out the south side is a line that curves to the east. At the tip of the curve is again another curve going east which makes an 'M' appearance. Out of the first curve another line of rocks curves out to the west. The west curve is not as well defined. The rocks laying on the outside of the northern portion of the main ring are aligned in such a way to form a faint triangle. Additional rocks are scattered around the main ring and may be associated with it. Finally, the last feature is 10 m to the east from the possible configuration. It is a partial ring composed of 16 rocks.

6.6.8 EjOc-49

Located on the middle step of the Stranraer Terrace at an elevation of 608 m asl is the site of a large camp. The area here is generally flat with a slight downward slope towards the north. The boundaries of the site are 60 m by 40 m and is populated by three simple rings, one partial ring, and one oval-elliptical ring. The most southern ring is complete. It is made up of 52 rocks and has a diameter of 5 m. To the north is a cluster of two partial rings and one complete ring. The ring directly north is complete with a diameter of 5 m. The oval-elliptical ring is directly in the corner of the terrace with 5 m between the feature and the edge. It measures 3.5 m from north

to south and 5 m from east to west. On the north side of the feature is an indentation that makes the oval look 'bean' shaped. On the south side is an outer line of rocks that parallels the 'bean' shape. One large rock was placed on the east portion of the ring and one on the west portion. In total 60 rocks make up this feature. Thirty meters to the east is another complete ring. This feature has 43 rocks and has a diameter of 4.5 m. At the opposite edge of the terrace about 100 m to the east side is another large camp (EjOc-50) and 770 m to the north is Eagle Creek.

6.6.9 EjOc-50

The site is situated on the edge of terrace 2 and continues to the base of the valley. The area here offers no geographical protection other than some at the base of the terrace. In total, there are 10 simple rings and one ambiguous ring that make up this site. Three are located at the base of the terrace close to the incline. They are spaced out evenly and are positioned in a single file line in a southeast to northwest direction. The diameters range from between 3 and 5 m and are composed of between 12 and 33 rocks. The low count of rocks may be due to how deeply buried these features are. The remaining rings are positioned on top of the terrace close to the edge. They range from between 56 and 82 rocks and vary in diameters from 4 to 7 m. The ambiguous feature is located 20 m to the south of the cluster. This feature has a 'Pac-Man' shape. Two lines of rocks made with 4 rocks each are located in the ring, creating a triangular shape. The point originates near the centre and opens up to form the mouth of the 'Pac-Man'. The diameter is 4.5 m and composed of 67 rocks.

6.6.10 EjOc-52

The site is located at an elevation of 612 m asl within Coal Mine Ravine and 2 km from the perimeter of the Eagle Creek valley. Its location at the base of the northern terrace makes it well sheltered from the elements; however, the area only offers a view of the immediate area. Due to the location at the base of a terrace, the site itself has been heavily disturbed from water runoff. The topography here gently slopes down towards the Coal Mine Creek and resembles a badlands-like environment. Vegetation is very low in the immediate area due to heavy erosion. The site itself consists of one simple ring, a partial ring, and one ambiguous feature. It was photographed using a drone to accurately document the site and preserve what is left (Figure 6.11). On the western portion of the site are two rings. They are located on a small slope and most likely became exposed from large water runoff. Just south is a ring consisting of 53 rocks

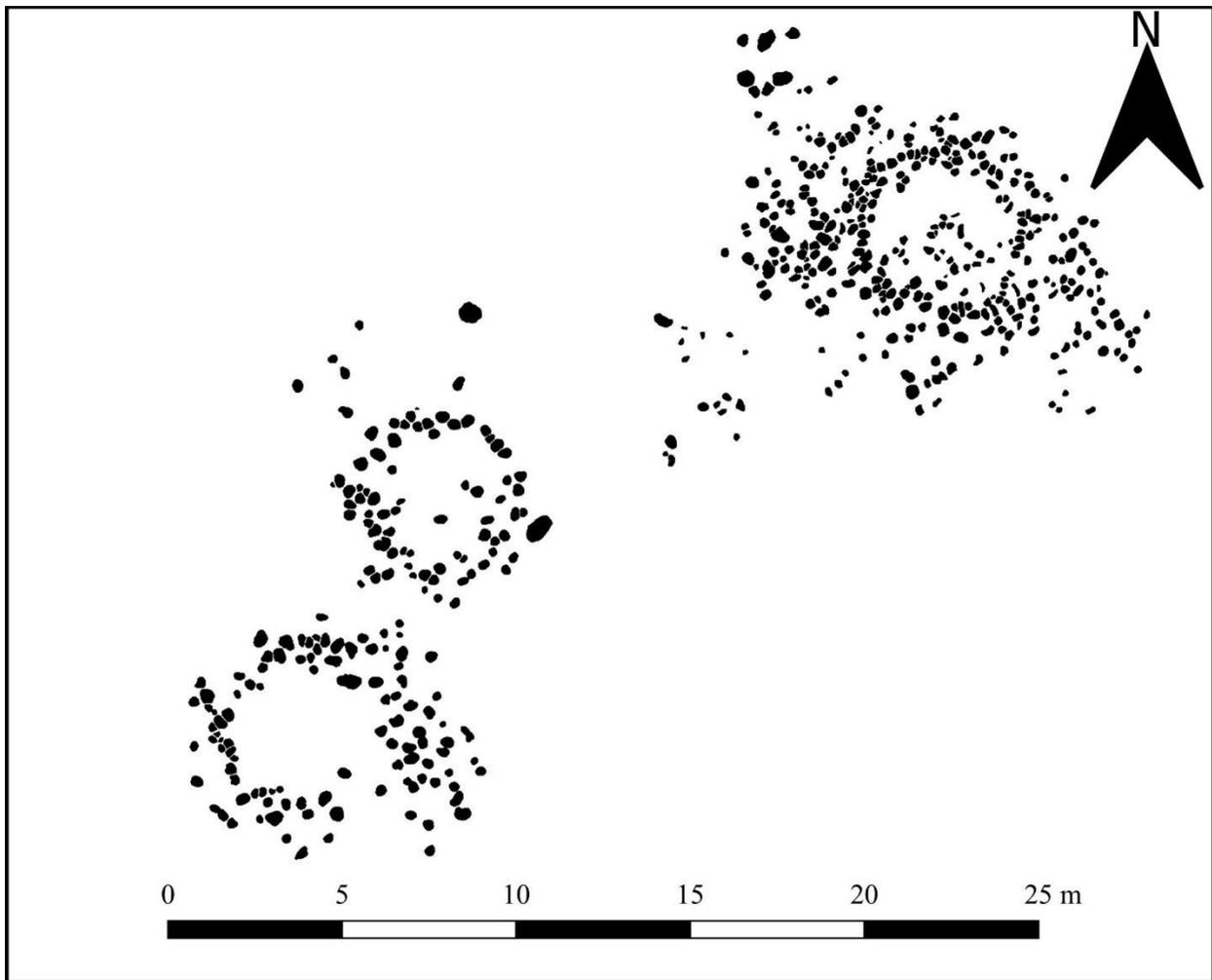


Figure 6.11. EjOc-52.

with a diameter of 5 m. Directly south is a heavily damaged ring. Sixty-seven rocks compose this feature with a general diameter of 5 m. Erosion has blown the circle out on the east side. The ambiguous feature located on the northern portion of the site is a large ring with a few lines extending away from the perimeter. The main ring is 5 m in diameter. Two of the lines on the southeast side are parallel to each other; each made with four stones. Another four stone line is located on the adjacent corner. Within the inner ring is a ‘bean’ shaped configuration measuring about 0.5 m. There is a large congregation of stones on the northwest side and one can faintly see the outlines of two additional circles attached to the perimeter of the main ring.

6.6.11 EjOc-61

On the top of the flat plains of the Stranraer Terrace is a mid-sized camp. The entire area has a slight decline towards the valley with a large drainage channel on the west side, the terraces

edge to the north, and flat continuous plains to the south and east. Due to its location, there is no geographical protection; however, the view is advantageous as it offers a 360° view of the area. The site consists of four simple rings, a large piled cairn, and an apron cairn all arranged in a zig-zag pattern. At the southern portion of the site is a simple ring. It has 76 rocks with a diameter of 6 m. The three stones located in the centre may indicate a hearth. Ten meters to the northwest is the second ring. This feature is partial ring. The absent rocks are in the southeast corner. The ring has 39 rocks and has a diameter of 5 m. Ten meters to the northeast is the third ring. It is simple ring with 55 rocks with a diameter of 5 m. In the centre are what seem to be two lines of rocks that start from the south end and go north. This lines only go about 1/4th of the way through the centre. The fourth feature is 10 m northwest of third ring. This feature has the appearance of a circle although there are openings on both the west and east sides. These gaps seem deliberate as there are parallel lines that extend from the openings. This feature has 56 rocks and a diameter of 5 m. Ten meters to the northeast is a large oblong cairn. It is made up of 61 rocks and stands above the ground by 40 cm, making it visible from the surrounding area. Lastly, to the northwest apron cairn. It is a partial ring where the opening of the ring faces east and at the end of the north sided curve is a small rock pile. The rocks in the pile are bigger than the rocks that make up the partial ring. This feature has a general diameter 5 m and is composed of 68 rocks.

6.6.12 EjOc-5 (Update)

The site was first recorded in 1981 by Ian Dyck with a later update by Kim Weinbender in 2012. The stone lines observed by Dyck, previously thought to be drive lanes, could not be relocated. Weinbender later observed rocks that formed a line on the edge of a mound which may have been what Dyck observed. These rocks were relocated; however, the number of rocks and random orientation suggests they are natural. An additional piled cairn was found during the 2020 survey on the northern portion of the site near the edge of a steep decline. It consists of 38 rocks and has a diameter of 0.75 m. The additional ring was found near where Ian Dyck's lines of rocks may have been. This ring is deeply buried and would not be visible if the grass were taller. It is made up of 25 rocks and has a diameter of 4 m. Taken as a whole, the site appears to be a mid-sized camp.

6.7 Recurrent Features

6.7.1 EkOc-37

On the middle step of the Stranraer Terrace is EkOc-37. It is isolated on both the west and east sides by large drainage coulees. There is no shelter from the elements at this spot; although, one can see the entire valley system below. The two cairns that make up this site lie just 5 m from the edge of the coulee. The ground is devoid of rocks except the ones that make up the features. Further down the slope, rocks are seen in vast quantities. The cairns are lined up from southeast to northwest and are separated by 25 m. They can be seen protruding from the surrounding grass by about 30 cm. Nine rocks make up the northern cairn while the southern cairn is much larger at 19 rocks. Both are considered piled cairns as they consist of medium sized rocks and were most likely transported to the site to construct the features. About 830 m to the northeast is Eagle Creek.

6.7.2 EkOc-30

In a drainage coulee between two large hills is a small camp. It is situated on a raised flat portion within the coulee at an elevation of 613 m asl and is adjacent to a seasonal stream. Surrounding the site is a large amount of lithic material. Shelter is granted on all sides except to the north. Since the site is nearly on the valley bottom, the view here is not advantageous as it only allows for a small window of the valley bottom. To the north by 920 m is Eagle Creek. The features that make up the small camp are two simple rings. They are lined up in a southwest and northeast direction and are separated by 20 m. In total, 58 rocks comprise the northern feature and 76 rocks make up the southern one. Both have a diameter of 5 m. There is no indication of a hearth or a doorway in any of the rings.

6.7.3 EkOc-32

On the middle step of the Stranraer Terrace is a site composed of four piled cairns. It is located on a flat narrow expanse, where both the east and west sides drop down into large drainage coulees. From this location on can see the entire Eagle Creek valley. The area does not offer any protection from the elements. The cairns parallel the contours of the terrace's edge in a northeast to southwest direction. They are arranged in a relatively straight line; however, one cairn is positioned a little outside the line. The number of rocks that make up these cairns range from 10 to 19 rocks. Each stand about 30 cm above the ground surface.

6.7.4 EkOc-33

On the middle step of the Stranraer Terrace at an elevation of 631 m asl, near the base of a slope is a small camp site. To the east and west are large drainage coulees whereas the northern direction is a long flat expanse of land. The nearest water source, Eagle Creek is just north of the site at a distance of 880 m. One simple ring and a partial ring are lined up in a single file line in an east to west direction and separated by 40 m. Both are 20 m from the edge of a decline. The northern ring is made up of 46 rocks and has a diameter of 5 m. The southern ring has 66 rocks with a diameter of 5 m. There is no geographical protection other than the large terrace to the south of the site. Rocks would have had to be transported to the site as the large flat plain is devoid of them.

6.7.5 EkOc-42

Located on the middle step is a mid-sized camp. It is situated at the base of a large incline and has ample geographical shelter on all sides. The site consists of four simple rings, with one situated on top of a mound. This is the only ring that would have a view of the region as the rest are in a small valley-like area. Each ring parallels the fence which is aligned in a north to south direction. The most southern ring is 60 meters away from a grouping of two rings and the northern ring is another 60 m from the previous two. Each ring has a diameter of 5 m and the number of rocks that comprise them range from 50 to 64.

6.7.6 EjOc-47

The site is situated on the middle step between terrace 2's edge and the base of terrace 1. Rolling hills characterize this area with drainage coulees on both the east and west sides. In total, three platform cairns make up this site. They are near the east facing drainage coulees edge and are aligned in a southwest to northeast direction. Each cairn decreases in size from south to north. The most southern cairn is composed of 47 rocks with a diameter of 1 m, the second cairn is just 10 m north and is made up of 23 rocks with diameter is 1 m. The last cairn is 5 m further north and is made up of 10 rocks and has a diameter of 0.5 m.

6.7.7 EjOc-56

Located on the middle step at an elevation of 614 m asl is a large camp site. On the west is a large drainage coulee and on the east side is a valley surrounded by small mounds. In total,

six simple rings make up this site. Four of them are located in a geographically sheltered area at the south base of a large mound. On top of the mound are two rings each placed on opposite ends. Both rings on top of the mound have advantageous vantage points of the surrounding area. The rings at the base of the mound are aligned in a row from southwest to northeast and parallel the contours of the slope. Each ring is spaced out by 5 m. Rocks range from between 44 and 76 and diameters between 4 and 5 m. The nearest suitable water source is Eagle Creek to the north by 1.52 km. Rocks used in the construction of the rings most likely originated in the drainage coulees just west of the site, although small scattering can be seen at the base of terrace 1.

6.7.8 EjOc-62

The site is situated near the edge of the flat plains on top of the Stranraer Terrace at an elevation of 680 m asl. The area offers a 360° view of the entire region. The site consists of three piled cairns. They are all spaced out by 7 m and together form a triangular shape. Rocks range from between 14 and 30 and all have a diameter of 1 m. One cairn has two small lines extending from the south, east, and west sides. These lines are made up of two rocks each and seem to be intentionally placed. The nearest water source is about 1.63 km to the north; however, there are numerous kettles to the south that may have been used.

6.7.9 EkOc-46

The site consists of two deeply buried simple rings located in a drainage channel at an elevation of 610 m asl. On both the east and west sides are steep terraces. The area here is well sheltered except on the northeast side as this direction declines to the valley's bottom. Both rings are separated by 5 m and are aligned in a northwest to southeast direction. The west ring has 57 rocks with a diameter of 4.5 m. There are several rocks located in the ring which may indicate a hearth. The second ring is deeply buried. It is composed of 54 rocks and has a diameter of 4.5 m.

6.8 Single Feature

6.8.1 EjOc-36

EjOc-36 is a small camp consisting of one partial ring. It is located on the northern terrace of the valley at an elevation of 597 m asl and on relatively flat terrain. To the east by 5 m is a small drainage coulee and 10 m to the south is the edge of the valley's terrace. There is no geographical shelter here; however, the site does offer an advantageous view of the valley system

down below. The view across the plains to the north is more restricted due to small rolling hills that obstruct the view. At the base of the terrace, 180 m from the sites boundaries is Eagle Creek. On top of the terrace the soil is light coloured, and patches of gravel can be seen outcropping in certain areas. Larger rocks can only be found on the terraces base and slope. The ring itself is missing the east portion and all rocks are partially buried below the surface. Nineteen rocks make up the feature with a diameter of 5 m. No stones are present within or outside the circle and a doorway is absent.

6.8.2 EjOc-37

On the north terrace of the valley at an elevation of 602 m asl, is a small camp site consisting of simple ring. The surrounding terrain is generally flat with a slight incline to the south. Even with the small incline, the topography does not offer any geographical protection. The ring is 30 m north of the edge of the terrace and allows for an unobstructed view of the valley, although the incline to the north restricts this view. At the base of the terrace 155 m from the site is Eagle Creek. Along the way, gravel and larger rocks are abundant on the terraces slope and glacial erratic's dot the land around the site. The feature itself is made up of 43 stones and has diameter of 4.5 m. No rocks are present in or around the ring and a doorway is absent.

6.8.3 EjOc-38

To the northwest of EjOc-37 on the north terrace is a small camp consisting of a simple stone ring. The terrain here is generally flat; however, to the north the land gently slopes down. The site is situated right between a large seasonal slough to the north and 20 m from the edge of a terrace to the south. This location offers an advantageous view of the valley system below; however, the area offers no geographical shelter. At the base of the terrace 158 m away is Eagle Creek. Lithic material is plentiful with patches of Tertiary gravels throughout the flat plains and larger rocks present on the terrace's slopes. The diameter of the ring is 5 m and is composed of 48 rocks. No rocks are present within or outside the feature. Another site consisting of a single stone ring is located 98 m to the northwest (EjOc-39).

6.8.4 EjOc-39

On the north terrace is a site consisting of a large multi-course ring. It is situated 20 m north from the terrace's edge at an elevation of 660 m asl. Patches of Tertiary gravels can be seen

eroding out of high points along the terrain. The site itself is on a very gentle incline towards a slough. Even with the high points to the north, the area does not offer any geographical protection. The high point instead restricts the view to the north but does not restrict the view of the valley system. With a diameter of 6.5 m, the ring is quite large. Rocks are placed side by side to form a double ring and is composed of 91 rocks. All the stones are deeply buried. To the south by 153 m and directly at the base of the terrace is Eagle Creek. Another site consisting of a single stone ring is located 98 m southeast (EjOc-38).

6.8.5 EjOc-40

Along the west terrace edge in Coal Mine Ravine, just north of the petroglyphs (EjOc-3), is a single simple ring. It is located between two small kames in a relatively flat area. The site is well sheltered from all directions except to the east. The eastern direction gives a restricted view of Coal Mine Ravine; however, standing on one of the nearby kames, the whole ravine comes into view. The stone ring consists of 34 rocks and has a diameter of 5 m. Numerous rocks surround the ring although they do not seem to be culturally placed. To the west by 380 m is Coal Mine Creek.

6.8.6 EkOc-23

In the centre of a small kame, on top of the north terrace is a simple ring. The kame elevates the site to 614 m asl, allowing for a 360° view of the surrounding area. At the base of the terrace, is Eagle Creek. It is 260 m from the site. Cobbles and gravel at this location are scarce. One would have to travel a distance to obtain usable lithic material. Since the site is on top of a kame, the edges of the slope are all 10 m from the feature. The ring is composed of 77 rocks and has a diameter of 6.5 m. Some rocks are doubled up in certain spots but are not consistent to one side in particular. Three rocks are observed within the ring and may indicate a hearth.

6.8.7 EkOc-24

On the north terrace, at an elevation of 618 asl, is the location of a simple ring. It lies 15 m from the terrace edge and 450 m north from Eagle Creek. The immediate surrounding area offer no geographical protection; however, the site does offer an advantageous view of the valley system. Cobbles used in the construction of the ring most likely came from the immediate area as

they are numerous. The feature itself is made up of 51 rocks and has a diameter of 6 m. All rocks are deeply buried and there is no indication of a hearth or a doorway.

6.8.8 EkOc-27

The site is situated on the flat plain of the northern terrace. To the northwest and west is a large drainage coulee and to the south is the terrace's edge. There is no geographical protection from the elements; although, the area does offer an unobstructed view of the valley system. To the south at a distance of 550 m is Eagle Creek. The site consists of one simple ring. Forty-three rocks comprise the feature and it has a diameter of 6 m. Since all rocks are deeply buried, there may be more below the surface. There is no indication of a central hearth. Cobbles are scattered on the surface around the site and on the terraces slope.

6.8.9 EkOc-26

On the shelf of terrace 1 of the Stranraer Terrace is a simple ring at an elevation of 680 m asl. Given this elevation, one can see the entirety of Eagle Creek region; however, the southern region beyond Eagle Creek valley is obstructed. The shelf itself is not much larger than the feature. Two-thousand meters to the north is Eagle Creek. Access to usable cobbles is readily available as the material is strewn across the entire slope. The large amount of lithic material would have attracted people to utilize this spot. The ring itself is complete with a diameter of 6 m and is composed of 78 rocks. All rocks are deeply buried and there is no indication of a central hearth or a doorway.

6.8.10 EkOc-31

EkOc-31 is composed of a single piled cairn on the middle step of the Stranraer Terrace. It is situated near a deep drainage coulee on an east facing slope. Twelve rocks make up the cairn and together they protrude 30 cm above the grass line making it easily visible from some distance away. Each rock is uniform in size and due to the lack of cobbles within the vicinity, they most likely originated elsewhere. The nearest reliable water source is Eagle Creek which lies 635 m to the northeast; however, the nearby seasonal drainage channel may have offered water seasonally.

6.8.11 EjOc-46

On the middle step located on complex terrain is a small camp site. It is situated at an elevation of 626 m asl and is surrounded on both the east and west sides by large drainage coulees. To the north and south are rolling hills and further to the north at 1.76 km is Eagle Creek. Halfway up the southern mound on a flat portion is a simple ring. Large glacial erratics sit just outside the rings perimeter and mid-sized cobbles are numerous in the surrounding area. The stone ring itself is composed of 60 rocks and has a diameter of 6 m. There is a slight depression covering the entire area of the circle, with a maximum depth of 30 cm. The area here offers no protection from the elements; however, it does offer an advantageous view of the valley system.

6.8.12 EjOc-44

On the middle step of the Stranraer Terrace, 2 km west from Herschel is a hollow cairn. Here the terrace is quite narrow, surrounded on both the east and west sides by large drainage coulees. A few knobs are also present on top of the terrace making a complex terrain. Both the east and west directions decline down allowing for a view of the valley. Further to the north at a distance of 1.78 km is Eagle Creek. The feature itself is composed of 133 rocks with a diameter of 6.5 m. All the rocks are less than 20 cm in size and are piled up to form a small wall-like structure with a depression in the middle. The height of the structure protrudes up from the ground by 35 cm.

6.8.13 EjOc-45

The site consists of a single erratic cairn located on the middle step of the Stranraer Terrace. Here the terrain is quite complex consisting of small mounds and paralleling meandering drainage coulees. The cairn is situated on a flat portion of an east facing edge. To the north is another decline into the same drainage coulee making the terrace edge look like an isolated protuberance. Further north, at a distance of 1.76 km is Eagle Creek. Water could also have been accessed to the east in Coal Mine Ravine, although traversing the complex terrain would make the journey considerably more difficult. The feature itself is made up of 27 rocks and has a diameter of 1.2 m. It protrudes from the ground surface by about 45 cm and can be seen from some distance away. Rocks have been placed onto two larger glacial erratics which most likely originated there. Adjacent to the cairn on the east side is a scattering of three additional rocks.

Since the area is devoid of cobbles, the additional rocks may have been part of the cairn at some point.

6.8.14 EjOc-48

Directly north of the Herschel petroglyphs (EjOc-3) by 2.4 km is an apron cairn. It is situated on the topmost portion of a small kame and surrounded by cobbles and brush (Figure 6.12). Given the rise above the surrounding terrain, the spot gives an advantageous view of the surrounding area. It sits at an elevation of 620 m asl with 1.28 km between the site and Eagle Creek. Overall, the feature is oblong in shape with rocks missing from east side of the ring. The partial ring measures 2 m from east to west, and 3 m from north to south. Rocks are not all uniform in size and range from between 20 cm and 40 cm. In total, 78 rocks comprise the feature. There are slightly more rocks located around the west side forming a cairn structure. At each corner of the feature is a single rock located 30 cm away.

6.8.15 EjOc-54

The site consists of a single piled cairn located 60 m west of Doug Richards Medicine Wheel (EjOc-20) and separated by a drainage coulee. It sits on the topmost portion of the Stranraer Terrace which grants a 360° view of the entire region. The feature is an oblong piled cairn completely covered by gooseberries (*Ribes oxycanthoides L.*). It measures 1.5 m from north to south, and 1 m east and west. In total, 80 rocks were used to construct it. A number of them are deeply buried which suggests more maybe located below the surface. Due to the number of rocks used, the feature sticks up from the ground by 40 cm and can be seen from some distance away. A few of the rocks are scattered on the peripheral of the cairn and may have been part of it. At this location Eagle Creek is 1.28 km to the north; however, several kettles are located to the south which may have supplied suitable water. The presence of cobbles scattered on the flat plains in the vicinity suggests that the cairn is not Euro-Canadian since the land around it was never broken.



Figure 6.12. EjOc-48 (Facing south).

6.8.16 EjOc-51

On top of the Stranraer Terrace, 700 m to the northwest of Doug Richards Medicine Wheel (EjOc-20) is a single deeply buried simple ring. It is situated on the flat plains overlooking the entire region at an elevation of 665 m asl. The area does not offer anything in geographical protection, but it does offer an advantageous 360° view of the region. The feature itself is made with 13 uniformly sized stones and each one is evenly spaced out. Suitable water for drinking is quite a distance away, with the nearest water source being Eagle Creek at a distance of 1.87 km. Some kettles to the north may have also been used for water.

6.8.17 EjOc-58

The site is situated 10 m from the edge of terrace 1 at an elevation of 615 m asl. Here, the terrain has a gentle slope down towards the north and is generally flat. The area offers no geographical protection; however, it does offer an advantageous view of the valley region below. The feature itself is a single platform cairn. Twenty-six rocks make it up, all of which are in contact with the ground. Directly north is Eagle Creek at 830 m away.

6.8.18 EjOc-59

Southeast of EjOc-56 is a stone arc configuration. The feature is situated on the shelf of terrace 1 of the Stranraer Terrace at an elevation of 622 m asl. This location allows for an advantageous view of the valley system; however, the view is completely obstructed to the south. The shelf the site is covered with small cobbles and a few larger glacial erratics. Within the debris is an arc feature composed of 64 rocks with an overall diameter of 5 m. Both lines at the end of the 'U' shaped arc slightly curve outwards.

6.8.19 EkOc-45

EkOc-45 consists of one feature located on the middle step at an elevation of 690 m asl and is just south of the hamlet of Stranraer. This feature is a multi-course ring. This inner circle has a diameter is 2 m and 27 rocks make it up. Rocks located within the inner ring may represent a partial ring. The outer circle has a diameter of 3 m with 25 rocks that make it up. This outer ring is not complete with missing stones on both the south side and northeast side.

6.8.20 EkOc-47

The site is situated near the edge of terrace 1 of the Stranraer Terrace at an elevation of 634 m asl. It sits on a narrow hill about 50 m back from the valley's edge. To the north by 1.13 km is Eagle Creek. The site consists of a single piled cairn. It has 29 rocks with a diameter of 1 m and protrudes from the ground by 30 cm. Its location on a small mound and the height of the features allows it to be seen from some distance away.

6.9 Diagnostic Artifacts in the Collections

Of the two collections analysed, 147 artifacts proved to be diagnostic. Figure 6.13 illustrates the number of diagnostic points in relation to their determined complex. On the figure, two points are represented as time periods instead of complexes. This is due to insufficient data. The Early period is only represented by a thick cross-section of a supposed lanceolate and the Middle period point bears some resemblance to Mummy Cave/Gowen; however, they can not be narrowed down further. Additionally, the Pelican/Besant point shares similarities of both Besant and Pelican Lake. From the data, Oxbow, Prairie Side-notched, and Besant are more prevalent in the collections. This is followed by Pelican Lake and Plains Side-notched. For a complete list of all the artifacts in both the Ancient Echoes and Doug Richards collections, refer to Appendix 1.

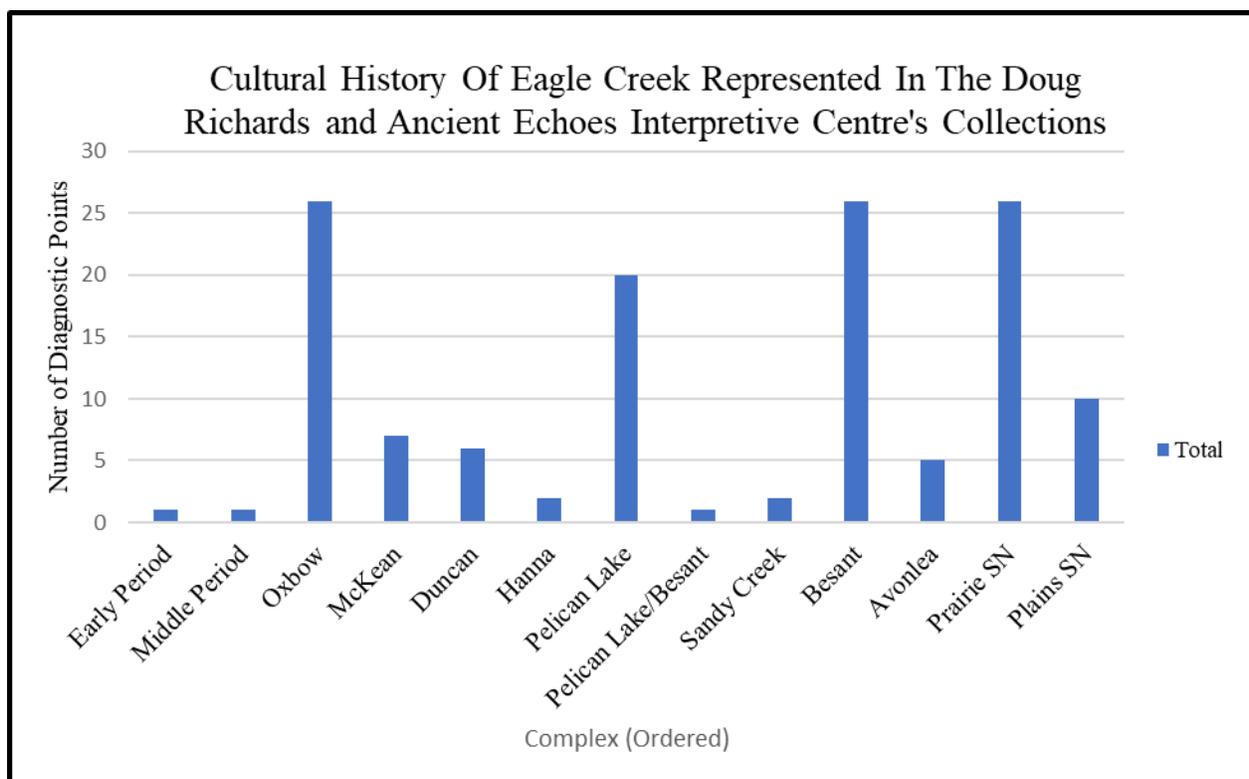


Figure 6.13. Cultural history of Eagle Creek represented in Doug Richards and Ancient Echoes Interpretive Centre’s collections.

CHAPTER 7. IDENTIFYING PLACE THROUGH THE ARCHAEOLOGICAL RECORD

7.1 Introduction

An in-depth knowledge of the landscape allows one to fully exploit their environment. Knowing where biological and cultural needs can be met requires a way to ‘read’ the natural features of the land. Through repetitive use of the landscape, certain locales become centres of meaning and as a result place is idealized. The cultural landscape is a network of these places. Each place is a unique manifestation that owes its meaning to what it may provide to the individual or group. To Binford (1982), in order to understand the wider cultural system, these places should be explored as a unit of interest. The identification of place through the archaeological record thus has implications for understanding regional landscape interactions and use.

Place as a concept is not new to archaeology (Ashmore 2002; Oetelaar and Oetelaar 2007). However, identifying place has seen little attention and is mostly restricted to cultural anthropology and geography (Basso 1996; Golledge 2003; Relph 1976; Tuan 1977) with some exceptions (Zedeño and Bowser 2009; Rockman and Steele 2003). Archaeologists tend to focus on ecological models of settlement patterns when referring to locational choices and incorporate ethnological data when possible (Binford 1982; Jochim 1976; Kelly 1995; Oetelaar and Oetelaar 2007). The discussion presented here focuses on the approaches regarding the concept of place and what constitutes a meaningful place. A general framework of landscape archaeology borrowed from Whittlesey (2009) will guide the discussion. The models presented below will then be applied to the data gathered from the 2020 survey of Eagle Creek to show how the Stranraer Terrace is a meaningful place in a wider cultural landscape.

7.2 The Framework

The framework proposed by Whittlesey (2009), is an accumulation of approaches from contemporary landscape archaeology. These dimensions are the cognitive, the formal, the historical, the relational, and the ideological. The cognitive dimension describes how humans perceive and interact with their surroundings. The formal dimension is an analysis of the physical unmodified characteristics of a topographical feature or landscape. The historical dimension is what Ashmore (2002) has described as the life history of place. This is “examining evidence for human recognition, use, and modification of a particular position, locality, or area over the full-time span of its existence” (Ashmore 2002:1178). “The relational dimension focuses on

organization, linking humans and the environment at a variety of scales” (Whittlesey 2009:75). Finally, the ideological dimension is understanding meaning and how people assign it to their landscape. As Shanks and Tilley (1987:76) put it, “ideologies are not merely reflected in the psyche ... they are always inscribed in the materiality of social practices and objectified in material manifestations”.

7.3 The Concept of Place

The concept of place is the foundation for the phenomenological approach to geography (Relph 1976). It is the understanding that place is more than a spatial location. It is the relationship between memory, experience, and the landscape. This approach recognizes that as one imparts meaning upon the landscape, so too can the landscape impart meaning on the self. To Zedeño and Bowser (2009:6), a place is “a discrete locus of behaviour, materials, and memory – a meaningful locale, a product of people’s interaction with nature and the supernatural as well as with one another”. Further, a meaningful locale or place is “that which reminds people of their past and teaches them how to cope with the present and plan for the future” (Zedeño and Bowser 2009:13). These “places possess a marked capacity for triggering acts of self-reflection, inspiring thoughts about who one presently is, or memories of who one used to be, or musing on who one might become” (Basso 1996:107).

Space is intricately tied to the concept of place. To Relph (1976), space provides the context for places. Physically it is the environment out ‘there’; however, space may be an intangible location that transcends the physical. To Relph (1976:10), space has “content and substance that derive both from human intention and imagination”. Tuan (1977:58) sees it as “a resource that yields wealth and power when properly exploited”. “Space becomes a reality of places that owe their meaning to the past actions of the observers” (Wilson 1995:171). By experiencing space and endowing it with value, the landscape becomes organized through the process of claiming and naming place (Tuan 1977; Wilson 1995).

Places hold in them the cumulative ideals that a culture endows upon them. They are first formed due to a pause in movement to satisfy some biological need (Tuan 1977). At first the pause may be insignificant. A biological need is met, and one moves on. However, repeatedly stopping at the same locale time and time again, may have the effect of reinforcing felt value. As Relph (1976:32), explains “much ritual and custom and myth has the incidental if not deliberate

effect of strengthening attachment to place by reaffirming not only the sanctity and unchanging significance of it, but also the enduring relationships between a people and their place”.

Each place then, is a unique manifestation that owes its meaning to the nature of the space and the perception of the observer. As such, they will not be experienced the same way from culture to culture. The psychological qualities that a place holds may even change the meaning from individual to individual (Relph 1976). “Some places are uplifting and others gloomy [and] some are more memorable than others” (Wilson 1995:171). Further, Rodman (1992) argues that the general location of a place within a network of places may even derive or determine its unique meaning. In studying hunter-gatherer regional use and mortuary practices in the Kawartha Lakes Region in Ontario, Conolly (2019:200) has shown that there are centralized locations within long term mobility patterns. He concludes that these areas most likely were hubs that ‘reinforced both intra and intercommunity relationships’.

Understanding the boundaries of a place is more problematic. However, as Ingold (1993:156) puts it, “in a journey from place A to place B it makes no sense to ask, along the way, whether one is ‘still’ in A or has ‘crossed over’ to B”. In this context, it is more appropriate to say that places have centres. When viewing it as such it is easier to explain that “centers exist within centers” and may be connected or overlap (Wilson 1995:171). As the boundaries of place expand, the meaning changes. For example, ‘your’ home belongs to ‘your’ neighbourhood, and ‘your’ city belongs to ‘your’ country. There is more meaning pertaining to the home than that of your country. Thus, places exist at different scales in a heterarchical fashion (Tuan 1977). However, when talking about centres or boundaries there will always be an inside and an outside. This ‘outside’ is what defines space.

7.4 Optimal Foraging Theory and Settlement Patterns

Models of settlement patterns within archaeology have been widely borrowed from ecology and economics. They bring with them formal explanatory principles to answer key questions of biological choices using environmental parameters (Hardesty 1980). A prominent theory utilized in explaining the behaviour choices of settlement patterns is optimal foraging theory. It states “an activity should be enlarged as long as the resulting gain in time spent per unit food exceeds the loss. When any further enlargement would entail a greater loss than gain no such enlargement should take place” (MacArthur and Pianka 1966:603). Winterhalder (1986) advances this idea through the understanding of risk. To him, risk is the probability of loss and

that animals and humans should avoid it whenever possible. Since humans do not always make optimal choices, it is important to include cultural variables (Jochim 1988).

Patch theory is a major analytical category of optimal foraging theory. Patches are characterized by areas on the landscape that have either higher or lower biotic productivity. When looking at a landscape's ecology, these differences in productivity create a mosaic of differentiated land (Osborn and Kornfeld 2003). These patches can substantially vary in size and dramatically change through time (Bamforth 1988). Within the Plains, these areas include uplands, riparian zones, canyons, playas, escarpments, dune fields, and other topographical features. Patch choice depends on either productivity and/or predictability (Bamforth 1988). The knowledge to accurately predict resource availability thus becomes a risk minimizing behaviour. Patch theory can help explain settlement patterns since residing in or near low-risk patch (that of high biotic productivity) should be favoured.

Jochim (1976) has described three goals which operate in settlement placement. These are "proximity to economic resources, shelter and protection from the elements, [and a] view for observation of game and strangers" (Jochim 1976:50). Economic resources do not only take the form of consumables. Since humans do not always make optimal choices, other categories/variables such as food storability, non-food yields, and social factors need to be considered (Jochim 1988). Additionally, resource reliability is an important variable. Among the Waswanipi Cree, settlement would usually be placed near a reliable source of fish in case the less reliable hunting method did not pan out (Jochim 1976).

When analyzing the data from a large-scale survey in the lower Red Deer River, Adams (1978) found that finer soil was preferred for the placement of a camp, in addition to complex topographical features for shelter and areas with an advantageous view. Brumely (1983), in a similar study analyzed the placement of tipi rings within the Suffield Military Reserve in southern Alberta. The area offers diverse topographical features from a portion of the Cypress Hills, several major rivers streams, coulees, sandhills, and both gentle and strong rolling prairie. He concluded that the densest concentration of rings was found along the major rivers, streams, and coulees. His explanation included ecological variables discussed above such as the proximity to food, water, fuel, and lithic resources.

7.5 Mobility Patterns

Mobility patterns refers to “the nature of the seasonal movements of hunter-gatherers across a landscape” (Kelly 1983:277). According to Binford (1982:6), “the way in which a group uses its habitat is directly conditioned by the pattern of moving out and then returning to a residential camp”. Residential camps can be defined as the home base of a group or an individual family. Surrounding this camp is the foraging radius and beyond that is the logistical radius. The foraging radius is used for exploiting resources that have a low risk. When utilizing this radius, an individual can return back to their camp within a day. The logistical radius on the other hand is several kilometers away. It would take more than one day to return home once out this far. This area coincides with high-risk resources and is used by hunting parties. Binford labels the combined area of the residential camp, foraging radius, and the logistical radius as the camp range (Binford 1982). According to Kelly (1995), the size of the camp range increases if there is a high dependence on hunting.

Once resources have been diminished in the camp range, a group will relocate. The way in which a group moves has been discussed by Binford (1982) through two different patterns: the complete radius leap-frog pattern or the point-to-point pattern. The leap-frog pattern is used in a high biomass environment where resources are exploited as they are encountered during movement. Here camp ranges would overlap with each other. A point-to-point pattern is where “a residence is moved from one relatively rare location providing access to food, water, and fuel to another such location within the region” (Binford 1982:9). The camp ranges here may be several kilometers in between and would have to be located outside the previous logistical radius.

Within Alberta, Brumley (1983) identified large concentrations of tipi rings on the Northwestern Plains about 14.3 to 27.4 km away from both the South Saskatchewan and Red Deer Rivers. He interprets these distances as “an average days travelling distance across the plains from the river valley” (Brumley 1983:182). Oetelaar (2004), agrees with this interpretation as it aligns to historic travel accounts by European explorers led by Indigenous guides. The implications of travel distance and mobility patterns aids in the understanding of how places become linked together. As Zedeño and Bowser (2009:10) express, “To piece together people’s histories from a place-making perspective it is necessary to address the ways in which places, by virtue of human action, become linked to one another to form a place network”.

7.6 Cognitive Mapping and Wayfinding

“Cognitive mapping concerns how we think about space, and how those thoughts are used and reflected in human spatial behaviours” (Kitchin and Freundschuh 2000:1). Downs and Stea (1973:7) describe it as “a process composed of a series of psychological transformations by which an individual acquires, stores, recalls, and decodes information about the relative locations and attributes of the phenomena in his everyday spatial environment”. Cognitive mapping integrates both geography and psychology. However, psychology is usually concerned with small-scale controlled laboratory experiments whereas geography concerns itself with larger regional analyses (Freundschuh 2000).

Navigating through space requires a way of reading and internalizing the landscape. To travel from point A to point B requires a set of processes “to be able to identify origin and destination, to determine turn angles, to identify segment and lengths and directions of movement, to recognize on route and distant landmarks, and to embed the route to be taken in some larger reference frame” (Golledge 1999:7). This is the concept of wayfinding. Golledge (2003) has identified four separate processes involved in wayfinding: homing, piloting, chunking, and schema. Homing is the process in which an individual processes their spatial position in relation to some other object in the environment. Piloting uses known landmarks as guides, as one traverses the land. In piloting, “the traveler relies exclusively on sequentially organized knowledge; one landmark is associated with specific direction information that leads to another” (Allen 1999:49). Chunking refers grouping landmarks to aid in memorization and lastly, schema is the process of using pre-existing navigational knowledge. “This schema will have been developed from past experiences – not necessarily specific past experience in the same environment – but rather the anticipatory schema is made up of assumptions, beliefs, and predictions derived from environmental experience in general” (Kitchin and Blades 2002:20).

When navigating an environment, “humans tend to rely most heavily on visual or, in cases of visual impairment, on auditory, vestibular, and proprioceptive information” (Allen 1999:40). Visual markers in space act as important ‘strategic foci’ as people move throughout their environment. These markers are referred to as landmarks. According to Sorrows and Hirtle (1999), there are three types of landmarks: visual, cognitive, and structural. Visual landmarks are features that have saliency in their environment. Cognitive landmarks have meaning to the individual or group and structural landmarks are symbolic representations such as the *inukshuk* to the Inuit or a street sign in an urban environment. In a micro-scale environment such as a closed

experimental laboratory, landmarks may be small objects. In a macro-scale environment such as a geographical region they may be large structures or geographic features (Freundschuh 2000). Landmarks then, are usually determined by their “visual form, peculiarity of shape or structure, or because of sociocultural significance” (Golledge 1999:17).

Navigating the environment also relies on the routes that connect between nodes. The traveler must consciously choose which route to travel to achieve their purposeful destination. These routes are determined based on what is needed at the time and may change to accommodate unforeseeable events. Depending on the year it may even be wise to travel a different route to better manage resources, fulfill a cultural need, or follow a moving resource. “Therefore, pathway networks vary in formal properties, in behaviour and cultural associations, and in specific life histories” (Zedeño and Stoffle 2003:61).

7.7 Cognitive Maps and Information Exchange

Cognitive maps are the “internal representation of spatial information” (Golledge 2003:15). They are developed through either primary learning (moving through the environment) or secondary learning (map use or verbal directions; Golledge 1999; Kitchin and Blades 2000; Whallon 2011). According to Golledge (1999), this knowledge is represented cognitively by nodes (places), lines (routes), and areas (a region). Cornell and Hetb (2000:73) explain, that taken together this knowledge is a network of a person’s movement throughout their life, similar to a map representation but without a ‘superordinate frame of reference’. As Kitchin and Blades (2002:9), explain “many aspects of a person’s spatial behaviour are based on his or her cognitive map, and understanding cognitive map processes can lead to explanation and prediction of behaviour”.

Primary learning of spatial knowledge is gained by interacting with and moving through the environment. There are three main theories of how cognitive maps are learned through primary learning (Kitchin and Blades 2000). The first uses landmarks as building blocks to organize the landscape in which other information such as routes are built upon it. Conversely, the second theory states that route-based information proceeds the use of landmarks. After paths are integrated, landmarks and other information is then added. Lastly, the third theory does not rely on landmarks at all and instead the landscape is internalized as a series of ordered views or vistas.

Secondary learning relies on the ability to accurately retrieve information from a cognitive map. “Given that information is differentially acquired by individuals or groups, no one of these entities usually has access to all available information necessary or useful for any action or response unless this information is circulated and shared in some way” (Whallon 2011:7). The sharing and acquisition of environmental knowledge allows groups to know areas beyond their own perceptual experience. This builds environmental knowledge of a nearby region and the ability to know where other resources and groups are. This knowledge “includes plans, intentions, routes, and destinations of groups ... others know where you are, where you will be, or where you should be, or where you could be” (Lovis 2016:123). According to Lovis (2016), acquiring this knowledge of the environment through communication allows for network maintenance.

Aporta (2016) has documented the Inuit approach to describing and communicating a precise location on the landscape. This approach reveals descriptive stages that one goes through when externalizing environmental knowledge. The first is that of identifying the region or general area, next is the identification of a major topographical landmark. The landmark then acts as a backdrop for the final step. When standing at the precise location, certain features of the landmark will be visible. Describing these visual cues allows for the person receiving the information to visualize the location. According to Kitchin and Blades (2002), this hierarchical system of explanation may be a universal human property.

In most groups on the plains of North America, the Sun Dance is an important event that begins around the end of spring. The ceremony is initiated by sending out a messenger to neighbouring groups. The messenger relays the location to where the Sun Dance will take place. On the first day of the ceremony each camp moves to the previously selected location. Within days of initiating the event, numerous groups congregate to perform the ceremony (Ewers 1958; Wissler 1918). Communicating a specific location requires shared cultural knowledge of the landscape and the ability to describe spatial knowledge.

Communication is aided when the landscape is organized through place-naming. Oetelaar and Meyer (2006), have looked at the maps made from the early explorers of the Blackfoot homeland to understand place names. These early explorers were guided by members of the Blackfoot along traditional trails. The Blackfoot guides would identify trail routes and places and the explorers would jot them down on a map. Of the 184 names collected, 64% refer to important visual landmarks. These include names of hills, ridges, buttes, mountain peaks, isolated groves of

trees, springs, and grassy plains (Oetelaar and Meyer 2006). Similarly, in the Boreal forest of Alberta and Saskatchewan, Cree place names recorded in 1887 highlight the focus on landmarks. Seventy-nine percent of the 113 names recorded refer to a visual topographical feature (Oetelaar and Meyer 2006:362). However, not all topographical features within the Boreal forest were included on the Cree maps. The lakes omitted appear to have had no economic importance to the group and thus were not visited or discussed.

7.8 The Modified Cultural Landscape

Walker (2012) makes a useful distinction between a built environment and a marked environment. To him, a built environment is a large investment of time. It “emphasizes the relationship between what societies construct and how those constructions affect societies” (Walker 2012:15). Conversely, a marked environment “reflects a smaller investment of labor but no less an investment of meaning”. The distinction here is important to understand the purpose of a particular landmark. A marked environment includes the navigational markers used to orient oneself in space. Built environments as the name implies are ‘built’ upon the marked environment. Zedeño et al. (2014) advances this idea using the term “engineering”. Landscape engineering is the “intentional modification of place and resource networks through sequences of action and inscriptions” (Zedeño et al. 2014:24).

The idea of ‘landscape engineering’ was incorporated into analyzing the Two Medicine River Valley located on the Blackfeet Indian Reservation in Montana (Zedeño et al. 2014). The large-scale survey documented large systems of bison drive lines, large ‘mega-cairns’ on highly elevated topographical features, and ceremonial sites. To Zedeño et al. (2014:24), “such modifications aimed to increase permanence, manage the flow of people and resources, and thus plan for the future”. The idea is based on the assumption that it takes a large investment of time to perform bison jumps, build, and maintain drive lanes, and the associated processing of large kills. Not only does this allow people to work towards a massive kill, perhaps once a year, it also allows future generations to utilize these features as well. Secondly, the production of ritual wealth through the construction monuments shows a continued connection with the land (Zedeño et al. 2014). The task of assembling and designing such structures does not happen with a single person or group. It requires a large amount of invested time and labour spent in addition to tasks associated with basic survival.

In analyzing the tipi ring data provided by Vickers (1991) from southern Alberta, Oetelaar (2004) noticed large concentrations of tipi rings occurring in the vicinity of important landmarks. These landmarks are well known to the Blackfoot, as they appear on historic maps with their associated Blackfoot names. One such location “represents the convergence of an important east-west trail and fords across both Seven Persons Creek and the South Saskatchewan River” (Oetelaar 2004:144). The landmark thus acted as a navigational marker, allowing groups to know where they are in space. To the Blackfoot, both a marked and built environment make up their cultural landscape. Each path or place is associated with myths, legends, and narratives (Oetelaar and Meyer 2006). Oetelaar and Meyer (2006:359) explain, as the Blackfoot move from place to place, they are journeying through history. “Movement through the landscape becomes a lesson in the history of the group and in the transmission of knowledge from one generation to the next” (Oetelaar and Meyer 2006:359). Destinations thus become idealized places. Culturally known places to the Blackfoot include Cypress Hills and Sweet Pines Hills in Alberta (Oetelaar and Oetelaar 2006).

7.9 The Stranraer Terrace as a Meaningful Place

The data gathered from the 2020 survey shows a large concentration of archaeological sites on a prominent landform on the plains of North America (Figure 6.1). Fifty-four sites in total are located directly on the Stranraer Terrace with an additional 19 sites in the Coal Mine Ravine section. Of these sites, 46 represent stone rings and/or cairns, 8 represent sacred/symbolic sites (these include sites of special nature outlined under section 64 of the *Heritage Property Act*) and 13 represent artifact scatters/finds. Of the sacred/symbolic sites, two are Medicine Wheels (EjOc-20, EkOd-2), three are petroglyph sites (EjOc-6, EkOc-35, EkOd-3) where EkOc-35 has a platform cairn next to the carved rock, one is Vision Quest site (EjOc-25), one is a cairn formation (EkOc-41), and one contains a conjoined circle (EkOc-44). Within a radius of 15 km from the upland feature are 44 sites of either artifact finds or cairn/stone ring sites. Based on the excavated sites (EkOc-3, EjOc-13, EkOd-6) and the artifacts found within the study zone, Oxbow appears to be the earliest occupant. Pelican Lake, Besant, Avonlea, and Prairie and Plains Side-notched have also been found as surface finds during both previous HRIAs and the 2020 survey. The artifact collections housed within the Ancient Echoes Interpretive Centre suggest the area was more diverse as it includes Hanna and Duncan points. One mid-shaft of a point with a thick mid-section may indicate an even older occupation dating back to the Early period. This would

be plausible since deglaciation would have made this area habitable sometime between 12,000 and 9,000 BP.

The Stranraer Terrace would have provided ecological benefits to past peoples. It is located adjacent to a constant water source and a rich riparian zone. Since Eagle Creek is the only drainage point within the mid-western portion of Saskatchewan (between the North and South Saskatchewan Rivers), it most likely attracted groups to stay within the vicinity of the creek to access this water. The creek system with its riparian zone should be classified as a high biotic patch. Not only does it provide water, fuel, and vegetal needs to humans, but it would also attract other wildlife. According to optimal foraging theory, groups should position themselves near this high biotic patch to minimize loss and reduce risk. Risk is further reduced when considering the predictability of this patch. Additionally, Jochim's (1976) three goals that operate for hunter-gatherers in settlement placement explain the behaviour choice of utilizing the Stranraer Terrace. The Stranraer Terrace, along with Coal Mine Ravine provides complex topography with multiple levels of elevation. Different viewsheds of the surrounding area are accessible allowing one to monitor resources and neighbouring groups. Besides EkOc-50 and EjOc-52 all sites are either surrounded by topographical shelter or located on the terraces; however, EkOc-50 includes rings on top of the nearby terrace as well. The upland feature also provides easier access to lithic resources. The Tertiary rock seen in the assemblages can be seen outcropping in various spots and the riparian zone of the creek and Coal Mine Ravine also provide fuel.

Within the relatively flat plains, the Stranraer Terrace acts as a landmark. It is differentiated from the surrounding area by its size, height, and complex topography. According to cognitive mapping, landmarks are used in organizing spatial data allowing one to navigate through the landscape. Landmarks provided the traveler the knowledge to know whether they are on the right route, whether or not they should change their direction of travel, and whether or not they have achieved their destination. Decisions of route selection then can be made once one reaches this landmark. Since the Stranraer Terrace is a landmark, it acts as a building block of a cognitive map. It thus becomes an anchor point in which routes, assumptions, and beliefs are aided. It is important to note that this landmark can only be seen when viewing it from the north. Due to its topography the south side does not dramatically drop down. Rather, it is a gradual slope making the land look relatively flat. This is not unlike Bull's Head Hill in Alberta. The upland feature resembles the Stranraer Terrace topographically although it is only visible from the south and partially from the north. This example has led Oetelaar and Oetelaar (2006) to

believe that perspective is important when understanding landmarks and, in this case, topography may even have implications when determining the direction of travel.

As demonstrated, Stranraer Terrace is a useful locale on the landscape by acting as a landmark for navigational purposes and providing ecological benefits. These two characteristics of the locale had the affect of attracting groups to return and use the space. As the locale underwent repeated use it had the affect of accumulating meaning through memory and transforming the space into a place. It is important to distinguish whether this landmark is part of a marked or built landscape as it will glean the significance and meaning of this locale. It is through the analysis of specific sites and their relation to a wider cultural landscape that this is made possible.

The Herschel Petroglyphs (EjOc-3) along with EjOc-6 and EkOc-35 all bear striking similarities to other Hoofprint tradition sites. The bison imagery at Monolith 1, the ribstone, and the techniques used to carve these rocks can be attributed to this tradition. The difference is the stone platform identified in levels 1 through 8. Similar platforms have been found at the Forks and Minor Ceremonial Area along the Red Deer River in eastern Alberta and may suggest western Algonkian use (Reeves and Kennedy 2017). EjOc-6, EkOc-35 and Monolith 3 at EjOc-3 are more ambitious carvings representing geometric designs. As Buchner and Steinbring (1995b:16) explain, these may be “carving rituals at loci not providing appropriate media for the dimensional imagery”. EjOc-6 and EkOc-35 may represent these carving rituals too. In addition, the excavated site of EjOc-13 (a secondary butchery site) is located directly below the petroglyphs in the ravine, bearing a similar cultural history as EjOc-3. This is a pattern seen at other Hoofprint tradition sites such as Saddle Butte and the Big Bend region of the Milk River (Keyser and Klassen 2001). Evidence supports the notion that “some Hoofprint petroglyphs are associated with ritual activities relating to communal bison hunting” (Keyser and Klassen 2001: 188). Keyser and Klassen (2001), believe the association “between petroglyphs and bison kill or processing sites imply that some of the rock art was subject of rituals conducted by a hunt shaman” (Keyser and Klassen 2001:188). The offerings identified during the excavation of EjOc-3 supports this notion.

On the higher elevated spots of the Stranraer Terrace is the presence of two Medicine Wheels (EjOc-20, EkOd-2) interpreted to be made by western Algonquian groups (Reeves et al. 2018; Mirau 1995). According to Brumley’s (1988) classification scheme, both EjOc-20 and EkOd-2 are considered subgroup 3. It has been shown that other wheels under the subgroup 3

classification represent human memorials as evidenced by the Halbrite Medicine Wheel (DiMv-2) excavation that revealed a partial skeleton and a clay pipe (Reeves et al 2018). However, Reeves et al. (2018) believes not all subgroup 3 wheels are memorials. Some may represent entopic visions or constellations. According to Mirau (1995:206), these subgroups may signify a “specific language group occupied this area and that the structures were manifestations of a particular set of cultural beliefs”. He goes on to say that these structures “served as inspiration to groups that came into contact with them long after they were built” (Mirau 1995:206). ‘Outsider’ groups who view these structures may know their specific meaning but the way they interpret it would differ. There is a noticeable difference between the two wheels identified here. EkOd-2 seems to have had a larger investment of time. According to Mr. A.J. McGill, the cairns that composed this feature were stacked 6 ft high and made with fist sized stones (Farrel 1983). The tipi rings located adjacent to the wheel and the flaking station, suggests continued maintenance of this wheel which is common for these more developed wheels. In contrast, EjOc-20 is not as well developed. Each cairn is composed of 3 or 4 stones and the two stone rings nearby are much further away.

The cairn alignment (EkOc-41) may represent what Reeves et al. (2018) considers place markers or wayfinding markers. An example, given by Reeves et al. (2017) shows that there are specific signs given to specific places. To both the Gros Ventre and Nitsitapii the “sign for the Sweetgrass Hills is three hills, and a slightly asymmetric inverted U for Chief Mountain” as shown on Peter Fiddlers maps (Reeves et al. 2017:22). They go on to say that “place signs may well have been laid out as stone markers for these significant locales” as evidenced by a horseshoe shaped structure located at the great bend of the Red Deer River (Reeves et al. 2017:22). The construction of this alignment may signal to other groups who this locale belongs to and/or signify where the next destination is.

Two other significant sites to consider are EkOc-44 containing a conjoined circle and the Vision Quest site (EjOc-25). According to Reeves and Kennedy (2017:8), “the joining of two or more tents is commonly done in camps during ceremonies such as bundle openings, society dances and other gatherings with large numbers of participants”. This type of activity has been seen in Gros Ventre groups (Reeves et al. 2017:8). The Vision Quest site (EjOc-25) located near the petroglyphs is the only site of this type identified in the study area. According to Reeves and Kennedy (2017:16), these sites imply that “people occupied these in view of a sacred structure or

place to obtain personal benefits and power or give thanks for power/benefits previously received”.

The Stranraer Terrace is a navigational marker and a node in a cultural landscape. The sites found here show that it supported both small groups of one or two tipis and larger groups with more than four (EjOc-49, EjOc-50, EjOc-56, and EkOc-34). The excavated sites (EjOc-3, EjOc-13, and EkOd-6) and artifact collections show repeated occupation of this locale for several centuries. As the concept of place highlights, repeated use of a locale transforms space into place. It is a cumulative process in adding meaning. However, the significance of this place and its role in the wider cultural landscape is best understood by identifying whether it is a meaningful place. According to Zedeño and Bowser (2009:13), the criteria for a meaningful place “is a locale which reminds people of their past, teaches them how to cope with the present, and plan for the future”. Furthermore, as Zedeño et al. (2014) explains, the notion of planning for the future requires the place to be ‘built’. When considering the aforementioned sites, the Stranraer Terrace becomes more than a marked place on the landscape. The presence of the Herschel Petroglyphs and the two Medicine Wheels shows an investment of time to create and maintain this landmark. In the case of the petroglyphs, the dolomite stones were selected to be concentrated points of spiritual energy. As Buchner and Steinbring (1995a) have shown, the petroglyphs have been utilized for over 1,300 years. The artifacts identified here show numerous groups visiting, maintain, and conducting ceremonies. It was not built in a day but rather over a long timespan. Through upholding this ritualized behaviour, a deeper connection with the land is maintained. The Medicine Wheels signify an event that tied meaning upon the landmark. Whether as a memorial or a pictorial representation, the construction of these features has been built on the landscape in hopes of preserving that meaning. EkOd-2 suggests construction or maintenance over a period of time, strengthening the idea of building upon this landmark whereas EjOc-20 may have been a one-time event to mark the locale. In addition, if it is accepted that the cairn formation represents a place marker or wayfinding marker, then the construction of this feature gives additional significance to this landmark. If the former notion is accepted, then the place name would indicate who this landmark belongs to. The latter, would imply that the landmark is an important hub for navigating to the next destination. Through repeatedly using this space, the landmark has transformed into a place, resulting in the accumulation of meaning. The life history of this place shows use and modification over a long span of time with an

ideological understanding of this being a ceremonial place. Thus, the Stranraer Terrace can be considered a meaningful place.

7.10 Summary

The cultural landscape is a network of interlinked places. Each place provides a biological and/or cultural need. As Binford (1982) explains, to understand the wider cultural system, these unique places should be explored as a unit of interest. To identify place through the archaeological record, it is important to consider the formation processes involved.

Differentiating space from place requires a way of understanding the behavioural choices in selecting a locale and through evidence of ritualized and symbolic behaviour, meaning can be found. To understand regional landscape use, a network of places needs to be considered and thus identifying place becomes the building blocks of this type of analysis.

The models used to identify place begin with the behaviour choices used in selecting and transforming space. Both ecological principles and wayfinding complement each other.

Navigating the environment relies on the cognitive processes of wayfinding to obtain biological/economic or cultural needs. Further, the circulation of information through the use of cognitive maps gives groups the ability to know the environment beyond their own perceptual experience allowing for plasticity when conditions are not favourable. Thus, extensive spatial knowledge of the environment is a risk minimizing behaviour. It is through the use of landmarks that navigating and communicating the environment is possible. It is not surprising then, that important landmarks have been named by the people who use them.

The transformation of space into place is a temporal process. Place is the cumulation of cultural experience and only through repetitive interactions is place idealized. This continued interaction with the environment produces meaning. As Shanks and Tilley (1987) explain, meaning is not merely reflected in the psyche, it can be found through the manifestation of material remains. The data gathered in the 2020 survey show the Stranraer Terrace as being a meaningful place. It is replete with symbolic and sacred sites and thus acts as a repository of narratives, memory, and meaning.

CHAPTER 8. CONCLUSION

The goal of this thesis was to understand how to identify a meaningful place through the archaeological record and apply it to a major landmark in western Saskatchewan. To achieve this goal several objectives were put forth:

1. Increase site inventory of the area
2. Determine the cultural history of the region through artifact collections
3. Examine cognitive theories of spatial navigation and biological theories of patch selection
4. Apply the geographical concept of place
5. Determine whether the Stranraer Terrace is a meaningful place

Since the identification of the Herschel Petroglyphs in the 1960s, the Stranraer Terrace has had several professional and avocational archaeological endeavours. Previous site inventory was at 64 within the region as a whole. By undergoing the 2020 survey 54 new sites were identified showing that a large portion of these sites were concentrated on the Stranraer Terrace. In addition to the previous artifact catalogue, surface finds during the 2020 survey and the artifact collections analyzed showed a clearer understanding of the cultural history of the area. The artifact collections show Oxbow, Besant, and Prairie Side-notched being the most numerous in the area followed by Pelican Lake, Plains Side-notched, McKean, Duncan, Avonlea, and Sandy Creek respectively. The presence of a thick cross-section of a projectile point shaft may indicated an older occupation but the evidence is inconclusive.

Both cognitive and ecological theories help explain why a particular locale was chosen and repeatedly used. Wayfinding theory explains a reliance of landmarks for navigational purposes and ecological theories explain patch selection through economical reasons. Overtime, the repetition of a locale transforms a space on the landscape to a place. This transformation involves a connection with the land where memory, experience, and the landscape are intertwined. As memory and experience deepen, so to does the spiritual and utilitarian use. It is a transformation from a marked landmark, used solely for navigational and/or ecological use, to a built environment. As seen from the excavations and cultural history, this locale has been repeatedly used for several millennia. There was a need to return and reuse the locale. The construction of the petroglyphs and the Medicine Wheels show a deep connection and the legacy of the Stranraer Terrace. It has been engineered to provide future generations with ritual wealth. The Vision Quest site and the presence of a conjoined circle aid in the ceremonial quality of the

landmark and the significance can be gleaned from the cairn formation as a possible place marker. The transformation of this landmark over time as seen through the ritual wealth makes the Stranraer Terrace a meaningful place.

The rediscovery of the petroglyphs marked a new chapter for the Stranraer Terrace. A community effort began in the early 1990s to help preserve and share the Indigenous history of the area. It has since been a point of interest for hundreds of tourists over the years. In 2017, Ancient Echoes Interpretive Centre hosted a Shared Land event, in which several elders from various groups participated in discussions and ceremonies in front of the petroglyphs. It was a way to reconnect with the land and strengthen ties. Through the efforts of the Centre, Indigenous peoples have reconnected with this forgotten place. The meaning has taken on several perspectives and understandings throughout its lifetime; each one different from the next. However, now the meaning of this place can be explained by the people who currently use it. Not only is this a place for the Herschel community and the numerous tourists who revisit year after year, but it is also a place once again to the Indigenous peoples.

REFERENCES CITED

- Acton, D. F., G. A. Padbury, and C. T. Stushnoff
1998 *The Ecoregions of Saskatchewan*. University of Regina, Saskatchewan.
- Adams, Gary.
1978 *Tipi Rings in Southern Alberta: The Alkali Creek Sites Lower Red Deer River*. Occasional Papers No. 9. Archaeological Survey of Alberta. Edmonton.
- 1986 Archaeological Reconnaissance of Grasslands National Park. *Saskatchewan Archaeology* 7:3-24.
- Allen, Gary L.
1999 Spatial Abilities, Cognitive Maps, and Wayfinding: Bases for Individual Differences in Spatial Cognition and Behaviour. In *Wayfinding Behaviour: Cognitive Mapping and Other Spatial Processes*, edited by Reginald G. Golledge, pp. 46-80. The John Hopkins University Press, Maryland, Baltimore.
- Aporta, Claudio
2016 Markers in Space and Time: Reflections on the Nature of Place Names as Events in the Inuit Approach to the Territory. In *Marking the Land: Hunter-Gatherer Creation of Meaning in Their Environment*, edited by William A. Lovis and Robert Whallon, pp. 67-88. Routledge, London.
- Ashmore, Wendy
2002 "Decisions and Dispositions": Socializing Spatial Archaeology. *American Anthropologist* 104(4):1172-1183.
- Bamforth, D. B.
1988 *Ecology and Human Organization on the Great Plains*. Plenum Press, New York.
- Banks, Kimball M., and J. Signe Snortland
1995 Every Picture Tells a Story: Historic Images, Tipi Camps, and Archaeology. *Plains Anthropologist* 40(152):125-144.
- Banning, E. B.
2002 *Archaeological Survey*. Kluwer Academic/Plenum Publishers, New York.
- Basso, Keith H.
1996 *Wisdom Sits in Places: Landscape and Language Among the Western Apache*. University of New Mexico Press, Albuquerque.
- Binford, Lewis
1980 Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45(1):4-20.
- 1982 The Archaeology of Place. *Journal of Anthropological Archaeology* 1:5-31.

- Bowser, Brenda J., and Maria N. Zedeño (editors)
2009 *The Archaeology of Meaningful Places*. The University of Utah Press, Salt Lake City.
- Brink, Jack, and Stuart J. Baldwin
1998 The Highwood River Site: A Pelican Lake Phase Burial from the Alberta Plains. *Canadian Journal of Archaeology* 12:109-136.
- Brumley, John H
1983 An Interpretive Model for Stone Circles and Stone Circle Sites Within Southeastern Alberta. In *From Microcosm to Macrocosm: Advances in Tipi Ring Investigation and Interpretation*, edited by L.A. Davis, pp. 171-191. Plains Anthropologist Memoir 19.

1988 *Medicine Wheels on the Northern Plains: A Summary and Appraisal*. Archeological Survey of Alberta Manuscript Series No. 12. Alberta Culture and Tourism. Alberta.
- Buchner, A.P., and J. Steinbring
1995a *Report on the 1992, 1993 and 1994 Field Seasons at The Herschel Petroglyph Site (EjOc-3), Swift Current (EbNw-15), Green (EbNw-17), Gouldtown, Cabri Lake (EgOk-10) and Hazlet (EcOe-1) Sites*. The Southwest Saskatchewan Rock Art Project. Submitted to The Saskatchewan Heritage Foundation. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.

1995b *Report on the 1992, 1993 and 1994 Field Seasons at The Herschel Petroglyph Site (EjOc-3)*. The Southwest Saskatchewan Rock Art Project. Submitted to The Saskatchewan Heritage Foundation. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.
- Burley, David, and J. Michael Quigg
1982 *Nipawin Reservoir Heritage Study*. 9 vols. Saskatchewan Research Council, Saskatchewan.
- Bryne, William J.
1973 *The Archaeology and Prehistory of Southern Alberta as Reflected by Ceramics*. Archaeological Survey of Canada Mercury Series Paper 14. Canadian Museum of Civilization, Quebec, Gatineau.
- Christiansen, E. A.
1965 *Geology and Groundwater Resources of the Kindersley Area (72-N) Saskatchewan*. Report No. 7. Saskatchewan Research Council, Saskatchewan.
- Clarke, David L.
1977 Spatial Information in Archaeology. In *Spatial Archaeology*, edited by David L. Clark, pp 1-32. Academic Press, California, San Diego.
- Conolly, James
2018 Hunter-gatherer Mobility, Territoriality, and Placemaking in the Kawartha Lakes Region, Ontario. *Canadian Journal of Archaeology* 42:185-209.

- Cornell, Edward, H., and C. Donald Hetb
2000 Route Learning and Wayfinding. In *Cognitive Mapping: Past, Present and Future*, edited by Rob Kitchin and Scott Freundschuh, pp. 44-65. Routledge, London.
- Davis, Emma L.
1963 The Desert Culture of the Western Great Basin: A Lifeway of Seasonal Transhumance. *American Antiquity* 29(2): 202-212.
- Davis, Leslie B., John W. Fisher Jr., Douglas W. Owsley, David G. Mogle, Richard L. Jantz, and Kerry Lippincott
2017 An Avonlea Inhumation at Split-Rock Ridge, Big Dry Creek Valley, Eastern Montana High Plains. *Plains Anthropologist* 62(241):32-66.
- De Vries, Bernard
2011 *Getting to Know Saskatchewan Lichens: Lichens of the Prairie, Aspen Parkland and Boreal Forest*. Special Publication No. 12. Nature Saskatchewan, Regina.
- Downs, R.M., and D. Stea
1973 *Images and Environment: Cognitive Mapping and Spatial Behaviour*. Aldine Press, Illinois.
- Duke, Philip, and Michael C. Wilson (editors)
1995 *Beyond Subsistence: Plains Archaeology and The Postprocessual Critique*. The University of Alabama Press, Tuscaloosa.
- Dyck, Ian
1981 *Saskatchewan archaeological resource record forms for sites EjOc-3 to 8*. Forms on file, Heritage Conservation Branch, Government of Saskatchewan, Regina.
- 1997 Prehistory of Southern Saskatchewan. In *Tracking Ancient Hunters Prehistoric Archaeology in Saskatchewan*, Second Printing, edited by Henry Epp and Ian Dyck, pp. 63-139. Saskatchewan Archaeological Society, Saskatoon.
- Dyck, Ian., Ian Brace, and Anne Tasker
1981 SMNH Field Work in 1981. *Saskatchewan Archaeological Society Newsletter* 2(6):122-123.
- Epp, Henry T., and Ian Dyck
1997 *Tracking Ancient Hunters Prehistoric Archaeology in Saskatchewan*. Second Printing. Saskatchewan Archaeological Society, Saskatoon, Saskatchewan.
- Ewers, John C.
1958 *The Blackfeet: Raiders on the Northwestern Plains*. University of Oklahoma Press, Norman.

Farrel, Joyce

1983 *Saskatchewan archaeological resource record form for EkOd-2 with Attached Letter from Mr. AJ McGill (1977)*. Form on file, Heritage Conservation Branch, Government of Saskatchewan, Regina.

Finnigan, James T.

1982 *Tipi Rings and Plains Prehistory: A reassessment of Their Archaeological Potential*. Archaeological Survey of Canada Mercury Series Paper 108. Canadian Museum of Civilization, Quebec, Gatineau.

1983 Tipi to Tipi Ring: A Transformational Model. *Plains Anthropologist* 28(102):16-28.

Flint, Richard F.

1971 *Glacial and Quaternary Geology*. John Wiley and Sons, Ontario.

Fedirchuk, G. J., E. J. McCullough, C. Lewis, J.D. Brandon, and L.V. Hills

1998 *Heritage Resources Impact Assessment Report Alliance Pipeline Limited Partnership Alliance Pipeline Project Saskatchewan*. Submitted to TERA Environmental Consultants (Alta.) Ltd., Permit #96-091 and 97-028. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.

Freundschuh, Scott

2000 Micro- and Macro-scale Environments. In *Cognitive Mapping: Past, Present and Future*, edited by Rob Kitchin and Scott Freundschuh, pp. 125-146. Routledge, London.

Friesen, Nathan

2013 *Saskatchewan archaeological resource record forms for Permit #13-001*. Forms on file, Heritage Conservation Branch, Government of Saskatchewan, Regina.

Fung, Ka-iu (editor)

1999 *Atlas of Saskatchewan*. Second Edition. University of Saskatchewan, Saskatoon.

Golledge, Reginald G.

1999 Human Wayfinding and Cognitive Maps. In *Wayfinding Behaviour: Cognitive Mapping and Other Spatial Processes*, edited by Reginald G. Golledge, pp 5-45. The John Hopkins University Press, Maryland, Baltimore.

2003 Human Wayfinding and Cognitive Maps. In *The Colonization of Unfamiliar Landscapes: The Archaeology of Adaption*, edited by Marcy Rockman and James Steele, pp. 25-43. Routledge, London.

Golledge, Reginald G. (editor)

1999 *Wayfinding Behaviour: Cognitive Mapping and Other Spatial Processes*. The John Hopkins University Press, Maryland, Baltimore.

Gordon, Anthony

1979 *Geology of Saskatchewan: A Historical Approach*. Senior Edition. Western Extension College Educational Publishers, Saskatchewan, Saskatoon.

- Gorham, L. R., G. J. Fredirchuk, and Brad Himour
 1998 *Heritage Resources Impact Assessment, Mitigation and Monitoring Enbridge Pipelines Inc. Terrace Phase 1 Expansion Program*. Submitted to TERA Environmental Consultants (Alta.) Ltd., Permit #98-036. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.
- Green, D'Arcy Clarke
 1998 *A Re-Evaluation of the Oxbow Dam Site (DhMn-1): Middle Holocene Cultural Continuity on the Northern Plains*. Master's thesis, Department of Archaeology and Archaeology, University of Saskatchewan, Saskatoon.
- Gregg, Michael L.
 1987 Knife River Flint in the Northeastern Plains. *Plains Anthropologist* 32(118):367-77.
- Greiser, Sally T.
 1994 Late Prehistoric Cultures on the Montana Plains. In *Plains Indians, A.D. 500-1500: The Archaeological Past of Historic Groups*, edited by Karl H. Schlesier, pp. 34-55. University of Oklahoma Press, Chambersburg.
- Grove, Jean
 1988 *The Little Ice Age*. Routledge, New York.
- Hall, Jonathan B.
 2009 *Pointing It Out: Fluted Projectile Point Distribution and Early Human Populations in Saskatchewan*. Master's thesis, Department of Archaeology, Simon Fraser University, Burnaby, British Columbia.
- Hardesty, Donald L.
 1980 The Use of General Ecological Principles in Archaeology. *Advances in Archaeological Method and Theory* 3:157-187.
- Hjermstad, Benjamin E., and Todd A. Paquin
 2002 *2001 Archaeology Permit Report Heritage Resources Impact Assessment Alberta to Market Route (Saskatchewan Section)*. Submitted to Department of Culture, Youth and Recreation (Heritage Assessment Unit), Permit #01-084. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.
- Hofman, Jack L., and Russel W. Graham
 1998 The Paleo-Indian Cultures of the Great Plains. In *Archaeology on the Great Plains*, edited by W. Raymond Wood, pp. 87-139. University Press of Kansas, Lawrence.
- Houston, Marvel
 1988 The Wheel That Was. *Saskatchewan Archaeological Society Newsletter* 9(1):3.
 1993 An Update on The Herschel Petroglyph Site (EjOc-3). *Saskatchewan Archaeological Society Newsletter* 14(2):28-31.

- Hovde, David M.
1983 The Hermosa Tipi Ring Site (39PN375). *Plains Anthropologist* 28(10):29-33.
- Ingold, Tim
1993 The Temporality of the Landscape. *World Archaeology* 25(2):152-174.
- Irwin-Williams, Cynthia, Henry Irwin, George Agogino and C. Vance Haynes
1973 Hell Gap: Paleo-Indian Occupation on The High Plains. *Plains Anthropologist* 18(59):40-53.
- Jochim, Michael
1976 *Hunter-Gatherer Subsistence and Settlement a Predictive Model*. Academic Press, New York.
- Johnson, Ann M.
1988 Parallel Grooved Ceramics: An Addition to Avonlea Material Culture. In *Avonlea Yesterday and Today: Archaeology and Prehistory*, edited by Leslie B. Davis, pp. 137-143. Saskatchewan Archaeological Society, Saskatoon.
- Kehoe, Thomas F.
1966 The Small-Notched Point System of the Northern Plains. *American Antiquity* 31(6):827-841.
- Kelly, Robert L.
1983 Hunter-Gatherer Mobility Strategies. *Journal of Anthropological Research* 39(3):277-306.

1995 *The Foraging Spectrum: Diversity in Hunter-Gatherer Lifeways*. Smithsonian Institution Press, Washington.
- Keyser, James D.
1984 *The North Cave Hills*. Special Publication of the South Dakota Archaeological Society No. 9. South Dakota Archaeological Society, Rapid City.
- Keyser, James D., and Michael A. Klassen
2001 *Plains Indian Rock Art*. University of Washington Press, Seattle.
- Kitchin, Rob, and Mark Blades
2002 *The Cognition of Geographic Space*. I.B. Tauris, London.
- Kitchin, Rob, and Scott Freundschuh (editors)
2000 *Cognitive Mapping: Past, Present and Future*. Routledge, London.
- Kitchin, Rob, and Scott Freundschuh
2000 Cognitive Mapping. In *Cognitive Mapping: Past, Present and Future*, edited by Rob Kitchin and Scott Freundschuh, pp. 1-8. Routledge, London.

Klassen, R.W.

1989 Quaternary Geology of the Southern Canadian Interior Plains. In *Quaternary Geology of Canada and Greenland*, edited by R. J. Fulton, pp. 138-174. Geology of Canada no.1. Canadian Government Publishing Centre, Ottawa.

Kooyman, Brian P., and Jane H. Holden (editors)

2004 *Archaeology on the Edge: New Perspectives from the Northern Plains*. University of Calgary Press, Alberta.

Kornfeld, Marcel and Alan J. Osborn (editors)

2003 *Islands on the Plains: Ecological, Social, and Ritual Use of Landscapes*. The University of Utah Press, Salt Lake City.

Kornfeld, Marcel, George C. Frison, and Mary Lou Larson

2010 *Prehistoric Hunter-Gatherers of the High Plains and Rockies*. Third Edition. Left Coast Press, California, Walnut Creek.

Kupsch, Walter

1999 Phanerozoic Basin. In *Atlas of Saskatchewan*, edited by Ka-iu Fung, pp. 80. University of Saskatchewan, Saskatoon.

Lovis, William A.

2016 Network Maintenance in Big Rough Spaces with Few People. In *Marking the Land: Hunter-Gatherer Creation of Meaning in Their Environment*, edited by William A. Lovis and Robert Whallon, pp. 116-130. Routledge, London.

Lovis, William A., and Robert Whallon

2016 The Creation of Landscape Meaning by Mobile Hunter-Gatherers. In *Marking the Land: Hunter-Gatherer Creation of Meaning in Their Environment*, edited by William A. Lovis and Robert Whallon, pp. 1-9. Routledge, London.

Lovis, William A., and Robert Whallon (editors)

2016 *Marking the Land: Hunter-Gatherer Creation of Meaning in Their Environment*. Routledge, London.

Lundqvist, Olivier

1999 Climate. In *Atlas of Saskatchewan*, edited by Ka-iu Fung, pp. 118-119. University of Saskatchewan, Saskatoon.

Maathuis, Harm

1999 Groundwater in Southern Saskatchewan. In *Atlas of Saskatchewan*, edited by Ka-iu Fung, pp. 127-128. University of Saskatchewan, Saskatoon.

MacArthur, Robert H., and Eric R. Pianka

1966 On Optimal Use of a Patchy Environment. *The American Naturalist* 100(916):603-609.

- Mackay, B.R., H. N. Hainstock, and G. Graham
1936 *Ground-Water Resources of the Rural Municipality of Mountain View No. 318 Saskatchewan*. Water Supply Paper No. 103. Department of Mines Bureau of Economic Geology Geological Survey, Ontario, Ottawa.
- Malasiuk, Jordyce, Brad Himour, Stacy Kozakavich, and Allison Bailey
2002 *Heritage Resource Studies Alliance Pipeline Limited Partnership Alliance Pipeline Project Saskatchewan*. Submitted to TERA Environmental Consultants (Alta.) Ltd., Permit #00-031. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.
- Malasiuk, Jordyce, David Graham, Ewald van Rooyen, and Sarah Lebedoff
2015 *Heritage Resources Impact Assessment for the Proposed Enbridge Line 3 Replacement Program Saskatchewan Portion*. Submitted to Enbridge Pipelines Inc., Permit #14-140 and #15-030. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.
- Malouf, Carling
1961 The Tipi Rings of The High Plains. *American Antiquity* 26(3):381-389.
- Marrow, Juliet E.
2006 Anzick: A Clovis Burial in Montana. *Central States Archaeological Journal* 53(1):27-32.
- McCullough, E. J., and G.L. Stuart
1987 *Historical/Heritage Resource Impact Assessment Interprovincial Pipe Line Limited Line 1 Pipeline Replacement Project*. Submitted to Interprovincial Pipe Line Limited, Permit #87-019. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.
- McCullough, E., R. Callaghan, and C. Lewis
1994 *Heritage Resources Impact Assessment Mitigation and Monitoring*. Submitted to Interprovincial Pipe Line Inc., Permit #94-032. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.
- McKeand, Peggy
2004 *Heritage Impact Assessment of Husky Oil Operations Ltd. 2004 Developments*. Submitted to Husky Oil Operations Ltd. Permit #04-006. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.
- Miller, J.F.V.
1978 *The Gray Burial Site: An Early Plains Burial Ground*. Manuscript Report 304. Parks Canada, Ontario, Ottawa.

Mirau, Neil A.

1995 Medicine Wheels on the Northern Plains: Context, Codes, and Symbols. In *Beyond Subsistence: Plains Archaeology and The Postprocessual Critique*, edited by Philip Duke and Michael C. Wilson, pp. 169-192. The University of Alabama Press, Tuscaloosa.

Mitchell J., H.C. Moss, and J.S Clayton

1977 *Soil Survey of Southern Saskatchewan from Township 1 to 48 Inclusive*. Fourth Printing. Soil Survey Report No. 12. University of Saskatchewan, Saskatoon.

Mueller, James W.

1974 *The Use of Sampling in Archaeological Survey*. Memoirs of the Society for American Archaeology No. 28. American Antiquity, New York.

Mulloy, William

1954 The McKean Site in Northeastern Wyoming. *Southwestern Journal of Anthropology* 10(4):432-460.

1956 *A Preliminary Historical Outline for the Northwestern Plains*. University of Wyoming Publications 22.

Oetelaar, Gerald A.

2004 Stone Circles, Social Organization, and Special Places: Forbis' Skepticism Revisited. In *Archaeology on the Edge: New Perspectives from the Northern Plains*, edited by Brian P. Kooyman and Jane H. Holden, pp. 125-155. University of Calgary Press, Alberta.

Oetelaar, Gerald A., and David Meyer

2006 Movement and Native American Landscapes: A Comparative Approach. *Plains Anthropologist* 51(199) 355-374.

Oetelaar, Gerald A., and D. Joy Oetelaar

2006 People, Places and Paths: The Cypress Hills and the Niitsitapi Landscape of Southern Alberta. *Plains Anthropologist* 51(199):375-397.

2007 The New Ecology and Landscape Archaeology: Incorporating the Anthropogenic Factor in Models of Settlement Systems in the Canadian Prairie Ecozone. *Canadian Journal of Archaeology* 31(3):65-92.

Osborn, Alan J., and Marcel Kornfeld

2003 Biogeographical Islands and Ecological Patches: Seeing the Great Plains from the Inside Out. In *Islands on the Plains: Ecological, Social, and Ritual Use of Landscapes*, edited by Marcel Kornfeld and Alan J. Osborn, pp. 1-18. The University of Utah Press, Salt Lake City.

Orton, Clive

2000 *Sampling in Archaeology*. Cambridge University Press, England.

Peck, Trevor R.

2011 *Light from Ancient Campfires: Archaeological Evidence for Native Lifeways on the Northern Plains*. Athabasca University Press, Alberta, Edmonton.

Ramsay, Charles L.

1993 *The Redtail Site: A McKean Habitation in South Central Saskatchewan*. Master's thesis, Department of Anthropology and Archaeology, University of Saskatchewan, Saskatoon.

Ray, Arthur J.

1974 *Indians in the Fur Trade: Their Role as Hunters, Trappers and Middlemen in the Lands Southwest of Hudson Bay*. University of Toronto Press, Ontario.

Reeves, Brian

1973 The Concept of the Altithermal Cultural Hiatus in Northern Plains Prehistory. *American Anthropologist* 75(5):1221-1253.

1978 Head-smashed-in: 5500 Years of Bison Jumping in the Alberta Plains. In *Bison Procurement and Utilization: A Symposium*. *Plains Anthropologist* Memoir 14 23(82), Part 2.

1983 *Culture Change in the Northern Plains: 1000 B.C.-A.D.1000*. Occasional Paper No. 20. Archaeological Survey of Alberta, Alberta.

Reeves, Brian, and J. M. Calder

1976 *Historical Site Impact Assessment Cochin Pipeline Fort Saskatchewan, Alberta to Elmore, Saskatchewan*. Submitted to Cochin Pipe Lines LTD, Permit #1976-000-REE. Copies available from Royal Saskatchewan Museum, Regina.

Reeves, Brian, and Margaret Kennedy

2017 Stone Feature Types as Observed at Ceremonial Site Complexes on the Lower Red Deer and the Forks of the Red Deer and South Saskatchewan Rivers with Ethnohistorical Discussion. Electronic document, <https://thesas.ca/wp-content/uploads/2017/04/Reeves-and-Kennedy-2017.pdf>, accessed January 9, 2021.

Reeves, Brian, Margaret Kennedy, and Joanne L. Braaten

2018 *Medicine Wheels of the Plains and Rocky Mountains*. Occasional Papers of the Archeological Society of Alberta, No. 15 (2nd edition). Archaeological Society of Alberta. Calgary.

Relph, Edward

1976 *Place and Placelessness*. Pion Limited, London.

Richards, Doug

1998 Newly Recorded Medicine Wheel (EjOc-20). *Saskatchewan Archaeological Society Newsletter* 19(1):21-22.

- Robbins, Chandler S., Bretel Bruun, and Herbert S. Zim
1983 *A Guide to Field Identification: Birds of North American*. Expanded, Revised Edition. Western Publishing Company, Wisconsin.
- Rockman, Macy, and James Steele (editors)
2003 *The Colonization of Unfamiliar Landscapes: The Archaeology of Adaption*. Routledge, London.
- Rodman, Margaret C.
1992 Empowering Place: Multilocality and Multivocality. *American Anthropologist* 94(3):640-656.
- Rollans, Maureen
1997 *Coal Mine Ravine 1996: Assessment of a Multi-component Site (EjOc-13) Near Herschel, Saskatchewan*. Submitted to the Eagle Creek Historical Society, Permit #96-53. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.
1998 *Coal Mine Ravine 1996: Assessment of a Multi-component Site (EjOc-13) Near Herschel, Saskatchewan, Addendum: Results and Significance of Carbon Dating*. Submitted to the Eagle Creek Historical Society, Permit #96-53. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.
- Rollans, Maureen, and Peggy McKeand
1993 *Initial Assessment of Woods Opuntia Site Plenty, Saskatchewan*. Submitted to the Eagle Creek Historical Society, Permit #93-40. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.
- Sask Water
1999 Hydrography. In *Atlas of Saskatchewan*, edited by Ka-iu Fung, pp. 123-126. University of Saskatchewan, Saskatoon.
- Secoy, Frank R.
1992 *Changing Military Patterns of the Great Plains Indians (17th Century through Early 19th Century)*. University of Nebraska Press, Lincoln.
- Scribe, Brian
1997 *Nistam Ka-ke Askihkokechik Pushwaw-askkihk: An Assessment of Besant-Sonota Pottery on the Canadian Plains*. Master's thesis, Department of Archaeology and Archaeology, University of Saskatchewan, Saskatoon.
- Shanks, Michael, and Christopher Tilley
1987 *Social Theory and Archaeology*. University of New Mexico Press, New Mexico, Albuquerque.
- Simpson, Mark
1999 Quaternary Geology. In *Atlas of Saskatchewan*, edited by Ka-iu Fung, pp. 86-87. University of Saskatchewan, Saskatoon.

Sorrows M. E., and Hirtle S.C.

1999 The Nature of Landmarks for Real and Electronic Spaces. *Spatial Information Theory* 1661:37-50.

Storer, John

1989 *Geological History of Saskatchewan*. Government of Saskatchewan, Regina.

Tasker, Anne

1982 *Saskatchewan archaeological resource record form for site EjOc-10*. Form on file, Heritage Conservation Branch, Government of Saskatchewan, Regina.

Thorpe, J.

1999 Natural Vegetation. In *Atlas of Saskatchewan*, edited by Ka-iu Fung, pp. 134-137. University of Saskatchewan, Saskatchewan, Saskatoon.

Tuan, Yi-Fu

1977 *Space and Place: The Perspective of Experience*. University of Minnesota Press, Minneapolis.

Tverky, Barbara

2000 Levels and Structures of Spatial Knowledge. In *Cognitive Mapping: Past, Present and Future*, edited by Rob Kitchin and Scott Freundschuh, pp. 24-43. Routledge, London.

Vance, F.R., J.R. Jowsey, and J.S. McLean

1984 *Wildflowers Across the Prairies*. Edited and Revised. Western Producer Prairie Books. Saskatchewan, Saskatoon.

Vickers, Rod J.

1991 Seasonal Round Problems on The Alberta Plains. *Canadian Journal of Archaeology* 15:55-72.

Walde, Dale A.

2006 Avonlea and Athabaskan Migrations: A Reconsideration. *Plains Anthropologist* 51(198):185-197.

Walde, Dale A, David Meyer, and Wendy Unfreed

1995 The Late Period on the Canadian and Adjacent Plains. *Revista de Arqueologia Americana* 9:7-9, 11-66.

Walker, Ernest G.

1992 *The Gowen Sites: Cultural Responses to Climatic Warming on the Northern Plains (7500-5000 B.P.)*. Archaeological Survey of Canada Mercury Series Paper 145. Canadian Museum of Civilization, Quebec.

Walker, John H.

2012 Recent Landscape Archaeology in South America. *Journal of Archaeological Research* 20(4):309-355.

Webster, Michael S

2004 *A Re-Evaluation of the McKean Series on the Northern Plains*. Master's thesis, Department of Archaeology and Archaeology, University of Saskatchewan, Saskatoon.

Weinbender, Kim

2012 *Saskatchewan archaeological resource record forms for Permit #12-001*. Forms on file, Heritage Conservation Branch, Government of Saskatchewan, Regina.

Wissler, Clark

1918 The Sun Dance of the Blackfoot Indians. *Anthropological Papers of The Natural American Museum of Natural History* Vol 16(3). American Museum of Natural History, New York.

Whallon, Robert

2011 An Introduction to Information and Its Role in Hunter-Gatherer Bands. In *Information and Its Role in Hunter-Gatherer Bands*, edited by Robert Whallon, William A. Lovis, and Robert K. Hitchcock, pp. 1-28. Cotsen Institute of Archaeology Press, California, Los Angeles.

Whallon, Robert, William A. Lovis, and Robert K. Hitchcock (editors)

2011 *Information and Its Role in Hunter-Gatherer Bands*. Cotsen Institute of Archaeology Press, California, Los Angeles.

Wheeler, Richard P.

1954 Two New Projectile Point Types: Duncan and Hanna Points. *Plains Anthropologist* 1:7-14.

Whittlesey, Stephanie M.

2009 Mountains, Mounds, and Meaning: Metaphor in The Hohokam Cultural Landscape. In *The Archaeology of Meaningful Places*, edited by Brenda J. Bowser and Maria N. Zedeño, pp. 73-89. The University of Utah Press, Salt Lake City.

Wilson, Michael C.

1995 The Household as A Portable Mnemonic Landscape: Archaeological Implications for Plains Stone Circle Sites. In *Beyond Subsistence: Plains Archaeology and The Postprocessual Critique*, edited by Philip Duke and Michael C. Wilson, pp. 169-192. The University of Alabama Press, Tuscaloosa.

Winterhalder, Bruce

1986 Diet Choice, Risk, and Food Sharing in A Stochastic Environment. *Journal of Anthropological Archaeology* 5(4):369-392.

Wood, Barry P.

2013 *NAL Flowline Construction Alignment with N½, Section 35 and NW¼, Section 36, Twp 31, Rge 19, W3M*. Submitted to Summit Liability Solutions, Weyburn, Saskatchewan, Permit #13-016. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.

Wood, W. Raymond

1998 *Archaeology on the Great Plains*. University Press of Kansas, Lawrence.

Wormington, H. M.

1957 *Ancient Man in North America*. Denver Museum of Natural History Popular Series No. 4, Colorado, Denver.

Young, Patrick, and Katie Zdunich

2009 *SaskTel Herschel to Plenty Fibre-Optic Line Heritage Resource Impact Assessment*. Submitted to SaskTel, Permit #09-069. Copies available from Heritage Conservation Branch, Government of Saskatchewan, Regina.

Zedeño, Maria N., and Brenda J. Bowser

2009 The Archaeology of Meaningful Places. In *The Archaeology of Meaningful Places*, edited by Brenda J. Bowser and Maria N. Zedeño, pp. 1-14. The University of Utah Press, Salt Lake City.

Zedeño, Maria N., Jesse A. M. Ballenger, and John R. Murray

2014 Landscape Engineering and Organization Complexity Among Late Prehistoric Bison Hunters of The Northwestern Plains. *Current Anthropology* 55(1):23-58.

Zedeño, Maria N., and Richard W. Stoffle

2003 Tracking the Role of Pathways in the Evolution of a Human Landscape: the St Croix Riverway in Ethnohistorical Perspective. In *The Colonization of Unfamiliar Landscapes: The Archaeology of Adaption*, edited by Marcy Rockman and James Steele, pp. 59-80. Routledge, London.

APPENDIX ARTIFACTS

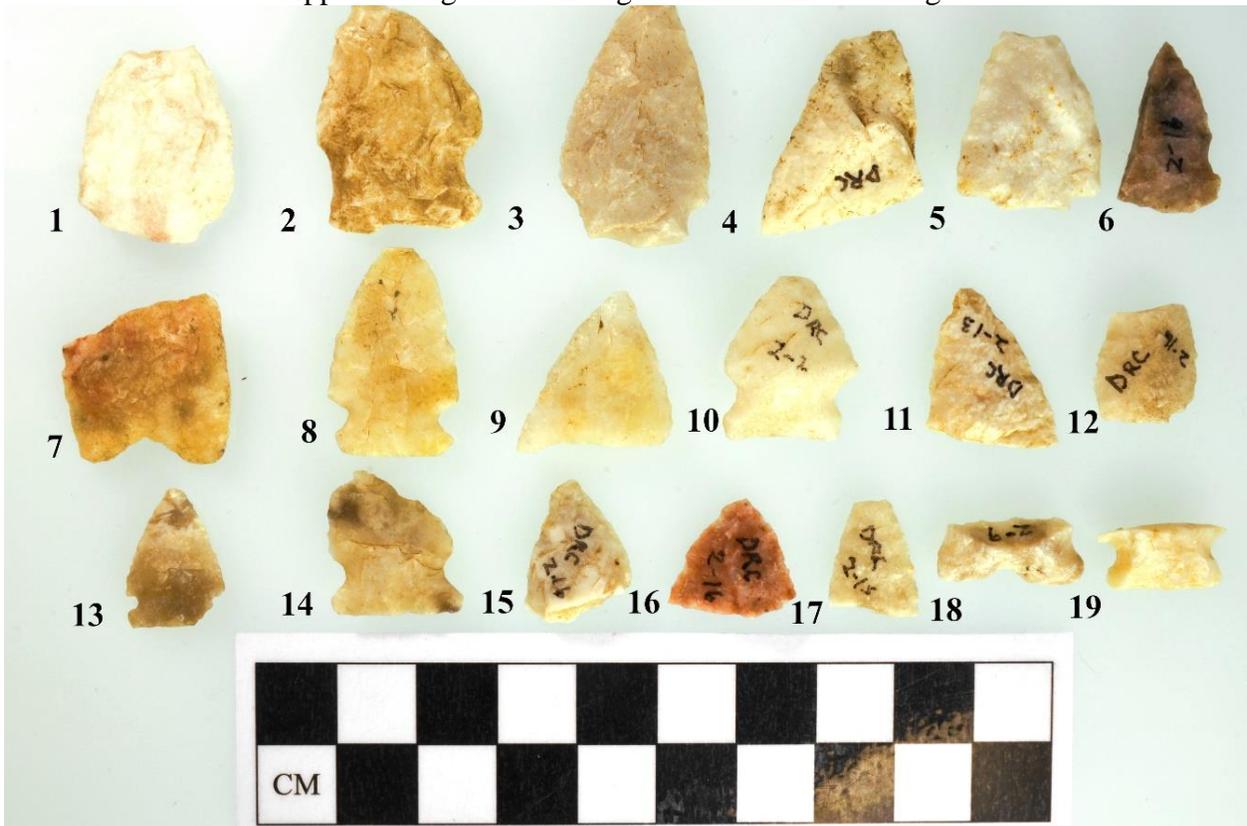
A.1.1. Projectile Points in Doug Richards' Collection.

Collection	Bag #	Location	Bag Label	Type	Complex	Material	Height (cm)	Width (cm)	Thickness (cm)	Photo Ref
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Oxbow	White Quartzite	2.4	2.3	0.5	A 1.1 -1
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Oxbow	Feldspathic Siltstone	3.2	2.2	0.4	A 1.1 -2
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	McKean	Black Siltstone	3.7	2.05	0.6	A 1.1 -3
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Besant	Brown Chalcedony	2.2	1.1	0.5	A 1.1 -4
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Duncan	Black Siltstone	3	1.6	0.5	A 1.1 -5
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Prairie SN	Brown Chert	2.5	1.7	0.4	A 1.1 -6
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Plains SN	Swan River Chert	2.5	1.5	0.4	A 1.1 -7
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Oxbow	Tan Chert	2.3	1.8	0.4	A 1.1 -8
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Prairie SN	White Chert	1.7	1.6	0.45	A 1.1 -9
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Unknown	Grey Quartzite	2.2	1.5	0.45	A 1.1 -10
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Pelican Lake	Black Siltstone	1.75	1.4	0.5	A 1.1 -11
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Oxbow	Black Siltstone	2.2	1.5	0.4	A 1.1 -12
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Pelican Lake	Black Siltstone	2.5	1.8	0.4	A 1.1 -13
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Pelican Lake	White Chert	2.4	1.5	0.45	A 1.1 -14
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Plains SN	Grey Siltstone	1.75	1.5	0.4	A 1.1 -15
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Oxbow	Grey Chert	2.1	1.7	0.4	A 1.1 -16
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Besant	Brown Chalcedony	2.4	1.6	0.4	A 1.1 -17
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Pelican Lake/Besant	Swan River Chert	1.75	1.5	0.4	A 1.1 -18
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Plains SN	White Quartzite	1.4	1.2	0.4	A 1.1 -19
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Prairie SN	White Quartzite	1.5	1.2	0.35	A 1.1 -20
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Prairie SN	White Quartzite	1.9	1.3	0.4	A 1.1 -21
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Plains SN	Pink Chert	2.1	1.3	0.3	A 1.1 -22
DRC	1	SWNW 11-34-18-3	Ruthilda Cemetary	Point	Prairie SN	Feldspathic Siltstone	2	1.6	0.5	A 1.1 -23
DRC	2		Plenty	Point	Unknown	White Quartzite	2.4	1.8	0.45	A 1.2-1
DRC	2		Plenty	Point	Oxbow	White Quartzite	2.75	2	0.7	A 1.2-2
DRC	2		Plenty	Point	Besant	Swan River Chert	3.2	1.85	0.5	A 1.2-3
DRC	2		Plenty	Point	Unknown	White Quartzite	2.9	2.1	0.45	A 1.2-4
DRC	2		Plenty	Point	Unknown	Grey Quartzite	2.1	1.9	0.4	A 1.2-5
DRC	2		Plenty	Point	Unknown	Grey Chert	2.1	1.3	0.45	A 1.2-6
DRC	2		Plenty	Point	McKean	White Quartzite	2.1	2	0.5	A 1.2-7
DRC	2		Plenty	Point	Besant	White Chert	2.6	1.6	0.3	A 1.2-8
DRC	2		Plenty	Point	Unknown	White Quartzite	2.2	1.9	0.45	A 1.2-9
DRC	2		Plenty	Point	Prairie SN	White Quartzite	2	1.7	0.6	A 1.2-10
DRC	2		Plenty	Point	Unknown	White Quartzite	2.2	1.6	0.45	A 1.2-11
DRC	2		Plenty	Point	Unknown	White Quartzite	1.45	1.4	0.35	A 1.2-12
DRC	2		Plenty	Point	Avonlea	Grey Quartzite	1.7	1.2	0.25	A 1.2-13
DRC	2		Plenty	Point	Prairie SN	Grey Quartzite	1.7	1.6	0.4	A 1.2-14
DRC	2		Plenty	Point	Unknown	Swan River Chert	1.7	1.35	0.45	A 1.2-15
DRC	2		Plenty	Point	Unknown	Pink Chert	1.4	1.5	0.4	A 1.2-16
DRC	2		Plenty	Point	Unknown	White Quartzite	1.5	1.1	0.25	A 1.2-17
DRC	2		Plenty	Point	Oxbow	Grey Quartzite	0.8	1.8	0.5	A 1.2-18
DRC	2		Plenty	Point	Besant	White Quartzite	0.7	1.6	0.4	A 1.2-19
DRC	6	SE 36-35-18-3	Ruth Archdekin	Point	Besant	Tan Quartzite	1.9	1.9	0.6	A 1.3-1
DRC	6	SE 36-35-18-3	Ruth Archdekin	Point	McKean	Black Siltstone	1.6	1.6	0.4	A 1.3-2
DRC	6	SE 36-35-18-3	Ruth Archdekin	Point	Besant	Petrified Peat	1.8	1.7	0.5	A 1.3-3
DRC	6	SE 36-35-18-3	Ruth Archdekin	Point	Avonlea	Black Siltstone	1.9	1.4	0.4	A 1.3-4
DRC	6	SE 36-35-18-3	Ruth Archdekin	Point	Plains SN	Grey Chert	1.1	1.3	0.25	A 1.3-5
DRC	8	SW 35-34-18-3	Porter Lands	Point	Pelican Lake	Tan Chert	2.3	1.9	0.5	A 1.4-1
DRC	9	No Provenience		Point	Oxbow	Silicified Peat	3.2	2.2	0.5	A 1.5-1
DRC	9	No Provenience		Point	Pelican Lake	Black Siltstone	2.7	2.1	0.45	A 1.5-2
DRC	9	No Provenience		Point	Oxbow	Black Siltstone	3.1	2.2	0.5	A 1.5-3
DRC	9	No Provenience		Point	Besant	Brown Chalcedony	3	1.9	0.45	A 1.5-4
DRC	9	No Provenience		Point	Sandy Creek	White Quartzite	3.5	2.1	0.55	A 1.5-5
DRC	9	No Provenience		Point	Besant	Black Siltstone	2.8	1.9	0.5	A 1.5-6
DRC	9	No Provenience		Point	Pelican Lake	Feldspathic Siltstone	2.9	1.7	0.55	A 1.5-7
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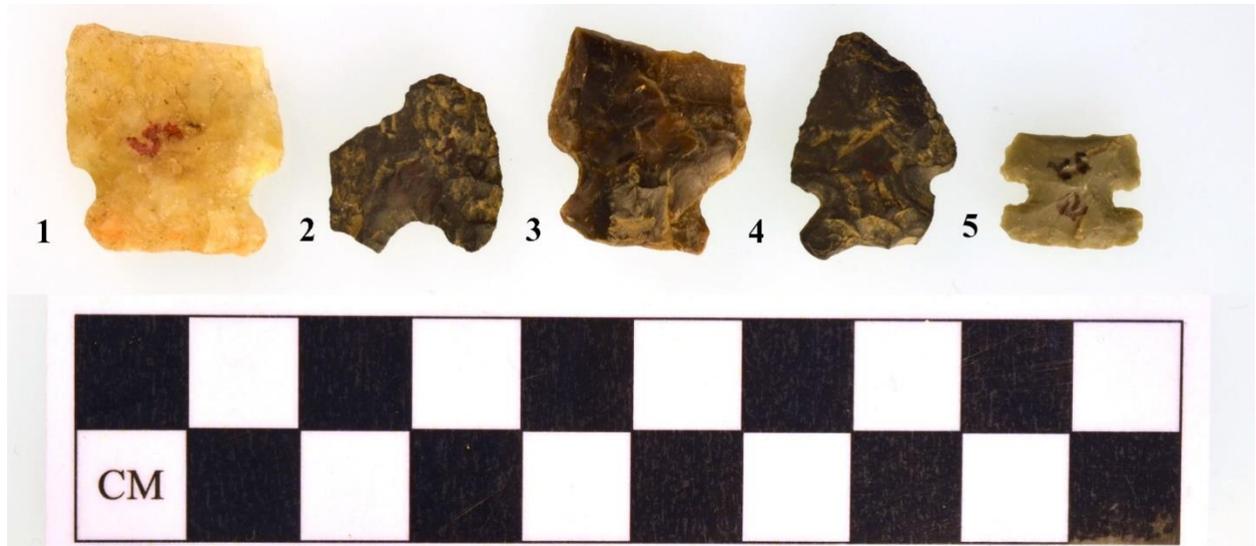
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DRC	9	No Provenience		Point	McKean	Black Siltstone	2.4	2	0.55	A 1.5-10
DRC	9	No Provenience		Point	Pelican Lake	Grey Chert	2.5	1.7	0.45	A 1.5-11
DRC	9	No Provenience		Point	Avonlea	Red Chert	3.1	2	0.6	A 1.5-12
DRC	9	No Provenience		Point	Besant	Black Siltstone	2.2	2	0.5	A 1.5-13
DRC	9	No Provenience		Point	Besant	Black Siltstone	2.2	2	0.6	A 1.5-14
DRC	9	No Provenience		Point	Prairie SN	Black Siltstone	2.4	1.4	0.3	A 1.5-15
DRC	9	No Provenience		Point	Hanna	Quartz	2.1	1.8	0.5	A 1.5-16
DRC	9	No Provenience		Point	Prairie SN	White Quartzite	2.4	1.6	0.7	A 1.5-17
DRC	9	No Provenience		Point	Unknown	Purple Quartzite	2.3	2	0.65	A 1.5-18
DRC	9	No Provenience		Point	Hanna	Feldspathic Siltstone	2.4	1.9	0.5	A 1.5-19
DRC	9	No Provenience		Point	Plains SN	White Quartzite	1.8	1.6	0.45	A 1.5-20
DRC	9	No Provenience		Point		Brown Chalcedony	1.9	1.7	0.4	A 1.5-21
DRC	9	No Provenience		Point	Plains SN	Black Siltstone	2.4	1.5	0.45	A 1.5-22
DRC	9	No Provenience		Point	Besant	Grey Chert	2	1.7	0.35	A 1.5-23
DRC	9	No Provenience		Point	Prairie SN	Black Siltstone	2	1.4	0.2	A 1.5-24
DRC	9	No Provenience		Point	Prairie SN	White Quartzite	2	1.4	0.3	A 1.5-25
DRC	9	No Provenience		Point	Prairie SN	White Quartzite	0.9	1.4	0.45	A 1.5-26
DRC	12	SW 35-34-18-3	Porter Lands	Point	Oxbow	Siltstone	2.1	1.8	0.4	A 1.6-1
DRC	12	SW 35-34-18-3	Porter Lands	Point	Pelican Lake	Grey Chert	2.5	1.9	0.5	A 1.6-2
DRC	12	SW 35-34-18-3	Porter Lands	Point	Besant	White Quartzite	2.2	2	0.55	A 1.6-3
DRC	12	SW 35-34-18-3	Porter Lands	Point	Avonlea	Grey Quartzite	1.7	2.1	0.55	A 1.6-4
DRC	12	SW 35-34-18-3	Porter Lands	Point	McKean	Grey Quartzite	2.5	1.5	0.4	A 1.6-5
DRC	12	SW 35-34-18-3	Porter Lands	Point	Duncan	White Quartzite	1.4	1.7	0.55	A 1.6-6
DRC	12	SW 35-34-18-3	Porter Lands	Point	Besant	White Chert	1.9	1.9	0.5	A 1.6-7
DRC	12	SW 35-34-18-3	Porter Lands	Point	Prairie SN	Feldspathic Siltstone	2	1.4	0.5	A 1.6-8
DRC	12	SW 35-34-18-3	Porter Lands	Point	McKean	Siltstone	1.9	1.4	0.4	A 1.6-9
DRC	12	SW 35-34-18-3	Porter Lands	Point	Besant	Pink Quartzite	1.8	1.7	0.5	A 1.6-10
DRC	12	SW 35-34-18-3	Porter Lands	Point	Oxbow	Tan Chert	1.7	1.7	0.4	A 1.6-11
DRC	12	SW 35-34-18-3	Porter Lands	Biface	Unknown	Feldspathic Siltstone				A 1.6-12
DRC	12	SW 35-34-18-3	Porter Lands	Point	Early Period	Grey Chalcedony	1.5	1.9	0.6	A 1.6-13
DRC	14	NW 11-34-18-3	Ruthilda Cemetary	Point	Oxbow	Brown Chalcedony	4.6	2.6	0.6	A 1.7 -1
DRC	14	NW 11-34-18-3	Ruthilda Cemetary	Preform		Black Siltstone	2.9	1.4	0.45	A 1.7 -2
DRC	14	NW 11-34-18-3	Ruthilda Cemetary	Point	Besant	Black Siltstone	2.4	1.8	0.5	A 1.7 -3
DRC	14	NW 11-34-18-3	Ruthilda Cemetary	Point	Besant	Black Siltstone	2.8	1.9	0.5	A 1.7 -4
DRC	14	NW 11-34-18-3	Ruthilda Cemetary	Point	Besant	Black Siltstone	2.4	1.2	0.45	A 1.7 -5
DRC	15	NW 11-34-18-3	Ruthilda Cemetary	Point	Pelican Lake	Brown Chert	3.7	2.4	0.55	A 1.8-1
DRC	15	NW 11-34-18-3	Ruthilda Cemetary	Point	Middle Period	White Chert	4.5	1.9	0.75	A 1.8-2
DRC	15	NW 11-34-18-3	Ruthilda Cemetary	Point	Pelican Lake	Grey Chert	3.1	1.9	0.5	A 1.8-3
DRC	15	NW 11-34-18-3	Ruthilda Cemetary	Point	Unknown	Swan River Chert	3	2.8	0.75	A 1.8-4
DRC	15	NW 11-34-18-3	Ruthilda Cemetary	Point	Prairie SN	Fossil Stone	2.6	1.7	0.6	A 1.8-5
DRC	15	NW 11-34-18-3	Ruthilda Cemetary	Point	Unknown	Petrified Peat				A 1.8-6
DRC	15	NW 11-34-18-3	Ruthilda Cemetary	Retouched Flake		Brown Chalcedony				A 1.8-7
DRC	15	NW 11-34-18-3	Ruthilda Cemetary	Point	Pelican Lake	Swan River Chert	1.8	2	0.4	A 1.8-8
DRC	16	No Provenience		Point	Prairie SN	Black Siltstone	1.9	1.6	0.5	A 1.9-1
DRC	19	No Provenience		Point	Pelican Lake	Brown Chert	1.8	2	0.55	
DRC	19	No Provenience		Point	Oxbow	Silicified Peat	1.8	1.4	0.4	
DRC	29	SW 35-34-18-3	Porter Lands	Point	Besant	Grey Siltstone	3.8	2.8	0.65	A 1.10-1
DRC	29	SW 35-34-18-3	Porter Lands	Point	Oxbow	Siltstone	3.3	1.8	0.5	A 1.10-2
DRC	29	SW 35-34-18-3	Porter Lands	Point	Prairie SN	Black Siltstone	1.9	1.3	0.3	A 1.10-3
DRC	29	SW 35-34-18-3	Porter Lands	Point	Prairie SN	Siltstone	2.2	1.4	0.35	A 1.10-4
DRC	29	SW 35-34-18-3	Porter Lands	Drill		Silicified Peat				A 1.10-5
DRC	36		Woods Opuntia	Point	Oxbow	Petrified Wood	2.4	1.5	0.5	A 1.11-1



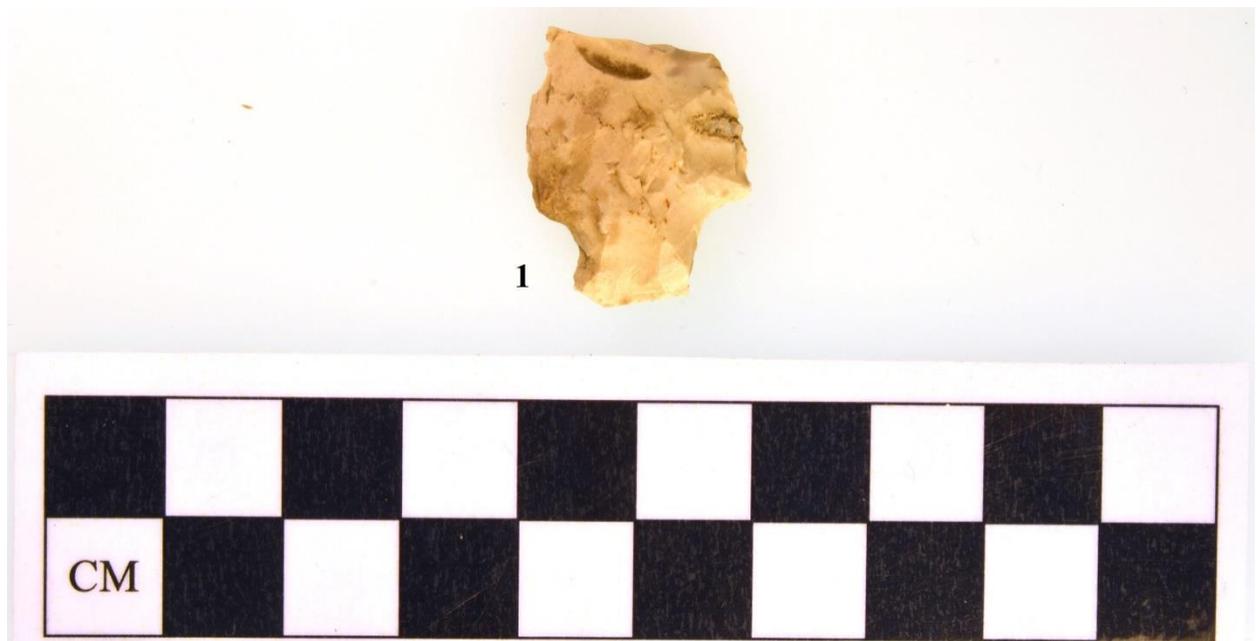
Appendix Figure 1.1. Doug Richards collection bag 1.



Appendix Figure 1.2. Doug Richards collection bag 2.



Appendix Figure 1.3 Doug Richards collection bag 6.



Appendix Figure 1.4. Doug Richards collection bag 8.



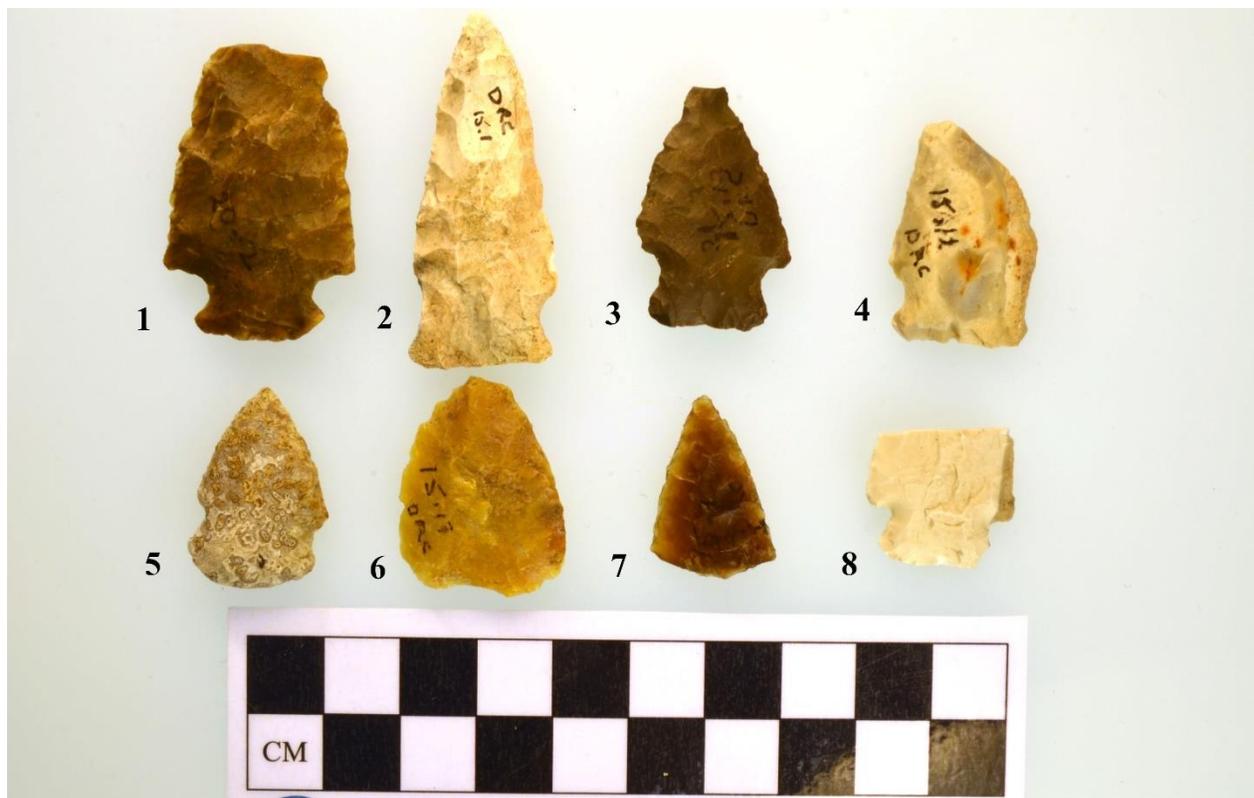
Appendix Figure 1.5. Doug Richards collection bag 9.



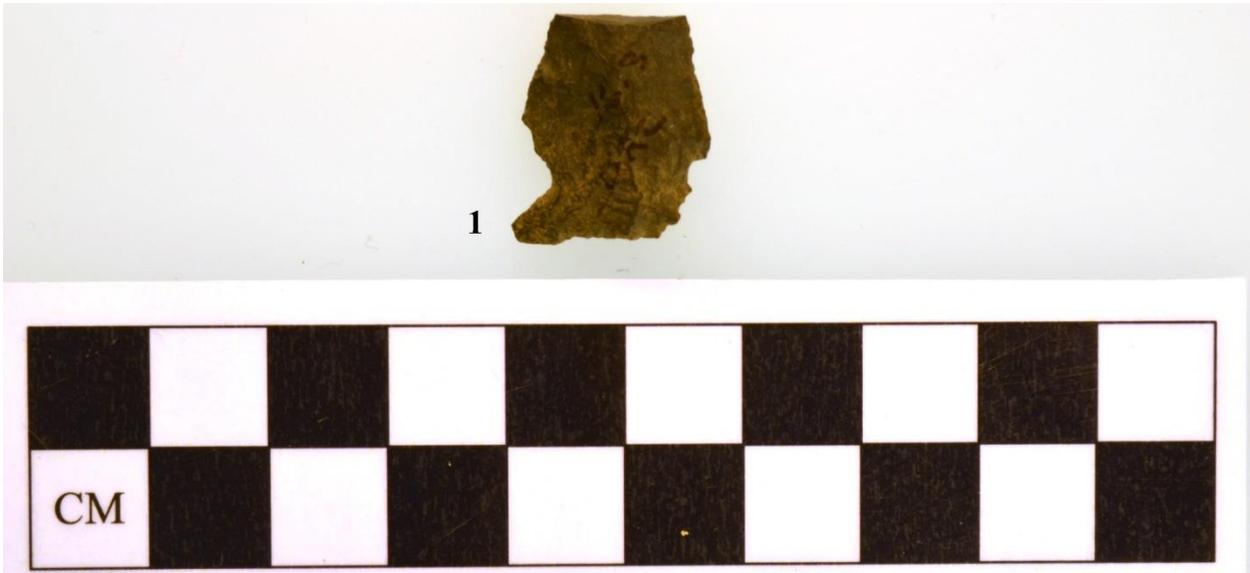
Appendix Figure 1.6. Doug Richards collection bag 12.



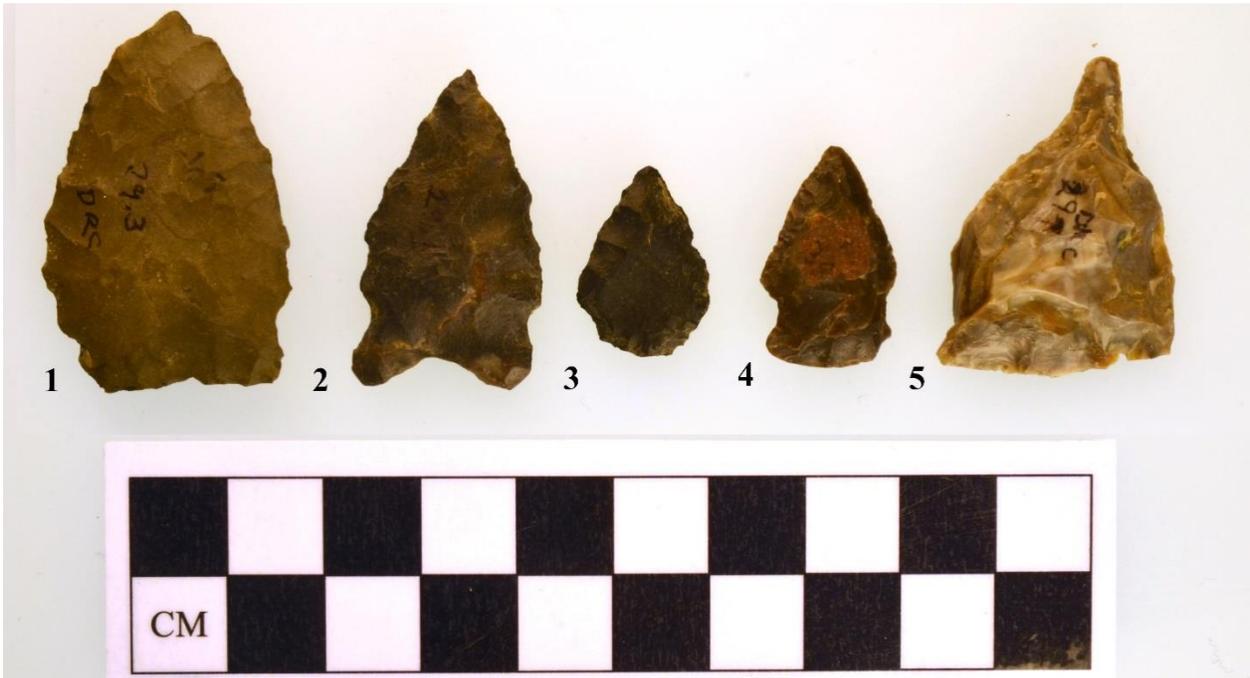
Appendix Figure 1.7. Doug Richards collection bag 14.



Appendix Figure 1.8. Doug Richards collection bag 15.



Appendix Figure 1.9. Doug Richards collection bag 16.



Appendix Figure 1.10. Doug Richards collection bag 29.

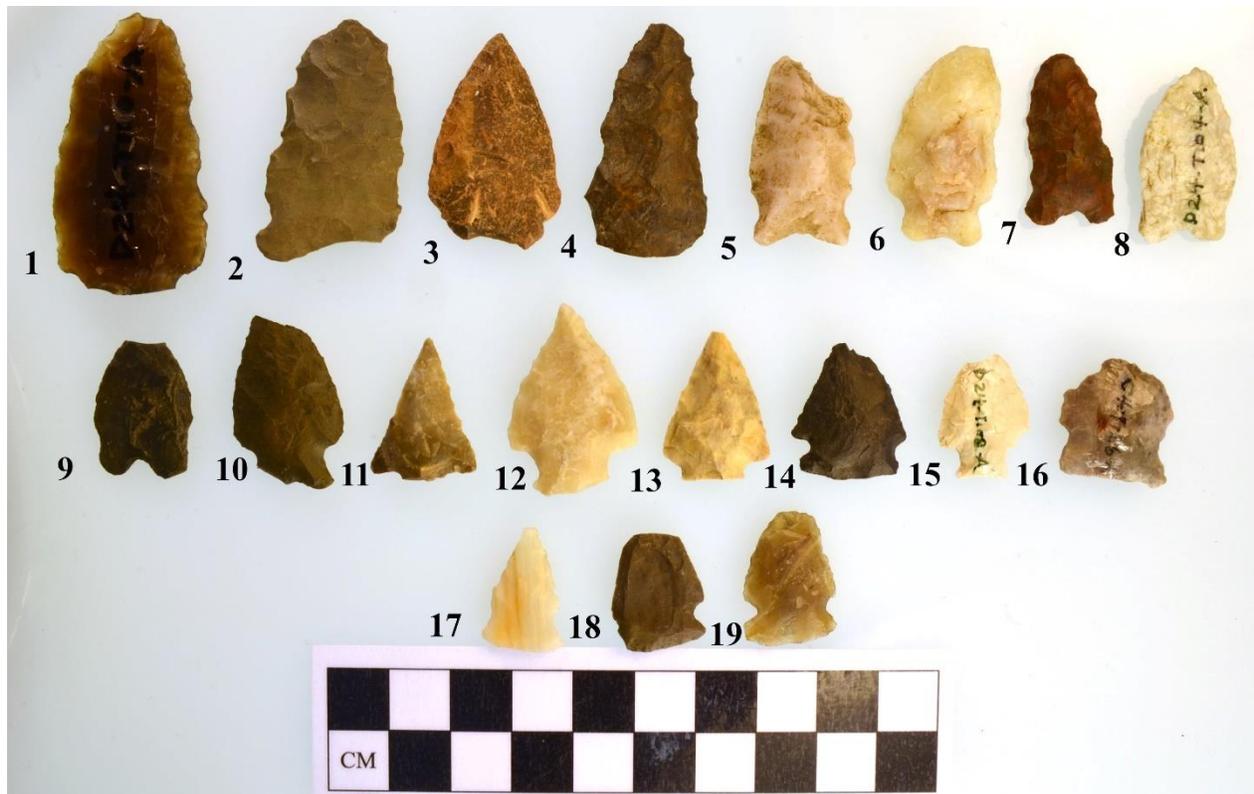


Appendix Figure 1.11. Doug Richards collection bag 36.

A.1.2. Projectile Points in the Ancient Echoes Interpretive Centre's Collection.

Collection	Bag #	Location	Type	Complex	Material	Height (cm)	Width (cm)	Thickness (cm)	Photo Ref
AEC	On Display	No Provenience	Point	Besant	Brown Chalcedony	4.4	2.4	0.6	A 1.12-1
AEC	On Display	No Provenience	Point	Oxbow	Grey Chert	3.8	2.2	0.5	A 1.12-2
AEC	On Display	No Provenience	Point	Avonlea	Tan Chert	3.5	2.1	0.4	A 1.12-3
AEC	On Display	No Provenience	Point	Prairie SN	Tan Chert	3.7	1.9	0.55	A 1.12-4
AEC	On Display	No Provenience	Point	Duncan	Quartzite	3	1.6	0.7	A 1.12-5
AEC	On Display	No Provenience	Point	Pelican Lake	White Quartzite	3.2	1.7	0.75	A 1.12-6
AEC	On Display	No Provenience	Preform	Oxbow	Feldspathic Siltstone	2.8	1.5	0.6	A 1.12-7
AEC	On Display	No Provenience	Point	Duncan	White Quartzite	2.9	1.6	0.4	A 1.12-8
AEC	On Display	No Provenience	Point	Oxbow	Black Siltstone	2.2	1.6	0.4	A 1.12-9
AEC	On Display	No Provenience	Point	Oxbow	Grey Chert	2.9	1.8	0.5	A 1.12-10
AEC	On Display	No Provenience	Point	Pelican Lake	Grey Chert	2.3	1.7	0.5	A 1.12-11
AEC	On Display	No Provenience	Point	Oxbow	White Chert	3	2	0.6	A 1.12-12
AEC	On Display	No Provenience	Point	Pelican Lake	Tan Chert	2.4	1.7	0.5	A 1.12-13
AEC	On Display	No Provenience	Point	Oxbow	Black Siltstone	2.2	1.8	0.5	A 1.12-14
AEC	On Display	No Provenience	Point	Prairie SN	White Chert	2	1.4	0.4	A 1.12-15
AEC	On Display	No Provenience	Point	Prairie SN	Purple Chert	1.9	1.9	0.45	A 1.12-16
AEC	On Display	No Provenience	Point	Prairie SN	White Chert	2	1.4	0.25	A 1.12-17
AEC	On Display	No Provenience	Point	Prairie SN	Black Siltstone	1.9	1.5	0.3	A 1.12-18
AEC	On Display	No Provenience	Point	Plains SN	Grey Chalcedony	2.1	1.5	0.4	A 1.12-19
AEC	4	Herschel Area	Point	Oxbow	Black Siltstone	2.7	2.1	0.4	A 1.13-1
AEC	4	Herschel Area	Point	Oxbow	Silicified Peat	2.8	2.6	0.6	A 1.13-2
AEC	4	Herschel Area	Point	Oxbow	Black Siltstone	2.1	1.8	0.4	A 1.13-3
AEC	4	Herschel Area	Preform		Grey Chert				A 1.13-4
AEC	4	Herschel Area	Point	Besant	Brown Chalcedony	2.8	1.6	0.45	A 1.13-5
AEC	4	Herschel Area	Point	Duncan	Red Quartzite	4.1	1.9	0.7	A 1.13-6
AEC	4	Herschel Area	Point	Sandy Creek	Quartzite	3	2.1	0.6	A 1.13-7
AEC	4	Herschel Area	Point	Pelican Lake	White Quartzite	2.1	2	0.6	A 1.13-8
AEC	4	Herschel Area	Point	Pelican Lake	Black Siltstone	2.4	1.7	0.4	A 1.13-9
AEC	4	Herschel Area	Point	Pelican Lake	Siltstone	3.6	2.4	0.55	A 1.13-10

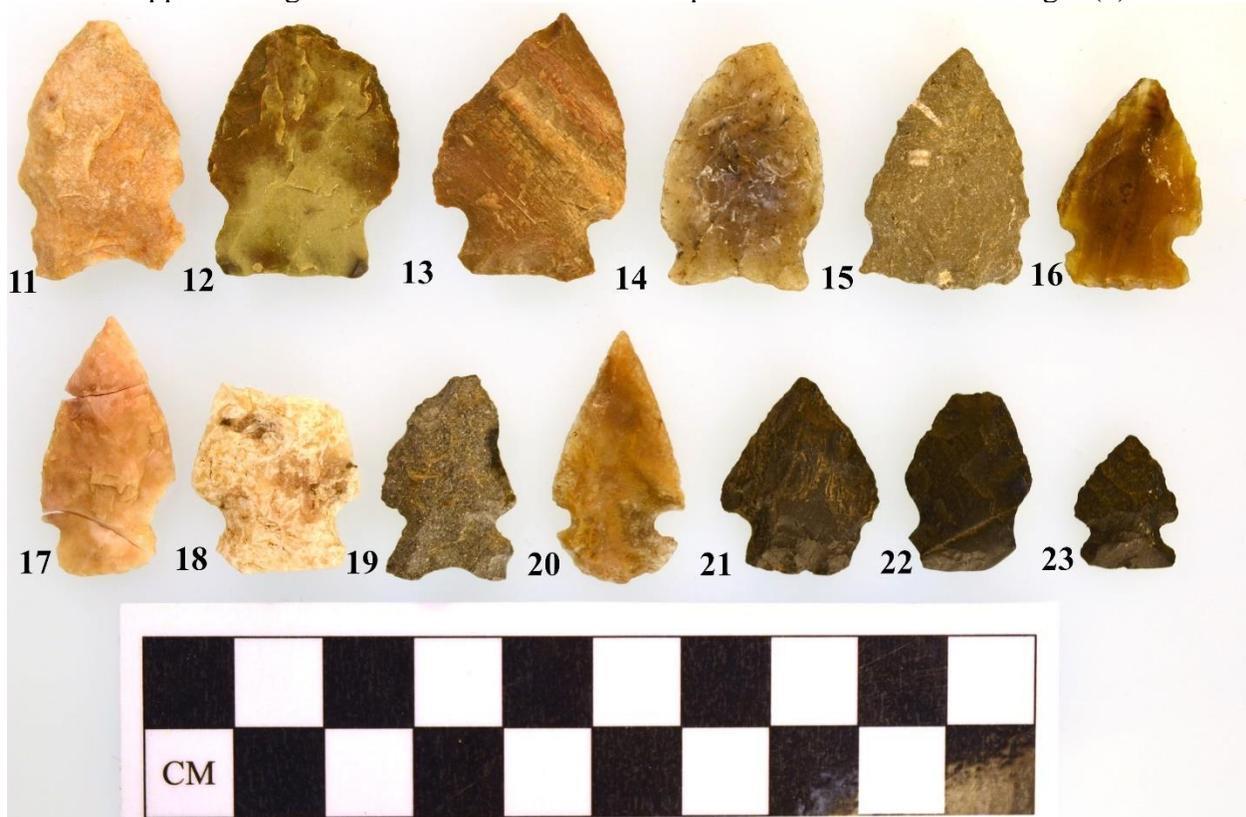
AEC	4	Herschel Area	Point	Oxbow	Pink Quartzite	2.8	1.8	0.4	A 1.14-11
AEC	4	Herschel Area	Point	Besant	Brown Chert	2.8	2	0.55	A 1.14-12
AEC	4	Herschel Area	Point	Pelican Lake	Petrified Peat	3	2.1	0.5	A 1.14-13
AEC	4	Herschel Area	Point	Duncan	Grey Chalcedony	2.6	1.7	0.5	A 1.14-14
AEC	4	Herschel Area	Point	Prairie SN	Limestone	2.7	1.7	0.5	A 1.14-15
AEC	4	Herschel Area	Point	Prairie SN	Brown Chalcedony	2.4	1.5	0.4	A 1.14-16
AEC	4	Herschel Area	Point	Besant	Pink Quartzite	2.8	1.4	0.45	A 1.14-17
AEC	4	Herschel Area	Point	Besant	White Quartzite	3.1	1.9	0.6	A 1.14-18
AEC	4	Herschel Area	Point	Oxbow	Black Siltstone	2.2	1.5	0.4	A 1.14-19
AEC	4	Herschel Area	Point	Pelican Lake	Tan Chalcedony	2.9	1.4	0.2	A 1.14-20
AEC	4	Herschel Area	Point	Prairie SN	Black Siltstone	2.2	1.7	0.5	A 1.14-21
AEC	4	Herschel Area	Point	Prairie SN	Black Siltstone	2	1.4	0.3	A 1.14-22
AEC	4	Herschel Area	Point	Plains SN	Black Siltstone	1.5	1.1	0.25	A 1.14-23
AEC	4	Herschel Area	Point	Plains SN	Quartz	1.3	1.7	0.6	
AEC	4	Herschel Area	Point	McKean	Quartz	1.6	2.1	0.4	



Appendix Figure 1.12. Ancient Echoes Interpretive Centre collection display points.



Appendix Figure 1.13. Ancient Echoes Interpretive Centre collection bag 4 (1).



Appendix Figure 1.14. Ancient Echoes Interpretive Centre collection bag 4 (2).