Archaeological Investigations in the Quill Lakes Region, East Central Saskatchewan.

A Thesis

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By

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ABSTRACT

Archaeological research was carried out in the Quill Lakes region of east central Saskatchewan using data derived primarily from surface collections augmented with site survey. In all, 15 collections, representing an estimated 35 000 to 45 000 artifacts, were examined. From this, 1291 diagnostic projectile points and 17 ceramic vessels were identified. These diagnostic artifacts served as the focus of this thesis.

The results from this study indicate a long occupation of the Quill Lakes region. The Agate Basin complex initiates occupation in the area some time after 12 900 B.P. (10 500 rcybp). Cody complex and Terminal Paleo-Indian complexes are also identified. Distinctive, large corner-notched projectile points represent the transition between the Paleo-Indian and Middle Plains Indian periods. These points, manufactured primarily from Knife River Flint, have yet to be described in the archaeological literature. Large corner-notched points of this type contain characteristics of both Paleo-Indian and Middle Plains Indian lithic technologies. The Middle Plains Indian period is the most intensively occupied period with the largest number of components and projectile points of any period. Diagnostic artifacts are identified from the Mummy Cave series, and Oxbow, McKean and Pelican Lake complexes. The presence of Besant series projectile points marks the start of the Late Plains Indian period. A large Bratton component was identified, the first such component since initial descriptions of this point type. During the Avonlea phase, the Quill Lakes region was the least intensively occupied. Ceramics were also notably absent from the collections.

Finally, the role of the aspen parkland as a zone of transition and/or interaction between forest- and plains-adapted groups during the past 3000 years was explored. Data from the collections indicate no evidence of any interaction between these two groups of people. Diagnostic artifacts for this period fit well within existing culture-historical schemes outlined for the Northern Plains. These findings are in accordance with those of Meyer and Epp (1990).

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Numerous people have provided support for this research. I would like to thank the members of my thesis committee. Drs. David Meyer and Ernie Walker served as co-supervisors and provided much guidance and direction to the research. I would also like to thank Drs. Ian Dyck and Robert Bone for their many useful comments and suggestions.

This thesis would not have been possible without the co-operation and support of the many collectors and landowners from the Quill Lakes region. In particular, I would like to thank Ed Stachyruk for initiating this research by lending his extensive well-organized collection to the Department of Anthropology and Archaeology for study. Many hours were also spent at the home of Ed and Ruth Yurach who provided unlimited access to Ed's collection. Special thanks also go out to Bob and Laureen Hamilton, Mitch Malinowski, Anne Michaluk (Wadena Museum), Ken Kerluke, and Ed Rorquist. These individuals also allowed access to examine and record their collections. In addition, many landowners provided access to their land. Their interest and support is much appreciated.

The Saskatchewan Archaeological Society and the Saskatchewan Heritage Foundation provided financial support for this project. Their support is appreciated. In addition, Dr. Margaret Hanna from the Royal Saskatchewan Museum kindly lent me slides from the Collection Registry Program for this study. This research was completed complying with Saskatchewan Heritage Legislation under permit # 99-023.

I would like to thank my family and friends at the University of Saskatchewan. Their support made things go much easier. Thanks to my parents for their continued support throughout my university years. Sean Webster provided needed advice on field methods and Aileen Novecosky, Peter Popkin, and Layne Holmlund helped with the site surveys. Kim Weinbender rendered all of the maps in this thesis using Corel Draw. Finally, my 'lab partners' Peter Popkin, Laureen Bryant, and Tomasin Playford provided friendship, moral support and advice on much of this thesis.

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Chapter 1

1.1 Introduction

During the past century, collecting prehistoric aboriginal artifacts has been a popular pursuit for many people in Saskatchewan. Many large, well-organized collections have been amassed, but the majority remain unrecorded and contain information valuable to archaeologists. This thesis combines data provided primarily by collectors and their artifacts with information gathered during fieldwork and applies it to archaeological questions posed for a particular region.

The Quill Lakes study area is located in the aspen parkland of east central Saskatchewan (Figure 1.1). The study encompasses a region bounded roughly by the north face of the Touchwood Hills to the south with the north boundary an east-west line through the town of Quill Lake. Jansen Lake is the western border and the Fishing Lake Indian Reserve serves as the eastern border. The study boundaries measure approximately 50 km by 70 km, covering 3500 km^2. Figures 1.2, 1.3, and 1.4 show the study area with the locations of all known archaeological sites.

Ed Stachyruk, a collector from Wynyard, SK, identified the need for a systematic archaeological study of the region (Stachyruk 1981). In a local history book he noted:

> As of yet there has been no intensive archaeological study or excavation done around the Quill Lakes region. The potential for furthering our understanding about the prehistoric cultures, events of the historic fur trade, and the early European homesteaders is very promising. It is hoped that the future scientific work, here, can help make us more knowledgeable and aware of the continuity of our local history (Stachyruk 1981:2).

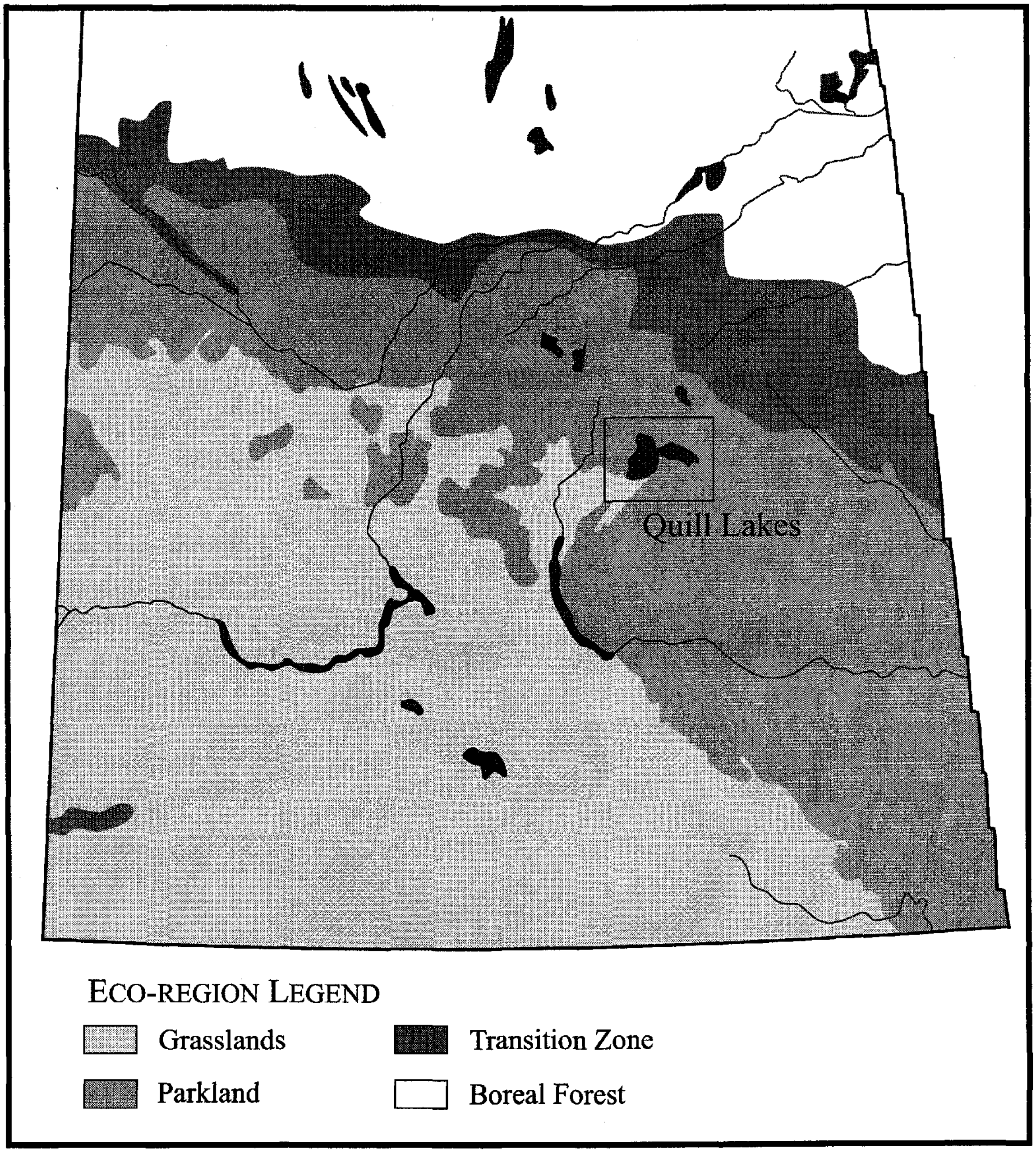


Figure 1.1. Map of Saskatchewan showing eco-regions and the location of the Quill Lakes study area (Based on Coupland and Rowe 1969:76-77; Zoltai 1975:Figure 1).

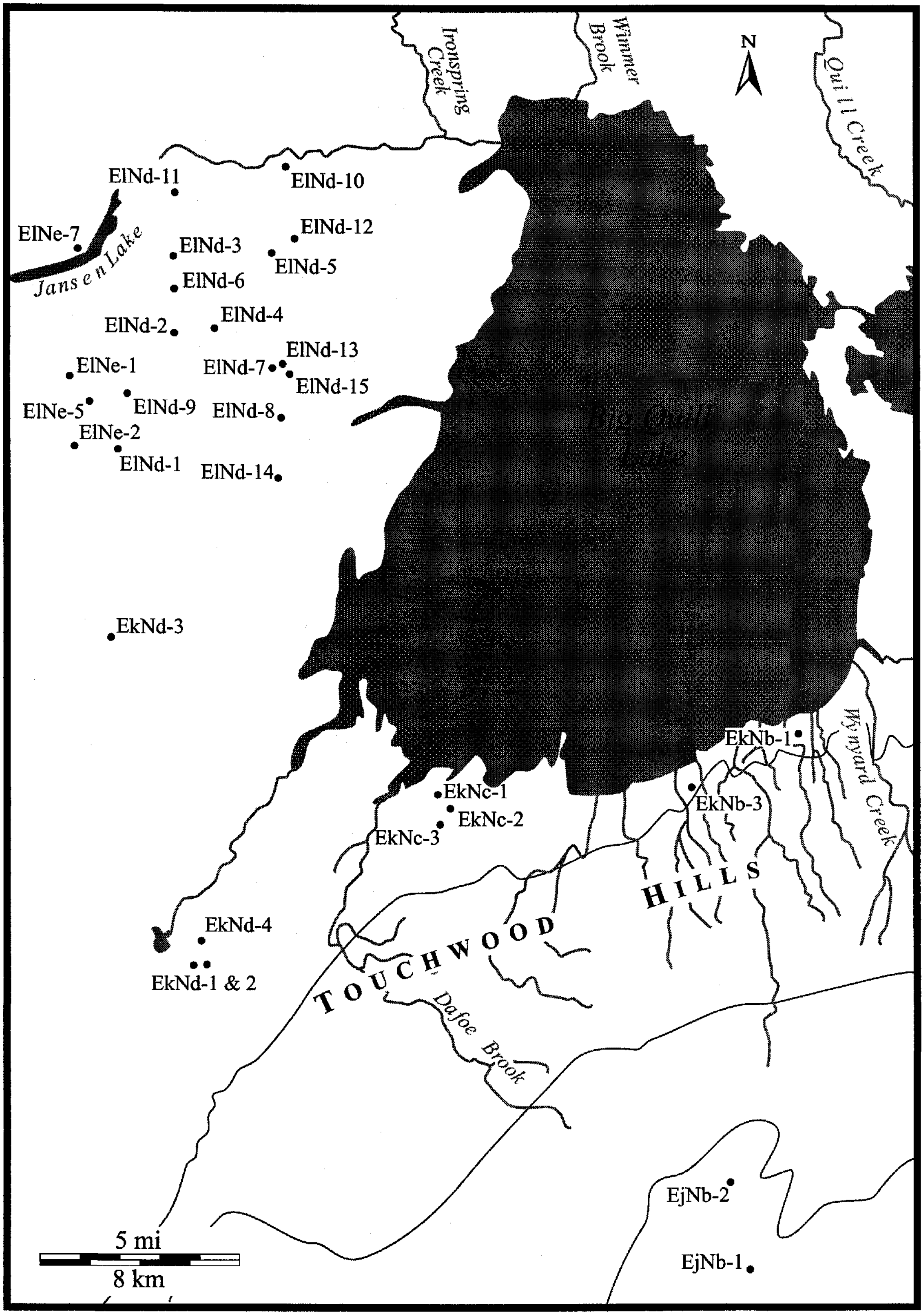


Figure 1.2. Map of the study area illustrating known archaeological sites (west half).

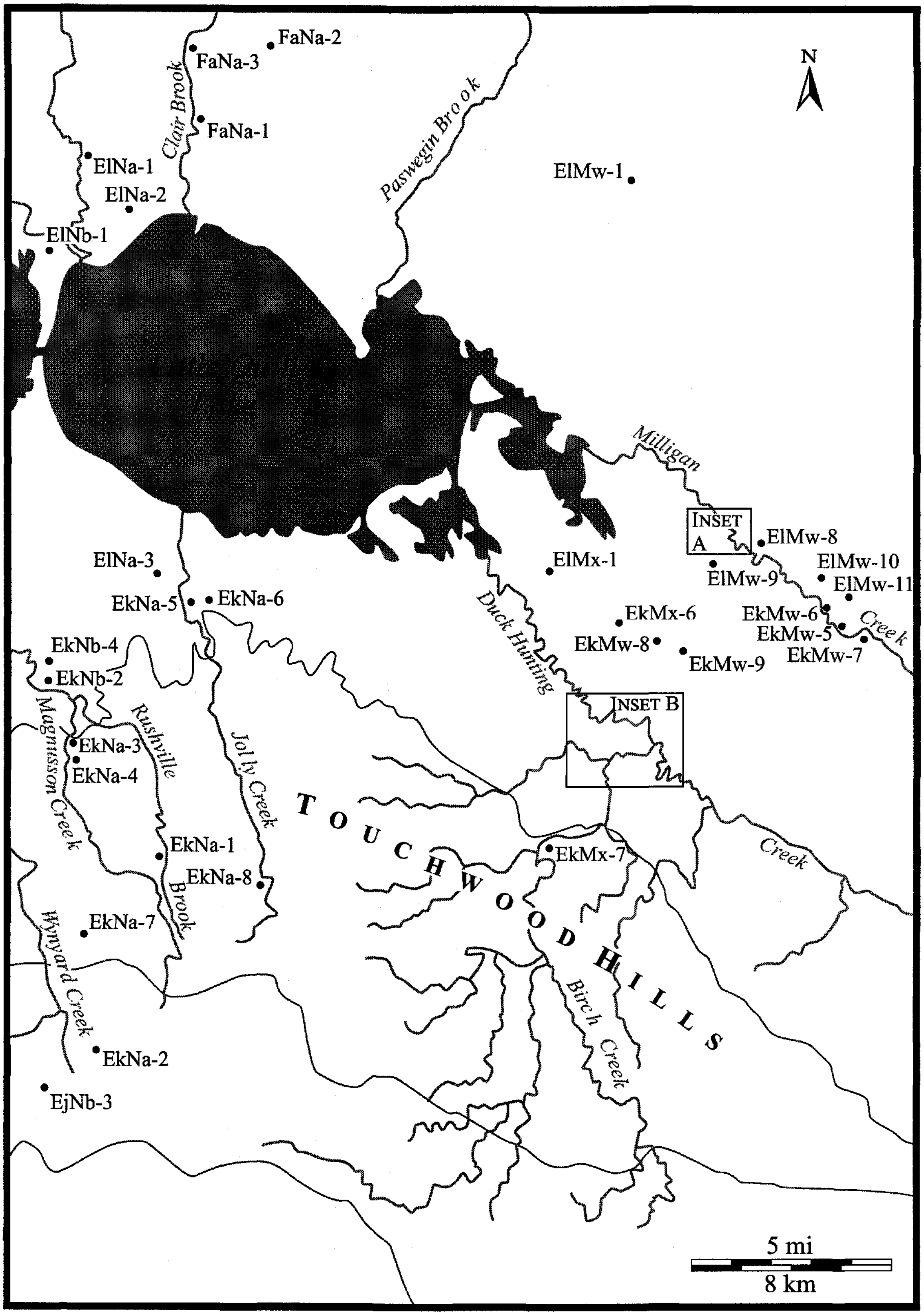
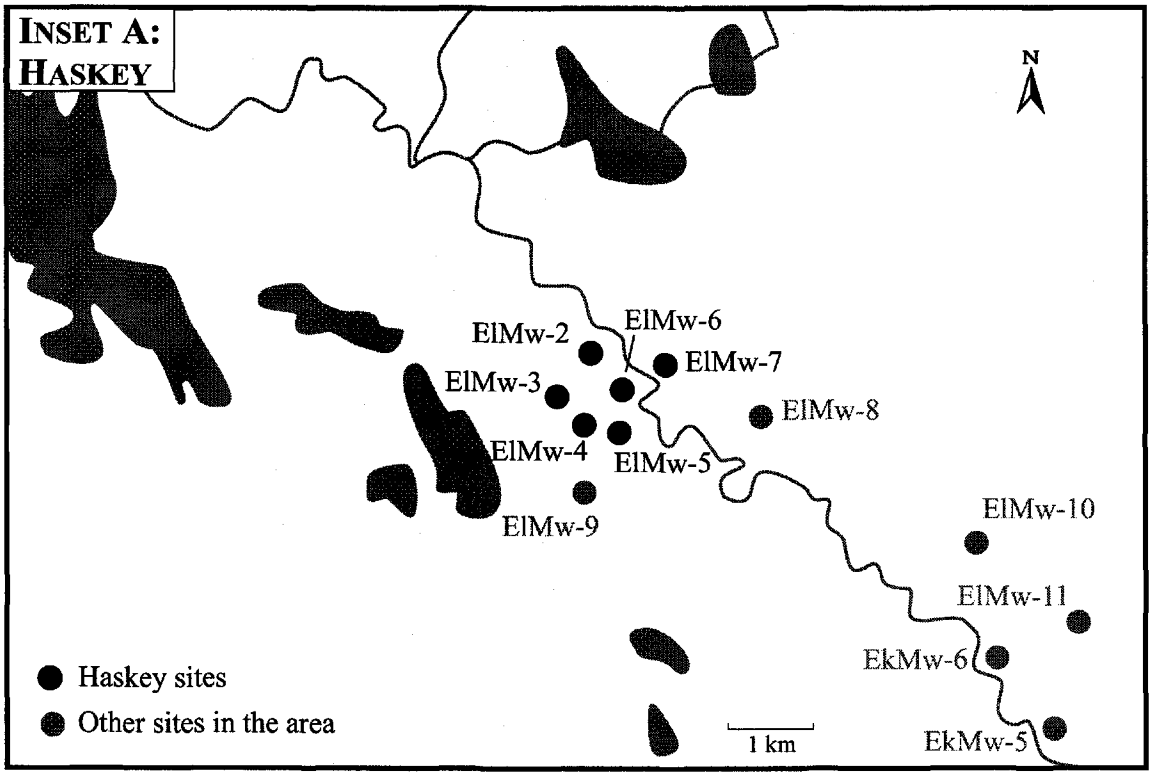


Figure 1.3. Map of the study area illustrating known archaeological sites (east half).



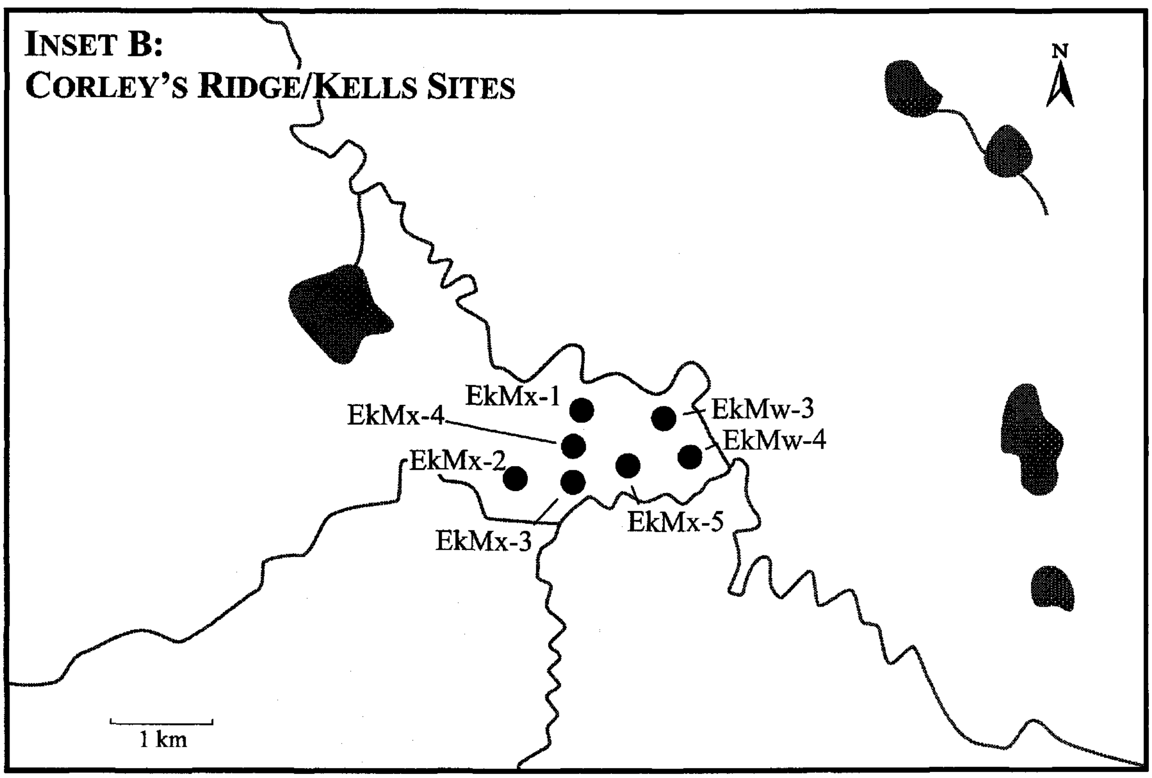


Figure 1.4. Insets showing individual sites at the Haskey and Corley's Ridge/Kells area.

Ed Stachyruk lent his extensive and well-organized collection to the Department of Anthropology and Archaeology at the University of Saskatchewan with the hope that it would be analyzed and contribute to the archaeological knowledge of the Quill Lakes region.

There have been few archaeological investigations in the parkland region of east central Saskatchewan. Several factors contribute to this exclusion. The most important factor is that the majority of the archaeological investigations in the province are cultural resource management (CRM) projects and there has been little CRM activity in the parklands of eastern Saskatchewan. Because of the lack of professional archaeological investigations, the cultural historical data desired as a base for further investigation, is lacking. In addition, it is important to gather archaeological data for this region because the parklands are considered an ecotone used by both forest-adapted people from the north and grassland-adapted people of the south (Ray 1972, 1974; Syms 1977; Losey 1978; Nicholson 1987, 1988; Meyer and Epp 1990). Since there is a paucity of archaeological knowledge for the parklands, additional information would be useful to evaluate these models.

1.2 Research Objectives

The main objectives of this thesis are to:

1) Identify and record artifact collections from the study area;

2) Locate and verify the site locations that the collections represent;

3) Construct the local culture history using diagnostic artifacts identified from the collections,

4) Identify lithic materials and sources used by the occupants of the region,

5) Briefly examine site location and settlement patterns,

6) Undertake a critical evaluation of the role the parkland may have had for the inhabitants of the region and explore the nature of possible interactions between plains-adapted and forest-adapted groups in the Quill Lakes region.

1.3 Previous Archaeological Work in the Quill Lakes Region

At the start of this research, only 27 sites from the 13 Borden zones in the Quill Lakes region were on file at the Heritage Branch at Saskatchewan Municipal Affairs and Housing in Regina (MAH). The bulk of the known site locations are the result of the Collection Registry Program coordinated by the Saskatchewan Museum of Natural History[1]. It ran from 1983 to 1986 and inventoried approximately 870 sites represented in 130 collections from across the province (Conaty et al. 1988:15). Two of these collections (Joe Hamilton and Llewelyn Wildeman collections) came from the Quill Lakes region. Site information has come from other collectors (Orly Felton[2]) and individual informants. Five sites reported in 1960 are from a local schoolteacher. Archaeologists from the Saskatchewan Research Council (SRC) recorded one site in 1985. The SRC was conducting a small archaeological survey as part of an environmental impact assessment for the sulphate potassium plant at Big Quill Lake (Wilson 1985). No sites were located during their surveys, but they visited a local collector from Wynyard who took them to one site just outside of Wynyard, which was subsequently recorded (Ed Yurach, personal communication 1999).

[1] It is presently called the Royal Saskatchewan Museum.

[2] Orly Felton has his collection recorded and is on file at the Saskatchewan Archaeological Society in Saskatoon.

Boyd Wettlaufer (1951) lists several collectors from the Quill Lakes region in his survey of Saskatchewan but it is unknown if he communicated with any of them or visited any sites in the area. Dennis Anderson also visited and recorded a couple of sites in the Clair area during the course of the Glacial Lake Agassiz surveys in the early 1960s. These site locations were not on file with the government agency in Regina. A summary of the informants and the date these sites were recorded is presented in Table 1.1. None of these sites have been excavated to date.

Table 1.1. A summary of the origins of the sites on file at MAH for the study area.

Source/Informant	Number of Sites	Date Recorded
Joe Hamilton	10	1986
Llewelyn Wildeman	4	1986
Orly Felton	3	1969
SRC	1	1985
Noreen Cressman	5	1960
Miscellaneous	4	1960-1995

1.4 Physiography

1.4.1 Glacial History and Surficial Geology

The modern topography and surficial geology of the study area are the remains of a once glaciated landscape (Greer and Christiansen 1963; Richard 1964). Deglaciation occurred between 12 000 and 11 000 B.P. (Christiansen 1979; Kehew and Teller 1994) and proceeded from the southwest to the northeast (Greer and Christiansen 1963; Richard 1964). The Touchwood Hills show three oxidized glacial till levels indicating at least three separate glaciation episodes (Greer and Christiansen 1963:7).

Four prominent topographic features characterize the study region. The Touchwood Hills and the Glacial Quill Lake plain are the two most salient features. To the north of the glacial lake plain is a set of low uplands while to the west exists a hummocky moraine plain bounded by Jansen Lake.

The Touchwood Hills Upland is an area with hummocky moraine having local relief of up to 30 m (Greer and Christiansen 1963:18). This upland is composed of two parts, the Touchwood Hills and the Little Touchwood Hills. The Touchwood Hills lie north of the Little Touchwood Hills and rise 180 m above the Quill Lakes. The north slope of the Touchwood Hills has a gradient of about 10 m per km (Langham 1970:3). The Touchwood Hills Upland acts as a ground water recharge area where water moves down vertically to the Wynyard Aquifer. The Wynyard Aquifer discharges to the Wynyard Formation Aquifer which then discharges along the southern shoreline of Big Quill Lake (Langham 1970:Appendix E; Maathuis 1985:B-10). The upper part of the Touchwood Hills is not well drained and there are numerous sloughs and small lakes. Deeply incised creeks drain the lower areas.

The Quill Lakes lie is a closed drainage basin on a glacial lake plain. The lakes have occupied a closed basin since glacial meltwaters stopped flowing into Glacial Quill Lake (Greer and Christiansen 1963:19). The presence of glacial lake features, such as lacustrine deposits, maximum outlet levels, and deltas where meltwater streams entered the glacial lake, indicate the highest level of Glacial Quill Lake was about 533 m above mean sea level (Greer and Christiansen 1963:22; Meneley 1964:62; Campbell n.d., 1986, 1987). The Glacial Quill Lake plain is flat and characterized by thin glaciolacustrine deposits (Greer and Christiansen 1963:22; Meneley 1964:62; Moran 1969:5).

1.4.2 Soils

Black chernozemic soils dominate the study area. These develop under grassland conditions and are characterized by a dark coloured A horizon, brown B horizon and a light coloured C horizon (Moss and Clayton 1969:72). The black soil zone corresponds to soils developed under a more humid climate and heavier vegetative growth contributing to the dark organic nature of the soils (Mitchell et al. 1944:104). Black soils generally correspond to the aspen parkland. The soils are formed on two types of parent materials in the study region. These are ice-lain and water-lain deposits.

Alkaline soils comprise the second main soil type. Alkaline soils located around the periphery of the Quill Lakes and in a large area from the southwest corner of Big Quill towards Last Mountain Lake, develop in areas with poor drainage such as sloughs, creek beds and dry lakes (i.e. recent alluvial and lacustrine deposits) (Mitchell et al. 1944:177).

Gray Luvisolic soils, the principal soils in the Touchwood Hills Upland, are former grassland soils that have been modified due to the invasion of trees and shrubs (Clayton and Moran 1969:72). The A horizon is lighter than in black chernozemic soils. In addition, a small strip of Dark Brown Chernozemic soils are found along the west slope of the Touchwood Hills bordering the saline soils that extend southwest from Big Quill Lake. These soils denote the most northerly extension of the mixed-grass zone into the study area.

1.4.3 Present Climate

The modern climate for the Quill lakes region, described as mid-latitude continental climate, has short warm to hot summers and long cold winters marked with meager seasonal precipitation (Shewchuk and Wheaton 1985:A-8). Following Koepen's modified classification, the Quill Lakes are situated in a humid microthermal zone (Dfb). This corresponds roughly with the aspen parkland and mixed forest regions (Lundqvist 1999:118). Historically, the Quill Lakes region was susceptible to drier conditions. The Dry region (BS) has, during recent droughts, extended into the Quill lakes as seen in 1937 and 1961 (Chakravarti 1969:58). From 1981 to 1990 the Dry region (BSk) also extended into the southwest portion of the study area (Lundqvist 1999:96). Thornwaite's Dry Subhumid moisture region covers the Quill Lakes area. This moisture region extends across two-thirds of Saskatchewan (Lundqvist 1999:96).

The climatic normals, from 1961 to 1990, show a slight difference between the two weather stations located at Wynyard and Paswegin (Environment Canada 1994). Wynyard is located just south of Big Quill Lake while Paswegin is north of Little Quill Lake. The mean January temperature is –17.6 degrees Celsius at Wynyard and –19.1 at Paswegin. The July mean is 17.9 degrees Celsius at Wynyard and 17.6 degrees Celsius at Paswegin. Wynyard receives an average of 406.3mm of precipitation with 294.5mm of rainfall and 129.0 cm of snowfall. Paswegin receives 447.3 mm of precipitation with 308.9 mm of rainfall and 138.3 cm of snowfall (Environment Canada 1994).

The Quill Lakes have a slight effect on the local climate (Shewchuk and Wheaton 1985). This is especially true on the leeward side where later spring and fall frosts are normal. The last frost generally occurs during the last week of May while the first frost befalls in the first week or two of September. Permanent ice normally forms on the Quill Lakes by November 2 and they completely freeze over by November 16 (Shewchuk and Wheaton 1985:A-15). The lakes usually start to thaw by April 19 and typically are clear of ice by May 6 (Shewchuk and Wheaton 1985:A-15).

1.4.4 Present Flora

The Quill Lakes region is situated within the southern half of the aspen parkland (Bird 1961; Thorpe 1999:133). The parkland belt, generally considered to represent a transition from grassland to forest, consists of a mosaic of aspen and mixed grasses. The northern boundary of the parkland is marked by the presence of conifers.
Zoltai (1975:10-11) describes a small transition zone between the parkland and boreal forest but considers it part of the boreal forest. The southern edge of the parkland is marked where moisture deficiency is sufficient to increase the proportion of grasses to trees. In the past, this boundary may have been affected by natural fires while recently it has expanded as cultivation and fire suppression have allowed aspen to grow and extend their range to the south (Bailey 1992, Thorpe 1999:136).

Abouguendia (1985) identified seven main plant communities for the Quill Lakes region. Spear grass, june grass, western wheat grass, northern wheat grass, and kentucky blue grass dominate the Upland Grass community. This is the primary plant community for this region. The Saline Grass type community, dominated by salt grass, blue grass, slender wheat grass, canby blue grass, and june grass can be found along lake margins and sloughs that have created saline soils. The Shrub type community, characterized by a number of shrubs including western snow berry, common wild rose, wild gooseberry, chokecherry, and silver willow or wolf willow, exists as small pockets in the Upland Grass community. The Riparian Vegetation community, characterized by manitoba maple, balsam poplar, western snowberry, common cattail as well as species of marsh reed grass, sedges and rushes, can be found along the streams that lead into the Quill Lakes. The Vegetated Beach community has two types. The beach ridge type has limited diversity, but includes trembling aspen, wild goose berry, and western snowberry. Other species include chokecherry, willow, sage, and brome grasses. The second type in this community occupies salt flats found around the lakes, especially to the west and north of Big Quill Lake. Grasses, especially salt grass, dominate the lakeshore flats. Other important grass species include marsh reed grasses, slender wheat grass, and alkali grass. Some common forbs include gumweed, sea milkwort, aster, and wooly yarrow. The Forest type community, dominated by trembling aspen with some balsam poplar, is found along the deep valleys of some streams and along the tops of some of these valleys. The understory is characterized by red-osier dogwood. Significant shrubs include saskatoon berry, chokecherry, common wild rose, and willow. Other common species include some forbs, notably smooth wild strawberry and common pink wintergreen. Cultivation has destroyed much of the natural vegetation and only a sparse scattering of these communities remains.

Descriptions of the natural vegetation in the region by surveyors, travellers and early settlers suggest that, apart from introduced plant species and cultivation, the vegetation was much the same then as it is now. Surveyors in the Touchwood Hills describe the local environment as "rolling land, thick with poplar, from two to eight inches in diameter, also willow and hazel underbrush" (O.J. Klotz 1880 cited in White 1886). E. Deville (1880, cited in White 1886) notes, "The north half of the east boundary [29-17-W2] is situated in the Big Touchwood Hills, and is covered with thick woods of poplar and birch, from 6 to 12 inches in diameter."

In 1909, the first naturalists to visit and study the Quill Lakes were John Farwell Ferry and R. Magoon Barnes (Houston 1980). John Ferry (1910:185) described the local vegetation as follows: "poplar thickets or 'bluffs' as they are locally termed, are a characteristic feature of the landscape. Toward the south end of the lake they almost entirely disappear, while around the northern edge they run together to such an extent that the term continuous woodland might be used to describe a large portion of the area they cover."

Archibald and Wilson (1980:2035) mapped the distribution of natural vegetation as recorded in the 1880s from surveyor's reports. Although the data is incomplete for the study region, they show parts of the Touchwood Hills having over 60% of the surveyed lines wooded. On the glacial lake plain, the abundance of wood decreases to 15% or less. Virtually no data is available for areas north of the Quill Lakes. Archibald and Wilson (1980:2034) illustrate grasslands dominating the southern shore of Big Quill and extending from the southwest corner toward Last Mountain Lake.

Travellers and explorers noted the flat treeless plain located to the southwest of the Quill Lakes. Many travellers following the Carlton Trail found no potable water between the Touchwood Hills Fort and the Humboldt region and crossed the stark landscape in haste. Henry Youle Hind (1971:412), travelling southeast toward the Touchwood Hills noted, "The Touchwood Hills, as seen from this open 'salt prairie,' present a bold outline gently rising from the vast level." In the popular account of Milton and Cheadle's (1970:56) journey through western Canada in 1862, they stated, "After passing the deserted old Fort at Touchwood Hills, we came, in the course of a day or two, to a long stretch of bare rolling prairie, destitute of tree or shrub, and its hollows occupied by nothing but salt lakes, where we were obliged to carry with us a supply of fire-wood and fresh water." Captain Butler (1872:217), travelling through the region, stated, "From one of the westward jutting spurs of the Touchwood Hills the eye sees far away over an immense plain."

1.4.5 Present Fauna

According to Robert Wapple (1999:139-141), 54 species of mammals include the Quill Lakes region in their natural range. Presently, the main large game animal is the white-tailed deer but this species was not common on the prairies before European settlement (Pepper 1978:114). In fact, cultivation and settlement of the land has had a tremendous impact on the natural flora and fauna and its present condition is vastly different from its natural one. Now, in the Quill Lakes region, mammals likely to occur in the native prairie include white-tailed jackrabbit, Richardson's ground squirrel, American badger, and coyote (Polson 1985:I-9). Common species expected in the aspen parkland include snowshoe hare, Franklin's ground squirrel, red fox, striped skunk, American porcupine, ermine, deer mouse, and Gapper's red-backed vole (Polson 1985:I-9). Mink, muskrat and meadow vole are common in wetlands and marsh habitat.

At one time, large mammals such as bison, elk, grizzly bear, black bear, pronghorn antelope, and mountain lions existed in this part of Saskatchewan, but they have been extirpated since European settlement (Wapple 1999:142). Early travellers in the region note the presence of bison in the Quill Lakes region. Captain Butler describes the scene:

> This region bears the name of the Touchwood Hills. Around it, far into endless space, stretch immense plains of bare and scanty vegetation, plains seared with the tracks of countless buffalo which, until a few years ago, were wont to roam in vast herds between the Assineboine and the Saskatchewan. Upon whatever side the eye turns when crossing these great expanses, the same wrecks of the monarch of the prairie lie thickly strewn over the surface. Hundred of thousands of skeletons dot the short scant grass; and when fire has laid barer still the level surface, the bleached ribs and skulls of long-killed bison whiten far and near the dark burnt prairie (Butler 1872:217).

Carrie Walter, a homesteader in the Quill Lake district, mentions the 'Old Bone Trail' (cited in Anonymous 1980:162) and that it was created by a few white people and Indians who gathered buffalo bones to take to Saskatoon or Regina to sell. In addition, numerous buffalo rubbing stones, some associated with archaeological sites, have been noted in the district (e.g. Yerex 1975:190).

Early settlers in the Quill Lake district often described the presence of elk, moose, and some bears (Anonymous 1955:7). For example, in a 1904 letter to his niece, Jack Price describes some of the mammals at his homestead, located 5 miles south of Big Quill Lake. He states, "There are a great many small, wild animals around this country, badgers, foxes, wolves, etc., but the days of the buffalo, bear, and wild horses, have gone, they are however, still to be found further north" (cited in Anonymous 1981:9). In a subsequent letter, dated Feb. 9th 1905, he reported seeing a black bear near his home (cited in Anonymous 1981:10).

The Quill Lakes, known internationally for their significance to waterfowl, nesting and migrating shorebirds, have areas dedicated as protected. The region has been named a Western Hemisphere Shorebird Reserve Network site (WHSRN). The Saskatchewan Wetland Conservation Corporation (SWCC) manages activities in the Quill Lakes on behalf of the North American Waterfowl Management Plan (NAWMP), the first site in Canada to receive this designation. The RAMSAR Convention on Wetlands designated Big Quill Lake as a wetland of international importance. In addition, areas are protected under provincial jurisdiction. Islands in Middle Quill Lake are designated Provincial Wildlife Refuges under the Saskatchewan Critical Wildlife Habitat Protection Act, and Ducks Unlimited maintains several areas in the region.

The importance of the Quill Lakes to avifauna was well known at an early date. During Henry Youle Hind's 1857 (1971:412-413) travels through the Touchwood Hills, he noted that the Quill Lakes "have long been celebrated for the large numbers of goose quills which were occasionally collected there by Indians and brought to the fort for exportation." In 1909, two American naturalists came to the Prince Albert region to collect specimens for the Field Museum of Natural History in Chicago. While there, they learned of the wealth of birds at the Quill Lakes and visited the region to collect specimens (Houston 1980:219). Their report (Ferry 1910) is important because it provides a list of avifauna and signified the importance of the Quill Lakes at this early date.

Historically, the abundance and presence of fish in the Quill Lakes fluctuated because of changes in water levels and salinity. Presently, nine-spined sticklebacks, the only fish species in the Quill Lakes, reside in Little Quill Lake (Atton 1986:70). In the past, when water levels were higher and salinity was lower larger fish species were present. In the spring of 1920, A.G. Huntsman and A. Willey visited the Quill Lakes to assess their potential to be stocked with fish (Huntsman 1922). Mr. Stefansson, a local informant for the scientists, related that when he came to the lakes in 1905 there were no fish, although, some of the older Indians told him that formerly there were plenty. However, in 1908 he started catching suckers in Little Quill and in 1910 in Big Quill (Huntsman 1922:9-10). When Huntsman and Willey visited the lakes, they observed numerous dead suckers on the shores. Also reported to exist in the lakes at the time were pike, although not nearly as abundant (Huntsman 1922:10). In 1918, a single large perch, nearly a foot long, was apparently caught near Kandahar

(Huntsman 1922:11). In 1928, a large population of nine-spined stickleback and smaller numbers of suckers were observed in the Quill Lakes (Mozley 1939:244-245). He (1939:244-245) also noted that pike and perch were reported to occur but he did not collect any specimens. By 1939 only nine-spined stickleback were found in Little Quill and none in Big Quill (Rawson and Moore 1944). Several attempts at introducing species into the lakes since have proved unsuccessful (Atton 1986:71).

1.4.6 Paleoenvironment

Climatic conditions have changed dramatically since the deglaciation of North America. Studying sediments of closed lake basins is useful to infer general climatic conditions because closed basin lakes respond "dramatically to environmental changes and thus their sediments provide excellent documentation of such changes" (Schweyen and Last 1983:46). Several lakes from the Northern Plains have been studied and provide useful indications of climate.

Waldsea Lake, located northeast of the study area, produced a sediment core spanning a 4000-year period (Schweyen and Last 1983; Last and Schweyen 1985). Cores of lacustrine deposits indicate that at 4000 B.P. the lake was small and hypersaline. An increase in pine and spruce as well as other forest elements in the grass-dominated aspen parkland indicate that the Hypsithermal had ended and a trend toward cooler/moister conditions was occurring (Last and Schweyen 1985:232). At 2800 B.P., a warm period initiated and saw the return of conditions that are more prairie-like and a decrease in water levels due to high evaporation, whose rates peaked at 2300 B.P.

Following this, there was a quick return to a wet/cool climate and by 2000 B.P. the lake returned to a deep-water state. At 700 B.P., there was a slight decrease in water levels.

At Deadmoose Lake, located just north of Waldsea Lake, pollen and stable isotope data have provided climatic information as well (Last and Slezak 1988). They indicate much lower lake levels before 1000 B.P. followed by wetter/cooler conditions with an increase in arboreal pollen and a decrease in grasses.

A study of ostracod remains, palynology, and sediment stratigraphy allowed a detailed 10 000-year record to be examined from an ephemeral pond near Regina (Guliov 1963; Last and Slezak 1988). Temperatures, low after deglaciation, gradually rose to well above present between 7000 and 4000 B.P. During this period, the pond eventually dried up. After 4000 B.P., cool waters returned to the basin and gradually warmed to modern temperatures.

Climatic indicators at Harris Lake, located in southwest Saskatchewan, suggest that by 9000 B.P. the Mid-Holocene optimum was in progress (Sauchyn and Sauchyn 1991; Wilson and Smol 1999). Maximum warmth and aridity had occurred between 7700 and 5000 B.P. This warm period was followed by cooler/moister conditions with the modern vegetation being established by 3200 B.P.

The diatom record at Clearwater Lake in south-central Saskatchewan indicate that from 9700 to 9400 B.P. the lake saw fluctuations in salinity and by 9400 B.P. the lake was completely saline (Wilson and Smol 1999). Periods of maximum salinity occurred between 9650 and 9400 B.P. as well as 9200 and 8600 B.P. Following this, by 8200 B.P. there was a transformation towards fresher water. However, after 6600 B.P., a marked decrease in water destroyed the fossil record until 400 B.P. For the last 400 years, there were sharp increases in salinity from A.D. 1580-1620, A.D. 1710-1750, A.D. 1920-1940 and A.D. 1993.

These studies in Saskatchewan are further supported by similar results from surrounding regions on the Northern Plains. In Manitoba, an $^{18}O/^{16}O$ analysis of carbonates in the southern basin of Lake Manitoba indicated that lake temperatures were higher but decreasing at 9000 B.P. (Last and Slezak 1988). At 4000 B.P., these temperatures stabilized until 2000 B.P. when a sharp decrease in temperature occurred indicating cool/moister conditions. A similar pattern is seen at Killarney Lake in southwestern Manitoba (Richmond and Goldsborough 1999). The paleolimnological record at this lake indicates that from 4700 to 3000 B.P. there was the infilling of the dry or nearly dry lake. From 3000 to 1800 B.P. there was an increase in water levels indicating cooler and wetter conditions. An even wetter period was subsequently experienced to about 1500 B.P. From that period on there was a decrease in water levels to about 300 B.P. where water levels then increased to modern levels.

In Alberta, there have been several studies of internal basin lakes to determine past climates. At Chappice Lake, located in southeast Alberta, a 7000-year climatic record was made from pollen and sediment examined from the lacustrine deposits (Vance et al. 1992). The results indicated that from 7300 to 6000 B.P. a warm/dry period completely dried the lake. At 6000 to 4400 B.P. the lake experienced stable environmental conditions, but remained a shallow, saline, perennial lake. In the period 4400 to 2600 B.P. an increase in water levels decreased salinity. While at 2600 to 1000 B.P. there was a prolonged high water level phase with a few droughts. From 1000 to 600 B.P., significant droughts lowered the lake levels followed with a return to high levels until about 100 years ago. Vance et al. (1992:881) also noted that the historical droughts of the late 1800s, 1930s, and 1980s were less severe than those experienced during the Mid-Holocene and 1000-600 B.P. period droughts.

In central Alberta, Forbes and Hickman (1981) conducted paleolimnological studies at Hastings Lake and Lac Ste. Anne. They concluded that the lakes did not become permanent until the end of the Altithermal when the climate became cooler. However, the lake remained shallow until 4000 B.P. when its water levels were significantly increased. This lasted until 2500 B.P. when a decline in water levels occurred.

Schweger and Hickman (1989) studied 28 lakes and bogs in central Alberta to determine paleoenvironmental conditions. The results of their study of *Ruppia* sp. pollen shows an increase in salinity at many lakes from 8000-3000 B.P. implying higher evaporative stresses on these lakes. Earlier in the Holocene, conditions were dry, as most basins did not fill until about 8000 B.P.

In Montana, Barnosky (1989) interpreted pollen assemblages from 2 lakes. She interpreted climatic and vegetative histories from these two assemblages from deglaciation to modern environments. At 12 000 B.P. the climate was cooler/moister and extensive forestation had occurred. From about 11 500 B.P. there was a warming/drying trend. The beginning of the Altithermal occurred at 9400 B.P. and continued to about 6000 B.P. At this time, the climate shifted to cooler/wetter conditions.

A long paleoenvironmental record, retrieved from Devil's Lake, North Dakota, indicated that from 12 000 to 10 500 B.P. the region experienced a cool/moist climate and was vegetated by spruce (Haskel et al. 1996). The presently saline lake contained fresh water. Between 10 500 and 8000 B.P. the development of a closed basin occurred.

During this period, the lake experienced its maximum salinity and grasses replaced the spruce. From 8000 to 3500 B.P. there was a general trend to lower salinity, but large fluctuations did occur. The salinity was particularly low from 4500 to 3500 B.P. After this time, there was a return to higher salinities as experienced in the modern environment.

Using diatoms, a 2300-year record of drought intensity was obtained for Moon Lake in North Dakota (Laird et al. 1996). This closed lake basin provided evidence for three periods of intense droughts. These drought periods were 950 to 750 B.P., 1250 to 1100 B.P., and 1750 to 1580 B.P. However, salinity for the past 750 B.P. suggests generally wetter and cooler conditions than for the preceding 1500 years.

The preceding examples illustrate a general climatic trend on the Northern Plains. A summary of the paleoenvironmental studies (Figure 1.4) indicates a warming/drying trend following the deglaciation of the Northern Plains that peaks between 7500 and 5000 B.P. Following this period, a trend toward cooler, moister conditions to present levels occurred. However, as noted at several lakes, fluctuations in moisture regularly occurred and had dramatic local consequences.

The Quill Lakes study area is presently situated in the aspen parkland, but composition and the boundaries of the parkland have changed considerably though time. Changes in moisture and temperatures directly influence the vegetation that inhabits the land. Ritchie and Harrison (1993:402) note that the "transition from the southern boreal forest to the aspen parkland and prairies coincides more or less with moderate gradients of increasing summer temperature and decreasing effective moisture."

<table>
<tr><th>Years B.P.</th><th>Clearwater Lake</th><th>Regina</th><th>Waldsea Lake</th><th>Harris Lake</th><th>Killarney Lake</th><th>Lake Manitoba</th><th>Devil's Lake</th><th>Montana Plains</th><th>Chappice Lake</th><th>Central Alberta</th><th>Moore Lake</th></tr>
<tr><td>12000</td><td rowspan="5"></td><td rowspan="11"></td><td rowspan="15"></td><td rowspan="7"></td><td rowspan="15"></td><td rowspan="7"></td><td rowspan="4">Cool/ Moist Fresh H_20</td><td>Cool</td><td rowspan="11"></td><td rowspan="4"></td><td rowspan="6">Fresh Water
Slow +Saline</td></tr>
<tr><td>11500</td><td rowspan="6">Increase In Drought</td></tr>
<tr><td>11000</td></tr>
<tr><td>10500</td></tr>
<tr><td>10000</td><td rowspan="5">Max Salinity
Closed Basin</td><td rowspan="3">Peak Warmth /Aridity</td></tr>
<tr><td>9500</td><td>+/-Salinity</td></tr>
<tr><td>9000</td><td>Saline</td><td rowspan="2">Sharp +Saline</td></tr>
<tr><td>8500</td><td rowspan="5">Move Toward Fresh Water Lake</td><td rowspan="3">Warmer Drier</td><td rowspan="8">Higher Temps. But Gradual Decrease In Temps.</td><td rowspan="6">Dry</td><td rowspan="2">Permanent Water</td></tr>
<tr><td>8000</td><td>Fresh</td></tr>
<tr><td>7500</td><td rowspan="6">Trend To Lower Salinity
Unstable</td><td rowspan="10">Slow Increase To Modern Conditions</td><td rowspan="3">Max. Aridity Saline</td></tr>
<tr><td>7000</td><td rowspan="5">Max Aridity</td></tr>
<tr><td>6500</td><td rowspan="6">+Temps - Water
Warmer Than Average</td><td rowspan="2">Complete Drying</td></tr>
<tr><td>6000</td><td rowspan="10">After 6600 B.P. - H_20
No Deposition Record</td><td rowspan="2">Low Salinity</td></tr>
<tr><td>5500</td><td rowspan="5">Wetter And Cooler</td><td rowspan="3">Shallow Saline Stable</td></tr>
<tr><td>5000</td><td rowspan="2">+/- Salinity</td></tr>
<tr><td>4500</td><td rowspan="2">Shallow Playa</td><td rowspan="4">Cooler +Water
Modern</td><td rowspan="4">Infilling Of a Dry Lake</td><td rowspan="2"></td><td rowspan="3">Low Salinity</td></tr>
<tr><td>4000</td><td rowspan="3">+ H_20
- Salinity</td><td rowspan="9">Cooler/ Wetter
Modern Temps. And Salinity</td></tr>
<tr><td>3500</td><td rowspan="8">Slow Return To Modern Temps.</td><td rowspan="3">+ Water</td><td rowspan="4">Stable Temps.</td></tr>
<tr><td>3000</td><td rowspan="7">Increase In Salinity To Modern Condition</td><td rowspan="7">Further Cooling</td></tr>
<tr><td>2500</td><td rowspan="6">Vegetation</td><td rowspan="2">Cooler Wetter</td><td rowspan="4">- Salinity + H_20 Droughts Rare</td><td rowspan="6">Modern Temps. And Vegetation</td></tr>
<tr><td>2000</td><td>- Water</td></tr>
<tr><td>1500</td><td rowspan="3">+ Water (Cooler)</td><td>+ H_20</td><td rowspan="4">Strong Decrease In Temps.</td></tr>
<tr><td>1000</td><td rowspan="3">+/-Salinity</td><td rowspan="2">- H_20</td></tr>
<tr><td>500</td><td>Droughts</td></tr>
<tr><td>Present</td><td>- Water</td><td>+ H_20</td><td>+ H_20</td></tr>
</table>

Figure 1.5. Summary of paleoenvironmental studies at closed basin lakes on the Northern Plains.

Spruce dominated vegetation closely followed the disintegration of the ice as it retreated through Saskatchewan (Ritchie 1976:1805, 1985, 1987). Yansa and Basinger (1999:147) note that at 10 200 B.P. a white spruce forest developed on diamicton overlying stagnant glacial ice at the Andrews site located near Moose Jaw. Grasslands in turn, quickly replaced this forest. By 10 500 B.P. a grassland dominated landscape extended north to the Missouri Coteau, Riding Mountain, the Tiger Hills, and the Assiniboine Delta (Ritchie 1976:1810). At the Quill Lakes, an abrupt change from spruce forest to grasslands occurred at about 9500 B.P. (Ritchie 1976:1814). At the Andrews site near Moose Jaw, a deciduous parkland developed after 10 200 B.P. and persisted until 8800 B.P. (Yansa and Basinger 1999:149). They note that aspen and birch dominated the parkland. Increased fires from 8800 to 7700 B.P. at the Andrews site are attributed to drier conditions and a prairie environment replaced the parkland (Yansa and Basinger 1999:150). Aitken et al. (1999) suggest that the maximum aridity occurred earlier than 8800 B.P. at this site. They note that geochemical data suggest that about 10 000 B.P. this maximum aridity occurred. By 5800 B.P. the pond at the Andrews site became ephemeral, likely the result of aridity and the basin had sufficiently in filled to reduce the water-holding capacity of this basin, preventing the preservation of plant remains (Yansa and Basinger 1999:150-151).

The grasslands continued to shift northward to a maximum northern position at the expense of the boreal forest during the Hypsithermal (Beaudoin 1999:19). For example, in central Alberta there was a dry period before 5000 B.P. that created an open grass-mixed-wood parkland environment (Vance et al. 1983). After 5000 B.P., an increase in moisture, with cooler climatic conditions, encouraged the growth of pine and created the pine-parkland type of environment now present at these lakes. A similar pattern was observed at Moore Lake (Hickman and Schweger 1996). At 8600 B.P., the open birch-spruce forest was replaced by parkland/grassland. Not until 6200 B.P. was there a cooling trend that allowed the boreal forest (birch-spruce-alder) to encroach south into the area replacing the parkland/grassland environment.

From 6500 to 2500 B.P. there is a gradual shift of the southern border of the boreal forest to a position recognized today (Ritchie 1976:1812, 1985, 1987). It was during this period that the aspen parkland fully developed in the region of the Quill Lakes. By about 3000 B.P., modern vegetative schemes are present at most areas.

1.5 Summary

Collections are an important source of information for archaeologists studying a particular area. Riddle (1985:2) notes that by studying collections "not only will more sites and information be available to the archaeologist, some of this information may be more important than that collected by the archaeologist alone." A study of collections combined with site survey from the Quill Lakes region was undertaken with several goals in mind. These include identifying and recording collections from the region while at the same time locating and recording the sites they came from. The culture history of the region would then be derived from this information. In addition, attention will be given to settlement patterns and lithic materials used to manufacture tools. Finally, because the study area has existed in the parkland for the past 3000 years, an examination of possible interaction between forest- and grassland-adapted peoples will be undertaken.

Chapter 2 Methods

2.1 Introduction

Archaeological data for this project was derived largely from information gathered from artifact collections and their owners. Surveying and mapping the locations of sites that the collections were derived from supplemented this data. Examining local collections and obtaining accurate site provenience from the collectors is an important step in gathering the basic archaeological data for a region. Surveying the site locations is equally important. It allows one to assess how representative of the sites the collections are and to gain an understanding of the local environment.

This chapter will outline the methods used to examine and record each collection studied and the type of fieldwork employed to survey the site locations. Consideration is also given to defining terms and laying out a theoretical framework within which the archaeological data could be organized. A brief description of each known site location and the nature of work done at each site is provided in Appendix 1.

2.2 Culture Historical Outline

Archaeologists have proposed several culture historical outlines for organizing the archaeological materials from the Northern Plains (Figures 2.1 and 2.2). These schemes are primarily variations of one proposed by Mulloy (1958) from his work at Pictograph Cave. But, as Walker (1992:121) points out, the scheme of Mulloy (1958),

Years B.P.	Mulloy 1958		Wheeler 1995 [1958]		Malouf 1960		Wormington & Forbis 1965
200	Historic		Historic		Historic		Historic
1000	Late Prehistoric		Late Prehistoric	Late	Late Hunters		Neo-Indian
				Early			
2000	Middle Prehistoric	Late	Middle Prehistoric	Late			Meso-Indian
3000		Early		Early	Foragers		
5000	Hiatus		Hiatus		Hiatus		Hiatus
7500	Early Prehistoric		Early Prehistoric	Late	Early Hunters	Plano	Paleo-Indian-Indian
10500				Early		Llano	
12000							

Figure 2.1. Cultural chronologies from the Northern Plains

as well as Wheeler (1995), Malouf (1960), and Wormington and Forbis (1965) are no longer relevant as they include a cultural hiatus that has been shown not to exist, especially for the Canadian Plains/Parklands. Preference is not given to Frison's (1978) scheme because of its lack of relevance to the Northern Plains/Parkland of Saskatchewan. The use of the term "Plains Archaic" in Frison's scheme was intended for the High Plains of Wyoming and adjoining foothills and should not be used outside of that region (Reeves 1985:13-14). Although Walker (1992), Dyck (1983) and Reeves (1973) all indicate that the transition from the Paleo-Indian to Middle period is marked by a change from spear to atlatl technology, Walker's (1992) and Dyck's (1983) schemes are favored over Reeves' (1973) scheme in agreement that the initiation of the Late period is marked by both widespread bow and arrow and ceramic technology.

Wright's (1995) scheme is rejected because he created his periods with data from across Canada and lacks specific emphasis on the Northern Plains. Wright's (1995) period boundaries are not correlated with technological changes that occurred on the Northern Plains. Dyck's (1983) scheme has merit and is followed in this thesis because it was developed employing Saskatchewan stratigraphy and absolute dates. The fact that it does not arbitrarily divide the Middle period into an Early, Middle, and Late components is also appealing. However, the term Paleo-Indian is favored over the use of Pleistocene Hunters and Early Plains Indian period.

<table>
<tr><th>Years (rcybp)</th><th colspan="2">Reeves 1973</th><th colspan="2">Frison 1978</th><th>Dyck 1983</th><th colspan="2">Walker 1992</th><th>Wright 1995</th></tr>
<tr><td>200</td><td colspan="2">Historic</td><td colspan="2">Historic</td><td>Historic</td><td colspan="2">Historic</td><td>Period V Plains</td></tr>
<tr><td>1000
2000</td><td colspan="2">Late Prehistoric</td><td colspan="2">Late Prehistoric</td><td rowspan="2">Late Plains Indian</td><td colspan="2" rowspan="2">Late Prehistoric</td><td rowspan="3">Period IV Late Plains</td></tr>
<tr><td rowspan="3">3000</td><td rowspan="6">Middle Prehistoric</td><td rowspan="3">Late</td><td rowspan="6">Plains Archaic</td><td rowspan="3">Late</td></tr>
<tr><td rowspan="5">Middle Plains Indian</td><td rowspan="5">Middle Prehistoric</td><td rowspan="2">Late</td></tr>
<tr><td rowspan="3">Period III
Middle Plains</td></tr>
<tr><td rowspan="3">5000</td><td>Early I</td><td>Middle</td><td>Middle</td></tr>
<tr><td rowspan="2">Early II</td><td rowspan="2">Early</td><td rowspan="2">Early</td></tr>
<tr><td rowspan="2">Early Plains
Period II
Plano</td></tr>
<tr><td>7500</td><td colspan="2" rowspan="2">Early Prehistoric</td><td colspan="2" rowspan="2">Paleo-Indian</td><td>Early Plains Indian</td><td colspan="2" rowspan="2">Paleo-Indian</td></tr>
<tr><td>10500
11000</td><td>Pleistocene Hunters</td><td>Period I
Palaeo-Indian</td></tr>
</table>

Figure 2.2. Cultural chronologies for the Northern Plains.

2.3 Taxonomy Definitions

Several terms used to describe taxonomic units and designations used by the archaeologists on the Northern Plains are defined here for clarity. A *culture* "encompasses the evidence pertaining to a pattern of broadly shared behavior as expressed in technology, subsistence, settlement patterns, and cosmology" (Wright 1995:6). Following Dyck (1983:69) a *complex* is:

> a large composite archaeological unit. It consists of interconnected sites, features, and artifacts, tied together by similarities in functions, style, technology, and subsistence-settlement system. The parts of a complex are found within a common geographical distribution and within a common segment of time. The change in terms from culture to complex reflects the notion that an archaeological complex is not necessarily equivalent to an ethnological tribe or culture. It may by equivalent, but it may also spread across ethnological groupings.

Dyck (1983:69) defines a *series* as:

> a sequence of archaeological components sharing a common geographical space (sometimes within a single site, sometimes within a region), but belonging within separate segments of time. A series is a crude unit of archaeological analysis used for convenience before sites, features, and artifacts are ready for reclassification into complexes and traditions.

2.4 Artifact Definitions

2.4.1 Pottery

Definitions of vessel portions follow Malainey (1991, 1995).

2.4.2 Stone Tools and Debitage

Debitage includes all chipping debris from the manufacture and use of stone tools, including flakes, shatter, and core fragments (Kooyman 2000:15). Flakes are generally thin, have a striking platform, and a bulb of percussion (Kooyman 2000:12-13). Shatter is waste material that lacks these features (Kooyman 2000:14). Cores are defined as "any large piece of lithic material from which a flake or flakes is removed" (Kooyman 2000:14).

Stone tools are classified according to definitions commonly used by archaeologists for the Northern Plains (cf. Dyck and Morlan 1995; Brink and Dawe 1989). This thesis will follow the definitions that Dyck and Morlan (1995:122-125) have outlined in their monograph on the Sjovold site.

2.4.3 Lithic Materials

Lithic materials were identified by macroscopic examination along with the aid of a hand lens. Materials were identified using personal experience with the aid of comparative materials in the Department of Anthropology and Archaeology at the University of Saskatchewan. Lithic materials that could not be identified were placed into an unknown category. A brief definition of each material identified from the Quill Lakes is provided.

Chalcedony (CHL)

Chalcedony and agate are cryptocrystalline rocks (Millar 1991:451). While perhaps not geologically correct, archaeologists generally identify chalcedonies based on their translucency (Kooyman 2000:29-30). Kooyman (2000:29) describes chalcedonies as characteristically light in colour ranging from colourless, milky, grey, white, light blue, light green, tan brown, to darker brown. Except for distinctive agates, (i.e. moss agate) agates are included in the chalcedony category.

Chert (CHR)

Chert, a general term for sedimentary rocks consisting of microcrystalline quartz, can come in all varieties of colours and texture (Kooyman 2000:28). This category usually finds itself as a catchall category for most materials that cannot be specifically identified.

Feldspathic Siltstone (FPS)

This maroon coloured, fine-grained sedimentary rock has previously been called quartzite, red quartzite, maroon quartzite or argillite (Johnson 1986:92-95). Johnson (1986:93) notes that archaeologically it has been used to manufacture relatively large flaked artifacts with the most common being a large endscraper. Feldspathic siltstone is found in the Tertiary gravels of southwestern Saskatchewan.

Fused Shale (FSH)

Johnson (1986:89-92) describes fused shale as metamorphosed fine grained to glassy material formed along combusting coal beds. Colour varies, ranging from light grey to black including yellow, red, green and brown. Fused shale is opaque and usually has a dull lustre for unheated specimens to glassy for highly heated specimens (Johnson 1986:91). Fused shale is found in outcrops in southern Saskatchewan where combusted coal beds are exposed.

Gronlid Siltstone (GST)

Gronlid Siltstone, a distinctive black opaque material that patinates to a distinctive white speckle, occurs in nodules that are thin plates with remnants of light-coloured calcareous shale adhering to the siltstone (Johnson 1986:86-87). Gronlid Siltstone, found in glacial drift extending southwest from the Nipawin region, appears regularly in east central Saskatchewan (Johnson 1986:88).

Jasper (JAS)

Jasper, essentially a chert with iron oxides added to it to give it its distinctive colour and texture, is opaque with a dull lustre giving it a waxy appearance (Kooyman 2000:30). Reds, yellows and browns are typical colours.

Knife River Flint (KRF)

Knife River Flint is a brown translucent material extensively exploited by people across much of the Northern Plains and adjacent areas. It is described as a " fairly uniform, nonporous, dark-brown flint" (Clayton et al. 1970:287). A dull white to grey patina is commonly found on old fractured surfaces. The source area is defined as the Dunn and Mercer Counties in North Dakota (Ahler 1986). Knife River Flint is sometimes mistaken for good quality petrified wood or other brown chalcedonies.

Moss Agate (MAG)

Moss agate is a chalcedony characterized by dendritic inclusions. The source for this material is likely near Moorcroft, Wyoming and western margin of the Plains near Lusk, Wyoming (Millar 1991:473).

Obsidian (OBS)

Obsidian, a distinctive black volcanic glass, is widely distributed across the Northern Plains in small amounts. The main sources are the Yellowstone Plateau in northwest Wyoming, eastern Idaho and southwest Montana (Millar 1991:472). Obsidian was rare in the collections observed for this study.

Petrified Peat (PPT)

Petrified peat is the result of the silicification of peat. This material can be used to make chipped stone tools, but is often difficult to work because of the multiple irregular parting planes (Johnson 1986:74). The colours range from grayish brown to dark brown. The cortex is usually a tan colour. A white to yellowish patina can occur. The exact natural distribution of petrified peat is unknown but it is common in the Tertiary gravels of southern Saskatchewan (Johnson 1986:75).

Petrified Wood (PWD)

Petrified wood is formed by the replacement of wood structure by silica while the structure of the wood remains intact. It commonly is found in southern Saskatchewan, but it occurs elsewhere (Johnson 1986:80-81).

Quartzite (QTE)

Quartzite is metamorphosed sandstone. It is identified by its feathered, sparkling lustre and come in a variety of colours (Kooyman 2000:36). Quartzite is found in the glacial till throughout Saskatchewan. Quartzite is particularly abundant in archaeological sites from southwestern Saskatchewan (Johnson 1986:62).

Quartz (QTZ)

Quartz is generally white or colourless and lacks cleavage planes (Kooyman 2000:28). It is translucent and occasionally clear and sees limited use on the Northern Plains.

Red River Chert (RRC)

This material, commonly called cathead chert in eastern Saskatchewan and Manitoba, is a limestone chert characterized by its mottled appearance. It is found in a variety of colours including white, cream, tan, red, and banded grey-white (Leonoff 1970:14). Bakken (1985:36) proposes that the name Red River Chert be given to these materials obtained from glacial drift because the term cathead chert refers to the geological "Cat Head" member of the Red River Formation. It is unclear if the outcrops of limestone chert are the same as those found in the glacial drift so the general term Red River Chert is preferred.

Silicified Siltstone Pebbles (SSP)

Silicified Siltstone Pebbles are small and smooth with a dense black cortex. The interior is commonly black but grey, brown, yellow, pink, red and green occur (Johnson 1986:83). Use of this material requires a special technology to split them along their main axis. Commonly, projectile points and scrapers fashioned from these pebbles are relatively small. This material is sparse in the glacial drift of west-central Saskatchewan but is common at some locations in Alberta (Johnson 1986:83-84).

Swan River Chert (SRC)

Swan River Chert, a common lithic material found in east central Saskatchewan, is named after the Swan River Valley where it is very abundant (Leonoff 1970:29). Its macroscopic appearance is quite variable. The colours range from whites, grays, and blues, to pinks and reds to yellow and orange and often contain combinations of these colours (Campling 1980; Leonoff 1970). Perhaps the best macroscopic diagnostic feature is the "spongy" or "vuggy" nature of this chert. Swan River Chert is found naturally within the glacial till covering the region (Low 1996:168).

2.5 Collections Recorded

The primary purpose of examining and recording collections was to acquire two basic types of information: firstly, to identify temporally diagnostic materials (i.e. projectile points and pottery) and secondly, to obtain the site provenience of the artifacts. The methods used to record the collections depended on a number of factors. These included: 1) accessibility to the collections; 2) amount of time available to examine each collection; 3) site provenience data for the collections; and 4) amount of diagnostic materials in the collection. A brief description of each collection and the method used to record each collection used in this project are outlined below.

2.5.1 Ed Stachyruk Collection

This was the most extensively studied collection from the region. There are a number of reasons for this, mainly that Mr. Stachyruk lent his extensive collection to the Department of Anthropology and Archaeology at the University of Saskatchewan for several years for study. This unlimited access to the collection allowed detailed recording of all of the materials in the collection. In addition, Mr. Stachyruk kept detailed site provenience for all of the materials he collected. This included sketch maps, when the material was collected, and whom he collected with. This information, part of the basic record keeping needed for these types of collections (Brace 1983), proved invaluable since the material was all collected 20 or more years ago.

Over 15 000 items, almost exclusively lithic material including flakes, shatter, and cores, were catalogued from about 25 sites. All types of tools are present in the collection. Very little bone was collected. Only a small amount of pottery was collected, but this likely reflects the general paucity of Late period archaeological cultures in the region, not a collecting bias. Historic items consist of a handful of glass beads as well as late 19th century and early 20th glass bottles, buttons, and other small miscellaneous items.

The archaeological data from this collection was recorded in accordance with defined categories normally used for Northern Plains archaeological assemblages (c.f. Dyck and Morlan 1995). Emphasis was placed on lithic material type, tool form, and diagnostics. All material was counted and weighed. Analysis of the debitage (i.e. flakes, shatter, and cores) was restricted to the identification of lithic material type, number, and weight. The general format of the catalogue followed was that used by Charles Ramsay (1998) to record the Archie Campbell collection. Measurements were taken only to obtain specific information for particular diagnostic projectile points. These measurements help in the comparison of these diagnostics with other similar types found on the Northern Plains.

The collecting locales for nearly all of the sites were visited with Mr. Stachyruk. This information, plus that gathered from sketch maps and subsequent surveys to the region, allowed Saskatchewan Archaeological Resource Records (SARR) to be completed and submitted to the Heritage Branch to be included in the provincial heritage inventory.

2.5.2 Ed Yurach Collection

Mr. Yurach's large collection was extensively examined and photographed at his home. Both colour slides and black and white prints were taken. Mr. Yurach did not spend much time collecting debitage and focused on collecting formed tools. The majority of the projectile points have been glued onto mats in display drawers. At least 30 sites were identified from his collection. The provenience of the projectile points was recorded on large sheets of paper with either numbers or outlines of the projectile points on them that correlated to collection locations marked on a Rural Municipality map. Provenience data that was not certain was not included in this study. Some provenience data could only be made to a general area (i.e. to a number of closely related sites along a creek). This type of information was included because it provides general distributional informational data for particular areas in the study region.

Several road trips were taken with Mr. Yurach to observe site locations firsthand. In addition, township photomaps were used to identify other collecting locations. This also allowed several site forms to be completed and added to the provincial registry of sites.

2.5.3 Mitchell Malinowski Collection

Mr. Malinowski's collection consists of several hundred projectile points, tools and some debitage collected entirely from the Corley's Ridge/Kells area. The majority of his material was mounted on felt covered boards and covered with plastic. Colour slides and black and white prints were taken of the collection.

2.5.4 Ken Kerluke Collection

Mr. Kerluke's collection consisted of the entire range of formed tools as well as some debitage. Mr. Kerluke has kept excellent records of the material. His artifacts were photographed with colour slides. Compared to the previous three collections Mr. Kerluke's collection was relatively small.

2.5.5 Ed Rorquist Collection

Mr. Rorquist's collection consisted primarily of projectile points but also included many other formed tools and some pottery. The bulk of his artifacts are mounted behind glass in large picture frames. His collection was photographed with colour slides and black and white prints. He kept no detailed provenience records but knows the locations of many of the individual artifacts. Only parts of his collection were used for the purposes of this study.

2.5.6 Wadena Museum

The Wadena Museum had a small collection of artifacts that have been donated over the past few years. It consisted primarily of grooved mauls but also contained a unique incised rock. Plasticine impressions were made of this incised stone, it was photographed with colour slides, and black and white prints. Tim Jones, director of the Saskatchewan Archaeological Society, also studied the incised stone (see Novecosky 2001; Jones 2001).

2.5.7 Jack Evans Collection

Jack Evans has a small collection of artifacts collected over a number of years while working on his land. No provenience data was kept. None of his artifacts were photographed. Mr. Evans provided access to FaNa-1, located in his bison pasture. FaNa-1 is a stone feature site with a large buffalo rubbing stone and spring nearby (Yerex 1975). This site was surveyed and mapped.

2.5.8 Margaret Panchuk Collection

Margaret Panchuk had a small collection from the Alex Proznick site (EkNa-7). The collection was briefly examined and consisted primarily of debitage. A single Late Plains Side-Notched series arrowhead was noted in the collection.

2.5.9 Llewelyn Wildeman Collection

Mr. Wildeman's collection from Quill Lakes region represented two sites. He had his collection recorded during the collection registry program. His collection was examined from colour slides loaned by the Royal Saskatchewan Museum. Permission to copy the slides was also obtained. This collection was not personally examined.

2.5.10 Joe Hamilton Collection

Mr. Hamilton's collection was represented at nine sites in the study region. It was also recorded during the collection registry program. The same methods used to record Mr. Wildeman's collection were used. The artifacts were not examined personally.

2.5.11 Leroy Museum Collection

The local museum in Leroy has a collection of artifacts from the district. This consisted primarily of grooved mauls found in cultivated fields by local farmers. No information from this collection was used for this research.

2.5.12 Bob and Laureen Hamilton Collection

Mr. and Mrs. Hamilton's collection was extensively examined and photographed with both colour slides and black and white prints. It was useful because of its good site provenience records. Joe Hamilton, a relative, has collected from many of the same sites.

Bob and Laureen Hamilton's collection contained a variety of tools including projectile points, bifaces, and scrapers, plus some debitage, but no bone or ceramics. Seven sites they that they had collected from are included in this thesis.

2.5.13 Orly Felton Collection

Information from Mr. Felton's collection was derived from three site forms that he filled out. Because of the small amount of material (i.e. a couple flakes, a scraper, and a projectile point base), no attempt to examine the collection was made.

2.5.14 Vic Knight Collection

Vic Knight's collection from the Quill Lakes region is known from one site from the records of the Glacial Lake Agassiz survey, conducted by Dennis Anderson in the early 1960s, which are on file at the Department of Anthropology and Archaeology at the University of Saskatchewan. Information from the collection was derived from black and white prints.

2.5.15 University of Saskatchewan Collection

The University of Saskatchewan curates the collection from the Glacial Lake Agassiz survey conducted by Dennis Anderson in the 1960s. During that survey, several sites in the Quill Lakes region were examined. A small collection made from one site was catalogued. It consisted primarily of debitage and several formed tools.

2.5.16 Other Collections

Several other collections from the Quill Lakes region are known to have existed. A report on the survey of collections in Saskatchewan by Boyd Wettlaufer (1951) lists several collectors from the study area. The report includes no photographs or accounts of visiting the sites or collectors. If the collections are still extant, the likelihood for obtaining good site provenience data for the artifacts is unlikely.

2.6 Site Survey

Surveys of collecting areas were conducted with several goals in mind. The primary goal was to verify and/or locate sites from the known collections. Often, site location information was provided with only a legal description. It was important to try to determine the site locations as precisely as possible especially when considering the relationship of the sites to natural landforms (i.e. creeks, hills, beach ridges etc.). It was also important to assess the accuracy of the site provenience provided by the collectors. A few sites could not be re-located after extensive survey of the supposed location. By surveying collecting locations, it was possible is to gain a better understanding of the local environment and the nature of the sites. Observing a site firsthand left a better impression than viewing the site only through topographic maps or air photos.

Another goal was to observe the distribution of artifacts on the surface. A method used by Malainey (1995) for pedestrian surveys at the Lozinsky site was followed with some modifications. During pedestrian surveys, all cultural material on the surface was flagged with pin flags and its provenience recorded with a 2 m by 2 m grid system laid over the site. A two-meter grid system was considered accurate enough provenience for sites disturbed by cultivation (Nance and Ball 1981; Roper 1976). The grid was constructed with three long ropes marked every two meters. One rope followed a baseline laid out with a transit from the site datum. From the baseline, two ropes were placed perpendicular at two-meter intervals. The grid started at one end of the site and after all the material between the two ropes was recorded, the outside rope was moved over to the next 2 m interval. This continued until all materials were recorded. Cultural material was recorded in broad artifact classes (i.e. flake, bone, core, projectile point, biface, fire-cracked rock etc.). Lithic material type was not identified in the field.

This method was modified after a short time in the field. Since one person did the majority of surveying it became time consuming to move long ropes around. To save time the ropes were placed perpendicular to the baseline every twenty meters and provenience was obtained by pacing off the perpendicular lines.

This method worked well for cultivated fields with summer fallow or stubble but in fields with swaths, the method became less reliable because one was forced to step over the swaths. Some sites were mapped without using the rope system. Site maps were made at these sites and the provenience of observed and collected artifacts were recorded.

Diagnostic and formed tools were collected. This increased the sample of known diagnostics and in some cases were the only diagnostics for that site. The additional materials could also be compared to see how they match with the known collections.

An additional goal of the surveys was to test the collecting localities. Since the majority of localities were located in cultivated fields, the purpose of digging test pits was to determine what integrity the sites might have below the plow zone. All test pits were dug at sites located in cultivated fields. As a result, the test pits were largely ineffective and did not provide much information. Because of time constraints, very few test pits were dug and they did not adequately assess the integrity of the sites below the plow zone.

The final goal of surveying sites was related to resource management. New and updated SARR forms are a valuable addition to the site inventory database. In addition, potential impacts, such as gravel operations, were noted for a couple of sites. By recording sites that might be impacted by such activities, they are more likely to be protected from further development.

2.7 Summary

This chapter outlines the theoretical and methodological aspects followed in this thesis. The cultural chronology of Dyck (1983), with minor modifications of terminology regarding the Paleo-Indian period, is followed. Archaeological taxonomic terms commonly used throughout this thesis were defined, and the methods used to analyze classes of artifacts and definitions of lithic materials were discussed. Each collection examined for the purposes of this thesis was also described. Finally, the methods used to survey the sites were also described.

Chapter 3

The Paleo-Indian Period

3.1 Introduction

The Paleo-Indian period, represented primarily from surface finds in southern Saskatchewan, is considered to date from the retreat of the Wisconsinan period glaciers to approximately 7500 rcybp. Long lanceolate spear points are the principal diagnostic artifact of Paleo-Indian components. Several types have been defined from excavated sites on the Great Plains. Representatives of Clovis, Folsom, Agate Basin, Hell Gap, Cody complex, and many late Paleo-Indian lanceolate points are commonly reported in Saskatchewan (Kehoe 1966a; Dyck 1983). This chapter describes the Paleo-Indian complexes as they are represented in the Quill Lakes region. Comparisons are made to other sites in Saskatchewan and the Northern Plains. In addition, comparisons among the Paleo-Indian complexes as they appear in the Quill Lakes are made.

The Agate Basin complex, the Cody complex, and various Terminal Paleo-Indian complexes represent the Paleo-Indian period in the Quill Lakes region. No Clovis or Folsom points were identified in any of the collections examined although fluted projectile points were reported from an area near Invermay, a few miles east of the study region (Gryba and Gryba 1980).

Agate Basin projectile points provide the earliest evidence for occupation of this region. No Hell Gap points were recorded, although many of the Agate Basin points were basal fragments that could conceivably be derived from Hell Gap points. The Agate Basin complex was originally defined from materials at the Agate Basin site in eastern Wyoming (Roberts 1943, 1951, 1961a, 1961b; Frison and Stanford 1982). Agate Basin projectile points are long, well made, lanceolate spear points. The base is usually slightly convex to straight with rounded corners. Occasionally it is rounded. The lateral edges of the base are usually ground smooth just past the basal corners. It has been noted that rounded bases are usually ground smooth across the entire basal edge (Frison and Stanford 1982:81). Flaking is invariably perpendicular to the midline of the point. The cross-sections of the points are lenticular and the longitudinal cross-sections grade to a point at the tip as well as the base. Frison and Stanford (1982:81) have also noted that Agate Basin projectile points do not have a longitudinal twist, as observed with Hell Gap points at the Casper site.

The next Paleo-Indian complex that is well represented in the Quill Lakes region is the Cody complex. The Cody complex is subsumed under the Cody tradition that includes the Alberta, Scottsbluff, Eden, Firstview and Kersey point types, as well as the distinctive stemmed Cody Knife (Hofman and Graham 1998). A distinctive transitional Alberta/Cody component has been defined at the Horner II site (Frison and Todd 1987). In particular, Scottsbluff points appear to be prevalent in the Quill Lakes region. A small number of Eden points and a Cody Knife were recorded as well.

The Cody complex was defined from Scottsbluff and Eden points found along with Cody Knives from the Horner site in northwest Wyoming (Jepsen 1951, Frison and Todd 1987). Wormington (1957:136-137) defined two variants of Scottsbluff points.

Type I points are characterized by "somewhat triangular or parallel-sided blades, small shoulders and broad stems" (Wormington 1957:266). The flaking is perpendicular to the midline or somewhat irregular. Type II Scottsbluff points "have wider triangular blades, are thin and lenticular in cross-section, and have more clearly defined shoulders" (Wormington 1957:266). Both forms appeared in the collections from the Quill Lakes region. Eden points are long narrow points with slight shoulders. Flaking is normally collateral with flakes terminating at the midline creating a distinctive diamond shaped cross-section.

Several poorly defined projectile point styles typify the Terminal Paleo-Indian category. Large side-notched or corner-notched points are occasionally found *in situ* with these points and archaeologists often consider these terminal Paleo-Indian groups to be transitional to the Middle or Archaic period (Hofman and Graham 1998). On the Northern Plains, types considered to be Terminal Paleo-Indian are frequently placed in the Allen/Frederick, Angostura, and Lusk complexes. Typically, projectile points from this period are lanceolate with parallel-oblique flaking and concave bases. The concavity of the base ranges from slight for forms usually referred to as Angostura and Lusk complexes to deep for the Allen/Frederick complex. The workmanship during this period is generally poorer than that of the flintknappers of earlier Paleo-Indian complexes.

3.2 Paleo-Indian Components Identified from the Study Area

3.2.1 Agate Basin

Agate Basin projectile points were found at six sites in the Quill Lakes region (Figure 3.1, 3.2). In total, 12 projectile points, three complete and nine base fragments,

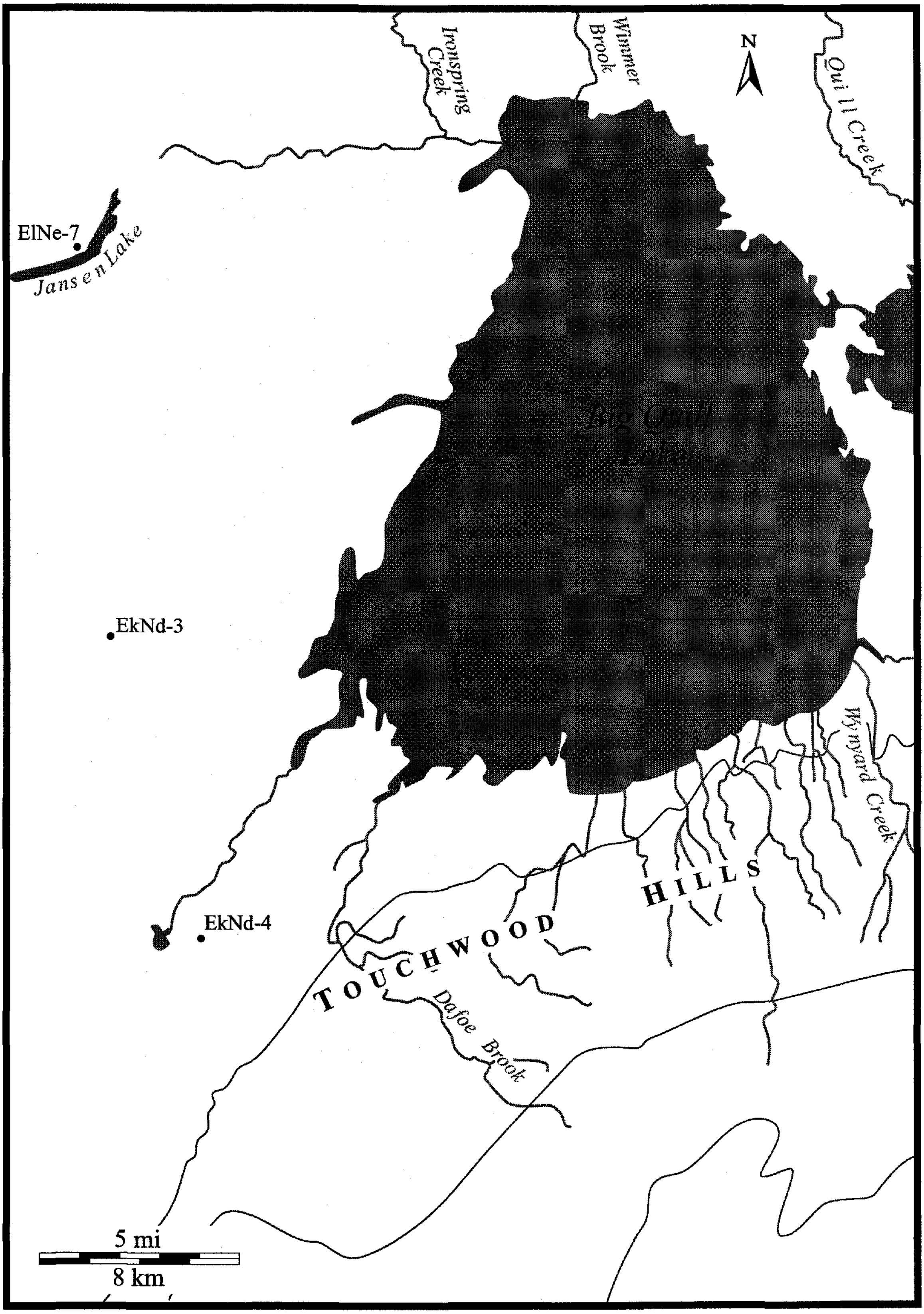


Figure 3.1. Distribution of Agate Basin components from the Quill Lakes region (west half).

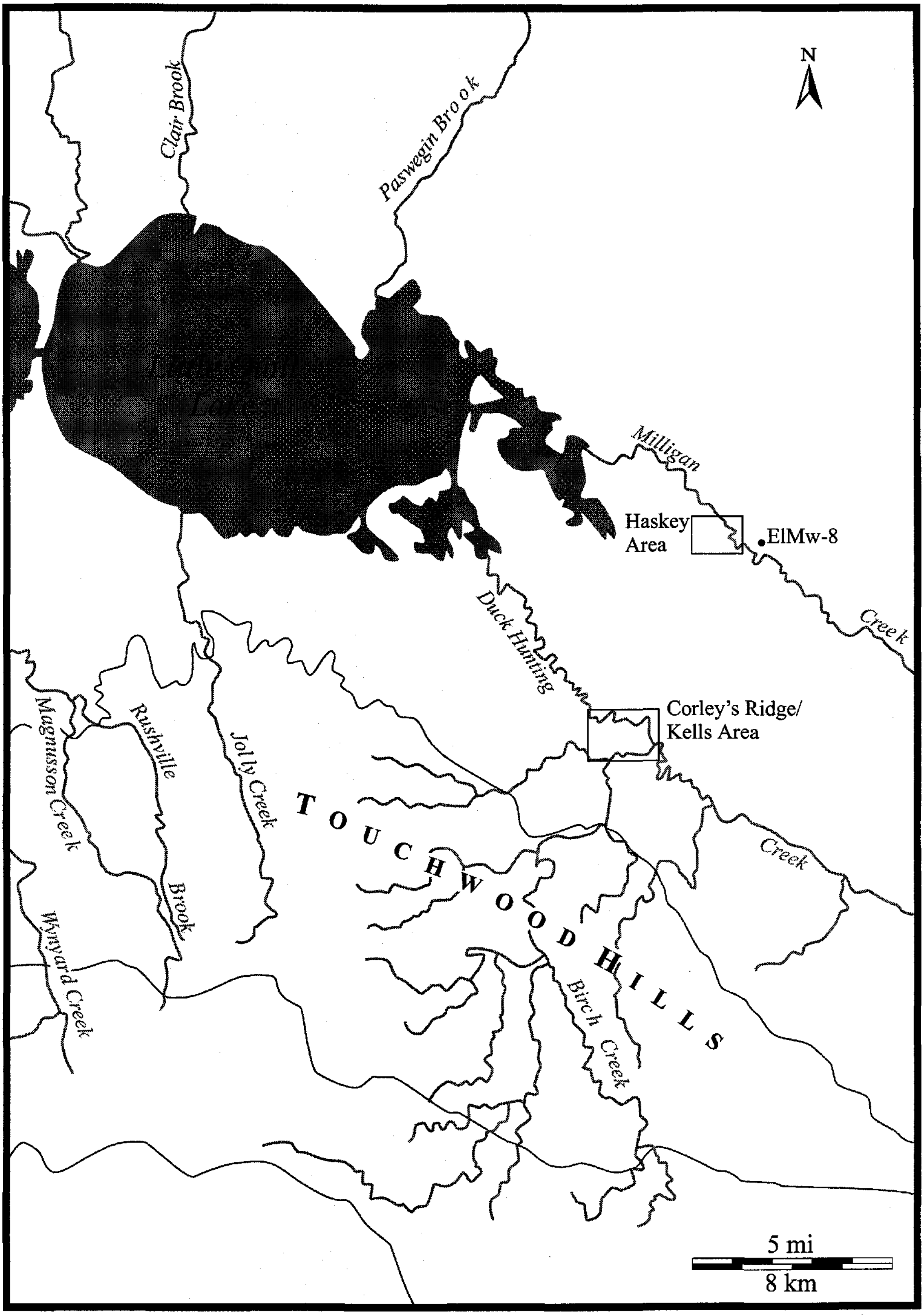


Figure 3.2. Distribution of Agate Basin components from the Quill Lakes region (east half).

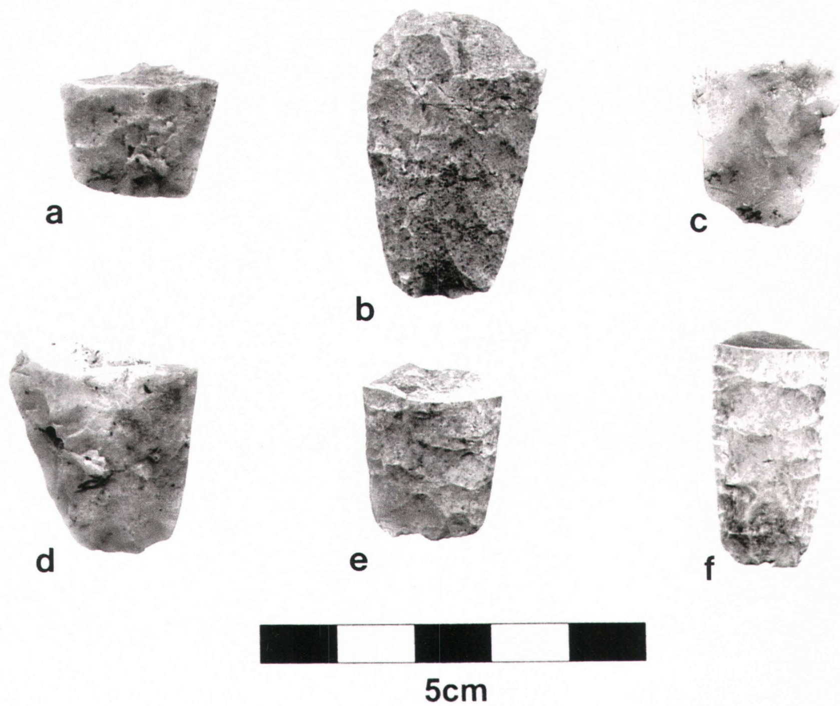


Figure 3.3. Agate Basin projectile points from the Stachyruk collection; Corley's Ridge/Kells area: a; ElMw-8: b; Haskey area: c-f.

were identified (Appendix 2:Table 1). Examples of Agate Basin projectile points recorded from the Stachyruk collection are shown in Figure 3.3. The sites are located in two general areas, one on the eastern and one on the western boundaries of the study area. On the east side, there were two sites located in close proximity to Milligan Creek.

Six Agate Basin points, two complete and four bases, were recorded from collections from the Haskey area along Milligan Creek. The two complete points have been extensively reworked and were likely discarded because they were no longer functional. The site area is large with points having been recovered from both sides of the creek. This is the largest concentration of Agate Basin points in the study area.

The remaining six Agate Basin points were isolated finds at various sites. A single Agate Basin point was recorded from ElMw-8. This site, located about one kilometer east of the Haskey area, is situated on a large sand ridge that extends to Milligan Creek. Two Agate Basin points were identified at the Corley's Ridge/Kells area. A few basal portions could not be positively identified as Agate Basin because they were too fragmented and were not included. A single point was found along a string of hills at EkNd-3. A base fragment was found at a site in a low wet area southwest of Big Quill at EkNd-4. Finally, a single point was recovered at ElNe-7, situated close to Jansen Lake.

Overall, Agate Basin components are few and small in the Quill Lakes region. The sites located near water are possibly small camp or resting spots. Two sites, Haskey area and ElMw-8, are in close proximity to Milligan Creek while another, EkMx-2, is located in close proximity to Duck Hunting Creek and its tributaries. Milligan Creek was an important watercourse for Paleo-Indian people in the region. The single occurrence of a projectile point at four of the six sites may overemphasize the importance of Agate Basin components in the Quill Lakes region. Given the presence of six broken and exhausted projectile points, the Haskey area may represent a campsite. A large number of tools and debitage were also recovered from this area but it is impossible to segregate those used by Agate Basin peoples and those from later occupants of the site.

The lithic materials used to manufacture the Agate Basin points indicate strong use of exotic material. Of the twelve points identified, four (33.3%) are manufactured from Knife River Flint and one (8.3%) is from moss agate. One base fragment (8.3%) is identified as chert and the remaining six (50%) are from Swan River Chert that can be found locally but has a wide distribution in the glacial till of eastern Saskatchewan and western Manitoba down into northwest Minnesota and adjacent North Dakota.

3.2.2 Cody Complex

Cody complex points were found at seven sites in the study area (Figures 3.4 and 3.5). In total, 38 diagnostic Cody complex artifacts were recorded from the collections. Most are classified as Scottsbluff (Appendix 2:Table 2). There were fragments from four Eden points identified from the collections (Appendix 2:Table 3). In addition, three knives diagnostic of the Cody complex were identified (Appendix 2:Table 4). One has an outline characteristic of a Cody Knife. A drill, likely diagnostic for the Cody complex, was also recorded from the Haskey area (Appendix 2:Table 5). It is similar to that found at the Niska site (Meyer and Liboiron 1990). Examples of diagnostic Cody complex artifacts from the Stachyruk collection are shown in Figures 3.6–3.9.

The majority of the Cody complex materials came from the Haskey area along Milligan Creek. Thirty-one of the 38 diagnostic Cody complex tools were recovered from this site. Because the material had been collected from a cultivated field, it is unknown if all of it represents a single or multiple occupation of the site. Material was collected from a large area on both sides of Milligan Creek. Most of the projectile points are broken or extensively reworked. These were likely discarded. There was also a large amount of other tools and debitage found at this collection area including four Eden point fragments. A single knife was found a few kilometers upstream from this site at EkMw-7.

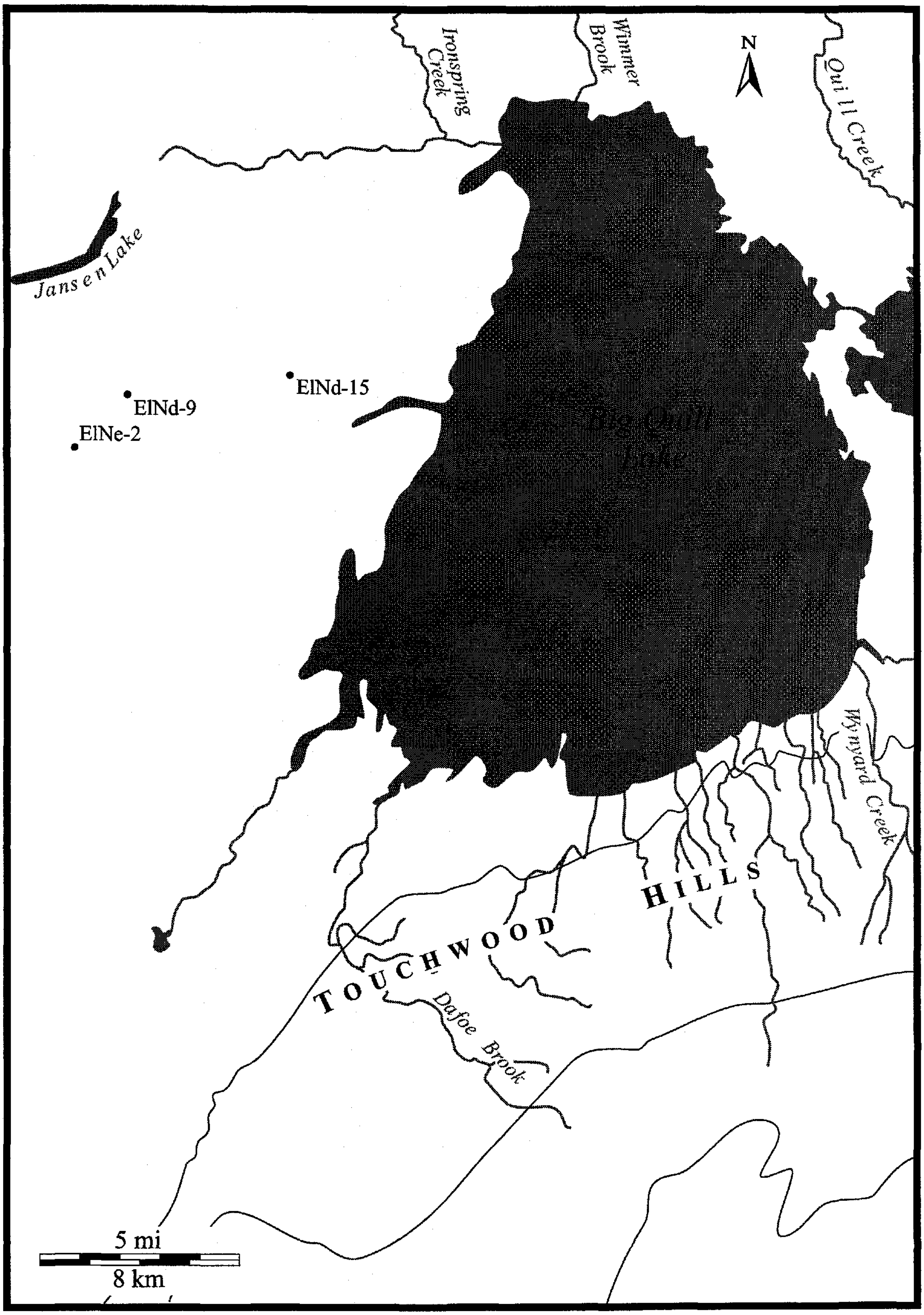


Figure 3.4. Distribution of Cody complex projectile points in the Quill Lakes region (west half).

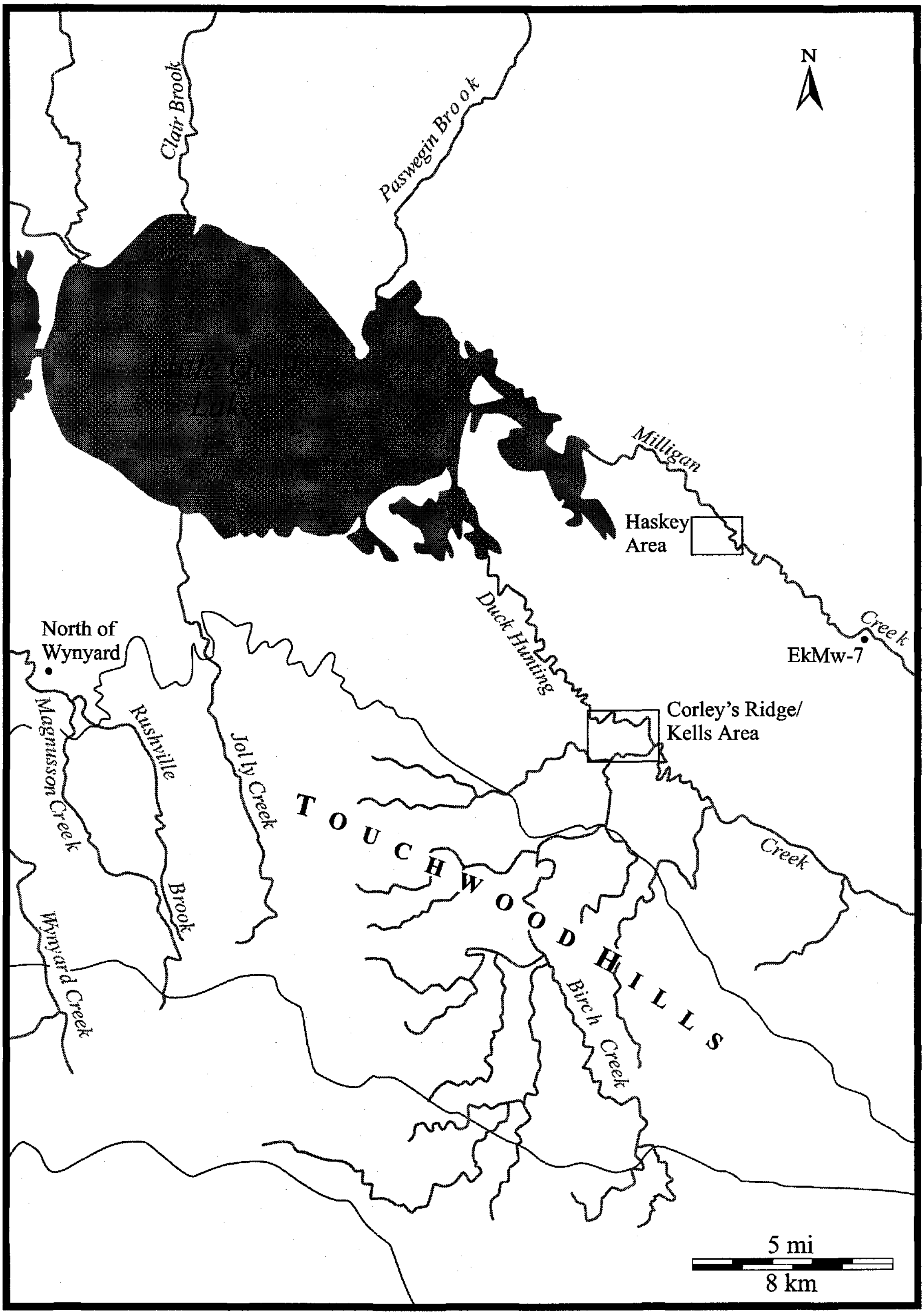


Figure 3.5. Distribution of Cody complex projectile points in the Quill Lakes region (east half).

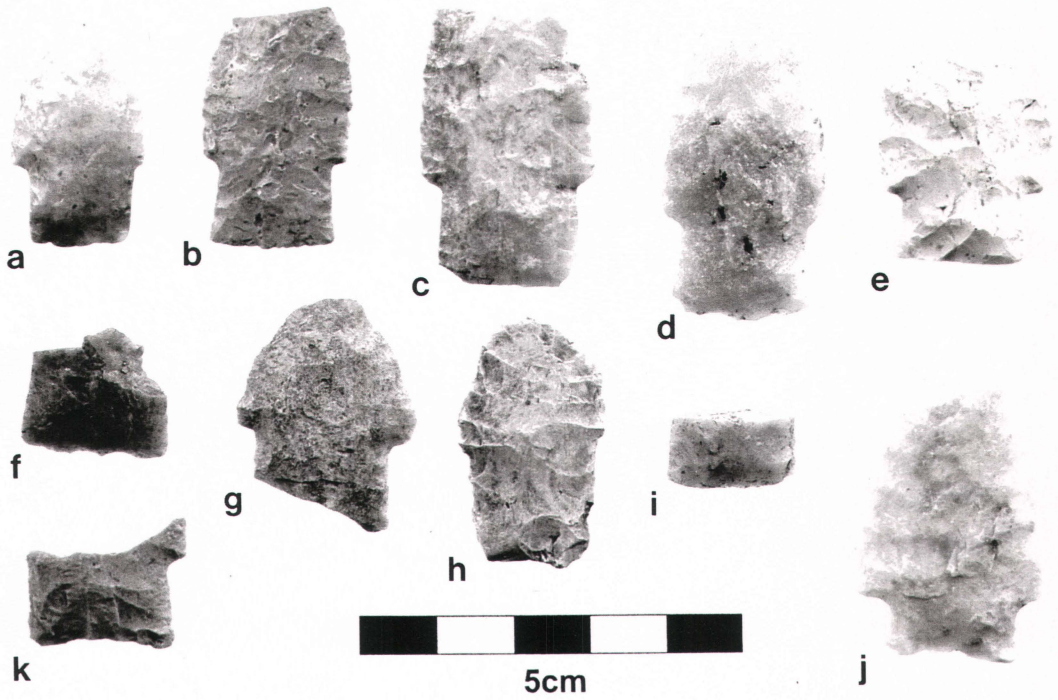


Figure 3.6. Cody complex projectile points from the Haskey area.

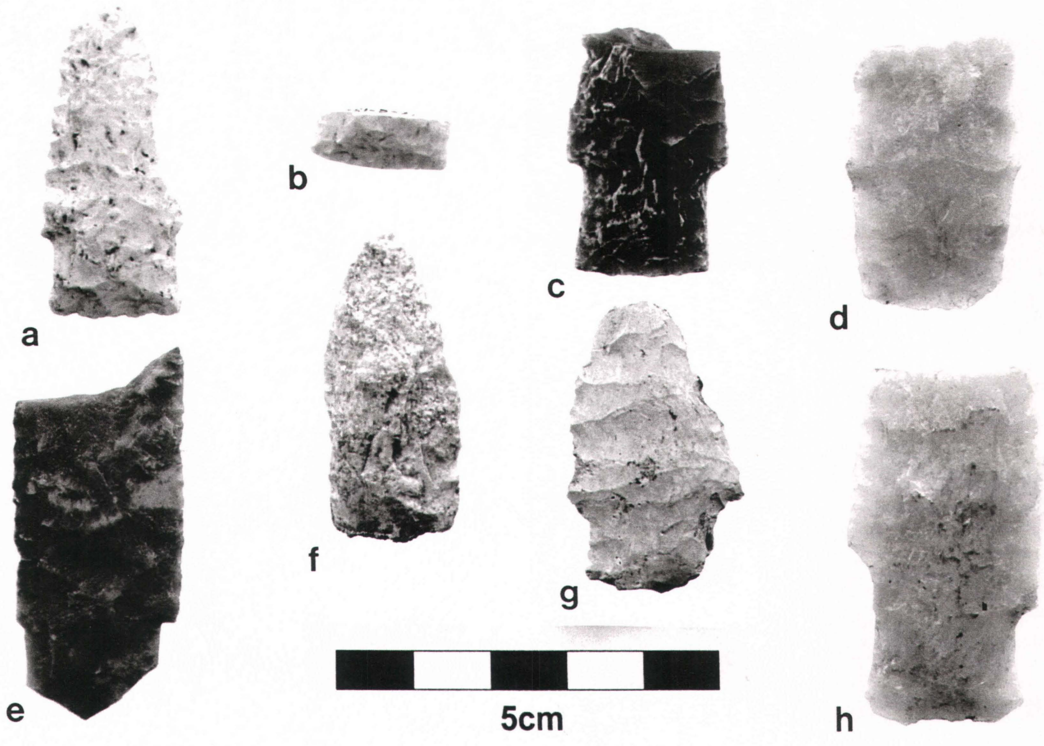


Figure 3.7. Cody complex projectile points from the Haskey area.

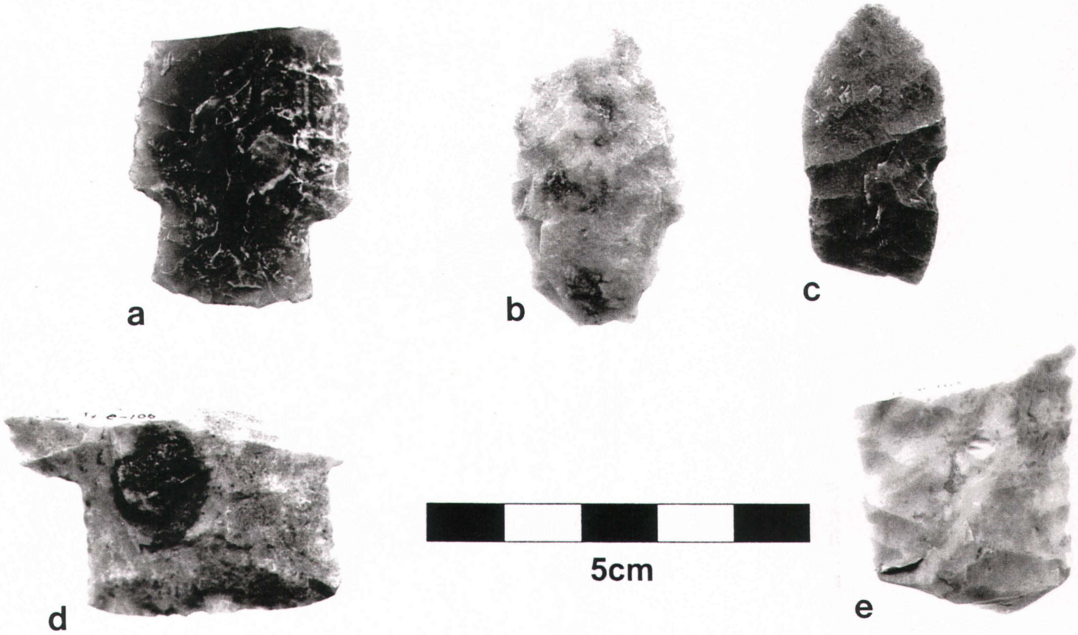


Figure 3.8. Cody complex artifacts from the Haskey area.

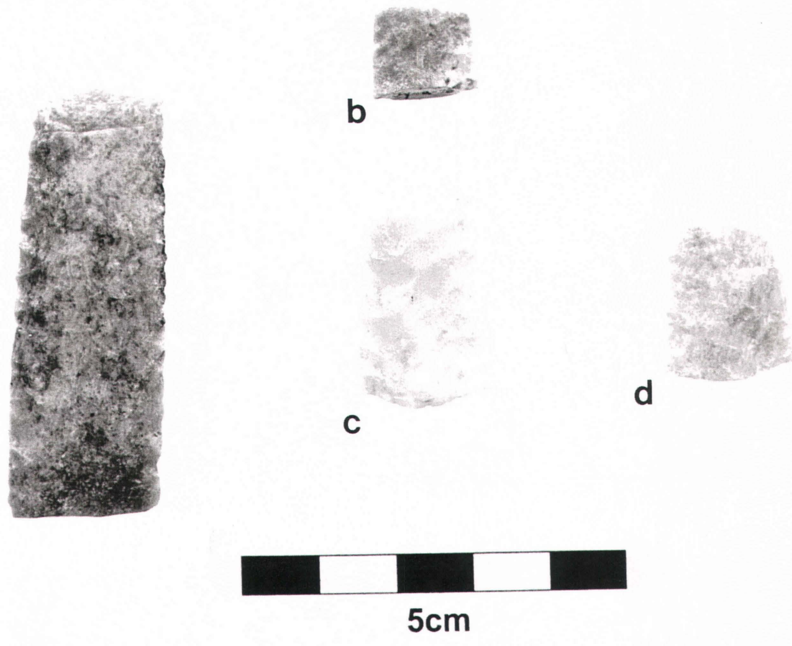


Figure 3.9. Cody complex artifacts from the Haskey area.

The locations of the remaining Cody complex sites were situated primarily along the small creeks that empty into the Quill Lakes or in the hummocky moraine between Big Quill Lake and Jansen Lake. Two Scottsbluff points were found at Corley's Ridge/Kells area north of Elfros. A single Scottsbluff point was recovered north of Wynyard along Magnusson Creek. Three Scottsbluff points were found in the hummocky moraine between Jansen Lake and Big Quill Lake. At ElNe-2, a complete point showing no evidence of use was collected. The owner of this point found it while breaking land and reported that another showed up in the furrow, but when he went back to get it he could not find it. At ElNd-15, a single point was found on a Glacial Quill Lake strandline. Finally, a single point was recovered from ElNd-9.

The lithic material utilized to manufacture the diagnostic tools indicates a preference for Knife River Flint. Of the 38 tools, 7 (18.4%) were fashioned from Knife River Flint, but the use of local materials was more prevalent than seen with the Agate Basin points. Swan River Chert accounted for 18 (47.4%) points while 11 (28.9%) were fashioned from chert. Two artifacts were made from unidentified materials.

3.2.3 Terminal Paleo-Indian

Seventeen Terminal Paleo-Indian points were identified from collections in the Quill Lakes region (Appendix 2, Table 6). These points were collected from four large sites (Figures 3.10 and 3.11). The location of the Terminal Paleo-Indian sites in the Quill Lakes region indicates a continued use of certain sites previously occupied by Paleo-Indian groups. For example, the Haskey area along Milligan Creek had the largest number of Terminal Paleo-Indian points from the collections studied (n=6). In addition, the Corley's Ridge/Kells area also produced several Terminal Paleo-Indian points (n=5).

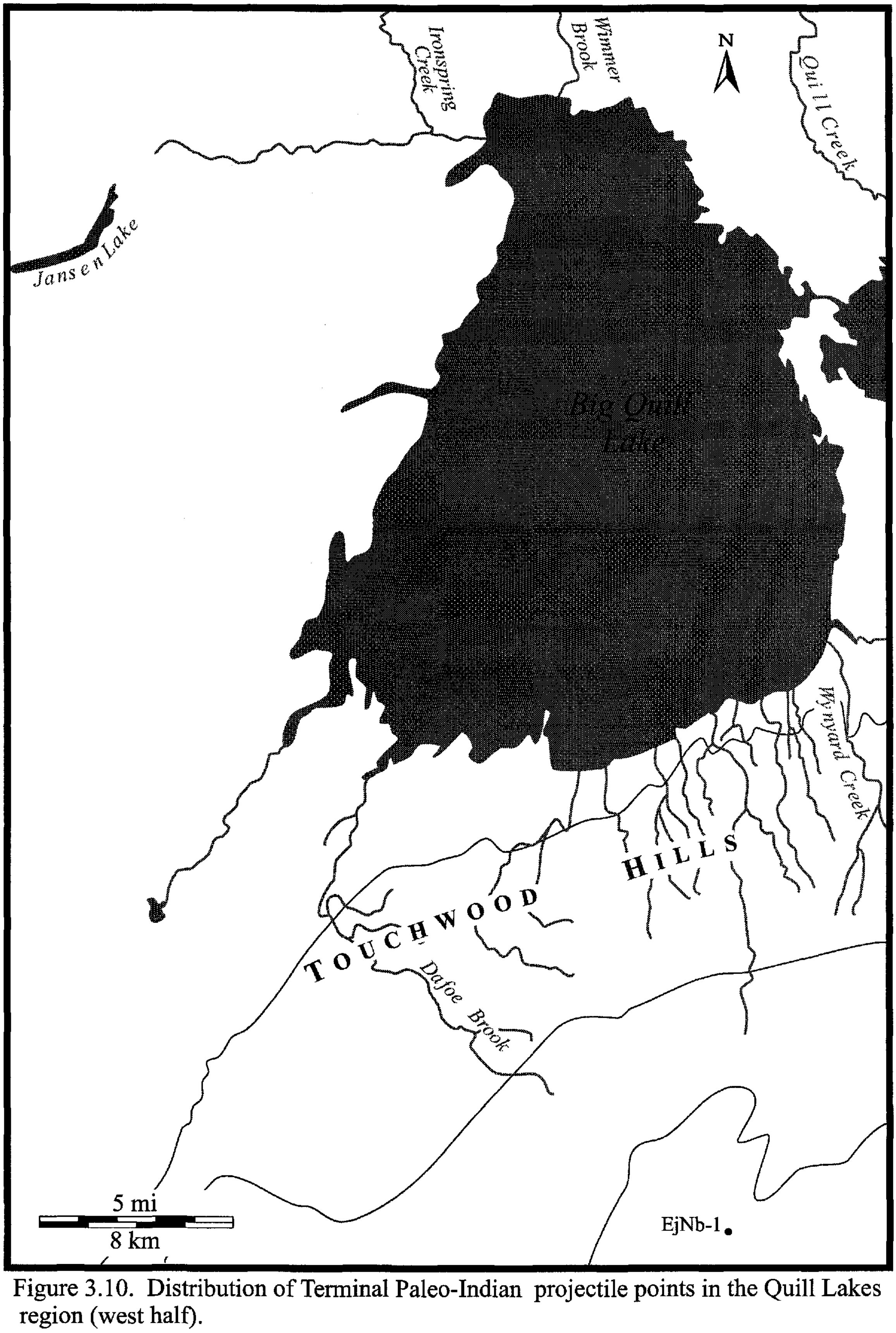


Figure 3.10. Distribution of Terminal Paleo-Indian projectile points in the Quill Lakes region (west half).

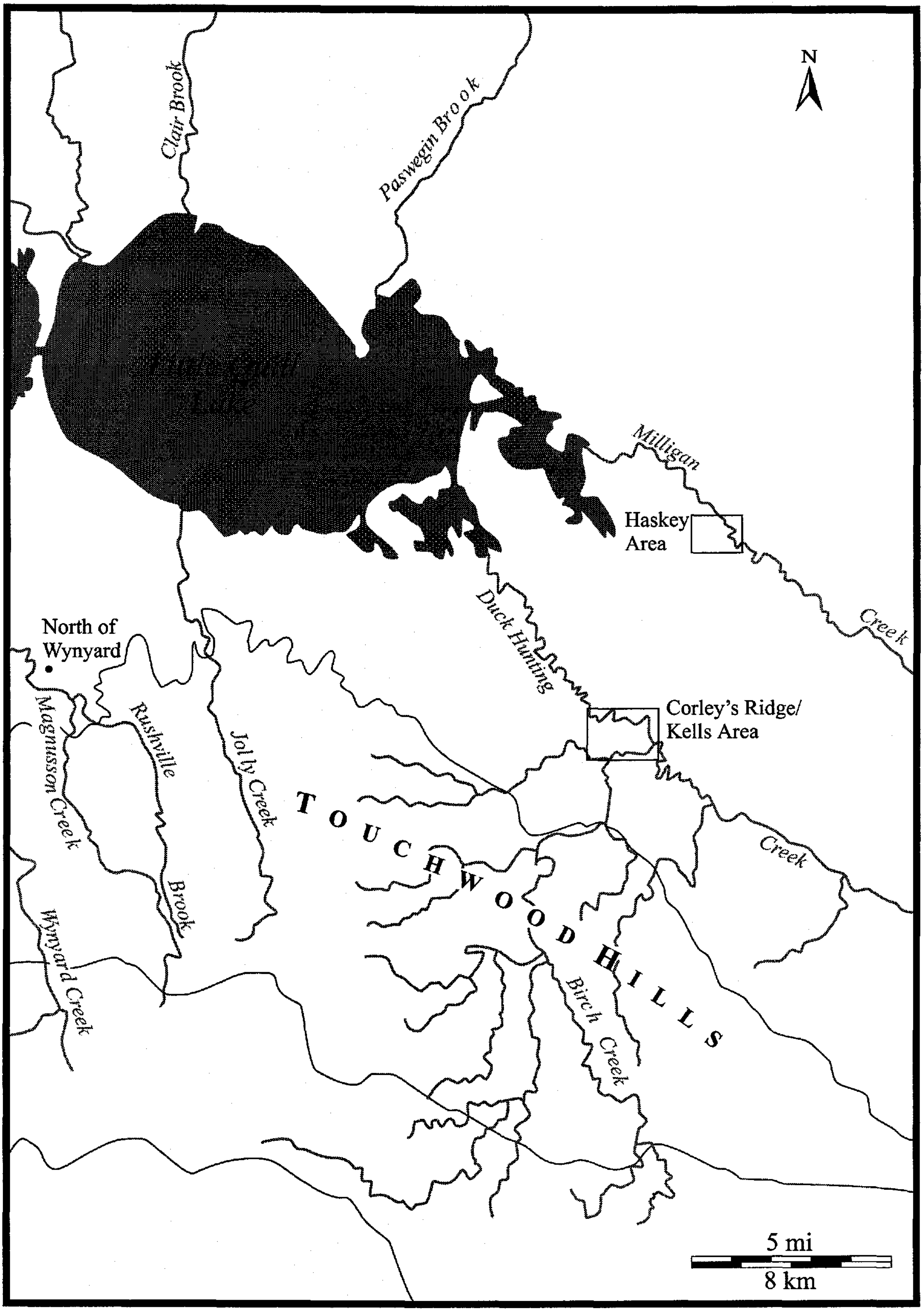


Figure 3.11. Distribution of Terminal Paleo-Indian projectile points in the Quill Lakes region (east half).

A third important area was north of Wynyard. Three projectile points were recorded for EkNb-2 as well as two more from the general area, likely related to EkNb-2. A single point was recorded from EkNj-2 in the Touchwood Hills.

Two basic point styles were identified from the collections for this period. Fourteen points, with slightly indented, narrow bases, represent one style (Figure 3.12:a-f). The lateral edges were ground smooth and several of the longer base fragments show evidence of a longitudinal twist. The basal corners normally were angular. In addition, oblique flaking was evident on most specimens. Three points, with wide, deeply concave bases represent the second style (Figure 3.13:a, d, e). Basal grinding was present on these points. This style of point was only recorded at the Haskey area. A possible knife has a wide straight base with ground, straight lateral edges (Figure 3.13:b).

Local lithic materials were utilized to fashion the Terminal Paleo-Indian points. Swan River Chert dominated with 58.8% (n=10) of the points being made from this material. Chert points accounted for 35.3% (n=6) of the points while only one Knife River Flint (5.9%) point was recorded. The makers of the Terminal Paleo-Indian points were evidently more willing to use poorer quality cherts than earlier groups. Also noticeable is the lower quality of the craftsmanship; however, this may be related to the poorer lithic materials being used.

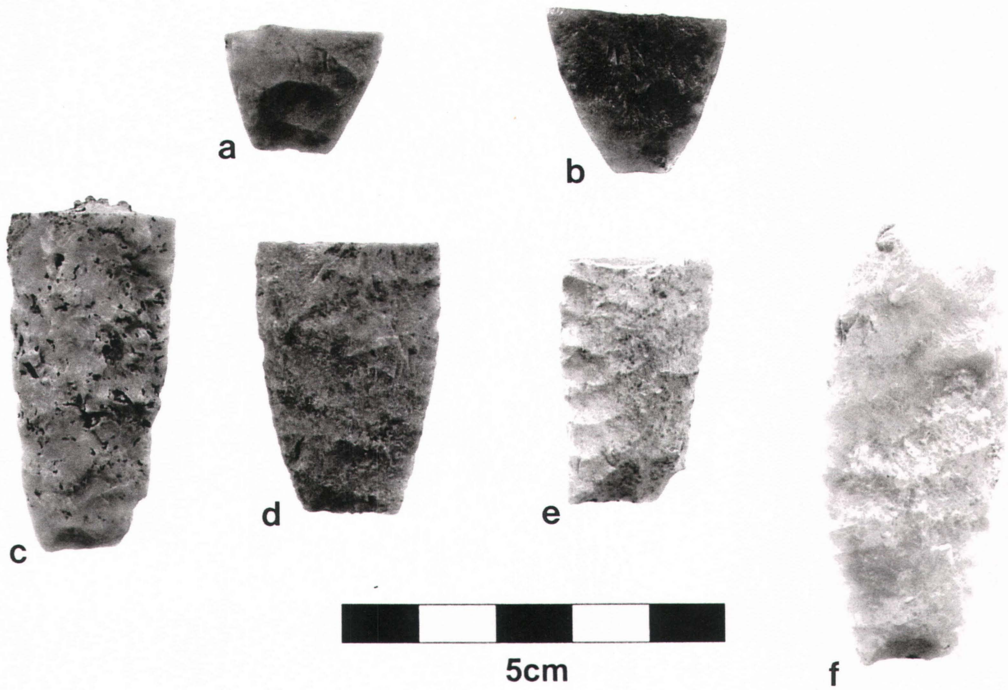


Figure 3.12. Terminal Paleo-Indian projectile points from the Stachyruk collection; Haskey area: a, e; Corley's Ridge/Kells area: b, c, f; EjNb-1: d;

Figure 3.13. Terminal Paleo-Indian projectile points from the Stachyruk collection; Haskey area.

3.3 Discussion

3.3.1 Agate Basin

Specimens from the study area closely resemble those present in large Agate Basin components found elsewhere on the Great Plains. Comparisons with well-illustrated points from the Agate Basin type-site suggest a close relationship (c.f. Frison and Stanford 1982: Figures 2.48-2.59). However, direct comparison with the projectile points from the Agate Basin site is made difficult by the small sample of points from the study area, and unlike the type-site, these points are not from a kill site. The identification of the points was made primarily from basal fragments, as there are only two complete points. Close examinations of the points, however, has allowed the identification of attributes consistent with the detailed descriptions of the manufacture of Agate Basin points by Bradley (1982).

The distribution of Agate Basin, known only from surface collections, is relatively thin, but widespread throughout southern Saskatchewan (Dyck 1983). The Parkhill site, near Moose Jaw, is a large campsite that has produced numerous Agate Basin points (Nero 1959, Ebell 1980). Although there have been several apparent Agate Basin projectile point fragments reported from the boreal forest for northern Saskatchewan (Meyer 1983:144-148) and the Barrenlands further north (Gordon 1996:221), the connection with southerly Agate Basin components remains to been seen. There have been no archaeological excavations of intact Agate Basin components in Saskatchewan.

The use of exotic lithic materials such as Knife River Flint in Agate Basin components from the Quill Lakes is comparable to that of other large Agate Basin assemblages on the Northern Plains. At the Agate Basin site, 72 of 169 points (43%) were made from Knife River Flint (Frison and Stanford 1982:80). At the Parkhill site, Ebell (1980) reported that 41% of all artifacts recovered were made from Knife River Flint. At this site, 26% of the projectile points were made from Knife River Flint. Ebell (1980) also reported a moss agate point from the site. From the Quill Lakes region, 33% of the projectile points were made from Knife River Flint. In addition, one point was fashioned from moss agate. This similar pattern of Knife River Flint usage may indicate connections between the sites. The high proportions of exotic southern materials, especially Knife River Flint, suggests that the Agate Basin people from the Quill Lakes region were either recently in the North Dakota region or had strong connections to that area.

Principal investigators at Agate Basin sites seem convinced that Agate Basin materials are well dated at 10 000-10 500 rcybp (Irwin-Williams et al. 1973; Frison 1991). Radiocarbon dates have been reported from a few Agate Basin sites (Table 3.1), but none for Agate Basin components on the Canadian Prairies. From Saskatchewan, the Parkhill site remains the only large Agate Basin site studied in any detail (Nero 1959, Ebell 1980). Ebell (1980) suggested an age of 8500–8000 rcybp for this site. He based his estimate assuming an expansion of Agate Basin from the Southern Plains to the north where Agate Basin dates are 4000 radiocarbon years younger (Ebell 1980:72). Ebell (1980:69-72) used sites and radiocarbon dates associated with Agate Basin-like materials in the North West Territories and the Yukon Territory and accepted them as belonging to the Agate Basin complex as expressed on the Plains. Such a relationship remains tenuous (Frison and Stanford 1982:366).

Other Saskatchewan archaeologists have extended the temporal length of Agate Basin a few hundred years younger than those from the United States. Recently, Meyer and Walker (1999:20) suggested an age of 10 500–9 500 rcybp for Agate Basin in Saskatchewan. Others (Dyck 1983; Linnamae et al. 1988) have analyzed Agate Basin and the closely related Hell Gap complexes together. They consider the Agate Basin/Hell Gap complexes to persist until 9600 and 9400 rcybp respectively.

Table 3.1. Selected Agate Basin radiocarbon assays.

Site	Date (rcybp)	Lab Number	Reference
Brewster	9990 ± 225	M-1131	Frison and Stanford 1982
Brewster	9350 ± 450	O-1252	Frison and Stanford 1982
Agate Basin	10 430 ± 570	RL-557	Frison and Stanford 1982
Frazier	9550 ± 130	SMU-31	Cassells 1983
Frazier	9000 ± 130	SMU-32	Cassells 1983
Hell Gap	10 850 ± 500	I-167	Frison 1991

3.3.2 Cody Complex

The Cody complex projectile points (Scottsbluff and Eden) recorded from the Quill Lakes region correspond closely with identified types for this complex. Similar points are found at sites throughout the Northern Plains. One or, possibly, two stem fragments are too large for the normal variation of Scottsbluff, but are not complete enough to allow them to be designated as points from the Alberta complex (Figure 3.8:d, e). One Cody Knife was found in association with the Scottsbluff and Eden material from the Haskey site. Two other knives do not conform to the typical Cody Knife outline.

A Scottsbluff point recorded from ElNe-2 was similar to those recovered from the Larson Cache (Frison and Todd 1987). Bradley and Frison (1987) interpreted these as functional knives. The slightly asymmetrical outline of the points supports this interpretation. This projectile point/knife is unique in this region because of its pristine condition. There is no evidence of reworking on this artifact.

Cody complex components have been excavated at many important sites on the Great Plains. Excavations at the Horner site in Wyoming have provided valuable information about the Cody complex (Frison and Todd 1987). The Heron-Eden (Corbeil 1995), Niska (Meyer 1985), and Napao sites are Cody complex components excavated by professional archaeologists in Saskatchewan. The materials from the Quill Lakes are comparable to the materials illustrated from these sites.

Cody complex materials are common surface finds in Saskatchewan south of the Saskatchewan River (Dyck 1983). A major surface collection located in south central Saskatchewan is the Dunn site (Ebell 1988, 1964). The Dunn site points have slight shoulders compared to the Scottsbluff points recorded from the Quill Lakes region. In addition, Ebell (1988:509) reported that all but two of the projectile points from this site are fashioned from Knife River Flint. Knife River Flint comprised a minority of Cody complex projectile points from the Quill Lakes. Another important site is the Macleod site in southeastern Saskatchewan (Joyes 1997; 2000). At this site, nearly 80% of 76 projectile points were made from Knife River Flint.

Three Scottsbluff points were recovered northeast of the study area at the Snider site along the Red Deer River (Campbell and Meyer 1971:10-14). These points are similar in outline to points recorded from the Quill Lakes region. They also showed extensive amounts of reworking. Orly Felton (1971:8-9) reported three comparable points from sites located to the north and northwest of the Quill Lakes region. Although they are similar in outline to the points recorded in the study region they are large and may represent the Alberta type.

Most archaeologists consider dates for the Cody complex to range a few hundred years on each side of 9000 rcybp (e.g. Frison 1991) (see Table 3.2). Radiocarbon dates have been obtained from three sites in Saskatchewan. Morlan (1993:37) notes, however, that the shallow deposits of the components at these sites make the dates somewhat suspect. The Heron Eden site (Corbeil 1995) temporally fits the best with other Cody complex sites on the Plains. This site was also the least deflated, providing the most reliable dates of the Saskatchewan Cody complex sites (Morlan 1993:37).

Several attempts to radiocarbon date the Niska site have met varied success. Meyer (1985:29) viewed these dates with skepticism and suggested that the Niska site should still likely date to the typical Cody complex period (i.e. ca. 9000 rcybp). One date from the site (S-2510) fell within the expected Cody complex range, but had such a large error that it cannot be considered reliable. Several other dates have been rejected as too low or high. Many of the dates from the Niska site are from paleosols that can present problems when trying to date them. Wilson (1993:183) noted that there were several problems with trying to date paleosols at the Niska site and suggests that these have affected the dates making them younger than expected. Dates at the Napao site suffer the same conditions seen at the Niska site and may not be reliable (Morlan 1993:13).

For Saskatchewan, Dyck (1983) and Linnamae et al. (1988) do not suggest a temporal span for the Cody complex alone. They do, however, suggest that by 8600 rcybp, Cody complex materials in Saskatchewan have disappeared. Meyer and Walker (1999:20) suggest that the Scottsbluff and Eden points date 8800 – 8400 rcybp

Table 3.2 Selected Cody complex radiocarbon assays.

Site	Date (rcybp)	Lab Number	Reference
Heron Eden	8930 ± 120	S-3114	Corbeil 1995
Heron Eden	10 210 ± 100*	S-3118	Corbeil 1995
Heron Eden	8160 ± 200*	S-3208	Corbeil 1995
Heron Eden	9210 ± 110	S-3309	Corbeil 1995
Heron Eden	8920 ± 130	S-3309	Corbeil 1995
Niska	7000 ± 185	S-2353	Meyer 1985
Niska	7165 ± 320	S-2453	Meyer 1985
Niska	5910 ± 270*	S-2235	Meyer 1985
Niska	8475 ± 650	S-2510	Morlan 1993
Napao	6635 ± 205*	S-2891	Morlan 1993
Napao	8075 ± 230	S-2890	Morlan 1993
Horner	7880 ± 1300	SI-74	Frison 1991
Horner	8750 ± 120	UCLA-697A	Frison 1991
Horner	8840 ± 140	UCLA-697B	Frison 1991
Horner	9390 ± 75	SI-4851	Frison 1991
Horner	9875 ± 85	SI-4851A	Frison 1991
Horner	10 060 ± 220	I-10900	Frison 1991
Frasca	8910 ± 90	SI-4848	Fulgham and Stanford 1982
Finley	8950 ± 220	RL-574	Frison 1991
Finley	9026 ± 118	SMU-250	Frison 1991
Jurgens	9070 ± 90	SI-3726	Frison 1991
Hell Gap	8600 ± 600	I-245	Frison 1991
Medicine Lodge Creek	8830 ± 470	RL-446	Frison 1991
Carter/Kerr-McGee	6950 ± 190*	RL-737	Frison 1984

* indicates rejected date

in Saskatchewan. This puts the end date some 400 radiocarbon years younger than expected elsewhere on the Plains. The dates at the Napao and Niska sites can, for the most part, be considered unreliable, whereas dates at the Heron Eden site suggest the Cody complex occurred in southern Saskatchewan at the same time as elsewhere in the Northern Plains. Therefore, one might consider that the dates at the Heron Eden site are reliable and until further data is gathered, there is no reason to expect that Cody complex dates in southern Saskatchewan should be different than those found elsewhere on the Plains.

3.3.3 Terminal Paleo-Indian

Excavation of Terminal Paleo-Indian components has occurred at many sites but because of problems with taxonomy and the description of these artifacts, not much is known about these complexes (Hofman and Graham 1998). The Terminal Paleo-Indian points from the Quill Lakes region are similar to others found in Saskatchewan. Similar points have been found to the north in the Carrot River (Meyer 1970) and Nipawin regions (Finnigan et al. 1983). In addition, similar points were found at Stoney Beach and Bulyea areas (Dyck 1983:83).

In Saskatchewan, Dyck (1983) considered the Frederick/Lusk/Angostura/Browns Valley line to exist from 9200 – 8000 rcybp whereas the Jimmy Allen style points fall in the period from 8500 – 7900 rcybp. Linnamae et al. (1988) suggested the Terminal Paleo-Indian period existed from 8500 – 7500 rcybp while Meyer and Walker (1999), considering the age of Angostura points, give it a temporal range of 8400 – 7500 rcybp. The majority of the Terminal Paleo-Indian projectile points from the Quill Lakes region resemble the Angostura type, but because of the apparent confusion regarding the Angostura type, the term is used here with some reservation (c.f. Hofman and Graham 1998:114). A list of some important sites and their dates are presented in Table 3.3. These dates should only be considered as tentative because of the limited number and problems associated with the dating methods and materials used for these sites (Holliday 1997).

Table 3.3. Selected Terminal Paleo-Indian radiocarbon assays.

Site	Date (rcybp)	Lab Number	Reference
Betty Greene	7880 ± 430	WSU-670	Frison 1991
James Allen	7900 ± 400	M-304	Frison 1991
Ray Long	9380 ± 500	M-370	Frison 1991
Hell Gap	8690 ± 380	A-501	Frison 1991
Mummy Cave	8100 ± 130	I-2354	Frison 1991
Mummy Cave	8740 ± 140	I-2353	Frison 1991

3.4 Comparison of Paleo-Indian Complexes

The number of sites occupied, for several thousand years in the Quill Lakes region, during the Paleo-Indian period is relatively low. Sixty-three diagnostic artifacts representing a minimum of 17 components were represented in the collections examined in the study area (Figure 3.14). There were 6 sites with Agate Basin diagnostics, 7 with Cody complex diagnostics, and 4 with Terminal Paleo-Indian diagnostics. Although the components seem relatively equal throughout the Paleo-Indian period the number of diagnostic artifacts suggests a much more intense Cody complex occupation in the region. There were 38 diagnostic Cody complex artifacts recorded from the collections. This is much higher than the 12 Agate Basin and 17 Terminal Paleo-Indian diagnostic artifacts recorded.

The most important site area utilized by peoples responsible for all three Paleo-Indian complexes was the Haskey Area along Milligan Creek. This area contained the majority of the Agate Basin (50.0 %), Cody (82.6 %), and Terminal Paleo-Indian (35.3 %) artifacts. Explanations for the importance of this particular spot are difficult to discern from the present conditions. Although Milligan Creek is one of the major creeks entering the Quill Lakes, it is presently a small, intermittent stream. Milligan Creek is

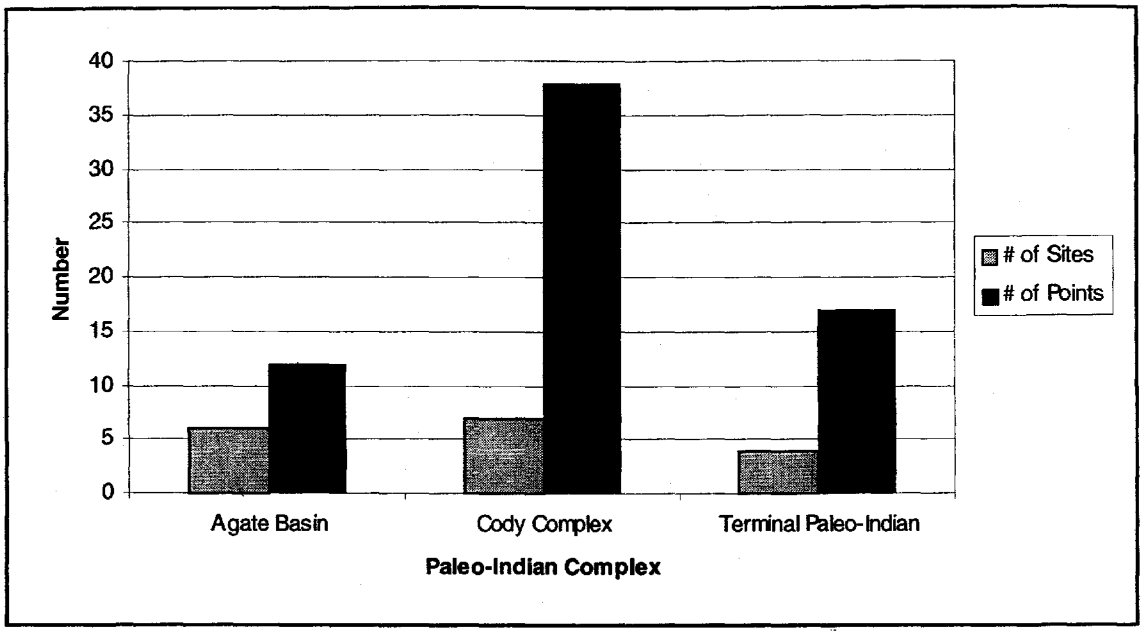


Figure 3.14. Number of sites and projectile points for the various Paleo-Indian complexes.

not deeply incised (~1.5m-2m) at the site area and shows no alternate channels that it may have occupied in the past. Examination of the Paleo-Indian projectile points suggests that they have been abandoned due to breakage and/or reworked to the end of their usefulness. This likely indicates some sort of campsite or workshop area. This is supported by the abundance of domestic tools (e.g. scrapers) and flaking debris.

The use of Knife River Flint to manufacture the diagnostic artifacts during the Paleo-Indian period suggests a pattern (Figure 3.15). Agate Basin projectile points were fashioned from Knife River Flint 33.3 % (n=4) of the time. The use of Knife River Flint during the Cody complex decreased by almost half (18.4 %, n=7) and became rare during the Terminal Paleo-Indian complexes (5.9 %, n=1). The amounts of Swan River Chert utilized to manufacture projectile points remained relatively constant throughout the Paleo-Indian period (47.4%-58.8%).

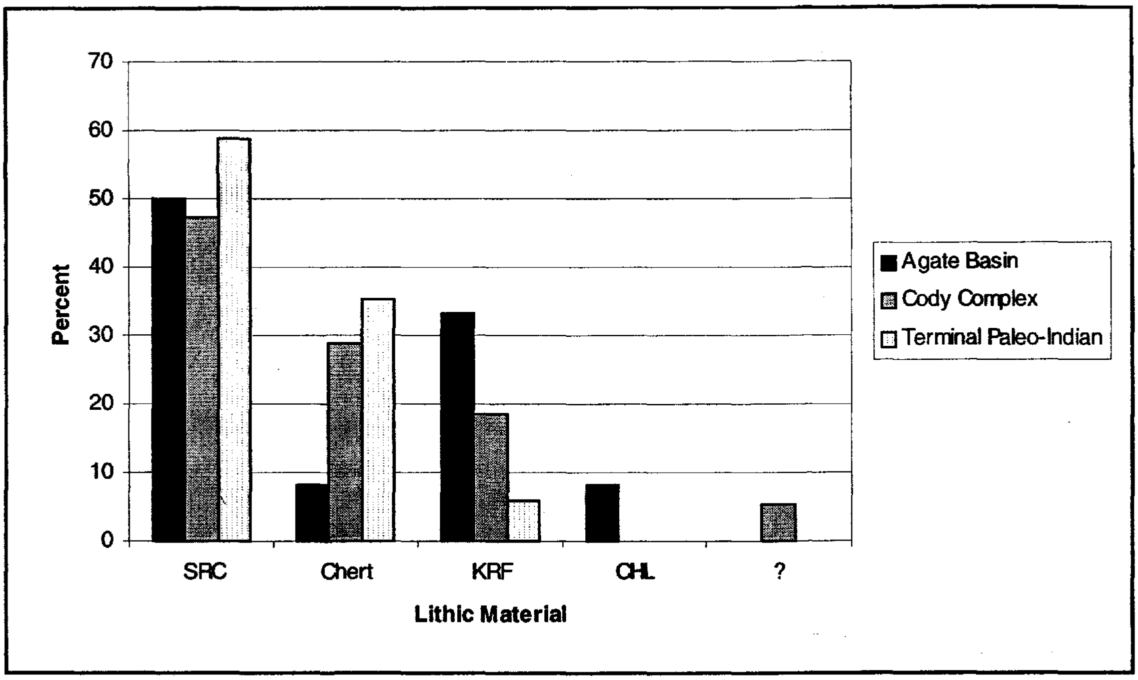


Figure 3.15. Lithic materials used for Paleo-Indian projectile points.

When one compares the use of local lithic sources and exotic sources, a clear pattern emerges. There is a distinct increase in the amount of local materials and corresponding decrease in non-local utilized through time (Figure 3.16).

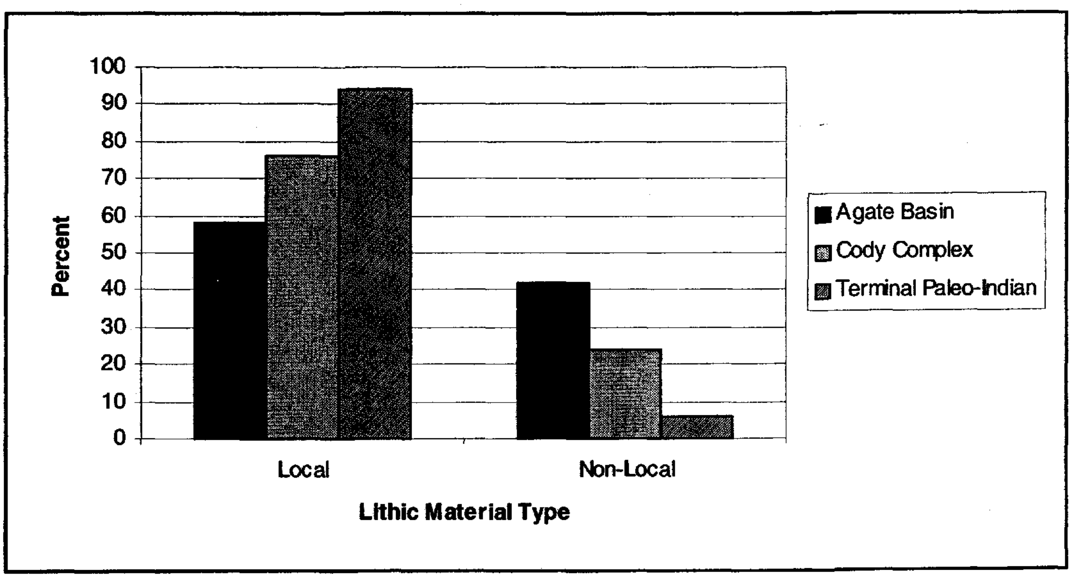


Figure 3.16. Local versus non-local lithic materials used to manufacture projectile points.

This pattern suggests that through time there was less reliance on or desire for exotic lithic sources. Terminal Paleo-Indian period flint-knappers utilized generally poorer quality local materials than those manufacturing Agate Basin points. This in turn influenced their ability to work the stone resulting in a lower quality of craftsmanship. A decrease in access to source areas could have forced these Paleo-Indian groups to rely on local sources. Alternatively, these people may simply have been willing to use coarser lithics.

3.5 Summary

There is a small but significant Paleo-Indian occupation in the Quill Lakes region. The earliest occupation of people appears to be the makers of Agate Basin projectile points. Agate Basin dates occur ca. 10 500–10 000 rcybp elsewhere on the Plains. The next major archaeological culture in the region is the Cody complex. In particular, Scottsbluff and Eden points are prevalent. Excluding Alberta, Cody complex materials commonly date ca. 9200–8800 rcybp on the Northern Plains. Dates in Saskatchewan are comparable to these. The Terminal Paleo-Indian complex represents the people who occupied the region next. These complexes are dated from ca. 9000-8500 rcybp on the Northern Plains and persist until the appearance of side-notched and corner-notched atlatl forms beginning ca. 7500 rcybp.

A major Paleo-Indian site is closely associated with an area along Milligan Creek where large components of each Paleo-Indian complex are recorded. A significant but smaller site is found at the Corley's Ridge/Kells area as well. The dominant Paleo-Indian occupation is the Cody complex component at the Haskey site area. This makes it one of the largest recorded Cody complex sites this far north.

Smaller single finds of Paleo-Indian points are recorded throughout the Quill Lakes region.

Chapter 4

The Middle Plains Indian Period

4.1 Introduction

The Middle Plains Indian period is well represented in the Quill Lakes region. Several archaeological complexes or archaeological series are included in this period. The earliest archaeological manifestation expected in the Quill Lakes region are projectile points defined for the Mummy Cave series (Reeves 1973; Dyck 1983). However, several large corner-notched points, that likely represent a transition from Paleo-Indian lanceolate to side-notched forms, may predate the Mummy Cave series or at least may be coeval with it. Generally, it is believed that the transition from lanceolate forms to side-notched forms was somewhat gradual and that there was continuity between the two (Frison 1998:160). Although large corner-notched projectile points are not well defined, they have been described at a number of sites on the Northern Plains and adjacent areas. Generally, these points are well-made exhibiting wide, deep corner-notches and often have basal notches. The exact relationship of the makers of these points with Paleo-Indian groups is unknown but there may have been some co-existence.

Abundant in the archaeological record and in collections from the study area are point types attributed to the Mummy Cave complex (Reeves 1969, 1973) or Mummy Cave series (Dyck 1983). For the Northern Plains, Walker (1992) described five types. They include Blackwater Side-Notched, Northern Side-Notched (Bitterroot), Hawken

Side-Notched, Gowen Side-Notched (Salmon River), and Mount Albion Corner-Notched. In Saskatchewan, these points are usually identified as Bitterroot and Gowen. More generally, the various point types are often referred to as Early Side-Notched or Mummy Cave points, terms that are favored in this thesis. Other types have not been named specifically, but occur in components dated to this period.

Correctly identifying Mummy Cave series projectile points is difficult and remains a problem for archaeologists working with surface collections. Many Early Side-Notched types resemble later types such as Hanna or even Besant. This is especially apparent when identifying reworked projectile points. Criteria such as thickness, overall shape outline, and basal grinding are important when trying to identify points from this period. In addition, it is crucial to examine the entire set of projectile points from a site to assess the variability and range of periods represented. The confidence level for identifying an Early Side-Notched component based on a single projectile point is much lower than with several examples from a site.

The Oxbow complex is well defined on the Northern Plains. Several sites have been excavated, providing good chronological and stylistic control for the complex. Oxbow projectile points are the diagnostic artifact of the Oxbow complex. Oxbow points were initially described from the Oxbow Dam site (Nero and McCorquodale 1958; Green 1998). They are side-notched with a concave basal edge creating an eared appearance. Oxbow points are distinctive and are readily identified in the collections. The similarity of Oxbow points at the Long Creek site and Oxbow Dam with Early Side-Notched point sites signifies continuity between the two (Reeves 1973:1245).

Based on projectile types described by Wheeler (1952, 1954), Mulloy (1954) defined the McKean complex based on materials from the McKean site in Wyoming.

Diagnostic projectile points include McKean Lanceolate, Duncan and Hanna points. McKean points are lanceolate in outline, thin and generally well made. They have a deep basal concavity and lack notches. These points are readily identifiable in the collections studied. Duncan and Hanna points have been argued to be separate types (Wheeler 1954) or variations of the same type (Mulloy 1954; Davis and Keyser 1999). Generally, both the Duncan and Hanna points are medium in size, stemmed with concave to straight bases. The bases often exhibit a flared appearance. The main difference between Duncan and Hanna points is normally found in the shoulders. Hanna points have sharply defined shoulders while Duncan points have rounded, sloping shoulders. Despite this, distinguishing between the two often is difficult. For the purposes of this thesis, no distinction between Duncan and Hanna was made.

Pelican Lake projectile points are diagnostic of the Pelican Lake complex. These projectile points were first described from southern Saskatchewan at the Mortlach site (Wettlaufer 1955). Pelican Lake points are "corner-notched points with an oval cross-section. The workmanship is superb, with very fine parallel and diagonal flakes running across the specimens" (Wettlaufer 1955:55). Wettlaufer (1955:55) goes on to say, "The points are beveled to the edges and toward the base. They are widest just above the notches and taper to a long symmetrical point." A narrow neck width along with straight lateral edges of the blade further distinguishes Pelican Lake points. Pelican Lake points are common and are readily identifiable in the collections.

4.2 Middle Plains Indian Components Identified from the Study Area

4.2.1 Corner-Notched Point Type

In the collections studied, 42 Large Corner-Notched points from eight different sites were identified (Figures 4.1 and 4.2). In addition, a single large corner-notched point was recovered during site survey. Of these points, 26 are relatively complete, 14 are blade fragments, and three are base fragments (Appendix 2, Table 7). The site locations are similar to the locations of the Paleo-Indian sites (i.e. along Milligan Creek, and the hummocky moraine west of Big Quill in the Jansen/Leroy region).

The New site (EkMw-6), a multi-component site along Milligan Creek, was important for users of this particular point type. At this location, 21 projectile points were recorded (Figures 4.3 – 4.6). In addition, two lanceolate projectile points, both made from patinated Knife River Flint appear to be associated with the large corner-notched points (Figure 4.7:a, b). They have been reworked and are different from other Paleo-Indian points in the region. Milligan Creek is deeply incised at this point and sits in a relatively wide valley. The distribution of artifacts straddles a low run that drains into Milligan Creek.

Two other sites along Milligan Creek (ElMw-7 and ElMw-8) each had a large corner-notched projectile point identified at them (Figure 4.8). In addition, a single point was recorded in a collection from the Corley's Ridge/Kells area. Finally, a large corner-notched point from the Yurach collection came from site EkNa-5.

On the west side of the Quill Lakes, four sites located in relative proximity to each other have large corner-notched projectile points similar to those at the New site (EkMx-6). The largest collection was from ElNe-1 with 9 projectile points recorded.

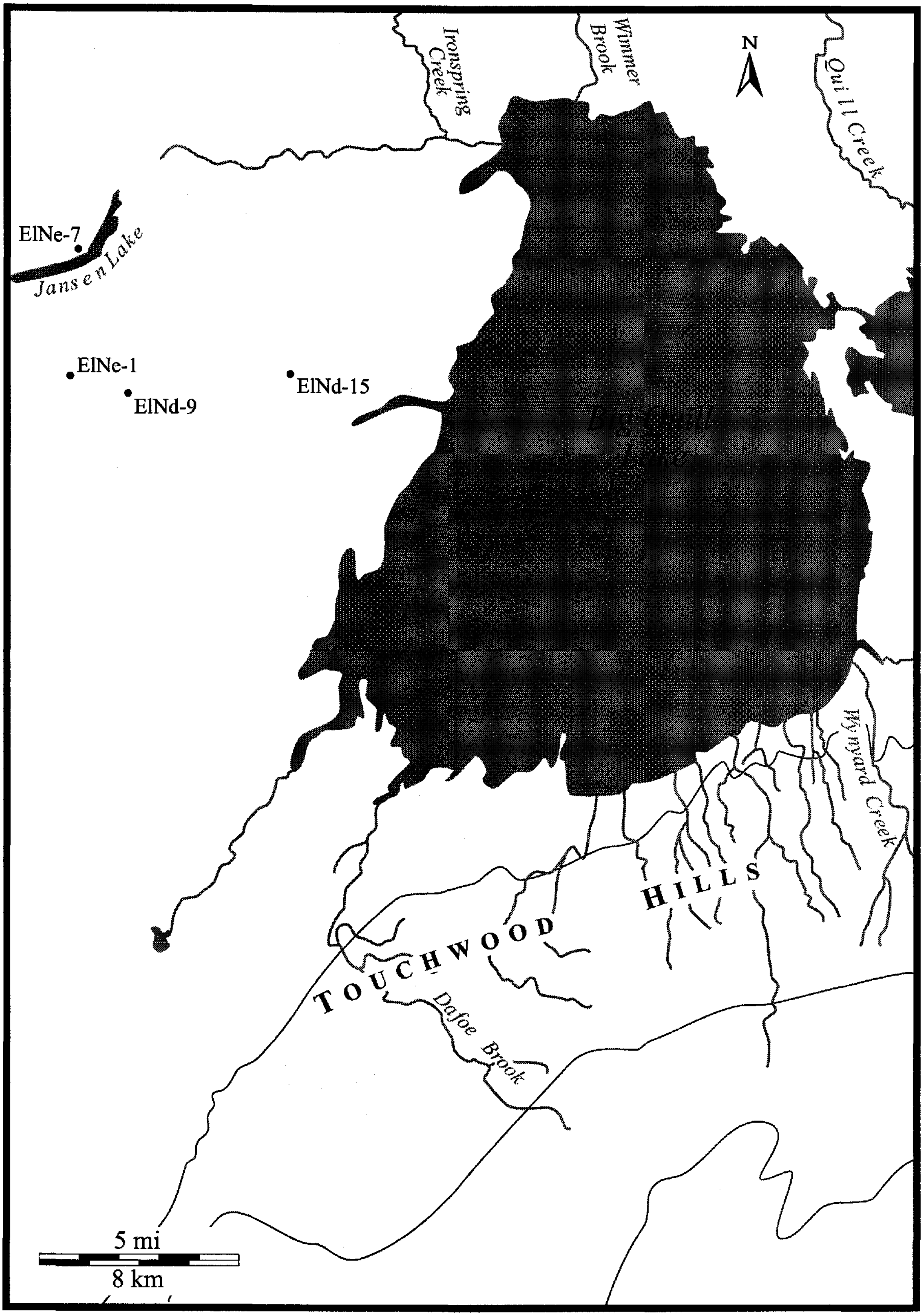


Figure 4.1. Distribution of large corner-notched projectile points in the Quill Lakes region (west half).

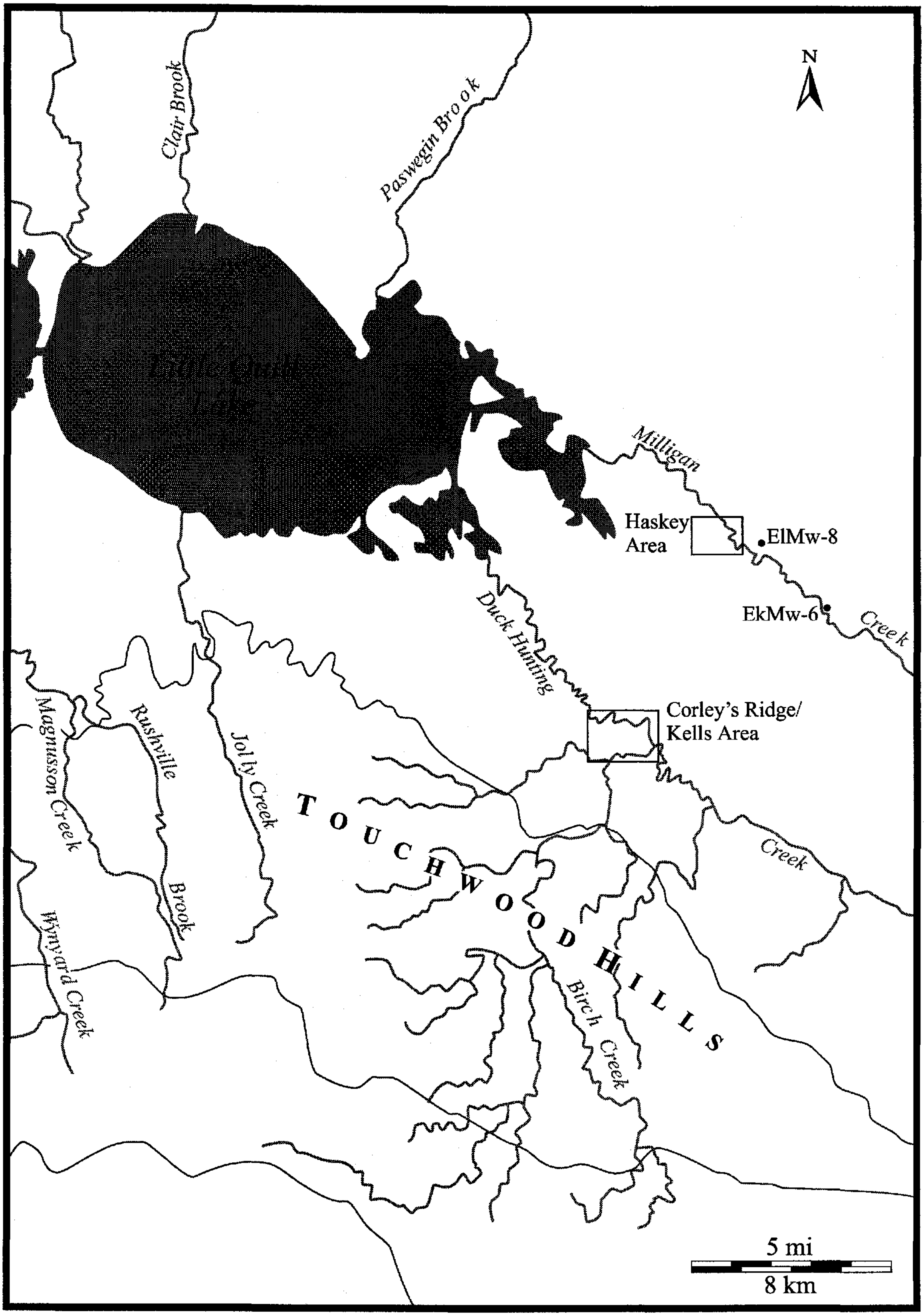


Figure 4.2. Distribution of large corner-notched projectile points in the Quill Lakes region (east half).

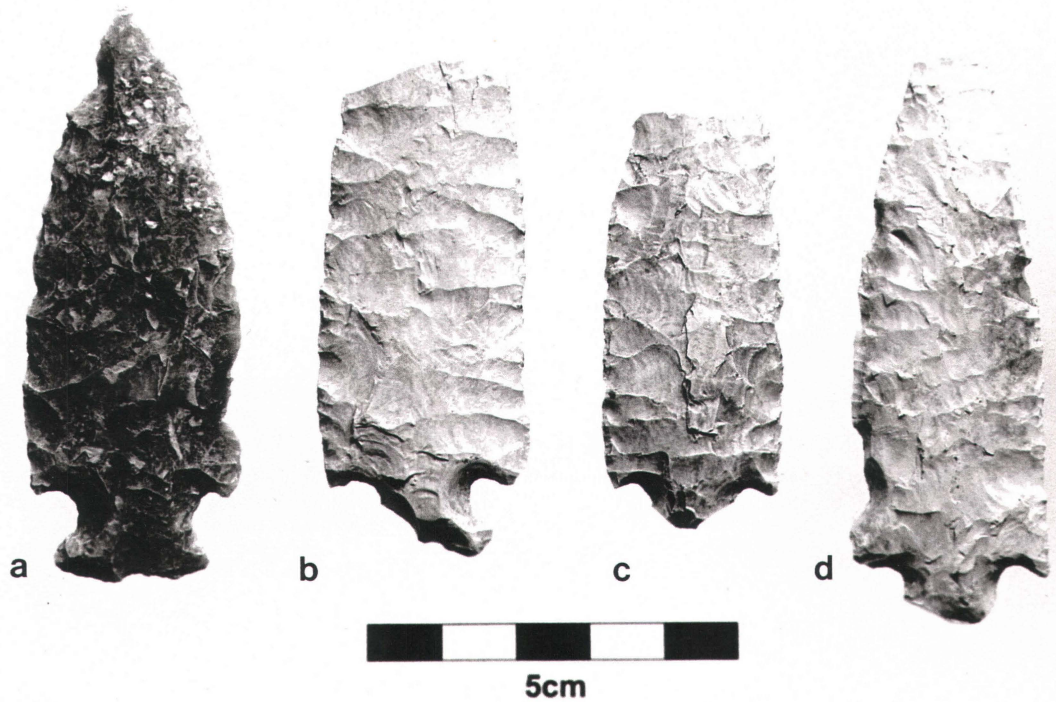


Figure 4.3. Large corner-notched points from the New site (EkMw-6).

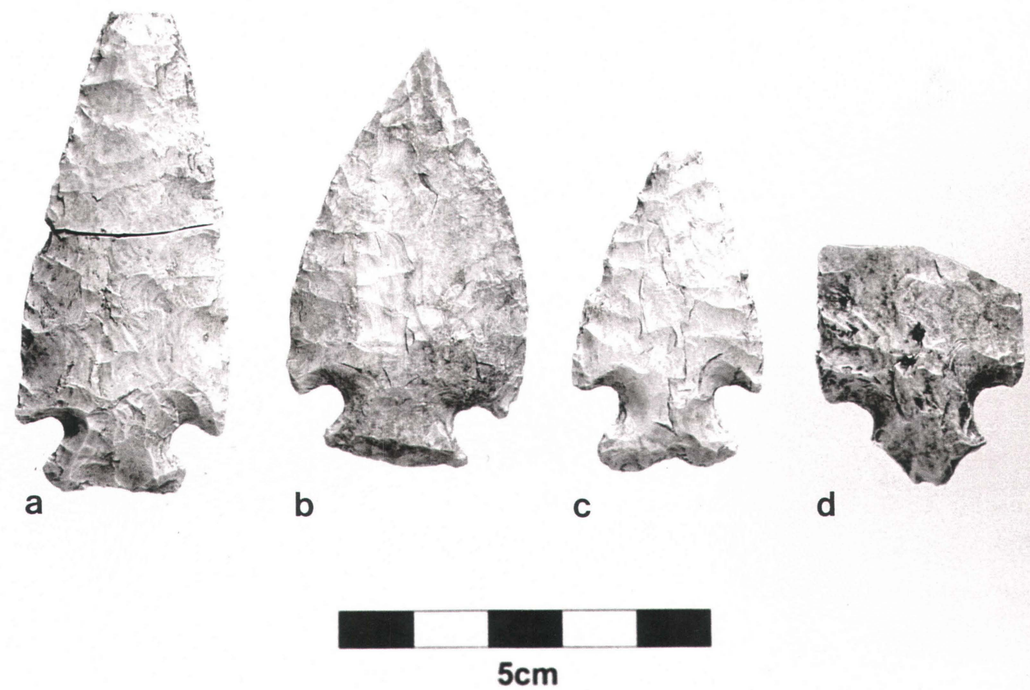


Figure 4.4. Large corner-notched projectile points from the New site (EkMw-6).

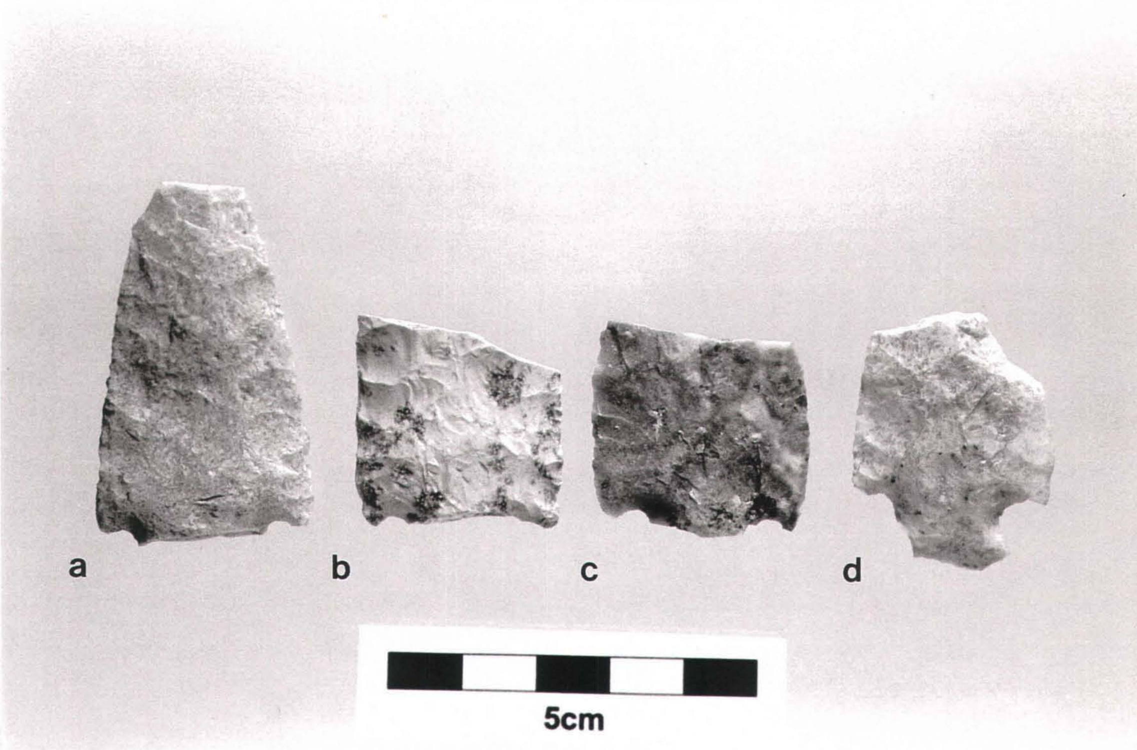


Figure 4.5. Large corner-notched projectile points from the New site (EkMw-6).

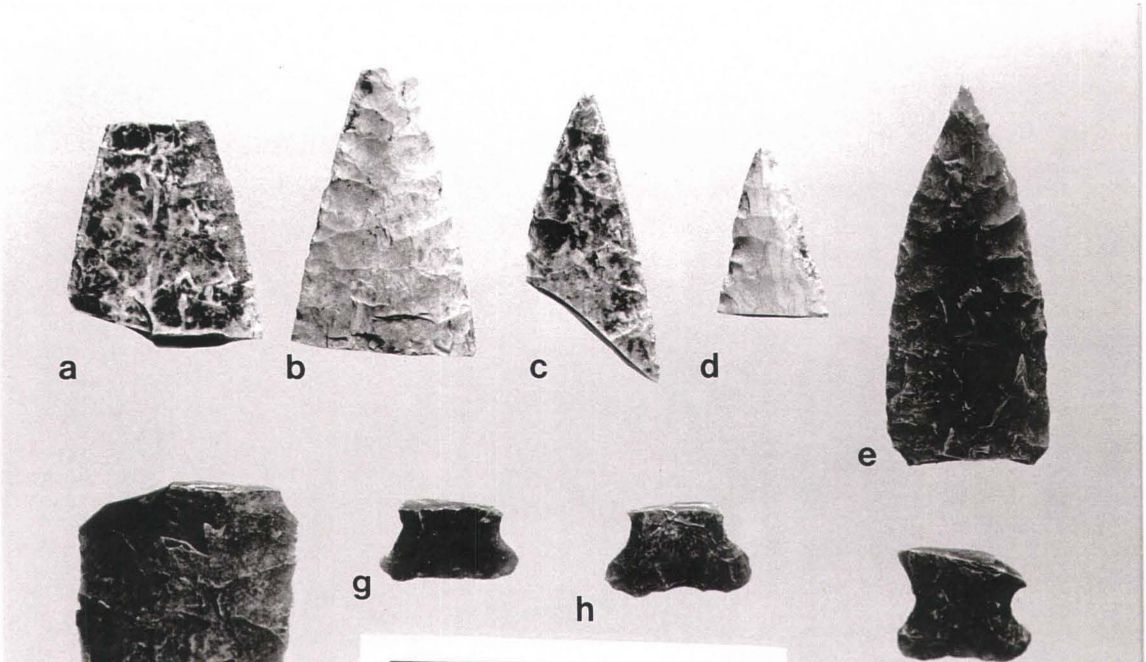


Figure 4.6. Large corner-notched projectile points from the New site (EkMw-6).

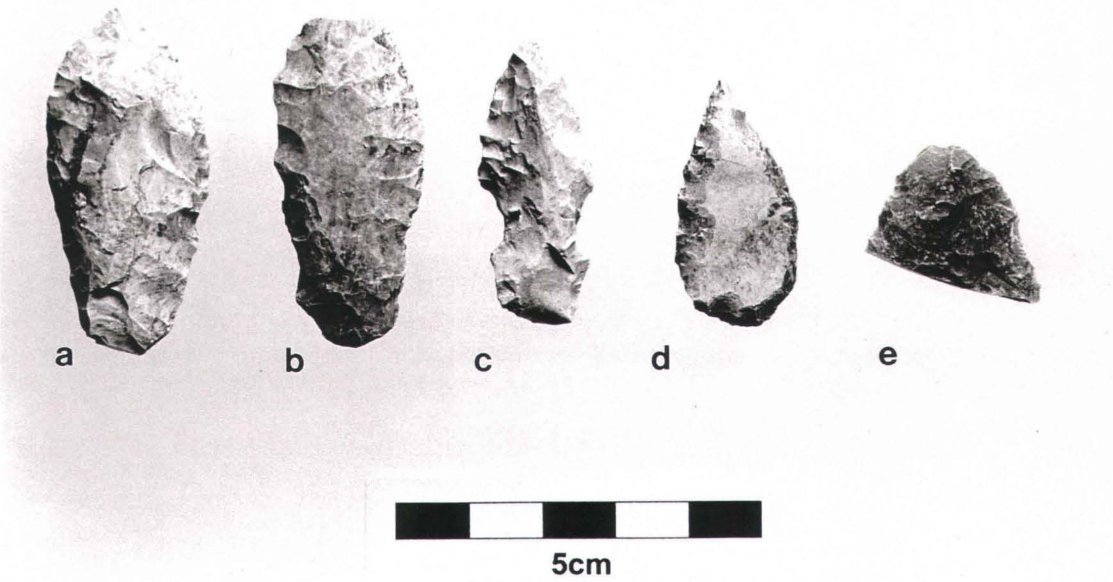


Figure 4.7. Projectile points and formed tools associated with the large corner-notched projectile points from the New site (EkMw-6).

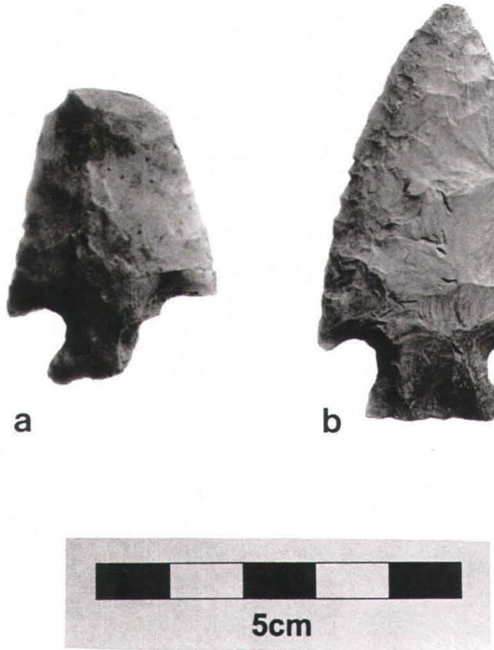


Figure 4.8. Large corner-notched points; Haskey area:a; ElMw-8:b.

From ElNd-9, east of ElNe-1, six large corner-notched projectile points were identified and at ElNe-7, located on the north side of Jansen Lake, three additional projectile points were recorded. This site is located about 5 km north of the ElNd-9 and ElNe-1. In addition, a single Swan River Chert large corner-notched projectile point was recovered while surveying ElNd-15.

Although the locations of these points coincide with the general pattern of site locations noted for the Paleo-Indian complexes, they are different sites than the Paleo-Indian sites. For example, the large Haskey site area that produced many Agate Basin, Cody complex, and Terminal Paleo-Indian specimens only had one large corner-notched point. However, a couple of kilometers upstream is site EkMw-6; it had a large number of the large corner-notched points recorded from it. The Corley's Ridge/Kells area had only one large corner-notched point, but it had a significant number of Paleo-Indian projectile points, particularly Terminal Paleo-Indian, recorded from it. On the west side of the Quill Lakes, the large corner-notched assemblages are from sites with little or no Paleo-Indian material although there are many small sites with Paleo-Indian materials nearby. The exceptions are ElNd-9 and ElNd-15. These sites have both Cody complex and large corner-notched components identified at them.

The lithic materials used to manufacture these large corner-notched points were overwhelmingly Knife River Flint (Figure 4.9). Points fashioned from Knife River Flint accounted for 35 (81.4%) of the points. Swan River Chert was second with 7 points (16.3%) made from this material, while a single chert point accounted for 2.3% of the material used. The Knife River Flint projectile points from the New site (EkMw-6) are heavily patinated. The single Knife River Flint point from ElMw-8 is patinated on one side. The rest of the points were not patinated.

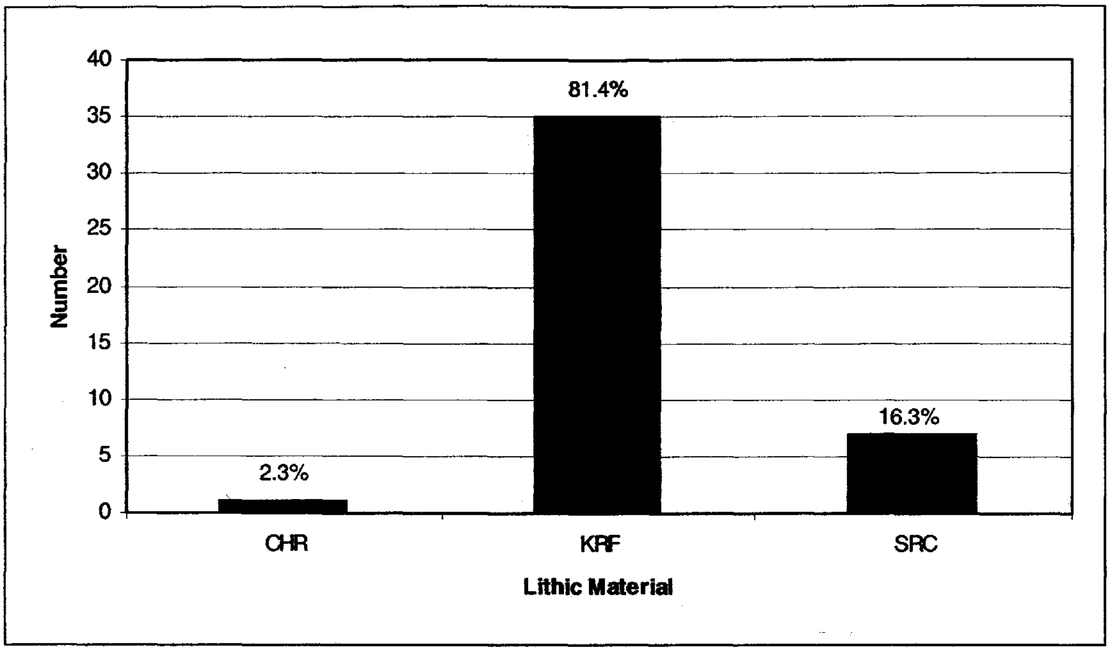


Figure 4.9. Lithic material used to manufacture large corner-notched projectile points.

4.2.2 Mummy Cave Series

One hundred and fifty-six projectile points diagnostic of the Mummy Cave series were found at 16 collection localities (Figures 4.10 and 4.11; Table 4.1). This is a conservative estimate given the difficulties in identifying Early Side-Notched projectile points out of context. Projectile points that did not clearly show diagnostic features of Mummy Cave series points were not included. Examples of Mummy Cave series points from the Stachyruk collection are shown in Figures 4.12 – 4.20.

Early Side-Notched points were collected from a variety of different topographic settings. The largest collection of points was from the Corley's Ridge/Kells area. From this area, 62 points were identified as Early Side-Notched. This particular area is rich archaeologically and has attracted many collectors.

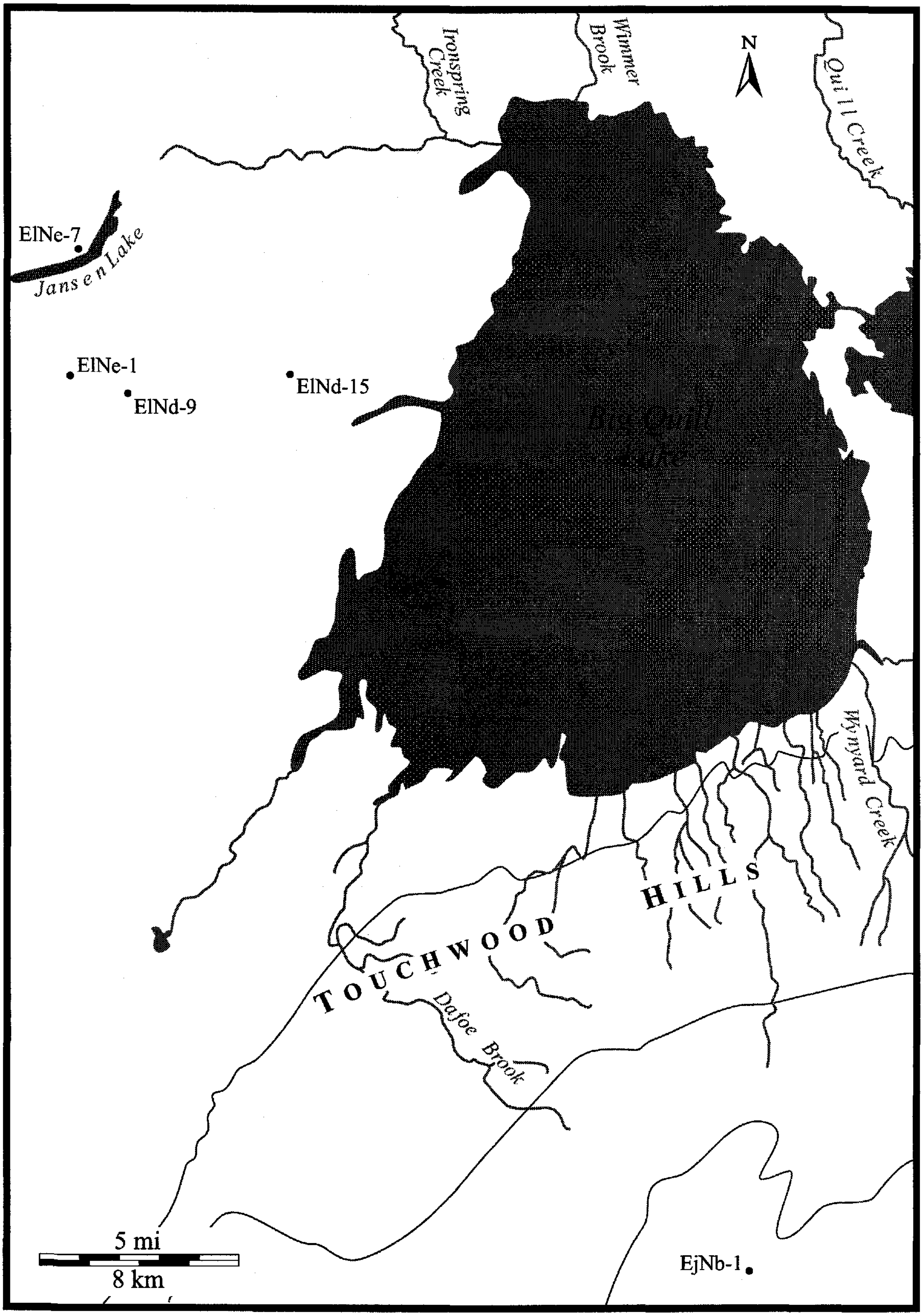


Figure 4.10. Distribution of Mummy Cave series components from the Quill Lakes region (west half).

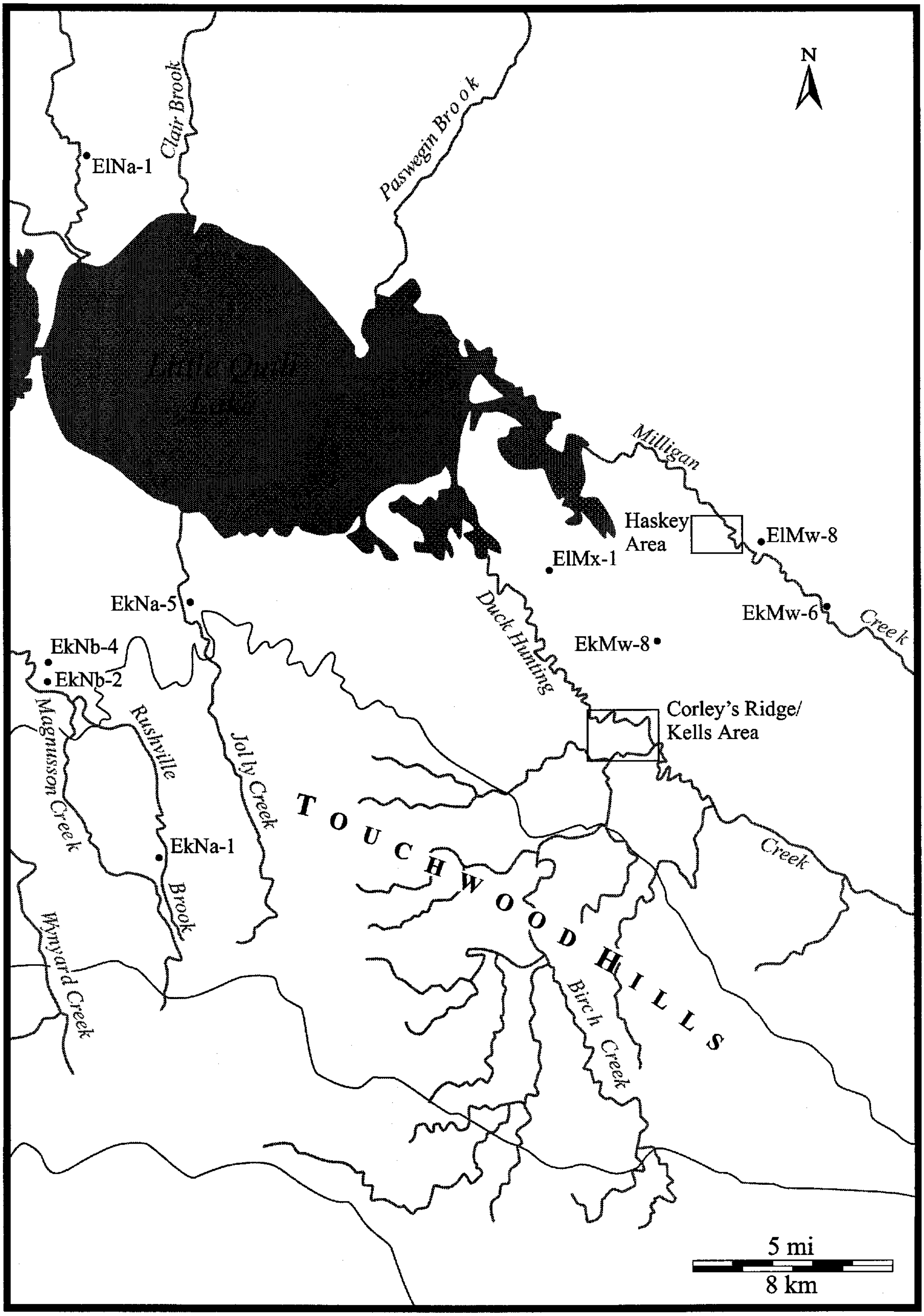


Figure 4.11. Distribution of Mummy Cave series components in the Quill Lakes region (east half).

Table 4.1. Sites bearing Mummy Cave series projectile points in the Quill Lakes region.

Site	Collector	# Of Diagnostic Points	Site Total
EkMw-6	Stachyruk	24	24
ElMw-8	Stachyruk	9	
	Kerluke	2	
	Novecosky	2	13
EkMw-8	Stachyruk	2	2
Haskey Area	Stachyruk	8	
	Novecosky	2	10
EkNa-1	Stachyruk	2	2
EjNb-1	Stachyruk	1	
	Novecosky	1	2
ElNa-1	Stachyruk	1	1
Corley's Ridge/Kells	Stachyruk	36	
	Malinowski	22	
	Yurach	4	62
ElMx-1	Kerluke	2	2
EkNa-5	Yurach	1	1
EkNb-2	Yurach	6	6
EkNb-4	Yurach	5	5
North Wynyard Area	Yurach	5	5
ElNd-9	Hamilton	9	9
ElNe-7	Hamilton	6	6
ElNd-15	Hamilton	1	1
ElNe-1	Hamilton	3	3
TOTAL			**156**

Large Mummy Cave components were identified from a series of sites along Milligan Creek. In particular, the New site (EkMw-6) had 24 diagnostic Early Side-Notched projectile points identified for it. A couple of kilometers downstream are the Bill Kereluke (ElMw-8) and the Haskey area sites. These had 13 and 10 Early Side-Notched points each.

Further to the west, an area north of Wynyard had a relatively large number of Early Side-Notched projectile points. Two closely situated collecting areas, EkNb-2 and EkNb-4, had 6 and 5 such projectile points respectively. In addition, in Mr. Yurach's collection, five more points were recorded for this general area, but could not be

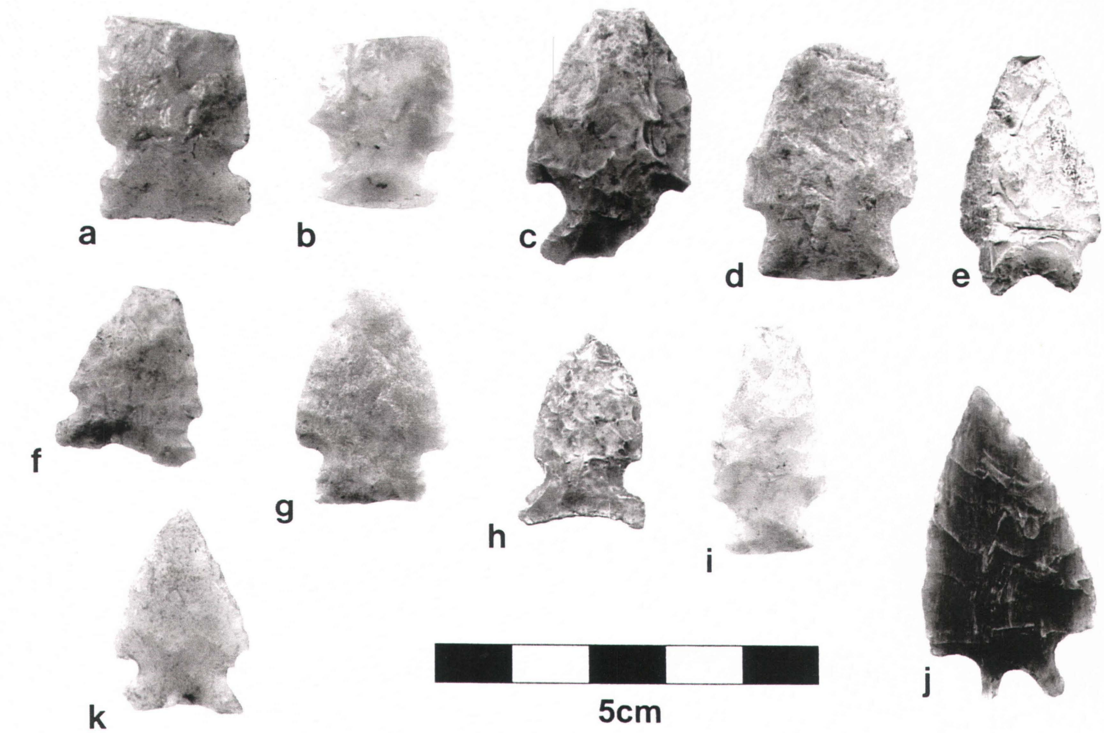


Figure 4.12. Mummy Cave series projectile points from EkMw-6.

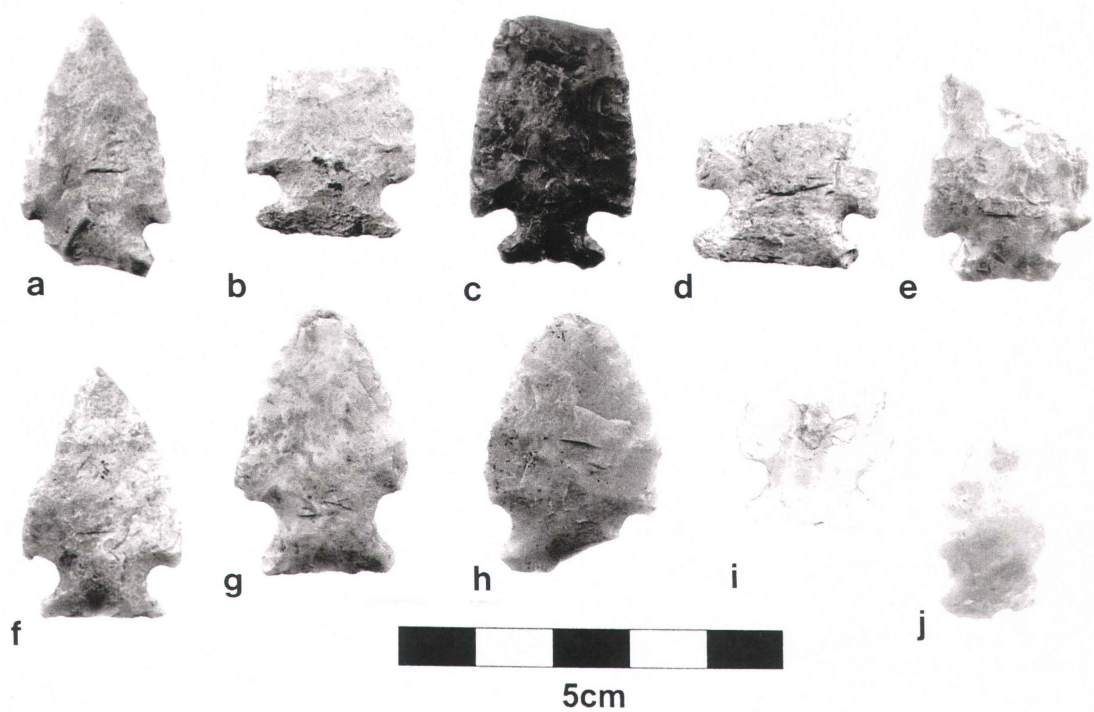


Figure 4.13. Mummy Cave series projectile points from EkMw-6.

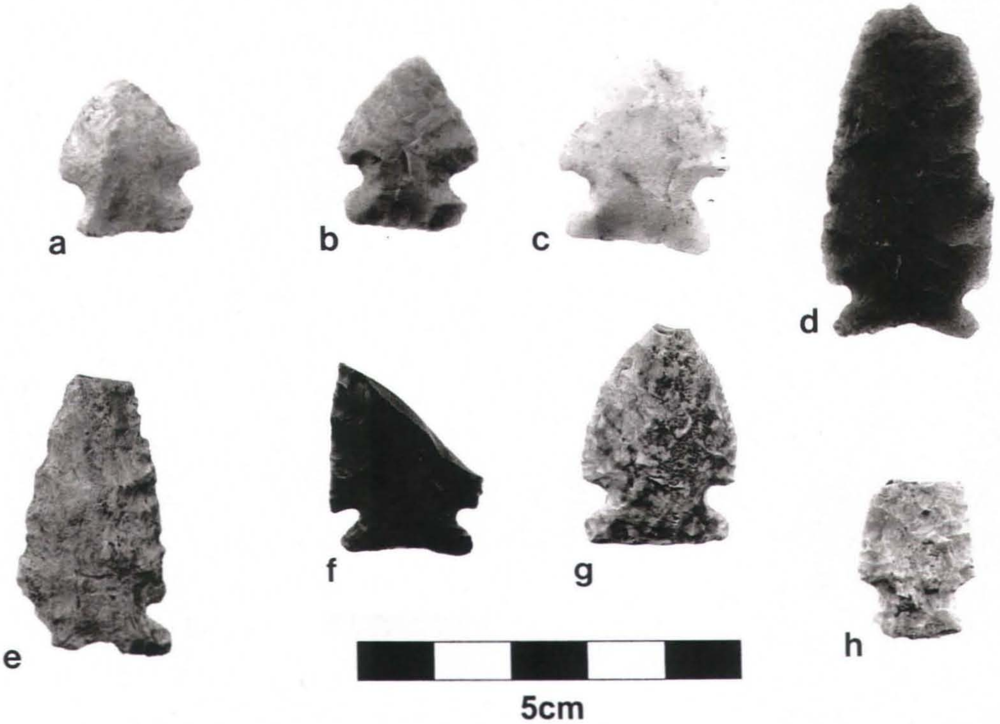


Figure 4.14. Mummy Cave series projectile points from the Haskey area.

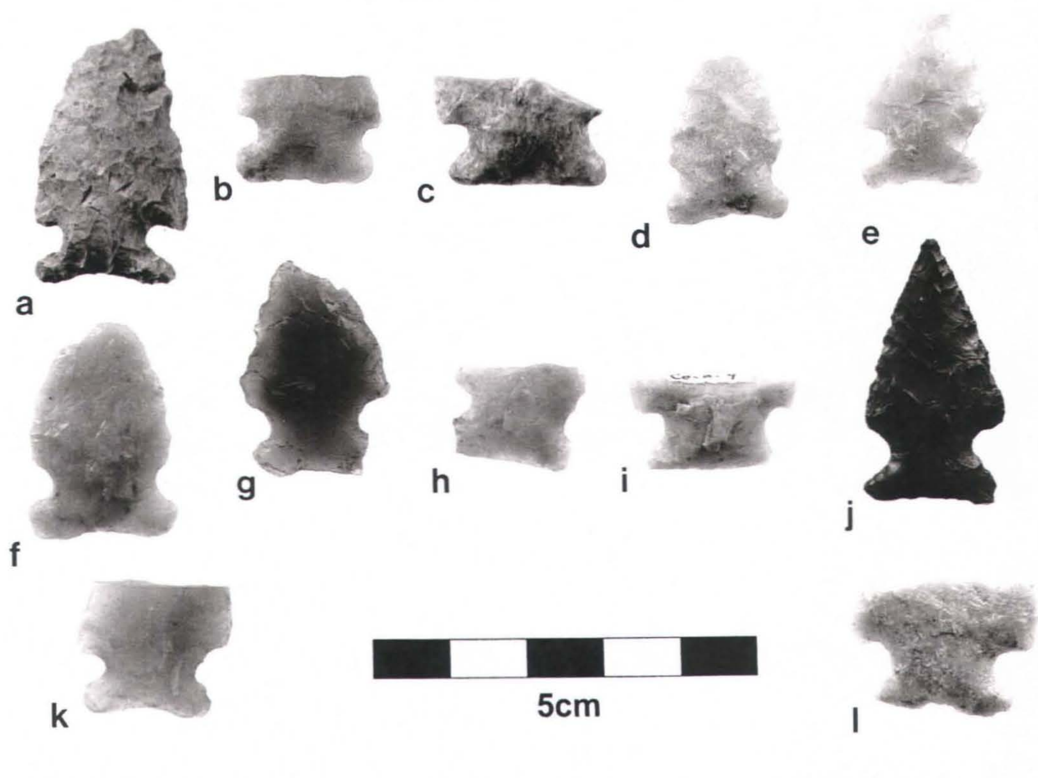


Figure 4.15. Mummy Cave series projectile points from the Corley's Ridge/Kells area.

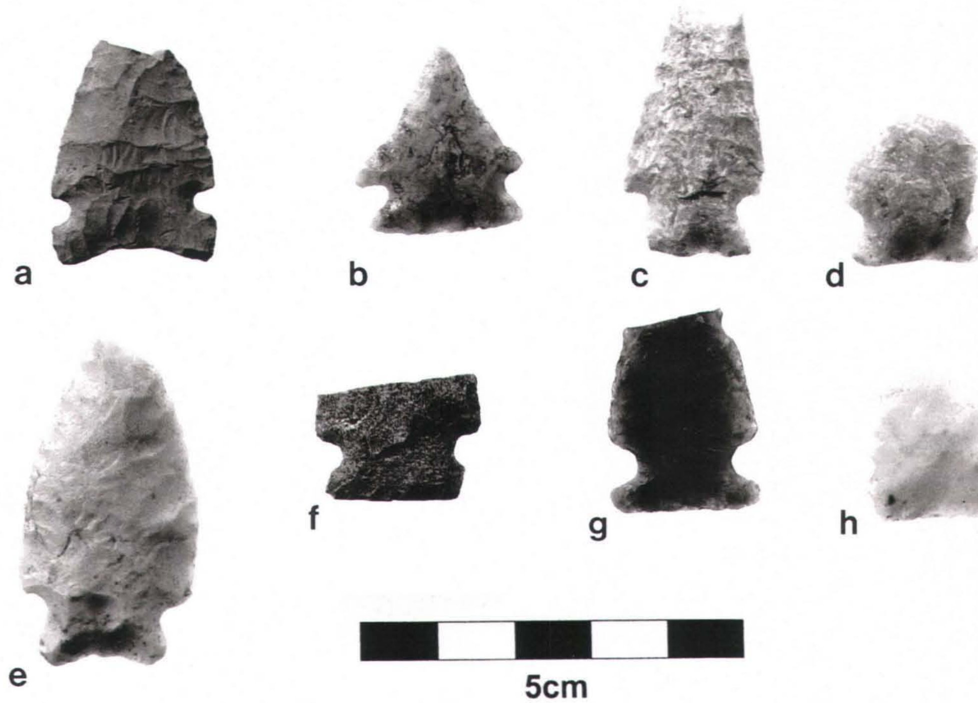


Figure 4.16. Mummy Cave series projectile points from the Corley's Ridge/Kells area.

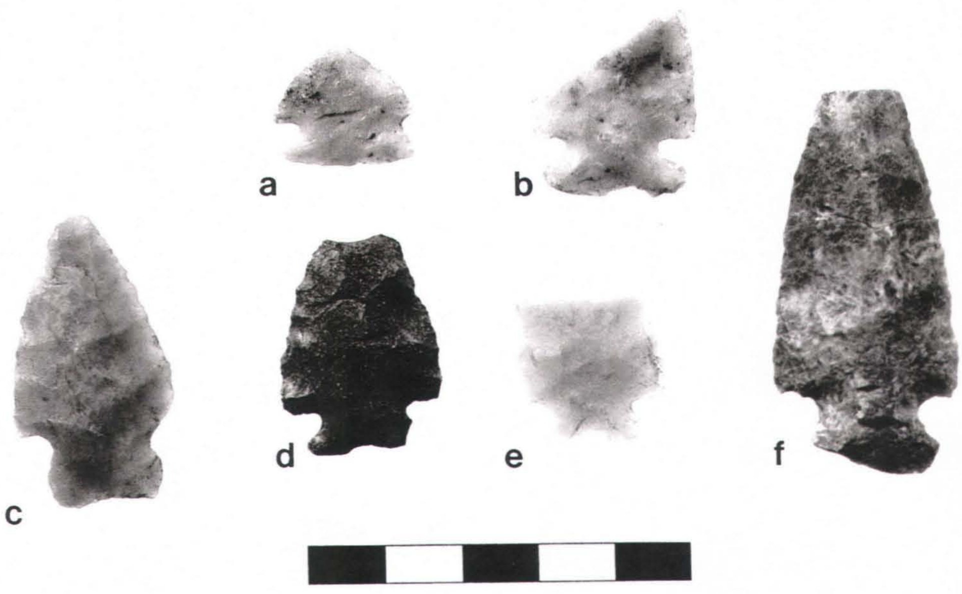


Figure 4.17. Mummy Cave series projectile points from the Corley's Ridge/Kells area.

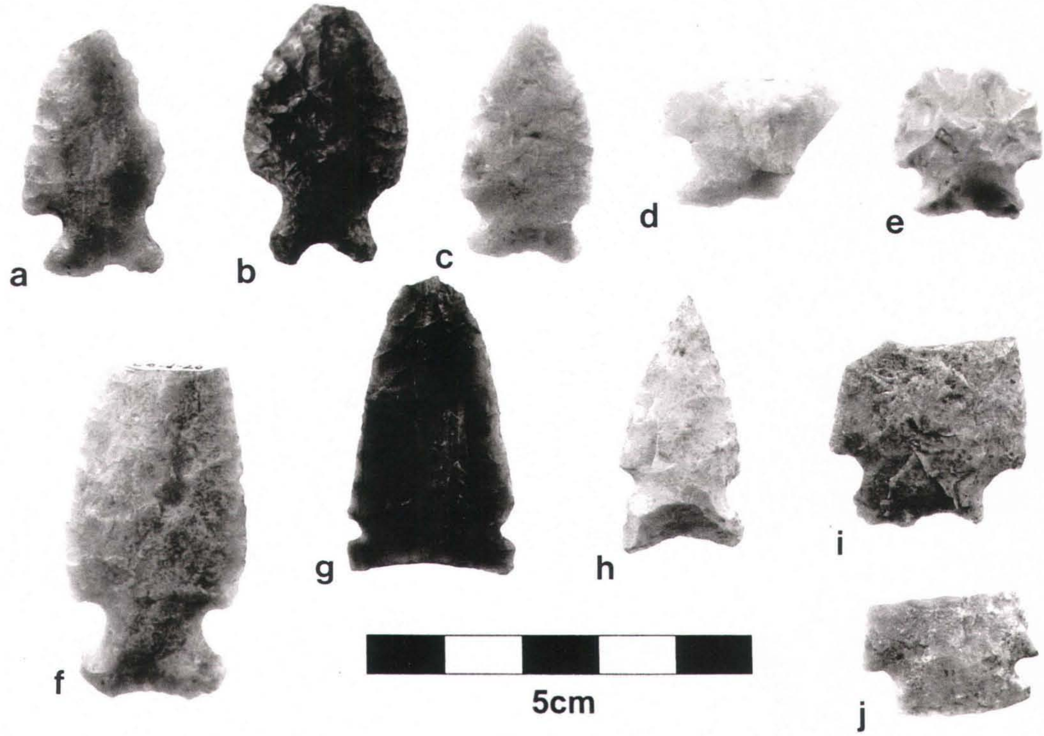


Figure 4.18. Mummy Cave series projectile points from the Corley's Ridge/Kells area.

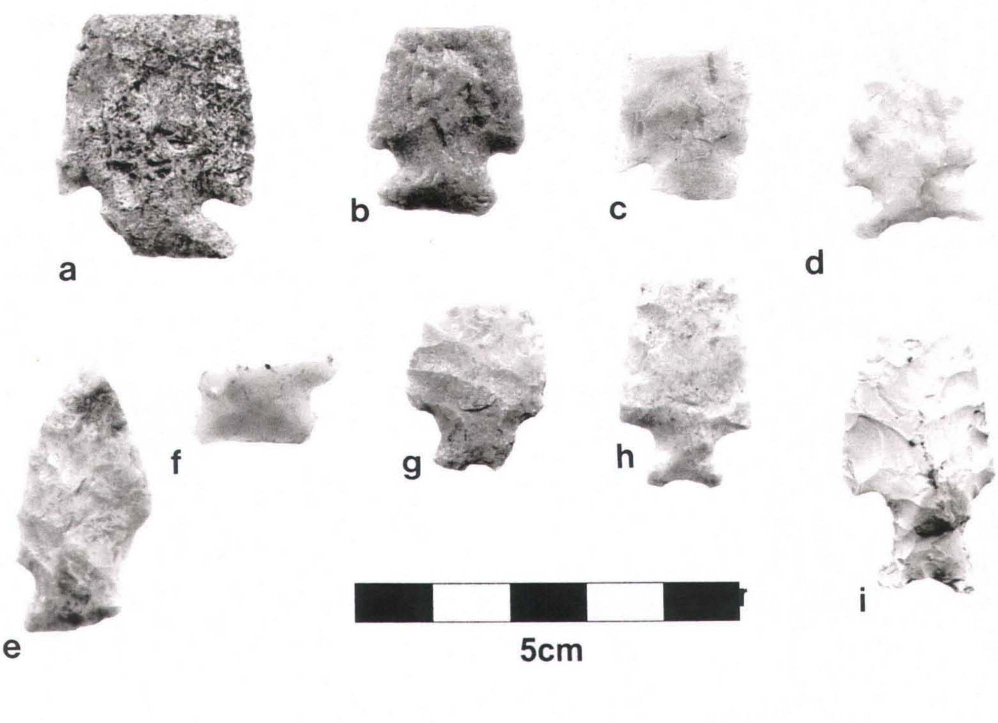


Figure 4.19. Mummy Cave series projectile points from ElMw-8.

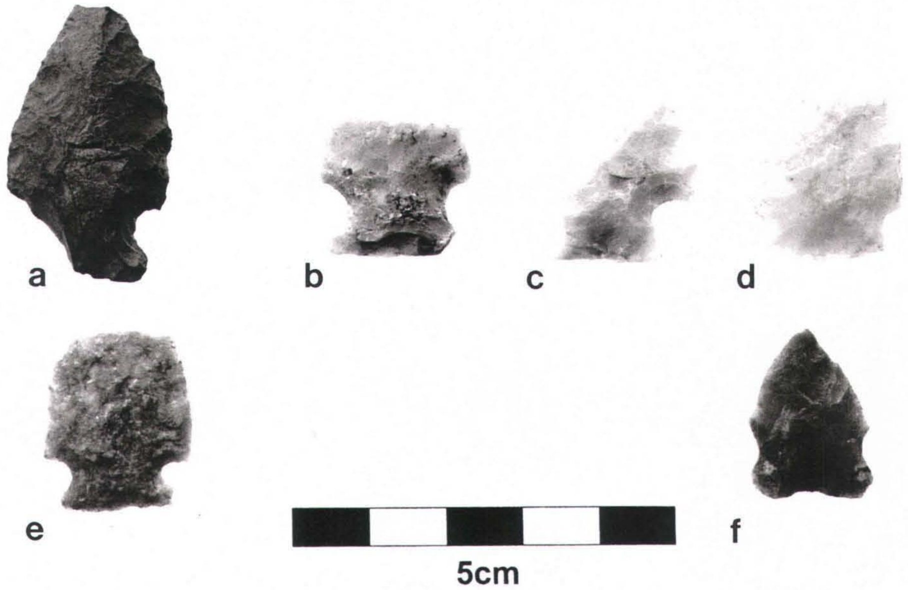


Figure 4.20. Projectile points from the Mummy Cave series; EkMw-8:a, b; EkNa-1:c, d; EjNb-1:e; ElNa-1:f.

associated with an exact location. These sites are associated with Magnusson Creek and are connected with a prominent Glacial Quill Lake strandline.

Further yet to the west was the last large concentration of Mummy Cave series sites in the study region. Here, in the hummocky moraine just west of the flat glacial lake plain, are three closely situated sites. One site (ElNe-7) is near Jansen Lake while the other two (ElNd-9 and ElNe-1) are located in the hills. ElNd-9 has 9 Early Side-Notched points, the largest collection in this area. ElNe-1 had three recorded for it while ElNe-7 had 6 points.

The remaining sites with Early Side-Notched points are distributed throughout the study area. Each of these has two or fewer diagnostic Early Side-Notched points.

The importance of these locations is difficult to ascertain. Most, but not all, are located along a watercourse. One site is located on Blue Hill, the highest 'peak' in the study region. The other locations are in cultivated fields with few topographic features.

The lithic materials used to fashion Early Side-Notched points was identified for the 83 Early Side-Notched points from Mr. Stachyruk's collection (Figure 4.21). It came from a variety of sources. The dominant material was Swan River Chert. Out of 83 points, 41 (49.4%) were made from this material. Next was chert at 25 points (30.1%). These materials were the dominant local sources. Knife River Flint was the dominant exotic material. Eight (9.6%) projectile points were made from this material. In sum, 82% of the lithic materials were from locally available sources while 18% were from non-local sources. The non-local sources are all south of the study area (as far away as North Dakota and Montana).

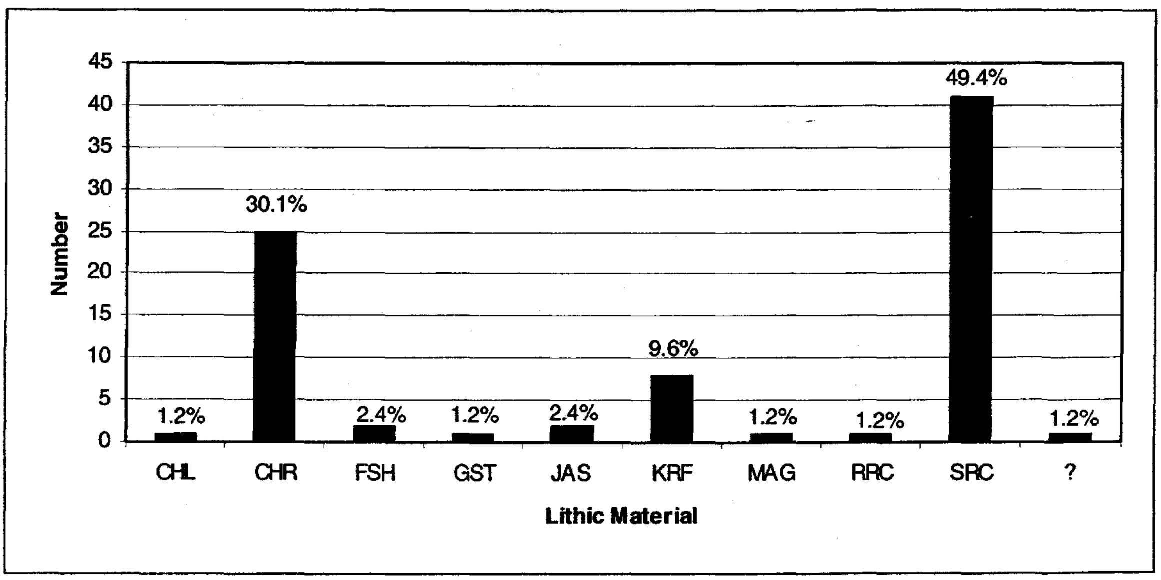


Figure 4.21. Lithic material used to manufacture Mummy Cave series projectile points.

4.2.3 Oxbow Complex

Projectile points diagnostic of the Oxbow complex were identified at 17 collection locales (Figures 4.22 and 4.23). From these sites, 152 points were identified as Oxbow (Table 4.2). Oxbow projectile points from the Stachyruk collection are shown in Figures 4.24–4.28. For the most part, the distribution of sites appears to be widespread with sites located in a variety of topographic settings. Proximity to water was an important factor. Nine of the 17 sites (53%) were located along major creeks. In addition, at least five (29%) were located in areas with numerous sloughs that could contain water.

The site with the most projectile points was the Corley's Ridge/Kells area. It produced 105 Oxbow points, 69% of the total number of Oxbow points from the collections studied. One explanation for these numbers could be the vast amounts of time spent collecting at this area by many of the collectors. Since other areas that have been subject to intensive collecting for many years have not produced nearly as many Oxbow projectile points it is obvious this site was an important area for the makers of this point type.

The lithic materials used to manufacture Oxbow projectile points indicated a strong, almost exclusive, use of local materials (Figure 4.29). Of the 61 Oxbow points examined in Mr. Stachyruk's collection, 39 (63.9%) were made from Swan River Chert. An additional 14 (23.0%) points were made from chert. Small amounts of Knife River Flint, petrified peat, jasper, and chalcedony were also used. About 90% of the lithic materials are available locally.

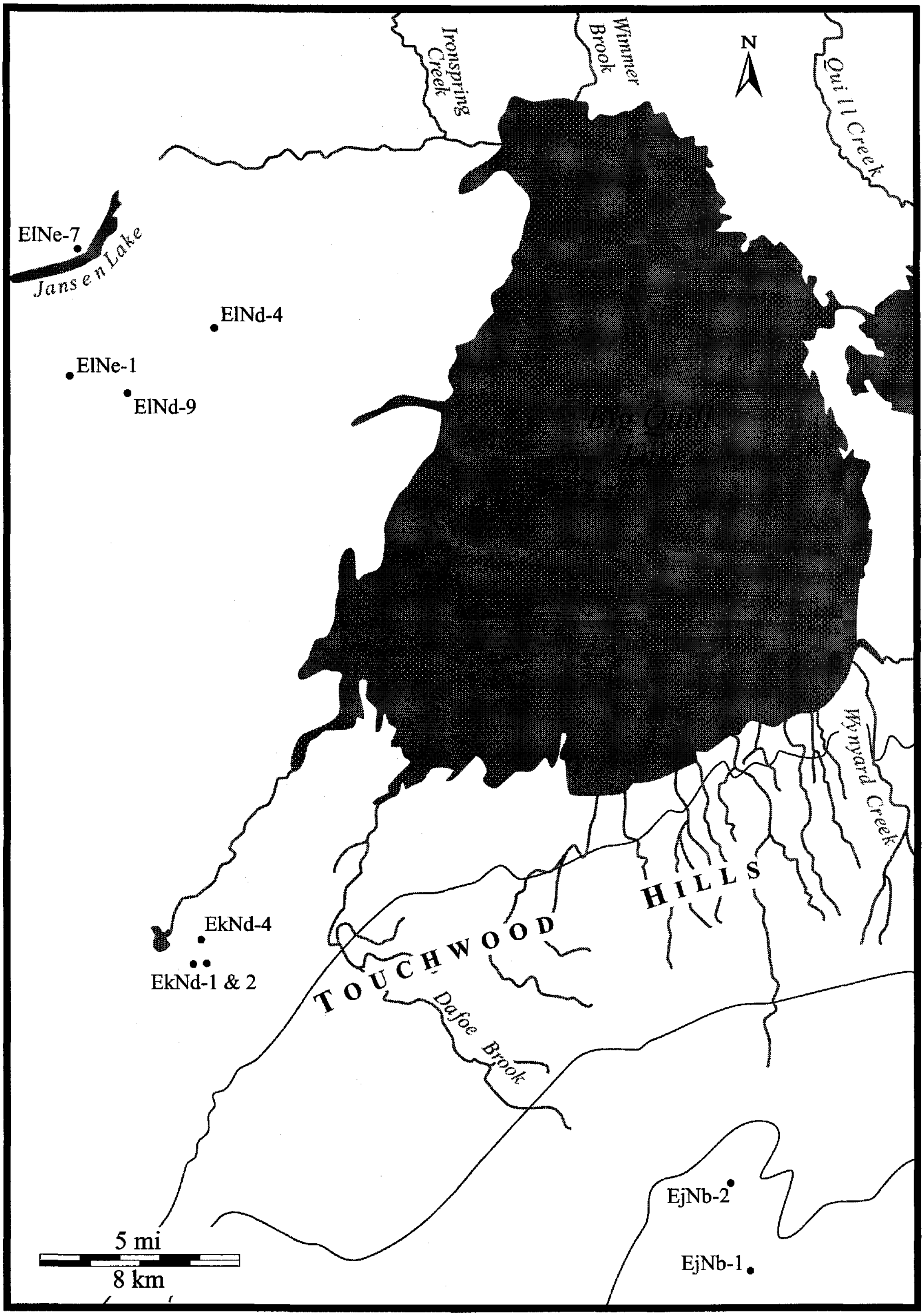


Figure 4.22. Distribution of Oxbow sites in the Quill Lakes region (west half).

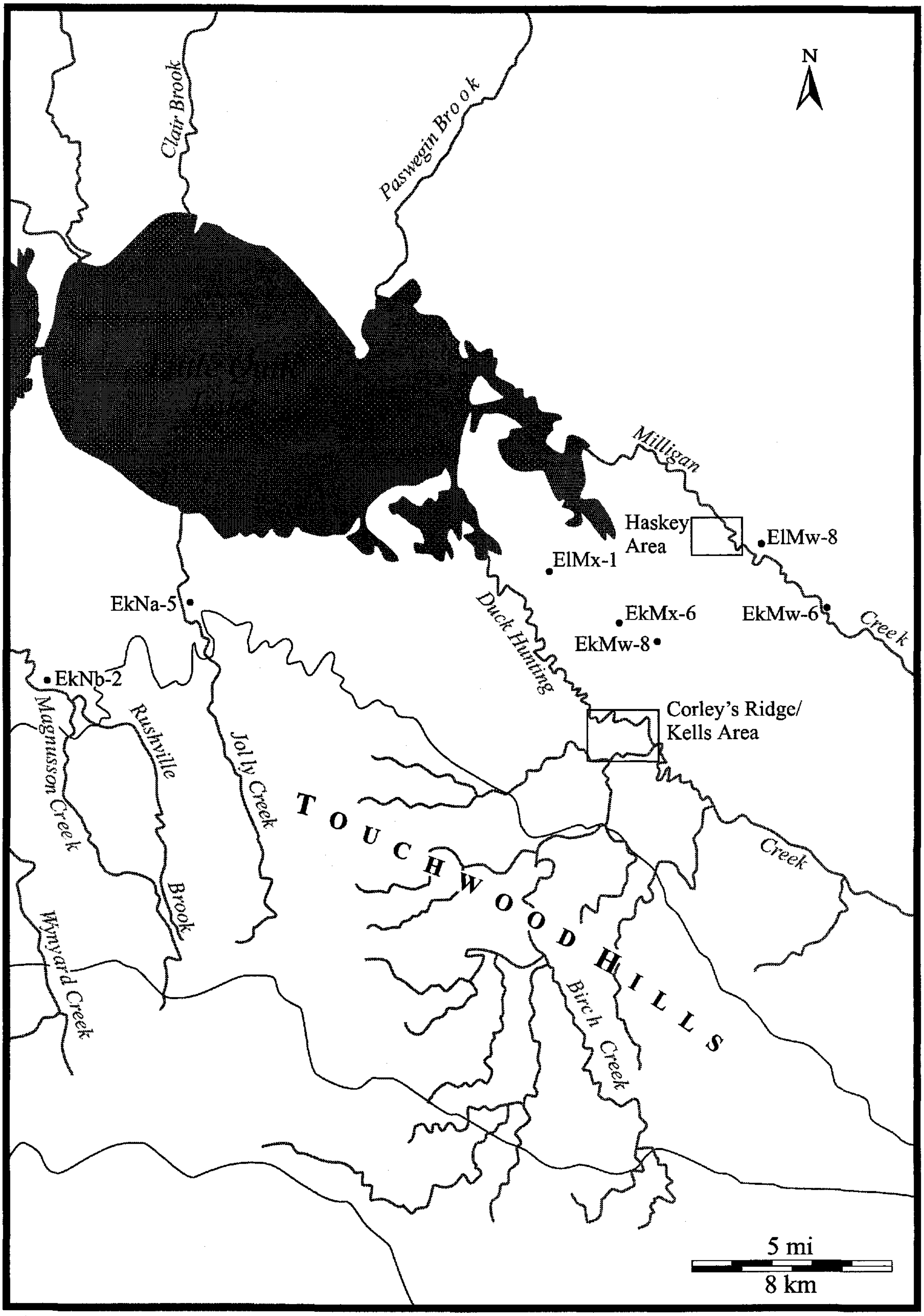


Figure 4.23. Distribution of Oxbow sites in the Quill Lakes region (east half).

Table 4.2. Site bearing Oxbow projectile points in the Quill Lakes region.

Site	Collector	# Of Diagnostic Points	Site Total
Haskey Area	Stachyruk	5	
	Novecosky	1	6
EkMx-6	Stachyruk	1	1
EkMw-8	Stachyruk	2	2
EkMw-6	Stachyruk	1	1
ElMw-8	Stachyruk	5	5
EjNb-1	Stachyruk	1	1
EjNb-2	Novecosky	1	1
Corley's Ridge & Kells Area	Stachyruk	46	
	Malinowski	50	
	Kerluke	1	
	Yurach	8	105
EkNb-2	Yurach	7	7
North of Wynyard	Yurach	2	2
EkNa-5	Yurach	4	4
ElMx-1	Kerluke	2	2
EkNd-4	J. Hamilton	1	1
ElNd-4	J. Hamilton	4	4
EkNd-1 & 2	Wildeman	5	5
ElNd-9	B&L Hamilton	2	2
ElNe-1	B&L Hamilton	1	1
ElNe-7	B&L Hamilton	2	2
TOTAL			**152**

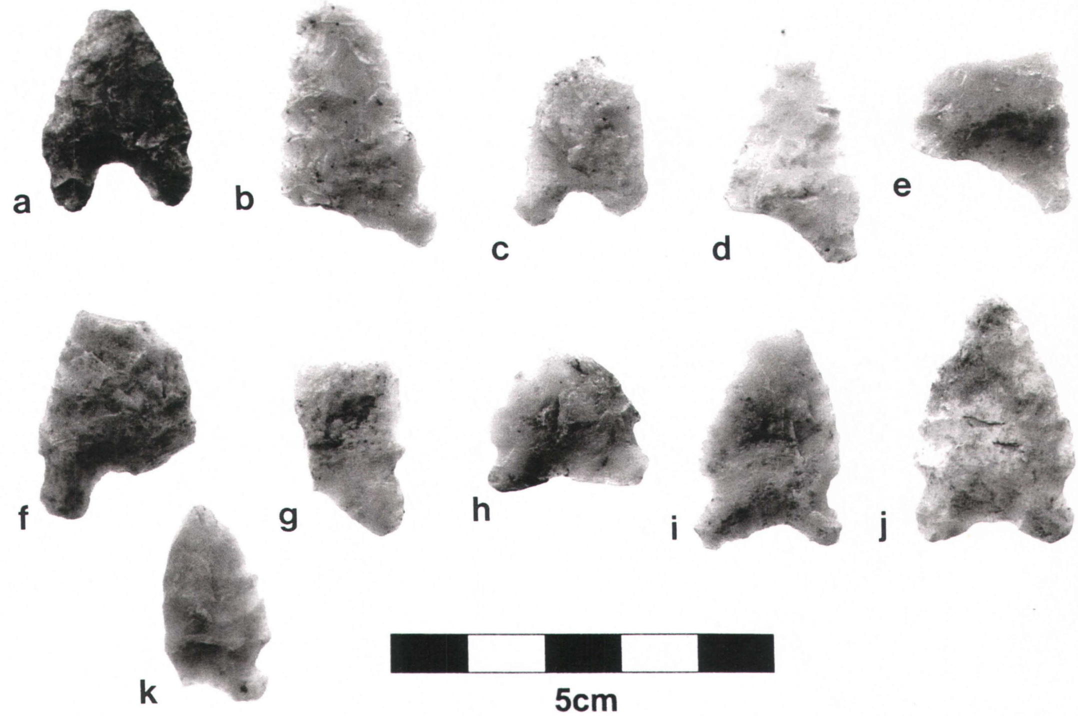


Figure 4.24. Oxbow projectile points from the Corley's Ridge/Kells area.

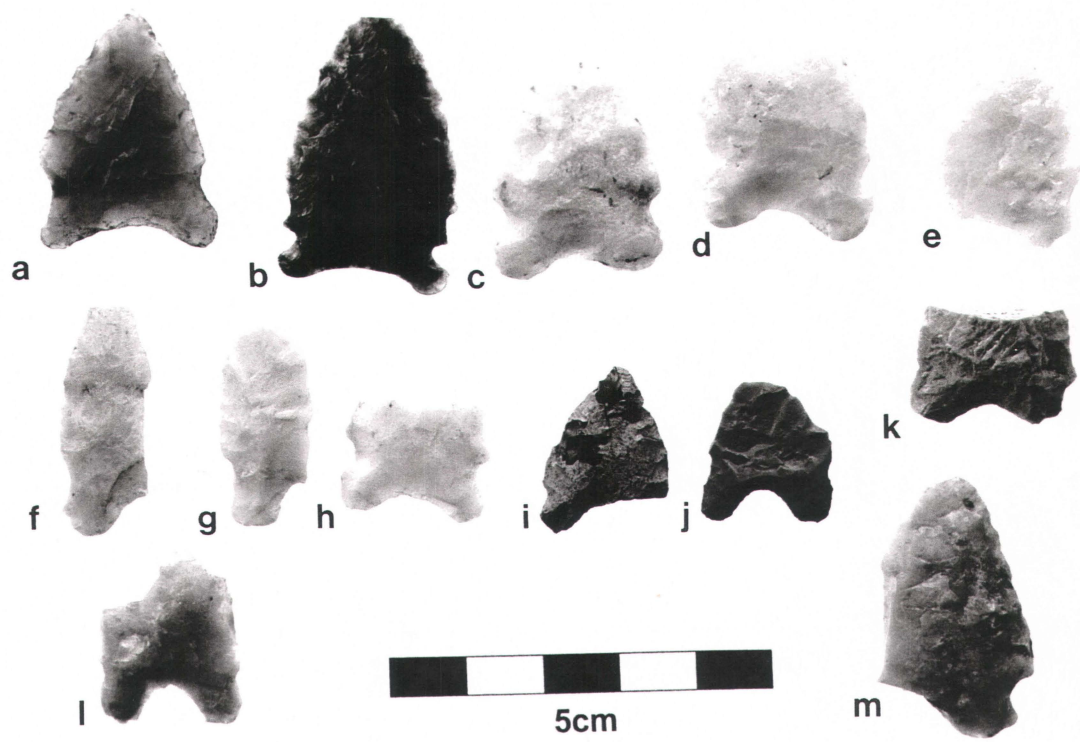


Figure 4.25. Oxbow projectile points from the Corley's Ridge/Kells area.

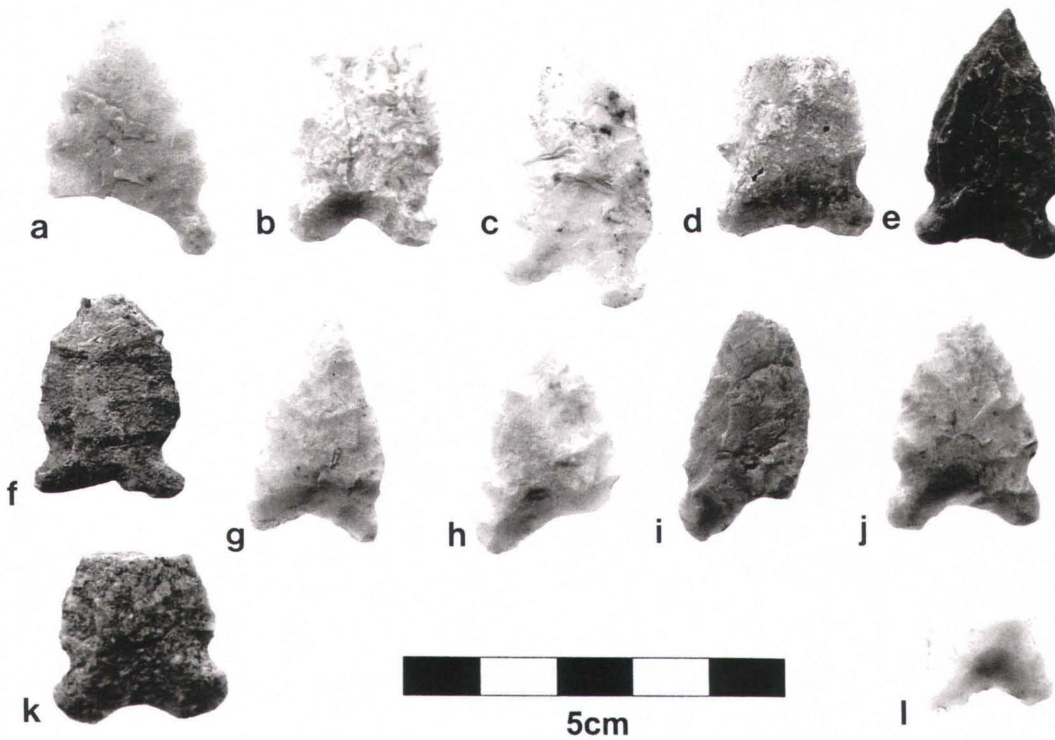


Figure 4.26. Oxbow projectile points from the Corley's Ridge/Kells area.

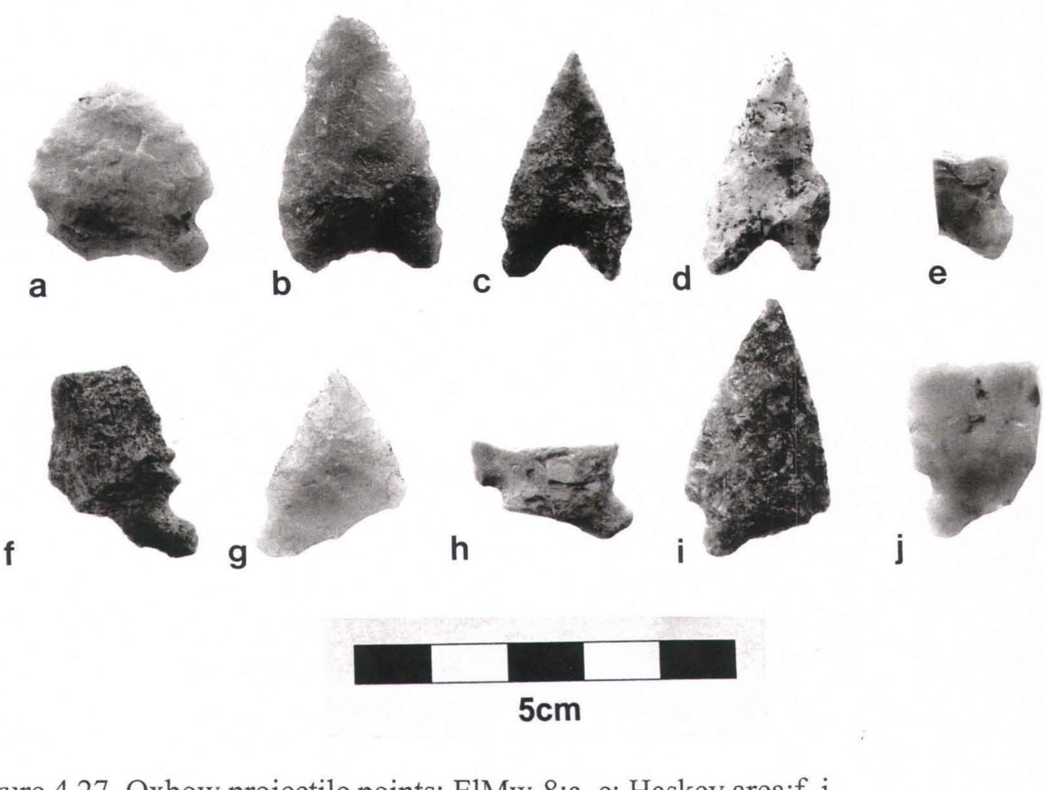


Figure 4.27. Oxbow projectile points; ElMw-8:a–e; Haskey area:f–j.

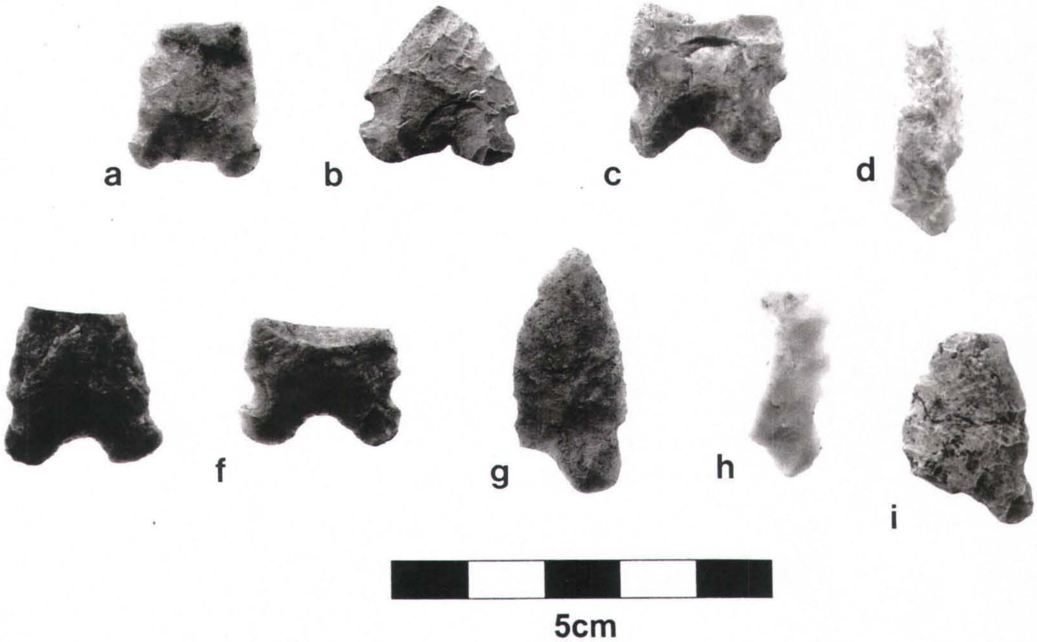


Figure 4.28. Oxbow projectile points; Corley's Ridge/Kells area:a–d; the New site (EkMw-6):e; EkMw-8:f, g; EjNb-1:h; EkMx-6:i.

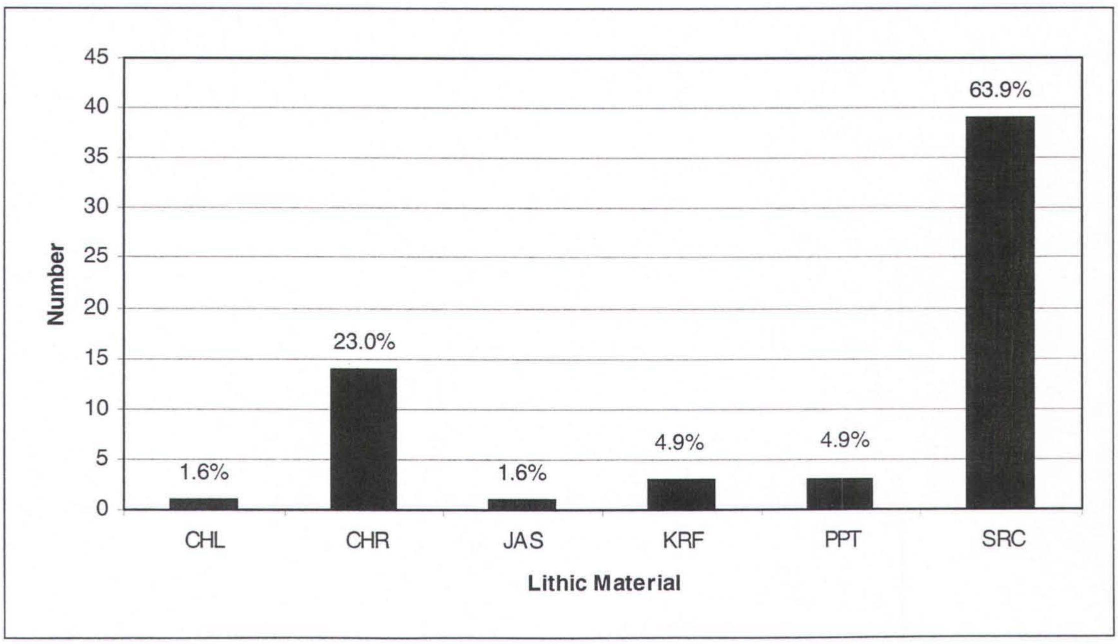


Figure 4.29. Lithic material used to manufacture Oxbow projectile points.

4.2.4 McKean Complex

A total of 282 McKean complex projectile points were identified from 19 collecting areas (Figures 4.30 and 4.31). Duncan/Hanna points accounted for 225 (80%) and McKean Lanceolate points numbered 57 (20%). For a breakdown by site, see Tables 4.3 and 4.4. Examples of McKean complex projectile points from the Stachyruk collection are shown in Figures 4.32 – 4.40.

The overall distribution of diagnostic McKean complex projectile points was widespread with sites occurring in nearly all of the major topographic zones. The largest collections came from a few large sites, the Corley's Ridge/Kells area being the largest. From this area, 109 Duncan/Hanna and 42 McKean Lanceolate points were recorded. These accounted for 53.5% of the total number of McKean complex projectile points in the study area. This one location also accounted for the majority of the McKean Lanceolate points (n=42, 73.7%).

The distribution of points with known provenience at the Corley's Ridge/Kells area (i.e. Stachyruk's collection) indicates a strong correlation between McKean Lanceolate and Duncan and Hanna points. Nearly all of the Duncan/Hanna points, in the Stachyruk collection, were found at Corley's Ridge (EkMx-2). The majority of the McKean Lanceolate points (n=12, 66.7%) were also found at Corley's Ridge (EkMx-2).

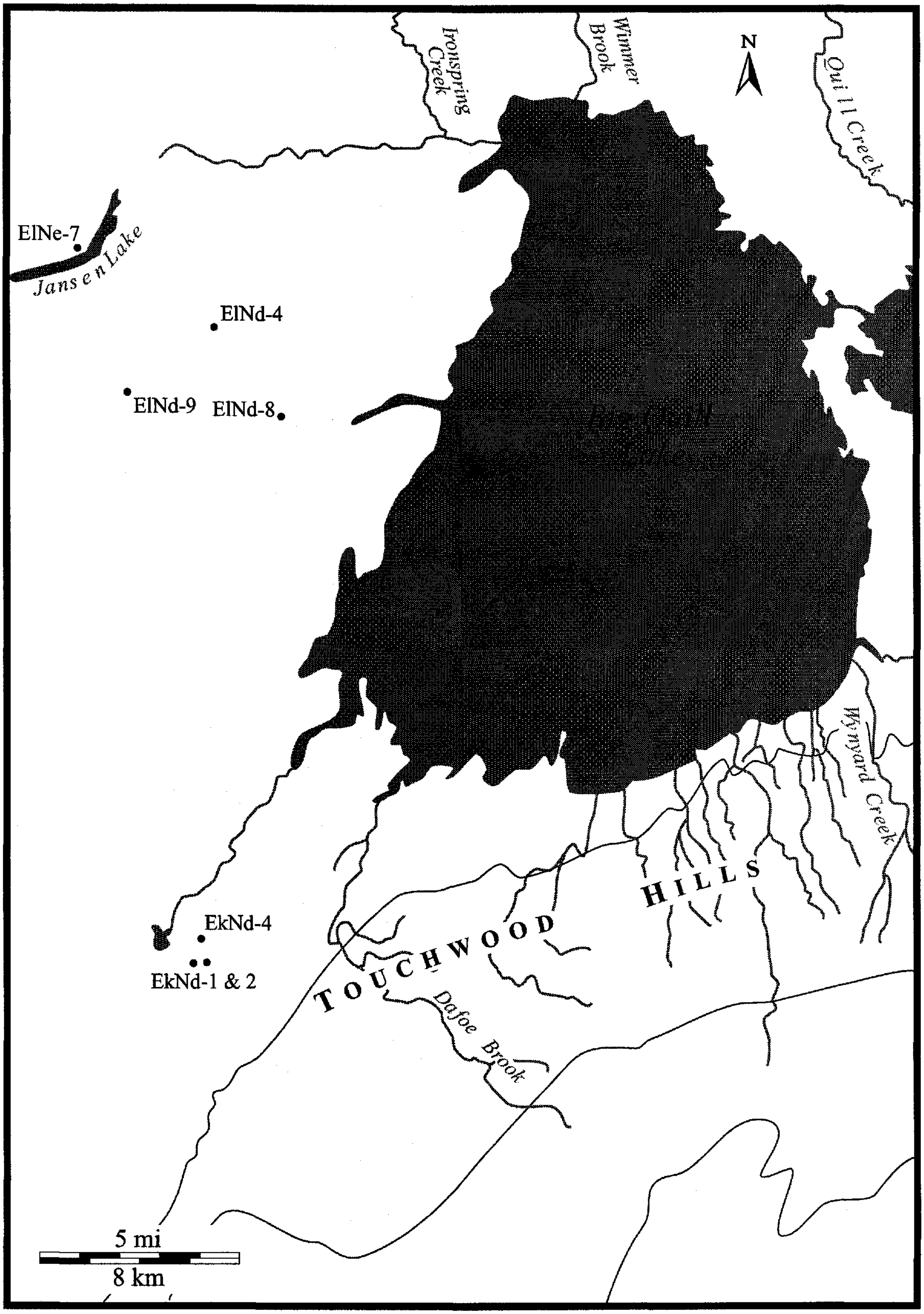


Figure 4.30. Distribution of McKean complex components in the Quill Lakes region (west half).

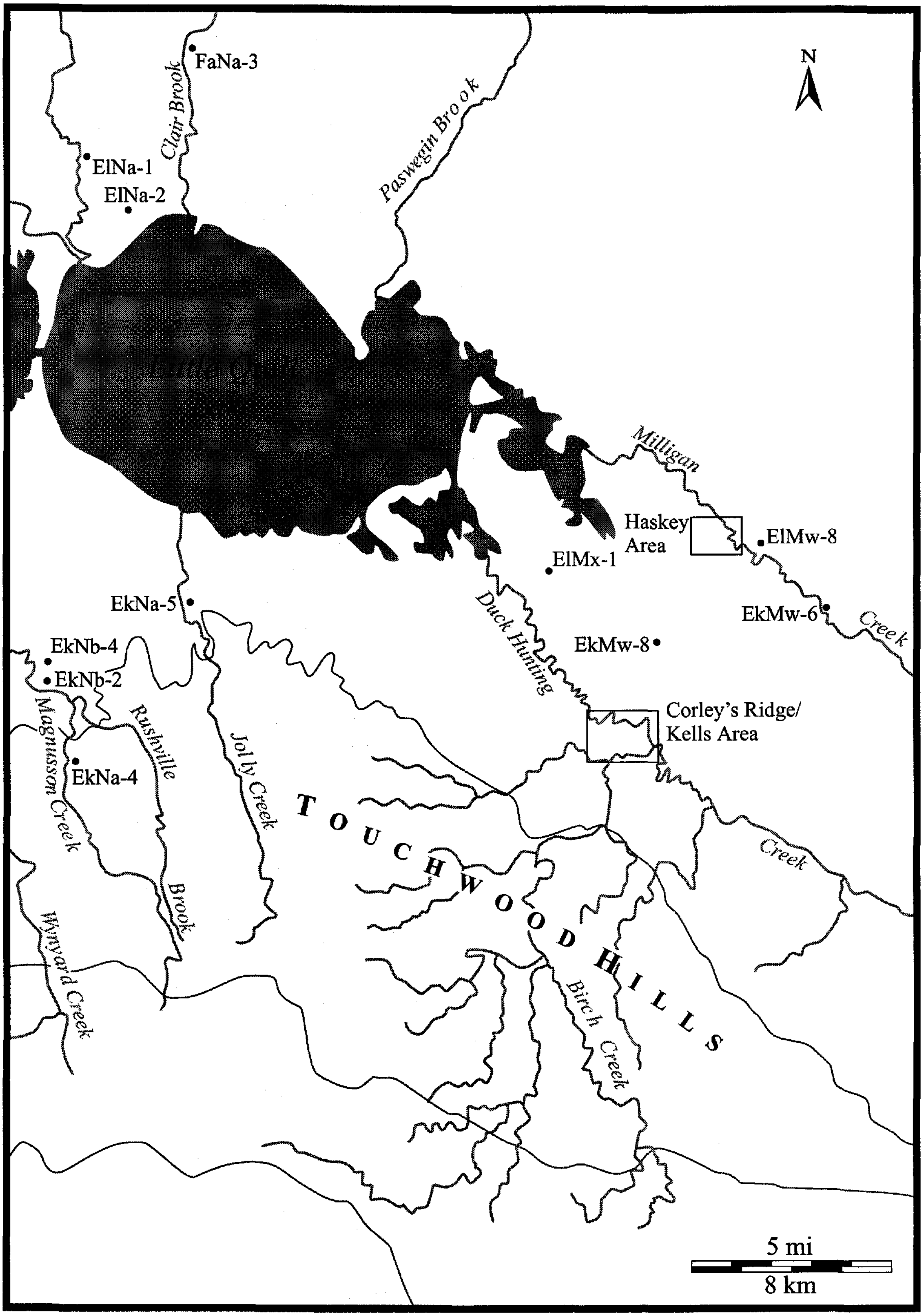


Figure 4.31. Distribution of McKean complex components in the Quill Lakes region (east half).

Table 4.3. Sites bearing Duncan/Hanna points in the Quill Lakes region.

Site	Collector	# Of Diagnostic Points	Site Total
EkMw-6	Stachyruk	11	11
Corley's Ridge & Kells Area	Stachyruk	37	
	Malinowski	58	
	Yurach	7	
	Kerluke	3	
	Knight	4	109
Haskey Area	Stachyruk	11	
	Kerluke	3	14
EkMw-8	Stachyruk	1	1
ElNa-1	Stachyruk	1	1
ElMw-8	Stachyruk	6	6
North of Wynyard	Yurach	24	24
EkNb-2	Yurach	21	21
EkNb-4	Yurach	3	3
EkNa-4	Yurach	2	2
EkNa-5	Yurach	5	
	Novecosky	1	6
ElMx-1	Kerluke	2	
	Novecosky	1	3
EkNd-4	J. Hamilton	2	2
ElNd-4	J. Hamilton	2	2
EkNd-1 & 2	Wildeman	5	5
ElNd-9	B&L Hamilton	8	8
ElNe-7	B&L Hamilton	3	3
ElNd-8	Novecosky	1	1
FaNa-3	Novecosky	1	1
ElNa-2	Novecosky	2	2
TOTAL			**225**

Table 4.4. Sites bearing McKean Lanceolate projectile points in the Quill Lakes region.

Site	Collector	# Of Diagnostic Points	Site Total
EkMw-6	Stachyruk	2	2
Corley's Ridge & Kells Area	Stachyruk	19	
	Malinowski	22	
	Kerluke	1	42
Haskey Area	Stachyruk	4	
	Kerluke	1	
	Novecosky	1	6
North of Wynyard	Yurach	3	3
EkNb-2	Yurach	2	2
ElNd-9	B&L Hamilton	2	2
TOTAL			**57**

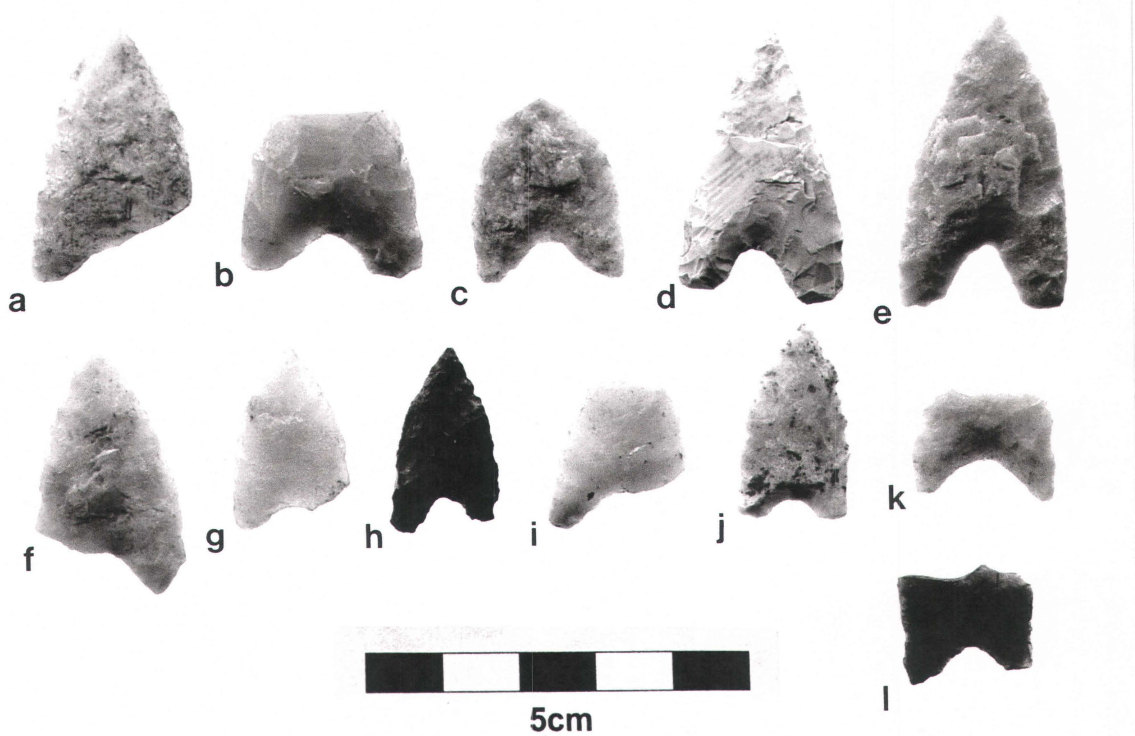


Figure 4.32. McKean Lanceolate projectile points from the Corley's Ridge/Kells area.

Figure 4.33. McKean Lanceolate projectile points; Corley's Ridge/Kells site:a–g; EkMw-6:h–i.

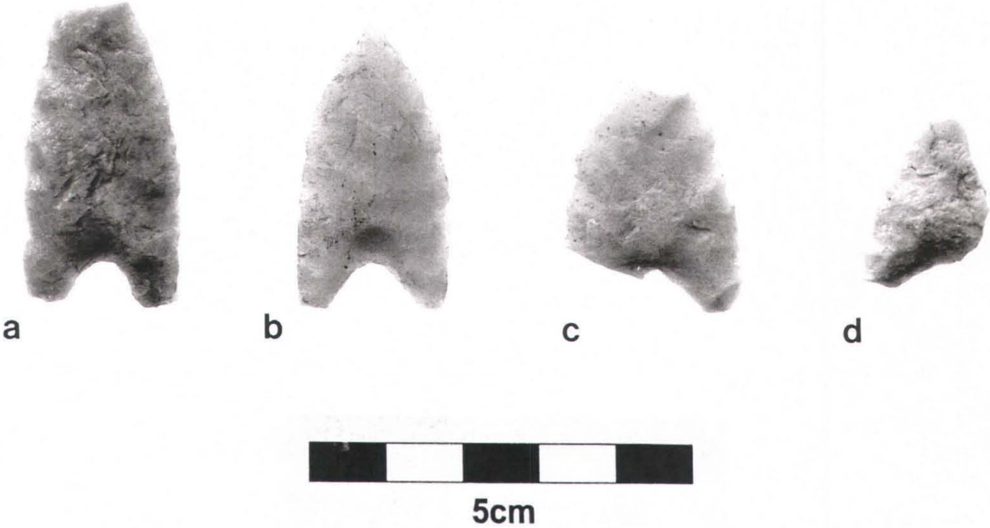


Figure 4.34. McKean Lanceolate projectile points from the Haskey area.

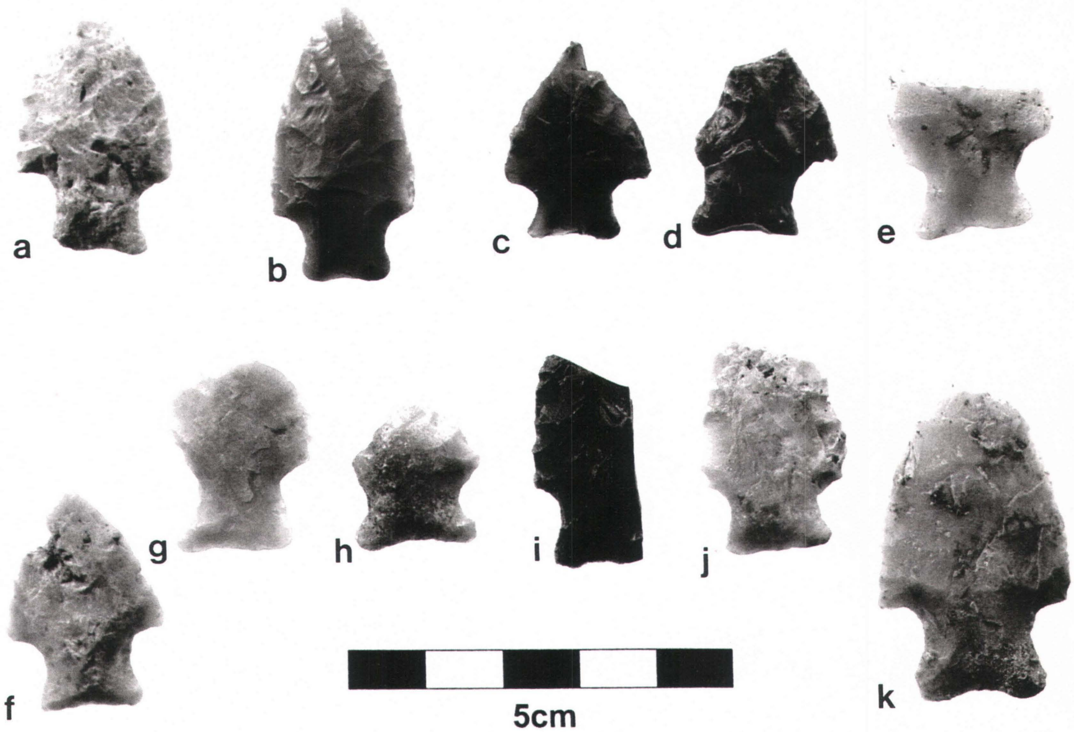


Figure 4.35. Duncan/Hanna projectile points from the Corley's Ridge/Kells area.

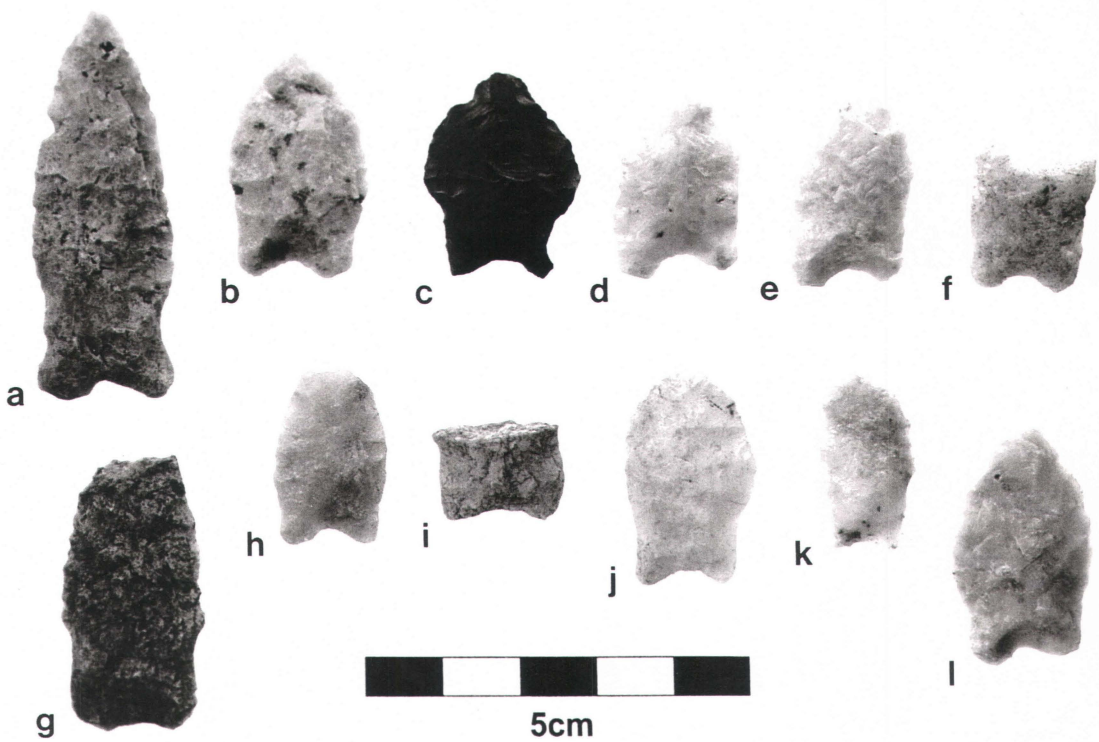


Figure 4.36. Duncan/Hanna projectile points from the Corley's Ridge/Kells area.

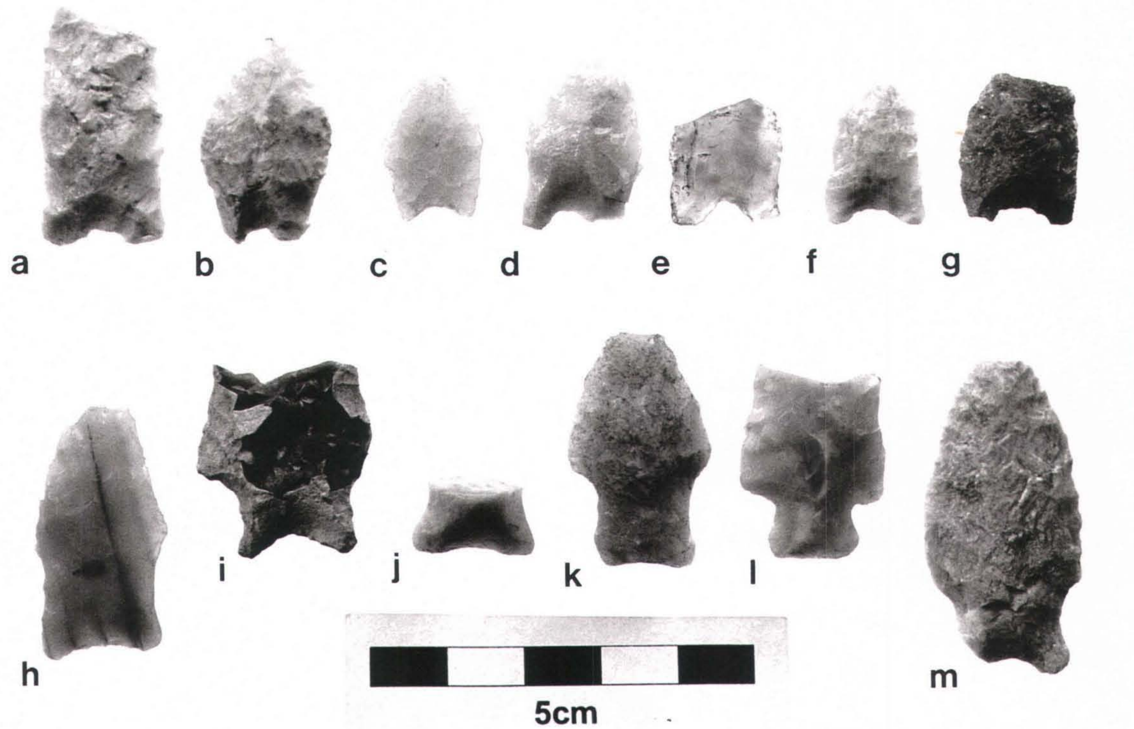


Figure 4.37. Duncan/Hanna projectile points; Corley's Ridge/Kells area:a–k; EkMw-8:l, m.

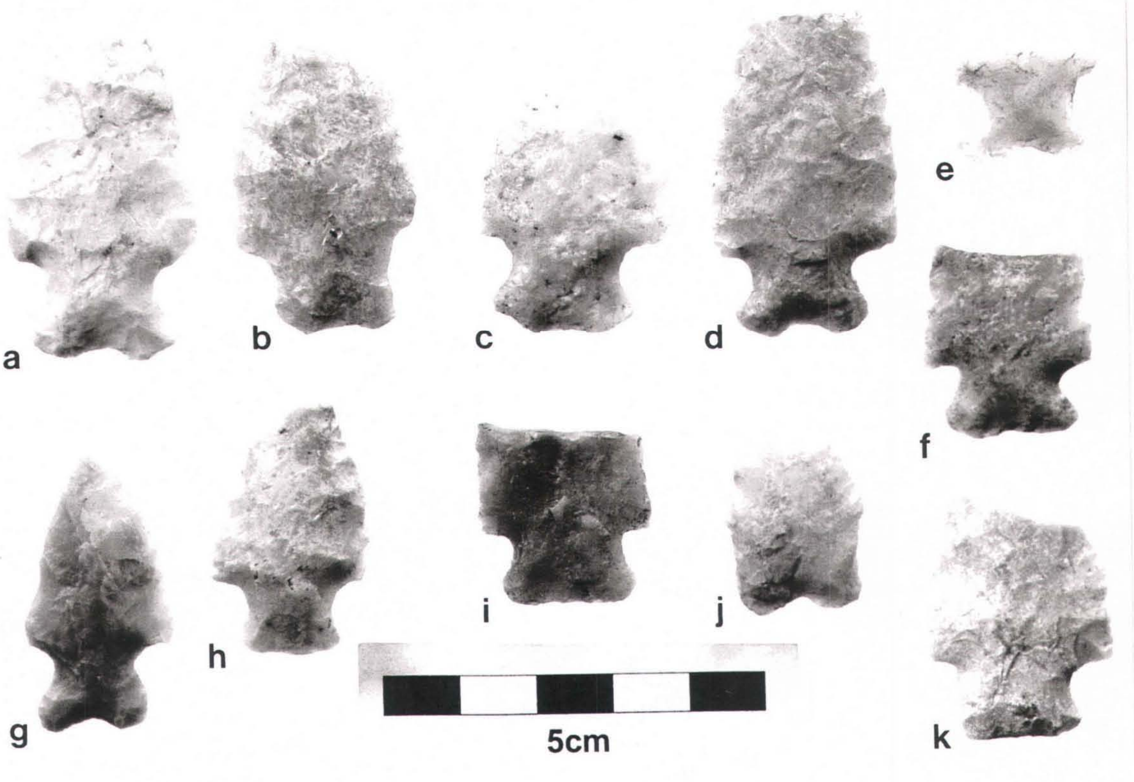


Figure 4.38. Duncan/Hanna projectile points from the New site (EkMw-6).

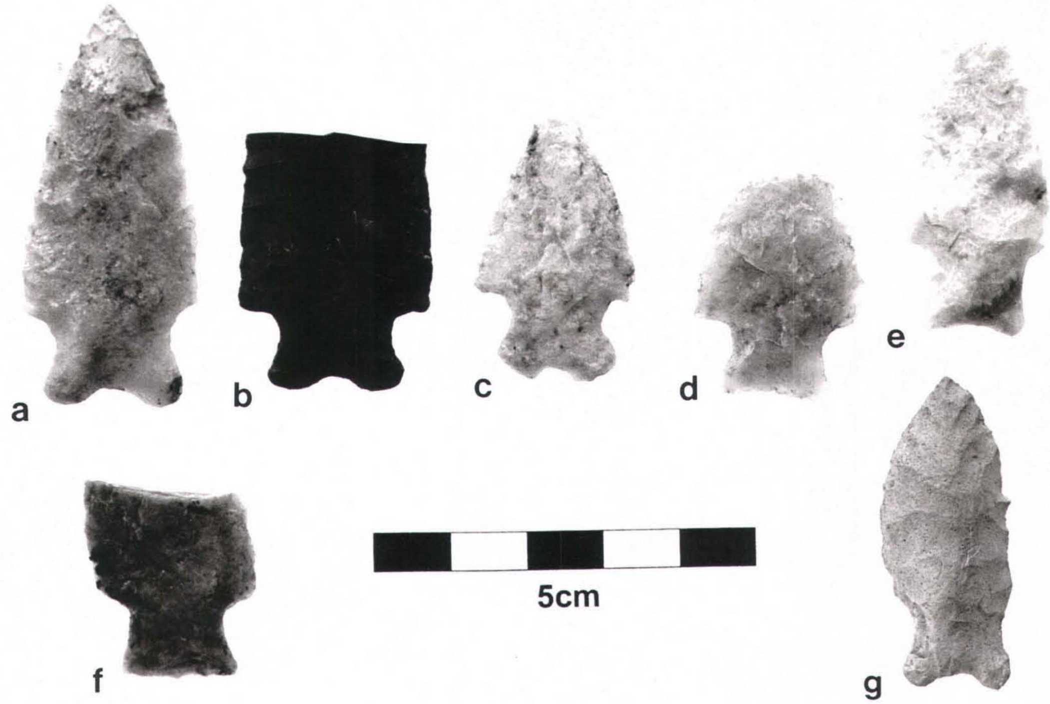


Figure 4.39. Duncan/Hanna projectile points; ElMw-8:a–f; ElNa-1:g.

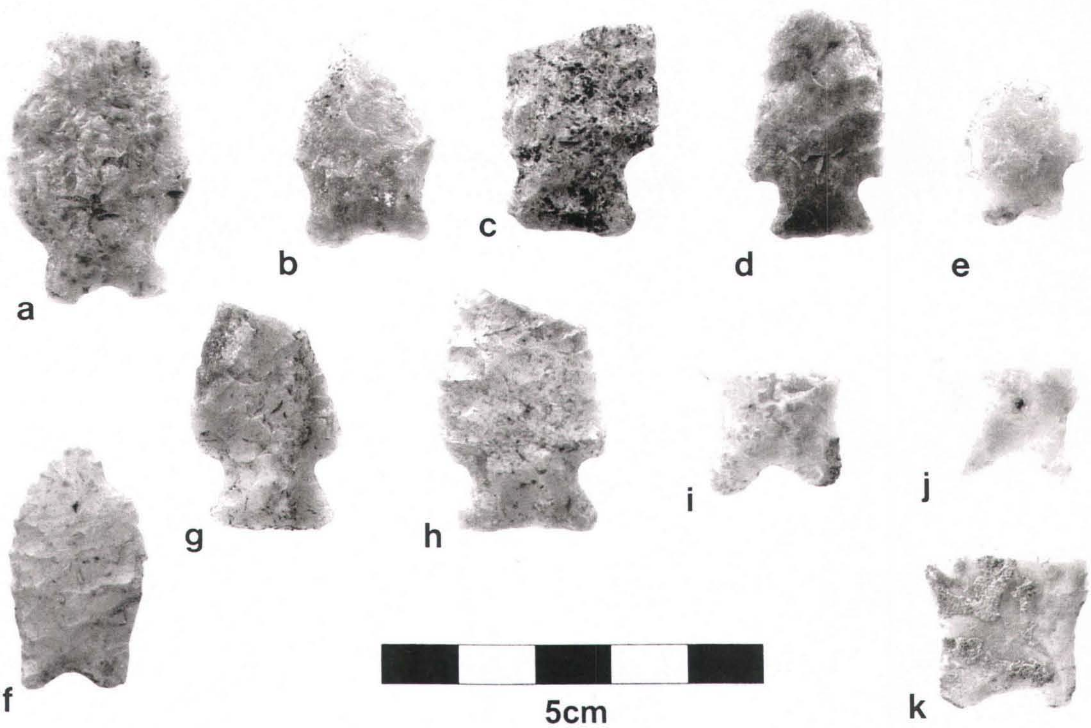


Figure 4.40. Duncan/Hanna projectile points from the Haskey area.

It is difficult to determine the function of the occupation of this area. If the majority of projectile points were related to the same occupation, then the large number of projectile points might suggest a kill site. However, the vast majority of projectile points are damaged and this area may have served as a large campsite. Large numbers of endscrapers, perforators, bifaces and other tools recorded from this site also support this. Alternatively, the large number of points could represent repeated small occupations of the same area over a number of years or a large single occupation of the locality, but not focused on killing bison. Because of the large area and the multi-component nature of the site, the other debris and tools noted and recorded for this site cannot be used to assess the nature of the McKean complex occupation here.

Several McKean complex sites were found along Milligan Creek. The New site (EkMw-6), Haskey Area, and Bill Kereluke site (ElMw-8) all had six or more projectile points. Of interest, two of these sites also had McKean Lanceolate points. In particular, the Haskey area had six McKean Lanceolate points, the second most abundant occurrence of these in the study region.

Moving eastward, another area with a strong McKean occupation is associated with Magnusson Creek, north of Wynyard. There are a number of McKean sites in this area, including EkNb-2 and EkNb-4. From this area, 48 Duncan/Hanna points and 5 McKean Lanceolate points were recorded, nearly half of them being in EkNb-2. This site was multi-component making it difficult to suggest site function.

The McKean complex's presence on the western side of the study area was relatively limited. The largest number of diagnostics came from ElNd-9 with 10. Of these, 2 were McKean Lanceolate. ElNd-9 was the only site on the western side of the study area to have any McKean Lanceolate points. The remaining five sites each had five or fewer points. In fact, all sites in the study region with 8 or more Duncan/Hanna points also had McKean Lanceolate points recorded at them.

The lithic materials utilized to fashion McKean complex projectile points indicate a strong preference for locally available materials, in particular, Swan River Chert (Figures 4.41 and 4.42). Exotic lithic materials such as Knife River Flint were noticeably rare.

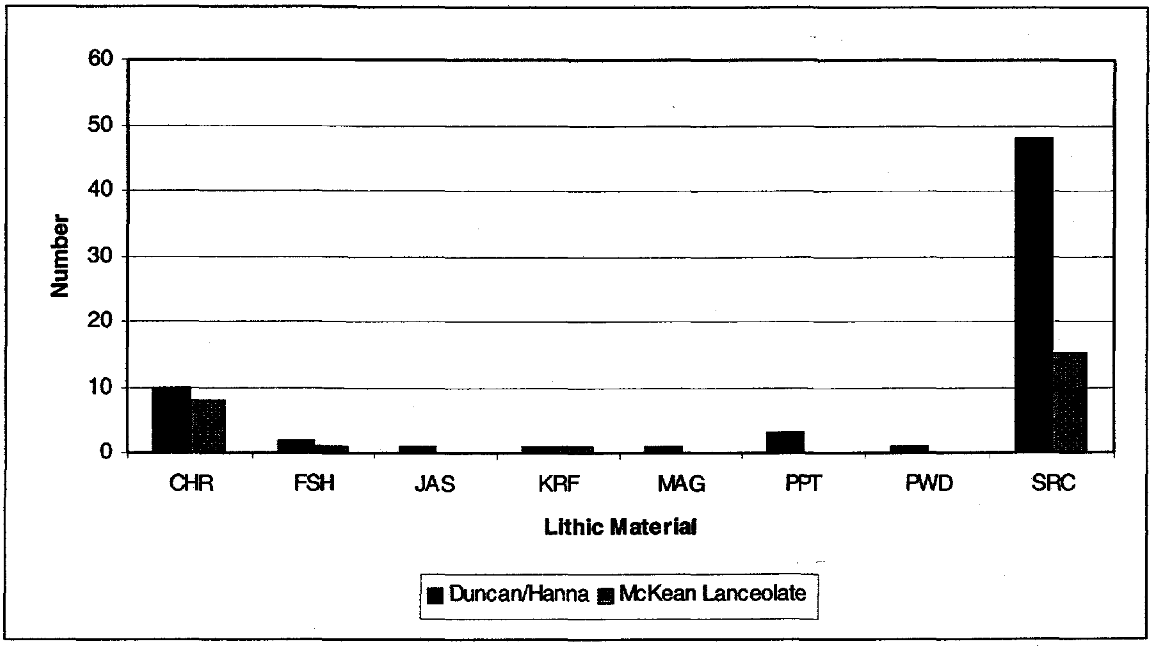


Figure 4.41. Lithic material used to manufacture McKean complex projectile points.

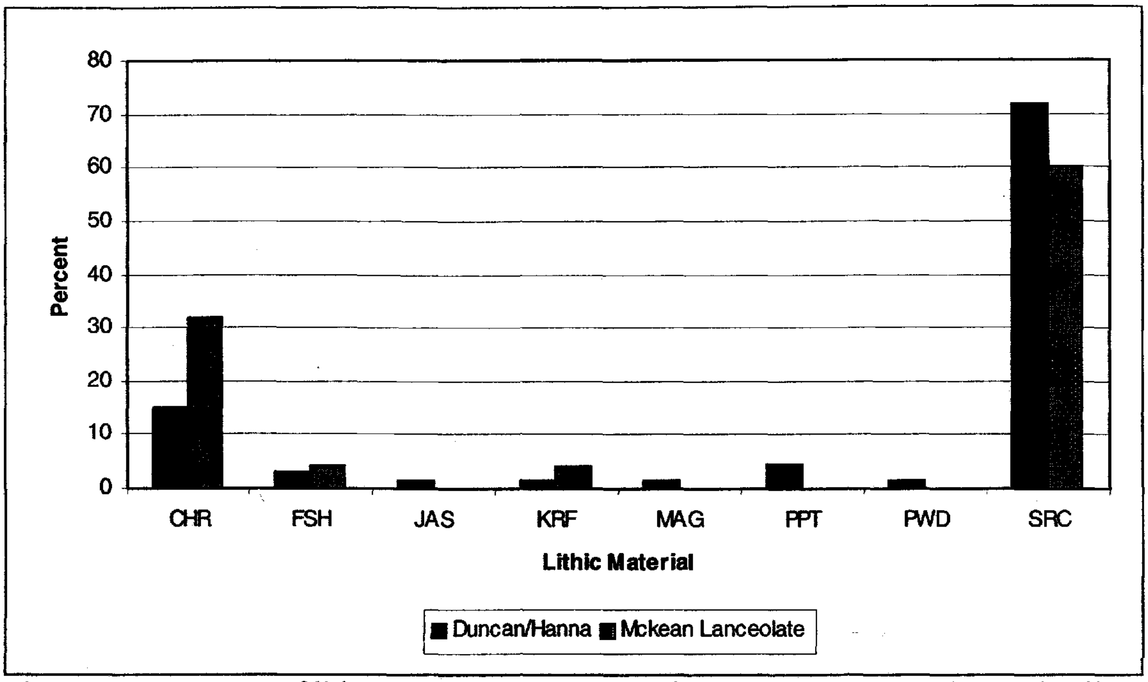


Figure 4.42. Percent of lithic material used to manufacture McKean complex projectile points.

4.2.5 Pelican Lake Complex

Some 169 projectile points diagnostic of the Pelican Lake complex were identified at 21 collection localities (Figures 4.43 and 4.44, Table 4.5). The Pelican Lake projectile points from the Stachyruk collection are shown in Figures 4.45 and 4.46.

Pelican Lake components were found at nearly every site that contained diagnostic projectile points of any type. This included sites in various topographic settings. The locale with the most projectile points (53, 31%) was the Corley's Ridge/Kells area. Site EkNb-2 was second with 16 points (9%). This clearly indicates an intense occupation at the Corley's Ridge/Kells site. Whether this was a single large event or re-use of the site over a number of years is difficult to assess. A closer look at the provenience of the Stachyruk collection reveals that 90% of the points came from EkMx-2.

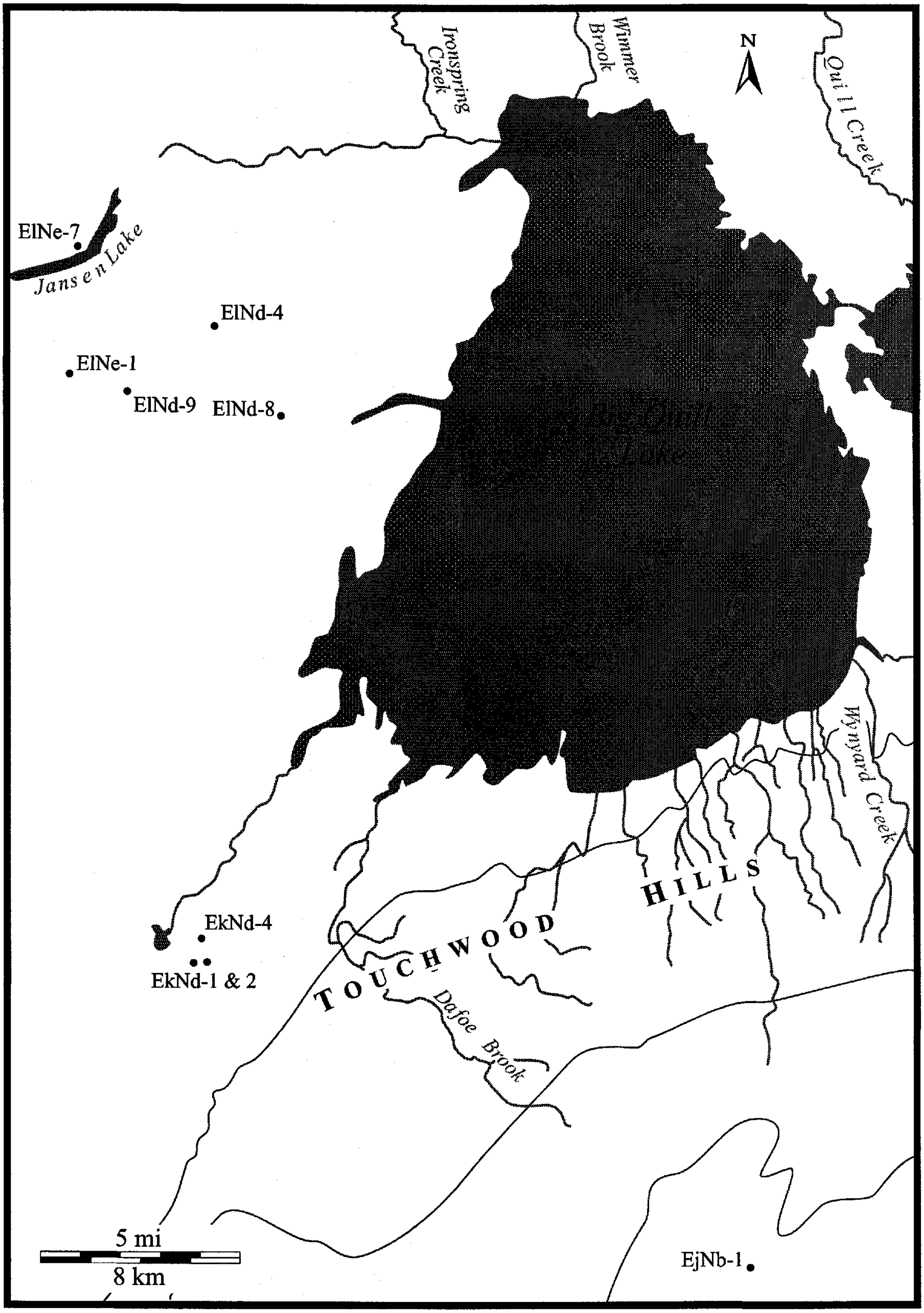


Figure 4.43. Distribution of Pelican Lake components in the Quill Lakes region (west half).

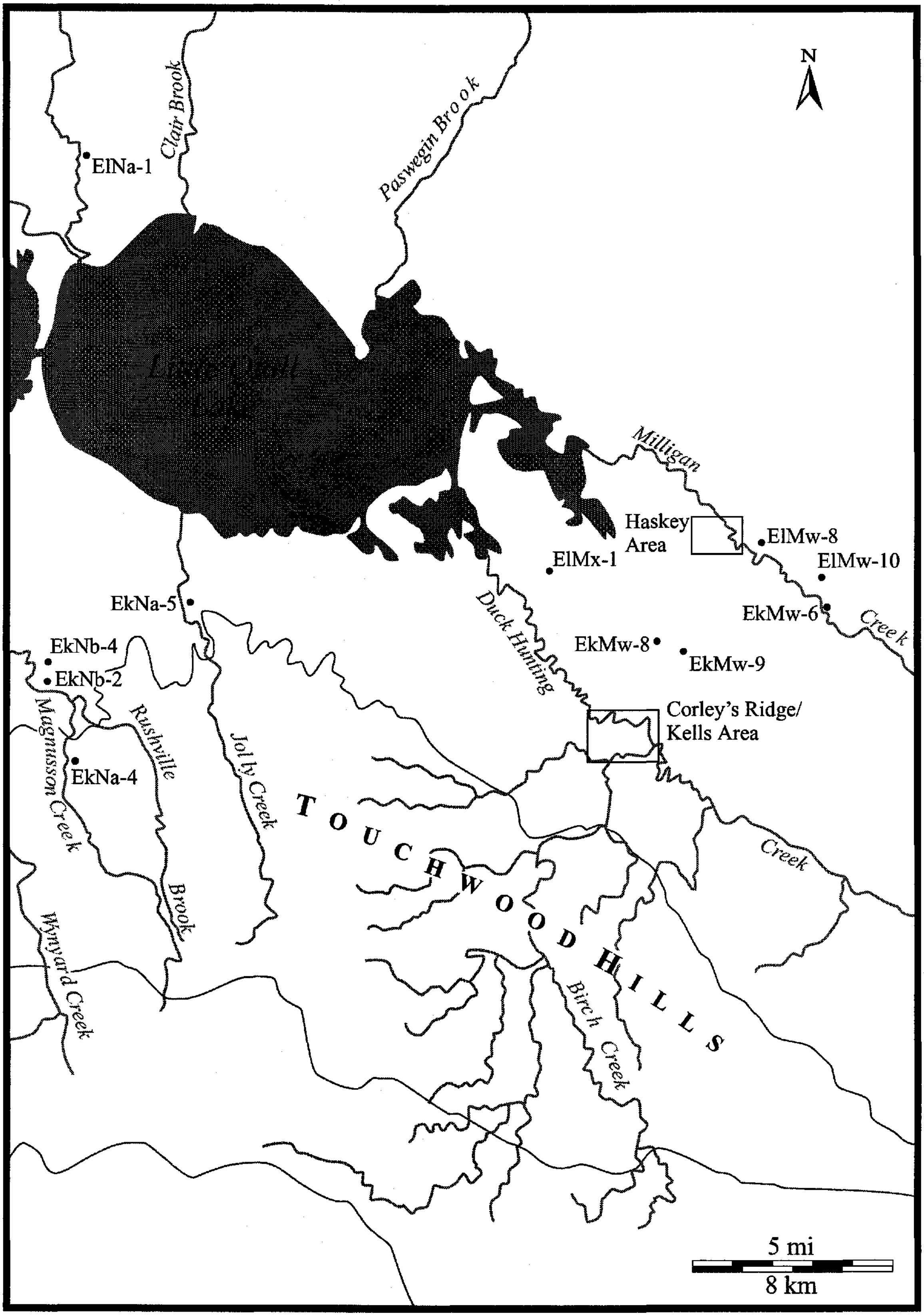


Figure 4.44. Distribution of Pelican Lake components in the Quill Lakes region (east half).

Table 4.5. Sites bearing Pelican Lake projectile points in the Quill Lakes region.

Site	Collector	# Of Diagnostic Points	Site Total
Haskey Area	Stachyruk	5	
	Kerluke	10	15
ElMw-8	Stachyruk	2	2
EkMw-8	Stachyruk	8	8
ElNa-1	Stachyruk	2	2
EjNb-1	Stachyruk	2	2
ElMw-10	Stachyruk	2	2
EkMw-9	Stachyruk	1	1
EkMw-6	Stachyruk	3	3
Corley's Ridge & Kells Area	Stachyruk	30	
	Malinowski	12	
	Kerluke	3	
	Yurach	8	53
ElMx-1	Kerluke	5	
	Novecosky	1	6
North of Wynyard	Yurach	11	11
EkNa-4	Yurach	3	3
EkNa-5	Yurach	8	8
EkNb-2	Yurach	16	16
EkNb-4	Yurach	1	1
ElNd-4	J. Hamilton	4	4
EkNd-4	J. Hamilton	3	3
EkNd-1 & 2	Wildeman	14	14
ElNd-9	B&L Hamilton	5	5
ElNe-7	B&L Hamilton	8	8
ElNe-1	B&L Hamilton	1	1
ElNd-8	Novecosky	1	1
TOTAL			**169**

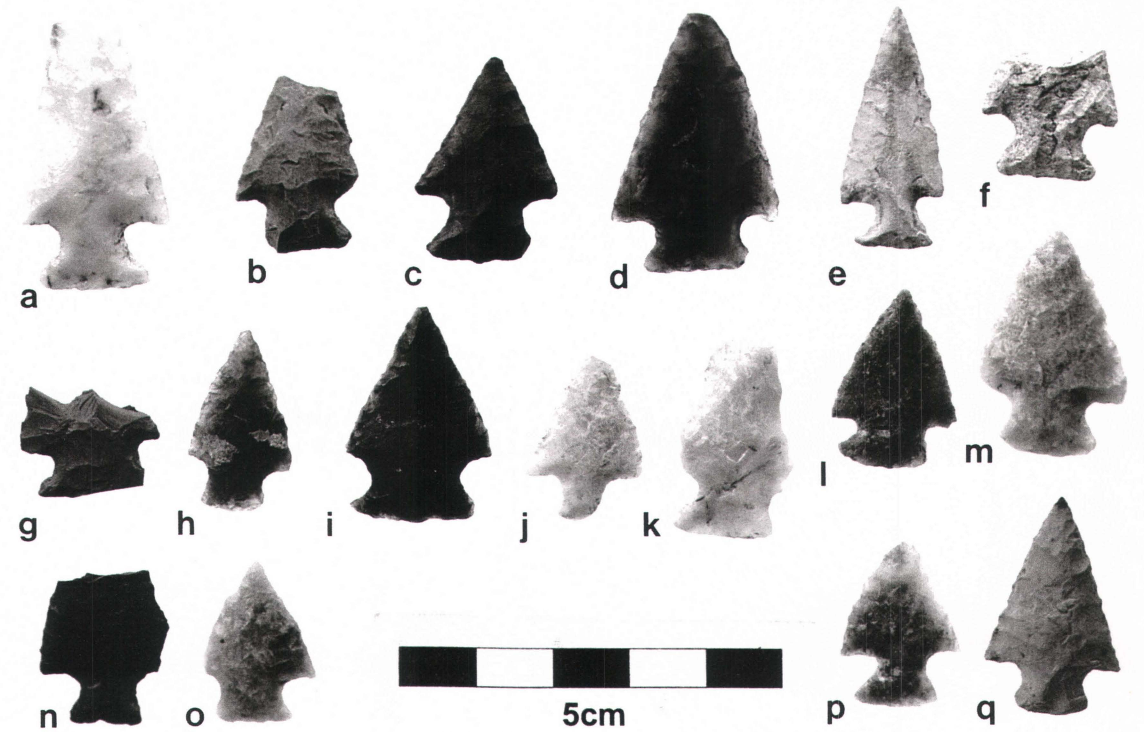


Figure 4.45. Pelican Lake projectile points from the Corley's Ridge/Kells area.

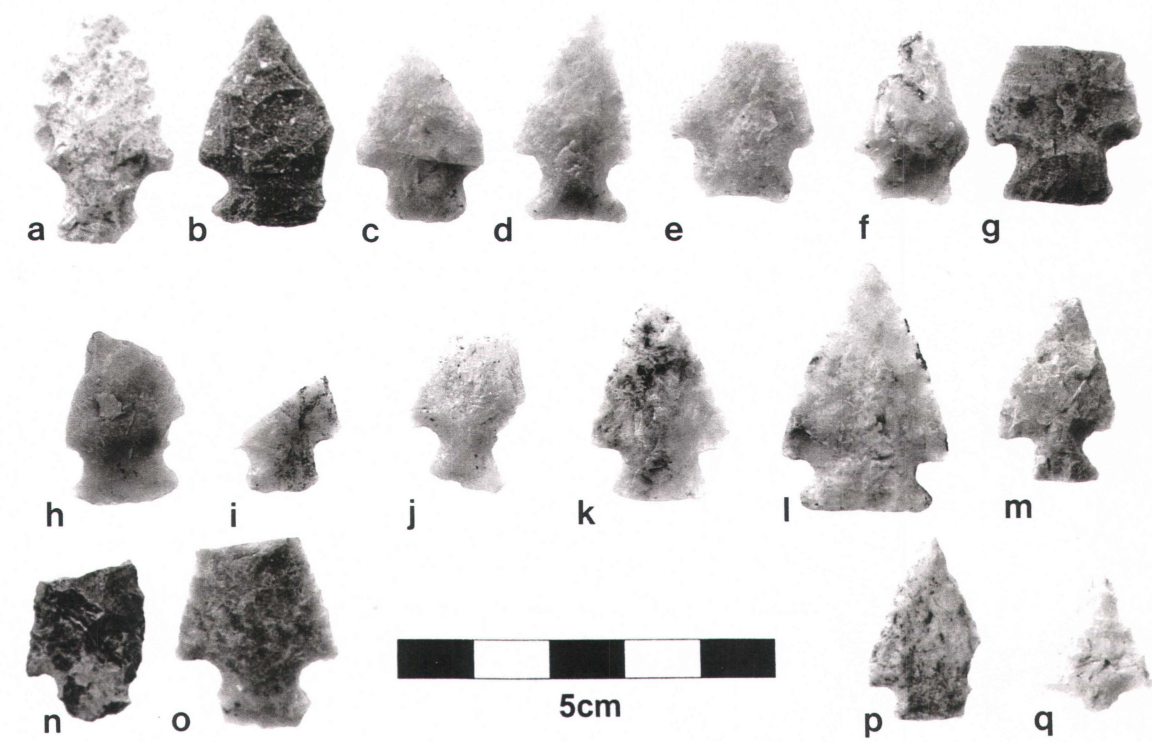


Figure 4.46. Pelican Lake projectile points; Corley's Ridge/Kells area:a – l; EkMw-9:m; EjNb-1:n, o; ElNa-1:p, q.

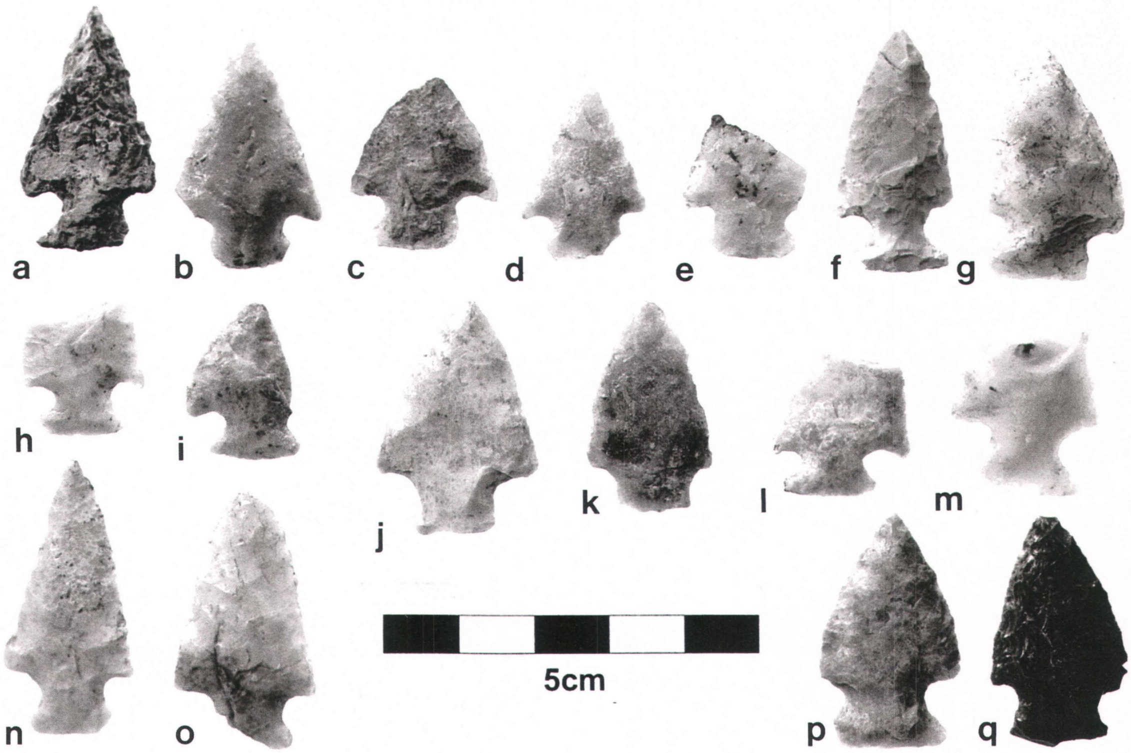


Figure 4.47. Pelican Lake projectile points; EkMw-8:a–g; Haskey area:h–l; EkMw-6:m, p, q; ElMw-8:n, o.

Other important sites with relatively strong components in the eastern part of the study area included the Haskey area and EkMw-8. At the Haskey area, Pelican Lake components appear to be concentrated on the west side of Milligan Creek. This area was offset slightly from the Paleo-Indian area of the site.

The area north of Wynyard, including EkNb-2 and EkNb-4, also appeared to have had a significant Pelican Lake occupation. From this area, 28 Pelican Lake points were recorded. These sites are loosely congregated along Magnusson Creek as well as on a glacial lake strandline. Because the site provenience of many of these points is unknown, it is difficult to say if they are all from the same spot or same occupation.

Near the western boundary of the study area, near Jansen Lake, a relatively large Pelican Lake component (8 points) was found at ElNe-7. A strong Bratton component was also present at this site (see next chapter). The connection between Bratton points and the Pelican Lake complex is not clear at present, since they have been found both with Pelican Lake and also with later Besant components at various sites on the Northern Plains (Dyck and Morlan 1995:378-379).

The last strong Pelican Lake presence was in a low marshy area at sites EkNd-1& 2, and EkNd-4. The majority of the points were found at EkNd-1 & 2 (n=14, 82.4%). The remaining sites are characterized as having relative small Pelican Lake components with 6 or fewer projectile points.

The lithic materials used for projectile points showed a preference for local cherts, especially Swan River Chert (Figure 4.48). From the Stachyruk collection, 35 of 55 Pelican Lake projectile points (63.6%) were identified as Swan River Chert. Other cherts were used 10.9% of the time (n=6). There was a small importance placed on fused shale, which is seen for the first time in the study area. Four points (7.3%) were fashioned from this material. The remaining materials include Knife River Flint (n=3, 5.5%), petrified peat (n=5, 5.5%), Red River Chert (n=1, 1.8%), and silicified siltstone pebble (n=1, 1.8%). Two (3.6%) were of an unknown material type.

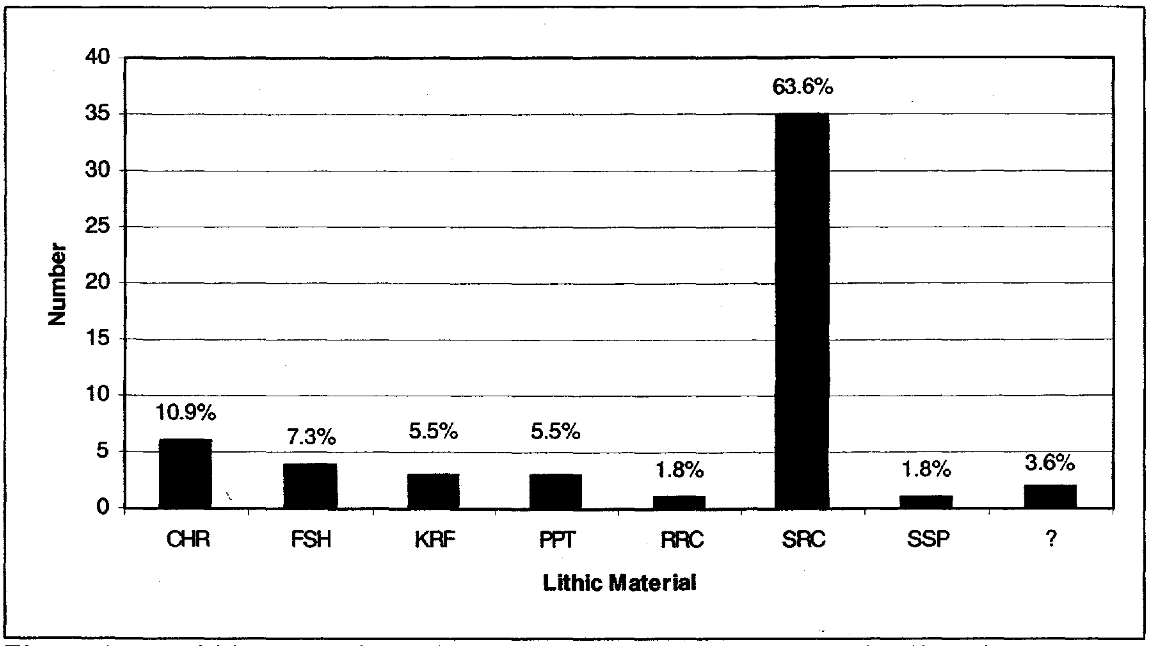


Figure 4.48. Lithic materials used to manufacture Pelican Lake projectile points.

4.3 Discussion

4.3.1 Corner-Notched Point Type

Large Corner-notched points such as those recorded from the study area have not been well described in the archaeological literature. Cultural historical studies in Saskatchewan (e.g. Pohorecky 1970; Dyck 1983; Linnamae et al. 1988) make no mention of large corner-notched points. However, the presence of several components in the Quill Lakes region with numerous examples of these projectile points provides evidence of a significant presence in the area for this unique point type. By examining some technological aspects of the projectile points and associated tools, and by reviewing the literature for possible parallels to other corner-notched forms, some statements regarding these points can be made.

The similarity of these points suggests that they belong to a single projectile point type with perhaps two varieties. One variety is long, with wide corner-notches. The base is indented, the amount of indentation ranging from a large thinning flake up to a concavity just over 2mm (Figure 4.3:a–d; Figure 4.4:a, c, d). The second variety is shorter, wide, and is characterized by a straight to slightly convex base (Figure 4.4:b). This variety is not as common as the first. However, the difference is superficial; all of the measurements show no difference between the two, aside from the basal indentation. Measurements of these points are given in Appendix 2, Table 7.

Several factors indicate that this point type temporally belongs at the beginning of the Middle Plains Indian period. There is a strong continuity between Paleo-Indian technology and the large corner-notched points. The length of the points can reach over 100 mm. Reworked specimens are between 30 to 50 mm in length. All of the other measurements are consistent with rather tight standard deviations (see Table 4.6). The relative width of the points compared to the thickness is typical of Paleo-Indian assemblages. For example, Cody complex materials from the Larson Cache range in width from 20.1–30.0 mm and the thickness varies from 3.4-3.7 mm (Ingbar and Frison 1987:467). The large corner-notched points from the Quill Lakes region have an average width of 28.9 mm and an average thickness of 6.0 mm. The manufacture of such wide, thin points is not normally associated with post-Paleo-Indian archaeological cultures. In addition, the lengths of the points are clearly indicative of Paleo-Indian cultures. With the adaptation of the atlatl dart technology, projectile points without fail are much shorter.

Table 4.6. Measurements of large corner-notched points (see Appendix 2:Figure 4 for measurement definitions).

	A	B	C	D	E	F	G
AVE	14.09	28.90	18.39	10.43	1.14	64.58	5.98
STD DEV	1.63	2.69	2.00	1.17	0.92	20.03	0.92

The lithic material used to manufacture these large corner-notched points follow a pattern indicative of Paleo-Indian technologies. The large corner-notched points were almost exclusively manufactured from Knife River Flint. Preference for this material is evident at many of the Paleo-Indian sites on the Northern Plains. For example, the Agate Basin component at the Agate Basin site had 43% of its points made from Knife River Flint (Frison and Stanford 1982:80). This was also mirrored for the Agate Basin component at the Parkhill site in Saskatchewan (Ebell 1980).

After the Paleo-Indian period, Knife River Flint did not see such widespread use until relatively recently during the Besant complex. The almost exclusive use of Knife River Flint at large kill sites such as Muhlbach (Gruhn 1971), Fitzgerald (Hjermstad 1996), Melhagen (Ramsay 1991) and Richards Kill (Paulson 1980) mirrored that of the Quill Lake points. However, the use of Knife River Flint is where the similarities between Besant points and these corner-notched points end. Although Knife River Flint was important during the Paleo-Indian period, there was not such an emphasis as seen with the Quill Lake corner-notched points. In this regard, the Quill Lake corner-notched points are unique.

The patination present on the large corner-notched points from EkMw-6 gives some indication of age. All of the large corner-notched projectile points made from Knife River Flint at EkMw-6 were heavily patinated. Although moisture, soil chemistry, and temperature affect the patination rate, it can be used as a relative indicator. At the nearby Haskey area, all of the Paleo-Indian projectile points manufactured from Knife River Flint, except one, were heavily patinated. This included Agate Basin, Scottsbluff, and Terminal Paleo-Indian projectile points. In addition, all of the Mummy Cave series projectile points made from Knife River Flint at the Haskey area were also heavily patinated. Any later points made from Knife River Flint at this and nearby sites along Milligan Creek are not patinated. At EkMw-6, two Mummy Cave series projectile points were made from Knife River Flint. One was not patinated at all while the other one was lightly patinated on one side. The degree of patination on the Quill Lake points from EkMw-6 suggests greater antiquity. By comparing the degree of patination with nearby Paleo-Indian points, it is clear that they are temporally relatively closely related.

From the nearly 2600 items catalogued at EkMw-6, there were 17 other formed tools made from Knife River Flint that showed the same degree of patination (Figure 4.7:c–e). In addition, numerous flakes and shatter show similar amounts of patination. From the seventeen tools, two were identified as lanceolate projectile points (Figure 4.7:a, b). One had suffered a recent impact and the tip was broke off. The other was complete but showed signs of reworking. The bases were rounded, with little or no grinding of the hafting portion. This was the only site recorded where lanceolate points were identified. In addition, eight endscrapers were recorded at EkMw-6 (Figure 4.49). The form of the endscrapers is reminiscent of Paleo-Indian scrapers. The familiar spur commonly found on Paleo-Indian scrapers is present on two of the eight (Figure 4.49:a, d). The use of spurred endscrapers as a diagnostic tool is noted by Frison (1991:128) as not completely reliable, but in general seems to fit the pattern.

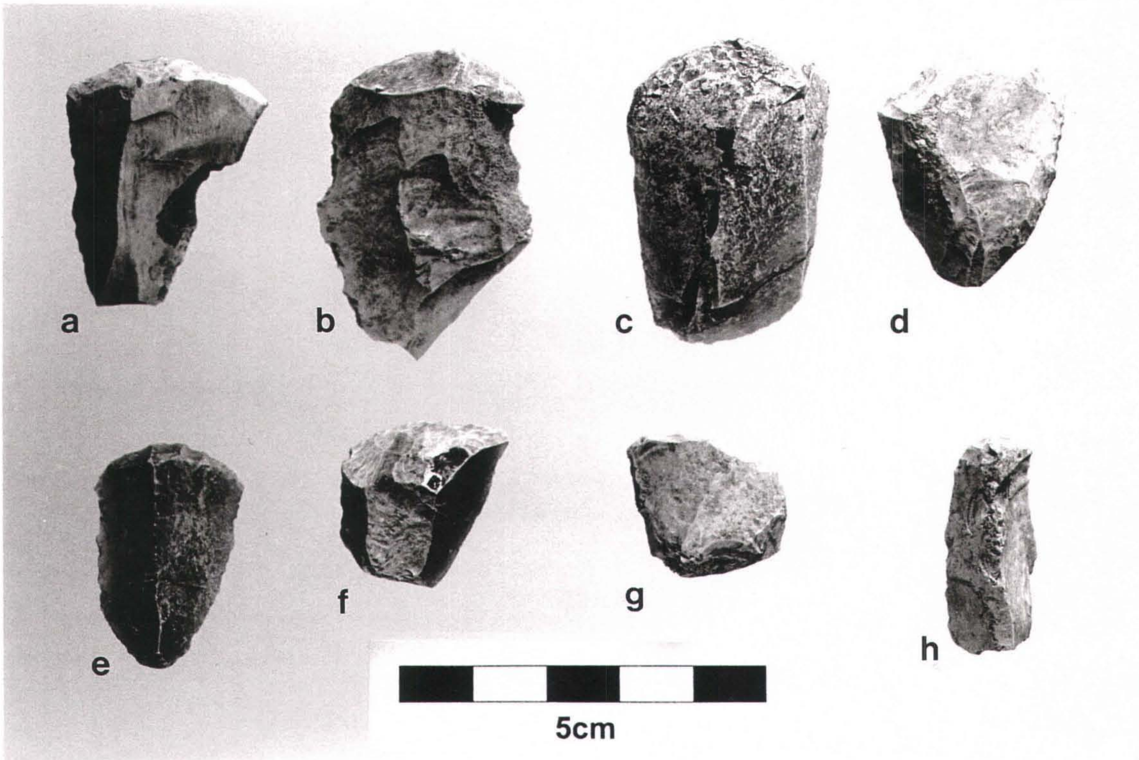


Figure 4.49. Endscrapers associated with the large corner-notched projectile points at EkMw-6.

The large corner-notched points from the Quill Lakes represent an archaeological manifestation that can be temporally placed at the end of the Paleo-Indian or beginning of the Middle Plains Indian period. Aside from the notches (a definitive feature of the Middle Plains Indian period) the manufacture of the points, their size, and choice of lithic material are indicative of Paleo-Indian assemblages. In addition, the presence of spurred endscrapers and two lanceolate projectile points supports the connection. Finally, the degree of patination of projectile points from EkMw-6, when used as a relative dating tool, is not unlike that of Paleo-Indian points from the immediate area.

Dates for large corner-notched points from the Northern Plains and adjacent areas are relatively sparse (Table 4.7). From the Rocky Mountain and adjacent foothills, there are examples of large corner-notched points from a few sites. At Mummy Cave, two similar points were illustrated from level 23 (McCracken et al. 1978:Plate 59, g, h). A date of about 7600 rcybp for this level was given. These points were found in a level with Early Side-Notched points and this level was just above the Terminal Paleo-Indian levels. Vickers (1986:61) noted a similar point found at an undated component below the Mazama ash level (ca. 6800 rcybp) at EgPn-146 in southwestern Alberta (Vickers 1986:61). These points were in association with other Mummy Cave series point styles similar to Salmon River and Boss Hill Corner-Notched. In addition, a similar point was noted at Head Smashed-In (Reeves 1978). At the Jensen Springs site in the Crowsnest Pass of southwestern Alberta, excavations uncovered a similar point below Mazama Ash (Ronaghan 1985:143-148). This level was dated to 6040 ± 450 rcybp (AECV-112), which is slightly later than expected for a pre-Mazama Ash level (Ronaghan 1986:206). A Bitterroot point was also found on the surface during an earlier survey (Reeves 1974).

Table 4.7. Radiocarbon dates for selected early large corner-notched projectile points.

Site	**Date (RCYBP)**	**Lab Number**	**Reference**
Mummy Cave	7630 ± 170	I-1588	Frison 1991
Looking Bill	7140 ± 160	RL-554	Frison 1991
Boss Hill	7875 ± 130	S-1251	Doll 1982
Boss Hill	7750 ± 105	S-1371	Doll 1982
Hawkwood	8250 ± 330	RL-1554	Van Dyke and Stewart 1985
Jensen Springs	6040 ± 450	AECV-112	Ronaghan 1986
Norby site	5560 ± 120	S-3206	Zurburg 1991
Norby site	5740 ± 110	S-3205	Zurburg 1991
Norby site	5885 ± 265	S-3006	Zurburg 1991

Two sites in Alberta have components with both lanceolate and notched projectile point forms. The Boss Hill site contained lanceolate points designated as Parkhill Lanceolate and large corner-notched points named Boss Hill Corner-Notched

(Doll 1982). Two radiocarbon dates indicate an age of about 7800 rcybp. The Boss Hill Corner-Notched type does not share similarities with the large corner-notched points from the Quill Lakes past the fact that they are both large-corner notched points. The Hawkwood site, located in Calgary, contained an occupation level below the Mazama Ash with a lanceolate point, a Salmon-River Side-Notched, and a stemmed or large corner-notched in association (Van Dyke and Stewart 1985). A radiocarbon date of 8250 ± 330 rcybp (RL-1554) was obtained from this level (Van Dyke and Stewart 1985:39). Vickers (1986:47-49) sees the association of lanceolate and notched projectile points in terms of diffusion of Paleo-Indian technology carried over into the Middle Plains Indian period. Although Doll (1982) attempted to define a transitional period, "Pre-Archaic", Vickers (1986:49) notes that the sparse data does not warrant a new designation.

Excavations at two sites in Saskatchewan have produced similar corner-notched points. The Norby site (Zurburg 1991), a kill site located in Saskatoon, had four diagnostic projectile points recovered. Two were identified as Gowen points, one a Manitoba point and one was a large corner-notched point. The corner-notched point was made from Knife River Flint. It shares general similarities to those found at the Quill Lakes. The Manitoba point closely resembles projectile points associated with Terminal Paleo-Indian components but the radiocarbon dates indicate an age similar to the Gowen sites, near the end of the Mummy Cave series. A large corner-notched point was excavated along with a Bitterroot point at the Stuart Lake site (Hjermstad 2001). The large corner-notched point, manufactured from petrified wood, is similar to the large corner-notched points from the Quill Lakes. It has large corner-notches and is basally indented. Phytolith analysis conducted at the site indicates that the occupation of the site occurred during the Hypsithermal period. During this period the vegetation in the area was dominated by grasses (Hjermstad 2001:67). Hjermstad (2001:52) noted that, based on point morphology and phytolith analysis from the site, this point type likely belongs to the Mummy Cave series.

A Terminal Paleo-Indian component with basally indented points that share similarities to the Quill Lake points was reported from the Looking Bill site from the southern Absaroka Mountains in Wyoming (Frison 1991:74). These points are similar in width and length, but the specimens illustrated by Frison (1991:Figure 2.37:b-d) lack corner-notches. They have indented bases somewhat similar to the Quill Lake points. This level was dated at 7140 ± 160 rcybp (RL-554).

Other sites with large corner-notched specimens include Mammoth Meadow I in southwest Montana (Bonnichsen et al. 1992). At this site, a large corner-notched point, not unlike those from the Quill Lakes region, was found in stratum III with Cody complex projectile points. The overlying stratum contained Bitterroot and Cody complex points. The authors offer no interpretations regarding the presence of this point.

An identical large corner-notched projectile point is curated at the Parkland Archaeological Laboratory at Dauphin, Manitoba. This point is reported to have come from a site on the north shore of Lake Dauphin. The site is multi-component, but no information specific to the corner-notched point was obtained.

4.3.2 Mummy Cave Series

The Mummy Cave series was defined with a number of projectile point types in mind. The majority of the projectile points assigned to the Mummy Cave series from the Quill Lakes region closely resemble those generally called Salmon River (Swanson 1962) or Gowen (Walker 1988, 1992) points. Bitterroot points were also identified from the study area, but were less common. In addition, a number of points that do not fit into these types were also identified. In particular, there were examples of corner-notched points.

Several sites with Mummy Cave components have been excavated in the general region of the study area. Four sites have been radiocarbon dated and can be considered good chronological indicators for the Mummy Cave components in the Quill Lakes region (Table 4.8).

Table 4.8. Radiocarbon dates for the Mummy Cave series from Saskatchewan.

Site	Date (rcybp)	Lab Number	Reference
Gowen 1	4725 ± 130*	S-1526	Walker 1988
	5670 ± 135	S-1527	Walker 1988
	5760 ± 135	S-1448	Walker 1988
	6065 ± 200	S-1488	Walker 1988
	6150 ± 110	S-1457	Walker 1988
Gowen 2	5665 ± 110	S-2037	Walker 1988
	5080 ± 150*	S-2036A	Morlan 1993
	5910 ± 165	S-2036B	Walker 1988
	5915 ± 130	S-1970	Walker 1988
	6075 ± 160	S-1971	Walker 1988
Norby	5560 ± 120	S-3206	Zurburg 1991
	5740 ± 110	S-3205	Zurburg 1991
	5885 ± 265	S-3006	Zurburg 1991
Below Forks	5845 ± 140	S-2245	Dyck 1983
	5740 ± 95	S-1994	Dyck 1983
	4055 ± 265*	S-2034	Dyck 1983

* indicates rejected dates

Many of the Early Side-Notched points in the collections resemble those illustrated from the Gowen sites at Saskatoon (Walker 1992:Plates 6, 24, 25). Walker (1992:133) has identified them as Gowen Side-Notched points, but he notes that they are statistically the same and may be synonymous with Salmon River Side-Notched. A small number of Bitterroot points were found in the excavations as well. Averaged radiocarbon dates from the two sites indicate an age of 5870 ± 48 rcybp.

The Norby site, a site with similar points to those at Gowen, was excavated in the City of Saskatoon. Diagnostic projectile points included a small sample of Gowen points along with a corner-notched point and a lanceolate point (Zurburg 1991). This site also has dates similar to those at the Gowen sites (Table 4.8). Many of the Early Side-Notched points from the Quill Lakes are similar to these points with the exception of the reworked lanceolate point.

The Below Forks site, located near the confluence of the North and South Saskatchewan Rivers, is a deeply stratified site with a Mummy Cave series component (Meyer 2000). This site is located to the northwest of the Quill Lakes Region. A radiocarbon date of 5845 ± 140 rcybp (S-2245) has been obtained from the occupation here. A single diagnostic point found eroding from the occupation level in a cut bank is similar in form to those described at the Gowen site (Meyer 2000).

An Early Side-Notched component was identified at Steeprock Lake in the Porcupine Hills located to the Northeast of the Quill Lakes (Simpson 1970). Simpson (1970:147-149) reported that several points were found at the site. No radiocarbon dates were obtained for the component.

Surface finds of Mummy Cave series projectile points occur at several sites. The problems with identifying these points out of context have likely led to an underestimation of the number of components for this period. Gryba (1981, 1980, 1977, 1976) reported Early Side-Notched points from the Swan River Valley located to the east of the study area. Conaty et al. (1988:32) recorded a site along the Arm River that contained Early Side-Notched points. Ramsay (1998:14) reports both Bitterroot and Salmon River varieties of Early Side-Notched points from Archie Campbell's collection from the Bjorkdale region.

4.3.3 Oxbow Complex

The Oxbow complex is widespread with diagnostic points easily recognized in the collections. Although the Oxbow Dam site (Nero and McCorquodale 1958) is considered the type-site, and the Long Creek site (Wettlaufer and Mayer-Oakes 1960) providing the first subsequent excavated published report, the Oxbow projectile points reported from these two sites are considered by most archaeologists not to be typical. Green (1998) noted during a re-examination of the Oxbow Dam site that the Oxbow level material was mixed with a lower level that produced an exceptionally old date for Oxbow.

Many comparable dated Oxbow components are available for evaluation from sites near the study area. A selection of sites and their dates are presented in Table 4.9. From the Saskatoon area, 150 km west of the study area, the Moon Lake, Harder, Caruthers, and Amisk sites have dated components. These dates span about 1000 radiocarbon years from 3050 ± 80 to 4100 ± 90 rcybp. The later dates, however, were derived from insoluable collagen extractions and remain suspect (Morlan 1993). Oxbow projectile points identified from the collections in the study region correspond well with those described from these excavations. The Greenwater Lake site is a burial located about 80 km northeast of the Quill Lakes. This burial contained a projectile point that is not typical of most 'eared' Oxbow points. In addition, the radiocarbon date suggests an earlier occupation than those in the Saskatoon region.

Table 4.9. Selected Oxbow radiocarbon dates.

Site	Date (rcybp)	Lab Number	Reference
Moon Lake	4100 ± 90	S-403	Morlan 1993
Harder	3360 ± 60*	S-490	Dyck 1970
	3425 ± 105*	S-668	Dyck 1977
	3420 ± 140*	S-3453	Morlan 1994
	4190 ± 90	S-3452	Morlan 1994
	4410 ± 150	S-3444	Morlan 1994
Carruthers	3050 ± 80*	S-742	Dyck 1983
Greenwater Lake	4390 ± 105	S-1447	Walker 1981
Amisk	4015 ± 195	S-2546	Amundson 1986
	4120 ± 190	S-2535	Amundson 1986

* indicates rejected dates

In addition, there have been several Oxbow surface sites recorded. Conaty et al. (1988:33) recorded sites along Last Mountain Lake, 50 km southwest of the study area, and along Lanigan Creek and Arm River that drains into the lake. Conaty et al. (1988:33) also recorded a number of Oxbow points from sites along the South Saskatchewan and Saskatchewan Rivers near Birch Hills and Nipawin. Finnigan et al. (1983) also identified numerous Oxbow projectile points from the Nipawin area. There are several surface finds also reported for the Saskatoon region, (Linnamae et al. 1988; Dyck 1970, 1972; Walker 1988), Melfort area (Nero 1957), Carrot River area (Meyer and Dyck 1968), Bjorkdale region (Ramsay 1998), and Swan River Valley (Gryba 1976, 1977, 1981). This distribution of sites in all directions from the study region indicates the widespread occurrence of Oxbow points. During the recording of collections from around Saskatchewan, Oxbow points were not recorded in any collections to the east of the Quill Lakes and north of the Qu'appelle River (Conaty et al. 1988:33). This was somewhat surprising given that a number of sites around Yorkton were examined and the ease of identifying these distinctive points. Although the data available for Saskatchewan appears to show a lack of sites in eastern areas, there are several sites in southwest Manitoba that apparently have dated Oxbow components (Spurling and Ball 1981; Morlan et al. 2000).

4.3.4 McKean Complex

The diagnostic projectile points of the McKean complex are the most widely recognized and distributed points of the Middle Plains Indian period. In Saskatchewan, McKean complex diagnostics have been reported from across the southern half of the province (Dyck 1983:100). McKean complex points in the Quill Lakes region are similar to the many excavated and surface finds from east central Saskatchewan. Dyck (1983:100) also noted that McKean Lanceolate projectile points are far less common than Duncan/Hanna points; a similar pattern was noted in the Quill Lakes region.

There have been several excavated components with McKean complex diagnostics from the general vicinity of the study area. The first excavated component in Saskatchewan was at the Mortlach site (Wettlaufer 1955). A Duncan/Hanna point, called a Thunder Creek point in the report, was found in level 8 and was dated 3400 ± 200 rcybp (S-2) (Wettlaufer 1955) but Morlan (1993:39) warns that this date may not be reliable. The deepest levels at the Sjovold site contained a Hanna point. This level was dated to 4130 ± 205 rcybp (S-1770) (Dyck 1983:90). The best-dated McKean site is Redtail (Ramsay 1993). Several McKean levels produced dates ranging from about 3400–4360 rcybp. The three older dates (S-3374, S-3375, and S-3009) from this site are associated with McKean Lanceolate projectile points. A Hanna point was in association with date S-3372. The nearby Thundercloud site had a McKean complex component dated to 4140 ± 90 rcybp (S-3645) (Mack 2000). Duncan, Hanna and McKean Lanceolate points were all found in this level. At the Crown site, Quigg

(1986:table 2.1) provided numerous radiocarbon assays for McKean complex components. Morlan (1993:table 2) attributed only two of these to definite McKean Lanceolate levels. In addition, level 4 from the east excavation block contained a discrete dated Hanna component (Quigg 1986). From Manitoba, materials excavated at Steeprock Lake (Simpson 1970) also appear to belong the McKean complex. Table 4.10 provides a summary of radiocarbon dates for the McKean complex from the vicinity of the study area.

McKean complex burials have also been excavated. The Graham site, located south of Saskatoon, is reported as a Duncan burial (Walker 1984). A radiocarbon date of 3245 ± 50 rcybp (S-1574) was obtained from this site. A burial associated with an Hanna level at the Crown site has also been reported (Walker in Quigg 1986).

Table 4.10. Selected McKean complex radiocarbon dates.

Site	Date (rcybp)	Lab Number	Reference
Mortlach	3400 ± 200	S-2	Wettlaufer 1955
Graham	3245 ± 50	S-1574	Walker 1984
Thundercloud	4140 ± 90	S-3645	Mack 2000
Redtail	3480 ± 80	S-3372	Ramsay 1993
	3470 ± 80	S-3373	Ramsay 1993
	3660 ± 75	S-3008	Ramsay 1993
	3860 ± 70	S-3374	Ramsay 1993
	3880 ± 70	S-3375	Ramsay 1993
	4280 ± 80	S-3009	Ramsay 1993
Crown	2010 ± 100*	S-2557	Quigg 1986
	3330 ± 110	S-2292	Quigg 1986
	3425 ± 105	S-2291	Quigg 1986
	3600 ± 80	S-2554	Quigg 1986
	3995 ± 80	S-2526	Quigg 1986
	3610 ± 105*	S-2524	Quigg 1986
Sjovold	3530 ± 115	S-2062	Dyck and Morlan 1995
	4130 ± 205*	S-1770	Dyck and Morlan 1995

* indicates rejected dates

Many surface collections of McKean complex projectile points have been reported from areas surrounding the Quill Lakes. Several Duncan/Hanna points were recorded from collections in the Yorkton area, along Arm River, Lanigan Creek and Last Mountain Lake (Conaty et al. 1988:15-16). Conaty et al. (1988:15-16) also recorded sites with Duncan/Hanna points south of the Qu'appelle and in the Birch Hills area. Points were also identified from the Nipawin district (Finnigan et al. 1983). Ramsay (1998) reported a strong McKean presence in the Archie Campbell collection from the Bjorkdale region. Gryba (1976, 1977, and 1981) identified many McKean complex diagnostics from the Swan River Valley in Manitoba.

4.3.5 Pelican Lake Complex

Diagnostic projectile points of the Pelican Lake complex are well known across Saskatchewan (Dyck 1983) and the Northern Plains (Foor 1982; Reeves 1983). Pelican Lake points recorded from the collections correspond well with most Pelican Lake components described for the Northern Plains. Although Pelican Lake is considered widespread throughout the region, there are few excavated, dated components in the region surrounding the study area (Table 4.11).

Table 4.11. Selected Pelican Lake complex radiocarbon dates.

Site	Date (rcybp)	Lab Number	Reference
Newo Asiniak	3025 ± 215*	S-2764	Kelly 1986; Walker 1988
Cline	2925 ± 110	S-2264	Morlan 1993
Sjovold	3275 ± 160	S-1769	Dyck 1983
	3595 ± 150	S-2061	Dyck and Morlan 1995
	2090 ± 165	S-1767	Dyck 1983
	2340 ± 120	S-3366	Dyck and Morlan 1995
	2190 ± 140	S-3367	Dyck and Morlan 1995
Wallace Adair	2335 ± 50	S-1573	Dyck 1983

* indicates rejected dates

Excavations at sites in the Opimihaw Creek valley at Wanusekwin Heritage Park have included at least one Pelican Lake component. At the Newo Asiniak site, level 4, dated to 3025 ± 215 (S-2764) rcybp, is considered Pelican Lake (Walker 1988; Kelly 1986).

The Cline locality, also located near Saskatoon, has Pelican Lake components revealed by excavation (McCann 1995). The Sjovold site, a campsite/river crossing located on the South Saskatchewan River near Outlook, has at least two dated Pelican Lake components. These two components date from 3100-3750 rcybp. Dyck and Morlan (1995) identified level 10 at the Sjovold site as Besant/Pelican Lake. The three radiocarbon dates (S-1767, S-3366, and S-3367; see Table 4.11) indicate a relatively late presence of projectile points classified as Pelican Lake in association with Besant projectile points. To the north of the study area, a Pelican Lake point was excavated at the Gravel Pit site (Klimko 1985a) along the Saskatchewan River near Nipawin.

Surface collections of Pelican Lake points are also abundant in east central Saskatchewan. Sites with Pelican Lake components were recorded in private collections at a number of sites in the Yorkton region, along Lanigan Creek, Last Mountain Lake, and Arm River, as well as a few sites south of the Qu'appelle River (Conaty et al. 1988:37). Conaty et al. (1988) also recorded sites in the Birch Hills district near the confluence of the North and South Saskatchewan Rivers. In the Saskatoon region, Pelican Lake points were identified at numerous sites including the O'Donnell (Linnamae et al. 1988) and Grandora sites (Dyck 1972). From the Archie Campbell collection from the Bjorkdale region, Ramsay (1998) reported that Pelican Lake projectile points were common and Finnigan et al. (1983) identified Pelican Lake points from the Nipawin area. Finally, Gryba (1976, 1977, 1981) notes the presence of Pelican

Lake components at several sites in the Swan River Valley in Manitoba, located to the east of the study region.

4.4 Comparison within the Middle Plains Indian Period

The Middle Plains Indian period is well represented in the collections studied from the Quill Lakes region. In all, 802 diagnostic projectile points representing a minimum of 81 components were recorded (Figure 4.50). The general trend in the study area was a gradual increase in the number of components through time. There were 8 sites with large corner-notched points. This was the first time a number of these large corner-notched points have been recorded in one general location. Mummy Cave and Oxbow components were nearly equal in site numbers and projectile points. The McKean complex had the most abundant projectile points. They outnumbered the next diagnostic type, Pelican Lake, by over 100 points while only having one less component.

The most important location during the Middle Plains Indian period was the Corley's Ridge/Kells Area. This area provided the largest samples of all point styles excluding large corner-notched points. It is uncertain if the large numbers of points at this site represent large campsites or kill sites. If one considered this site a kill site, then it would be significant given the lack of known kill sites for some of these archaeological cultures. However, the large numbers of projectile points are not out of line compared to other large campsites recorded. For example, the Gowen sites produced 110 projectile points (Walker 1992) and the Harder site (Dyck 1977) had 73 Oxbow points recovered.

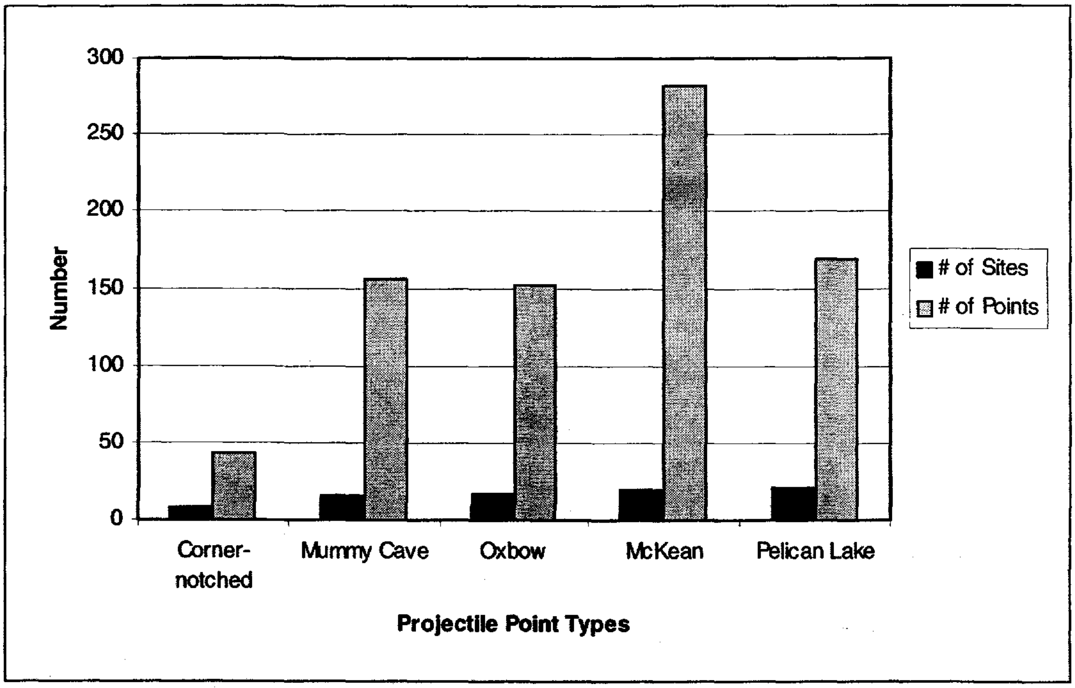


Figure 4.50. Number of sites and projectile points for the Middle Plains Indian period.

The types of lithic materials utilized to manufacture projectile points were identified for the Stachyruk collection and for large corner-notched points from all the collections examined (Figures 4.51 and 4.52). The most obvious difference within the Middle Plains Indian period assemblages is the almost exclusive use of Knife River Flint in the manufacture of the large corner-notched points. This implies a strong connection to the source area for this material in North Dakota. All other Middle Plains Indian groups examined in the Quill Lakes did not utilize Knife River Flint to the same degree. The presence of Knife River Flint was somewhat strong among Early Side-Notched points, with nearly 10% of the sample being manufactured from that material. This was nearly twice as many as the Oxbow (4.9 %), McKean Lanceolate (4.0%), and Pelican Lake (5.5%) samples. Of the 67 Duncan/Hanna points recorded from the Stachyruk collection, only one was fashioned from Knife River Flint (1.5%).

Overall, Swan River Chert was the most common lithic material utilized. For post-Mummy Cave series projectile points the utilization of Swan River Chert ranges from 60.0% to 71.6%. Nearly 50% of the Early Side-Notched points were manufactured from this material.

Another interesting difference was found with the amount of petrified peat utilized to manufacture projectile points. This material was made into Oxbow, Duncan/Hanna, and Pelican Lake projectile points. Petrified peat is normally found in southern Saskatchewan. Fused shale was favored for making Pelican Lake points compared to the other projectile points. Just over 7% of Pelican Lake points were made from this material. Fused shale is commonly found in southern Saskatchewan. Other point types that included fused shale examples were McKean Lanceolate (4.0%), Duncan/Hanna (3.0%), and Early Side-Notched (2.4%).

Apart from the large corner-notched points, the primary materials suitable for the manufacture of projectile points were from local sources (Figure 4.53). This amounts to about 92% for Oxbow, McKean Lanceolate, and Duncan/Hanna points, and just over 80% for Mummy Cave and Pelican Lake. The difference in the amount of exotic material between Oxbow/McKean and Mummy Cave/Pelican Lake points is likely cultural. The increased amount of southern lithic material suggests greater connections to the south for Mummy Cave and Pelican Lake groups. Large corner-notched points were primarily fashioned from Knife River Flint. This clearly does not match the trend observed for the other Middle Plains Indian groups.

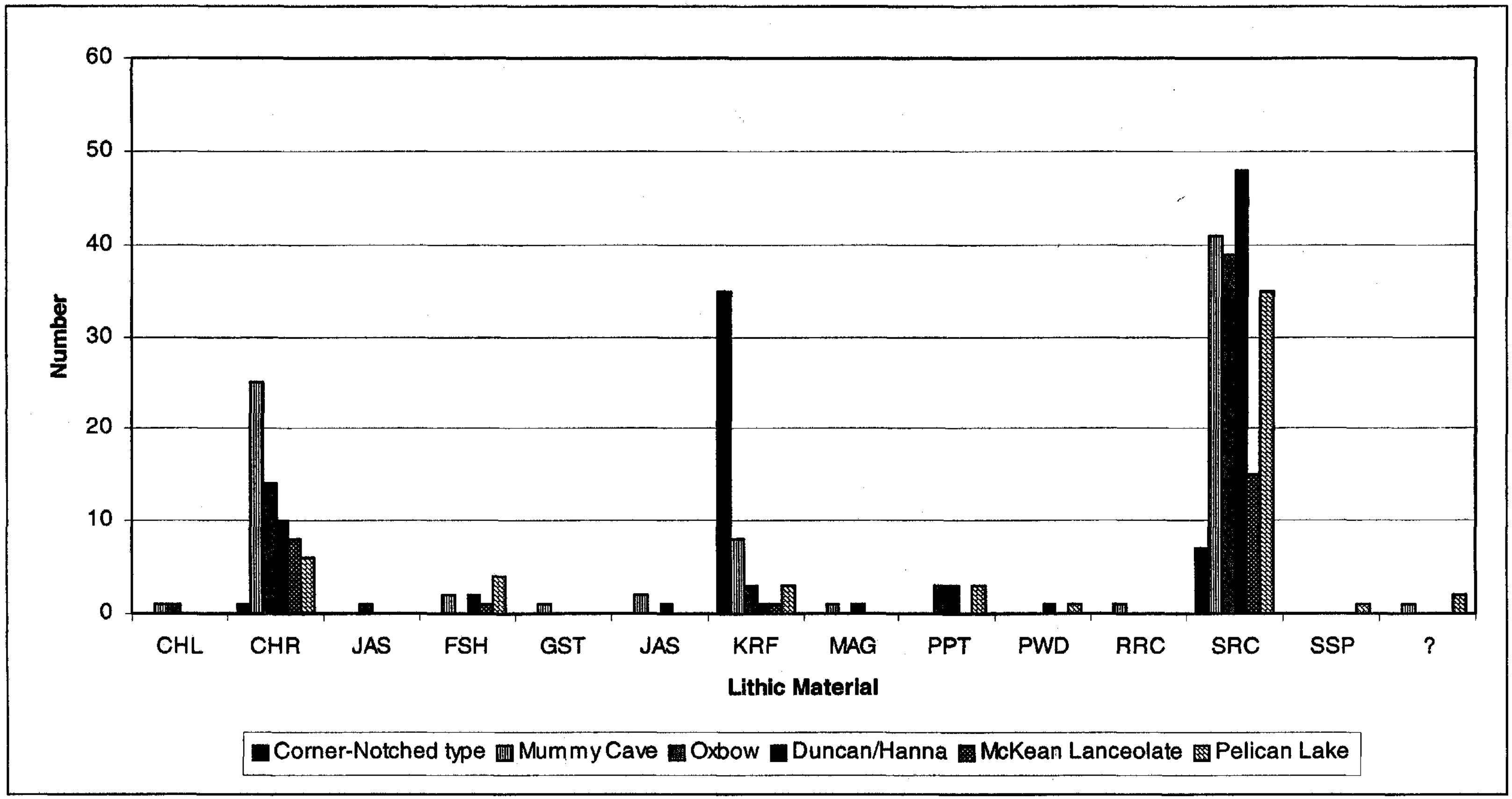


Figure 4.51. Lithic material utilized during the Middle Plains Indian period in the Quill Lakes region.

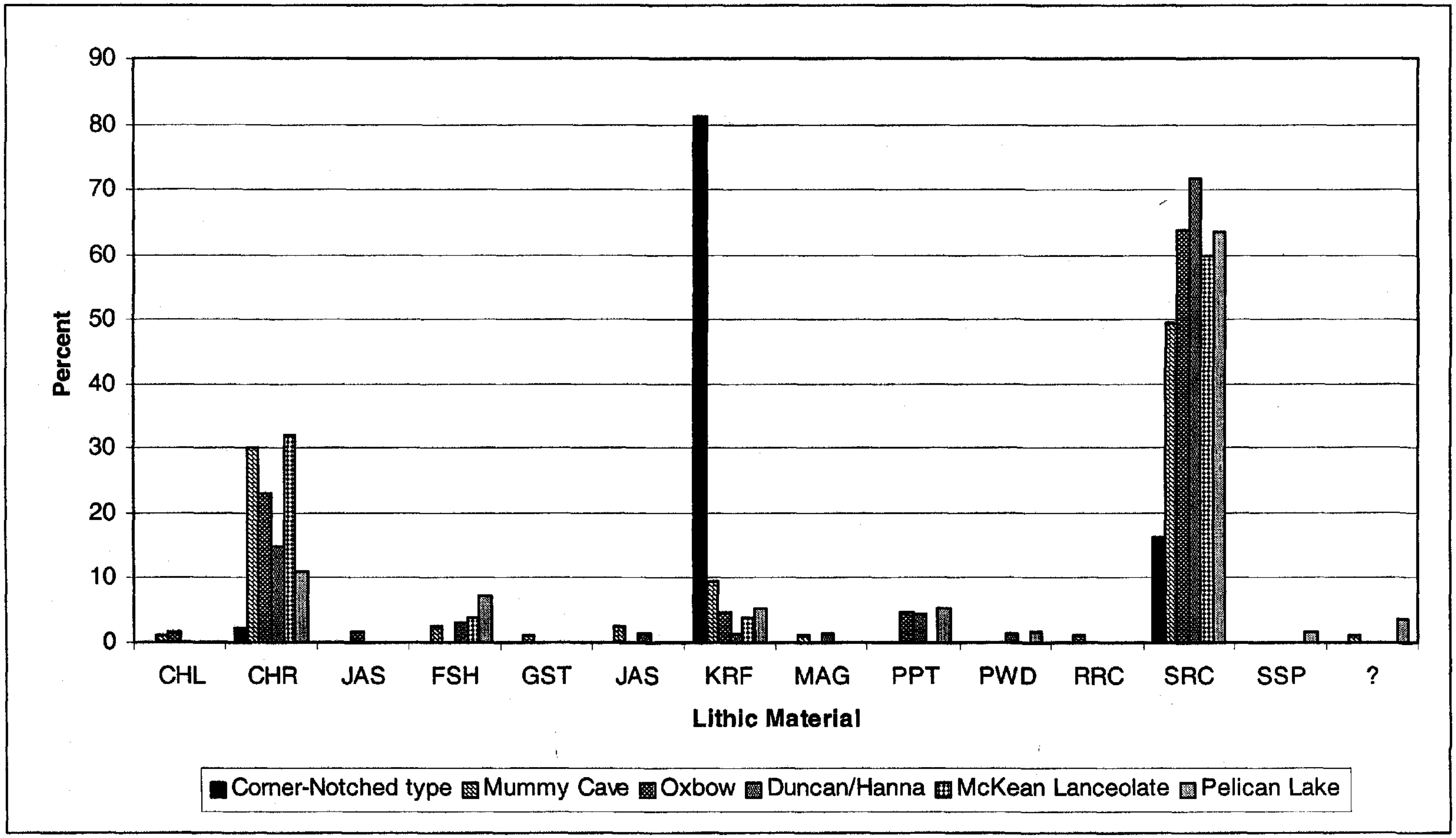


Figure 4.52. Percent lithic material utilized during the Middle Plains Indian period in the Quill Lakes region

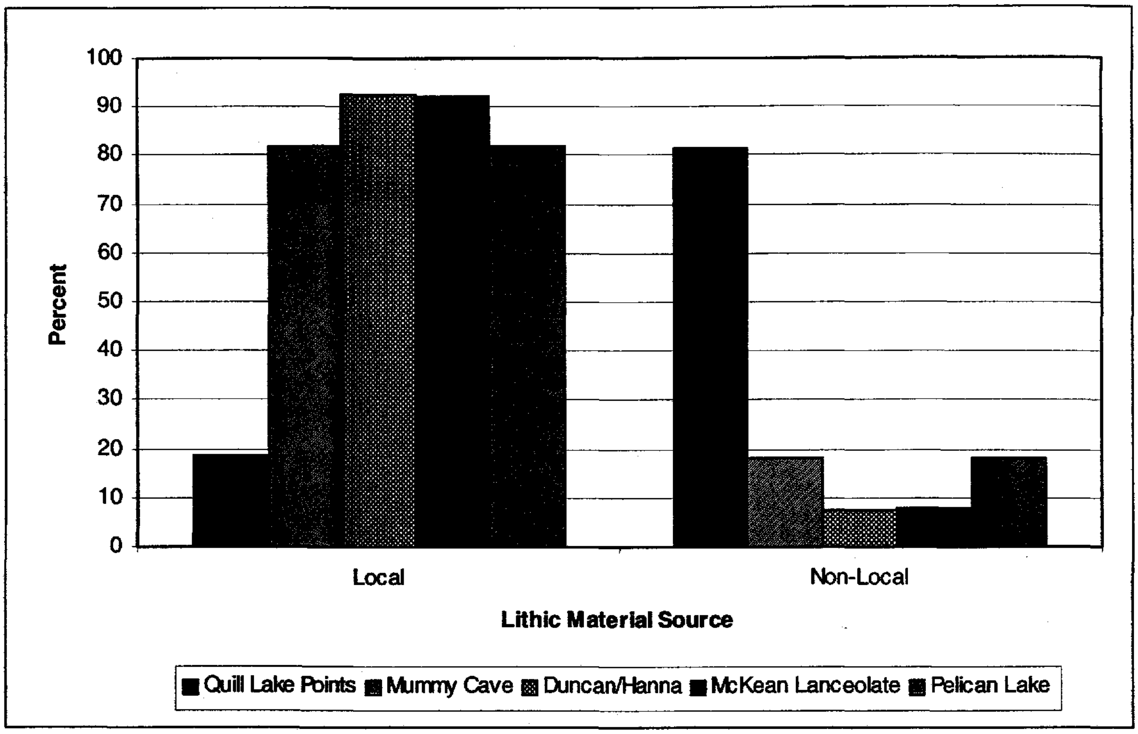


Figure 4.53. Local versus non-local lithic material for the Middle Plains Indian period.

4.5 Summary

The Middle Plains Indian period was well represented in the collections from the Quill Lakes region. An unknown archaeological culture using large corner-notched points is suggested to occupy a time early in the period. That was followed by groups using Early Side-Notched points belonging to the Mummy Cave series, which were found at a number of sites. The number of Middle Plains Indian components with diagnostic points increased slightly through time. The number of projectile points spiked upwards during the McKean complex. By far, the largest site, in terms of numbers of projectile points for all types except the large corner-notched, was the Corley's Ridge/Kells area.

The lithic materials utilized suggest a strong preference for local materials, in particular Swan River Chert. The exception is, of course, the large Knife River Flint corner-notched point type. Slightly higher amounts of southern exotic lithics were noted for Early Side-Notched and Pelican Lake than for Oxbow and McKean complex points.

Chapter 5

The Late Plains Indian Period

5.1 Introduction

The Late Plains Indian period, according to Dyck (1983:110) is marked by the introduction of pottery and bow and arrow technologies. However, the bow and arrow technology was not used exclusively at first. It remained of minor importance until the Avonlea phase, well into the Late Plains Indian period, while users of Pelican Lake projectile points probably used bow and arrow technology during the last part of the Middle Plains Indian period. Therefore, the onset of ceramic technology appears to be the important technological marker.

The Late Plains Indian period begins with the Besant series. Historically, Besant points were first described from the Mortlach site (Wettlaufer 1955). Wettlaufer described them as:

> Short and broad with shallow side notches and a slightly concave base. This base is thinned by striking a number of flakes off the base running toward the tip. The practice is the cause of the slight concavity in the base and creates "lugs" or "tangs" at the corners of the base (Wettlaufer 1955:44).

Traditionally, Besant components in Saskatchewan have been dated from about 2000 – 1150 rcybp (Dyck 1983:113). A recent analysis of the Sjovold site (Dyck and Morlan 1995) near Outlook defined the Besant series and described three projectile point types. Dyck and Morlan (1995:379) defined the Bratton point as a notched point where the notches are located at the baso-lateral juncture or no more than 1mm above this point. The bases are convex (between 1-7mm). The lateral edges are generally straight to slightly concave. They noted that this projectile point is commonly found in both Pelican Lake and Besant components. Therefore, according to Dyck and Morlan (1995) the Bratton point type is relatively long lived (3000-1300 B.P.) and if accepted in the Besant series this might push the earliest dates back a thousand years. Bratton points are persistent, but relatively scarce in the archaeological record.

Wettlaufer (1955) originally defined Sandy Creek points in a separate archaeological culture, but Dyck and Morlan (1995:398) included it in the Besant series. Sandy Creek points are side-notched with a concave base, large, and often made from Knife River Flint. Outlook Side-Notched (Dyck and Morlan 1995:437) was the third point type identified for the Besant series. These points have a straight base (± 1mm), broad u or v notches close to the basal edge, often removing 1-2mm of it. The blade edge is generally slightly convex and the cross-section is biconvex or plano-convex.

Ceramics are relatively scarce in Besant components. Besant ceramics are best known from Besant related Sonota burial mounds located in North and South Dakota (Neuman 1975). Neuman (1975:93) described them as conoidal with cord marked or plain exteriors, and grit and sand temper. Decoration normally consisted of a row of punctates along the rim of the vessel. Besant pottery has been identified at a number of sites in Saskatchewan (Meyer and Rollans 1990). Important sites include Walter Felt (Kehoe 1964) and Garratt (Morgan 1979).

Avonlea succeeds Besant on the Northern Plains. Although radiocarbon dates for each overlap, Morlan (1993:40) note that in Saskatchewan, Besant components are found consistently below Avonlea and therefore provide no definitive evidence of overlap. Kehoe and McCorquodale (1961a) defined the Avonlea projectile point type from the Avonlea type-site in southern Saskatchewan. They described the point as:

> a delicate point, made on a thin flake. Workmanship is excellent, with flake scars broad and shallow and both faces usually entirely dressed. Side notches on the triangular point are small, shallow, but fairly wide, and placed extremely low on the blade. The notches are V or U-shaped, never rectangular; they are equidistant from the base and symmetrically opposed (Kehoe and McCorquodale 1961a:137).

Avonlea ceramics are well known on the Northern Plains. These conoidal vessels have net-impressed (Byrne 1973, Morgan 1979), parallel-grooved (Fraley and Johnson 1981, Johnson 1988), or plain exteriors. Quigg (1988) described a globular vessel with a plain exterior from a site in Montana. This vessel was decorated with cord-wrapped tool impressions on the exterior lip portion of the vessel.

The Late Side-Notched series replaces Avonlea. In Saskatchewan, the Late Side-Notched series are points traditionally referred to as Plains and Prairie Side-Notched types (Kehoe 1966b). Prairie Side-Notched points are characterized by relatively poor flaking, with wide and shallow V- to U-shaped notches placed low on the point (Kehoe 1966b:830). Plains Side-Notched points are well made and generally have straight bases with small, deep, and narrow notches placed relatively high on the points (Kehoe 1966b:832). Components with Prairie Side-Notched projectile points generally are slightly older than those with Plains Side-Notched points.

Ceramics are associated with Plains and Prairie Side-Notched projectile points. Pottery associated with Prairie Side-Notched points is generally known as Old Women's pottery while ceramics found with Plains Side-Notched points are known as Mortlach. Based on this association between projectile points and pottery, Peck and Ives (2001) have proposed a new system of nomenclature for the projectile points. They noted that projectile points in good context with Mortlach ceramics have distinctive square bases, with square and deep notches high from the base. They suggested these points should be called Mortlach points. They also suggested that all of the other points belong to the Caley type.

The Historic period is recognized with the arrival of Europeans in the region for the purposes of exploration, the fur trade, and settlement. By the end of the 19th century, European settlement was well on its way in most parts of Saskatchewan.

5.2 Late Plains Indian Components Identified from the Study Area

5.2.1 Besant Series

From the collections studied, 254 Besant projectile points were recorded from 16 sites (Figures 5.1 and 5.2; Table 5.1). In addition, two projectile points were found during the site surveys. The number of Besant points should be considered a minimum because of some of the difficulties in distinguishing between some Early Side-Notched points and Besant forms. If there was any doubt about how to classify a point, then that point was considered non-diagnostic and left out of the count. Of the 254 points, the overwhelming majority was considered to belong to the Outlook Side-Notched type. Bratton points were scarce (n=41) with the majority identified at ElNe-7 (n=31). No examples of Sandy Creek points were recorded. No ceramics diagnostic of the Besant series were noted. Besant projectile points from the Stachyruk collection are shown in Figures 5.3 – 5.6. In addition, Bratton points from the Bob and Laureen Hamilton collection are shown in Figure 5.7.

Besant points were found at sites in different topographic settings. A source of water was an important factor regarding site selection. On the flat glacial plain and the

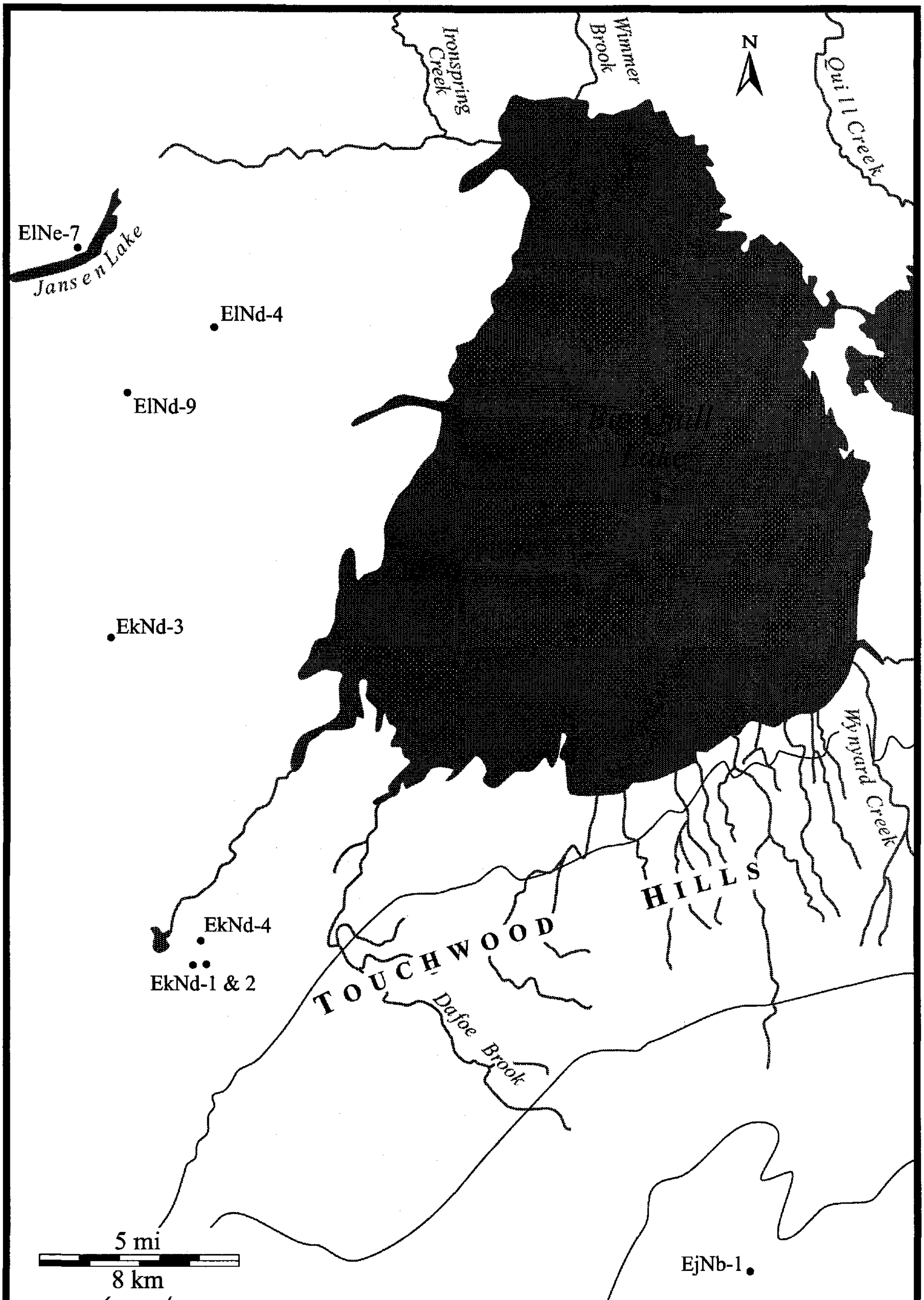


Figure 5.1. Distribution of Besant components in the Quill Lakes region (west half).

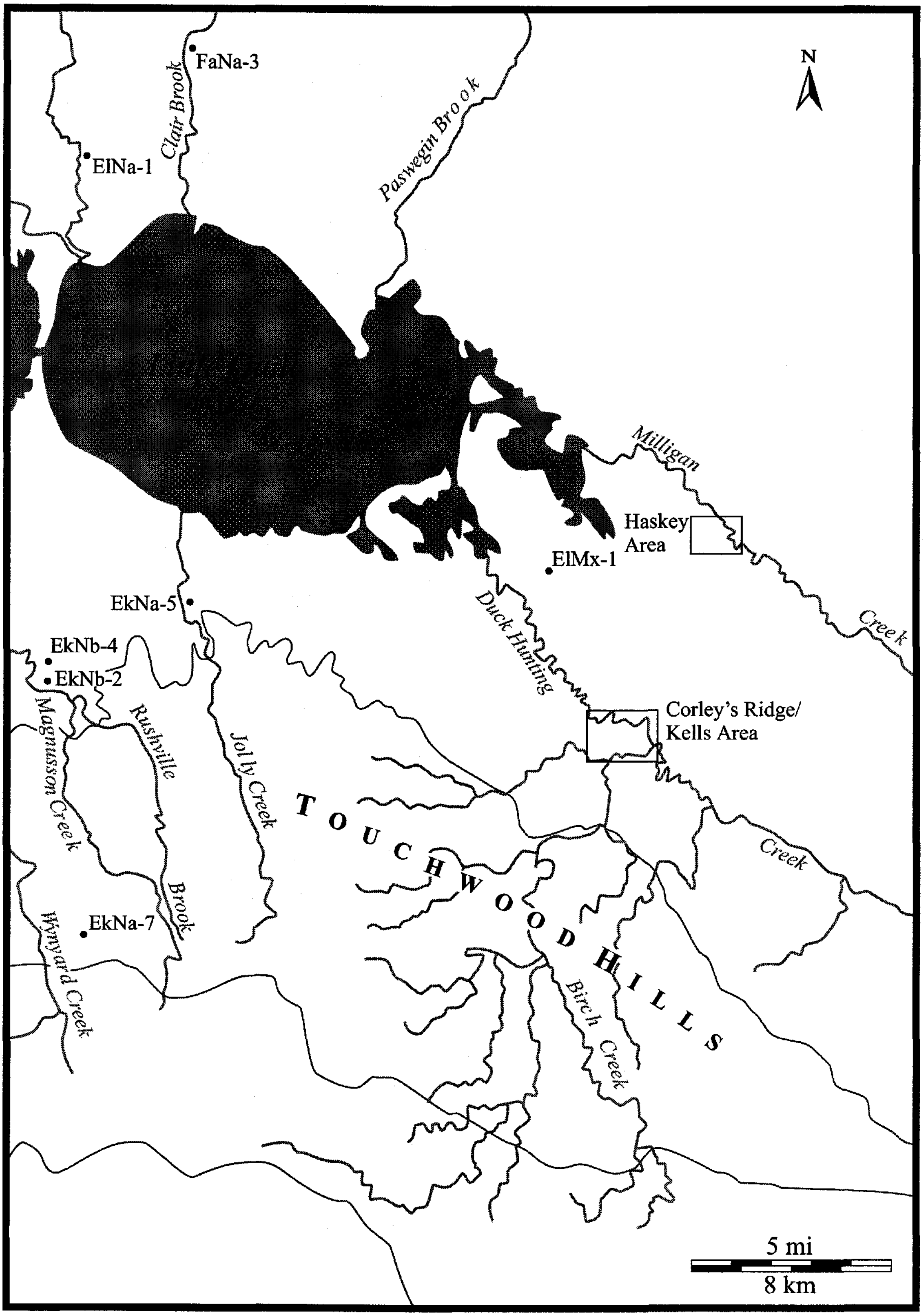


Figure 5.2. Distribution of Besant components in the Quill Lakes region (east half).

Table 5.1. Sites bearing Besant series projectile points in the Quill Lakes region.

Site	Collector	# Diagnostic Points	Site Total
EjNb-1	Stachyruk	2	2
ElNa-1	Stachyruk	1	1
EkNa-7	Stachyruk	1	1
Haskey	Stachyruk	6	
	Kerluke	3	9
Corley's Ridge/Kells site	Stachyruk	63	
	Kerluke	2	
	Yurach	10	
	Malinowski	59	
	Knight	2	136
ElMx-1	Kerluke	3	
	Novecosky	1	4
EkNa-5	Yurach	15	15
EkNb-2	Yurach	10	10
EkNb-4	Yurach	1	1
North of Wynyard	Yurach	5	5
EkNd-4	J. Hamilton	9	9
ElNd-4	J. Hamilton	4	4
EkNd-1 & 2	Wildeman	7	7
EkNd-3	Wildeman	5	5
ElNe-7	B&L Hamilton	37	37
ElNd-9	B&L Hamilton	6	6
FaNa-3	U. Of S.	1	
	Novecosky	1	2
Total			**254**

north slopes of the Touchwood Hills, all of the sites were in close proximity to water (i.e. creeks). Two points were found at EjNb-1. This site was situated at the base of a prominent hill in the Touchwood Hills. Sites located west of Big Quill Lake were in hummocky moraine characterized by numerous sloughs and poplar bluffs. The site with the majority of Bratton points was located close to Jansen Lake.

The largest site was the Corley's Ridge/Kells area. Nearly 55% of the projectile points came from this area. More specifically, the majority of points appear to have been found in the same area (EkMx-2). From the Stachyruk collection just over 80% of Besant series points were found at this spot.

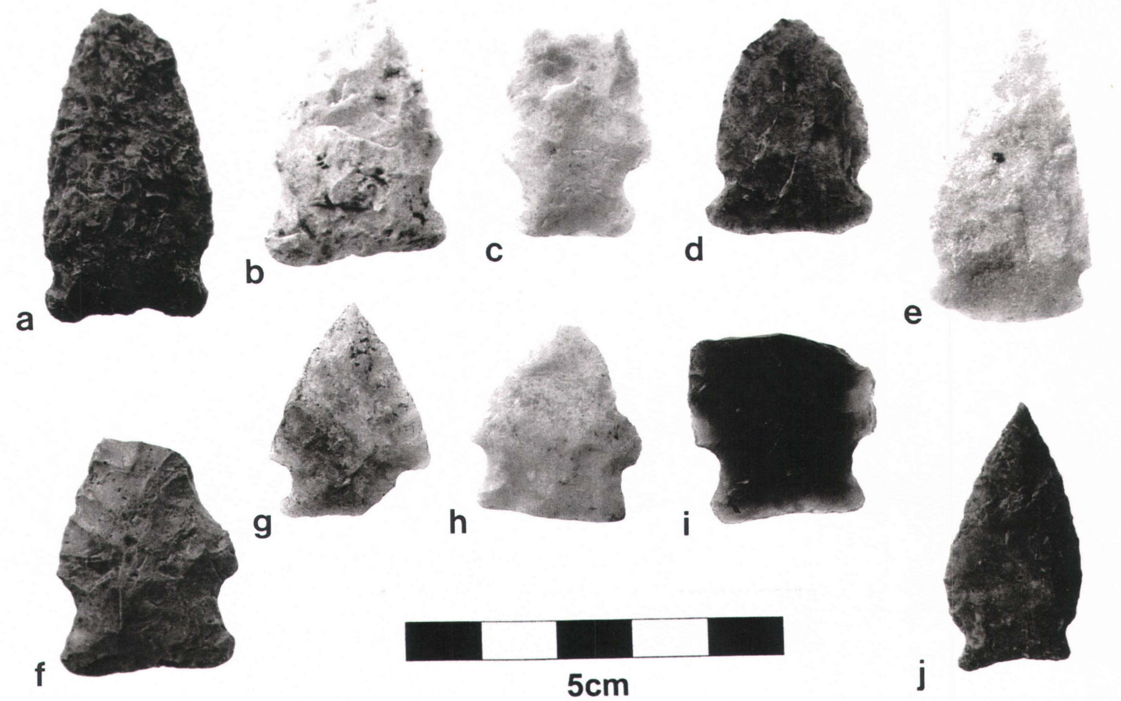


Figure 5.3. Besant projectile points from the Corley's Ridge/Kells area.

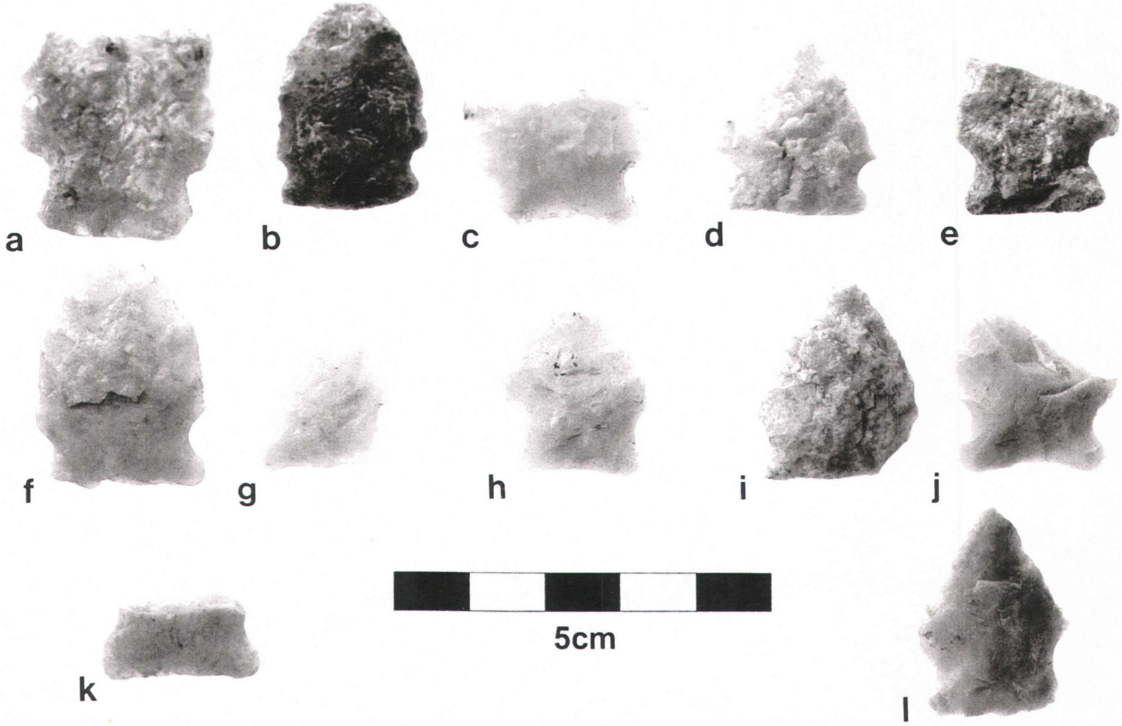


Figure 5.4. Besant Projectile points from the Corley's Ridge/Kells area.

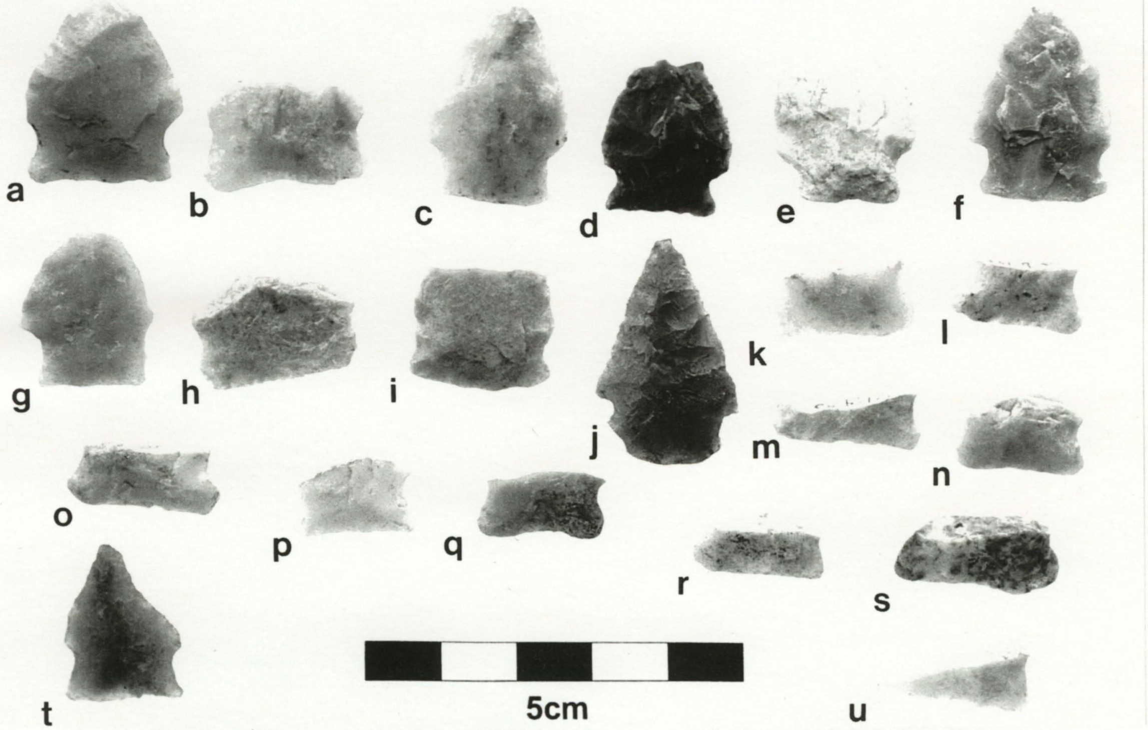


Figure 5.5. Besant projectile points from the Corley's Ridge/Kells area.

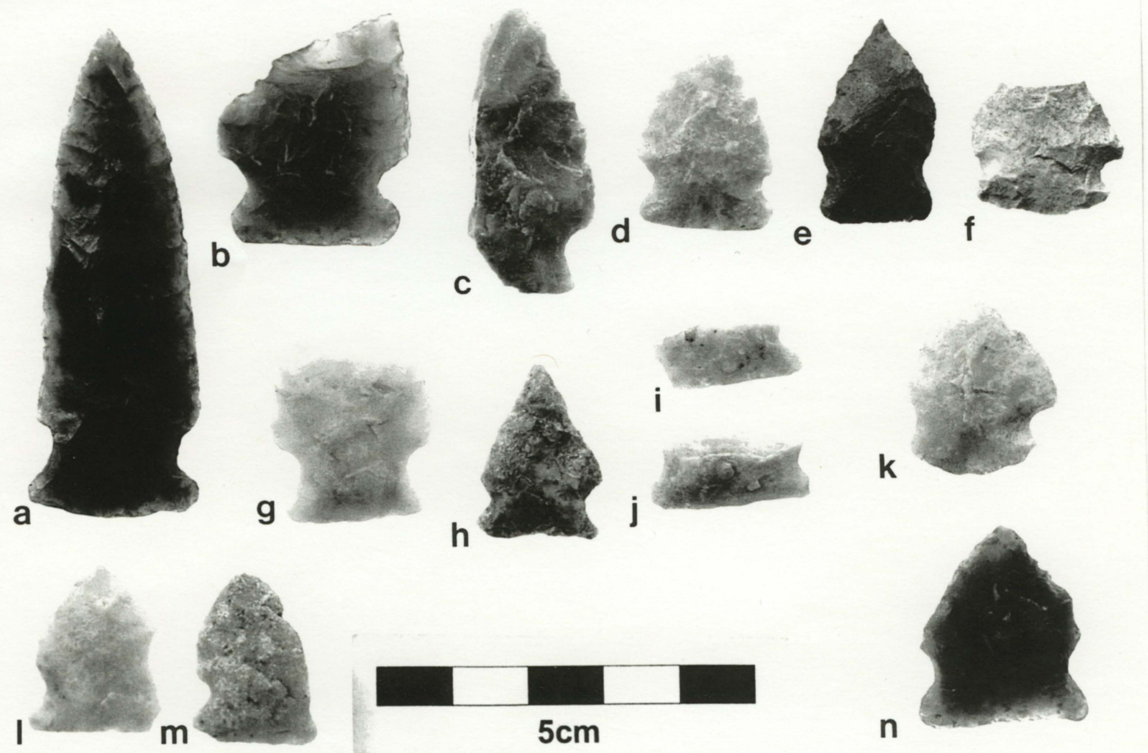


Figure 5.6. Besant projectile points; Corley's Ridge/Kells area: a – k; EjNb-1: l, m; EkNa-7: n.

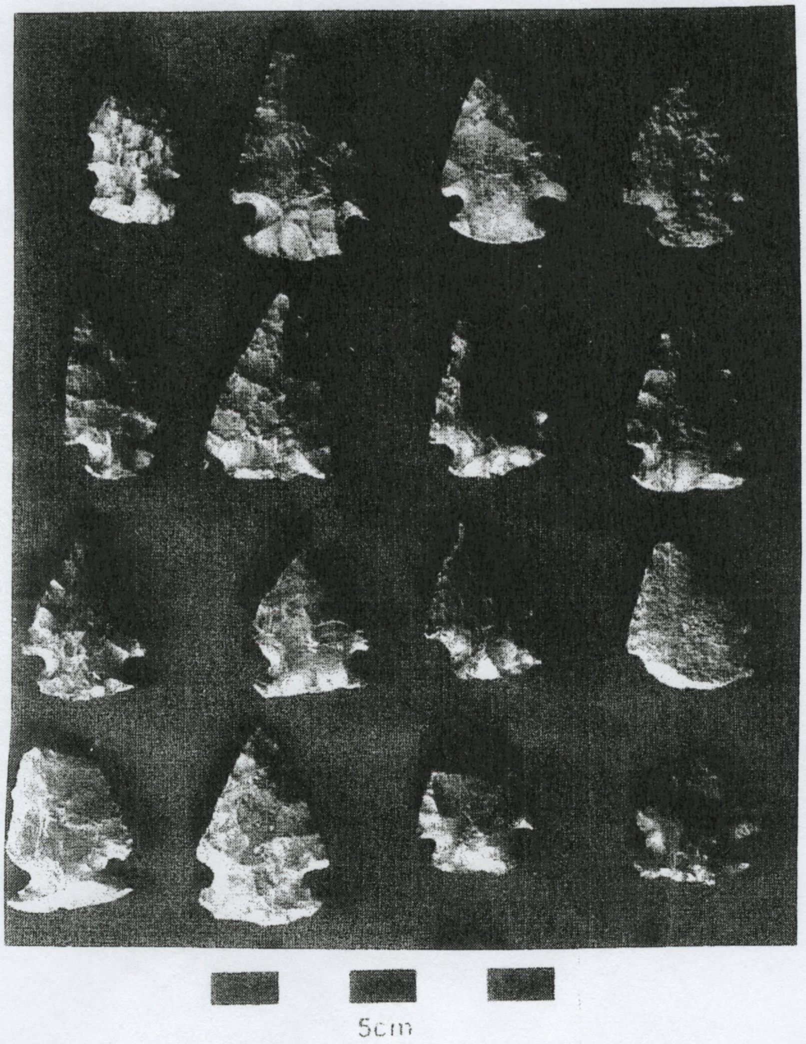


Figure 5.7. Bratton projectile points from ElNe-7.

Sites north of Wynyard along Magnusson Creek also have produced a number of diagnostic points. This area includes EkNb-2 and EkNb-4. Nearly 10% of all the diagnostic Besant points were recorded from this area. East of this spot, EkNa-5 also had a number of Besant points identified at it (n=15). This site, like the ones north of Wynyard, was associated with a glacial beach ridge and an intermittent creek.

Site ElNe-7 had the largest number of Besant points west of Big Quill Lake. The majority of the points from this site (n=31, 84%) fit into Dyck and Morlan's (1995) definition of the Bratton type. The remaining Besant points appear to be Outlook Side-Notched.

The lithic material used to manufacture Besant points was examined for the Stachyruk collection (n=73). There was a high preference for Swan River Chert and other local cherts (Figure 5.8). Combined, these account for 89.2% of the material utilized to manufacture Besant projectile points. Knife River Flint was the most important exotic lithic material utilized, but its frequency of occurrence is quite low (n=4, 5.4%). Small amounts of other local (i.e. Gronlid Siltstone and petrified peat) and non-local materials (i.e. fused shale and silicified siltstone pebble chert) were also utilized.

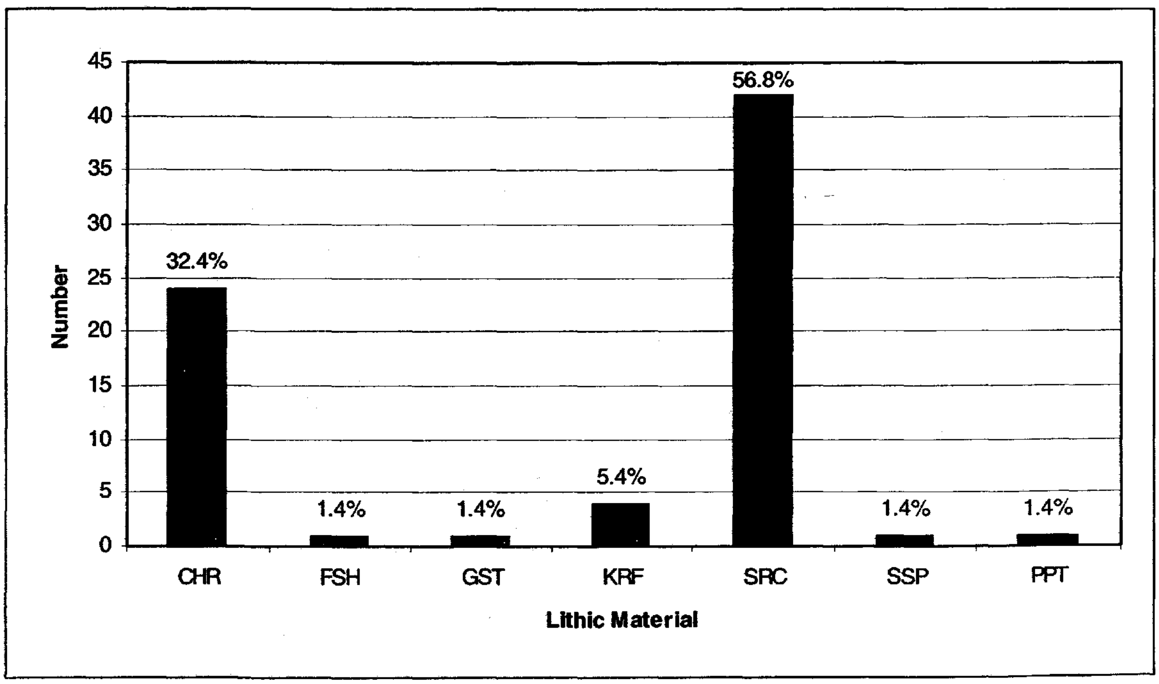


Figure 5.8. Lithic materials used to manufacture Besant series projectile points.

Silicified siltstone pebble dominates (87%) the collection of Bratton points from ElNe-7. This material is not found locally in the region. From the Stachyruk collection, only 5.7 g (0.01%) of the total 50171.1 g of lithic materials were made from silicified siltstone pebble chert. Minute amounts of this material were noted in the other collections examined. In addition to projectile points, large numbers of split silicified siltstone pebble endscrapers and debitage were collected from ElNe-7.

5.2.2 Avonlea Phase

Thirty-four Avonlea projectile points from 6 sites were recorded from the collections examined (Figures 5.9 and 5.10; Table 5.2). This is an accurate number because of the distinctive appearance of Avonlea points and the relative ease in identifying them. Avonlea projectile points from the Stachyruk collection are shown in Figure 5.11.

The site with the largest number of Avonlea points was the Corley's Ridge/Kells area (n=23, 67.6%). The remaining sites each had three or less points. The locations of these sites are in close proximity to water. In addition, Avonlea points are only found at large multi-component sites. No single component Avonlea sites were identified.

Lithic materials utilized for the manufacture of Avonlea points were examined for the Stachyruk collection (n=14) (Figure 5.12). From this small sample, it appears that cherts were the preferred material. Chert accounted for 50% of the points and Swan River Chert accounted for about 36%. The remaining points were made from non-local chalcedony and Knife River Flint.

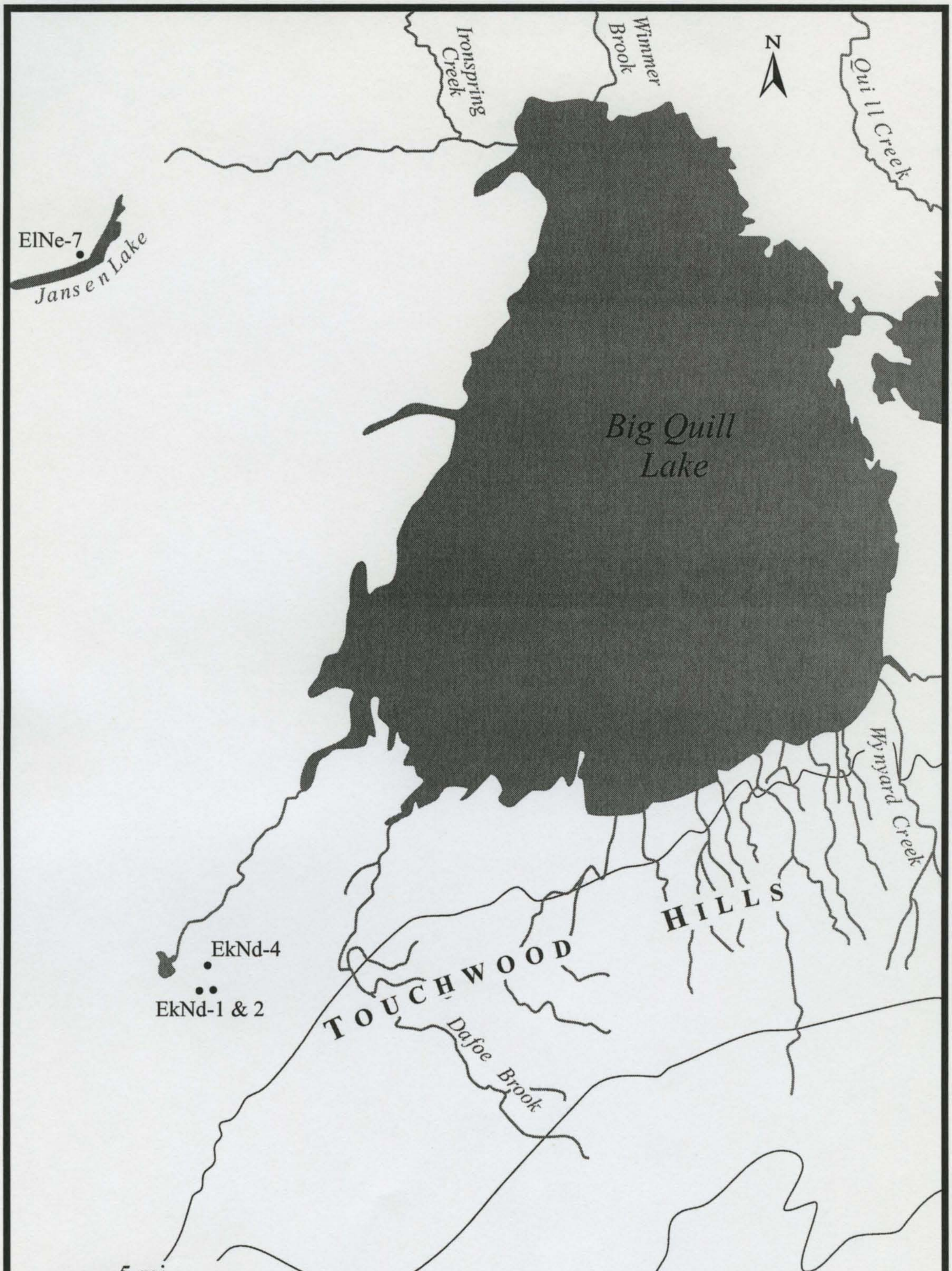


Figure 5.9. Distribution of Avonlea components in the Quill Lakes region (west half).

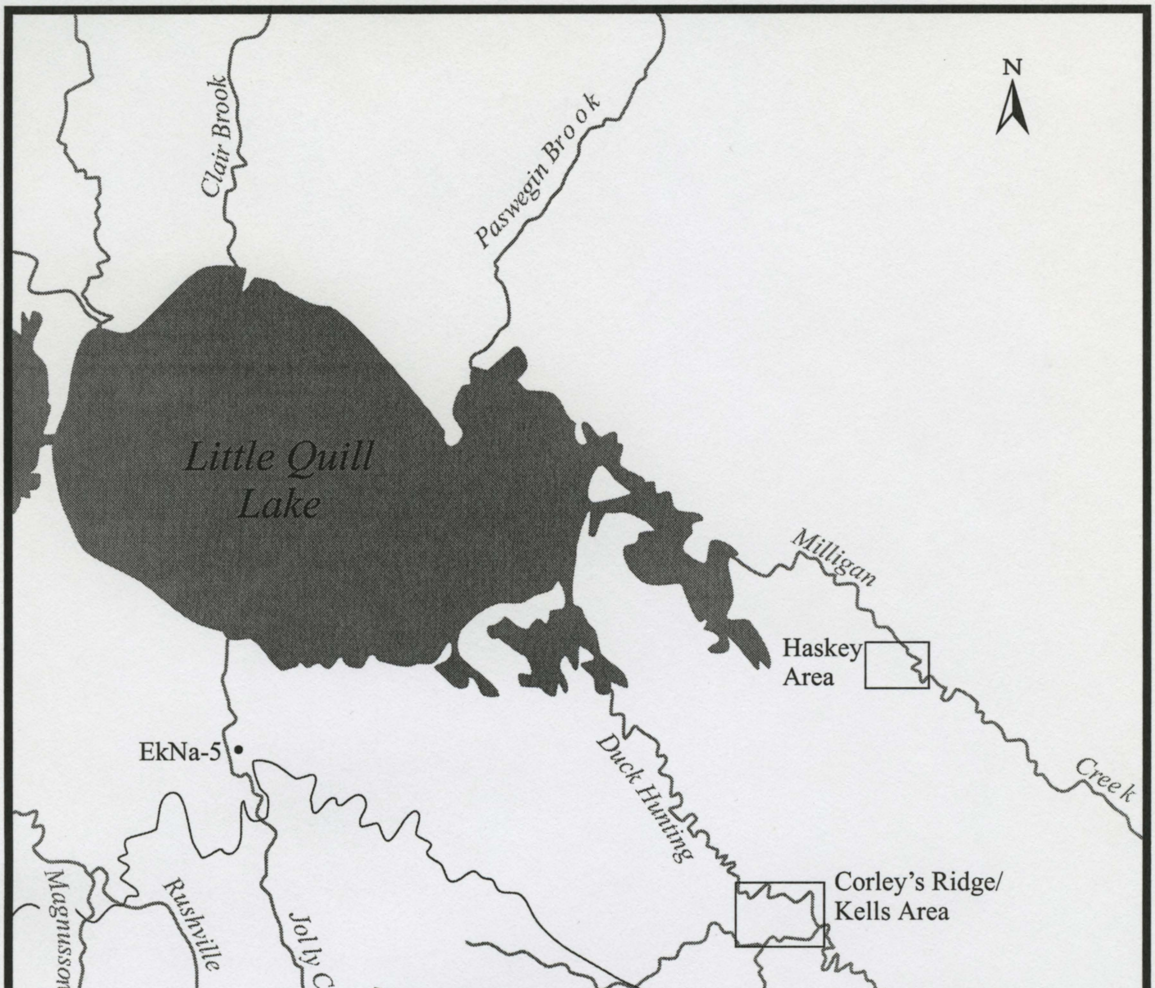


Figure 5.10. Distribution of Avonlea components in the Quill Lakes region (east half).

Table 5.2. Sites bearing Avonlea projectile points in the Quill Lakes region.

Site	Collector	# Projectile Points	Site Total
Corley's Ridge and Kells Area	Stachyruk	13	
	Yurach	1	
	Malinowski	9	23
Haskey	Stachyruk	1	1
EkNa-5	Yurach	2	2
EkNd-4	J. Hamilton	3	3
EkNd-1 & 2	Wildeman	3	3
ElNe-7	B&L Hamilton	2	2
Total			**34**

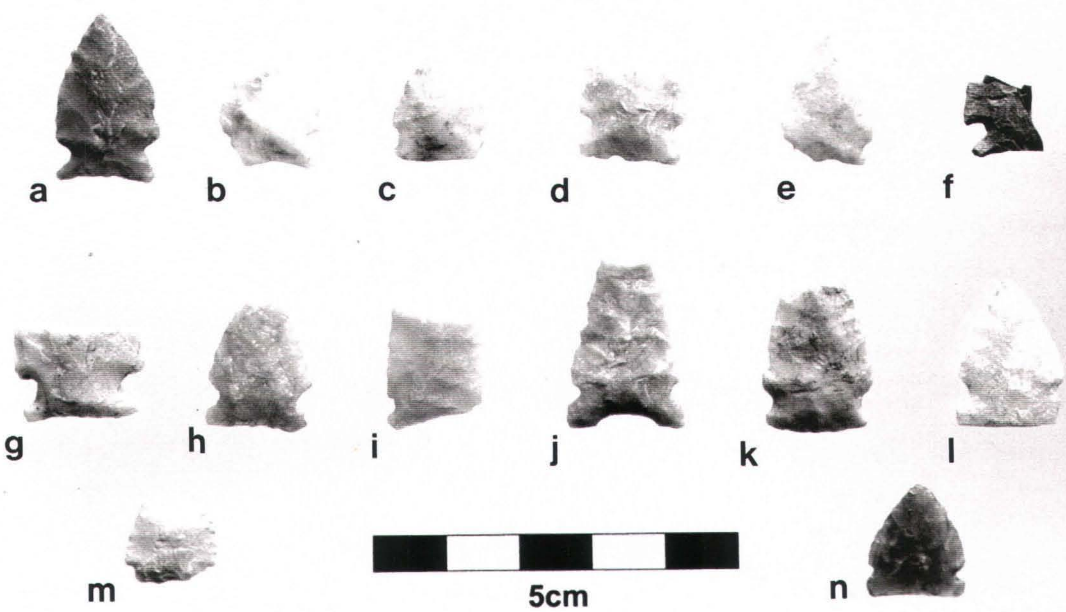


Figure 5.11. Avonlea projectile points; Corley's Ridge/Kells:a – m; Haskey area:n.

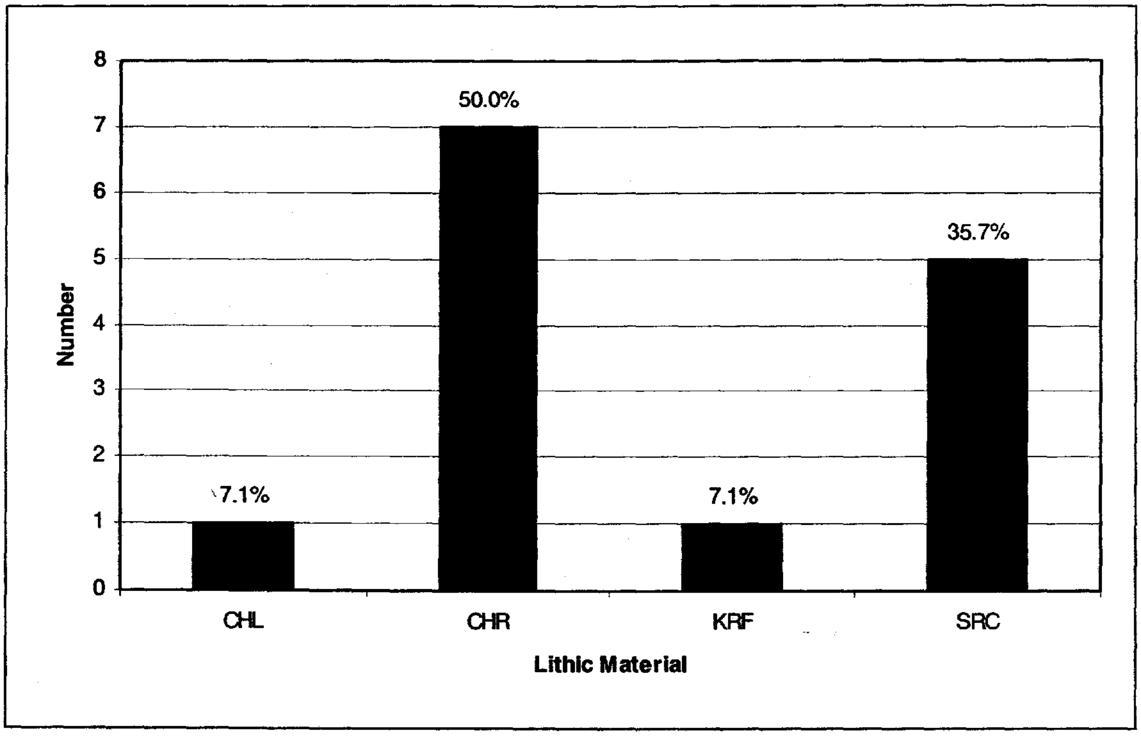


Figure 5.12. Lithic material used in the manufacture of Avonlea projectile points.

5.2.3 Late Side-Notched Series

In all, 131 diagnostic projectile points were recorded from 14 collecting locations (Figures 5.13 and 5.14; Table 5.3). Following Kehoe's (1966b) small side-notched classification system, 47 (35.9%) were identified as Plains Side-Notched and 84 (64.1%) fit into the Prairie Side-Notched type. The scheme proposed by Peck and Ives (2001) was also used to evaluate its usefulness for Late Side-Notched projectile points from the Quill Lakes region. Using the criteria described by Peck and Ives (2001) the majority of the points fall into the Cayley category (n=114; 87%). The measurements taken are presented in Appendix 2:Table 8. Examples of Late Side-Notched series projectile points from the Stachyruk collection are shown in Figures 5.15 – 5.18.

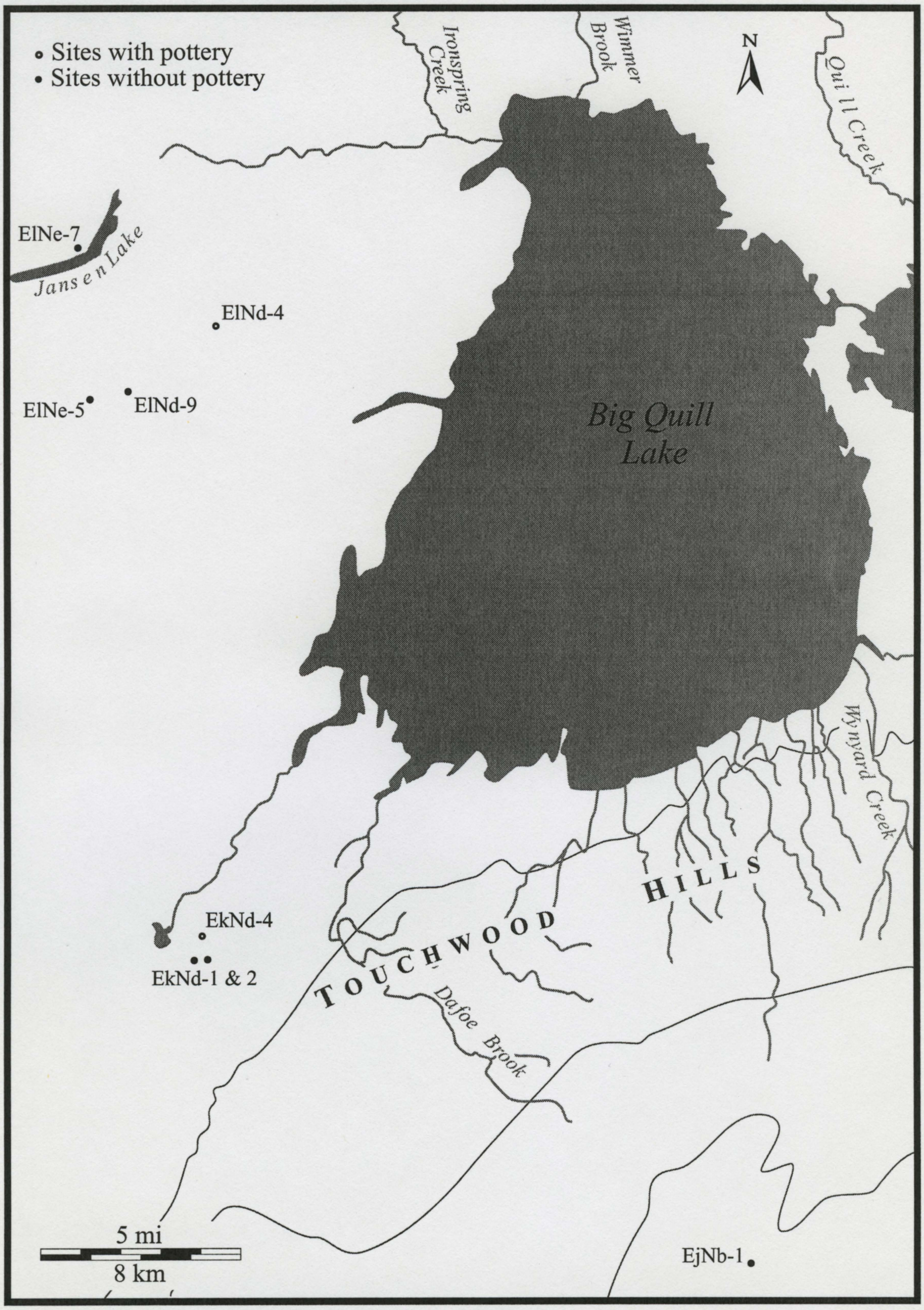


Figure 5.13. Distribution of Late Side-Notched series components in the Quill Lakes region (west half).

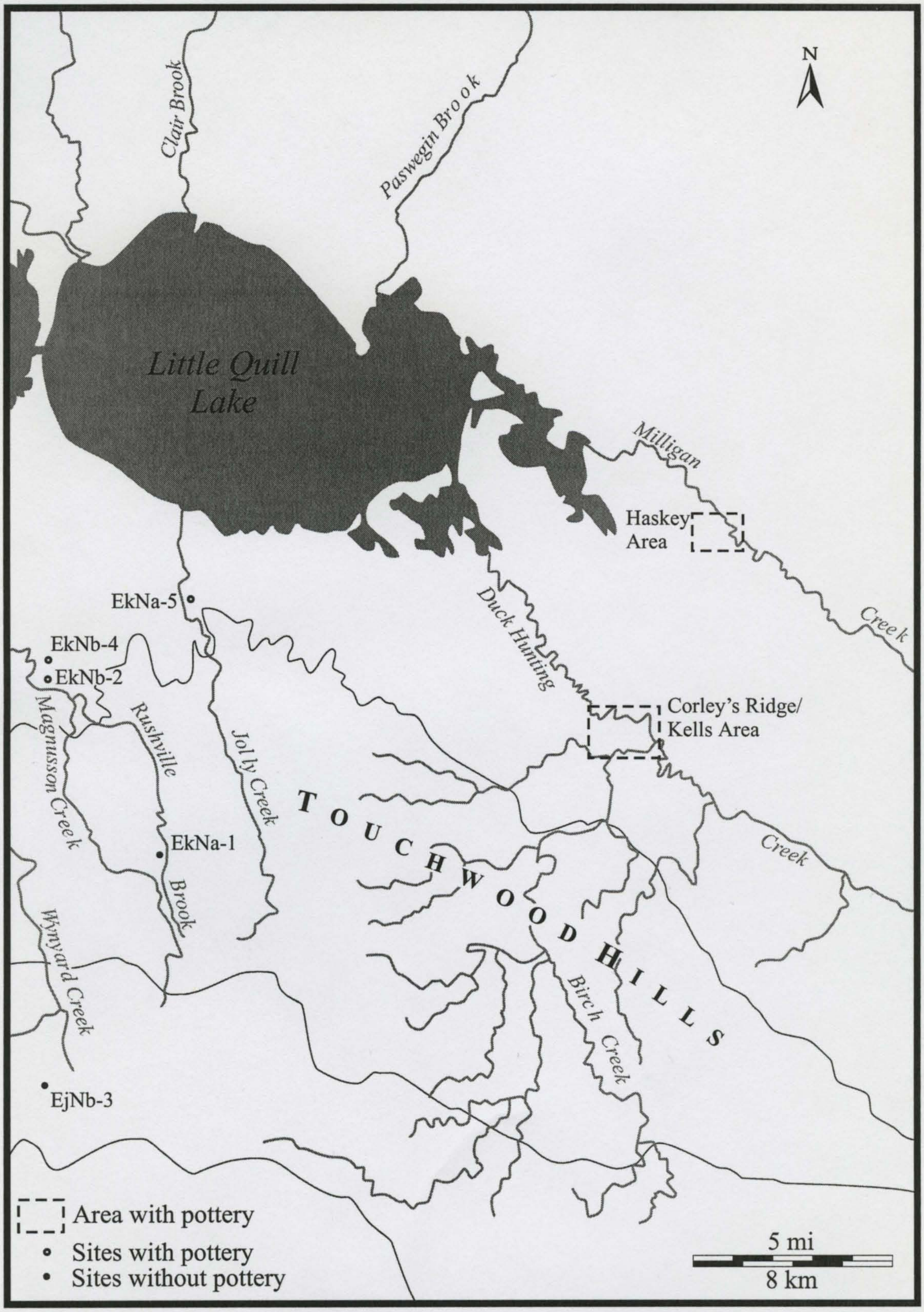


Figure 5.14. Distribution of Late Side-Notched series components from the Quill Lakes region (east half).

Table 5.3. Sites bearing Late Plains Side-Notched series projectile points in the Quill Lakes region.

Site	Collector	Plains	Prairie	Mortlach	Cayley	Site Total
EkNa-1	Stachyruk	1		1		1
EjNb-1	Stachyruk	1		1		1
EjNb-3	Yurach	1			1	1
Corley's Ridge And Kells Area	Stachyruk	12	18	1	29	
	Malinowski	14	15	1	28	
	Yurach	2		1	1	61
Haskey Area	Stachyruk		7		7	7
EkNa-5	Yurach		2		2	2
EkNb-2	Yurach	2		2		2
EkNb-4	Yurach	2		2		2
North of Wynyard	Yurach	2	2	2	2	4
EkNd-4	J. Hamilton		1		1	1
ElNd-4	J. Hamilton	1	2	1	2	3
EkNd-1 & 2	Wildeman	3	20	3	20	23
ElNd-9	B&L Hamilton	2	4		6	6
ElNe-7	B&L Hamilton	4	11	2	13	15
ElNe-5	B&L Hamilton		2		2	2
Total		**47**	**84**	**17**	**114**	**131**

The largest site was the Corley's Ridge/Kells area. From this site 61 (46.6%) Late Side-Notched projectile points were recorded, including 28 Plains Side-Notched and 23 Prairie Side-Notched points. Measurements of these points following Peck and Ives (2001) indicate different results. Eleven of the 61 points fit into the expected range for Mortlach points while the remaining fall into the Cayley category. However, when one considered the discrete attributes (i.e. notch shape and base characteristics) all but 3 points fit well into the Cayley type. In addition, measurements of the basal edge of the points from the Corley's Ridge/Kells Area suggested two temporal occupations. Cayley points defined for the period 1250-650 B.P. make up 27.9% (n=17) while Cayley points defined for 650 B.P. to present make up 44.3% (n=27). A number of points fell into the

Table 5.2. Sites bearing Avonlea projectile points in the Quill Lakes region.

Site	Collector	# Projectile Points	Site Total
Corley's Ridge and Kells Area	Stachyruk	13	
	Yurach	1	
	Malinowski	9	23
Haskey	Stachyruk	1	1
EkNa-5	Yurach	2	2
EkNd-4	J. Hamilton	3	3
EkNd-1 & 2	Wildeman	3	3
ElNe-7	B&L Hamilton	2	2
Total			**34**

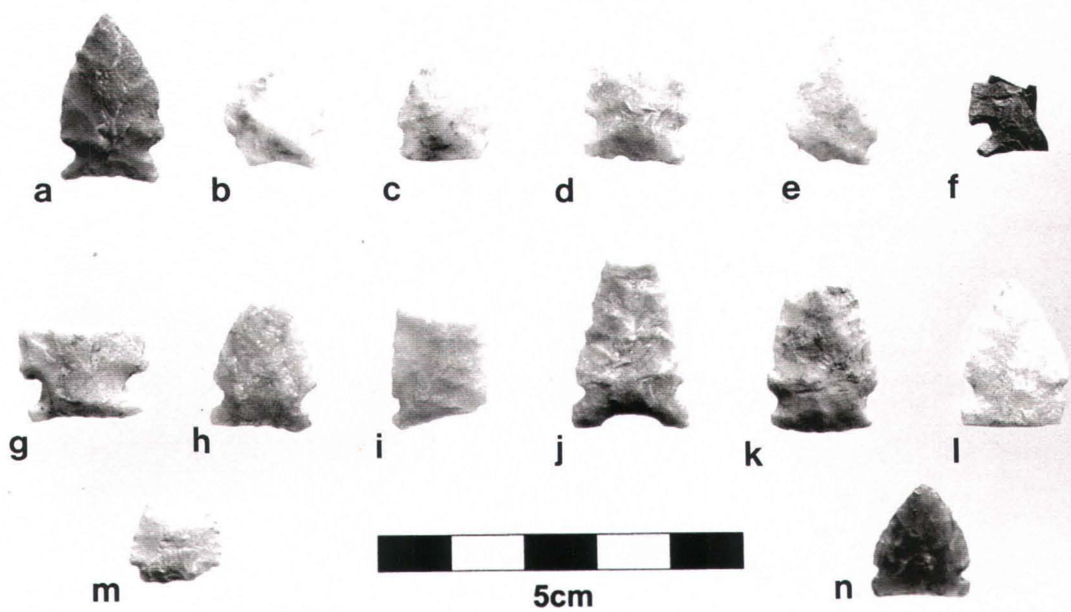


Figure 5.11. Avonlea projectile points; Corley's Ridge/Kells:a – m; Haskey area:n.

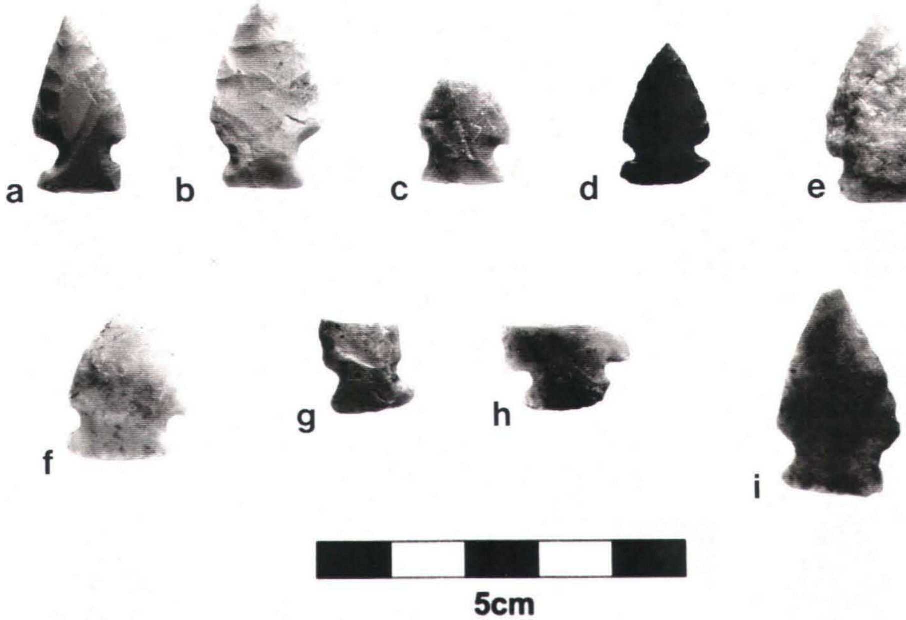


Figure 5.15. Late Side-Notched series projectile points from the Corley's Ridge/Kells area.

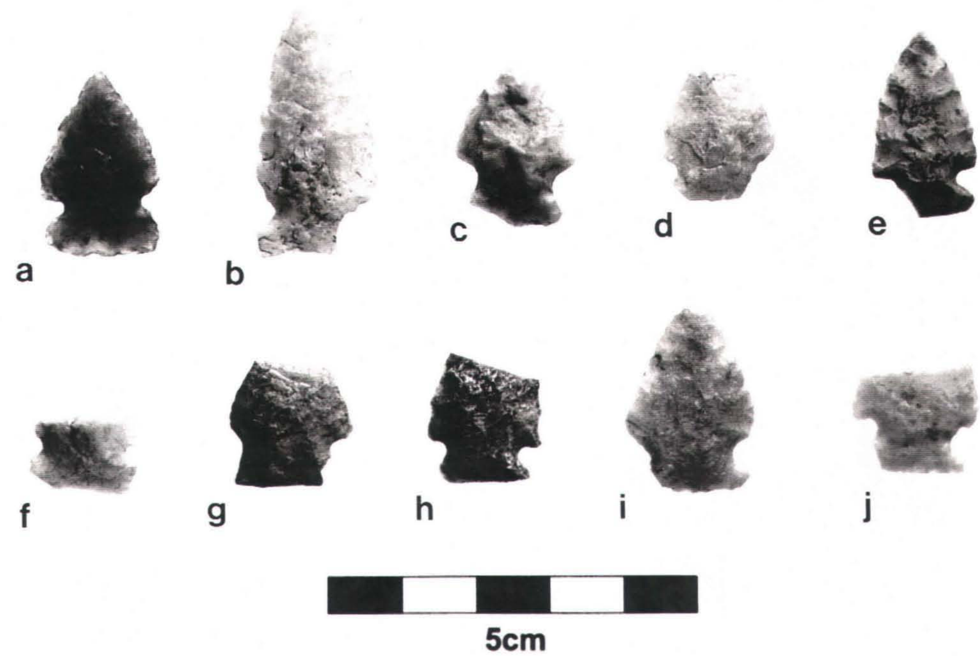


Figure 5.16. Late Side-Notched series projectile points from the Corley's Ridge/Kells area.

range for the both early and late Cayley points (11.5%, n=7) and a few were outside the range for either (16.4%, n=10).

Distribution of Late Side-Notched series components from the study area is weighted to the western half. From the eastern section, roughly east of Wynyard, there were four sites while 10 sites were recorded west of Wynyard. The majority of sites were in close proximity to a water source. From the Haskey area along Milligan Creek, 7 (5.3%) projectile points were recorded. A significant number of Late Side-Notched projectile points were found along Magnusson Creek north of Wynyard. This includes sites EkNb-2 and EkNb-4, which produced 6 Plains Side-Notched/Mortlach and 2 Prairie Side-Notched/Cayley points. This was the largest number of projectile points identified as Mortlach points from a single area.

Aside from the Corley's Ridge/Kells area, the largest number of Prairie Side-Notched points came from EkNd-1&2. At these sites, 20 Prairie Side-Notched (Cayley) and 3 Plains Side-Notched (Mortlach) points were found. At EkNd-4, just to the north, an additional Prairie Side-Notched point was recorded. In the hummocky moraine between Jansen and Leroy, four sites with Late Side-Notched series points were recorded. The largest was ElNe-7 where 11 Prairie Side-Notched and 4 Plains Side-Notched points were identified. Two of the Plains Side-Notched points could be considered Mortlach points.

Lithic materials from the Stachyruk collection were identified for the Late Side-Notched series. The results show a high preference for local materials (Figure 5.19). Swan River Chert was the most common material used to manufacture projectile points during this period (n=24, 61.5%). Other cherts were also common (n=9, 23.1%). These, together with Gronlid Siltstone, meant that locally available lithic materials accounted for 87.2% of the projectile points. Exotic lithic materials included moss agate, Knife River Flint, jasper and fused shale. The sources for these materials are located to the south of the study region.

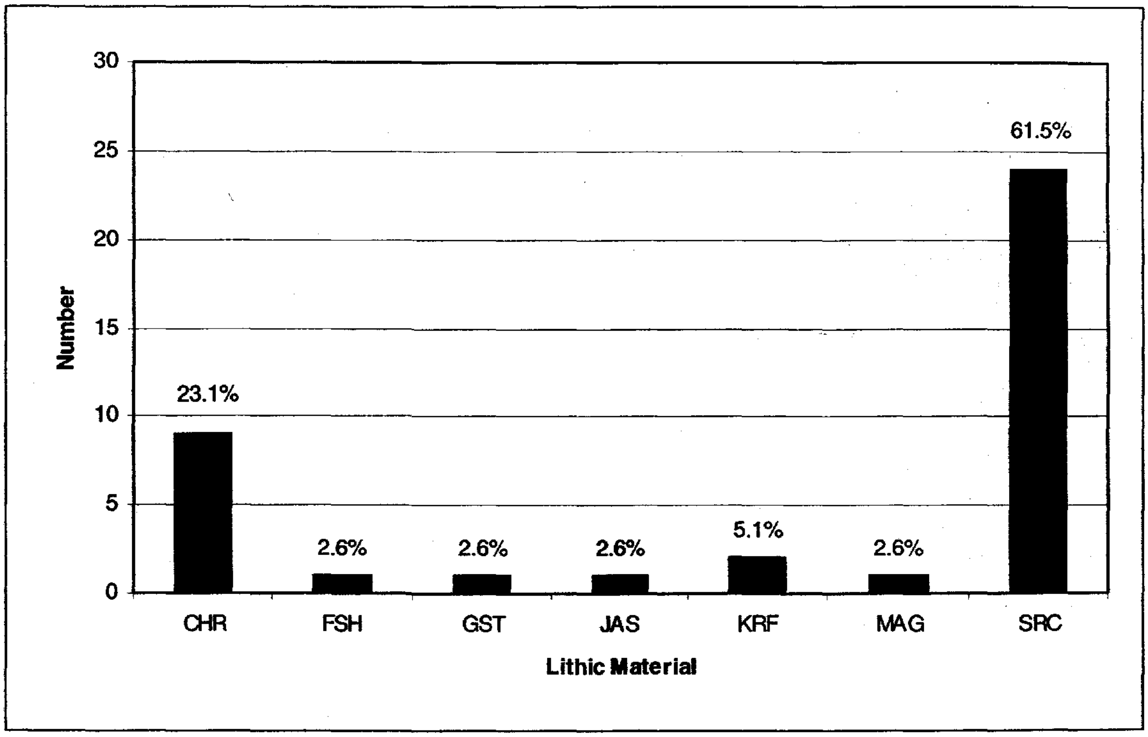


Figure 5.19. Lithic material used to manufacture Late Side-Notched series projectile points.

5.2.4 Ceramics

Ceramics were recorded from 6 areas (Figures 5.7 and 5.8; Table 5.4). A minimum of 17 vessels were identified in the collections for these sites. The largest collections came from Corley's Ridge/Kells and from 2 closely related sites north of Wynyard (EkNb-2 and EkNb-4).

Table 5.4. Sites bearing ceramics in the Quill Lakes region.

Site	Collector	# Sherds	# Vessels	Total # Vessels
EkNb-2 & 4	Yurach	92	6	6
Corley's Ridge And Kells Area	Stachyruk	15	1	
	Malinowski	3	3	
	Rorquist	?	3	7
ElNd-4	J. Hamilton	2	1	1
EkNd-4	J. Hamilton	2	1	1
EkNa-5	Novecosky	1	1	1
Haskey	Stachyruk	2	1	1
Total				**17**

EkNb-2 & EkNb-4

A summary of selected attributes is presented in Table 5.5. All of the sherds except for one rim/shoulder fragment and two body sherds are from the collection of Ed Yurach. The pottery from this site is fragmentary with most sherds less than 3 cm in diameter. Despite the small sample, the pottery from these sites most closely resembles pottery identified as Mortlach.

Rim sherds (n=7)

Two rim sherds represent Vessel One (Figure 20:a). The exterior cord-roughened surface appears to have been smoothed slightly. The orientation of the cord-roughened impressions is slightly left oblique. A remnant of a horizontal CWT impression is located 25 mm from the lip surface. The interior of the two sherds has been smoothed. Horizontal striations are visible.

One rim sherd represents Vessel Two (Figure 20:b). This sherd is heavily carbon-stained. The lip profile has a slight interior flange. No decoration is noted on this vessel. The interior of the vessel is smooth.

Table 5.5. Summary of vessel characteristics from EkNd-2 and EkNd-4.

	Vessel 1	Vessel 2	Vessel 3	Vessel 4	Vessel 5	Vessel 6
Rim Profile	n/a	n/a	n/a	n/a	n/a	n/a
Paste Texture	slight laminations	slight laminations	slight laminations	slight laminations	slight laminations	slight laminations
Temper Size	medium grit	coarse grit	medium grit	sand	fine grit	medium grit
Temper Amount	medium	medium	sparse	med.	sparse	sparse
Exterior Finish	cord-roughened	fabric	plain	indeterminate	indeterminate	indeterminate
Lip Profile	interior bevel/flange	interior flange	expanding	round	indeterminate	interior flange
Lip Surface Decoration	none	fabric impressed	2 horizontal CWT	hollow tool	right oblique CWT	right oblique CWT
Inner Lip Edge Decoration	none	none	none	none	indeterminate	none
Outer Lip Edge Decoration	none	none	none	none	none	none
Outer Rim Decoration	horizontal CWT	n/a	n/a	n/a	horizontal CWT	n/a
Inner Rim Decoration	none	n/a	n/a	n/a	n/a	n/a
Lip Thickness	10.5 – 11.1 mm	8.9 – 10.0 mm	8.1 – 8.3 mm	7.1 – 7.3 mm	7.3 mm	6.5 mm
Rim Thickness (25 mm below lip)	n/a	n/a	n/a	n/a	n/a	n/a

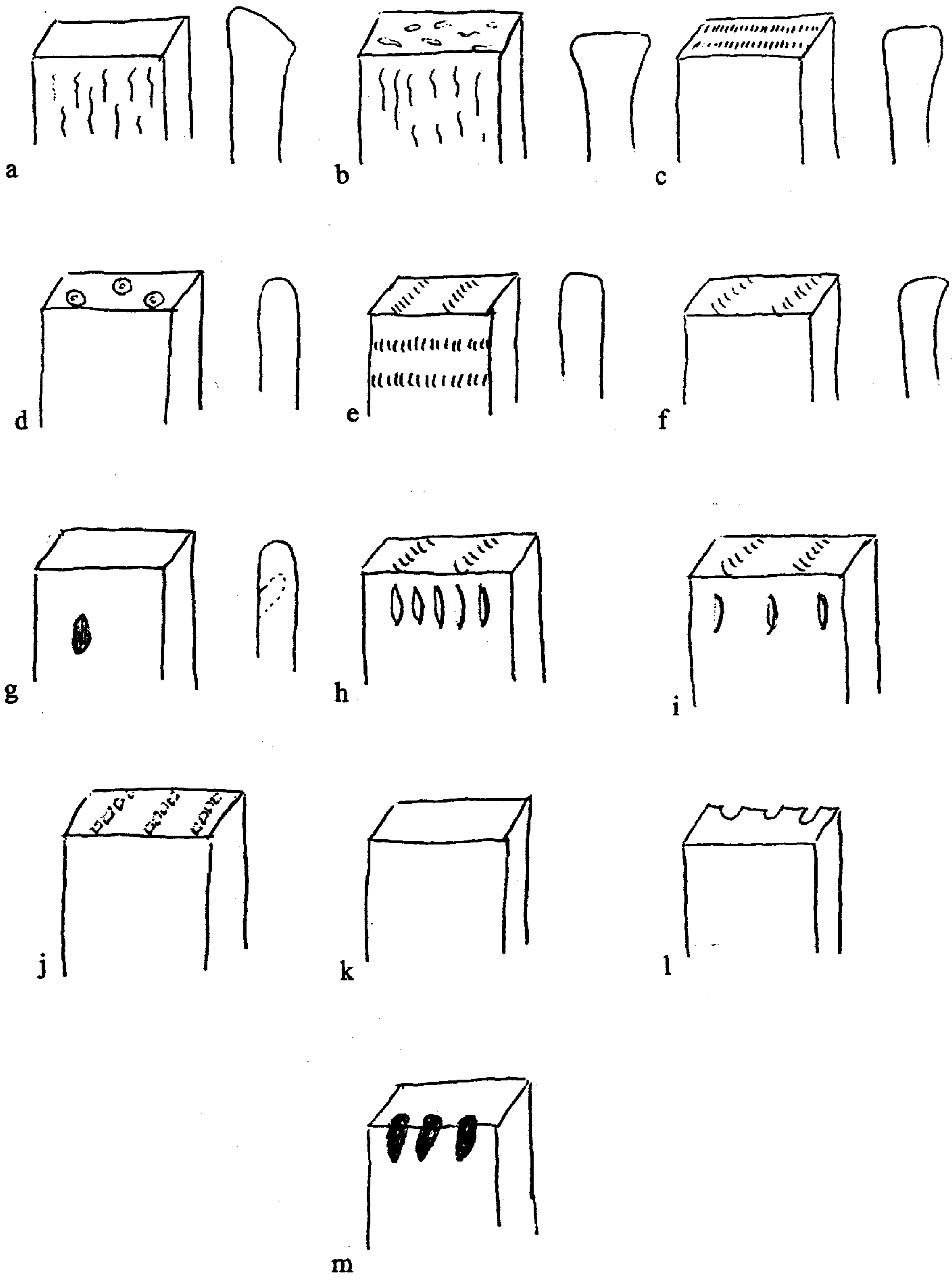


Figure 5.20. Schematic representation and profiles of pottery vessels; EkNb-2 & EkNb-4: a – f; Corley's Ridge/Kells area: g – m. Profiles are drawn with the exterior on the left side. No profiles were drawn for vessels h – m.

Vessel Three is represented by a single small, thin rim sherd (Figure 20:c). The decoration on the lip consists of two parallel CWT lines. The impressions are 1.9 mm wide and 2.0 mm apart. The exterior line is 1.6 mm from the outside lip edge while the interior line is 1.7 mm from the inside lip edge. The interior of the vessel has been smoothed.

A single rim sherd represents Vessel Four (Figure 20:d). This small sherd displays decoration on the round lip surface. The decoration consists of a series of hollow tool impressions alternating between the interior edge and the exterior edge of the lip surface. The impressions were made at a slight angle toward the interior of the vessel. They are 3.1 mm long, 2.3 mm wide, and about 1.2 mm deep. The two impressions on the interior portion of the lip are located 4.1 mm apart. The interior has been smoothed.

A single rim sherd represents Vessel Five (Figure 20:e). Decoration on the lip consists of two right oblique CWT impressions. The impressions are 2.1 mm wide and 2.9 mm apart. On the exterior, two horizontal lines of CWT are present starting 5.1 mm below the lip surface. The CWT impressions are 2.2 mm wide. The remnant of a second row starts 3.6 mm below the first. Not enough remains of the interior surface of the vessel to determine its treatment.

A small, highly eroded rim sherd represents Vessel Six (Figure 20:f). The remnants of right oblique CWT impressions were identified on the surface of the lip. No other decoration was noted for this sherd. The interior of the sherd has been smoothed.

Shoulder/Angled Neck Sherds (n=12)

Three angled shoulder/neck sherds have a plain surface finish. The decoration consists of right oblique CWT 3.4 mm wide and 5.5 mm apart. The interiors are smooth. The sherds have medium-grained grit temper and are slightly laminated.

Three angled shoulder sherds have no decoration. The exterior is cord-roughened. The cords are oriented vertically on two, but one contains both vertical and horizontally orientated impressions. The paste is slightly laminated, the temper sparse and comprised of medium-grained grit. The interior of the sherds is plain and carbon residue adheres to the interior of one sherd.

Two angled shoulder sherds with hollow tool gouge decoration were recorded from Mr. Yurach's collection. An identical third sherd was found while surveying EkNb-4. The hollow tool gouges are 9.7–10.5 mm long, 3.2–4.4 mm wide and 1.8–2.0 mm deep. The impressions are placed in a horizontal row at the angle of the sherd, and spaced 3.5–4.6 mm apart. The paste is slightly laminated and the temper is sparse, medium-grained grit. The exterior surface is cord-roughened; the interior is plain.

Two angled sherds are decorated with impressed triangles. They are placed at the juncture of the angle. The impressions are 5.1–5.6 mm wide, 4.3–4.7 mm high and 1.2–1.5 mm deep. The paste is slightly laminated and the temper is sparse, medium-grained grit. The exterior surfaces are cord-roughened; the interiors are plain.

Horizontal and vertical lines made with sharp incisions, superficially resembling CWT impressions, were identified on one small angled sherd. There are four horizontal rows, which are 2 mm wide and 2.9 mm apart. Overlying the horizontal rows is a group of two vertical lines. These are 2 mm wide and 1.1 mm apart. The paste is slightly laminated and the temper is sparse, medium-grained grit. The exterior surfaces are cord-roughened; and the interiors are plain.

Neck/Rim Sherds (n=6)

Three neck/rim sherds are undecorated. They have vertically orientated cord-roughened impressions. The paste is slightly laminated. The temper is sparse, medium-grained grit. The interior of the sherds is plain. One sherd has carbon residue adhering to the interior surface.

One neck/rim sherd is highly decorated. It has a horizontal line of CWT impressions 4.1 mm wide. Next to this row, 4.9 mm away, is a horizontal line of vertically oriented hollow tool gouges. They measure 7.5–7.7 mm long, 3.3 mm wide and 1.5–1.7 mm deep. Another horizontal row of hollow tool impressions is located 5.3 mm away from this row. This row includes two poke-marks and two gouge-marks. The measurements are similar to the first row and were likely made with the same tool. The paste is slightly laminated. The temper is sparse, medium-grained grit. The exterior surface is cord-roughened. The interior of the sherds is plain.

Two sherds display lines of horizontal CWT. The lines are about 3.9 mm wide and about 3.4 mm apart. The paste is slightly laminated. The temper is sparse, medium-grained grit. The exterior surface is cord-roughened. The interior of the sherds is plain.

Unidentified Decorated Sherds (n=10)

Horizontal lines of CWT impressions characterize 5 of the decorated sherds. There are up to 4 lines that average 2.5 mm wide and are spaced 3.7–4.0 mm apart. The temper is sparse, medium-grained grit. One additional sherd also has horizontal lines (minimum four) of CWT impressions. However, these impressions are 3.4 mm wide and are spaced about 2.4–3.8 mm apart. The temper is medium-grained grit and medium in quantity. The paste of all of the sherds is slightly laminated. The exterior surfaces are indeterminate. The interiors of the sherds are plain.

Four sherds are characterized by a single row of CWT impressions. On two sherds, this impression is 1.7 mm wide. The paste is slightly laminated. The temper is medium-grained grit and medium in quantity. The exterior surface is indeterminate. The interior of the sherds is plain. On the other two sherds the CWT impression is 2.9 mm wide. These sherds have a cord-roughened exterior finish. The temper is coarse-grained and medium in quantity. All of the sherds are slightly laminated.

Body Sherds (n=57)

A slightly laminated paste characterizes all of the sherds. The temper is medium-grained grit and medium in quantity. A cord-roughened exterior is evident on 23 sherds. Seventeen sherds are either fabric impressed or are cord-roughened, but smoothing or erosion has obscured the original surface treatment. In addition, 17 vessels are plain. Six of these appear to have been intentionally smoothed or burnished on the interior.

Corley's Ridge/ Kells Area

The sherds from three collections (Rorquist, Stachyruk, and Malinowski) were examined and seven vessels were identified from this site area. Only rim sherds from the Rorquist and Malinowski collections were recorded. Limited information from these rim sherds was recorded in the field and much of the information was derived from colour slides taken of the pottery. Like Mr. Yurach's pottery collection, Mr. Stachyruk's pottery was examined in detail. A summary of attributes is presented in Table 5.6. This pottery is identified as Mortlach.

Vessel One (Figure 5.20:g) is represented by one rim sherd. This sherd appears to be decorated with a row of punctates. The single punctate on the vessel is 5.1 mm long, 3.8 mm wide, and 2.9 mm deep. It is slightly angle toward the top and has created a slight boss on the interior.

Seven rim sherds represent Vessel Two (Figure 5.20:h). From the slides, it appears to have a wedge profile. The right oblique CWT impressions on the lip surface are 3.9–4.1 mm wide and spaced 3 mm apart. Below the lip is a single row of fingernail impressions. These are spaced 8.4 mm apart.

Vessel Three is similar to Vessel Two (Figure 5.20:i). The right oblique CWT impressions are 3.1–4.0 mm wide and 2.5–4.2 mm apart. The fingernail impressions below the lip edge are spaced 5.5 mm apart. A small sherd with a set of right oblique dentate impressions on the lip surface, spaced 2.8 mm apart identifies Vessel Four (Figure 5.20:j). A smooth and undecorated sherd represents Vessel Five (Figure 5.20:k). Vessel Six and Vessel Seven are similar to each other (Figures 5.20:k, l). The difference between the two is the placement of notches on the lip edge. One vessel has notches on the inner edge of the lip while the other vessel has notches placed on the exterior lip edge.

Unidentified Decorated Sherds (n=1)

A single decorated sherd (EkMx-2, cat #1632) was recorded from the Stachyruk collection. This has remnants of 2 fingernail impressions, which are spaced

Table 5.6. Summary of vessel characteristics from Corley's Ridge/Kells site.

	Vessel 1 (Cat #721)	Vessel 2 (Rorquist)	Vessel 3 (Rorquist)	Vessel 4 (Rorquist)	Vessel 5 (Malinowski)	Vessel 6 (Malinowski)	Vessel 7 (Malinowski)
Rim Profile	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Paste Texture	slight laminations	?	?	?	?	?	?
Temper Size	medium grit	? grit	? grit	?	?	?	?
Temper Amount	heavy	?	?	?	?	?	?
Exterior Finish	indeterminate	indeterminate	indeterminate	indeterminate	smooth?	?	cord-roughened
Lip Profile	round	wedge?	wedge?	round?	round	interior flange?	exterior flange?
Lip Surface Decoration	none	right oblique CWT	right oblique CWT	right oblique dentate	none	none	none
Inner Lip Edge Decoration	none	none?	none?	none?	none	notches	none
Outer Lip Edge Decoration	none	none	none	none	none	none	notches
Outer Rim Decoration	oval punctates	horizontal fingernail	horizontal fingernail	n/a	none	none	none
Inner Rim Decoration	slight boss	?	?	?	none	none	none
Lip Thickness	5.7 mm	?	?	?	~5.5 mm	~7.2 mm	~7.2 mm
Rim Thickness (25 mm below lip)	n/a	n/a	n/a	n/a	n/a	?	?

8.5 mm apart, are similar to the fingernail impressions seen on Vessel Two, and which may belong to that vessel.

Body Sherds (n=14)

Six body sherds with plain surfaces were recorded from the Stachyruk collection for EkMx-2. The sherds from EkMx-2 have a slightly laminated paste. The temper is abundant and comprised of coarse-grained grit. An additional sherd was found while visiting site EkMx-3. This sherd has an indeterminate finish and the paste is slightly laminated. The temper is fine-grained grit and sparse in amount. Seven sherds from the Stachyruk collection have an indeterminate exterior finish. The paste is slightly laminated. The temper is coarse-grained grit and medium in abundance. All the body sherds range in thickness from 3.8–9.1 mm.

Haskey Area

Two sherds were recorded for this area from the Stachyruk collection. One sherd from ElMw-4 (catalogue #149) is an exfoliated sherd. The paste is highly laminated. The temper is coarse-grained grit and heavy in abundance. The second sherd is from ElMw-6 (catalogue # 33). This sherd has a cord-roughened exterior finish. The paste is slightly laminated. The temper is fine-grained grit and is sparse. The thickness ranges from 4.1 mm – 5.6 mm.

Yaskowich Site (EkNa-5)

A single body sherd (catalogue #7) was found during the survey of this site. The exterior finish is smoothed cord-roughened. The paste is slightly laminated. The grit is fine-grained and sparse. The sherd is 5.9 mm – 6.4 mm thick.

Bert Pumford Site (EkNd-4)

Two sherds were recorded from this site. No further information about the sherds is available. The sherds were identified from photographs of Joe Hamilton's collection. This collection was not personally examined.

Rosner Site (ElNd-4)

Two sherds were identified from photographs of Joe Hamilton's collection. A single rim sherd appears to have vertically orientated cord-roughened impressions. No other decorations could be discerned. One other sherd from this site may be a body sherd.

5.3 Discussion

5.3.1 Besant Series

There have been numerous radiocarbon dates for Besant components from areas west and south of the Quill Lakes (Table 5.7). Long sequences of Besant occupations at the Sjovold site (Dyck and Morlan 1995), the Mortlach site (Wettlaufer 1955), and the Walter Felt site (Kehoe 1974) form the basis for much of the chronological information known for Besant in Saskatchewan. Besant materials recorded from the collections in the Quill Lakes region compare well with these and other excavated sites.

Table 5.7. Selected Besant series radiocarbon dates. Abbreviations for Type are:SC - Sandy Creek, O - Outlook Side-Notched; B - Bratton, ? – Unidentified.

Site	Component	Type	Date (rcybp)	Lab Number	Reference
Lebret	B Level 6	SC	2495 ± 440	S-2796	Smith 1986
Lebret	A Level 4	SC	2980 ± 105	S-2791	Smith 1986
Mortlach	Level 4E	SC	2400 ± 173	S-28	Wettlaufer 1955
Sjovold	Layer XIV	SC	2500 ± 85	S-2060	Dyck and Morlan 1995
Walter Felt	Level 15b	SC	2430 ± 90	S-279	Kehoe 1974
Sjovold	Layer XI	B	2505 ± 90	S-2508	Dyck and Morlan 1995
Sjovold	Layer XI	B	2900 ± 70*	S-3365	Dyck and Morlan 1995
Sjovold	Layer XII	O	2355 ± 105	S-2059	Dyck and Morlan 1995
Garratt	Level 8	?	1990 ± 75	S-409	Morgan 1979
Melhagen	-	O/B	1960 ± 90	S-491	Ramsay 1991
Melhagen	-	O/B	1910 ± 70	S-1640	Ramsay 1991
Melhagen	-	O/B	1710 ± 50	S-1641	Ramsay 1991
Melhagen	-	O/B	1575 ± 115	S-2856	Ramsay 1991
Melhagen	-	O/B	810 ± 205*	S-2857	Ramsay 1991
Melhagen	-	O/B	1905 ± 110	S-2855	Ramsay 1991
Walter Felt	Level 13	O	1610 ± 70	S-200	Kehoe 1974
Walter Felt	Level 10	O	1535 ± 80	S-201	Kehoe 1974
Walter Felt	Level 10	O	1535 ± 90	S-260	Dyck 1983
Grandora	-	O	1560 ± 60	S-542	Dyck 1972
Mortlach	Level 4B	O	1580 ± 159	S-22	Wettlaufer 1955
Rocky Island		?	2475 ± 120	S-2437	Morlan 1993
Tipperary Creek	Level 13	?	1535 ± 75	S-2885	Walker 1988
Newo Asiniak	Level 3	O/B	2235 ± 70	S-2530	Kelly 1986
Fitzgerald		O/B	1490 ± 90	Beta 69005	Hjermstad 1996
Fitzgerald		O/B	1270 ± 140	S-3546	Hjermstad 1996
Fitzgerald		O/B	1340 ± 60	Beta 69004	Hjermstad 1996
Fitzgerald		O/B	1160 ± 170	S-3547	Hjermstad 1996
Coffin	Cairn	?	1550 ± 85	S-2481	Linnamae 1995

* denotes rejected dates

Excavations at the Mortlach site provided the initial descriptions and dates for the Besant and Sandy Creek point types (Wettlaufer 1955). Later, Kehoe (1974) described and dated several Besant and Sandy Creek components at the Walter Felt site. The Lebret site, located south of the study area, also had two components with Sandy

Creek projectile points (Smith 1986). Sandy Creek components were also identified at the Sjovold site (Dyck and Morlan 1995), with dates that are the earliest for this projectile point. Overall, it appears that dates for Sandy Creek tend to occur earlier in the Besant series (Morlan 1993:40).

The majority of excavated Besant sites are campsites containing Outlook Side-Notched points. Examples include points from Besant levels at Newo Asiniak (Kelly 1986), Grandora (Dyck 1972), Sjovold (Dyck and Morlan 1995), Walter Felt (Kehoe 1974), and Mortlach (1955).

A large tipi ring site west of the study area may also be related to the Besant series. Excavations at this site produced a single projectile point that, along with a radiocarbon date of 1550 ± 85 rcybp (S-2481), suggests a Besant presence (Linnamae 1995).

Only two kill sites (possibly three) have been excavated in Saskatchewan. The Melhagen site (Ramsay 1991) and Fitzgerald site (Hjermstad 1996) have provided examples of projectile points and radiocarbon dates. Dates for the Fitzgerald site appear to fall later in the sequence than those at Melhagen. A small number of Bratton points were identified at the Melhagen site (Dyck and Morlan 1995:378). The majority of the projectile points at Fitzgerald (Hjermstad 1996:59-64, Figures 4.1-4.6) were identified as Outlook Side-Notched with a couple of Bratton points. Walker (1988:83) has suggested that the Meewasin site near Saskatoon may also be a Besant kill site but the site is still under investigation.

With the exception of the late Pelican Lake date at the Wallace Adair site and Pelican Lake points in level 10 at the Sjovold site, there is no overlap of dates between the two series. Reeves (1983) considered Besant to originate from the Eastern

Woodlands and included it in a tradition (NAPIKWAN) separate from that of the Pelican Lake phase.

The range of dates for the region surrounding the Quill Lakes is similar to that for the entire province (Morlan 1993:39). However, the revision of the Besant complex into a series has expanded the range of dates, particularly on the older end (c.f. Dyck 1983; Linnamae et al. 1988; Vickers 1986). The revision of Besant complex into the Besant series and the use of the terms Bratton and Outlook Side-Notched have not been widely accepted for the Northern Plains thus far (e.g. Johnson and Johnson 1998; Walker 1999). Despite this, there is no evidence from the collections studied that presents problems with the proposed Besant series. In fact, the presence of a large Bratton assemblage from the collections lends some credence to this revision and it is followed here. It is conceded, however, that all of the Besant components could also easily be described under traditional definitions of the Besant phase.

Surface recoveries of Besant materials have also been noted throughout east central Saskatchewan and west central Manitoba. Conaty et al. (1988:38) reported numerous surface finds of Besant points from the Yorkton, Last Mountain Lake, and Arm River regions, as well as sites south of the Qu'appelle River. To the west of the Quill Lakes, Conaty et al. (1988:38) reported sites along Lanigan Creek as well as the Birch Hills district near the South Saskatchewan River. Besant is known in the Nipawin region north of Quill Lakes (Finnigan et al. 1983). In addition, from the Bjorkdale region, also north of the Quill Lakes, Ramsay (1998) reported that Besant and Late Side-Notched comprise 13% of Archie Campbell's collection. This is difficult to assess because it is not clear what he meant by Late Side-Notched and how it relates to Besant. In the Swan River Valley Gryba (1976, 1977, 1981) reported numerous finds of Besant points. The majority of these appear to fall into the Outlook Side-Notched category. In the Saskatoon region, several sites are known to have Besant components (Linnamae et al. 1988).

5.3.2 Avonlea Phase

Several Avonlea components have been excavated and dated in the areas adjacent to the Quill Lakes. Avonlea points from the Quill Lakes correlate well with points from these nearby sites. Selected Avonlea radiocarbon dates are listed in Table 5.8. The Avonlea site (Kehoe and McCorquodale 1961a, 1961b; Kehoe et al. 1988; Klimko and Hanna 1988), considered the type-site, has provided several dates. Two accepted dates come out about 1500 rcybp. The Lebret site (Smith 1986), situated due south of the Quill Lakes study area in the valley bottom of the Qu'appelle River, is one of the best-dated Avonlea sites. Several Avonlea components were identified at this location. The Garratt site (Morgan 1979) located at Moose Jaw had two acceptable radiocarbon dates. The Sjovold site (Dyck and Morlan 1995) had a ceramic-bearing Avonlea component and two radiocarbon dates. Finally, two dates for Avonlea components at Tipperary Creek (Walker 1988) provide a long range of 1235 ± 75 (S-2815) and 1790 ± 75 (S-2816) rcybp. A single date at Newo Asiniak suggests an even later time of 915 ± 70 rcybp (S-2533) for the presence of Avonlea in the Opimihaw Valley (Kelly 1986).

Table 5.8. Selected radiocarbon dates for the Avonlea phase.

Site	Component	Date (rcybp)	Lab Number	Reference
Lebret	A-3	1260 ± 115	S-2691	Smith 1986
	B-3	1635 ± 105	S-2797	Smith 1986
	Area R	1510 ± 105	S-2800	Smith 1986
	S-4	1530 ± 105	S-2799	Smith 1986
Avonlea		535 ± 230*	S-2628	Klimko and Hanna 1988
		1500 ± 100	S-45	Kehoe and McCorquodale (1961a, 1961b)
		1565 ± 205	S-2623	Klimko and Hanna 1988
		3605 ± 135*	S-2777	Morlan 1993
Garratt	Level 6	1280 ± 60	S-408	Morgan 1979
	Level 6	1450 ± 70	S-406	Morgan 1979
	Level 6-7	6100 ± 100*	S-407	Morgan 1979
Bethune Burial		1390 ± 40	S-1575	Dawson and Walker 1988
Camp Rayner		1600 ± 110	S-1318	Morlan 1993
Sjovold	Level 6	1380 ± 200	S-1762	Dyck 1983
	Level 6	1380 ± 190	S-1763	Dyck 1983
Hartley		1120 ± 60	S-3382	Clark 1995
Tipperary Creek	Level 11	1235 ± 75	S-2815	Walker 1988
	Level 12	1790 ± 75	S-2816	Walker 1988
Newo Asiniak	Level 2	915 ± 70	S-2533	Kelly 1986
Rousell		1185 ± 70	S-670	Dyck 1983
Goosen Pasture		1095 ± 100	S-2690	Morlan 1993
Gravel Pit		815 ± 135	S-2355	Klimko 1985a
Wallington Flat		2830 ± 90*	S-2458	Finnigan et al. 1983

* denotes rejected dates

Other dated components in the Saskatoon region include the Hartley site (Clark 1995) Goosen Pasture (Morlan 1993), and the Rousell site (Dyck 1983). Dates from these sites correspond well with each other. The range is from 1095 ± 100 (S-2690) to 1185 ± 70 (S-670) rcybp. These dates also correspond well with the two later dates from the Opimihaw Creek valley.

In the Nipawin region, excavations at the Wallington Flat and Gravel Pit sites have provided radiocarbon dates for Avonlea components (Finnigan et al. 1983;

Klimko 1985a). The early date from Wallington Flat site was rejected, but the rather late date from the Gravel Pit site was initially considered acceptable for Avonlea in this region (Klimko 1985b; Meyer et al. 1988). However, a thermoluminescence date of A.D. 680 ± 260 (Dur88TL125-2AS) was obtained on the Avonlea component at the neighboring Wallington Flat site (Meyer and Epp 1990:330). An additional thermoluminescence date, A.D. 710 ± 110 (Alpha-3206), on Avonlea pottery was obtained from the Municipal Camp site (Meyer and McKeand 1994:57). These two Avonlea dates accord well with Avonlea radiocarbon dates from Southern Saskatchewan. Several other Avonlea sites were identified during the course of investigations along the Saskatchewan River in the Nipawin region (Klimko 1985b; Meyer et al. 1988).

Surface collections of Avonlea projectile points are common, but not overly abundant from areas adjacent to the Quill Lakes. Conaty et al. (1988:39) reported relatively few Avonlea components in the region around the Quill Lakes but there are sites in the Yorkton region, along Last Mountain Lake and the Arm River, as well as along Lanigan Creek. They also recorded sites along the South Saskatchewan River near Birch Hills. Linnamae et al. (1988:166-168) report that Avonlea is commonly found in the Saskatoon area. To the north of the study area, in Archie Campbell's collection, Avonlea represented 2.6% of all components identified (Ramsay 1998). Compared to the preceding and succeeding components in that collection Avonlea appeared to be sparse. A similar situation was noted for the Swan River Valley district where small numbers of Avonlea points have been found at a couple of large sites (Gryba 1977, 1981). Elsewhere, in Manitoba, Avonlea is reported from a limited number of surface finds and excavations (Joyes 1988).

5.3.3 Late Side-Notched Series

Nine dated sites can be used to make comparisons with those in the Quill Lakes region (Table 5.9). The majority of dates come from sites in the Saskatoon region. At Tipperary Creek, 10 levels are reported to contain Plains and Prairie Side-Notched points as well as pottery (Walker 1988). At the Amisk site, projectile points from level 1 have three dates ranging from 415 to 1060 rcybp (Amundson 1986). Amundson classified the projectile points as Plains and Prairie Side-Notched. The dated level from Newo Asiniak (Kelly 1986) appears to contain Prairie Side-Notched points in addition to a metal point. The Thundercloud site (Mack 2000) contained several levels that produced Prairie and Plains Side-Notched points. However, no dates were obtained. The Tschetter site (Linnamae 1988) is a bison pound that contained exclusively Prairie Side-Notched points. The Bill Richards Site, classified as containing Mortlach points by Peck and Ives (2001), contained Plains Side-Notched points along with Mortlach pottery. The Walter Felt site is a stratified site with multiple levels of Late Side-Notched points, but has yet to be adequately described. The same problems exist for Lake Midden. The Sjovold Site (Dyck and Morlan 1995) and Lucky Strike (Wilson 1984) both contained components with Prairie Side-Notched points.

Surface collections of Prairie and Plains Side-Notched points are common. Conaty et al. (1988:40-41) reported numerous sites from the Yorkton region, along Last Mountain Lake, Arm River, Lanigan Creek, and areas south of the Qu'appelle River. They also recorded sites along the South Saskatchewan River in the Birch Hills district. A study of pottery from cultivated fields along Lanigan Creek has revealed the presence of both Mortlach and Old Women's components in region (Aileen Novecosky, personal

Table 5.9. Selected radiocarbon dates for Late Plains Side-Notched Series (Abbreviations for type: Pr- Prairie Side-Notched; Pl- Plains Side-Notched; C- Cayley; M- Mortlach).

Site	Component	Date (rcybp)	Lab #	Type	Reference
Walter Felt	Level 7	1260 ± 70	S-202	Pr/C	Morlan 1993
	Level 6	700 ± 80	S-203	Pr/C	Morlan 1993
	Level 4	400 ± 40	S-280	Pl/M	Morlan 1993
Sjovold	Level 4-5	1320 ± 190	S-1760	Pr	Dyck and Morlan 1995
	Level 4-5	1340 ± 190	S-1761	Pr	Dyck and Morlan 1995
Tschetter		1005 ± 75	S-669	Pr/C	Linnamae 1988
		915 ± 45	S-1631	Pr/C	Linnamae 1988
		1020 ± 100	S-2225	Pr/C	Linnamae 1988
Lake Midden		380 ± 100	S-2246	Pl/M	Morlan 1993
Bill Richards		820 ± 110	S-2884	Pl/M	Morlan 1993
Tipperary Creek	Level 1	<100	S-2805	Pl	Walker 1988
	Level 2	380 ± 70	S-2806	Pl	Walker 1988
	Level 3	200 ± 70	S-2807	Pl	Walker 1988
	Level 4	290 ± 70	S-2808	Pl	Walker 1988
	Level 5	510 ± 70	S-2809	Pl&Pr	Walker 1988
	Level 6	790 ± 135	S-2810	Pl&Pr	Walker 1988
	Level 7	855 ± 70	S-2811	Pl&Pr	Walker 1988
	Level 8	880 ± 70	S-2812	Pr	Walker 1988
	Level 9	945 ± 135	S-2813	Pr	Walker 1988
	Level 10	1155 ± 75	S-2814	Pr	Walker 1988
Newo Asiniak	Level 1	750 ± 70	S-2529	Pr	Kelly 1986
Amisk	Level 1	480 ± 65	S-2531	Pl&Pr	Amundson 1986
	Level 1	635 ± 85	S-2770	Pl&Pr	Amundson 1986
	Level 1	905 ± 155	S-2537	Pl&Pr	Amudson 1986
Lucky Strike		875 ± 95	S-2280	Pr/C	Wilson 1984
		1020 ± 90	S-2281	Pr/C	Wilson 1984

communication). There are several sites in the Saskatoon region that have seen some excavations or surface collecting and belong to the Late Side-Notched series (Linnamae et al. 1988). The Lozinsky site (Malainey 1995), located north west of the Quill Lakes close to the South Saskatchewan River, is a large site that contained a large number of Plains Side-Notched points and Mortlach pottery. The points from this site could easily be classified as Mortlach points. From the Bjorkdale region, Ramsay (1998) reported that Prairie and Plains Side-Notched points were well represented in Archie Campbell's collection. In the Swan River District Gryba (1976, 1977, 1981) also reported numbers of Prairie and Plains Side-Notched projectile points. He noted they likely are related to late Boreal Forest groups such as Selkirk.

5.4 Comparisons within the Late Plains Indian Period

A minimum of 36 components represented by 417 diagnostic projectile points delineates the Late Plains Indian Period in the Quill Lakes region (Figures 5.21 and 5.22). There was a sharp decrease in both the number of Avonlea components and the number of projectile points from the preceding Besant series. Besant projectile points are the most common. They exceed the Late Side-Notched Series points by over 100 points even though there are only two more components. The area that produced the largest number of points for Late Plains Indian types was the Corley's Ridge/Kells area (Besant: n=136, 54.0%; Avonlea: n=23, 67.6%; Late Side-Notched Series: n=61, 46.6%).

The lithic material used to manufacture projectile points was examined for the Stachyruk collection (Figures 5.23 and 5.24). Cherts were used almost exclusively. In particular, Swan River Chert dominated the lithic assemblages. However, an exception occurs for Avonlea projectile points. Chert is the lithic material of choice for the manufacture of these points followed by Swan River Chert. The amount of Knife River Flint is constant throughout the Late Plains Indian period. This is somewhat surprising for Besant, as Besant is normally cited for relatively high uses of this material on the Northern Plains (e.g. Gruhn 1971; Hlady 1967; Hjermstad 1996).

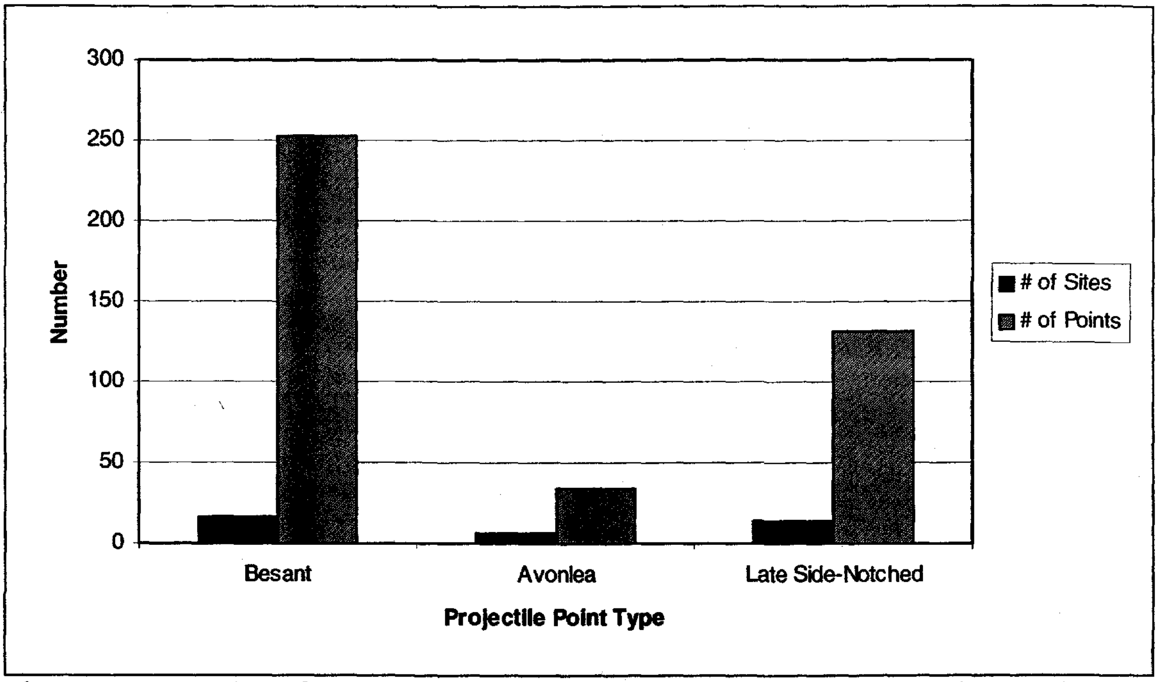


Figure 5.21. Number of sites and diagnostic projectile points for the Late Plains Indian period.

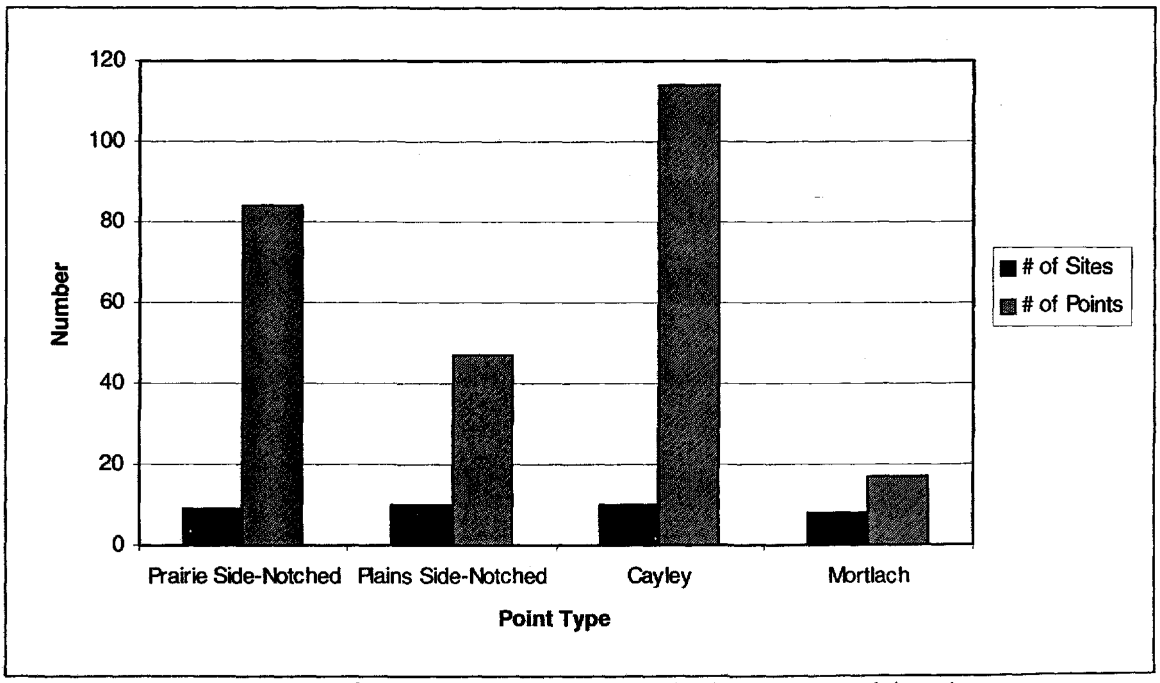


Figure 5.22. Comparison of Plains/Prairie Side-Notched and Mortach/Cayley types.

Small amounts of other exotic materials were identified from the collections. This included chalcedony, fused shale, jasper, moss agate, and silicified siltstone pebbles. These materials are commonly found to the south and west of the study area. In addition, small amounts of other local materials were utilized. This includes Gronlid Siltstone and petrified peat.

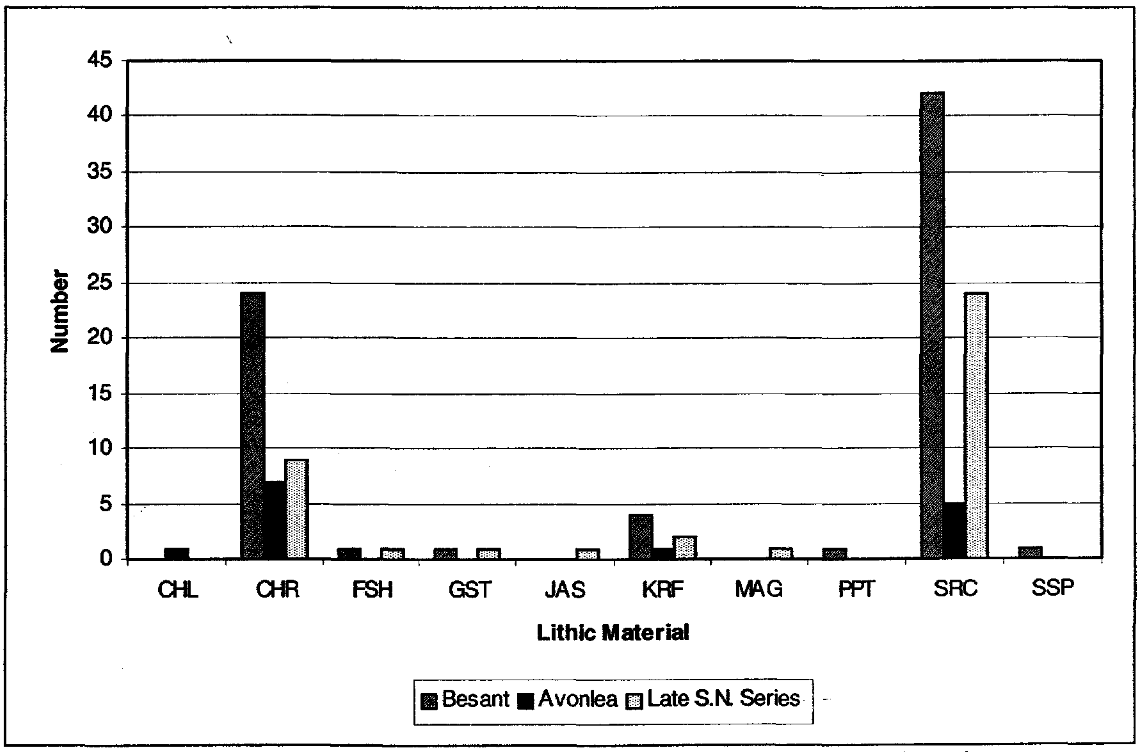


Figure 5.23. Lithic material used for Late Plains Indian period projectile points.

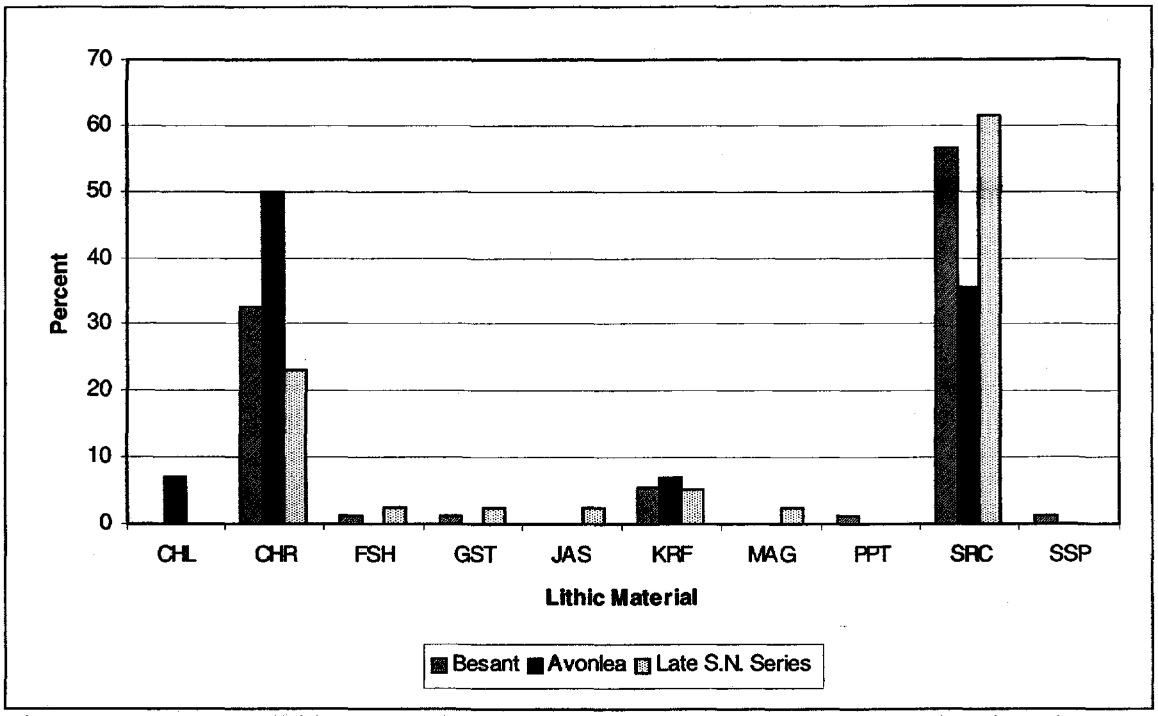


Figure 5.24. Percent lithic material used for Late Plains Indian period projectile points.

A look at the percentages of local versus non-local lithic material utilized for the manufacture of projectile points indicates a relatively constant amount for each period except for Besant (Figure 5.25). Only 7% of the Besant lithic materials were exotic compared to 14% each for Avonlea and the Late Side-Notched series. An exception to this trend was seen at ElNe-7, where several Bratton points were fashioned from silicified siltstone pebbles. This material is not available locally and is commonly found to the west of the study region. The exclusive use of that material at this site suggests that all of the points belong to a single occupation and that the makers of these projectile points had recently been in the west. This is also the largest number of Bratton points found together at one site. Normally only a small percentage of Bratton points are found with either other Besant points or Pelican Lake points. Here, too, both Besant and Pelican Lake projectile points are present.

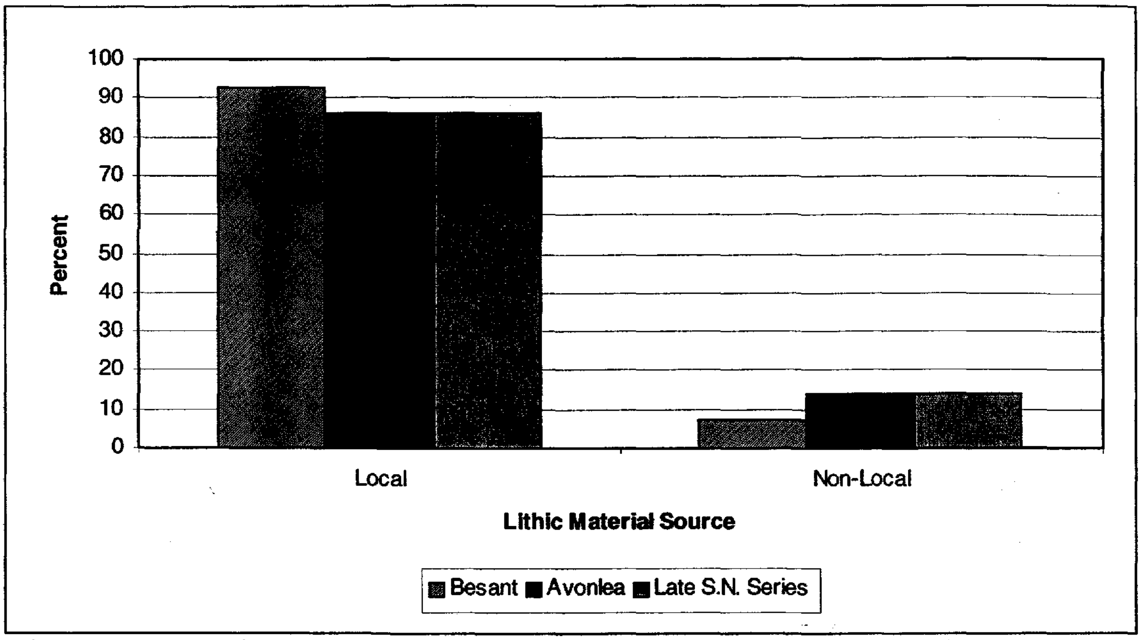


Figure 5.25. Local versus non-local lithic materials for the Late Plains Indian period.

5.5 Summary

There was a marked decrease in the number of components and diagnostic projectile points identified for the Late Plains Indian period in the study area. Of those present, the majority belonged to the Besant series, most of which came from a single site. A unique Bratton component was identified at ElNe-7. A site with such a large number of this point type has not been described elsewhere in the Canadian Plains. Avonlea components were nearly non-existent. There was an increase in the numbers points and components for the Late Side-Notched series but not reaching the numbers seen for the Besant series.

Ceramics identified from the collections were also relatively sparse. Only two sites had multiple vessels represented. From these two sites, the pottery was identified as Mortlach. No pottery from any other period was identified.

Lithic materials utilized in the manufacture of projectile points show a high use of local sources. Except for the Avonlea phase, Swan River Chert dominated the lithic materials. A high incidence of Knife River Flint normally seen in Besant assemblages was not observed at the Quill Lakes. However, an anomalous amount of silicified siltstone chert pebbles was identified for a Bratton component at ElNe-7. This material is not as well represented anywhere else in the study region.

Chapter 6

Culture History and Parkland Interaction

6.1 Culture History

Radiocarbon dates have been assembled from a two hundred kilometer radius around the Quill Lakes to place each archaeological period into a temporal framework relevant to the Quill Lakes region (see previous chapters). Dated components from this radius can be extended to the Quill Lakes area with confidence that they accurately reflect the temporal dimensions for various archaeological cultures that exist there. This radius follows a similar idea of Dyck and Morlan's (1995:38) description of the archaeological setting of the Sjovold site.

The disadvantage in restricting radiocarbon dates to those from a 200 km radius around the Quill Lakes is that, for certain archaeological cultures, there are few or no dates. This is especially true for the Paleo-Indian period. Where deemed necessary, outside dates were used as a supplement. In addition, only dates considered reliable were used in this analysis (c.f. Morlan 1993).

The radiocarbon dates were calibrated using the computer program Calib 4.3 (Stuiver et al. 1998). The normalized radiocarbon dates were obtained from the Canadian Archaeological Radiocarbon Database (CARD) compiled by Dr. Richard Morlan, accessed from the Internet at canadianarchaeology.com/card/html from July 20 to July 26, 2001. Where appropriate, dates were averaged using Calib 4.3 before calibration, to provide the most reliable calibrated assessment. Calibrated ages are presented with their 2-sigma limits. The intercepts are shown within parentheses. All calibrated dates are in years before 1950 (B.P.) whereas all radiocarbon assays are signified in terms of radiocarbon years before 1950 (rcybp). As Morlan (1993:41-42) notes, because of statistical errors and uncertainties there is a loss of precision when calibrating dates. Despite the loss of precision, by using radiocarbon dates at the 2-sigma level, the temporal chronology should be accurate. This provides a general temporal framework for each archaeological culture in the study region (see Figure 6.1).

6.1.1 Paleo-Indian Period

The temporal dimensions of the Paleo-Indian period are poorly known in Saskatchewan. There have only been a small number of excavated components and attempts to date these components have proved troublesome. Therefore, the temporal data presented for the Paleo-Indian period in Saskatchewan should be considered provisional until additional data is available.

Agate Basin (10 500 – 10 000 rcybp; cal. 12 900 – 11 200 B.P.)

There are no dates for Agate Basin from Saskatchewan. In fact, little is known about Agate Basin from this province. Most Agate Basin dates are from sites found to the south, mainly in Wyoming (Irwin-Williams et al. 1973; Frison 1991; Hofman and Graham 1998). No closely related Hell Gap materials were identified in the Quill Lakes region; therefore, 10,000 rcybp will be used as the end marker for Agate Basin in the Quill Lakes region.

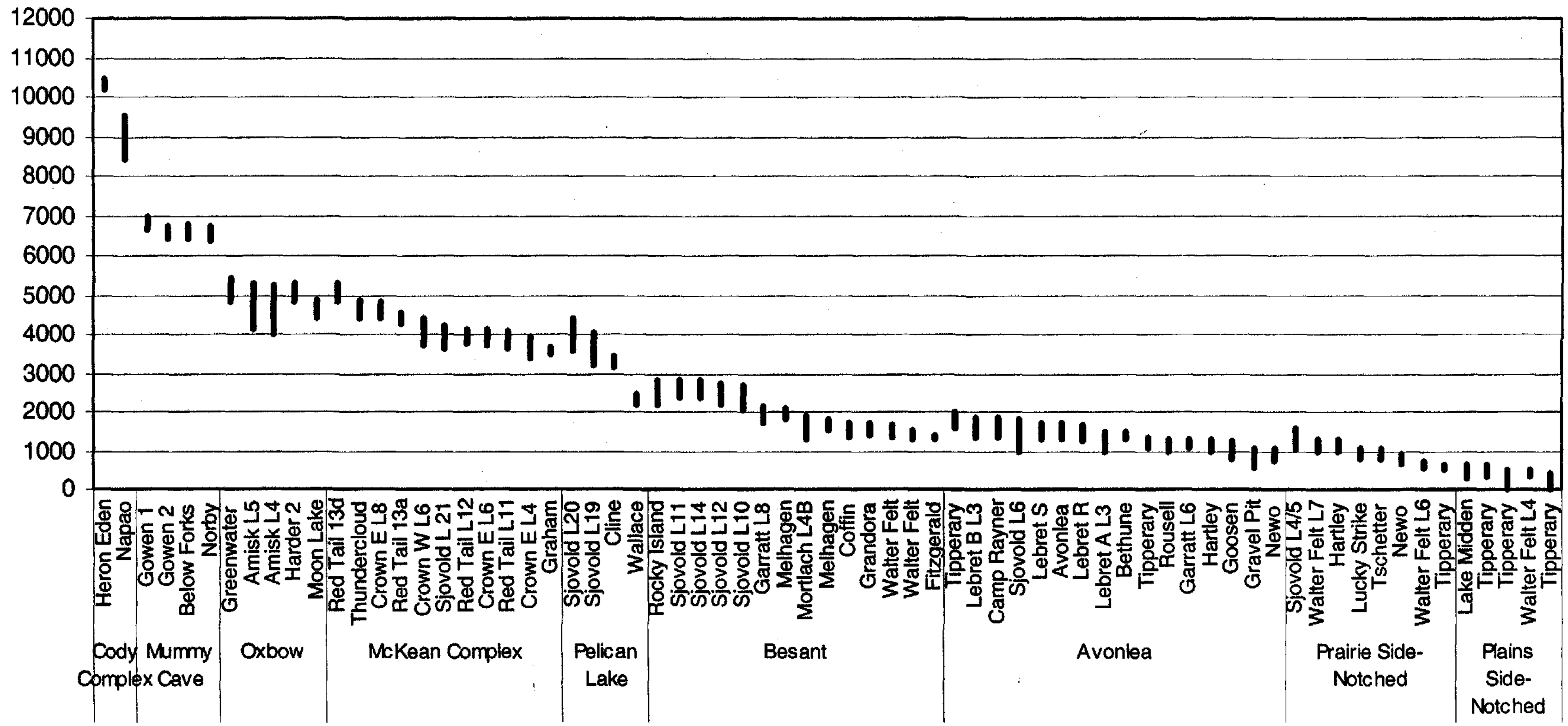


Figure 6.1. Selected calibrated radiocarbon dates (at 2-sigma limits) relevant to the Quill Lakes region.

Cody Complex (9200 – 8800 rcybp; cal. 10670 – 9550 B.P.)

The Cody complex belongs to a series of related complexes subsumed under the Cody tradition (Hofman and Graham 1998:113). The Cody complex, consisting of Scottsbluff and Eden points, dates to about 9000 rcybp (Hofman and Graham 1998). Although no comparable Cody complex dates were available within the 200 km radius around the Quill Lakes, three excavated sites from southern Saskatchewan have been dated. Dates in Saskatchewan indicate similar antiquity to those dates in the Northern United States. The Heron Eden site had three dates (S-3114, S-3309, S-3308) which could be averaged providing a calibrated age of 10,479 (10,237) 10,182 B.P.

Terminal Paleo-Indian (8800 – 7500 rcybp; cal. 9700 – 8200 B.P.)

The Terminal Paleo-Indian period has been difficult to date. No radiocarbon dates have been obtained from Terminal Paleo-Indian components from Saskatchewan. Elsewhere on the Plains, Hofman and Graham (1998) consider the period to last from about 9000 – 8000 rcybp. For this study, the beginning of Terminal Paleo-Indian complexes follows the Cody complex and ends with the onset of the Middle Plains Indian period.

Interpretations

Paleo-Indian occupation of the Quill Lakes region lasted approximately 4700 years. The occupations occurred during a period of rapid environmental transformation. These began with the Agate Basin complex and ended with points attributed to Terminal Paleo-Indian complexes. Although fluted points have been identified just to the east of the Quill Lakes basin (Gryba and Gryba 1980:171-172), none were recorded from the study area.

The absence of older archaeological remains in the Quill Lake basin may relate primarily to the unsuitability of the area for habitation. Christiansen (1979) shows that glacial ice and the proglacial lakes were well north of the Quill Lakes by 11 500 rcybp. However, a more recent paper by Kehew and Teller (1994) suggests that the deglaciation of the region occurred somewhat later. Kehew and Teller (1994:862) state that at 12 000 rcybp, the Laurentide ice-sheet was situated north of the Missouri Coteau and that by 11 000 rcybp it had moved north of the lower Saskatchewan River Valley. Shortly thereafter, the Laurentide ice-sheet moved off in a northeasterly direction although stagnant ice may have persisted in the Quill Lake basin for sometime afterward (Greer and Christiansen 1963, Richard 1964).

Once the ice sheets had moved to the north, large proglacial lakes persisted for sometime after. Glacial Quill Lake, at its maximum extent, covered much of the study area and briefly drained to the south into Glacial Last Mountain Lake (Greer and Christiansen 1963, Richard 1964). Proglacial lakes located to the south, east, and west of Glacial Quill Lake, in existence at the same time or slightly before, had drainage phases dated to about 10 800/10 900 to 11 000 rcybp (Kehew and Teller 1994:863). It was at this time that Glacial Last Mountain Lake drained and as a result caused Glacial Quill Lake to drain to a level of 529 m above mean sea level where it stabilized. The glacial lake persisted long enough at that level to develop extensive strandlines and beach ridges (Greer and Christiansen 1963:44). By about 10 800 rcybp, Glacial Quill Lake had minimal drainage into Last Mountain Lake and essentially had assumed the internal drainage basin that exists today. Only at sometime after this point, once water levels had receded, would the resulting lake basin be opened for habitation. This precluded any opportunity for people to inhabit the Glacial Quill Lake Plain much before the Agate Basin period.

During the expected temporal range for Agate Basin, a sparse spruce forest appears to have dominated the vegetation in the Quill Lakes region (Ritchie 1976:1805, 1987:129). Once the spruce forest was established, large game animals might have included bison, elk and possibly caribou. In addition, the Quill Lakes (or lake) at this time were deep and contained freshwater providing an additional important resource both to the animals and people in the region. The vegetation changed to a grassland-dominated landscape about 9500 rcybp, which roughly coincides with the appearance of the Cody complex in the region. At this point, a parkland composed of poplar and birch is known to have been located to the north of the Quill Lakes region (Ritchie 1976:1810). These environmental conditions likely existed through the remainder of the Paleo-Indian period.

While the environment may have had a limiting influence on the timing of initial settlement in the Quill Lakes region, once the area was open, the presence and absence of particular groups of people is more likely related to cultural factors than environmental ones. Once the spruce-dominated forest was replaced by grassland-dominated vegetation, conditions generally remained this way for thousands of years until the parkland encroached back onto the grasslands during relatively recent times (ca. 2500 – 3000 rcybp).

6.1.2 Middle Plains Indian Period

Large corner-notched type (ca. 7500 rcybp; cal. ca. 8200 B.P.)

The transition between the Paleo-Indian and Middle Plains Indian period is not a well-known time on the Northern Plains. Often, archaeologists dealing with this period note the presence of lanceolate and side-notched or corner-notched projectile points. Based on technological aspects of the manufacture of the large corner-notched point type from the Quill Lakes region and a few stratigraphic and chronological markers from the Northern Plains, the large corner-notched points are identified with an unknown archaeological group from the period between Terminal Paleo-Indian and Mummy Cave archaeological cultures. A date of ca. 7500 rcybp was chosen as likely for points of this type.

Mummy Cave Series (ca. 7500 – 5500 rcybp; cal. ca. 8200 – 6300 B.P.)

Walker (1992) has identified five main point types in the Mummy Cave series. Many of the Mummy Cave series points in the Quill Lakes region easily fit into the Gowen type. Investigations at four sites, Gowen 1 and 2, Norby and Below the Forks (Walker 1992, Zurburg 1991, Meyer 2000) all have produced points identified as Gowen. Several radiocarbon dates from these sites range from cal. 6999 – 6353 B.P. In addition to Gowen points, there are smaller numbers of Bitterroot points identified in many of the collections from the Quill Lakes region. Whether these assemblages are distinct from Gowen, it is unknown. Bitterroot points are frequently found mixed with other Mummy Cave assemblages (Walker 1992:76, plate 26). In addition to these types, other Mummy Cave series projectile point types are present.

Oxbow (4600 – 4000 rcybp; cal. 5470 – 4430 B.P.)

The Oxbow complex is tightly dated in the region around the Quill Lakes. Apart from some dates from the Harder and Carruthers sites, the dates fall within a 1040 year period. Younger dates from the Harder and Carruthers sites were not included because inadequate pretreatment methods were used for the dating of insoluble collagen extractions from the bone (Morlan 1993:29-30). Four of the five dates used came from the Saskatoon region while the remaining date came from north east of the study area.

McKean Complex (4440 – 3295 rcybp; cal. 5285 – 3470 B.P.)

Several excavations of deeply stratified sites have provided a good temporal framework for the McKean complex. In particular, the Red Tail (Ramsay 1993) and Crown (Quigg 1986) sites have provided multiple dates. These sites are also significant because they provide evidence of discrete McKean Lanceolate occupations below Duncan/Hanna points as well as providing older radiocarbon assays for the McKean Lanceolate components. McKean Lanceolate points date between cal. 5285 and 4260 B.P. (4440 – 3920 rcybp) and Duncan and Hanna components between cal. 4240 and 3470 B.P. (3660 – 3295 rcybp).

Pelican Lake Complex (3825 – 2895 rcybp, 2385 – 2285 rcybp; cal. 4421 – 3172 B.P., 2465 – 2183 B.P.)

There are four dated Pelican Lake components for the area surrounding the Quill Lakes study region. Two of these are from the Sjovold site (Dyck and Morlan 1995), one is from the Cline site (McCann 1995), and one is from Wallace Adair (Dyck 1983). The first three dates overlap considerably with the Duncan/Hanna dates. Then there is about a 700-year gap (500 radiocarbon years) between these dates and the Wallace Adair date. While one might be tempted to dismiss the Wallace Adair date as too late, other scholars have suggested that Pelican Lake should be split into two different complexes. For example, Morlan (1993:39) noted that the later Pelican Lake dates appear to be closely associated with Besant components.

Interpretations

The Middle Plains Indian period has the largest numbers of components and diagnostic artifacts (i.e. projectile points). This period spans 5000 years (4600 radiocarbon years) and began with the introduction of a large corner-notched projectile point type. The temporal span for this point type is unknown. A single date of ca. 8200 B.P. (7500 rcybp) is proposed to indicate that the point type represents a transition between the Mummy Cave series and Terminal Paleo-Indian period. The makers of the Quill Lake corner-notched points were, without doubt, recently in North Dakota where the source area is for Knife River Flint. Little else can be said about this unique assemblage until further work is done.

For nearly 2000 years after 8200 B.P., people making projectile points diagnostic of the Mummy Cave series occupied the Quill Lakes region. There are at least five diagnostic point styles recognized for this series, but only the Gowen point type has been dated in Saskatchewan. In addition, Mummy Cave sites are the first widespread archaeological culture in the Quill Lakes region.

Several scholars have offered temporal dimensions for the Mummy Cave series for Saskatchewan and adjacent areas. Dyck (1983) considered Mummy Cave materials to fall within a range of 7700 – 4700 rcybp where Morlan (1993), relying only on Saskatchewan dates, favored a tighter range of 6100 – 5500 rcybp. Walker (1992) in his review of the Early period cultures (i.e. Mummy Cave) presented a range of 7500 – 5000 rcybp for the Northern Plains. Morlan (1993:37) concedes that although the dated Mummy Cave components fall within a tight range, surface finds throughout the province suggest that earlier components are present and it will only be a matter of time before more radiocarbon dates match those from outside the province.

The climate during this period was warmer and drier than at present. The effect that the climate had on the inhabitants on the plains has been the focus of debate for the past 50 years. Early culture historical schemes included a period of abandonment of the Plains (e.g. Mulloy 1958, Wheeler 1958 (1995), Malouf 1960, Wormington and Forbis 1965). Since then, additional data has provided unequivocal evidence of continued occupation of the Plains (Walker 1992). Walker (1992:128) notes, however, that between 7500–6000 rcybp there are far fewer dated components than after 6000 rcybp. He suggests (1992:128) that there might have been an increase in population on the Plains, perhaps in accord with ameliorating climatic conditions during this time.

The climate also affected the local vegetation. By 6500 rcybp, grasslands were much further north of the Quill Lakes region possibly leaving only the Touchwood Hills still vegetated with aspen (Ritchie 1976:1811). A decrease in moisture and increased frequency of fire are other important factors spurring on this change. During the height of the Hypsithermal the Quill Lakes were likely shallow and saline like other lakes in the region (Last and Schweyen 1985; Schweyen and Last 1983). One would expect that the conditions of the lakes at that time would have affected the local animal and human populations to some degree.

The Oxbow complex is believed to have evolved directly out of the Mummy Cave series (Reeves 1973:1245). Components at two sites in Saskatchewan, Long

Creek and Oxbow Dam are considered transitional. However, recently Green (1998) has shown that the Oxbow Dam materials represents a mixture of Oxbow and earlier components.

There is a nine hundred radiocarbon year gap between the latest Mummy Cave and the earliest Oxbow date in the region surrounding the Quill Lakes. Perhaps the transition from Mummy Cave to Oxbow occurred elsewhere than in east-central Saskatchewan (c.f. Spurling and Ball 1981). The oldest Oxbow dates in Saskatchewan are found at the Gray Burial site (Millar 1978, Wade 1981) and at Long Creek Level 8 and possibly Level 9 (Wettlaufer and Mayer-Oakes 1960, Wettlaufer 1981). All other Saskatchewan dates fall within the range indicated for the region surrounding the Quill Lakes region. Most radiocarbon dates outside of Saskatchewan fall between 4000 and 5000 rcybp.

Oxbow has been hypothesized by some scholars to persist later in the parklands and boreal forest on the periphery of the plains (Gibson 1981). Gibson (1981:132-133) suggested, based on dated Oxbow components at Cherry Point, Moon Lake, Harder and Caruthers sites, these areas were occupied after 4000 rcybp. However, as Morlan (1993:29) noted many of these dates are questionable making such an hypothesis untenable. At the least in the parkland of Saskatchewan, there is no solid evidence for Oxbow occurring later than on the Plains.

Nearly completely overlapping with the Oxbow complex are dates from McKean Lanceolate components. In the region surrounding the Quill Lakes, the range overlaps by at least 400 rcybp. Despite this overlap, the relationship between the two remains obscure. Many scholars accept that the McKean complex represents an intrusion into the Canadian Plains, likely from the Great Basin (Vickers 1986; Brumley 1975). An alternative view offered by Wright (1995:301) suggests that McKean developed *in situ* from the preceding Oxbow complex. Although Oxbow and McKean Lanceolate points have been found together at many excavated sites, the situation at stratified sites is that Oxbow is consistently found below McKean Lanceolate. The Duncan/Hanna points occur later than McKean Lanceolate as shown at the Red Tail (Ramsay 1993), Crown (Quigg 1986) and Thundercloud (Mack 2000) sites.

The relationship between Duncan/Hanna points and McKean Lanceolate points is also somewhat obscure. Early investigators either considered each separately, temporally and technologically (Wheeler 1952, 1954), or as a single, closely related archaeological culture (Mulloy 1954). Most culture-historical schemes in Saskatchewan follow the latter (e.g. Dyck 1983; Linnamae et al. 1988; Morlan 1993; Walker 1999).

McKean Lanceolate points are always associated with Duncan/Hanna points in the collections studied in the Quill Lakes region. In fact, they only occur at sites with the largest number of Duncan/Hanna points. Although radiocarbon and stratigraphic evidence suggest that McKean Lanceolate points antedate Duncan/Hanna points in this region, this relationship is neither evident nor disproved from the collections studied.

Radiocarbon dates for the Pelican Lake complex are limited for the region surrounding the Quill Lakes, and completely overlap those for Duncan/Hanna. Reeves (1969:33; 1983:7) suggested that Pelican Lake developed out of McKean and he included it in his TUNAXA tradition. On the other hand, Foor (1982:182) concluded that the likely origin of Pelican Lake technology could be found in the Eastern United States. He also noted (1982:182), however, that corner-notched points are found, at about the same time, across most of North America. The oldest dates for Pelican Lake in Saskatchewan come from levels 19 and 20 at the Sjovold site (Dyck and Morlan

1995). The normalized radiocarbon date for level 19 is 3355 ± 160 (S-1769) and level 20 is dated at 3675 ± 150 (S-2061).

Two clusters of dates occur for Pelican Lake in Saskatchewan (Morlan 1993:39). This has prompted Morlan (1993:39) to suggest that Pelican Lake should be promoted to a series composed of two separate complexes. The later Pelican Lake complex overlaps temporally with the Besant series and may be closely related to it (Morlan 1993:39).

6.1.3 Late Plains Indian Period

Besant Series (2675 – 1390 rcybp; cal. 2854 – 1282 B.P.)

Following Dyck and Morlan (1995), these dates reflect Outlook Side-Notched and Bratton components found in the regions surrounding the Quill Lakes. Sandy Creek components were not identified in the Quill Lakes area. Outlook Side-Notched projectile points are the most common and most persistent form in the Besant series (Dyck and Morlan 1995:437).

Avonlea (1950 – 920 rcybp; cal 1990 – 735 B.P.)

Dates for Avonlea in the region around the Quill Lakes are comparable to those from the rest of the province. Although radiocarbon dates considerably overlap Besant dates, they consistently are found above Besant components at stratified sites (Morlan 1993:40). Avonlea dates found in the Missouri basin generally are younger than those in the Saskatchewan and Assiniboine River basins (Morlan 1988:304). In addition, dates from the parkland fringes are somewhat younger and Avonlea may have persisted longer along the edge of the boreal forest and parkland (Klimko 1985b; Meyer et al. 1988).

Thermoluminescence dates of Avonlea pottery from the Nipawin area, however, fit well in the expected temporal range of Avonlea from southern Saskatchewan (Meyer and McKeand 1994; David Meyer, personal communication).

Late Plains Side-Notched Series (1545 – 0 rcybp; cal. 1563 – 250 B.P.)

The Late Plains Side-Notched series includes both Prairie and Plains Side-Notched varieties of projectile points. In the region surrounding the Quill Lakes, Prairie Side-Notched forms date earlier than Plains Side-Notched forms. Plains Side-Notched forms replace Prairie Side-Notched forms by about 500 rcybp. Plains Side-Notched projectile points are associated with Mortlach pottery (Peck and Ives 2001).

Interpretations

Major advances in technology mark the Late Plains Indian period across the Northern Great Plains. This period saw the introduction of pottery, the dominant use of bow and arrow technology, and the peak of large-scale communal bison procurement strategies. In the Quill Lakes, this period also saw a significant decrease in the number of components. This was especially true for the Avonlea period. By the beginning of the Late Plains Indian period, climatic conditions allowed the modern vegetation scheme to take hold. Section 6.2 of this chapter will further examine this period and examine the role the parkland had, if any, in the selection of the Quill Lakes for use by both Plains- and Forest-adapted peoples.

6.1.4 Discussion of Culture History

A summary of the number of components and projectile points for each archaeological group over time is presented in Figures 6.2 and 6.3. From Figure 6.2, a clear pattern distinguishing Paleo-Indian groups from Middle and Late Plains Indian groups emerges. This pattern has been noted for other regions in the province as well (e.g. Epp 1986). Paleo-Indian components remain low, from 4 to 7, for about 5000 years. Although there are no temporal dimensions for the large corner-notched point type, the number of components for this point type resembles the Paleo-Indian pattern. There was a dramatic increase in the number of components with the onset of the Middle Plains Indian period. The number of components increased throughout this period culminating with at least 21 components during the Pelican Lake phase. Following the Pelican Lake phase there was a significant decrease in the number of components. This was especially true for Avonlea.

A similar pattern emerges with the number of projectile points identified for each archaeological group (Figure 6.3). Numbers were relatively low during the Paleo-Indian period and increased dramatically at the onset of the Middle Plains Indian period. Once again, the number of large corner-notched points emulates the Paleo-Indian pattern. The number of Besant points is high compared to the rest of the Late Plains Indian period, while Avonlea projectile points are nearly absent.

Figures 6.2 and 6.3 also demonstrate the degree of overlap between calibrated radiocarbon dates for the different archaeological cultures. This likely reflects the nature of calibrated radiocarbon dates rather than a long-term co-occupation of the region by different archaeological groups. The stratigraphic record from several stratified sites, for

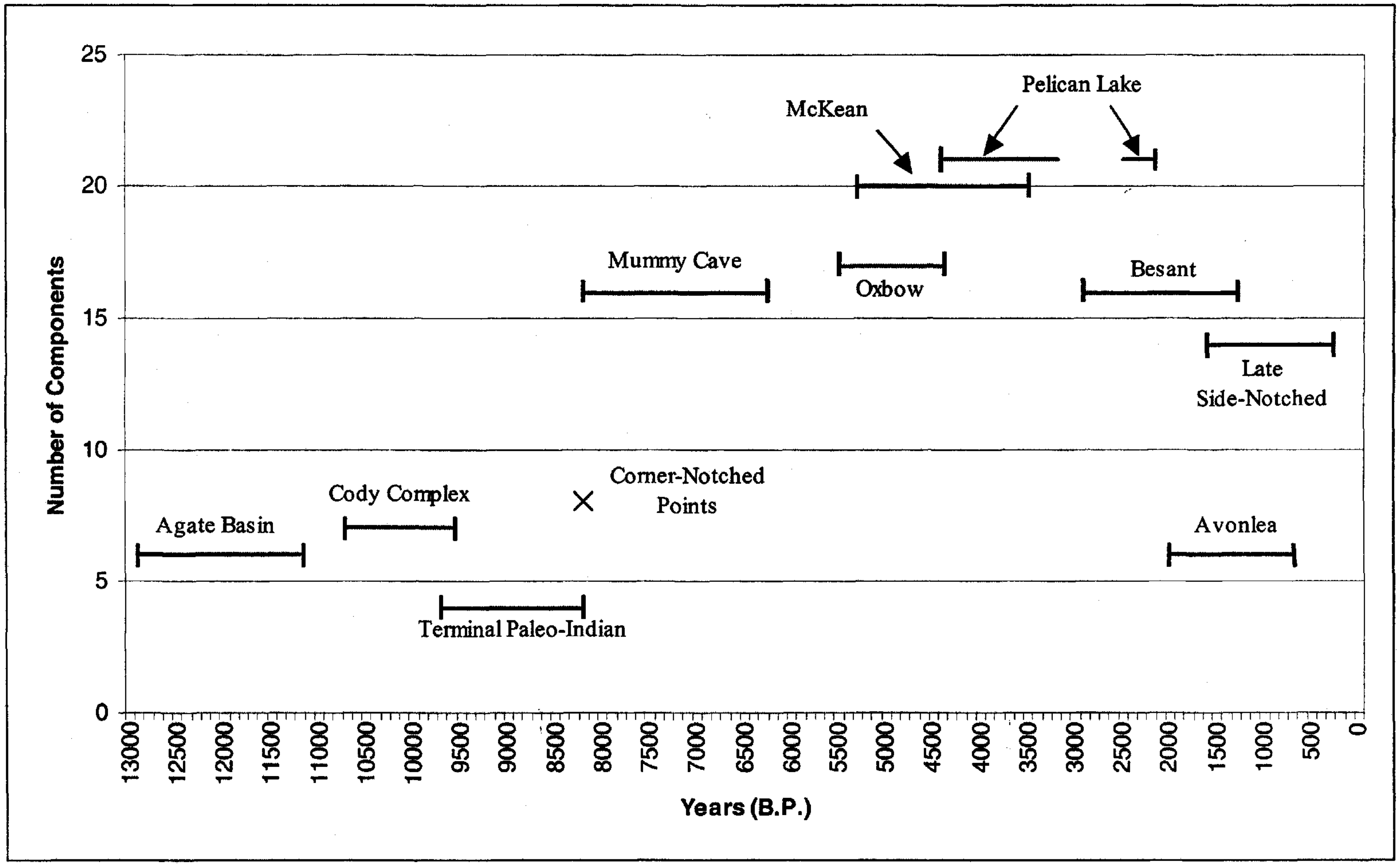


Figure 6.2. The number of components for each archaeological group represented through time.

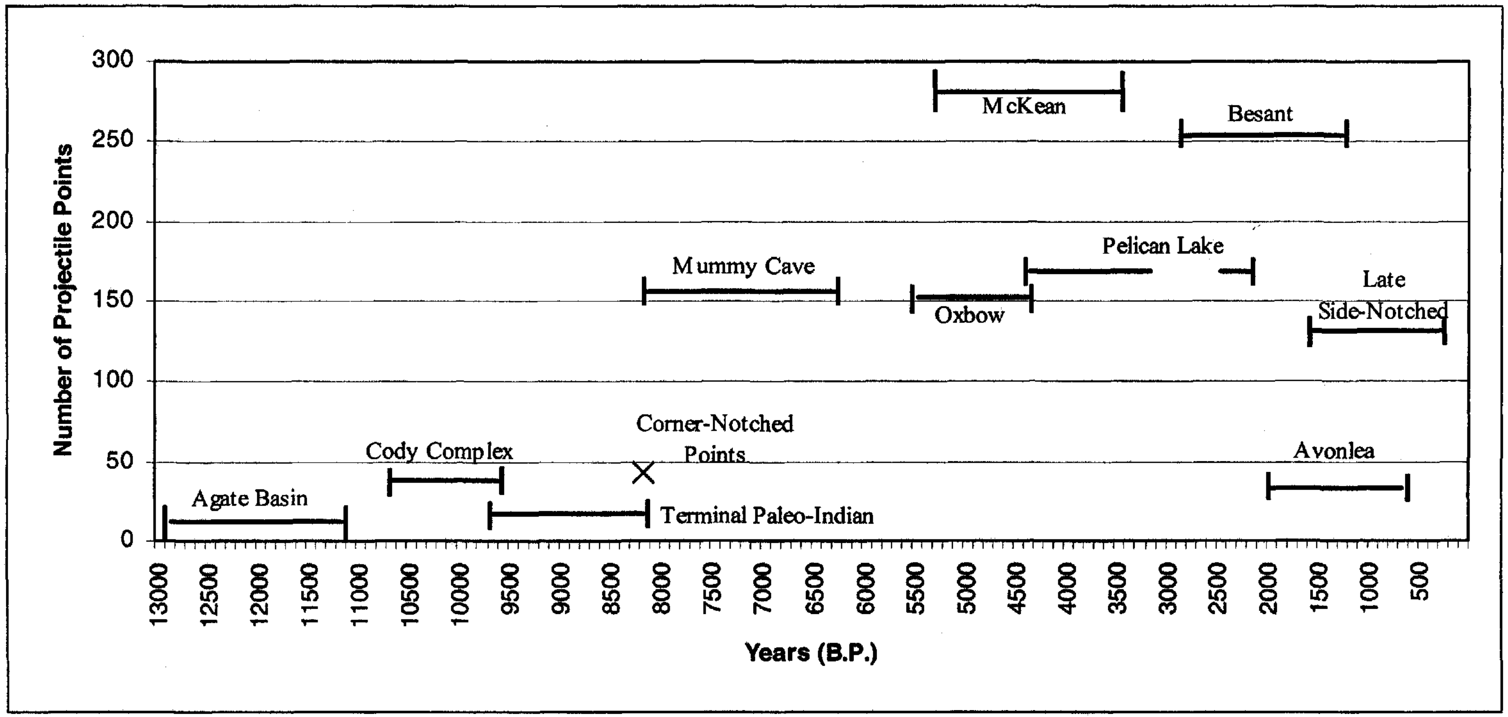


Figure 6.3. Number of projectile points represented for each archaeological group through time.

example, Mortlach (Wettlaufer 1955), Sjovold (Dyck and Morlan 1995), Crown (Quigg 1986), Garratt (Morgan 1979), and Thundercloud (Mack 2000), does not support such co-occupations.

To help compare the archaeological components directly, a relative index was used. This was necessary because each archaeological culture has different temporal dimensions. For example, one might expect that an archaeological entity that existed for twice as long as another would have twice the number of components and projectile points if all other things were equal. A relative index was used to compare the number of components as well as the number of projectile points taking into account the temporal length of each archaeological culture. To achieve a relative index for comparing the number of components, the following formulae were developed:

$$\text{Relative Index (components)} = 1 \div (n / c) \times 1000 \qquad (6.1)$$

n=number of years; c=number of components

The relative index of projectile points was achieved with the following formula.

$$\text{Relative Index (projectile points)} = 1 \div (n / p) \times 1000 \qquad (6.2)$$

n=number of years; p=number of projectile points

The relative indices for components and projectile points for each archaeological group are shown in Figures 6.4 and 6.5. From these, it is evident that the Quill Lakes region was most intensively occupied during the Middle Plains Indian period. Even though Pelican Lake has the largest overall number of recorded components, Oxbow has the highest relative number of components. Pelican Lake and McKean have the second and third largest relative number of components. With the exception of Besant, this pattern is repeated with the relative index of projectile points. The large number of Besant projectile points compared to the relatively low number of sites for that period reflects the one large Besant component at Corley's Ridge/Kells site where the majority of Besant points were found. The scarcity of Avonlea materials is also emphasized with Figures 6.4 and 6.5. The Cody complex is relatively more abundant both in numbers of components and projectile points than Avonlea.

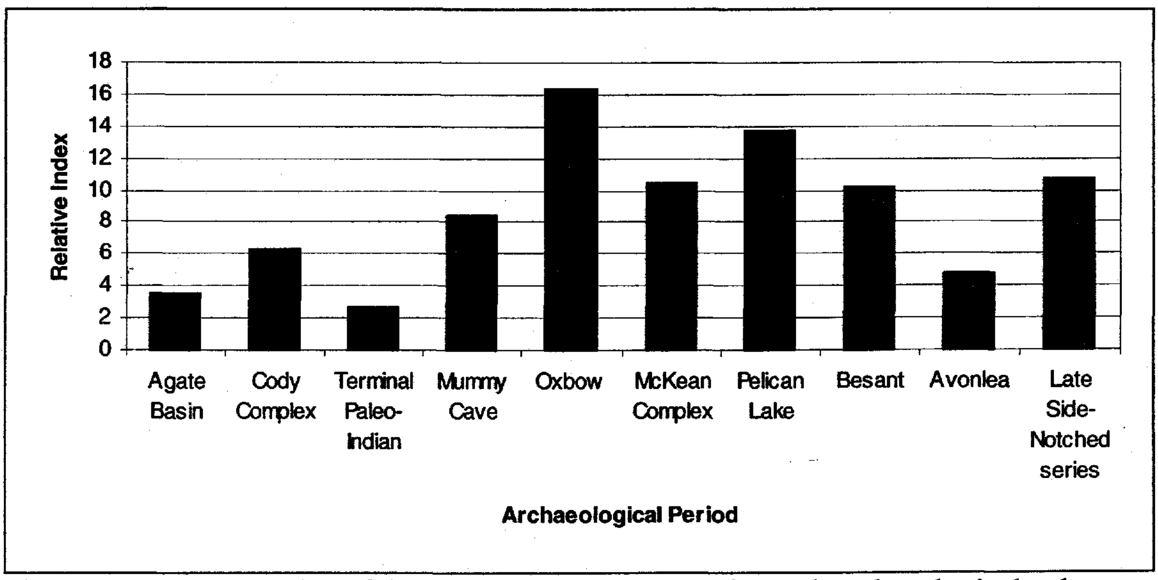


Figure 6.4. Relative index of the number of components for each archaeological culture.

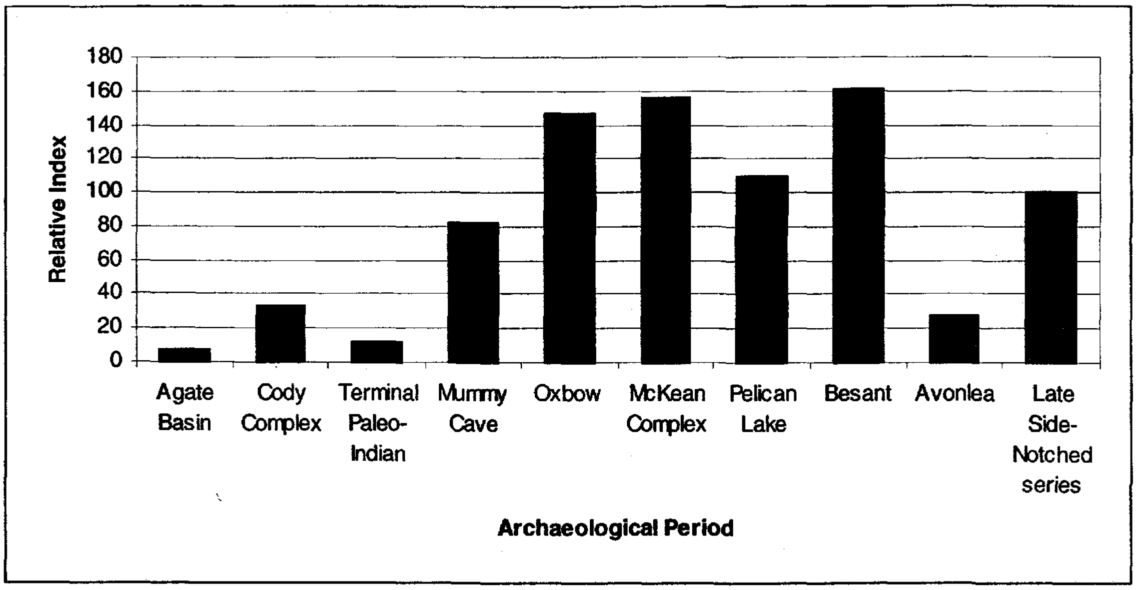


Figure 6.5. Relative index of the number of projectile points for each archaeological culture.

6.2 Interaction in the Parklands of the Canadian Plains

The Quill Lakes region has existed in a parkland environment for the past 3000 years. Because parkland is often considered a transition zone between forest and plains, it has often been assumed that it attracted both forest and plains-adapted peoples. The exact nature or extent of this interaction has been the focus of study by many scholars and, as a result, several models regarding interaction between forest- and plains-adapted groups on the Canadian Plains have been proposed. The remaining portion of this chapter will examine how the models relate to the culture-historical data collected from the Quill Lakes region.

Ray (1972, 1974) presented a model of parkland use for the Canadian Plains based on available resources found in the parkland. He proposed that for the fur trade period, Cree peoples inhabiting the forest moved into the parkland to exploit the bison moving up from the plains. At the same time, Assiniboine peoples moved north off the plains into the parkland to also exploit the bison wintering there. During this season a certain amount of interaction would occur.

Syms (1977:11), influenced by Ray (1972, 1974) also considered the parkland to consist of an ecotone that was characterized by "zones of high resource potential." This area was important to Cree peoples inhabiting the boreal forest and Assiniboine people out on the plains because of increased edge species density. Citing Ray (1974), Syms (1977:41) advocated a boreal forest-aspen parkland subsistence-settlement strategy for the Western Cree. Applying his Co-Influence Sphere model, Syms saw the core area for the Western Cree to include the western boreal forest and aspen parkland. Western Cree occupied the boreal forest during the summer and fall and moved into sheltered areas in the aspen parkland during the winter. Spring camps were located at lakes and creeks where spawning grounds of fish could be found (Syms 1977:41). The secondary area for the Western Cree included the aspen parkland and Plains where the main activities were trade and war, which occurred during the spring and fall. The tertiary area was the Plains proper, where bison could be found during warm winters. Syms (1977:40) believed this pattern was important since at least A.D. 1000.

For the parklands of central Alberta, Losey (1978:89-90) proposed five postulates for archaeological investigation of ecotonal borders (i.e. aspen parkland). These include: 1) Frontier zone – an area generally avoided by groups to circumvent conflict, 2) Buffer or Debatable Zone – an area generally avoided but used during periods of stress (i.e. food shortage), 3) Alternate-Seasonal Exploitation – an area shared by groups of people in alternating seasons, 4) Exclusive Ecotonal Adaptation – an area used exclusively by one group, 5) Diffuse Cultural/Ecological Transition – an area that would see a cultural transition of groups inhabiting the ecotone coincident with the ecological one. Losey (1978) favored the alternate-seasonal exploitation theory.

Pettipas (1980) elaborated on Ray's Parkland Convergence (1972, 1974) model and applied it to Late Woodland groups from southwest Manitoba. He saw a convergence of Blackduck and Selkirk groups in the parkland during the winter to hunt bison. Michlovic (1983) also discussed the exploitation of prairie resources by Woodland groups in the Red River Valley in Minnesota. Following the ideas of Syms (1977), Michlovic (1983:29) sees the forest-prairie edge being used simultaneously by both woodland and plains-adapted people.

Nicholson (1987, 1988) has also provided models for subsistence-settlement activities for western Manitoba. He (1988:357) proposes four different adaptive strategies. They are: 1) seasonal round within a single biome, 2) seasonal round within 2 or more biomes, 3) seasonal round utilizing resources of one biome with seasonal exploitation of one or more ecotones, 4) intensive occupation of one or more ecotones.

Joyes (1988) considers the parkland an important factor when discussing possible Avonlea and Blackduck interaction in Manitoba. He considers interaction between these two groups as being important in producing mixed assemblages in the parklands of southwestern Manitoba (Joyes 1988:233).

Meyer and Epp (1990) reviewed the archaeological evidence for interaction in the parkland of central Saskatchewan. They concluded that interaction between Plains- and Forest-adapted people has likely been occurring for the past 3000 years, but the nature of the interaction has changed through time and any interaction was limited to the southern edge of the boreal forest (Meyer and Epp 1990:338). They indicated that Plains-adapted groups treated the aspen parkland of Saskatchewan as simply an extension of the Plains and occupied it in all seasons, perhaps with the greatest numbers in the winter (Meyer and Epp 1990:339).

Similarly, Mirau (1990) downplayed the importance that the parkland may have had concerning subsistence-settlement patterns. He noted that scholars often consider the parklands to be an area with increased density and diversity of resources available to be exploited, thus, making it theoretically more attractive. He also noted, however, that even if there is an increased diversity of resources, this does not mean that there was a corresponding increase in density of these resources (Mirau 1990:10). He believed that archaeological models should not consider the parkland as a uniform area and assume that resources are distributed evenly through it (Mirau 1990:10). He (1990:11) concluded that ecotones as a whole are not necessarily more attractive to humans than any other ecological zones.

Walde (1994:115) disagreed with Meyer and Epp's (1990) interpretation of the role of the parkland and the nature of the effective ecotone. He saw the parkland as being occupied year round by a single group of people belonging to a subphase (Lozinsky) of Mortlach. However, Walde (1994:118) does acknowledge that contact between Selkirk people of the boreal forest and Mortlach phase (Lozinsky subphase) did frequently occur.

The notion of Forest- and Plains-adapted groups converging on the parkland to hunt bison that have abandoned the plains to seek shelter has also been challenged by Malainey and Sherriff (1996:351). Using archaeological and historical data, they concluded that both parkland and forest peoples moved to the northern edge of the plains to hunt bison in winter. Malainey and Sherriff (1996) contend that bison most frequently spent the winter on the plains. They propose that little interaction occurred between plains groups and forest groups because the plains groups moved well out into the plains to hunt bison which allowed for the northern forest/parkland groups to move south with little conflict (Malainey and Sherriff 1996:352).

The available evidence from the collections studied from the Quill Lakes region indicates that there was little or no interaction between forest and plains adapted groups in this region. This evidence supports the model of interaction proposed by Meyer and Epp (1990). They proposed that any interaction that would occur would happen at the southern edge of the boreal forest. The southern edge of the boreal forest lies only about 50-60 km northeast of the Quill Lakes. Alternatively, the lack of evidence regarding interaction between groups may relate more to the fact that there is relatively little occupation of the Quill Lakes during this period in general. The paucity of pottery is especially relevant because pottery is the artifact class that is most widely used in these discussions.

If, as Meyer and Epp (1990) note, the interaction should occur at the southern edge of the boreal forest then one should expect some evidence for interaction filtering into the Quill Lakes because of the relatively small distance between the Quill Lakes region and the southern edge of the boreal forest. A closer look at the interaction between groups described by Meyer and Epp (1990) and how it applies to the Quill Lakes will help to answer some of the problems.

6.2.1 Pelican Lake and Besant

Although the distribution of Pelican Lake and Besant occur throughout the plains and parkland, there is little evidence for any type of interaction with forest groups. This is attributed to a lack of data regarding these archaeological groups in the boreal forest

(Meyer and Epp 1990:337-338). However, Meyer and Epp (1990:337-338) note that if any interactions did occur they expect it would happen at the boreal forest/parkland fringe (1990:338). Pelican Lake and Besant are well represented in the Quill Lakes region and likely maintained a typical Plains-adapted lifestyle throughout the region.

6.2.2 Avonlea

Despite a considerable Avonlea presence to the north of the Quill Lakes in the Nipawin region, west in the Saskatoon area, and south along the Qu'appelle drainage system, there was a relatively weak presence of Avonlea in the study area. Meyer and Epp (1990:332-333) proposed that people responsible for Avonlea projectile points and pottery spent the spring and early summer in the southern edge of the forest and interacted with the makers of Laurel pottery. Later in the fall, these Avonlea groups moved south into the parklands and plains to spend the winter. They contend that there is no evidence of co-occupation of the parklands by these two groups. The paucity of Avonlea in the Quill Lakes suggests that more was going on than a simple movement into the parklands during the fall and winter. It seem plausible that the interaction between Laurel and Avonlea was focused along the Saskatchewan River with Avonlea moving back into the parkland and plains following this major water course and not venturing into Quill Lakes region to the east. Therefore, the movement of people and interactions seem to be focused on the river system and the parkland/forest border, not the parkland/forest border in general.

6.2.3 Old Women's

The presence of the Old Women's phase in the Quill Lakes is suggested by the recovery of Prairie Side-notched projectile points. No pottery from the collections was identified as Old Women's. Meyer and Epp (1990:334) noted that no interaction between Old Women's and contemporaneous Blackduck groups is expected. The evidence from the Quill Lakes is consistent with this. They also suggest that the makers of Old Women's components likely wintered on the northern plains and adjacent parklands.

6.2.4 Mortlach

Although there is much evidence for Mortlach-Selkirk interaction in the parkland and southern edge of the boreal forest, there was none in the Quill Lakes region. Meyer and Epp (1990:336) note that pottery is the best evidence for such interaction. In fact, the Pehonan complex (Meyer 1981, 1984; Meyer and Russell 1987) was defined as a complex of the Selkirk composite that was distinguished by its plains influences. Although there is evidence for Selkirk influences at several sites in the parklands, the paucity of pottery in the Quill Lakes precludes any statement about the presence of Selkirk in the region except to say that there is little evidence for any such interaction.

Walde (1994) notes that these mixed assemblages in the parklands share many similarities to Mortlach components elsewhere and assigns these components to the Lozinsky subphase of the Mortlach phase. Walde (1994:118) believed that the Lozinsky subphase people inhabited the parklands year round and had frequent contact with Selkirk people. There is not enough pottery from the Quill Lakes to assess the relationship to the Lozinsky subphase apart from determining that the Quill Lakes pottery resembles Mortlach pottery.

It is also important to note that most of the sites that contain vessels showing some evidence of interaction during this period are also found within proximity of major watercourses. It seems likely that these waterways are the primary attraction for these groups of people, and the interaction primarily occurred here, not at the parkland/boreal forest interface in general.

It seems clear that favored resources are located along the waterways and groups from the forest and plains/parklands were exploiting these resources. At the same time, there was regular contact between groups along these waterways. It is equally clear that the region around the Quill Lakes was not viewed in the same light and obviously was not as important. It seems that zones of interaction were likely related to social gathering centers (e.g. Meyer and Thistle 1995). Because the Quill Lakes are isolated with no large watercourse (i.e. it has internal drainage), the sites to be found in the region during the last 3000 years are likely small camps, with an occasional bison kill. These are not the conditions in which one would expect large campsites with large groups of people coming together for extended periods of time or intense activities (e.g. fishing during the spawning period).

In conclusion, where interaction between forest and plains people was occurring it likely was focused on activities related to major waterways. Evidence from the Quill Lakes region suggests that movement through the parklands between the forest and Plains did not occur evenly throughout the parkland. While there is abundant evidence for interaction between forest and plains groups along the river systems, there is none in the Quill Lakes region. Further, the absence of pottery could also reflect the idea that the parklands in this region were occupied primarily in the winter when pottery production is non-existent and therefore would not be abundant in the archaeological assemblages.

Chapter 7

7.1 Summary and Conclusions

Artifact collections from the Quill Lakes region have proved useful for outlining the basic archaeological resources for that region. In all, 15 collections representing an estimated 35–40 000 artifacts were examined. From this, however, only 1291 diagnostic projectile points with adequate provenience were recorded. In addition, pottery representing at least 17 vessels was identified. These diagnostics and the sites they came from became the focus of this thesis. It is reasonable to expect that the majority of the large sites in the Quill Lakes region have been identified by collectors and are represented in their collections. Because of the large number of collections and artifacts examined from the region, it is fair to say that the data collected represents a good sample of the archaeological material from the region.

An important aspect of recording the collections was the surface survey of the sites that the artifacts came from. This allowed a better understanding of the particular setting of each site and some insight into how the collection represented what was observed in the field. Often the survey produced a refined site location from what was originally just a legal description, allowing specification of the actual site area in the field. Another valuable result was the collection of additional diagnostic artifacts. Obviously, this was important for several small sites that had few or no diagnostics. Finally, from an archaeological resource management perspective, surveying the sites allowed accurate site record forms to be completed and added to the site inventory maintained by the Saskatchewan government.

My results indicate a long occupation of the Quill Lakes region. The Paleo-Indian period was initiated in the region with the presence of the Agate Basin complex some time after 12 900 B.P. (10 500 rcybp). No fluted points were identified from the collections. This was attributed to unsuitable conditions in the Quill Lake basin at this time, but it does not account for the absence of fluted points from sites on the slopes of the Touchwood Hills. The presence of Paleo-Indian diagnostics on the north slopes of the Touchwood Hills is limited to one Terminal Paleo-Indian point from the Blue Hill site (EjNb-1). It is clear that the north slopes of the Touchwood Hills, for some reason, were not suitable for occupation during this period. The remaining Paleo-Indian sites are concentrated along major creeks and in areas of hummocky topography on the east and west sides of the study area. The most important site is the Haskey area along Milligan Creek. From this site, the vast majority of diagnostic materials were identified. This was particularly important during the Cody complex.

The transition between the Paleo-Indian and Middle Plains Indian periods was represented by the presence of a distinctive large corner-notched projectile point type. Although individual examples of large corner-notched points have been identified at several sites on the Northern Plains with both Lanceolate Paleo-Indian projectile points and/or Middle period Early Side-Notched points, they have not been adequately described. The points from the Quill Lakes region are unique in several respects. One is that they are remarkably similar to each other. Measurements of the points reveal a tight standard deviation. Another unique feature is the almost exclusive use of Knife River Flint as a lithic material. The large corner-notched points from the Quill Lakes have many physical features characteristic of Paleo-Indian technology, but the points are corner-notched and were found at sites containing other large assemblages of Early Side-Notched projectile points. A speculative date of 8200 B.P. (7500 rcybp) was assigned to points of this type to reflect a period of transition between the Paleo-Indian and Middle Plains Indian period.

The Middle Plains period characterized by was the most intensive Precontact occupation in the Quill Lakes region; the number of components and diagnostic projectile points were the highest of any period. This period began about 8200 B.P. (7500 rcybp) and lasted for about 5000 years (4600 rcybp). The numbers of components were threefold or more than seen during Paleo-Indian times. This pattern was repeated for the number of projectile points as well.

One can speculate that the dramatic increase may be the result of a number of factors. During this period, the grasslands saw their maximum extent and likely covered the entire region, extending well north of the region. Bison populations changed in response and their populations likely increased. This period is signified by a fundamental shift in technology with atlatl dart technology favored over the spear technology of the Paleo-Indian period. This was likely an improvement in the effectiveness of hunting and may have contributed to human population increases.

Occupation during the Late Plains Indian period appears to have been less intensive than during the Middle Plains Indian period. This period began about 2850 B.P. (2675 rcybp) and lasted until the adoption of European goods (at the latest, ca. 250 B.P.). There were a large number of Besant points, but these were mostly found at a single site. The Avonlea complex is virtually non-existent in the Quill Lakes region compared to other cultures in the Middle and Late periods. Only 2.7 % of all recorded projectile points were Avonlea. Succeeding Avonlea, during the Late Side-Notched series there was an increase in the numbers of components and projectile points.

A unique Bratton component, containing 31 projectile points, was identified at ElNe-7. Interestingly, these points are all manufactured from silicified siltstone pebbles, a rare material in this region. This is also the first known large assemblage of this point type identified since Dyck and Morlan's (1995) definition of the type. The presence of a large number of these projectile points at a single site lends some evidence in support of Dyck and Morlan's (1995) Besant series. However, because the collection was from a disturbed context any relationship to the Besant series must remain somewhat speculative.

Although Avonlea has been noted to have a lower total number of sites than other archaeological groups (Dyck 1983:123), the presence of Avonlea in the Quill Lakes appears especially weak. In fact, the Cody complex appears to have a stronger presence in the study area. The locations of large Avonlea sites, from regions around the Quill Lakes, appear to favor situations near large watercourses (e.g. sites in the Nipawin district, Saskatoon region, and along the Qu'appelle River). The Quill Lakes are situated within an internal drainage basin with only minor creeks entering the lakes. Other cultural groups either excluded makers of Avonlea from entering the region or this area was avoided for other reasons (i.e. lack of desirable environmental conditions such as major waterways). It is difficult to assess this problem from the collections studied.

Pottery was rare in the collections examined. The lack of pottery likely reflects a real absence from the region, but because of the difficulty of finding pottery in cultivated fields, a collection bias against pottery might contribute to its apparent paucity. Most of the collectors were quite thorough in their collecting and picked up pottery where it was to be found. Small amounts of pottery were collected from a limited number of sites. The majority came from two site areas. One was EkNb-2 and EkNb-4, located north of Wynyard while the other was the Corley's Ridge/Kells region north of Elfros. Pottery from both of these locales was identified as Mortlach. Not enough pottery was identified to assess how it fits into Walde (1994) and Malainey's (1991, 1995) schemes for Mortlach. Measurements of the Late Side-Notched series projectile points from these sites were taken to assess the Mortlach/Cayley types proposed by Peck and Ives (2001). From sites EkNb-2 and EkNb-4 the projectile points (n=4) fit well within the Mortlach type. However, measurements from a much larger sample of points from Corley's Ridge/Kells (n=61) did not have similar results. Only 3 of the 61 points (4.9%) could be classified as Mortlach. Because both the pottery and projectile points were found from cultivated fields there is no way to prove that an association between the two exists but, with such a large sample of projectile points, if one accepted Peck and Ives (2001) arguments, then more Mortlach points should be observed. Alternatively, it is possible that the pottery at this site looks like, but is not Mortlach or that the makers of the Mortlach pottery did not leave behind any projectile points. It should also be noted that the presence of Mortlach in this region of the parklands of east central Saskatchewan is limited. Clearly, the new projectile point type concepts do not appear to work well for these collections and until further archaeological data is collected, the classification system of Kehoe (1966b) is preferred.

Finally, the role of the parkland as a zone of transition and/or interaction between forest and plains-adapted groups during the past 3000 years was explored. From the collections studied there appeared to be no evidence to suggest any presence of boreal forest-adapted cultural groups. All of the observed diagnostic artifacts fit well in the culture-historical schemes outlined for the Northern Plains. This does not preclude, however, any influence from boreal forest groups in the region. It was noted that during this period there was a decrease in the number of components, especially during Avonlea, and a decrease in diagnostic artifacts, particularly ceramics. How the lack of diagnostic artifacts and the decrease in the numbers of components relates to the boreal forest is unknown, but further research is needed before completely ruling out the possibility of interaction.

7.2 Future Research

A thorough analysis of collections from the study region has produced several avenues of future research. Acquiring specific information from excavations at a number of sites in the study area would help clear up several questions. The potential for excavation, however, is severely hampered by the extent of cultivation. Despite this, there still is potential at many of these sites for portions of intact components to be found. Information from excavations, combined with data from the collections could provide valuable information and help further the archaeological knowledge of the region.

One area of interest is the strong presence of the Cody complex in the region. Although Cody complex sites are common in Saskatchewan, they have only been described for the southern part of the province (e.g. Joyes 1997, 2000; Corbeil 1995; Ebell 1988; Meyer 1985). The Cody site at the Haskey site area is one of the largest documented Cody complex sites described for central Saskatchewan and deserves further investigation.

Another area needing further research is related to the large corner-notched points identified in the collections. Stratigraphic and/or radiocarbon assays would help put this point type into a temporal framework. Further research to ascertain the relationship between earlier Paleo-Indian and succeeding Mummy Cave components could be undertaken. This research would also provide some additional data to help determine the possibility of these specimens representing a new point type, or their inclusion in an already existing typology.

Several avenues of research could be undertaken concerning the Middle Plains Indian period. During this period, there was a dramatic increase in the presence of archaeological groups in the Quill Lakes region (and elsewhere on the Northern Plains). How the environment, changes in technology, and population increase may have played a role in this increase are important areas requiring additional research.

There are a few important aspects to explore in the Late Plains Indian period. Additional data regarding the large Bratton component at ElNe-7 is needed to help further assess the validity of Bratton points as a type. As it appears now, data from the site seems to support the type as proposed by Dyck and Morlan (1995). The apparent decrease in the importance of the Quill Lakes region during the Late Plains Indian period also needs to be examined. This was most dramatic during the Avonlea period. In addition, the paucity of pottery for the region is interesting because there are large sites with an abundance of pottery in regions surrounding the Quill Lakes (e.g. Last Mountain Lake, Saskatoon region, Bjorkdale area, and Nipawin district).

Finally, there is a good potential for a variety of historical studies. There have been many explorers and fur-traders in the region. Fur-trade posts were established in the Touchwood Hills and at Fishing Lake (Russell 1999:34). In addition, well-travelled trails existed once the forts were established in the Touchwood Hills. More recently, several Indian reserves were established in the region, providing an opportunity for additional historic research in areas related to these.

Recording artifact collections has proved valuable for providing baseline archaeological data for an area little known previously. A primary investigation of the region using collections is relatively easy, fast and cost effective for the degree of information gained. From this exercise, several important sites and many new archaeological problems have been identified. An added benefit is the relationship created between the artifact collectors and the professional archaeological researcher. Hopefully, the value of responsible artifact collection and curation was impressed upon the people contacted while at the same time an appreciation of the knowledge and dedication of many of the collectors was gained. Maintaining a good relationship between the two is important for better preserving and understanding the prehistory of any region.

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Appendix 1

Site Descriptions

Kells #4 Site (EkMw-3)

This site is situated in a cultivated field along Duck Hunting Creek north of Elfros. It was surveyed and artifacts observed included: 29 flakes and debitage, and 5 core fragments. In addition, 5 biface fragments, 2 endscrapers and 1 retouched flake were collected. This area has seen many different collectors come to this spot including Ed Stachyruk, Ed Yurach, Ed Rorquist, Mitch Malinowski, Ken Kereluke, and Vic Knight. The relationship between this site and others in the immediate area is unknown and for the purposes of this study it and others were analyzed together as part of the Corley's Ridge/Kells area.

Kells #5 Site (EkMw-4)

EkMw-4 is situated in a cultivated field along Duck Hunting Creek north of Elfros. It is located just to the south of ElMw-3. This site was not surveyed. Ed Stachyruk has a collection from this locale and other people likely have collected here as well. The relationship between this site and others in the immediate area is unknown and for the purposes of this study, it and others were analyzed together as part of the Corley's Ridge/Kells area.

Hilts Site (EkMw-5)

EkMw-5 is located in a cultivated field along Milligan Creek just south of the southwest corner of the Fishing Indian Reserve No. 89. Brad and Aileen Novecosky surveyed this site and two flakes and an endscraper were observed. The endscraper was curated. Ed Stachyruk has a small collection from this locale.

New Site (EkMw-6)

EkMw-6 is situated in a cultivated field along Milligan Creek next to the Fishing Lake Indian Reserve No. 89. Brad and Aileen Novecosky surveyed this site. They observed 20 flakes, 7 core fragments, 11 fire-cracked rocks and numerous bone fragments. Some bone may be recent and related to farming activities as one bone was identified as horse. One projectile point fragment was collected. Ed Stachyruk has collected from this locale.

EkMw-7

This site is situated in a cultivated field along Milligan Creek southeast from EkMw-5. Ed Stachyruk has a small collection from this site. It was not surveyed.

Angus Kereluke Site (EkMw-8)

EkMw-8 is situated in a cultivated field just off Highway 35 approximately 8 km north of Elfros. A small intermittent creek crosses the site. Sloughs are also present in the immediate vicinity. Ed Stachyruk collected from this site and it was not surveyed.

Ted Kereluke Site (EkMw-9)

This site is situated in a cultivated field just to the southeast of EkMw-8. Ed Stachyruk collected from this site. It was not surveyed.

EkMx-1

This site, situated on a flat plain close to Duck Hunting Creek, was recorded by Orly Felton in 1974 and is likely an extension of EkMx-2. The area was briefly examined and some bone was observed. Vic Knight has also collected from this area. The relationship between this site and others in the immediate area is unknown and for the purposes of this study, this site and others were analyzed together as part of the Corley's Ridge/Kells area.

Corley's Ridge (EkMx-2)

EkMx-2 is situated in a cultivated field. There are two main areas of this site. The most prominent feature is a long sandy ridge orientated WNW by ESE. The ridge rises 10 to 12 meters off a level plain that extends towards Little Quill Lake to the northwest. Dr. Meyer and Brad Novecosky dug an informal test pit in an uncultivated portion of the field. No cultural materials were recovered. Brad and Aileen Novecosky surveyed this site. Artifacts are found in abundance on the entire length of the ridge as well as on the level plain. A large amount of bone lies on the surface of the level plain with quantities of fire-cracked rock. This site has been extensively collected from since it was first broke. Mitch Malinowski, Ed Stachyruk, Ed Yurach, Ed Rorquist, Orly Felton, and Ken Kereluke have collections from this site. The relationship between this site and others in the immediate area is unknown and for the purposes of this study, this site and others were analyzed together as part of the Corley's Ridge/Kells area.

Kells #1 (EkMx-3)

This site is situated in a cultivated field. It is located at the eastern edge of the sandy ridge described above and is likely related to EkMx-2. Brad and Aileen Novecosky briefly examined this site. Two flakes were observed and one potsherd was collected. This area has seen many different collectors come to this spot including Ed Stachyruk, Ed Yurach, Ed Rorquist, Mitch Malinowski, Ken Kereluke, and Vic Knight. The relationship between this site and others in the immediate area is unknown and for the purposes of this study, this site and others were analyzed together as part of the Corley's Ridge/Kells area.

Kells #2 (EkMx-4)

EkMx-4 is located in a cultivated field between Birch Creek and Duck Hunting Creek. Twelve flakes, 13 fire-cracked rocks, and historic farming debris were observed. There was a farmhouse, now gone, located near the western boundary of this collecting area. This area has seen many different collectors, including Ed Stachyruk, Ed Yurach, Ed Rorquist, Mitch Malinowski, Ken Kereluke, and Vic Knight. The relationship between this site and others in the immediate area is unknown and for the purposes of this study this site and others were analyzed together under the Corley's Ridge/Kells area.

Kells #3 (EkMx-5)

This site is situated in a cultivated field to the east of EkMx-4. A small lithic scatter of 11 flakes and 17 fire-cracked rocks was observed. This area has seen many different collectors including Ed Stachyruk, Ed Yurach, Ed Rorquist, Mitch Malinowski, Ken Kereluke, and Vic Knight. The relationship between this site and others in the immediate area is unknown and for the purposes of this study this site and others were analyzed together under the Corley's Ridge/Kells area.

EkMx-6

Ed Stachyruk found a single projectile point at EkMx-6. This site was not surveyed.

Oli Eirickson Site (EkMx-7)

EkMx-7 is situated in a cultivated field along the crest of Birch Creek valley. Ed Stachyruk collected from this site. It was not surveyed.

Andronowich Petroglyph (ElMw-1)

ElMw-1 is situated in a cultivated field approximately 5 km northeast of Wadena. The site was originally recorded as a find spot for an incised rock that had been recovered during the 1960s. Brad and Aileen Novecosky surveyed the site. Several flakes, a small core fragment and a biface were noted (Novecosky 2001). The biface and core fragment were collected. Also observed was a modern historic scatter where it was reported that farm buildings were located in the past.

Jack Haskey Area 1 (ElMw-2)

This site is situated along Milligan Creek just to the east of Highway 35. Brad and Aileen Novecosky surveyed this site. A lithic scatter consisting of 21 flakes, 3 fire-cracked rocks, as well as numerous bone fragments were observed. In addition, several tools were collected: a complete side-notched projectile point, one projectile point fragment, 4 biface fragments and one large biface. Ed Stachyruk and Ken Kerluke have collected from this area. The relationship between this site and others in the immediate area is unknown. Therefore, for the purposes of this study, this site and others were analyzed together under the Haskey site area.

Jack Haskey Area 2 (ElMw-3)

ElMw-3 is situated in the same field as ElMw-2 but just to the south. A small scatter consisting of 4 flakes, 2 core fragments and a single biface fragment were noted. The biface fragment was collected. Ed Stachyruk and Ken Kerluke have collected from this area. The relationship between this site and others in the immediate area is unknown. Therefore, for the purposes of this study, this site and others were analyzed together under the Haskey site area.

Jack Haskey Area 3 (ElMw-4)

This site is situated in a cultivated field to the east of ElMw-3. Twenty flakes, 5 fire-cracked rocks, and 1 core were observed. Mckean Lanceolate and Oxbow projectile points as well as a biface fragment were collected. Ed Stachyruk and Ken Kereluke have collected from this area. The relationship between this site and others in the immediate area is unknown. Therefore, for the purposes of this study, this site and others were analyzed together under the Haskey site area.

Jack Haskey Area 4 (ElMw-5)

This site is situated in a cultivated field close to Milligan Creek directly east of ElMw-4. A small lithic scatter of 6 flakes, 1 biface fragment and 2 fire-cracked rocks were observed. Ed Stachyruk and Ken Kerluke have collected from this area. The relationship between this site and others in the immediate area is unknown. Therefore, for the purposes of this study, this site and others were analyzed together under the Haskey site area.

Jack Haskey Area 5 (ElMw-6)

This site is situated in a cultivated field next to Milligan Creek south of ElMw-5. A small lithic scatter consisting of six flakes were observed. Two side-notched projectile points were collected. Ed Stachyruk and Ken Kerluke have collected from this area. The relationship between this site and others in the immediate area is unknown. Therefore, for the purposes of this study, this site and others were analyzed together under the Haskey site area.

Jack Haskey Area 6 (ElMw-7)

This site is situated in a cultivated field directly across Milligan Creek from ElMw-6. Despite poor visibility, seven flakes, widely dispersed along with 10 fire-cracked rocks, were observed. In addition, several bone fragments were observed. Ed Stachyruk and Ken Kerluke have collected from this area. The relationship between this site and others in the immediate area is unknown. Therefore, for the purposes of this study, this site and others were analyzed together under the Haskey site area.

Bill Kereluke Site (ElMw-8)

This site is situated in a cultivated field about 1 km east of the Jack Haskey area. Brad and Aileen Novecosky surveyed the site. Milligan Creek is located 200 m south. An extensive lithic scatter was observed on a long, low sandy ridge. Along with the 154 flakes and debitage and 16 cores, there were 52 fire-cracked rocks and 165 bone fragments mapped. Several tools were collected including 2 biface fragments, 1 Knife River Flint graver, 2 projectile point fragments, and three complete projectile points. A single test pit was dug that proved to be negative. Ed Stachyruk and Ken Kerluke have collected from this area.

Ken Jones (ElMw-9)

ElMw-9 is situated in a cultivated field south of the grid road from the Haskey area. It is likely closely associated with these other areas. The site was not surveyed. Ed Stachyruk has collected from this area.

Elphinstone Site (ElMw-10)

This site is situated in a cultivated field to the west of Fishing Lake Indian Reserve No. 89 and was not surveyed. Ed Stachyruk has collected from this area.

ElMw-11

This site is located east of ElMw-6 on the Fishing Lake Indian Reserve No. 89 and was not surveyed. Ed Stachyruk has collected from this area.

Troy Kereluke Site (ElMx-1)

ElMx-1 is situated in a cultivated field about 2 km east of Little Quill Lake. Brad and Aileen Novecosky surveyed this site and a lithic scatter was observed over a large area. There were 69 flakes, 10 core fragments, 1 fire-cracked rock, and 29 bone fragments. Several tools were collected including a retouched flake, one large endscraper, two biface fragments, two projectile point fragments, one Pelican Lake projectile point, and two Besant projectile points. A single test pit was dug and one of the Besant points was recovered from the plowzone level. There is also a large buffalo rubbing stone located about 100 m north of the site. Ken Kereluke has a collection from this site.

Blue Hill (EjNb-1)

Blue Hill is located just north of Day Star Indian Reserve No. 87 in the Touchwood Hills portion of the Touchwood Uplands. The site is situated at base of the highest hill in the Touchwood Hills. The area has been cultivated on all sides of Blue Hill except on the east. Only the cultivated portion of the site located west of Blue Hill proper was examined. Blue Hill is a popular local attraction, as evidenced by the placement of a cairn at the top of the hill. In addition, a truck trail leads to the top of the hill to access a microwave tower. Although access to the site is through private property it is a well known location and many people have collected artifacts from here. Dr. David Meyer and Brad Novecosky briefly examined this site initially. During that visit, Dr. Meyer found an Early Side-Notched projectile point. Later that fall, the site was surveyed and mapped. Large numbers of debitage were noted but no formed tools were found. Ed Stachyruk and Ed Yurach have collected artifacts from this site. There is no doubt that many other collections also exist.

Glidden Site (EjNb-2)

The Glidden Site, located south of a small lake, lies just to the north of the Blue Hill. This site was reported to Brad Noveosky by the landowner, Ralph Glidden, who related that his father had collected arrowheads from this field but the collection has since been lost. The local topography is characterized by hummocky terrain with many steep hills. Brad and Aileen Novecosky surveyed the site and observed cultural material covering an area nearly 500m X 650m. The material was thinly dispersed, however, and has been severely impacted by cultivation. In addition, because of the steepness of some of the hills, some have been landscaped to smooth them out. This involves removing the topsoil and flattening the hill with land-moving equipment and then replacing the topsoil. This accounts for the thinly dispersed cultural material spread over a large area. Several tools were collected and a single Oxbow point was found. This is the only known diagnostic for the site. A modern historic component was also noted at this site.

Ed Yurach 10 & 11 (EjNb-3)

EjNb-3, bisected by a grid road, is located a few miles to the north east of EjNb-2. Ed Yurach collected a small amount of material from this site. The location was observed from the grid road but because of crops, it was not surveyed and no cultural material was observed.

Tt Site (EkNa-1)

EkNa-1 is situated along the valley crest of Rushville Brook. Ed Stachyruk collected material from both sides of the creek valley. The site location was observed from the road but was not surveyed.

'40 Ford Site (EkNa-2)

This site is located in the upper portion of the Touchwood Hills Transition Zone about 2 km northeast of EjNb-3. The portion that had been collected from lies in a cultivated field. Ed Stachyruk has a small collection from this site. The locale was observed from the road but was not surveyed.

Ed Yurach #3 (EkNa-3)

This site is located just northeast of Wynyard along Magnusson Creek. It lies in a cultivated field on a small terrace at the bend of the creek. The site was surveyed and a small amount of cultural debris was noted. A large quartzite core/chopper and a large retouched flake were collected. A core fragment and three flakes were also observed. Ed Yurach collected from this site.

Ed Yurach #4 (EkNa-4)

EkNa-4 is located about 200 m south of EkNa-3 in a cultivated field along the crest of the Magnusson Creek valley. Its relationship to EkNa-3 is unknown but the two sites may be related. Two flakes and a core were noted on the surface. Ed Yurach has a collection from this site.

Yaskowich Site (EkNa-5)

EkNa-5 is located in a cultivated field near a gravel pit 8 km north east of Wynyard. It is situated on a Glacial Quill Lake strandline at a point where the Jolly Creek crosses it. Brad Novecosky, Aileen Novecosky and Peter Popkin surveyed the site over the course of three days. Materials observed and mapped include 93 flakes, 3 cores, and 76 fire-cracked rock. Tools collected include 2 grooved mauls, 3 ovoid bifaces, 2 endscrapers, 1 chipping hammer, 1 potsherd, 4 projectile point fragments, and 1 complete Duncan point. Three test pits were dug along a fence line on the beach ridge. No cultural materials were found. The landowner, Michael Yaskowich, and Ed Yurach have collected artifacts from this site. A spring feeds Jolly Creek near the site. The landowner also reported that in the early part of the 20^{th} century the local Indians would camp at this spring to dig for Seneca root.

Steve Hayko Site (EkNa-6)

This site is located in a cultivated field on a small hill, adjacent to a slough, northeast of EkNa-5. Gravel operations lie to the south. Its relation to EkNa-5 is unclear and the two may be related. Brad Novecosky and Aileen Novecosky surveyed the site and observed 20 flakes and 3 core fragments. Ed Yurach has collected from this area.

Alex Proznick Site (EkNa-7)

EkNa-7 is situated in a cultivated field about 6 km south of Wynyard along Magnusson Creek. A prominent hill is an important feature at the site. The site was surveyed and a small amount of cultural material was observed. These included 3 flakes, and 7 core fragments. One retouched flake made from Knife River flint was collected. A small historic trash dump area was evidenced by amounts of glass, crockery, dishes, and metal. A single test pit was dug between the hill and the creek, but no intact deposits were noted. Ed Stachyruk has a small collection from this site. Margaret Panchuk, current landowner, has a small collection from this site.

Ed Yurach #12 & #32 (EkNa-8)

EkNa-8 is situated in a cultivated field along the crest of Jolly Creek. A small seasonal tributary runs along the other border of the site. Ed Yurach has collected from this site. The site location was observed from the road but the site was not surveyed.

Wynyard Burial (EkNb-1)

EkNb-1 is located near the southeast corner of Big Quill Lake about 500 m from the present shore. This site was discovered in the 1950s during gravel operations. No further information is known about the site.

Ed Yurach Site (EkNb-2)

EkNb-2 is situated 500 m south of the Wynyard Airport where a Glacial Quill Lake strandline is crossed by Magnusson Creek. This site has been cultivated and has experienced severe erosion. A portion of the site may remain intact as there is a grassy area that may have not been previously cultivated. James S. Wilson and Bill Ferris of the Saskatchewan Research Council recorded this site in 1985 (HRIA 85-14). The site was subsequently surveyed and mapped during this research. Two test pits were dug which proved to be negative. The following artifacts were observed: 62 debitage, 75 fire-cracked rock, and 13 bone fragments. Tools collected include: 1 biface fragment, 2 projectile point fragments, 1 endscraper, and 1 potsherd. Ed Yurach has a large collection from this site.

Ed Yurach #27 (EkNb-3)

EkNb-3 is situated in a cultivated field located 200 m north of Highway 16, 2.5 km east of Kandahar. It is located near the crest of unnamed intermittent creek. The site was surveyed and seventeen flakes were observed scattered over an area of 60 m X 50 m. Ed Yurach has collected from this locale.

Airport Site (EkNb-4)

EkNb-4 is situated in a cultivated field adjacent to the Wynyard Airport just north of EkNb-2. The relationship between EkNb-2 is unknown and it is possible that they are related. The site lies adjacent to the same Glacial Quill Lake strandline that EkNb-2 is on but extends to the end of the Wynyard Airport runway. This runway has recently been rebuilt and re-orientated in an east-west alignment and has heavily impacted the site. Mr. Yurach monitored much of the construction and reported that he noticed no subsurface debris being exposed. During an initial visit with Mr. Yurach, a potshered was collected. During a subsequent visit by Dr. Meyer and Brad Novecosky, Dr. Meyer found a hafted biface. Later that fall the site was surveyed and recorded by Brad and Aileen Novecosky. A single test pit was dug that proved to be negative.

Dafoe Tipi Ring Site (EkNc-1)

EkNc-1 is located about 800 m south of Big Quill Lake 4 km east of Dafoe. This site consists of 2 complete and 3 partial tipi rings. Ed Yurach and Brad Novecosky initially visited the site but tall grass precluded them from finding the site. At later date, Dr. David Meyer and Brad Novecosky visited the site again and were successful in locating the rings. Subsequently, Brad and Aileen Novecosky mapped the stone circle features using the tipi quick method. No artifacts are reported from this site. There are several large 'buffalo rubbing stones' a short distance north from the rings.

Ed Yurach #36 (EkNc-2)

This site is situated in a cultivated field south of Dafoe Tipi Ring Site. Ed Yurach has a collection from this site. The site was not surveyed.

Ed Yurach #38 (EkNc-3)

EkNc-3 is situated in a cultivated field just north of EkNc-2. A large gravel pit is located adjacent to the south. Ed Yurach collected from this site but the site was not surveyed.

Banford A (EkNd-1)

EkNd-1 is situated in a pasture, previously cultivated, approximately 8 km southwest of Dafoe. The local area is characterized as a low, wet, saline region with many intermittent sloughs. Large eskers are found 1.5 km to southwest. Llewelyn Wildeman collected from this site. Margaret Hanna recorded this site during the Collection Registry Program. This area was not surveyed. Identification of materials from this site was from colour slides.

Banford B (EkNd-2)

EkNd-2 is situated in a pasture, previously cultivated, just to the northeast of EkNd-1. Llewelyn Wildeman collected from this site. Margaret Hanna recorded his collection during the Collection Registry Program. The site was not surveyed. Identification of materials from EkNd-2 was made from colour slides.

Lorienz Site (EkNd-3)

EkNd-3 is situated in a cultivated field approximately 3.5 km northeast of Jansen. The site lies on a level portion adjacent to a string of prominent hills. This site was briefly visited and a large quartzite unifacially flaked tool was collected. Small numbers of debitage were noted. This site was collected from by Llewelyn Wildeman and originally recorded by Margaret Hanna during the Collection Registry Program. The Wildeman collection was examined from colour slides.

Bert Pumford Site (EkNd-4)

EkNd-4 is situated in a previously cultivated field north just north of EkNd-1 and EkNd-2. Joe Hamilton collected from this site. Margaret Hanna recorded his collection during the Collection Registry Program. This site was not surveyed. Identification of materials was made from colour slides.

Hutterite Site (ElNa-1)

ElNa-1 is located in a cultivated field north of Little Quill near the Quill Lake Hutterite Colony. It is situated near an unnamed creek that drains into Little Quill Lake. This site was observed from the road but was not surveyed. Ed Stachyruk has a collection from this locale.

ElNa-2

ElNa-2 is situated in a cultivated field southwest of Clair near Little Quill Lake. This site is situated adjacent to several dry sloughs that have been drained by trenches by the landowner. An abandoned farmyard is located adjacent to the area to the north. Brad Novecosky and Layne Holmlund surveyed this site and mapped 20 debitage, and numerous historic items (glass, metal, bone, bricks). Artifacts collected were 3 projectile points, 1 biface fragment, and 1 large endscraper. A single test pit was dug and a Swan River Chert flake was recovered from the plowzone level. No intact materials were noted. Ed Stachyruk has a small collection from this site.

Ed Yurach #9 (ElNa-3)

ElNa-3 is situated in a cultivated field some 8 km northeast of Wynyard. It was not surveyed. Ed Yurach has a collection from this site.

ElNb-1

ElNb-1 is situated in a cultivated field on/adjacent to a sand ridge along Quill Creek. The creek has been dammed down stream close to Little Quill Lake and has created a large marshy wetland area adjacent to the site. This site was not surveyed. Ed Yurach has a collection from this locale.

ElNd-1

ElNd-1 is recorded as a tipi ring site. Bob and Laureen Hamilton, collectors included in this study, live on this section and own this land. They report that no tipi rings to their knowledge ever have been found here. This site was originally reported by Noreen Cressman, a schoolteacher from Leroy, in 1960 and was recorded by Gil Watson. No attempt to locate the site was made.

ElNd-2

Noreen Cressman reported this site in 1960 and it was not surveyed.

ElNd-3

Noreen Cressman reported this site in 1960. It is recorded as a tipi ring site. This supposed site location was surveyed but no stone circles were identified. The field has been completely cultivated except for a small wet meadow. The landowner has no recollection of any tipi rings being located here.

Rosner Site (ElNd-4)

ElNd-4 is situated in a cultivated field near the western boundary of the Glacial Quill Lake plain. There are several sloughs adjacent to the site. Margaret Hanna originally recorded this site as part of the recording of Joe Hamilton's collection. Dr. David Meyer and Brad Novecosky visited the site and they observed a thin artifact scatter. Subsequently, the site was surveyed and a single endscraper was collected. Several fire-cracked rock, cores, flakes and some bone were observed.

ElNd-5

ElNd-5 is situated in a cultivated field at the western boundary of the Glacial Quill Lake plain. The local topography is gently rolling with numerous intermittent sloughs. Joe Hamilton collected from this site and Margaret Hanna recorded his collection during for the Collection Registry Program. This site was not surveyed.

ElNd-6

ElNd-6 is situated in a cultivated field near the western edge of the study area. Joe Hamilton collected a single granite maul from this site. Margaret Hanna recorded his collection during the CRP. This site was surveyed but no cultural materials were found. Visibility on the field was poor and may account for the failure to locate this site.

R.C. Labourne Site (ElNd-7)

ElNd-7 is situated in a cultivated field, 1.5 km south of Lampard, on a prominent Glacial Quill Lake strandline. Joe Hamilton collected from this site and Margaret Hanna recorded this site during the CRP. Aileen and Brad Novecosky surveyed this field but could not locate any cultural material where the site form indicated. Poor visibility likely was a factor. However, two other sites, EkNd-13 and EkNd-15, where recorded on the same quarter section during that visit.

Blancherd (ElNd-8)

ElNd-8 is situated in a cultivated field on a Glacial Quill Lake strandline about 3 km south of Lampard. A large, long slough lies adjacent to the west of the strandline. Joe Hamilton collected from this site and Margaret Hanna recorded it during the CRP. Several hundred debitage, bone fragments and several tools were observed during the survey of this site and a Pelican Lake and Duncan projectile point were collected. Also collected were two bifaces and an endscraper. Three test pits were dug. Two were negative but one close to the slough produced two long bone fragments below the plowzone. The bones were situated in a darkish, wet, sandy matrix. During a subsequent visit to the site, Dr. David Meyer found a hafted biface. This area was reported by local informants to have contained many bison remains when it was first broken for agriculture.

Block Site (ElNd-9)

ElNd-9 is situated on a level plain adjacent to a prominent string of hills. There are numerous sloughs in the immediate vicinity of the site. Joe Hamilton collected from this site. Margaret Hanna recorded this site during the CRP. This locale was not surveyed.

Dennis Site (ElNd-10)

This site is situated in a cultivated field adjacent to an unnamed tributary of Ironspring Creek. Joe Hamilton collected from this site. Margaret Hanna recorded this site during the CRP and it was not surveyed.

Volden (ElNd-11)

ElNd-11 is situated in a cultivated field with numerous sloughs in the vicinity. Joe Hamilton collected from this site. Margaret Hanna recorded this site during the CRP and it was not surveyed.

ElNd-12

ElNd-12, recorded as an isolated find, is situated in a cultivated field about 3 km north of Lampard. There is reported to be bison bone scattered in the field. This site was not surveyed.

Laybourne B (ElNd-13)

ElNd-13 is situated in a cultivated field on a prominent Glacial Quill Lake strandline. Its relation to ElNd-7 is uncertain and they may be the same site. Brad and Aileen

Novecosky surveyed this site and observed a small lithic scatter. No diagnostics were discovered. A large slough, drained by the landowner, lies adjacent to the site.

ElNd-14

ElNd-14 is situated in a cultivated field and is associated with a prominent Glacial Quill Lake strandline. This site was not surveyed.

Laybourne A (ElNd-15)

ElNd-15 is situated in a cultivated field on a prominent Glacial Quill Lake strandline. It is located a couple of hundred meters south of ElNd-13. Brad and Aileen Novecosky surveyed this site and observed a small lithic scatter mixed with modern historic debris. Aileen found one Swan River Chert, large corner-notched point.

ElNe-1

ElNe-1 is situated in a cultivated field near the western border of the study area. A large slough occupies a good portion of the quarter section for which this site is recorded. Gil Watson originally recorded this site from information obtained from Noreen Cressman, a schoolteacher from Leroy and it was not surveyed.

ElNe-2

ElNe-2 is situated in a cultivated field. Noreen Cressman reported this site to Gil Watson at the Saskatchewan Museum of Natural History in 1960. Bob and Laureen Hamilton have collected from this location. This site was not surveyed.

Dotschkat Site (ElNe-5)

ElNe-5 is situated in a cultivated field. Joe Hamilton collected from here and Margaret Hanna recorded this site during the CRP. Bob and Laureen Hamilton also have collections from this spot. This site was not surveyed.

Elke Site (ElNe-7)

ElNe-7 is situated in a cultivated field close to the west side of Jansen Lake near its northern extent. Joe Hamilton has collected from this site as well as Bob and Laureen Hamilton. Margaret Hanna recorded this site during the CRP. This site was visited on a couple of occasions but was not intensively surveyed. Some debitage, fire-cracked rock and bone were observed on the surface.

FaNa-1

FaNa-1 is situated in native prairie pasture currently being grazed by bison. Harry Yerex, then of Clair, reported this site in 1967 and Gil Watson assigned the border number then (Yerex 1975). The site contains a large buffalo rubbing stone, a large stone circle feature, a small campfire circle and one or two possible stone piles that may be somewhat disturbed cairns. Brad and Aileen Novecosky mapped the stone circles features using tipi quick method. The relationship of these features to the rubbing stone, spring, and stone piles were recorded as well. Harry Yerex may have had a collection from this site but the location of it is unknown to the author.

FaNa-2

FaNa-2 is situated in a cultivated field northeast of Clair. Orly Felton reported having collected a scraper from this locale. This site was not surveyed.

Yerex Site (FaNa-3)

FaNa-3 is situated in a cultivated field just northwest of Clair. Large gravel pits are located to the east of the site. The site is located on a large sandy area around a couple of springs. Clair Brook passes by the area as well. Harry Yerex showed Ed Stachyruk the location of this site. Ed Stachyruk has a single grooved maul fragment from this site. Dennis Anderson apparently visited the site as well. Records from the Glacial Lake Agassiz Survey indicate that he recorded the site (field # KR-132) and made a small collection of artifacts. These are curated by the Department of Anthropology and Archaeology at the University of Saskatchewan. Harry Yerex is reported to have collected from this site but the location of his collection is unknown to the author. The site was surveyed and two complete projectile points, two projectile point fragments, a scraper and a biface fragment were collected. A large amount debitage was observed on the surface.

Appendix 2

Quill Lakes region artifact data

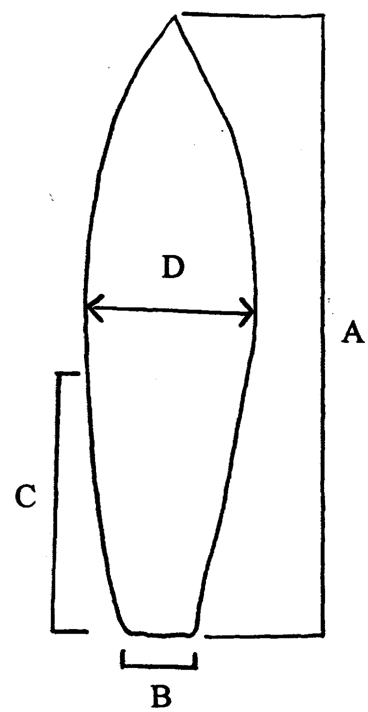

Figure 1. Agate Basin projectile point measurements.

A – Total Length

B – Base Width

C – Length of Haft (Lateral Grinding)

D – Maximum Width

Table 1. Measurements of Agate Basin points from the Quill Lakes region (*indicates estimated measurement).

Site	Cat#	Collector	A	B	C	D	Material
Haskey Unspecified	158	Stachyruk	-	14.6	-	-	KRF
Haskey Unspecified	159	Stachyruk	-	13.3	-	-	SRC
Haskey ElMw-7	629	Stachyruk	-	12.7*	-	-	SRC
Haskey ElMw-7	289	Stachyruk	-	11.5	-	-	KRF
Haskey Unspecified	-	Kerluke	63.3	14.6	38.9	20.6	KRF
Haskey Unspecified	-	Kerluke	61.8*	14.6	38.8	25.4	SRC
B. Kereluke ElMw-8	142	Stachyruk	-	13.7	-	-	SRC
Corley's EkMx-2	2239	Stachyruk	-	15.8	-	-	SRC
Corley's EkMx-2	-	Yurach	-	20.7	-	-	CHR
Elke ElNe-7	-	B & L Hamilton	-	19.6	-	-	KRF
Lorienz EkNd-3	-	Wildeman	40.2	10.1	18.3	18.1	MAG
Pumford EkNd-4	-	J. Hamilton	-	12.2	-	-	SRC

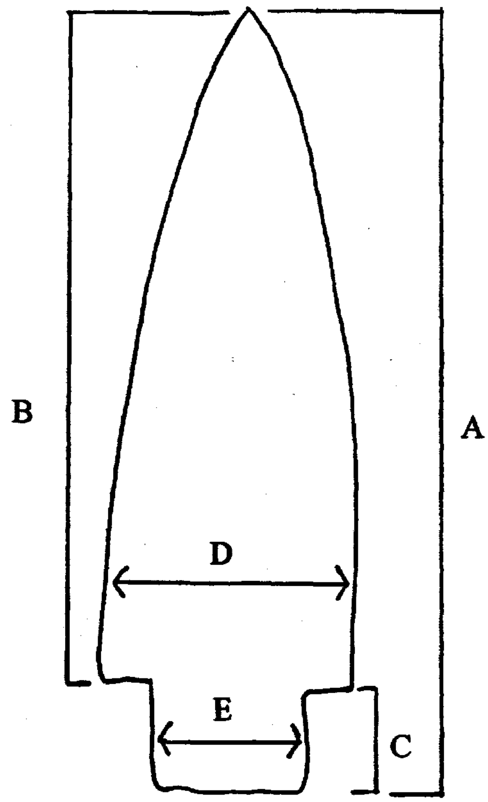

Figure 2. Cody complex projectile point measurements.

A – Total Length

B – Blade Length

C – Stem Length

D – Blade Width

E – Stem Width

F – Maximum Thickness

Table 2. Cody Complex artifact data from the Quill Lakes region (*indicates estimated measurement).

Site	Cat #	Collector	A	B	C	D	E	F	Material
Haskey ElMw-7	739	Stachyruk	-	-	-	-	18.0	4.0	CHR
Haskey ElMw-7	940	Stachyruk	33.5	17.5	16.0	19.5	16.5	6.0	KRF
Haskey ElMw-7	628	Stachyruk	-	-	-	22.5	-	8.0	CHR
Haskey ElMw-7	291	Stachyruk	36.0	26.0	10.0	-	-	7.5	SRC
Haskey ElMw-7	290	Stachyruk	-	27.5	-	23.5	17.0	6.5	KRF
Haskey ElMw-7	288	Stachyruk	-	-	12.5	21.5	18.5	9.0	SRC
Haskey ElMw-7	200	Stachyruk	-	-	-	-	19.0	7.0	CHR
Haskey ElMw-7	199	Stachyruk	-	-	-	-	17.5	6.0	CHR
Haskey ElMw-7	198	Stachyruk	31.0	20.0	11.0	23.5	18.0	6.5	SRC
Haskey ElMw-7	139	Stachyruk	-	-	7.5	26.0	18.0	7.0	SRC
Haskey ElMw-7	8	Stachyruk	-	-	9.5	24.0	17.0	6.5	SRC
Haskey ElMw-7	1035	Stachyruk	-	-	-	-	30.0	9.5	SRC
Haskey ElMw-7	7	Stachyruk	-	-	11.5	-	19.0	6.5	SRC
Haskey ElMw-7	1030	Stachyruk	29.5	19.0	10.5	17.5	13.5	7.0	SRC
Haskey ElMw-7	1033	Stachyruk	-	-	14.0	26.5	21.0	9.5	SRC
Haskey ElMw-7	1036	Stachyruk	-	-	13.0	23.0	18.5	7.5	SRC
Haskey ElMw-7	1034	Stachyruk	-	-	17.5	-	34.0	8.0	SRC
Haskey ElMw-7	1032	Stachyruk	-	-	10.5	20.0	16.5	6.0	SRC
Haskey ElMw-6	158	Stachyruk	-	-	17.5	23.5	21.5	7.5	CHR
Haskey ElMw-6	154	Stachyruk	40.5	29.5	11.0	18.5	17.0	7.0	SRC
Haskey ElMw-6	153	Stachyruk	-	-	14.0	21.5	18.0	7.5	KRF
Haskey	157	Stachyruk	-	22.0	-	19.0	17.0	6.0	SRC

Site	Cat #	Collector	A	B	C	D	E	F	Material
Haskey Unspecified	58	Stachyruk	-	-	12.0	29.5	21.0	6.5	KRF
Haskey Unspecified	59	Stachyruk	-	-	12.0	23.0	18.0	8.0	SRC
Corley's and Kells Area	-	Malinowski	-	-	13.0	24.0	21.0	-	SRC
Corley's and Kells Area	-	Malinowski	41.0	30.0	11.0	28.0	19.0	-	KRF
ElNe-2	-	B. & L. Hamilton	100.0	87.0	13.0	35.0	22.0	-	KRF
ElNd-15	-	B. & L. Hamilton	-	-	15.0	28.0	22.0	-	SRC?
ElNd-9	-	B. & L. Hamilton	37.0	25.0*	12.0	20.0	15.0	-	CHR
Wynyard Area	-	Yurach	-	-	14.5	27.5	23.0	6.5	?

Table 3. Eden projectile point data.

Site	Cat #	Collector	A	B	C	D	E	F	Material
Haskey ElMw-6	155	Stachyruk	-	-	-	20.0	-	8.0	CHR
Haskey ElMw-6	148	Stachyruk	-	-	-	18.5	-	8.0	CHR
Haskey ElMw-6	156	Stachyruk	-	-	-	17.5	-	7.0	CHR
Haskey ElMw-4	111	Stachyruk	-	-	-	14.0	-	5.0	CHR

Table 4. Cody Complex knives metric data.

Site	Cat #	Collector	A	B	C	D	E	F	Material
Haskey ElMw-7	1031	Stachyruk	41.5	13.5	28.0	19.0	18.0	10.5	CHR
Haskey Unspecified	162	Stachyruk	37.5	21.0	16.5	22.5	22.0	8.5	?
EkMw-7	1	Stachyruk	45.5	30.5	15.0	22.5	16.0	8.0	SRC

Table 5. Paleo-Indian drill metric data.

Site	Cat #	Collector	A	B	C	D	E	F	Material
Haskey Unspecified	155	Stachyruk	38.5	27.5	11.0	9.5	7.5	4.5	KRF

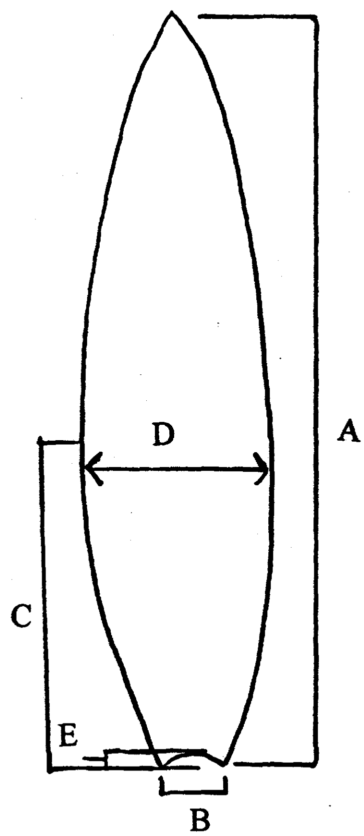

Figure 3. Terminal Paleo-Indian projectile point measurements.

A – Total Length

B – Base Width

C – Length of Haft Element

D – Maximum Width

E – Basal Indentation

F – Maximum Thickness

Table 6. Terminal Paleo-Indian artifact data (*indicates estimated measurement).

Site	Cat#	Collector	A	B	C	D	E	F	Material
Haskey ElMw-6	157	Stachyruk	-	16.1*	18.1	20.9	0.1	7.9	CHR
Haskey ElMw-4	204	Stachyruk	50.6	16.5	22.6	24.6	0.5	7.4	SRC
Haskey ElMw-2	1	Stachyruk	47.5	23.2	22.1	23.2	3.6	6.9	KRF
Haskey ElMw-2	2	Stachyruk	51.4	27.1*	19.7	27.0	-	8.4	SRC
Haskey Unspecified	57	Stachyruk	44.7	20.6	20.3	25.0	3.7	6.7	CHR
Haskey Unspecified	87	Stachyruk	-	10.1	-	-	0.3	7.6	SRC
Corley's/Kells EkMx-2	5039	Stachyruk	-	8.4	-	-	0.2	6.5	CHR
Corley's/Kells EkMx-5	17	Stachyruk	-	12.4	37.9	25.2	0.5	8.0	CHR
Corley's/Kells EkMw-3	145	Stachyruk	-	12.3*	-	21.9	0.3	10.1	SRC
Corley's/Kells	-	Malinowski	42.1	11.3	17.7	23.0	1.1	-	SRC
Corley's/Kells	-	Malinowski	31.8	22.3	15.6	22.3	3.1	-	CHR
Blue Hill EjNb-1	35	Stachyruk	-	12.7	22.5	24.3	0.0	8.9	SRC
Wynyard Area	-	Yurach	-	18.2	-	-	2.4	7.7	SRC
Wynyard Area	-	Yurach	41.7	13.3	21.2	19.7	-	-	SRC
EkNb-2	-	Yurach	52.2	11.8	19.9	21.6	0.0	-	SRC
EkNb-2	-	Yurach	49.1	12.1	21.5	20.4	1.0	-	SRC
EkNb-2	-	Yurach	-	10.5	-	-	1.9	-	CHR

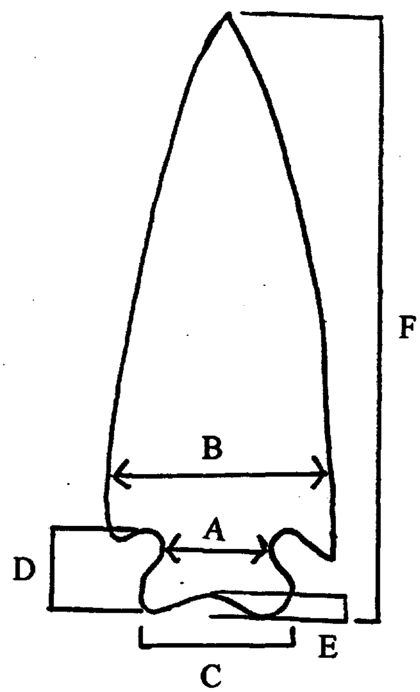

Figure 4. Large corner-notched point type measurements.

A – Stem Width

B – Maximum Blade Width

C – Maximum Base Width

D – Notch Height

E – Basal Indentation

F – Total Length

G – Thickness

Table 7. Large corner-notched point metric data (*indicates estimated measurement).

Site	Cat #	Collector	A	B	C	D	E	F	G	Mat
New EkMw-6	102	Stachyruk	13.1	26.5	19.3	11.2	1.4	45.6	5.9	KRF
New EkMw-6	1577	Stachyruk	14.7	28.8	19.5	10.2	0.8	76.6*	6.1	KRF
New EkMw-6	864	Stachyruk	12.8	29.0	18.0*	10.8	2.1	99.5*	6.1	KRF
New EkMw-6	2298	Stachyruk	12.7	27.0	-	-	-	-	6.1	KRF
New EkMw-6	2222	Stachyruk	14.1	28.5	-	11.8	-	-	7.1	KRF
New EkMw-6	863	Stachyruk	15.0	32.9	19.9	9.8	-	57.6	6.3	KRF
New EkMw-6	135	Stachyruk	15.5	30.1	20.9	13.0	0.9	80.1	7.0	KRF
New EkMw-6	144	Stachyruk	14.6	30.0	-	-	-	-	5.8	KRF
New EkMw-6	106	Stachyruk	17.4	29.4	-	-	-	-	7.4	CHR
New EkMw-6	600	Stachyruk	14.1	27.5	-	10.1	1.3	-	6.7	SRC
New EkMw-6	1579	Stachyruk	-	28.7	-	-	-	-	7.1	SRC
New EkMw-6	1041	Stachyruk	12.8	-	20.1	-	0.9	-	4.9	KRF
New EkMw-6	1174	Stachyruk	12.9	-	18.5	-	0.7	-	6.4	KRF
New EkMw-6	306	Stachyruk	13.6	-	19.1	-	0.1	-	4.8	KRF
New EkMw-6	1178	Stachyruk	-	23.2	-	-	-	-	5.8	KRF
New EkMw-6	930	Stachyruk	-	30.5	-	-	-	-	6.6	KRF
New EkMw-6	2185	Stachyruk	-	-	-	-	-	-	5.7	KRF
New EkMw-6	1441	Stachyruk	-	-	-	-	-	-	4.4	KRF
New EkMw-6	1578	Stachyruk	-	-	-	-	-	-	5.1	KRF
New EkMw-6	2140	Stachyruk	-	-	-	-	-	-	4.2	KRF
ElNe-1	-	B&L Hamilton	15.9	29.8	20.1	10.9	2.2	82.5*	-	KRF
ElNe-1	-	B&L Hamilton	15.6	33.7	-	-	-	-	-	KRF

Site	Cat #	Collector	A	B	C	D	E	F	G	Mat
ElNe-1	-	B&L Hamilton	14.9	31.6	19.3	10.3	0	59.8	-	KRF
ElNe-1	-	B&L Hamilton	-	34.5	-	-	-	-	-	KRF
ElNe-1	-	B&L Hamilton	17.9	31.6	21.1	10.7	0	59.1	-	KRF
ElNe-1	-	B&L Hamilton	-	26.9	-	-	-	-	-	KRF
ElNe-1	-	B&L Hamilton	11.2	31.7	16.4	11.6	2.0	-	-	KRF
ElNe-1	-	B&L Hamilton	13.1	31.1	14.5	9.4	1.5	-	-	KRF
ElNe-1	-	B&L Hamilton	11.7	22.9	12.7	7.3	1.4	105.6 *	-	KRF
ElNd-9	-	B&L Hamilton	15.2	28.9	17.4	10.0	1.8	61.0	-	KRF
ElNd-9	-	B&L Hamilton	14.9	28.1	20.0	10.7	1.0	78.5*	-	KRF
ElNd-9	-	B&L Hamilton	12.3	25.4	17.1	10.1	0.5	30.9	-	KRF
ElNd-9	-	B&L Hamilton	14.5	27.2	18.7	10.3	0.5	55.1*	-	KRF
ElNd-9	-	B&L Hamilton	12.3	25.3	-	8.5	-	43.5*	-	KRF
ElNd-9	-	B&L Hamilton	16.1	28.9	17.3	10.7	0	52.9	-	SRC
Elke ElNe-7	-	B&L Hamilton	11.5	27.2	-	-	-	-	-	KRF
Elke ElNe-7	-	B&L Hamilton	13.0	26.8	-	-	-	-	-	KRF
Elke ElNe-7	-	B&L Hamilton	14.9	28.3	18.9	9.6	0	46.2	-	SRC
Corley's/ Kells area	-	Malinowski	14.4	30.7	18.0	10.9	3.3	63.4	-	KRF
ElNa-5?	-	Yurach	14.2	30.9	17.7	11.5	2.6	-	-	SRC
ElMw-7	1	Stachyruk	13.2	29.1	-	10.4	0	65.5*	7.9	SRC
ElMw-8	399	Stachyruk	15.4	31.4	18.6	10.5	0	58.4	7.8	KRF
ElNd-15	1	Survey	15.9	31.3	-	10.9	0	67.0*	7.9	SRC

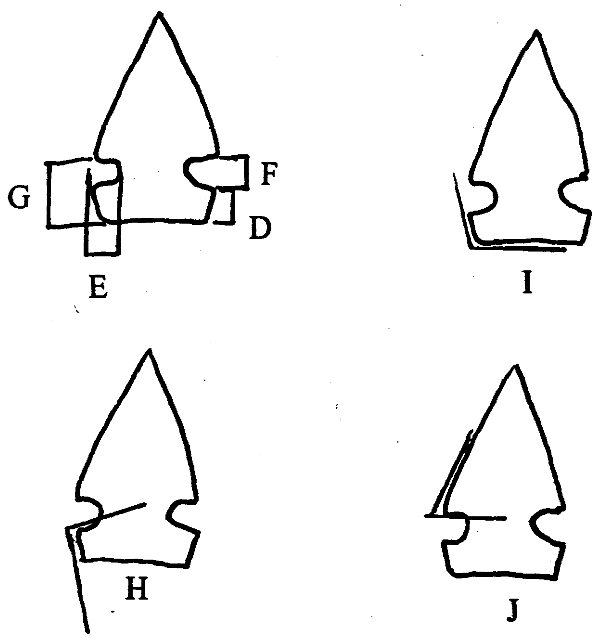

Figure 5. Late Side-Notched series projectile point measurements (Peck and Ives 2001).

Non-Metric

A – Basal Edge Shape

B – Notch Form

C – Base Form

Metric

D – Base Height

E – Notch Depth

F – Notch Height

G – Shoulder Height

H – Distal Base Angle

I – Proximal Base Angle

J – Shoulder Angle

Table 8. Late Plains Side-Notched series artifact data from the Quill Lakes region.

Collection	Site	Cat #	A[1]	B[2]	C[3]	D	E	F	G	H[4]	I[4]	J[4]
Stachyruk	EkMx-2	948	ST	U-B	R	4.0	2.7	3.3	6.6	C	M/C	M/C
		4887	ST	U-B	R	4.7	2.6	4.2	8.7	M/C	M/C	M
		4723	CC	V-N	?	6.0	2.2	1.9	7.9	M/C	M	M/C
		2240	ST	R-S	R	5.4	1.6	2.9	7.5	C	M/C	C
		1252	ST	U-B	R	3.3	2.0	2.9	5.8	C	M/C	C
		4674	ST	U-B	R	4.0	2.0	3.1	7.0	C	M/C	M/C
		4810	ST	U-N	R	4.1	2.5	1.9	6.0	M/C	M/C	M/C
		4888	ST	U-B	R	4.3	2.6	3.4	7.4	M	M/C	M
		4889	ST	U-B	R	4.2	2.5	3.2	6.7	M/C	M/C	M/C
		4895	ST	U-B	P	2.7	2.5	4.2	6.4	C	C	C
		3568	ST	U-B	R	4.5	2.8	4.1	7.9	M/C	M/C	M/C
		3618	ST	U-B	?	2.57	3.0	4.6	8.0	C	M/C	M/C
		4798	ST	A-B	?	0	2.25	7.3	8.5	-	-	C
		4808	ST	A-B	?	2.3	2.2	3.5	5.6	C	M/C	M/C
		3679	CV	V-B	?	2.5	1.9	2.7	5.9	M/C	M/C	C
		887	ST	A-B	?	1.8	2.0	3.8	5.2	C	M/C	M/C
		975	CV	R-S	?	2.5	1.7	4.1	6.8	C	M/C	M/C
		3847	ST	R-S	?	2.8	1.6	4.1	6.7	C	M/C	C
		4446	ST	A-B	?	0	2.7	4.5	4.5	C	-	M/C
		4782	ST	R-B	?	1.7	2.1	6.4	7.7	C	M/C	C
	EkMw-4	53	ST	U-B	?	5.2	3.1	3.5	7.0	C	M/C	M/C
	EkMw-3	73	CC	U-B	R	4.4	2.4	3.8	7.8	C	M/C	-
		148	IR	R-B	?	3.1	2.2	6.2	8.9	C	M/C	C
		2	ST	U-B	?	3.1	1.3	3.3	6.4	C	-	C
	EkMx-4	530	ST	V-B	?	2.3	2.8	3.9	6.0	C	M/C	M/C
		532	ST	U-B	?	4.6	1.2	3.2	7.4	C	M/C	C
		475	ST	A-B	?	0	1.3	7.6	7.6	-	M/C	C
		178	ST	A-B	?	2.9	1.6	3.4	5.8	C	M/C	M/C
		294	ST	U-B	-	2.5	2.6	4.7	7.0	C	M/C	M/C
		327	ST	A-B	?	1.9	2.7	4.4	6.2	C	M/C	M/C
Malinowski	Corley's/ Kells area		CC	U-B	R	5.8	2.4	3.4	8.7	C	M/C	M/C
			ST	U-B	R	1.7	1.7	3.3	4.6	C	M/C	C
			ST	V-B	R	4.0	2.5	2.8	6.7	C	M/C	M/C
			ST	U-B	R	3.1	2.7	3.7	6.2	C	C	C
			ST	U-B	R	5.8	2.6	4.5	9.5	M/C	M/C	M/C
			CV	R-B	?	2.6	1.4	4.3	6.7	C	M/C	C
			ST	U-B	?	2.8	1.2	5.1	8.1	C	M/C	-
			CC	A-B	F	1.7	2.8	6.5	8.4	-	M/C	C
			ST	U-B	R	4.9	2.5	3.2	7.4	C	M/C	C
			ST	U-B	R	3.7	2.2	4.9	8.5	C	M/C	C
			CV	R-B	?	1.9	2.9	3.5	5.5	M/C	M/C	M/C
			ST	V/U-B	R	4.6	2.5	3.8	7.1	C	M/C	C
			ST	V-N	R	5.2	3.3	2.5	7.3	M/C	M/C	M/C
			ST	U-N	R	5.0	3.0	2.8	7.7	M/C	M/C	M/C
			ST	U-B	R	5.8	2.7	3.1	7.8	M/C	M/C	M/C
			ST	V-B	R	4.5	2.3	4.4	8.5	C	M/C	C
			ST	U-B	O	3.0	2.5	4.1	7.7	C	M	C
			ST	U-B	?	2.7	1.7	4.0	7.6	C	C	M/C
			CC	V-N	R	7.0	4.0	2.2	8.6	M/C	M/C	M
			ST	U-B	R	4.8	2.8	4.6	9.0	C	M/C	M/C
			CV	A-B	R	4.8	2.0	3.7	7.4	C	M/C	M/C
			CC	U-B	?	3.9	1.7	5.1	8.8	-	M/C	M/C

Collection	Site	Cat #	A[1]	B[2]	C[3]	D	E	F	G	H[4]	I[4]	J[4]
			CC	V-B	R	5.5	2.3	4.4	9.6	C	M/C	C
			ST	A-B	?	2.4	3.3	3.8	5.5	C	M/C	M/C
			CV	V-B	?	3.2	2.4	4.0	7.6	C	C	M/C
			ST	U-B	R	3.8	1.3	2.8	6.1	M/C	M/C	M/C
			ST	V-B	L	3.5	2.1	3.0	6.3	M/C	M/C	M/C
			CC	R-S	?	2.2	1.1	3.3	5.1	-	M/C	-
			ST	U-B	?	4.0	1.6	2.8	6.1	C	M/C	M/C
Yurach			ST	U-B	R	3.3	2.4	3.0	3.2	M	M/C	M/C
			ST	U-N	R	4.5	2.8	2.3	7.2	M/C	M	M

[1] Abbreviations for basal edge shape are: straight (ST), concave (CC), convex (CV), and irregular (IR).
[2] Abbreviations for notch form are: U-shape broad (U-B), U-shape narrow (U-N), V-shape broad (V-B), V-shape narrow (V-N), round shallow (R-S), rectangular broad (R-B), and angular broad (A-B).
[3] Abbreviations for base form are: rectangular (R), fish-tailed (F), oblong (O), pie-pan shaped (P), and lens (L).
[4] A template for the range of angles was created for both Mortlach and Cayley. The point being measured could fit into the Mortlach range only (M), Cayley range only (C), both (M/C) or none (-).