The Dog Child Site (FbNp-24): A 5500 Year-Old Multicomponent Site on the Northern Plains

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By
Talina J. Cyr

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Abstract

The Dog Child site (FbNp-24) is located within the confines of the Wanuskewin Heritage Park, approximately 3 km north of the city of Saskatoon, Saskatchewan. It is a multicomponent site containing six occupation levels. The site was excavated throughout the 2004, 2005, and 2006 field seasons with the assistance of the University of Saskatchewan archaeological field school and the Saskatchewan Archaeological Society field school.

Projectile point, pottery, and other technologies deemed specific to a cultural period, in addition to radiocarbon age assessment, have revealed six occupations related to five different series or complexes. These include the Plains Side-Notched complex, Prairie Side-Notched complex, Duncan/Hanna complex, Oxbow complex, and Mummy Cave series. Two levels have been ascribed to the latter series. The Mummy Cave series occupation is an area of focus as it contributes to our knowledge surrounding Northern Plains occupation during the Mid-Holocene Climatic Optimum. The archaeological artifacts and features in addition to the geoarchaeological setting have been documented in order to create a comparative survey expressing the context and extent of these cultural periods.

Acknowledgements

My appreciation for my supervisor, Dr. Ernie Walker is immeasurable because of the assistance he has given me through the course of the excavation, identification, and analysis of this thesis. Thank your for giving me this opportunity. I would also like to thank the remaining members of my committee, Dr. David Meyer and Dr. Margaret Kennedy, for their advice, my external committee member, Dr. Dirk de Boer, as well as Debbie Croteau who kept my plan running smoothly.

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Finally I would like to acknowledge my family: J.T., David, Yvonne, Shannon, Adam, Marty, Jen, and all of the extensions for their confidence in me and their ability to listen. Thank you.

To my family

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Chapter 1

Introduction

1.1 Introduction

The Dog Child site (FbNp-24) is the eighth archaeological site in the Wanuskewin Heritage Park to be excavated. It is a multicomponent site with six occupation levels that contains both diagnostic artifacts and radiocarbon samples related to five different cultural periods. The site was excavated in the 2004, 2005, and 2006 field seasons and interest in the early components of the site has warranted a minimum of one further field season to be conducted in 2007. For the purposes of this thesis, only the 2004 and 2005 field seasons have been included in the discussion although the diagnostic artifacts recovered in 2006 have been interpreted in the analysis.

1.2 Thesis Objectives

An attempt will be made through the analysis to attain three objectives. They have been summarized as follows:

1: to compile a composite sequence of the site conveying the positions of both the archaeological soils and the depositional sediment, or lack thereof.

2: to determine the available technology, subsistence methods, activities, and seasonality within each occupation.

3: to survey a sample of Mummy Cave series occupations on the Northern Plains with the intent of generating or confirming trends.

It is hoped that through a careful documentation of the site and a detailed

analysis, this investigation can be used as a comparative sample for future research in the aim to better understand and interpret the archaeological sequence on the Northern Plains. Further excavations of the Dog Child site will aid in this process as it is expected that the success of the initial field seasons will continue.

1.3 Thesis Organization

This thesis is composed of nine chapters including this overview. Chapter 2 is concerned with illuminating the context of the Dog Child site. It considers the geological, geographical, and climatic environment of Wanuskewin Heritage Park as well as the faunal and floral resources available. Chapter 3 discusses the chronological sequence of cultural periods on the Northern Plains, describing the diagnostic artifacts of each and, when possible, their origins and influences. Chapter 4 is devoted to the complete methodology involved in the interpretation of this site. Excavation, laboratory, and analytical procedures are outlined. Chapters 5 through 7 deal with the specific archaeological assemblages recovered from each occupation. Level 1a and Level 1b are considered in Chapter 5, Level 2a and Level 2b in Chapter 6, and Level 3a and Level 3b in Chapter 7. Chapter 8 serves as a site survey of four Mummy Cave series occupations on the Northern Plains in comparison to the Dog Child site. Subsistence, lithic technology, and site placement and utilization will be discussed. Finally, Chapter 9 includes final discussions and conclusions regarding the site in its entirety.

Chapter 2

The Biophysical Environment of the Dog Child Site

2.1 Site History

Beginning in the 1930s, the region now known as Wanuskewin Heritage Park was identified as an area of archaeological interest. In 1932, two sites were recorded by the Saskatoon Archaeological Society. Small-scale surveys were periodically organized by both professional and avocational archaeologists continuing into the 1970s (Walker 1983). The Dog Child site was discovered in 1983 as a result of a large-scale survey of Wanuskewin Heritage Park subsidized by the Meewasin Valley Authority (MVA). The primary concern of the MVA was to protect this land from city expansion.

To determine the potential of the park, Dr. Ernest Walker from the University of Saskatchewan and a crew were contracted. The survey was conducted over the 1982 and 1983 field seasons. In total, 21 archaeological sites were recorded: two with contact and 19 containing precontact archaeological deposits. Actions were taken to designate the area as both a Provincial and National Historic Site which were completed in 1983 and 1987 respectively. Since 1983, the Department of Archaeology at the University of Saskatchewan has conducted excavations within the park continuously. In 1992, construction of the Wanuskewin Interpretive Centre was completed in order to facilitate archaeological research, promote tourism, and serve as an educational centre for the park visitors. Comparable to several other sites within the park, the Dog Child site has been protected from

agricultural activities, thereby conserving its archaeological and geographical integrity. The environment which contains the site is lush and diverse, providing a detailed picture of the modern context in which it is situated.

2.2 Geography

2.2.1 Geography of the Wanuskewin Heritage Park

Wanuskewin Heritage Park is located at 52^o 13' north latitude and 106^o 35' west longitude in the southwest $\frac{1}{4}$ Section 36, southeast $\frac{1}{4}$ Section 35, Township 36, Range 5, West of the Third Meridian, and lies approximately 500 m above sea level. It extends over 63 hectares of land 3 km north of the city of Saskatoon. The park is within the Moist Mixed Grassland ecoregion (Fig. 2.1), south of the Aspen Parkland (Padbury and Acton 1999:160). This zone is characterized by moist, open native grasslands commonly disconnected by slough depressions that harbour aspen groves.

Because it is found in the South Saskatchewan River valley, the physiographic classification of the park is the Saskatchewan Rivers Plain region (Martz and de Boer 1999:94). This is characterized by glacial lake plains and ground moraine. Hummock and glacial outwash channels contour the surface (Amundson 1986). More specifically, Wanuskewin is in the Warman Plain physiographic subsection. The topography in this region is described as having "undulating, eroded till plains and gravelly, glaciolacustrine plains" (Walker 1988:77). Ravines and coulees along the river valley permit settlement on land near a permanent water source while also providing shelter from the wind. The permanent source of water is the South Saskatchewan River, but the majority of the identified sites within Wanuskewin Heritage Park are found in a tributary on the north bank of the South Saskatchewan River valley called the Opimihaw Creek valley. Sites are distributed on terraces and point bars along the Opimihaw Creek, a misfit stream meandering through the valley.

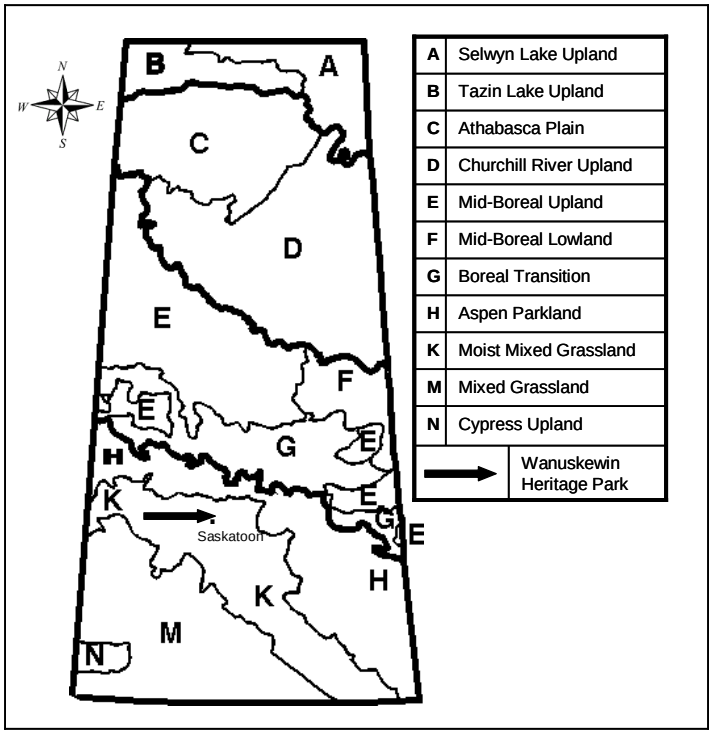

Figure 2.1: The Wanuskewin Heritage Park in the Moist Mixed Grassland Ecoregion (original map from Government of Saskatchewan website, modified by author)

2.2.2 Geography of the Dog Child Site

The Dog Child site is the most northern archaeological site identified in Wanuskewin Heritage Park. It is located on a flat terrace on the west bank of the Opimihaw Creek approximately 750 m from the South Saskatchewan River (Figs. 2.2 and 2.3). The creek can be accessed from the site by the gradual slope of the bank. Immediately west of the site is an incline that provides shelter from the wind. The valley walls on both the north and south sides of the site also provide shelter. This geographical setting has been host to human occupation over the last several thousand years.

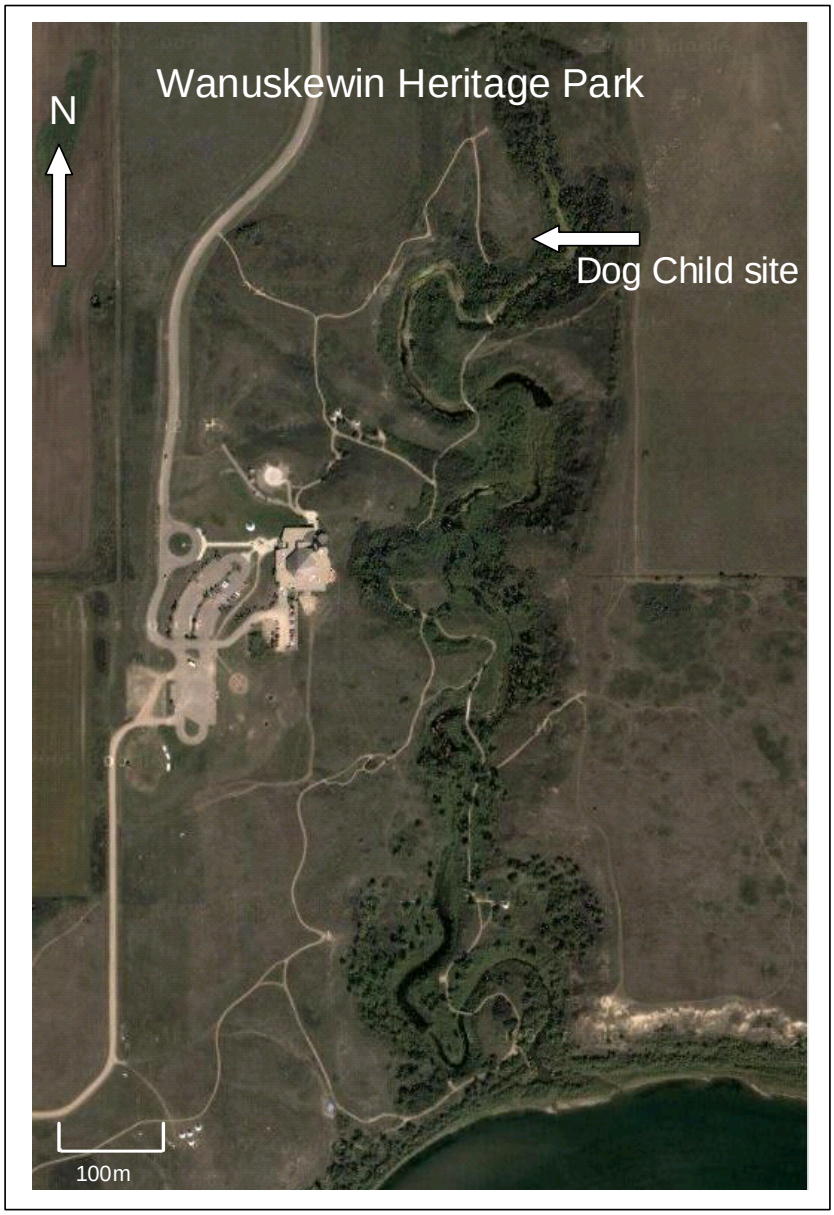

Figure 2.2: Location of the Dog Child site (map modified by author from Google Maps)

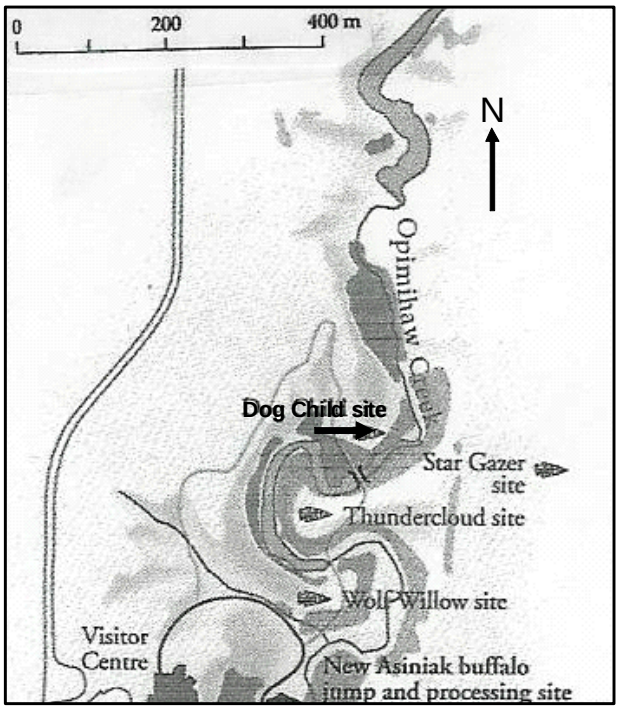

Figure 2.3: View of the Dog Child site in Proximity to the Opimihaw Creek (Original map from (Wilkins 1994:27), modified by author)

2.2.3 Hydrology

Opimihaw Creek, coursing south into the South Saskatchewan River, flows adjacent to the Dog Child site creating the northern and eastern boundaries. The primary source of water for the creek is the Hudson Bay slough, located northwest of the valley (Mack 2000:4). Snowmelt also contributes significant moisture in addition to springs which emerge along the valley walls. Periodic flooding has occurred at the Dog Child site. However, flood events were more common before the construction of the Gardiner Dam in the 1960s (Webster 1999:10). In recent years, the presence of the Gardiner Dam and damming activity by beavers have reduced the water level of the creek and flooding occurs less frequently. Through time, the Opimihaw Creek has cut deeper into the valley floor to match water levels of the South Saskatchewan River, creating a large vertical separation between the terrace ground surface and the maximum water level.

2.3 Climate

2.3.1 Modern Temperatures, Precipitation, Wind, and Cloud Coverage

Based on palaeoenvironmental studies, it has been postulated that the environmental patterns on the Northern Plains have remained relatively stable throughout the past 2000 years with only slight fluctuations in both temperature and precipitation (Walker 1999:26). The seasonal temperature extremes on the prairies can vary by approximately 90 degrees Celsius throughout the course of one year. Classified as a DfB climate in the Köppen-Geiger system (Strahler and Strahler 1992:159), this habitat is characterized by long, cold winters and short, primarily warm summers (Hare and Thomas 1974:101; Chakravarti 1969). July is the warmest month with an average temperature of 18 °C to 21 °C (Hare and Thomas 1974:102). This can reach up to approximately 40 °C, however. January and February are the coldest months and average temperatures vary from -10 °C to -25 °C. Temperatures have been recorded as low as -50 °C. The average number of frost-free days per year is 113 due to the extended length of winter (Bergsteinsson and Calvert 1977).

The South Saskatchewan River Basin has the lowest level of annual precipitation within the prairies (Hare and Thomas 1974:101). The mean annual precipitation is between 35 cm and 40 cm. Between 100 cm and 114 cm of snow falls each year, but because 10 cm of snowfall is equivalent to 1 cm of rain, this does not amount to a large amount of moisture. The majority of the precipitation falls between May and September, representing 70% of the annual moisture regime (Bergsteinsson and Calvert 1977). This amount allows for agricultural production, but in drier years may be insufficient to support the entire region.

The aridity is due to dramatic evaporation on the prairies. Saskatoon is one of the sunniest regions in Canada (Hare and Thomas 1974:102). The cloudiest months are May, June, November, and December (Maybank and Bersteinsson

1970:22). July and August receive the most sunshine, contributing to the fact that they are the warmest months. Winds approach predominantly from the west due to the warm Pacific air mass and from the northwest due to the cold Arctic air mass (Bergsteinsson and Calvert 1977; Phillips 1990:176). Eastern (moist maritime polar masses), southeast (Gulf of Mexico), and southwest (Pacific) winds can also affect the region but with much less frequency. The western Pacific air mass is responsible for the majority of the precipitation in the Saskatoon region.

2.4 Geology

2.4.1 Sedimentology of the Saskatoon Region

Several metres of sediment have been deposited as a result of "drift" on the surface of the bedrock in the Saskatoon region (Christiansen 1970:8). This drift accumulated as a result of glacial activity. This glacial activity was the dominant force in the creation of the modern topography in and surrounding Wanuskewin Heritage Park. At least four glacial advances and retreats occurred in this region. Glacial deposits were primarily cobbles, pebbles, and sand. More recent post-glacial sediments, however, are fine-grained sands and silts (Christiansen 1970:10) that have primarily been deposited due to aeolian, fluvial, and colluvial processes.

2.4.2 Sedimentology and Pedology of the Dog Child Site

Few factors have been involved in deposition at the Dog Child site. Depending on the amount of precipitation in a year, the terrace on which the site is found may flood. Although excavations within the park have revealed that periodic flooding has occurred in the past, archaeological deposits generally have been protected from surficial erosional processes. The current elevation difference between the Opimihaw Creek and the modern living surface is several metres. As deposits have accumulated on the terrace and the creek has eroded into the valley

floor, the elevation differences between the two have diverged. Consequently, the possibility of flooding and deposition has decreased.

Aeolian forces may also have generated deposition. Research suggests, however, that hillslope degradation has been the primary cause. Rutherford's analysis of the formation of several archaeological sites within the park suggests that "hillslope sedimentation influenced the formation of these archaeological sites" (Rutherford 2004:96). Due to the proximity of the valley slopes as well as the sites interpreted in Rutherford's survey, it is likely that erosional sedimentation played a significant role in the creation of the Dog Child site. This combination of alluvial and colluvial activity is believed to have begun during a time of increased temperatures and aridity approximately 5.42 ± 0.12 ka BP during the terminal period of the Mid-Holocene Climatic Optimum. This continued until moisture levels had increased enough for vegetation to re-establish and well-developed soils could stabilize the slopes (Rutherford 2004:96).

Many variables are involved in the processes of soil formation, including climate, vegetation, parent materials, topography, drainage, and time (Ellis and Stonehouse 1970:19). Human activity also affects soil formation. Fortunately, agriculture has not seriously affected the valley due to its topography, and the known sites in Wanuskewin have largely been preserved intact. Along the South Saskatchewan River valley, soils are typically classified as hillwash. The characteristic profile is a combination of Regosolic, Podzolic, and Chernozemic soils that were "developed on colluvial and eroded deposits on the slopes of valleys and escarpments" (Acton and Ellis 1978:65). This can be seen along the slopes and terraces of the Opimihaw Creek valley. Dark brown Chernozemic soils characterize the upland prairie surrounding the valley due to the thick grass cover (Thorpe 1999:131-2). Standard soil texture is sandy to clayey loam (Acton and Ellis 1978). Generally, darker soils indicate that there was a substantial amount of organic material decomposition. This dark soil signifies the presence of dense grass coverage and a humid environment in the Saskatoon region (Ellis and Stonehouse 1970:19). Occupation levels can often be identified in profile and during excavation

within these dark buried soils.

2.5 Floral Environment

Situated on the northern edge of the Mixed Moist Grassland ecoregion, Wanuskewin contains a lush assemblage of vegetation. Characterized by meadows with groves of trees and shrubs distributed throughout, the park has remained relatively unaffected by agriculture and urban development although other factors have affected the land through time such as prairie fires. Three vegetational environments exist in the modern conditions of the park. They are referred to as the Upland Prairie zone, Valley Slope zone, and Floodplain zone. The representative vegetation within these zones depends on the topography and moisture availability.

2.5.1 Upland Prairie Zone

The areas which may have been affected by cultivation and are significantly higher than the level of the proximal water source can be classified as the Upland Prairie zone. The vegetation is predominately represented by native grasses. In Wanuskewin, these include spear grass (*Stipa calamagrostis*), porcupine grass (*Stipa spartea*), northern wheat grass (*Agropyron dasystachyum*), and western wheat grass (*Agropyron smithii*) (Noble and Flory 1976; Coupland 1961:148). Less common are blue grama grass (*Bouteloua gracilis*), Canada blue grass (*Poa compressa*), and slender wheat grass (*Agropyron trachycaulum*). There are a variety of shrubs including wild rose (*Rosa sp.*), creeping juniper (*Juniperus horizontalis*), bearberry (*Arctostaphylos uva-ursi*), silverberry (*Elaeagnus commutata*), saskatoon berry (*Amelanchier alnifolia*), chokecherry (*Prunus virginiana*), western snowberry (*Symphoricarpos occidentalis*), pincherry (*Prunus pensylvanica*), and hawthorn (*Crataegus sp.*), as well as immature aspen poplar (*Populus tremuloides*), red-osier dogwood (*Cornus stolonifera*), and willow (*Salix sp.*) (Noble and Flory 1976). These shrubs are found primarily in depressions where the soil is moist and fertile.

2.5.2 Valley Slope Zone

The banks of the South Saskatchewan River valley and the Opimihaw Creek valley contain inclines wherein a separate assemblage of flora dominates. Along the embankments mature trees, shrubs, and herbs are abundant. Birch (*Betula sp.*), Manitoba maple (*Acer negundo*), and balsam poplar (*Populus balsamifera*) are the predominant trees present and the most common shrubs consist of silverberry, bearberry, red-osier dogwood, creeping juniper, wild rose, western snowberry, northern gooseberry (*Ribes oxyacanthoides*), willow, chokecherry, and saskatoon berry (Walker 1992:9-10; Amundson 1986:16). Herbs include wild rye (*Elymus canadensis*), violet (*Viola sp.*), northern bedstraw (*Galium boreale*), sage (*Artemesia sp.*), and horsetail (*Equisetum arvense*). The prairie crocus (*Anemone patens*), wild candytuft (*Iberis amara*), low goldenrod (*Solidago missouriensis*), and field chickweed (*Cerastium arvense*) are also frequently present (Mack 2000:8). If the slope is unstable the Upland Prairie zone vegetation will thrive more readily (Walker 1992:9).

2.5.3 Floodplain Zone

Regions adjacent to water sources are prone to flooding during snowmelt. Thus, they will exhibit a lush collection of riparian flora that flourishes in very moist environments. These include sedges (*Carex sp.*), rushes (*Scirpus sp.*) wild mint (*Mentha arvensis*), wild barley (*Hordeum jubatum*), mustard (*Brassica sp.*), marsh cress (*Rorippa islandica var. fernaldiana*), cattail (*Typha latifolia*), marsh marigold (*Caltha palustris*), water parsnip (*Sium sauve*), willow, silverberry, and a variety of other herbs and shrubs (Walker 1992:9-10; Amundson 1986:16). Balsam poplar, Manitoba maple, and other trees may grow if the flood events are infrequent enough that root systems can develop.

2.6 Faunal Environment

The South Saskatchewan River is a permanent source of water. Even during winter, the currents are active enough that the ice remains thin and may periodically open allowing for access to the water. The faunal species in Wanuskewin Heritage Park have been drastically altered due to agricultural practices and urbanization since European contact, but those animals that have remained or have since migrated to the park have benefitted from the river, its tributaries, the vegetation, and the protection that the valley provides.

2.6.1 Mammals

Herbivores

Before the fur trade industry in western Canada had drastically influenced the natural environment, the dominant large herbivore in the Wanuskewin region and on the Plains was the bison (*Bison bison*). Approximately 34,000,000 bison would have inhabited the Great Plains before their demise (Roe 1970; McDonald 1981). Mule deer (*Odocoileus hemionus*), elk (*Cervus elaphus*), and pronghorn (*Antilocapra americana*) were also very abundant before the advent of European colonization (Banfield 1974). The only artiodactyls occupying the park at present are mule deer and white-tailed deer (*Odocoileus virginianus*). Although humans would have procured all of these, excavation and ethnographic records indicate that bison were the most exploited mammal of the Northern Plains. Precontact Plains societies were greatly focussed on and impacted by bison procurement.

Carnivores

Several carnivores have been extirpated from the Wanuskewin region due to human influences as well. The wolf (*Canis lupus*), swift fox (*Vulpes velox*), grizzly bear (*Ursus arctos*), and mountain lion (*Felis concolor*) are rarely if ever seen in modern observations although their presence would have been normal in the past.

At present, the most common carnivores in the park are the coyote (*Canis latrans*), badger (*Taxidea taxus*), long-tailed weasel (*Mustela frenata*), and striped skunk (*Mephitis mephitis*). Also present, but in lower numbers, are the red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), ermine (*Mustela erminea*), least weasel (*Mustela nivalis*), mink (*Mustela vison*), and porcupine (*Erethizon dorsatum*) (Banfield 1974).

Rodents

Many species of rodents have been identified in the park. These include the least chipmunk (*Eutamius minimus*), Richardson's ground squirrel (*Spermophilus richardsonii*), thirteen-lined ground squirrel (*Spermophilus tridicemlineatus*), Franklin's ground squirrel (*Spermophilus franklinii*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), and northern pocket gopher (*Thomomys talpoides*). As well, several species of mice and voles have been identified (Banfield 1974). Often during excavation of a site, burrow tracks from rodents can be seen disrupting the profile of the soil. These are usually easily recognizable and the damage to the stratigraphy is often minimal.

Leporids

Typically, two leporid species are present in Wanuskewin Heritage Park. The snowshoe hare (*Lepus americanus*) prefers the forested sections of the park and the white-tailed jack rabbit (*Lepus townsendii*) is found in the open, grassy sections. One leporid that was native prior to colonization and has occasionally been seen recently is the Nuttall's cottontail (*Sylvilagus nuttallii*) (Banfield 1974).

2.6.2 Avifauna

Many species of songbirds, migrating waterfowl, and birds of prey are common in the region as well (Banfield 1974). Great blue heron (*Ardea herodias*), white pelican (*Pelecanus erythrorhynchos*), red-tailed hawk (*Buteo jamaicensis*),

great-horned owl (*Bubo virginianus*), red-winged black bird (*Agelaius phoeniceus*), western meadowlark (*Sturnella sp.*), black-billed magpie (*Pica pica*), ruffed grouse (*Bonasa umbellus*), crow (*Corvus brachyrhynchos*), and mallard (*Anas platyrhynchos*) are a small sample of the avifauna here presented.

2.6.3 Reptiles and Amphibians

The number of reptile and amphibian genera present in the park is minimal. Species of frog (*Rana sp.*), as well as Canadian toad (*Bufo hemiophrys*), tiger salamander (*Ambystoma tigrinum*), and garter snake (*Thamnophis sp.*) are some of these species.

2.6.4 Fish

Several species of fish can regularly be found in the South Saskatchewan River and its tributaries. Yellow perch (*Perca flavenscens*), walleye (*Stizotedion vitreum*), and northern pike (*Esox lucius*) are among the most common species.

Chapter 3

Cultural Chronology of the Northern Plains

3.1 Introduction

Determining the sequence of cultural groups that have occupied the Great Plains since the retreat of the last glacial advance has been an area of debate and revision over the past several decades. Multiple researchers have devised various frameworks to classify the chronology. Some of the frameworks have been dismissed as new evidence has been obtained. Mulloy's 1958 proposal of an occupational hiatus during the climatic episode known as the Mid-Holocene Climatic Optimum has been dismissed as research confirms the occupation of the Northern Plains region during that time. This discussion implements the chronology proposed by Walker (1992). Some modifications to the terminology will be made, however. To adapt this table (Table 3.1), the term "prehistoric" has been replaced by the term "precontact" when summarizing the period prior to European fur trading and colonization of the Northern Plains. The Protohistoric, or rather Protocontact period will also be included. This time period occurred during the transition from the Late Precontact to the Contact ("Historic") period when European goods had begun to filter onto the Plains. The material remains within sites therefore reflect both traditional and exotic items. Although the Plains populations were still predominantly nomadic and specialized in bison procurement, this time period reflected change. The utilization of new systems, including horticulture, began during this time (Walker 1999:27).

Table 3.1: Cultural Chronology of the Northern Plains (Modified from (Walker 1992:120))

<table>
<tr><th>Years (ka BP)</th><th>Mulloy 1958</th><th>Frison 1978</th><th>Dyck 1983</th><th>Walker 1992</th><th>Cyr 2006</th></tr>
<tr><td>0.2</td><td>Historic</td><td>Historic</td><td>Historic</td><td>Historic</td><td>Contact</td></tr>
<tr><td>0.3</td><td rowspan="2">Late Prehistoric</td><td rowspan="2">Late Prehistoric</td><td rowspan="2">Late Plains Indian</td><td rowspan="2">Late Prehistoric</td><td>Protocontact</td></tr>
<tr><td>2.0</td><td rowspan="2">Late Precontact</td></tr>
<tr><td>3.0</td><td rowspan="2">Middle Pre-historic</td><td>Late</td><td rowspan="3">Plains Archaic</td><td>Late</td><td rowspan="3">Middle Plains Indian</td><td>Late</td><td rowspan="3">Middle Precontact</td><td>Late</td></tr>
<tr><td>5.0</td><td>Early</td><td>Middle</td><td rowspan="2">Middle Pre-historic</td><td>Middle</td><td>Middle</td></tr>
<tr><td>7.5</td><td colspan="2">Hiatus</td><td>Early</td><td>Early</td><td>Early</td></tr>
<tr><td>10.5</td><td colspan="2" rowspan="2">Early Prehistoric</td><td colspan="2" rowspan="2">Palaeo-Indian</td><td>Early Plains Indian</td><td colspan="2" rowspan="2">Palaeo-Indian</td><td colspan="2" rowspan="2">Early Precontact (Palaeo-Indian)</td></tr>
<tr><td>12.0</td><td>Pleistocene Hunters</td></tr>
</table>

Before the cultural sequence can be discussed, there must first be clarification of the common terms used in describing it. In particular, the terms *phase, component, tradition, series*, and *complex* must be defined. A *phase* is defined by Willey and Phillips (1958) as:

> an archaeological unit possessing traits sufficiently characteristic to distinguish it from all other units...spatially limited to the order of magnitude of a locality or region and chronologically limited to a relatively brief interval of time (Willey and Phillips 2001:22).

A *component* is defined by McKern as "any given focus [phase] at a specific site" (McKern 1939:308) that is limited temporally. Multiple occupations at one site may be either representative of a single component or of multiple components (Willey and Phillips 2001:21). A *tradition* refers to a technological or other cultural pattern that "occurs in sequential complexes, passed down as it were from one to the other" (Dyck 1983:69). A *series* is a broader term, defined as:

> a sequence of archaeological components sharing a common geographical space...but belonging within separate segments of time. [It] is a crude unit of archaeological analysis used for convenience before sites, features, and artifacts are ready for reclassification into complexes and traditions (Dyck 1983:69).

Finally, a *complex* is an encompassing descriptor, stated as:

> a large composite archaeological unit. It consists of interconnected sites, features, and artifacts, tied together by similarities in function, style, technology, and subsistence-settlement system. [Complexes] are found within a common geographical distribution and within a common segment of time (Dyck 1983:69).

These terms will be maintained throughout the course of this thesis. In defining these archaeological concepts, confusion can be avoided and comparisons can be made in future research.

The cultural sequence has been determined based on artifact remains. Projectile points are the most common implement to describe the varying cultural expressions. It is accepted that the multiple forms of projectile points represent different cultural affiliations and, thus, are diagnostic to a specific group. In the Late Precontact period, pottery was introduced on the Northern Plains. Vessel construction and decoration are representative of cultural affiliation as well. Radiocarbon ages have been used to supplement the information that is obtained from these artifacts and have confirmed the time sequences and transitions. Burial patterns, settlement patterns, and other cultural aspects may also be used but the high frequency of excavated projectile points and pottery and their discernible differences make them acknowledged as cultural sequence indicators.

3.2 Early Precontact Period (12.0 to 7.5 ka BP)

There is considerable debate occurring in current research regarding the uncertainty as to whether populations occupied Saskatchewan immediately following the retreat of the Wisconsinan phase of the Laurentian ice sheet approximately 12.0 ka BP. Geological evidence confirms that by this time the glacier had retreated enough that southern Saskatchewan was ice-free (Christiansen 1970). The temperature increased and floral and faunal resources migrated or adapted. There are no artifacts found *in situ* in Saskatchewan to verify human occupation during this time period, but as it is difficult to locate and excavate

deeply-stratified sites, the possibility has not yet been disproved. To date, materials are limited to surficial finds.

The oldest artifacts that have been identified in Saskatchewan belong to the Clovis complex. Known to have been hunters of megafauna (i.e. woolly mammoth (*Mammuthus primigenius*)), analyses of excavation results from the American Great Plains have been able to determine that these populations were present from approximately 11.2 to 10.9 ka BP on the Plains (Walker 1999:25). Occupations are recognized based on the very distinct lanceolate projectile points with flutes (removal of thin channel flakes used in hafting) knapped longitudinally from the base on both faces of the tool. The spear foreshafts were often carved from bone or ivory. The discouraging factor is that Clovis artifacts have only been recovered from the surface in Saskatchewan.

Contemporary with the Clovis complex is a distinct collection of lanceolate spear points referred to as the Goshen-Plainview complex. The shape is similar to Clovis points except that it lacks flutes. Excavated from sites in Montana, South Dakota, and Wyoming, Goshen-Plainview artifacts have also only been found on the surface in Saskatchewan (Walker 1999:25).

During the ensuing Folsom-Midland complex (11.0 to 10.5 ka BP), the majority of the megafauna became extinct and excavated American sites demonstrate that there was a transition to bison procurement. This procurement became greatly intensified over the subsequent millennia. Folsom points are lanceolate and again fluted for hafting, although the flutes extend much further along the body of the point. Midland points are identical to Folsom points in size and knapping style, except they lack flutes (Walker 1999:25). Folsom and Midland artifacts are also restricted to surficial finds in Saskatchewan.

Agate Basin (10.5 to 9.5 ka BP) and Hell Gap (10.0 to 9.5 ka BP) complexes are often combined in discussion due the contemporaneous occurrence and the similar flaking patterns on the spear points. Although both projectile point styles are lanceolate, Hell Gap points are usually wider and have slight shoulders (Walker 1999:25). Comparable to all other Early Precontact complexes thus far, Agate

Basin and Hell Gap remains are found only on the surface in Saskatchewan.

The Alberta-Cody complex (9.5 to 8.4 ka BP) is the oldest complex from which artifacts have been excavated *in situ* in Saskatchewan. Stemmed points with abrupt shoulders represent the Alberta projectile point morphology. The Cody assemblages can be identified based on two unique point styles: Scottsbluff (transmedial flakes with a stemmed base) and Eden (co-lateral flakes and a diamond-shaped cross-section) as well as on a unique triangular tool known as a "Cody knife". The Niska site (DkNu-3) (Meyer 1985) near Ponteix, Saskatchewan and the Heron-Eden site (EcNx-2), a Cody complex bison kill near Prelate, Saskatchewan (Corbeil 1995), are two examples of excavated assemblages.

The Lusk, Angostura, and James Allen lanceolate point styles are diagnostic of terminal Early Precontact complexes. The basal section of a diagnostic point associated with this period was recovered from the excavation of the St. Louis site (FfNk-7) located on a terrace of the South Saskatchewan River, north of Saskatoon (Amundson and Meyer 2003:1).

3.3 Middle Precontact Period (7.5 to 2.0 ka BP)

3.3.1 Early Middle Precontact Period (7.5 to 5.0 ka BP)

Research concerning palaeoenvironments has indicated that the Middle Precontact period emerged due to a dramatic transition in climate on the Plains. This period was termed the "Altithermal" by Ernst Antevs in 1948 (Walker 1992:1). The impact of the Altithermal or Mid-Holocene Climatic Optimum, which is dated from 7.5 to 4.7 ka BP, was a fluctuating and gradual increase in temperature and decrease in precipitation (Vance et al. 1995). Because the climate became very arid during this climatic episode, it was once believed that the Northern Plains were abandoned. Recent excavations provide evidence to suggest that, although population may have decreased, people continued to occupy the land throughout the Mid-Holocene Climatic Optimum.

Excavated sites dating from 7.5 to 4.7 ka BP have exposed dart points now classified as part of the Mummy Cave series. Several variations of a side-notched point have been identified. The Bitterroot and Gowen point styles are the most common types found in Saskatchewan. Large assemblages were obtained from the Gowen 1 (FaNq-25) and Gowen 2 (FaNq-32) sites (Walker 1992) and the Norby (FbNp-56) site (Zurburg 1991), all of which are located within Saskatoon, Saskatchewan.

3.3.2 Middle Middle Precontact Period (5.0 to 3.0 ka BP)

During the middle segments of the Middle Precontact period populations witnessed a gradual decrease in temperature and increase in moisture. There is much more detail known about the Plains people and their lifeways beginning in this period. Multiple campsites and burial sites have been encountered, revealing evidence about settlement, seasonal activities, and, arguably, ideology.

From approximately 5.0 to 3.8 ka BP occupations associated with the Oxbow complex were widespread across Saskatchewan. First recognized in 1958 at the Oxbow Dam site (DhNn-1) (Nero and McCorquodale 1958), the points of this complex are side-notched with a deeply-concave basal edge. The Harder campsite (FbNs-1) near Saskatoon (Dyck 1977), Amisk campsite (FbNp-17) located in Wanuskewin Heritage Park (Amundson 1986), and the Gray cemetery site (EcNx-1a) near Swift Current (Millar 1981) are all excavated examples of Oxbow occupation in Saskatchewan.

The McKean series is composed of three different dart styles. The McKean style is a lanceolate point with a concave base (Wheeler 1954). The Duncan style has broad side-notches that give the dart point a stemmed appearance. Hanna points have relatively the same flaking pattern as Duncan but the side-notches are much narrower. The connection between these three styles is not known although they all date approximately to the same time period (4.2 to 3.1 ka BP). Webster (2004) suggests that the McKean period should be referred to as the McKean series on the Canadian Plains. Archaeological sites containing only McKean lanceolate

points on the Canadian Plains tend to be separated temporally from occupations containing Duncan and/or Hanna points. When separated, McKean lanceolate occupations are stratigraphically below Duncan/Hanna occupations (Quigg 1986; Webster 2004:118-9). The origins of the McKean series are currently being debated among researchers. It has been suggested that the McKean lanceolate point may have evolved out of the Oxbow projectile point form (Wright 1995:299) and also that it may have originated from the Great Basin (Reeves 1983). The McKean type site (48CK7) in Wyoming (Wheeler 1954; Mulloy 1954) as well as the Redtail (FbNp-10) (Ramsay 1993) and Thundercloud (FbNp-25) (Webster 1999; Mack 2000) sites (both located in Wanuskewin) contain multiple McKean occupations with a combination of these points.

3.3.3 Late Middle Precontact Period (3.0 to 2.0 ka BP)

The late part of the Middle Precontact period developed during the same time as the decline of the McKean series (Mack 2000:22). Due to remains found at excavated sites, this period has been associated with the increased intensification of bison procurement. As well, the projectile points typical of this period indicate that the bow and arrow was introduced to the Plains groups earlier than the Late Precontact period as was originally believed.

The Pelican Lake complex was first identified during excavation at the Mortlach site (EcNl-1) near Moose Jaw, Saskatchewan in 1955 (Wettlaufer 1955). Sites have been aged between 3.30 and 1.85 ka BP across western Manitoba, Saskatchewan, and eastern Alberta (Dyck 1983:105). The typical point style formed during this complex contains corner-notches. Several of the recovered dart points are large (more than 5 cm), but many are small (less than 2 cm) suggesting that they were used to tip arrows. Stratigraphic research has determined that these populations were often the first to use large bison procurement localities. Communal kill sites have been found associated with the Pelican Lake complex at the Walter Felt site (EcNm-3) (Kehoe 1965) in Saskatchewan and the Old Women's Buffalo Jump in Alberta (EcPl-1) (Forbis 1962). Subsequent layers demonstrate

that later populations continued to use these bison jumps and pounds until the near-demise of bison on the Northern Plains.

3.4 Late Precontact Period (2.0 to 0.3 ka BP)

The dawn of the Late Precontact period has been associated with important technological advances. The bow and arrow became a widespread tool during this period that commenced approximately 2.0 ka BP (Walker 1999:26). Pottery also became a very useful technology for these populations. These technologies were invaluable assets to communities and their use continued until European items became available and, often, desirable.

A significant research area that has developed pertaining to this late period is the ability to determine cultural origins and influences. Because these occupations are often not as deeply buried as the preceding complexes, more sites have been excavated that correspond to this period. As well, there may, in fact, be more occupations at this time due to an increase in population. More Late Precontact sites have been excavated not only on the Northern Plains, but also in surrounding regions such as the boreal forest and the foothills of the Rocky Mountains. The bow and arrow is believed to have originated from the west. Pottery, on the other hand, is believed to have an Eastern Woodland origin (Walker 1999:26). The determination of cultural dynamics and contacts is a goal that many researchers are pursuing.

The Besant complex was distributed across southern Saskatchewan from approximately 2.5 to 1.4 ka BP (Cloutier 2004:42). Pottery recovered from these excavations is simple in design. It is conoidal-shaped and usually cord-marked, although a smooth finish is also common. There is little decoration on the vessels. What decoration there is is predominately limited to the lip and rim. One row of bosses or alternating punctates and bosses frequently decorate the rim (Walde and Meyer 2003a:138; Meyer et al. 1990:2). Besant points are generally side-notched with a straight or slightly concave basal edge. Variations of these are the

Samantha points which are small and probably were used as arrowheads. Tipi rings and large communal bison traps are the most common types of Besant sites.

Excavations of Besant occupations have revealed that the preferred material utilized for stone tool manufacturing was Knife River flint. This material was extensively quarried in North Dakota. Thus, the high frequency of Knife River flint that has been observed suggests that Besant populations organized long distance trade networks or seasonal rounds. Burial mounds identified in North and South Dakota as well as southern Manitoba are contemporary with the Besant complex and contain similar artifacts. Believed to have originated from the Eastern Woodlands, this mound-building complex is known as Sonota and may have been a variant of the Besant complex. Two sites are the Mortlach site (EcNl-1) near Moose Jaw (Wettlaufer 1955), Saskatchewan and the Grandora site (FaNr-2) near Saskatoon (Dyck 1972).

Radiocarbon ages from Avonlea complex sites on the Northern Plains are calibrated between 1.75 and 1.15 ka BP. Although the radiocarbon ages of occupation overlap with and are subsequent to the Besant complex it has been argued that, based on the stratigraphic separation of each complex, there may have been little or no contact between these cultural groups (Cloutier 2004:147-52; Walde et al. 1995). Three general geographical variations of Avonlea complex pottery have been identified (Walde and Meyer 2003b:139-43). The variations consist of Rock Lake Net-Impressed vessels displaying punctates or incisions around the rim, vessels with parallel-grooved exteriors, and vessels with cord-roughened exteriors. Avonlea projectile points are small and thin, demonstrating fine pressure flaking technique. In Saskatchewan, the majority of identified Avonlea sites relate to bison procurement and processing. An example is the Gull Lake bison jump (EaOd-1) (Kehoe 1973) near Gull Lake, Saskatchewan.

Near the end of the Late Precontact period technology attributed to the Old Women's complex has been identified. The associated projectile points are known as Prairie Side-Notched points and are small with very triangular tips. Sites have been aged from approximately 1.20 to 0.55 ka BP. Recovered vessels are relatively

thick, globular-shaped, and have either cord-roughened or fabric-impressed exteriors usually with no decoration although punctates, incisions, and cord-wrapped tool impressions have been observed. The Sjovold site (EiNs-4) near Outlook (Dyck and Morlan 1995), Tschetter bison trap (FbNr-1) near Saskatoon (Prentice 1983; Linnamae 1981), and the Moose Bay Mound (EdMq-1) in the eastern Qu'Appelle valley (Hanna 1976) are Saskatchewan sites which contain significant Prairie Side-Notched assemblages.

Cultural origins and influences of this period have been suggested from two different regions. Side-notched points, cord-roughened pottery, and burial mounds were characteristic of the contemporary Eastern Woodland region. The introduction of corn agriculture which was practiced along the Northeast and Central Plains was distinctive to the contemporary Middle-Missouri region. Both regions influenced this late complex.

Dated, generally, from 0.55 to 0.10 ka BP, Plains Side-Notched projectile points characteristic of the Mortlach complex in Saskatchewan have been recognized. These projectile points are similar to the Prairie Side-Notched styles except that they are carefully flaked and the notches are located farther above the squared base. Pottery is typically fabric-impressed or check-stamped with punctates or cord-wrapped tool impressions. These vessels are much thinner than the preceding style (Walde 2003 Harty 2005:20). Occasionally, these artifacts are found associated with European trade items (Walde et al. 1995:44 Mack 2000:27). The Hartley site (FaNp-19) (Farrow 2004; Clarke 1995) is one of many Saskatchewan localities which has produced Plains Side-Notched projectile points. The excavated remains are suggestive, once again, of Middle-Missouri and Eastern Woodland influences (Walker 1999:27).

3.5 Cultural Sequence of the Dog Child Site

When viewed in composite section, the soil profile of the Dog Child site is highly compressed. A variable number of occupation levels can be identified throughout the strata of the site. The slope of the buried ground surfaces as well as erosional factors have resulted in the collapse of some of the strata. In total, six buried occupations have been recognized with a seventh on the surface. However, the latter is largely limited to pig (*Sus scrofa*) bones. Historically, there was a pig farm within the boundaries of Wanuskewin Heritage Park and thus their presence is not unexpected. Of the remaining six buried soils, separation is variable and in some areas within the site only three occupation levels can be identified. Thus, Level 1 is divided into Level 1a and Level 1b in several units. This is also the case for Level 2 and Level 3 although the separation is less apparent in the deepest level. Through the examination of diagnostic artifacts and chronometric ages, the six occupation levels have been categorized within the cultural chronology scheme recognized on the Northern Plains described in Table 3.1. The compression and separation of occupation levels can be seen in Figures 3.1, 3.2, 3.3, and 3.4.

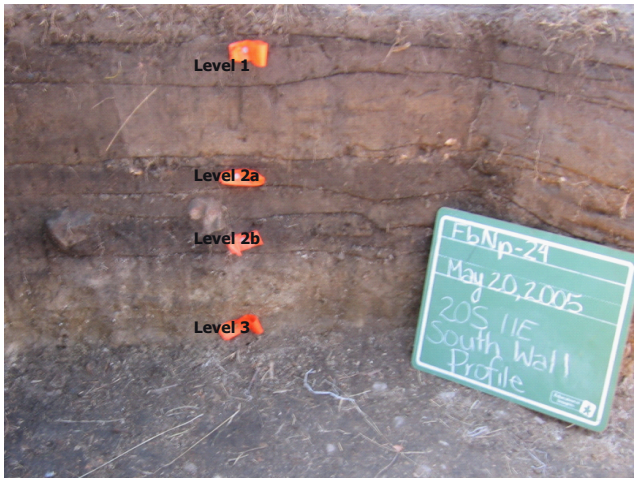

Figure 3.1: South Wall Profile Displaying Level 1, Level 2a, Level 2b, and Level 3

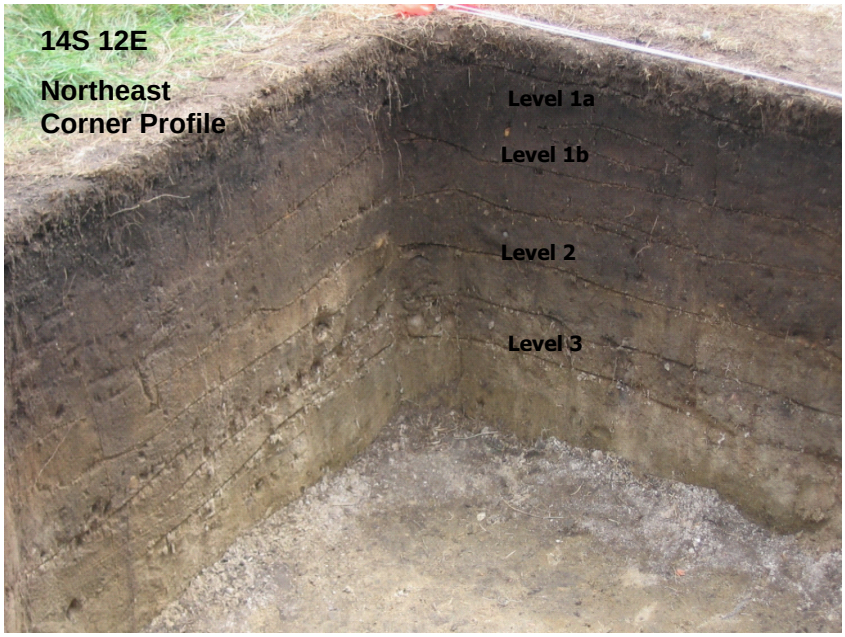

Figure 3.2: Northeast Wall Profile Displaying Level 1a, Level 1b, Level 2, and Level 3

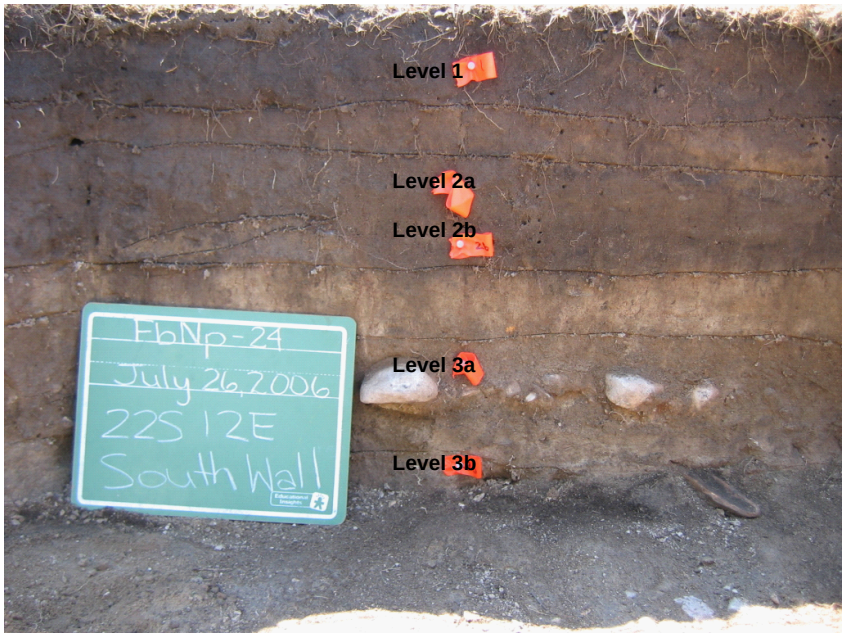

Figure 3.3: South Wall Profile Displaying Level 1, Level 2a, Level 2b, Level 3a, and Level 3b

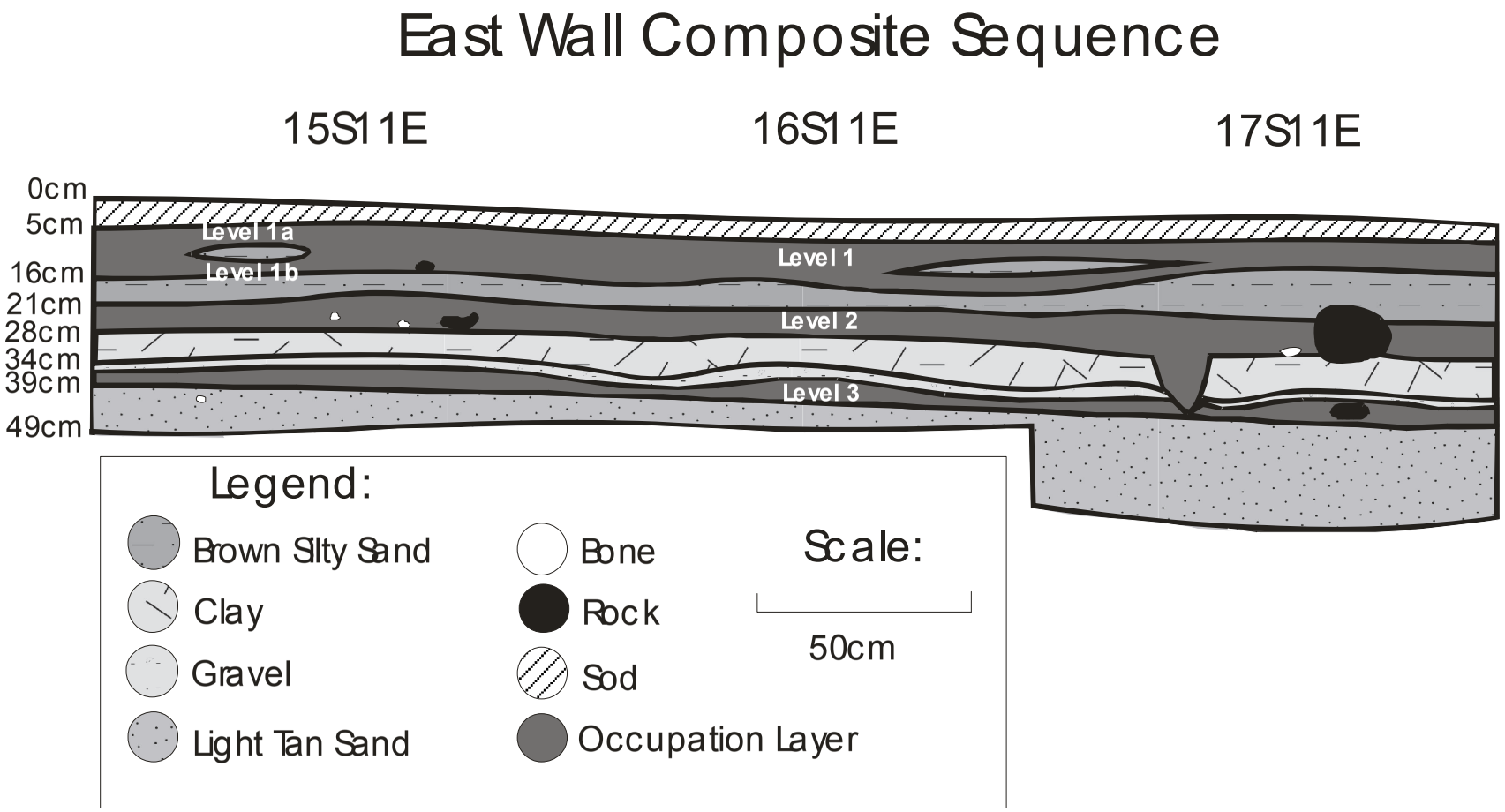

Figure 3.4: East Wall Composite Section Including Occupations Level 1a, Level 1b, Level 2, and Level 3

Level 1 was identified immediately beneath the sod. Its thickness varies depending primarily on the degree of separation between Level 1a and Level 1b. With no separation, the level is between 5 cm and 10 cm thick. When the separation is clear, in the form of light-coloured sand with small pebble lenses, Level 1a is approximately 4 cm thick and Level 1b is approximately 3 cm thick. Level 1a is associated with Late Plains Side-Notched materials. This is based on diagnostic artifacts and stratigraphic positioning. Level 1b is affiliated with Prairie Side-Notched materials. A chronometric age was obtained for this level using a charcoal sample. It was submitted from a hearth feature in unit #19S12E at a depth of 23 cm below the surface. The absolute age of this sample is calibrated to 0.30 ± 0.05 ka BP (BGS 2659). Using Two Sigma probability distribution, this age is measured between 0.257 and 0.342 ka BP (Table 3.2, (Stuiver and Reimer 1993)).

Table 3.2: Calibrated Radiocarbon Age Assessment (* Calibrated radiocarbon ages were obtained using Stuiver and Reimer 1993)

Sample Number	Level Number	Sample Type	Uncalibrated Age (ka BP)	Calibrated Age (ka BP)	Calibrated Error (+/-)	Two Sigma Minimum (ka BP)	Two Sigma Maximum (ka BP)
BGS 2659	1b	charcoal	0.241	0.300	50	0.257	0.342
BGS 2660	2a	bone	3.460	3.700	45	3.630	3.834
BGS 2661	2b	bone	3.867	4.270	50	4.148	4.417
BGS 2662	3a	bone	4.597	5.310	50	5.344	5.466
BGS 2663	3b	bone	4.780	5.530	50	5.499	5.604

Level 2 is recognizable beneath a layer of sand with a thin layer of gravel at the bottom. The top of Level 2 is highly subject to the slope of the terrace. In the northern section of Block 1, Level 2 occurs at a shallower depth on average than in the southern units. It appears, on average, at 15 cm depth immediately below the gravel layer. The average thickness is between 7 cm and 15 cm. When separable, Level 2a is approximately 5 cm thick and Level 2b is approximately 6 cm thick with a 7 cm layer of clayey sand in between. Level 2a is associated with the Duncan/Hanna period of the McKean series. A radiocarbon sample consisting of a left bison metacarpal was submitted for this occupation. The sample was

recovered from a depth of 21.5 cm. The calibrated age obtained was 3.700 ± 0.045 ka BP (BGS 2660). Two Sigma probability suggests an age between 3.630 and 3.834 ka BP (Table 3.2). Level 2b is believed to be an Oxbow complex occupation layer. The radiocarbon sample used to age this occupation was composed of two bones: a metacarpal shaft and a left distal bison radius. Both bones were taken from unit #15S9E at depths of 18 cm and 19 cm respectively. The rendered age is calibrated at 4.27 ± 0.05 ka BP (BGS 2661) with a Two Sigma probability of between 4.148 and 4.417 ka BP (Table 3.2).

Level 3 is separated from Level 2 by a thick layer of sandy clay. It is found almost exclusively as a single occupation layer except in the southeast section of Block 1. Beginning at a depth of approximately 40 cm, Level 3 is between 4 cm and 9 cm thick. It is immediately superior to a thick layer of very coarse pebbles and cobbles with calcium carbonate present on the surface of the artifacts. In the small percentage of the site where separation is clear, both Level 3a and Level 3b are typically 5 cm thick and divided by clay. Both occupations are associated with the Mummy Cave series or transitional Oxbow/Mummy Cave period. The Level 3a sample, a bison rib excavated at a depth of 46 cm, produced a calibrated age of 5.31 ± 0.05 ka BP (BGS 2662), with a Two Sigma relative probability of 5.344 to 5.466 ka BP (Table 3.2). The radiocarbon sample submitted for the earliest level (Level 3b) was a composite of a left bison mandible and a left bison ulna. The two samples were both taken from unit #20S12E at depths of 49.5 cm and 50 cm respectively. The calibrated age is 5.53 ± 0.05 ka BP (BGS 2663). Two Sigma analysis provides a range of between 5.449 and 5.604 ka BP (Table 3.2).

Chapter 4

Methodology

4.1 Excavation Procedures

This thesis is concerned with the archaeological materials recovered from Block 1 of the Dog Child site. Block 1 consists of 35 units that were fully excavated (Fig. 4.1). Data were collected through two consecutive field seasons. Assisting were the University of Saskatchewan's 2004 and 2005 archaeological field school students under the supervision of Dr. Ernest Walker and the author. Subsequent excavations were conducted by the author and volunteers from the Saskatchewan Archaeological Society (SAS). A complete map indicating all of the units that have been excavated to date, including the 2006 field season, can be seen in Figure 4.2.

At the outset of excavation, a datum was established in the northwestern corner of the flat terrace. Units were appointed south and east of this datum and were consistently $1\,m^2$. Initially, arbitrary 5 cm levels were excavated in order to determine the depositional environment. As the stratigraphic sequence became apparent, however, natural levels could be identified. All units were divided into quadrants in order to make excavation and cataloguing more manageable.

A number of methods were implemented in the field to make an efficient as well as carefully-executed excavation. Trowels were used when excavating an occupation level. Soft and hard bristled brushes as well as dental picks and chopsticks were particularly useful in sensitive areas with high concentrations of artifacts. When it was known that an archaeologically-sterile level was being excavated, shovels were often used instead of a trowel. Thin sections were removed by quadrant and all of the sediment was screened.

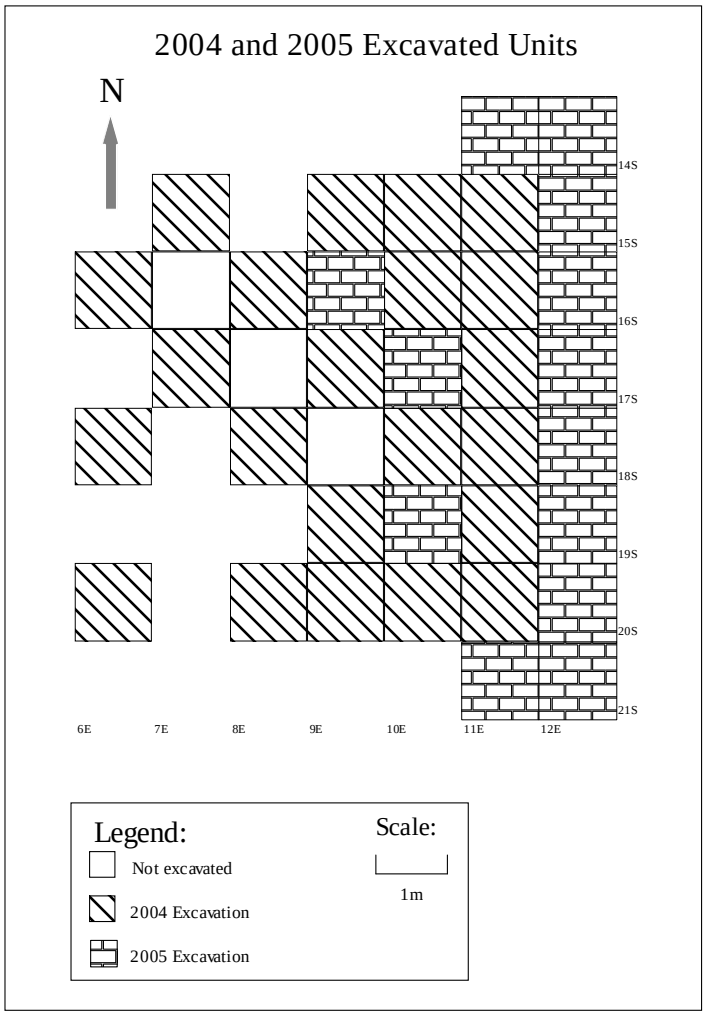

Figure 4.1: Excavated Study Area of the Dog Child Site (2004 and 2005 Field Seasons)

All artifacts that were larger than 2 cm and any artifacts that were either diagnostic or formed tools were left *in situ.* This practice was customary to facilitate mapping of the current occupation level once fully excavated. The remaining sediment and soil was screened in order to locate overlooked artifacts. Predominately, a 6 mm screen was implemented. If the excavator recognized that significant amounts of small artifacts such as micro-debitage or highly fragmented bone were present then a 3 mm screen was used instead in order to obtain as much of the archaeological data as possible. In the case of features (i.e. hearths) all

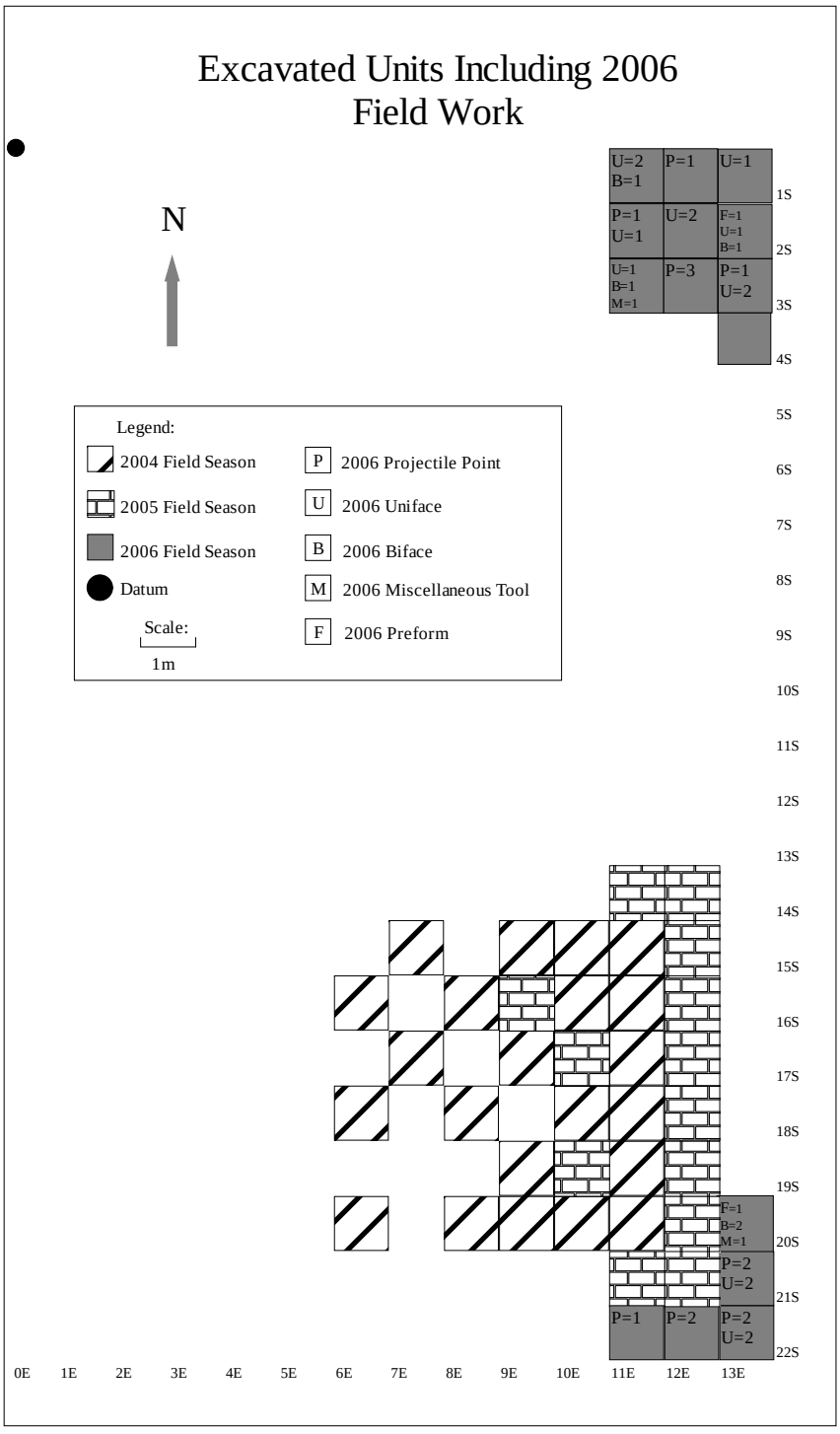

Figure 4.2: 2004, 2005, and 2006 Inclusive Field Season Excavation Units

sediment was collected and transported by quadrant to the archaeological laboratory for fine-screening as will be discussed in the laboratory procedures. All artifacts recovered from the screens and all artifacts not fitting one of the three size or use categories mentioned above were accumulated in fragment bags ("frag. bags") and, later, were sorted and identified in the laboratory. These bags were specific to occupation level and quadrant.

In order to be able to reconstruct the site, it was imperative that records be kept in the field. All of the artifacts that were not placed into bags immediately and all features that were uncovered were mapped using a standardized grid form. Artifacts and feature boundaries were measured south and east of the datum. The depth was then recorded, creating a three-dimensional provenience of all significant finds. Each artifact received a catalogue number and an index card providing its provenience as well as its description. Index cards were also inserted into fragment bags with the relevant information. In addition to the planview maps, all excavators filled in a standardized level record form upon completion of each occupation level. Significant finds were listed on these forms as was a description of the matrix and methodology. Daily logs were kept by all excavators as well, summarizing significant finds throughout the site and other information pertinent to the analysis.

4.2 Laboratory Procedures

All of the data collected from the site was brought to the Wanuskewin Archaeological Laboratory in the Department of Archaeology at the University of Saskatchewan. Samples collected from features were water-screened. By quadrant, samples were deposited into 2 mm sifters. Water was then gently funneled through the sifter, removing the sediment from larger pebbles and archaeological materials. These samples were then dried completely and subsequently screened through a sequence of graded screens in order to retrieve the artifacts. Because of the sensitive tools used, seeds, micro-debitage, and minute

faunal materials could be identified.

The first stage in the identification of the archaeological material was cleaning. Stable artifacts such as the majority of lithics and minimally-weathered bone were washed using water and a toothbrush. The remaining unstable artifacts were cleaned using a dry toothbrush. These artifacts included pottery, charcoal, fire-cracked rock, and highly-weathered faunal materials. Once fully cleaned and, when applicable, dried, artifacts were then individually sorted, identified, and weighed. The identification was verified by the author as part of the formal analysis of this research. All artifacts received a catalogue number and were compiled in a database using Microsoft^{TM} Access. The artifacts were initially identified based on one of six basic categories-lithic, faunal, floral, pottery, organic, and charcoal. They were then further subdivided into more specific classifications. For the purposes of this thesis, only lithic, faunal, floral, and pottery samples will be included.

Lithic artifacts were first identified according to material type. This was primarily completed by comparison with the Department of Archaeology's identified lithic collection and Eldon Johnson's overview of common Saskatchewan lithics (Johnson 1998). In some instances it is possible to recognize the effect that the application of heat can have on the lithic material. Thermal alteration of some lithics, primarily silicas, results in a finer-quality of material. Controlling the material during flintknapping becomes more manageable as a result (Leudtke 1992:93-4; Crabtree 1967). Swan River chert, chert, and silicified peat are the main resources that had undergone heat-treatment recognized at the Dog Child site. The material was further subdivided into form and function. Fire-cracked and fire-broken rock is characterized as having abrupt angles or structural cracks in the material. These fractures are caused due to extreme changes in temperature Rocks that were used to construct pits and hearths, or rocks that are heated and then deposited in water in order to heat the liquid are common causes of this form. It is important to note that freezing and thawing can, over time, create a similar effect. Granite, sandstone, basalt, schist, and gneiss are common resources which

exhibit this form of alteration. The remaining lithic artifacts were further divided into cobbles, cores, flakes, formed tools, and shatter. Cobbles are any useful raw lithic material that has not been reduced but, given the context within the archaeological site, are believed to have been intended for tool manufacture. A core or a core fragment is described as "any piece of lithic material from which another piece of lithic material has been detached for the purpose of use as a tool or to manufacture a tool" (Kooyman 2000:170). There are irregular platform cores wherein flakes are removed from one or several platforms with no specific pattern and without an anvil. As well, there are bipolar cores in which case an anvil is used and flakes may be removed from two directions, the superior and inferior margins, as a result. A flake is identified based on specific attributes including a bulb of percussion, compression rings, and a striking platform. Shatter is lithic debitage lacking all of these qualities. Primary decortication flakes are recognizable based on having 100% cortex on the dorsal surface of the flake (Kooyman 2000:18). Secondary flakes are those which exhibit less than 100% cortex on the dorsal surface and are larger than 1 cm. Tertiary flakes are flakes that are smaller than 1 cm (Whittaker 1994). These flakes are considered to be indicative of tool preparation stages wherein the largest and those containing the most cortex are produced earlier than smaller flakes with little or no cortex (Kooyman 2000). The stage of reduction can help in indicating the site activities. A further division exists for flakes exhibiting retouch or use-wear. Formed tools are those objects in which deliberate preparation can be identified. These include both flaked (projectile points, spokeshaves) and miscellaneous (anvils, hammerstones) stone tools. They were classified by type and their dimensions were measured.

The intent of the initial identification of faunal remains was to determine the specific bone present. The classifications used in this thesis were based on Grayson (1984) and Brink and Dawe (1989) ,who separate the faunal remains into elements, specimens or element portions, and fragments. An element is recognized as a "single complete bone or tooth in the skeleton of an animal" (Grayson 1984:16). A specimen is a bone or tooth that is recognizable but is not necessarily complete.

Fragments are the remaining unclassified pieces. According to Brink and Dawe (1989), such fragments may be specified as tooth enamel or long bone portions that "cannot be assigned to a specific element but rather to a class of elements, such as long bones or vertebrae" (Brink and Dawe 1989:80). Thus, the species can not be designated. In the event that a bone or tooth was identifiable, the side was determined as was the species when possible. In many instances, the exact species and genera were indefinable for a given specimen or fragment. Based on the size of the bone or tooth and the bony landmarks present, it was placed in a broader grouping based on body mass. These classes are summarized in Table 4.1.

Table 4.1: Size classifications of animals in thesis (Modified from Dyck and Morlan 1995:140)

Size Class	Mass (kg)	Associated Term	Example
SC6a	200 to 700	Very Large Mammal	Elk, Bison
SC5a	25 to 200	Large Mammal	Wolf, Pronghorn
SC4a	5 to 25	Medium Mammal	Coyote, Badger
SC3a	0.7 to 5	Small-Medium Mammal	Fox, Hare, Skunk
SC2a	0.1 to 0.7	Small Mammal	Ground Squirrel
SC1a	<0.1	Micro-Mammal	Mouse, Vole
SC5b	n/a	Large Bird	Crane, Eagle
SC4b	n/a	Medium Bird	Raven
SC3b	n/a	Small-Medium Bird	Duck
SC2b	n/a	Small Bird	Robin
SC1b	n/a	Micro-Bird	Warbler

The broad age category of the animal was assigned when a billowed surface was present on the bone and deciduous or immature teeth were recognized. In addition, cut marks, tooth marks (carnivores, rodents, artiodactyls), root etching, and insect and worm burrows were recorded when present on any of the bone or tooth samples. The degree of burning and the presence of diagenetic change were also documented. Finally, the stage of weathering was described. Stage 0 consists of bone that is greasy and may still retain some soft tissue while Stage 5 classifies bone that is extremely fragile and the cortical surface has exfoliated, exposing the inner cancellous bone (Todd 1987:123; Behrensmeyer 1978). These taphonomic processes and the resulting state of preservation are key in determining the

environment in which the faunal materials were deposited.

There were few floral remains recovered from the Dog Child site. Those that were recovered were found in a hearth and were burned which helped to preserve the seeds. These samples were identified by the Canadian Food Inspection Agency (CFIA), Saskatoon. The identification of these seeds is relevant in the interpretation of Plains subsistence.

A significant amount of pottery was also recovered through excavation of the upper occupations of the Dog Child site. This pottery was highly fragmented. Excavated sherds were classified as either body sherds, shoulder sherds, or lip and rim sherds. The form of temper was recorded as was the decoration on the lips and rims. This aids in determining the cultural affiliation of the associated level.

4.3 Quantitative Analysis

Determining numbers of individuals represented is a goal of this thesis. The identifiable faunal specimens were recorded in order to infer the quantities of faunal species during each occupation. Once all of the bones and teeth had been analyzed and all of the elements and specimens identified, quantitative measurements were performed. Values were then tabulated and graphed using Microsoft^{TM} Excel.

Several terms must be defined as they are essential in the determination of these quantities. These statistical counts include **NISP** (number of identified specimens), **MNI** (minimum number of individuals), **MNE** (minimum number of elements), **MAU** (minimum number of animal units), and **%MAU**. Each counting technique involved requires a slightly modified procedure. This was to ensure the clearest representation of the animal units present within the site occupations.

NISP is the most basic measurement that can be made regarding quantitative analysis. All of the identifiable teeth and bones - element, specimen, or fragment class - are counted (Brink and Dawe 1989:81). This method is useful for measuring the abundance of all of the units present within the entire level. It does not account for anatomical side or the identifiable fragments and specimens of one

individual bone or tooth. Thus this count had to be supplemented by others.

MNI values are obtained by dividing the identified faunal material into anatomical side (Grayson 1984:27). However, the fragmentary nature of the material is not taken into account. Thus, MNE values are measured as well in order to improve the counts . MNE quantification accounts for the presence of landmarks on the bone such as the coronoid process of the mandible. All bony landmarks were recorded and anatomical side was specified when applicable. The largest count represented the MNE.

MAU measurement was proposed by Binford and is calculated from the values obtained through MNE measurement (Binford 1978:70). To calculate MAU, the MNE (total count of each bony landmark) is divided by the number of times it appears within the body. This number varies depending on the unit being counted. For example, in a bison skeleton, there are two radii and eight first phalanges. Once the MAU has been determined, the %MAU is calculated by dividing each MAU value by the largest MAU determined within the given layer. The resulting values represent the frequency of each bony landmark with respect to the rest of the sample. Quantification of this faunal assemblage helps to provide a detailed perspective on the activities of a site and the subsistence strategies of each occupation.

4.4 Chronometric Age Assessment

Obtaining chronometric ages was pertinent in the analysis of the Dog Child site. Diagnostic artifacts suggested that the earliest occupations were much older than the shallow depth was suggesting. Ages were obtained from five of the six levels, confirming the expansive time frame encompassed within the site. Radiocarbon samples were taken from five occupation levels in the form of bone or charcoal. The samples were sent to Brock University in St. Catharines, Ontario, Canada for analysis. Specific samples and their ages are discussed in Chapter 3.

4.5 Specification of Occupation Levels

An immediate concern in dealing with the analysis of the Dog Child site was the separation or lack of separation of each occupation level. Both Level 1a and Level 1b exist, but this separation is incomplete due to geological, geographical, and cultural processes. When "Level 1" is being discussed, it must be noted that the separation between the two occupations could not be determined within a given unit. The terms "Level 2" and "Level 3" are used when separation could not be distinguished between Levels 2a and 2b and Levels 3a and 3b respectively. This method has been standardized within the catalogue and throughout the thesis.

Chapter 5
Occupation Level 1 (1a, 1b) Assemblage

5.1 Introduction

Immediately below the sod layer is the later portion of Occupation Level 1. The incomplete separation of this level has made it necessary to view it as three unique entities: Level 1, Level 1a, and Level 1b. Of the 35 units excavated, separation of the individual layers was recognized in 26 and partial separation was identified in another (unit #16S10E) (Fig. 5.1). The remaining eight are inclusively classified as Level 1 and artifacts from the inseparable portion of unit #16S10E are also included. There are three small clusters of units containing artifacts from Level 1 that can be noted in this figure. The first is located in units #16S6E and #15S7E along the western margins of the site. Lack of further excavation in this area removes the possibility of extrapolating the occurrence. The remaining two pockets exist in the northeast (units #15S11E, #16S10E, and #16S11E) and southeast sections (units #19S9E, #19S11E, #20S10E, and #20S11E) of the site. Erosional processes account for the absence of separating sediment lenses in these clusters. When present, diagnostic artifacts in Level 1a suggest that the level should be assigned to a Plains Side-Notched assemblage. No chronometric age was obtained for this level. Level 1b contains artifacts recognized as a Prairie Side-Notched assemblage. Based on two projectile points found at the bottom of Level 1b, there is a possibility that remnant Besant and Pelican Lake occupations remain. The chronometric age obtained for Level 1b is calibrated to 0.30 ± 0.05 ka BP (BGS 2659, Table 3.2). Included in the analyzed assemblage are lithic, faunal, and floral remains, in combination with pottery sherds. These

sherds are associated with the Mortlach complex.

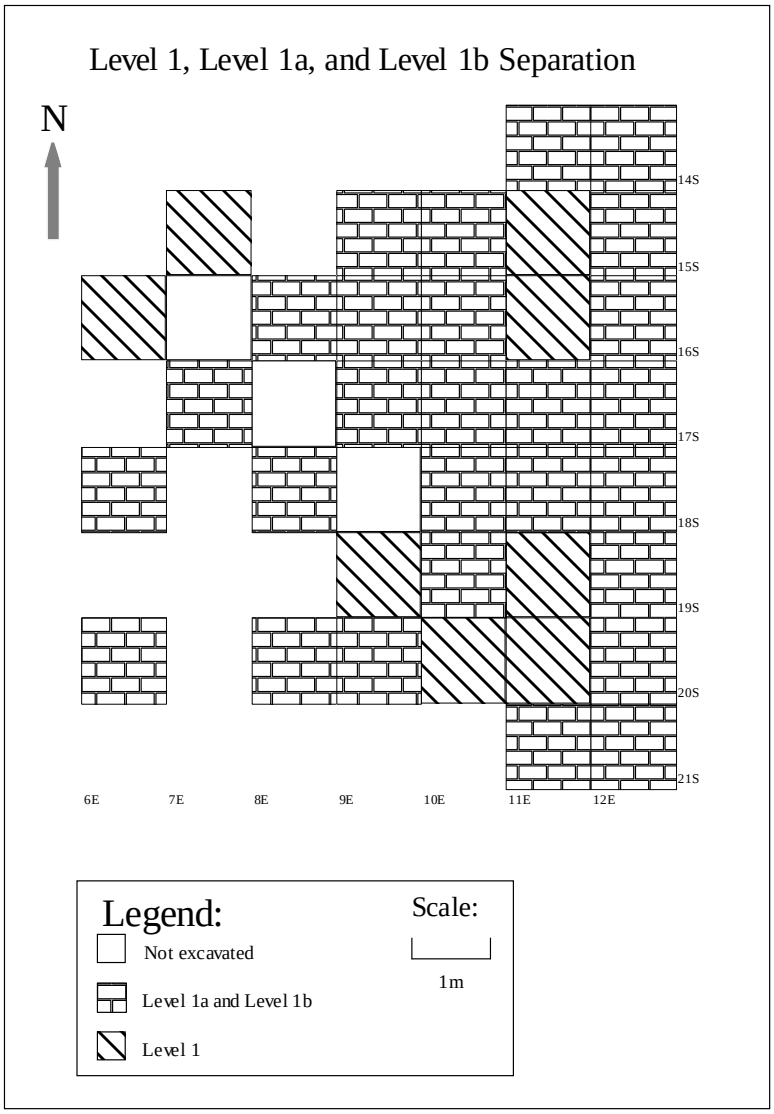

Figure 5.1: Separation of Level 1a and Level 1b Occupations

5.2 Lithic Assemblage

5.2.1 Debitage

The inventory for Level 1 when it could not be separated into Level 1a and Level 1b revealed a total of 1482 shatter fragments and flakes (Table 5.1). Swan

River chert is the predominant lithic material, accounting for 55.4% of the entire sample. Evidence of heat treatment is present on 23.8% of the Swan River chert debitage. Amorphous cherts are the second most frequent material, providing 13.2% of the sample. Sixteen discrete material types constitute the remaining 31.4% of the lithic assemblage. Pieces of shatter represent 53.0% (786 pieces) of the sample. Secondary flakes are the second most common form with a frequency of 27.1%. This is followed by tertiary flakes, representing 19.6%. Primary flakes are very rare. Only four were identified, constituting 0.3% of the sample. It is probable that the during the initial stage of flake removal, some of the primary decortication pieces snapped, thereby removing features associated with flaking patterns. These primary flakes may also have been reworked, skewing the diagnostic features.

Table 5.1: Occupation Level 1 Debitage Counts

Material	Shatter	Primary Flake	Secondary Flake	Tertiary Flake	Total	Percent (%)
Swan River Chert	449	4	196	172	821	55.4
Chert	70	0	79	47	196	13.2
Quartzite	64	0	24	6	94	6.3
Quartz	68	0	16	4	88	5.9
Silicified Peat	43	0	10	10	63	4.3
Chalcedony	13	0	24	22	59	4.0
Knife River Chert	12	0	17	13	42	2.8
Agate	3	0	14	11	28	1.9
Gronlid Siltstone	11	0	12	4	27	1.8
Basalt	21	0	4	1	26	1.8
Silicified Wood	21	0	4	0	25	1.7
Fused Shale	4	0	0	0	4	0.3
Limestone Chert	1	0	1	0	2	0.1
Silicified Siltstone	1	0	0	1	2	0.1
Jasper	2	0	0	0	2	0.1
Cathead Chert	1	0	0	0	1	0.1
Obsidian	1	0	0	0	1	0.1
Feldspathic Siltstone	1	0	0	0	1	0.1
Total	786	4	401	291	1482	100%
Percent (%)	53.0	0.3	27.1	19.6	100%	

When Level 1a was separable, 3074 fragments of shatter and flakes (Table 5.2)

were identified within the excavation of the level. A total of 1695 of these pieces are Swan River chert, representing 55.2% of the total count (66.2% heat-treated). A distant second-most common material is quartzite, totalling 406 pieces (13.2%) followed closely by chert with a total of 345 pieces (11.2%). The remaining 20.4% of the sample is composed of 15 other materials. Shatter is, again, the most common morphological debitage present, totalling 56.3% of the sample. Tertiary flakes are the second most common form, with a total of 24.8%. Secondary flakes represent 18.6% and primary flakes represent 0.3%.

Table 5.2: Occupation Level 1a Debitage Counts

Material	Shatter	Primary Flake	Secondary Flake	Tertiary Flake	Total	Percent (%)
Swan River Chert	865	3	311	516	1695	55.2
Quartzite	334	1	54	17	406	13.2
Chert	181	3	77	84	345	11.2
Silicified Peat	90	1	15	28	134	4.4
Quartz	102	0	12	18	132	4.3
Knife River Flint	15	2	32	25	74	2.4
Chalcedony	21	0	9	27	57	1.9
Gronlid Siltstone	20	0	18	9	47	1.5
Silicified Wood	33	0	6	8	47	1.5
Silicified Siltstone	13	0	13	16	42	1.4
Fused Shale	15	0	15	7	37	1.2
Basalt	13	0	3	0	16	0.5
Limestone Chert	12	0	1	0	13	0.4
Agate	5	0	4	1	10	0.3
Sandstone	8	0	0	0	8	0.3
Feldspathic Siltstone	1	0	0	5	6	0.2
Jasper	2	0	1	0	3	0.1
Cathead Chert	2	0	0	0	2	0.1
Total	1732	10	571	761	3074	100%
Percent (%)	56.3	0.3	18.6	24.8	100%	

A total of 6514 pieces of shatter and flakes were excavated from Level 1b. Consistent with the aforementioned levels, it continues to display a majority percentage of Swan River chert flakes and shatter. A total of 66.3% of the sample (4317 pieces) is composed of Swan River chert and 65.9% of this has been altered by heat. This is followed by quartzite which is represented by 667 pieces, 10.2% of the sample. The remaining 16 identified lithic materials present in Level 1b account for 23.5% of the debitage assemblage. The majority of the debitage forms

is, once again, comprised of shatter, constituting 65.9% of the assemblage. Secondary and tertiary flakes each represent 16.9% independently and primary flakes represent 1.3% (Table 5.3).

Table 5.3: Occupation Level 1b Debitage Counts

Material	Shatter	Primary Flake	Secondary Flake	Tertiary Flake	Total	Percent (%)
Swan River Chert	2746	8	710	853	4317	66.3
Quartzite	525	1	100	41	667	10.2
Chert	333	4	96	63	496	7.6
Quartz	234	1	53	40	328	5.0
Silicified Peat	234	0	37	33	304	4.7
Knife River Flint	28	1	31	27	87	1.3
Fused Shale	63	0	17	6	86	1.3
Chalcedony	21	1	17	24	63	1.0
Limestone Chert	24	0	20	0	44	0.7
Silicified Siltstone	22	1	7	9	39	0.6
Gronlid Siltstone	14	0	11	3	28	0.4
Silicified Wood	17	0	3	1	21	0.3
Basalt	15	0	2	0	17	0.3
Sandstone	6	0	1	0	7	0.1
Agate	3	0	2	0	5	0.1
Feldspathic Siltstone	2	0	0	0	2	0.03
Cathead Chert	2	0	0	0	2	0.03
Jasper	1	0	0	0	1	0.01
Total	4290	17	1107	1100	6514	100%
Percent (%)	65.9	0.3	16.9	16.9	100%	

It is evident from Level 1a and Level 1b and supported by the artifact assemblage in Level 1 that there was a heavy reliance on local lithic materials. Swan River chert is a material native to southern Saskatchewan as well as southeastern Alberta and westcentral Manitoba (Grasby et al. 2002; Johnson 1998). It is found abundantly in glacial till outcrops. Quartzites and cherts are also commonly represented in the archaeological record. Both materials can also be found locally. Quartzite is predominantly recovered from its secondary and tertiary source in gravel pits as well as within the outwash of the South Saskatchewan River (Walker 1992:66). A significant number of these pits exist in southwestern Saskatchewan (Johnson 1998:29). Athabasca quartzite can also be obtained from its primary sources in northern Saskatchewan (Johnson 1998:30). In fact, the majority of the lithics listed in Tables 5.1, 5.2, and 5.3 can be found

within Saskatchewan with the possible exception of some exotic chert varieties and Knife River flint which is native to Dunn County, North Dakota, as well as agate which is found in Montana (Zurburg 1991). Another exception is obsidian which is found in volcanic regions. As only one piece of obsidian shatter was recovered from the entire assemblage within Level 1, a discussion regarding long-distance contact or seasonal migration cannot be expanded upon.

5.2.2 Cores and Core Fragments

Level 1 revealed a total of 12 cores and fragments of cores (Table 5.4): four Swan River chert, five chert, one quartz, one quartzite, and one chalcedony. Of these, nine are irregular platform cores while three are bipolar cores. Grey chert is the most common lithic material, with five cores composed of it. All have multiple flakes removed and their small sizes suggest that they are in their final stages of utilization, perhaps being flaked into an early-stage tool. The four Swan River chert cores present are also in the final stages of utilization. Two have been heat-treated. The white quartz core exhibits multiple flake scars, as does the quartzite core. The chalcedony core is a very small expended fragment.

Table 5.4: Level 1 Cores and Core Fragments

Specimen	Material	Mass (g)	Type
1	Swan River Chert	22.8	Platform
2	Swan River Chert	9.9	Bipolar
3	Swan River Chert	9.0	Platform
4	Swan River Chert	7.9	Platform
5	Chert	10.1	Bipolar
6	Chert	4.8	Bipolar
7	Chert	4.4	Platform
8	Chert	4.1	Platform
9	Chert	3.3	Platform
10	Quartz	34.7	Platform
11	Quartzite	48.8	Platform
12	Chalcedony	1.1	Platform

Within Level 1a, 17 cores and core fragments were identified (Table 5.5): nine composed of Swan River chert, six of chert, one of chalcedony and one of fused

shale. One of the Swan River chert cores is bipolar and the remaining eight are irregular platform cores. Five have been heat-treated. With the exception of the two most massive cores, the remaining seven are in the final stages of flaking use. Both larger cores exhibit multiple flake scars which originate from multiple platforms. Similarly, the six chert cores (five grey amorphous and one brown) are highly flaked as are the core of fused shale and the bipolar chalcedony core.

Table 5.5: Level 1a Cores and Core Fragments

Specimen	Material	Mass (g)	Type
1	Swan River Chert	141.5	Platform
2	Swan River Chert	32.2	Platform
3	Swan River Chert	26.8	Platform
4	Swan River Chert	26.5	Bipolar
5	Swan River Chert	23.0	Platform
6	Swan River Chert	19.8	Platform
7	Swan River Chert	15.8	Platform
8	Swan River Chert	15.1	Platform
9	Swan River Chert	4.6	Platform
10	Chert	6.4	Platform
11	Chert	6.3	Platform
12	Chert	3.2	Platform
13	Chert	2.7	Platform
14	Chert	2.7	Platform
15	Chert	0.9	Platform
16	Chalcedony	5.4	Bipolar
17	Fused Shale	12.6	Platform

A total of 26 cores and core fragments were recovered from Level 1b (Table 5.6): 15 of these are composed of Swan River chert, four of chert (two grey and two brown), four of quartzite, one of basalt, one of fused shale, and one of Gronlid siltstone. Four of the 26 are bipolar cores. Of the Swan River chert cores, one fragment is fully expended and 10 others are almost completely flaked. Of the remaining four, two have minimal exploratory (searching for optimum flaking areas) and preparatory flakes removed and one has multiple flakes removed from prepared platforms. The fourth is composed of Swan River chert embedded within a conglomerate. Several individual Swan River chert pockets within the conglomerate have been flaked. Only six of the Swan River chert cores have been heat-treated. Optimal flintknapping is apparent on all of the chert cores. They

have been reduced significantly from one of several striking platforms. On the basalt core, there is one striking platform and it displays multiple flake scars. Numerous flake scars are also exhibited on all of the remaining quartzite, fused shale, and Gronlid siltstone cores and core fragments.

Table 5.6: Level 1b Cores and Core Fragments

Specimen	Material	Mass (g)	Type
1	Swan River Chert	352.9	Platform
2	Swan River Chert	97.3	Platform
3	Swan River Chert	80.8	Platform
4	Swan River Chert	73.7	Platform
5	Swan River Chert	52.4	Platform
6	Swan River Chert	50.6	Platform
7	Swan River Chert	39.7	Platform
8	Swan River Chert	32.6	Platform
9	Swan River Chert	22.9	Platform
10	Swan River Chert	21.1	Platform
11	Swan River Chert	20.4	Platform
12	Swan River Chert	19.2	Platform
13	Swan River Chert	18.8	Platform
14	Swan River Chert	13.6	Platform
15	Swan River Chert	2.8	Platform
16	Chert	18.8	Platform
17	Chert	8.8	Bipolar
18	Chert	7.9	Platform
19	Chert	1.1	Platform
20	Quartzite	50.6	Platform
21	Quartzite	38.1	Platform
22	Quartzite	30.5	Platform
23	Quartzite	14.1	Bipolar
24	Fused Shale	8.0	Bipolar
25	Basalt	220.4	Platform
26	Gronlid Siltstone	1.9	Bipolar

5.2.3 Flaked Stone Tools

The productive field season in 2006 yielded a number of flaked tools that are included in this catalogue. Excavation of Level 1 has revealed a total of seven flaked stone tools: three unifacial tools and four projectile points. The individual occupations, Level 1a and Level 1b, produced larger numbers of flaked tools due to the higher frequency of separation in the site. Level 1a contains 23 flaked tools

including two unifaces, six bifaces, and 15 projectile points. Comparably, Level 1b contains 21 flaked tools: 10 unifacial tools, five bifacial tools, and six projectile points.

Unifacial Tools

The examination of Occupation Level 1 revealed three unifacially-flaked tools. These include one retouched flake, one end scraper, and one combination side and end scraper (Table 5.7; Fig. 5.2). The retouched flake is composed of grey chert and flakes are removed from the right lateral edge (Fig. 5.2, **b**). This edge is slightly concave and would have been used as a cutting blade. It is roughly triangular with a significant amount of white cortex present. The end scraper is made of fused shale. The tool is broken, however, so the shape and size cannot be determined. The working edge is steep and exhibits several step fractures related to usewear. The second scraper is formed from a black silicified siltstone pebble. Both the distal end and right lateral margin have been steeply flaked (Fig. 5.2, **a**). The tool is ovoid in shape and similarly displays numerous step termination fractures.

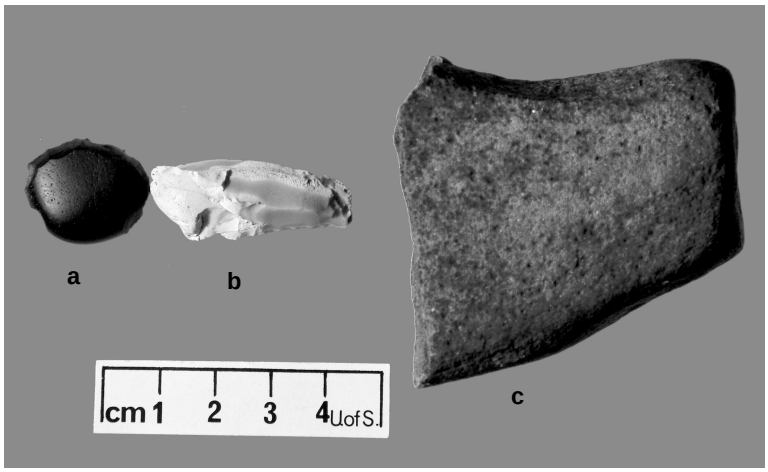

Figure 5.2: Unifacial and Miscellaneous Tools from Level 1

Occupation Level 1a contains two unifacially-worked tool: a spokeshave and an

Table 5.7: Level 1, Level 1a, and Level 1b Unifacial Tools (S.R. Chert refers to Swan River chert)

Specimen	Lev.	Material	Type of Uniface	Width of Working Edge (mm)	Max. Length (mm)	Max. Thickness (mm)	Working Edge Angle (°)	Mass (g)
1	1	Silicified Siltstone	right side and end scraper	side=13.60 end=22.10	20.00	6.45	side=80 end=70	3.7
2	1	Fused Shale	end scraper (broken)	15.35	n/a	5.25	70	0.8
3	1	Grey Chert	retouched flake	23.20	36.40	8.65	55	4.1
4	1a	Grey Chert	end scraper	12.75	26.65	8.40	60	3.5
5	1a	Fused Shale	spokeshave	8.05	24.15	5.55	50	1.4
6	1b	S.R. Chert (heat treated)	end scraper (broken)	13.05	n/a	5.80	80	1.8
7	1b	S.R. Chert (heat treated)	hafted end scraper	18.15	36.20	6.45	70	4.8
8	1b	S.R. Chert (heat treated)	end scraper	19.60	17.35	7.05	70	2.7
9	1b	S.R. Chert (heat treated)	right, left, and end scraper	right=n/a left=n/a end=17.05	n/a	6.75	right=60 left=75 end=75	2.1
10	1b	Black Chert (heat treated)	end scraper (broken)	21.20	n/a	7.40	70	3.6
11	1b	Black Chert	end scraper	20.45	21.70	7.55	80	3.2
12	1b	Grey Chert	end scraper	20.50	17.50	4.95	45	2.2
13	1b	Grey Chert	end scraper (broken)	n/a	n/a	6.55	75	2.0
14	1b	Brown Chalcedony	end scraper	21.45	19.90	10.20	60	3.8
15	1b	Jasper	left, right, and end scraper	left=7.90 right=9.90 end=14.40	13.40	6.95	left=65 right=55 end=75	1.4

end scraper (recovered in 2006) (Table 5.7, Fig. 5.3). The spokeshave or concave scraper is composed of fused shale. Retouch occurs on two discrete concave margins: one that has been smoothed and was either a failed tool or worn tool, the other that is still sharp and likely the most recent working edge (Fig. 5.3, **b**). The end scraper is made out of grey chert and is crescent-shaped (Fig. 5.3, **a**). A secondary flake was recovered from the same level which, when analyzed, was conjoinable with the scraper. It is likely that in the resharpening process, a large flake was expelled accidently, creating the crescent-shape.

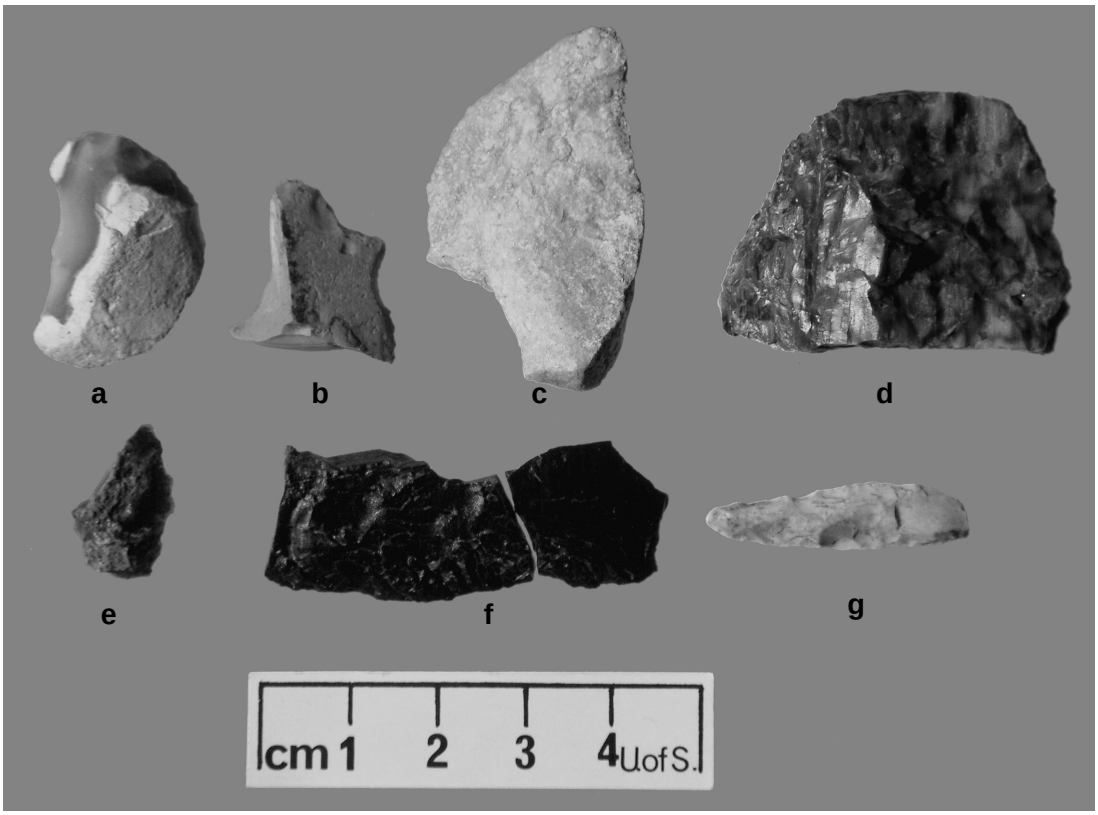

Figure 5.3: Unifacial and Bifacial Tools from Level 1a

The Occupation Level 1b assemblage contains 10 unifacial tools. All of them are scrapers (Table 5.7). Of the 10 scrapers, seven are exclusively end scrapers (only six pictured: Fig. 5.4, **a, b, d-f**, and **h**), with only one working edge, while the remaining three tools have been worked on three edges. The first is a jasper dual side and end scraper (Tool **c**, Fig. 5.4) and the second is composed of heat-treated Swan River chert and was recovered during the 2006 season (Fig. 5.4, **i**). The third is a hafted end scraper composed of heat-treated Swan River chert (Fig. 5.4, **g**). Although the tool has been broken transversely, both halves were recovered. It is triangular and exhibits unifacial retouch along its entire margin with minor bifacial retouch on the proximal edge. This edge is an apex, shaped in order to fit into a plug, possibly a rib end. The end scrapers are composed of heat-treated Swan River chert (two), chert (four), and brown chalcedony (one).

Only seven of the scrapers are complete.

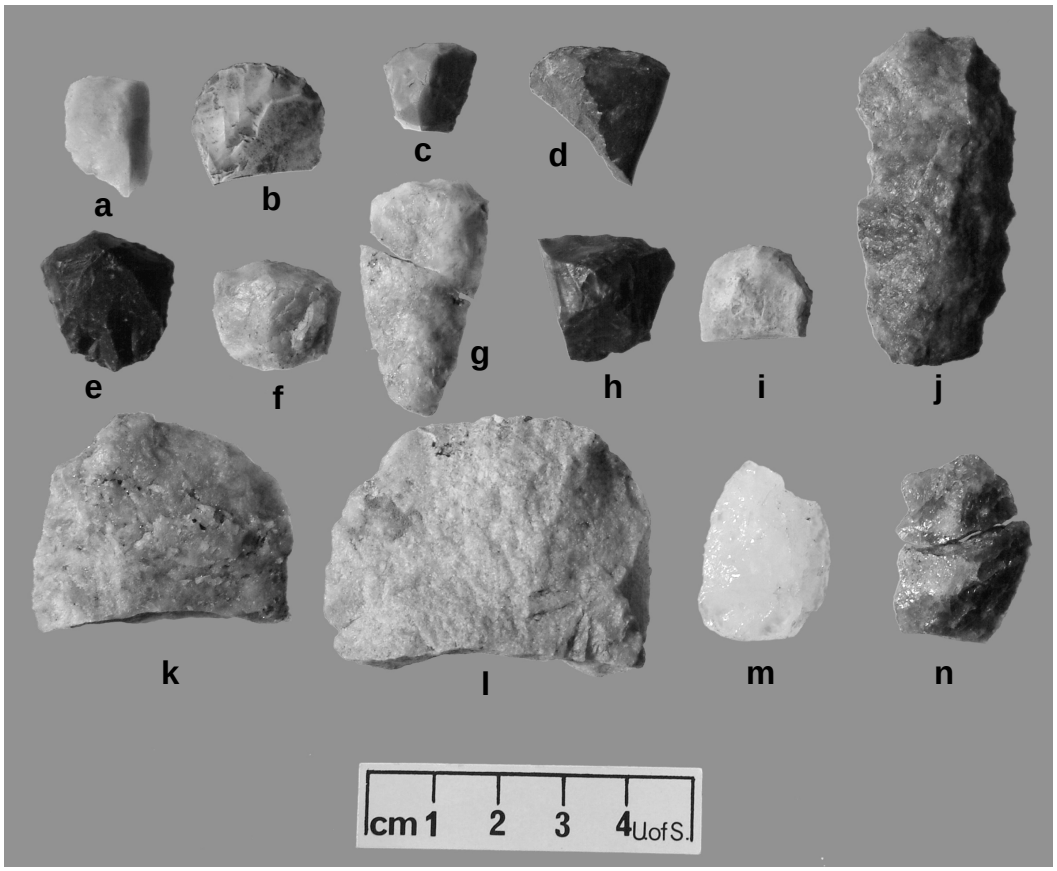

Figure 5.4: Unifacial and Bifacial Tools from Level 1b

Bifacial Tools

Bifacially-worked tools were also recovered from Level 1a and Level 1b. The analysis of these tools excludes projectile points. In Occupation Level 1a, six bifaces were identified (Table 5.8; Fig. 5.3). One biface, composed of chert, has been identified as a perforator (Fig. 5.3, **g**). This drill bit is complete and would likely have been plugged into a haft when in use. An asymmetrical backed knife composed of Swan River chert was also catalogued (Fig. 5.3, **c**). The working edge is concave, situated along a lateral margin. The remaining four tools are broken

and inconclusive as to function. A large tool composed of silicified wood may have been used as or intended as a chopping tool (Fig. 5.3, **d**). The remaining three (two composed of silicified peat and the third of white chert) are varied in shape but are all indicative of knives (only two pictured: Fig. 5.3, **e** and **f**).

Table 5.8: Level 1a and Level 1b Bifacial Tools (S.R. Chert refers to Swan River chert)

Specimen	Lev.	Material	Type of Biface	Max. Width (mm)	Max. Length (mm)	Max. Thickness (mm)	Mass (g)	Number of Flaked Edges
1	1a	S.R. Chert	knife	24.85	41.65	10.95	7.2	1
2	1a	Cream Chert	perforator	7.65	29.30	4.40	0.9	4
3	1a	White Chert	broken	n/a	n/a	3.10	0.9	1 known
4	1a	Silicified Wood	broken	39.65	n/a	13.70	17.6	3 known
5	1a	Silicified Peat	broken	n/a	n/a	5.65	5.8	1 known
6	1a	Silicified Peat	broken	n/a	n/a	4.70	0.8	2 known
7	1b	S.R. Chert (heat treated)	knife	23.90	51.75	10.55	14.8	3
8	1b	S.R. Chert (heat treated)	chopper	49.95	n/a	15.95	36.2	3 known
9	1b	S.R. Chert (heat treated)	broken	39.05	n/a	12.10	18.4	3 known
10	1b	Quartz	knife	19.80	n/a	8.95	5.1	3 known
11	1b	Quartz	broken	20.05	n/a	7.75	4.6	2 known

Level 1b contains five bifacial tools (Table 5.8, Fig. 5.4). A rectangular knife composed of heat-treated Swan River chert has been worked on three edges (Fig. 5.4, **j**). Two more heat-treated Swan River chert bifaces were identified. The more massive one has been classified as a broken chopper (Tool **l**, Fig. 5.4). Correspondingly, the third tool (Fig. 5.4, **k**) is catalogued as a probable chopper based on its resemblance to the possible chopper in Level 1a and the larger Level 1b chopping tool. Two quartz bifaces were recovered during the 2006 field season (Fig. 5.4, **m** and **n**). One is a symmetric knife and the second is a two-piece broken biface, consistent with a knife.

Projectile Points

Excavation of Occupation Level 1 uncovered a total of four projectile points. Only the tips remain on two of the points (neither pictured) while diagnostic

characteristics have survived on the others. Upon examination of Specimen **2** (Table 5.9), it can be described as exhibiting side-notches on a coarsely-flaked Swan River chert lithic. However, the notching is atypical of Plains and Prairie projectile styles. It is classified as a large, degenerate Late Side-Notched point (Fig. 5.5, **a**). The point is broken transversely along the upper half of the body. The fourth projectile point present in Level 1 is surprisingly classified as an Oxbow base due to the classic "ear" trait it exhibits which is created by broad side-notches as well as a deep basal notch (Fig. 5.5, **b**). It was found embedded within a root cast which aids in explaining its unanticipated presence.

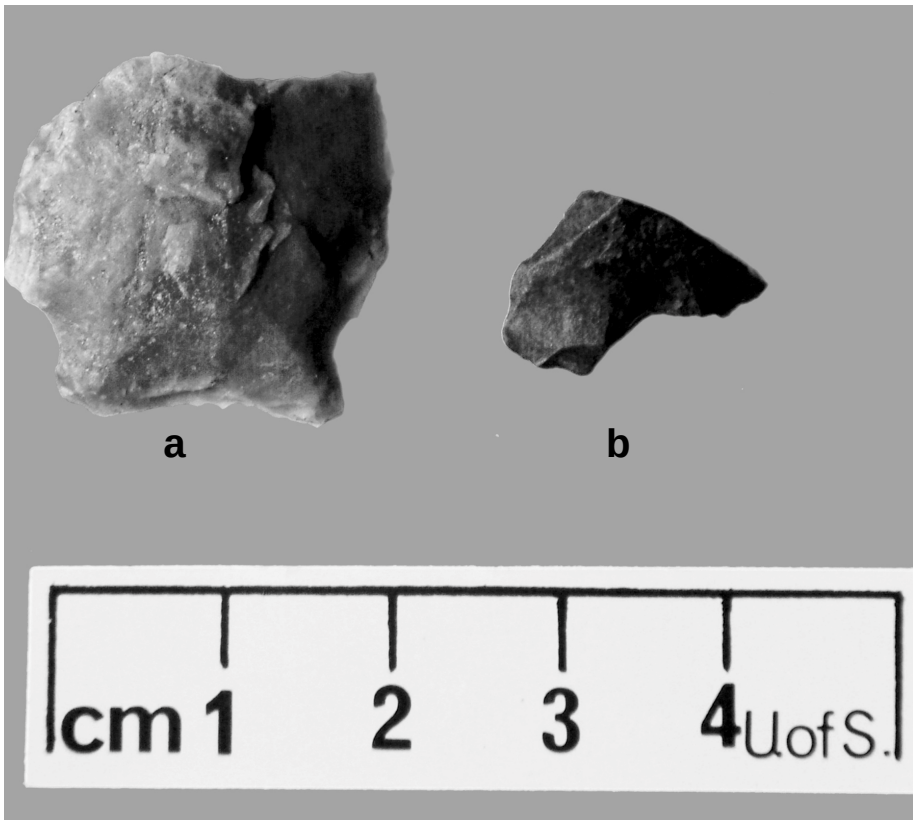

Figure 5.5: Projectile Points from Level 1

Table 5.9: Level 1, Level 1a, and Level 1b Projectile Point Dimensions (S.R. Chert refers to Swan River chert, S-N refers to side-notched)

Specimen	Lev.	Material	Projectile Form	Max. Length (mm)	Max. Body Width (mm)	Max. Stem Width (mm)	Inter-notch Width (mm)	Max. Thickness (mm)	Mass (g)
1	1	S.R. Chert (heat treated)	tip	n/a	n/a	n/a	n/a	3.65	0.6
2	1	S.R. Chert (heat treated)	Late S-N	n/a	22.65	17.10	16.35	9.15	3.1
3	1	Black Chert	tip	n/a	n/a	n/a	n/a	4.10	0.3
4	1	Black Chert	Oxbow	n/a	n/a	n/a	n/a	3.90	0.5
5	1a	S.R. Chert (heat treated)	tip	n/a	n/a	n/a	n/a	3.35	0.5
6	1a	S.R. Chert (heat treated)	Plains S-N	n/a	15.20	n/a	10.65	4.90	1.4
7	1a	S.R. Chert (heat treated)	Plains S-N	n/a	n/a	n/a	8.65	4.20	0.6
8	1a	S.R. Chert (heat treated)	Plains S-N	n/a	n/a	n/a	n/a	2.25	0.3
9	1a	S.R. Chert (heat treated)	Plains S-N	n/a	9.20	10.60	6.55	2.50	0.3
10	1a	S.R. Chert (heat treated)	Plains S-N	n/a	n/a	12.40	8.45	2.95	0.3
11	1a	S.R. Chert (heat treated)	Plains S-N	17.65	14.00	14.65	11.10	3.65	0.9
12	1a	S.R. Chert (heat treated)	Duncan	n/a	n/a	28.70	n/a	4.40	1.0
13	1a	Brown Chert	body	n/a	n/a	18.80	n/a	3.45	1.1
14	1a	Siltstone	Plains S-N	14.30	9.40	12.30	9.20	2.95	0.5
15	1a	Knife River Flint	preform	n/a	n/a	14.40	n/a	3.35	0.5
16	1a	Silicified Peat	Plains Triangular	14.95	11.10	n/a	n/a	3.40	0.5
17	1a	Silicified Peat	Plains S-N	16.70	12.25	13.95	10.45	3.55	0.8
18	1a	Silicified Peat	Prairie S-N	n/a	12.95	11.20	9.95	3.55	0.7
19	1a	Chalcedony	Plains S-N	n/a	13.95	n/a	9.75	3.15	0.5
20	1a	Agate	body	19.70	12.50	n/a	n/a	2.50	0.7
21	1b	S.R. Chert (heat treated)	tip	n/a	n/a	n/a	n/a	4.85	1.8
22	1b	S.R. Chert (heat treated)	Prairie S-N	21.10	12.70	13.85	9.30	4.95	1.2
23	1b	Black Chert	Plains S-N	19.15	11.20	n/a	9.55	2.50	0.5
24	1b	Black Chert	tip	n/a	1.75	n/a	n/a	2.10	0.3
25	1b	Brown Chert	Prairie S-N	20.30	15.40	11.15	7.70	4.20	1.0
26	1b	Silicified Peat	Besant	29.40	22.35	20.20	17.90	6.85	4.2

In Level 1a, 16 projectile points have been identified: nine are classified as Plains Side-Notched, one as a Plains Triangular, one as a Prairie Side-Notched, one as a Duncan, three as indeterminate points, and one as a preform (Table 5.9). Of the Plains Side-Notched projectiles, three are complete (Fig. 5.6, **a**, **b**, and **d**), one is missing only its tip (Fig. 5.6, **c**), and the remaining five are broken transversely along the body or at an oblique angle to the point, removing a portion of the body, the base or both (four pictured: Fig. 5.6, **e, f, h,** and **i**). One of these (Specimen **8,** Table 5.9; Fig. 5.6, **h**) has been produced on a flake and contains very few flake scars on its ventral surface. The remaining Plains Side-Notched projectiles have been flaked bifacially. Five are heat-treated Swan River chert, one is silicified peat, one is brown siltstone and one is chalcedony. The Plains Triangular projectile (Fig. 5.6, **j**) is composed of silicified peat. It is complete except for a small lateral break near the tip. The Prairie Side-Notched point (Specimen **18**, Table 5.9; not pictured) was excavated during the 2006 field season. It is composed of silicified peat and is almost complete, excluding the tip. Specimen **12** in Table 5.9 (Fig. 5.6, **k**) is classified as a heat-treated Swan River chert Duncan base due to its extant characteristics. As it is found within a unit located in the western section of Block 1, its presence can be explained resulting from the collapse of stratigraphy caused by erosion and bioturbation. A Knife River flint preform is present with a partial notch flaked on one lateral margin (Fig. 5.6, **g**). The tool is incomplete, having broken obliquely during manufacture. The preform is undiagnostic. The three remaining points in Level 1a (not pictured) lack diagnostic traits necessary to affiliate them. A heat-treated Swan River chert point is represented by only its tip; one is a brown chert point lacking both the base and the tip; one is an agate body which may be a point preform due to the fact that no notching is present on a substantial length of bifacially-flaked material.

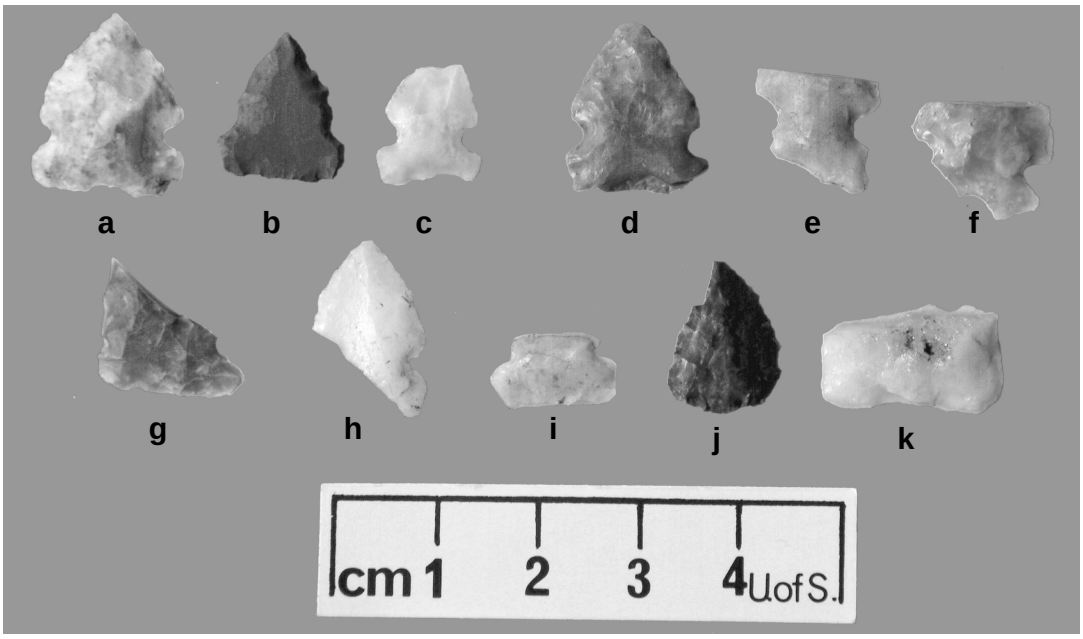

Figure 5.6: Projectile Points from Level 1a

There are six projectile points associated with Level 1b. Two are unidentifiable point tips (not pictured), composed one each of heat-treated Swan River chert and black chert. The latter tip along with one Plains Side-Notched point made of black chert and one complete Prairie Side-Notched point composed of Swan River chert were all excavated from the hearth feature located in unit #19S12E (Fig. 5.7, **a** and **b**). All three exhibit evidence of heat-alteration due to the effects of an active hearth. A highly retouched point was excavated from the 2006 field season (Fig. 5.7, **c**). It is a complete, grey chert point that has been highly retouched and the flaking pattern is a composite of side and corner notches and it may, in fact, be a Pelican Lake projectile point. Also complete is a large side-notched point consistent with a wide Besant projectile point (Fig. 5.7, **d**). Although the presence of these two latter points was not expected, the appearances support the hypothesis that geoarchaeological processes have removed sediment and soil layers which existed prior to Level 1b but succeeded Level 2a. These points may represent a remnant Pelican Lake occupation and Besant occupation.

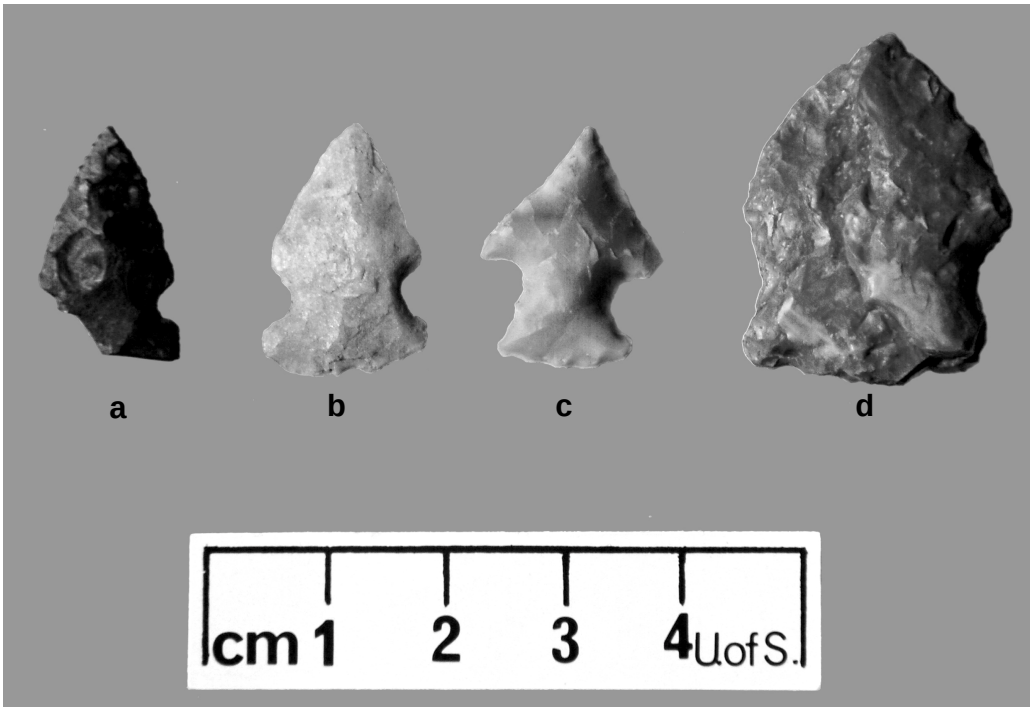

Figure 5.7: Projectile Points from Level 1b

5.2.4 Miscellaneous Stone Tools

Miscellaneous stone tools are categorized as such based on the fact that they have not been flaked, pecked, nor ground during their manufacture. In Level 1, one miscellaneous tool, an abrader, was identified (Table 5.10; Fig. 5.2, **c**). The abrader is composed of sandstone and exhibits marginal grinding due to usewear. The edge is highly ground while a second displays a minor amount of grinding. There are four sharply angular margins present on the tool and it is likely that all would have been used in tool preparation although only two demonstrate any use.

In Level 1b, three miscellaneous tools have also been identified (Table 5.10). One is a quartzite anvil and hammerstone that is broken perpendicular to the inferior and superior sides (Fig. 5.8, **a**) This dual-purpose tool exhibits several areas of pecking. Both the superior and inferior sides of the cobble (with respect to the position it was recovered in) have discrete areas of pecking for use as an

anvil. There are two of these regions on the superior side and at least one on the inferior side. The full extent of the use on this side is not known because the surface is partially sheathed in a calcium carbonate layer. Along the margins of the cobble are several areas of pecking as a result of its use as a hammerstone. A particularly large pecked area covers the tapered margin while several smaller concentrations exist around the remaining edges that are present. Excavations in 2006 uncovered a grinding stone composed of granite (Fig. 5.9, **a**). One surface of the boulder has been ground as a result of use and is concave. A lateral edge has been fractured, perhaps explaining why it was abandoned. The ground surface was prone when excavated. The third tool identified in Level 1b was located immediately adjacent to the hearth feature in unit #19S12E. It is also a grinding stone that exhibits evidence of heating and polish. Both the inferior and superior surfaces of the basalt tool are flat and smoothed.

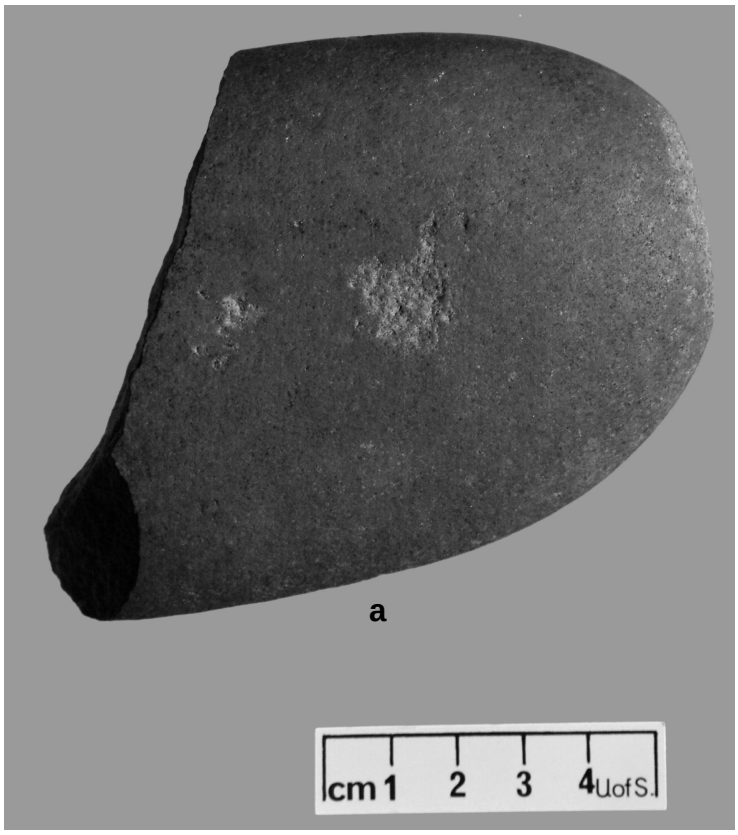

Figure 5.8: Anvil/Hammerstone from Level 1b

Figure 5.9: Grinding Stone from Level 1b

Table 5.10: Level 1 and Level 1b Miscellaneous Tools

Specimen	Level	Material	Type of Tool	Mass (g)
1	1	Sandstone (heated)	abrader	181.2
2	1b	Quartzite	anvil/ hammerstone	421.0
3	1b	Granite	grinding stone	>3100.0
4	1b	Basalt	grinding stone	>>3100.0

5.2.5 Fire-Cracked and Fire-Broken Rock

Within Level 1, 28 pieces of fire-altered rock were encountered (Table 5.11) equalling 1097.0 g of material. The most common material by mass is basalt, representing 50.3% of the sample. Additionally, in Level 1a, 130 pieces of fire-altered rock were identified, totalling 3047.8 g. Granite is the most common material in this level, accounting for 79.8% of the assemblage by mass. This total was amplified in Level 1b where 22065.2 g (148 pieces) were recorded. Again, granite represents the most massive sample constituting 76.1% of the total mass.

Investigation of artifact distribution has revealed two separate clusters of fire-cracked and fire-broken rock in Level 1a and two in Level 1b. In Level 1a, one cluster is located in unit #14S11E and the other is located among units #17S9E and #16S8E. In Level 1b, a small cluster exists in unit #15S12E and a very massive grouping was excavated from unit #19S12E. As has already been noted about this unit, a large hearth was recovered from this level. Within was a significant amount of artifacts including fire-altered rock.

Table 5.11: Level 1, Level 1a, and Level 1b Fire-Cracked Rock Counts

Level	Material	Count	Mass (g)	Percent by Mass (%)
1	Basalt	8	552.1	50.3
1	Granite	13	296.0	27.0
1	Sandstone	7	248.9	22.7
Level 1 Total		**28**	**1097.0**	**100%**
1a	Granite	104	2433.5	79.8
1a	Sandstone	9	289.8	9.5
1a	Basalt	11	258.0	8.5
1a	Argillite	1	28.0	0.9
1a	Quartzite	4	21.8	0.7
1a	Siltstone	1	16.7	0.6
Level 1a Total		**130**	**3047.8**	**100%**
1b	Granite	110	16788.0	76.1
1b	Sandstone	12	1855.2	8.4
1b	Limestone	3	1704.7	7.7
1b	Basalt	13	1210.1	5.5
1b	Quartz	6	314.3	1.4
1b	Gneiss	1	96.9	0.4
1b	Schist	1	46.0	0.2
1b	Quartzite	1	28.1	0.1
1b	Gronlid Siltstone	1	21.9	0.1
Level 1b Total		**148**	**22065.2**	**100%**

5.3 Pottery Assemblage

The excavation of the inclusive Occupation Level 1 uncovered a total of 49 sherds of pottery. All of the fragments are body sherds containing little evidence of decoration or shape. An inspection of the sherds revealed that they are tempered with fine to medium grit and are composed of a fine paste. The inspection also revealed that all of the exterior surfaces were plain or exfoliated

(Table 5.12). Plain surfaces are described by Malainey as having "no visible pattern, includ[ing] finishes that have been completely obliterated by smoothing" (Malainey 1991:56). The interior of the sherds were plain or exfoliated, or were coated with residue. This residue has not yet been analyzed. A concentration of sherds was located in units #20S11E and #19S9E (Fig. 5.11). It is unclear, however, whether these concentrations are associated with Level 1a, Level 1b, or a combination of both. The sherds obtained from each discrete level are similar, thereby reducing the opportunity for the division of the levels.

Table 5.12: Body and Shoulder Sherd Finish Style Frequencies

Lev	Type	Count	Surface	Exfol-iated (%)	Plain (%)	Check-Stamped (%)	Fabric-Impressed (%)	Indet. (%)	Residue (%)	Finger-Nail Gouge (%)
1	body	49	interior	27.6	7.0	0.0	0.0	0.0	65.4	0.0
			exterior	3.4	96.6	0.0	0.0	0.0	0.0	0.0
1a	body and shoulder	243	interior	42.9	26.4	0.0	0.0	1.0	29.7	0.0
			exterior	25.5	55.8	14.2	0.4	4.1	0.0	0.0
1b	body and shoulder	44	interior	58.5	12.2	0.0	0.0	0.0	29.3	0.0
			exterior	11.9	59.5	26.2	0.0	0.0	0.0	2.4

The investigation of Level 1a pottery remains is more encouraging in regards to the goals of this thesis. Stylistic characteristics present on several sherds are more indicative of age and affiliation. A total of 249 sherds were catalogued. Of this total, 242 are body sherds, five are lip and rim sherds, one is a lip sherd, and one is a shoulder sherd (Tables 5.12 and 5.13). Temper is predominantly fine grit with a few sherds containing medium-sized grit. The paste is exclusively fine. The majority of exterior surfaces are plain. A significant number (14.2%), however, exhibit a check-stamped pattern and it is probable that some of the exfoliated surfaces and smoothed surfaces were at one time stamped with this same design. A small percentage of sherds were deemed indeterminate, such that the surfaces were too minute to classify. The interior surfaces are primarily exfoliated (42.9%) although 29.7% contain carbon residue.

Table 5.13: Level 1a Lip and Rim Sherd Decoration

Specimen	Level	Lip Shape	Lip Decoration	Rim Decoration
1	1a	expanding flange	right oblique dentate	parallel dentate
2	1a	indeterm.	right oblique dentate	exfoliated
3	1a	exterior flange	fabric-impressed	cord-wrapped tool
4	1a	exterior flange	fabric-impressed	cord-wrapped tool
5	1a	square	plain	cord-wrapped tool
6	1a	square	plain	cord-wrapped tool

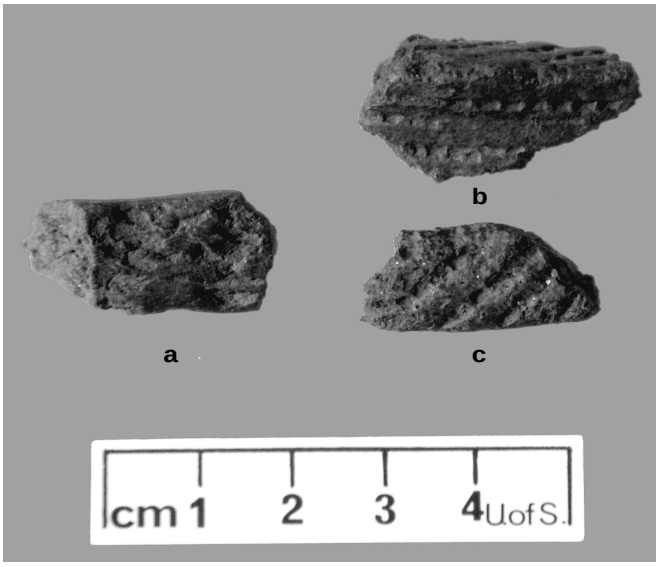

Figure 5.10: Decorated Rim and Lip Sherds from Level 1a

As indicated in Figure 5.13, six lip sherds with five rims maintained were recovered from the excavation of Level 1a. Lip styles varied evenly between right oblique dentates, fabric-impression, and plain decoration. One of the dentate lip sherds also contained parallel rows of dentates on the rim (Sherds **b** and **c**, Fig. 5.10). There were two complete rows and a third row between these two that only

extended partially across the sherd. Both the fabric-impressed and plain lip sherds were decorated with a cord-wrapped tool on the rim surface (Sherd **a**, Fig. 5.10). It is possible that the plain surface at one time was also fabric-impressed.

These vessels are highly fragmented and thus the reconstruction is extremely minimal. Only one rim and neck sherd and one body sherd were conjoinable. The number of vessels present is indeterminate. However, upon inspection of the sherd distribution detailed in Figure 5.12 as well as the stylistic differences in lip ornamentation, it can be inferred that there is a minimum of three vessels. All of the rim sherds were found within units #18S12E, #19S12E, and #21S11E. The concentration of sherds in units #18S6E and #18S8E suggests a possible fourth vessel. The recovery of one shoulder sherd suggests that the body shape of at least one of the vessels was globular.

The pottery assemblage recovered out of excavation of Level 1b is a total of 44 sherds. Body sherds account for 41 pieces while the remaining three are shoulder sherds. Both the temper and paste are fine. Examination of Table 5.12 details that the exterior finishes are primarily plain (59.5%) with 26.2% of the sample displaying check-stamped surfaces. One of the sherds had been impressed with a fingernail gouge wherein "the fingernail is pulled through the paste...creating a wide crescent-shaped decoration" (Malainey 1991:48). On the interior surfaces, 58.5% are exfoliated and 29.3% contain residue. The remaining surfaces are plain.

Reconstruction of the vessels proved once again to be minimal. Two shoulder sherds and two body sherds are conjoinable. In reference to the Level 1b distribution map, (Fig. 5.13), one concentration of sherds occurs within and in the vicinity of the hearth feature in unit #19S12E. A possible second, smaller concentration exists in unit #17S7E. Again, the three shoulder sherds suggests a minimum of one globular-shaped vessel.

5.3.1 Cultural Affiliation of Pottery

Thorough examination of the stylistic qualities of the sherds recovered from both Level 1a and Level 1b has provided information regarding cultural affiliation.

This thesis concludes that both occupations are affiliated with the Mortlach complex. Perhaps more specifically, in accordance with Walde (2003), the vessels can be associated with the Lozinsky sub-phase of the Mortlach complex. This sub-phase is considered to be a northern variant, associated with Plains Side-Notched projectile points and radiocarbon aged between 0.65 ka BP and the contact period (Harty 2005:48). The radiocarbon age obtained for occupation Level 1b is well within this parameter.

This affiliation is based on evidence regarding construction and decoration specifics. Examination of laminae in all of the pastes of the sherds indicated that the vessels were constructed in layers by means of a paddle. None exhibited any evidence suggesting that the vessels had been coiled. This layering technique is the most common type of vessel formation on the Northern Plains (Walker 1999:26). Wettlaufer's 1955 analysis of "Mortlach Check-Stamped" pottery describes it as having dentates on the rim with oblique dentates around the upper margin of the rim (Wettlaufer 1955). The shoulder may exhibit a pinch or fingernail design and the exterior surfaces are check-stamped (Novecosky 2003:33). As the body sherd exhibiting a fingernail gouge in Level 1b was recovered within a cluster of shoulder sherds, it is highly likely that this design was located immediately adjacent to the shoulder. Further analysis by later research including Walde and Malainey support the use of cord-wrapped tools and fabric-impressing in addition to the check-stamping and dentate style of Mortlach design (Walde 2003; Malainey 1998).

5.4 Vertebrate Faunal Assemblage

The Level 1 faunal assemblage is comprised of 992 fragments, specimens, and elements with a combined mass of 409.5 g (Table 5.14). Interpretation has determined that 79.5% of the collection by mass is unidentifiable fragments. Similarly, 89.0% of these unidentifiable fragments by mass are unburned bone. The entire identifiable sample is unburned. Evidence of root etching is the most common taphonomic indicator. A dark brown stain caused by contact with the

dark Chernozemic soils is also present on many of the surfaces of the faunal material. As well, almost all of the bones display evidence of butchering; larger specimens commonly contain spiral fractures or blunt impact scars. The smaller fragments are normally indicative of maximum processing for extraction of the nutritional portions of the bone. This includes both marrow and grease extraction. All of the faunal assemblage has been affected by weathering. The most common degree of weathering in Level 1 is equally Stage 3 and Stage 4 in accordance with Todd's 1987 survey on the stages of weathering.

Table 5.14: Level 1, Level 1a, and Level 1b Faunal Counts

Faunal Type	Level 1				Level 1a				Level 1b			
	Id.	Mass (g)	Unid.	Mass (g)	Id.	Mass (g)	Unid.	Mass (g)	Id.	Mass (g)	Unid.	Mass (g)
Unburned Bone	48	83.8	812	289.8	33	137.5	2567	925.6	311	1123.9	4606	2368.9
Burned Bone	0	0.0	78	24.5	0	0.0	163	38.0	0	0.0	763	304.3
Calcined Bone	0	0.0	43	8.8	0	0.0	112	21.1	0	0.0	2519	444.5
Unburned Enamel	0	0.0	11	2.6	7	27.7	83	23.3	144	399.4	129	59.3
Burned Enamel	0	0.0	0	0.0	0	0.0	6	0.3	0	0.0	6	0.7
Total	48	83.8	944	325.7	40	165.2	2931	1008.3	455	1523.3	8023	3177.7

In Level 1a, the faunal assemblage is composed of 2971 specimens. The total mass of this collection is 1173.5 g (Table 5.14). Unidentifiable materials represent the majority of the assemblage, incorporating 85.9% of the mass of the collection. Unburned bone represents 91.8% of the unidentifiable sample by mass. No burned or calcined materials are identifiable. Butchering patterns, root etching, and soil staining are the most common taphonomic process expressed on the faunal materials. Erosional evidence as a result of fluvial transport is present on a small number of the remains and three surfaces have been completely exfoliated. The degree of weathering on this bone is primarily Stage 3 and Stage 4.

A total of 8478 faunal materials were recovered from the excavation of Level 1b. The mass is 4701.0 g (Table 5.14). A total of 455 samples (32.4% by mass) are identifiable, restricted to unburned bone and unburned enamel. The majority of the unidentifiable sample is unburned bone, constituting 74.5% of the unidentifiable mass total. Calcined bone is the second most common category,

represented by 2519 fragments or 14.0% of the unidentifiable sample by mass. Soil staining, root etching, and butchering continue to be the most common taphonomic events evident on the faunal materials of Level 1b. A small amount of the sample has been eroded and exfoliated. Stage 3 is the predominant degree of weathering although Stage 4 is also common.

5.4.1 Identified Species

Level 1

A minimum of one bison (*Bison bison*) has been identified through the analysis of the faunal materials recovered from Level 1 (Table 5.15). No other taxa are present in the excavated assemblage. Due to the nature of the occupation levels, however, it cannot be confirmed whether the specimens are associated with Level 1a, Level 1b, or a combination of both. The MNI of one bison was determined based on the identification of five faunal specimens. For a complete survey of bison counts by landmark refer to Appendix B, Table B.1. Bison are gregarious artiodactyls native to the Great Plains. They were present in large quantities until the time of their near complete demise in the late 1800s. Bison environments ranged from open grasslands to river valleys, parkland, and boreal forest habitats (Banfield 1974).

Table 5.15: Minimum Number of Individuals (MNI) represented in Level 1, Level 1a, and Level 1b (* includes immature animals)

Level	Vertebrate	Taxon	NISP	MNI (side)
	Mammals			
1	Bison	*Bison bison*	5	1
1a	Bison	*Bison bison*	29	2*
1a	Large Mammal (SC5a)	*Canis sp.* (probable *C. lupus*)	2	1
1b	Bison	*Bison bison*	426	4*
1b	Snowshoe Hare	*Lepus americanus*	3	1
1b	Ground Squirrel	*Spermophilus sp.*	1	1
1b	Small-Medium Mammal (SC3a)	Rodentia (large-sized rodent)	1	1
	Miscellaneous			
1a	Very Large Mammal (SC6a)	Mammalia	2	n/a
1b	Very Large Mammal (SC6a)	Mammalia	16	n/a

Level 1a

At least three individuals were identified in the faunal remains recovered from Level 1a, representing two different genera (Table 5.15). The analysis of this level produced an NISP of 29 bison specimens. This resulted in a minimum of two individuals, including immature specimens. A summary of landmarks is included in Appendix B, Table B.2. Miscellaneous specimens from both Level 1a and Level 1b cannot be categorized beyond size category, although the morphology of the bones is not inconsistent with bison. A minimum of one large mammal (SC5a) from the taxon *Canis sp.* has been recognized from the analysis of Level 1a as well. The identification of a distal, left second metacarpal is the basis of this assessment. The size of the metacarpal is consistent with a large-sized dog (*Canis familiaris*) or a wolf (*Canis lupus*). Wolves are found throughout a number of habitats, including Plains (Banfield 1974:292). They, as well as domestic dogs may have been work dogs or food sources or else an intruding predator. As well, in domestic form, they may even have been companions.

Level 1b

In Level 1b, a minimum of seven individuals has been identified, representing at least three different taxa (Table 5.15). This total includes four bison, including one juvenile animal. This conclusion is based on the examination of 426 identifiable specimens. Landmark analyses of these specimens are presented in Tables B.3 and B.4, Appendix B. At least one snowshoe hare (*Lepus americanus*) was identified in Level 1b as well. This was as a result of the presence of three specimens: a left mandible with M_2 and M_3 embedded within the alveolar margin and two pieces of a left innominate, including acetabulum, ischium shaft, and ilium shaft. Snowshoe hares are and were native to the Wanuskewin area preferring the aspen groves and riverside thickets (Banfield 1974:83). Due to the presence of one mature, right distal tibia, a minimum of one ground squirrel (*Spermophilus sp.*) is also present in Level 1b. Bioturbation can have a significant effect on the archaeological record,

including redeposition of cultural and non-cultural remains. It is possible that this individual is archaeologically relevant, however. Examination of the state of the bone suggests that the bone is non-intrusive because the taphonomic processes present on the bone match those of the associated faunal elements. The excavation of one rootless incisor is evidence of one large-sized rodent (SC3a). The size of the incisor is consistent with that of a beaver (*Castor canadensis*) or porcupine (*Erethizon dorsatum*), both native to Wanuskewin Heritage Park.

5.5 Floral Assemblage

A significant sample of seeds was recovered from the excavation of Level 1b. All were found in the hearth located in unit #19S12E and had been charred as a result. The taxonomy of each seed was determined by the Canadian Food Inspection Agency resulting in the recognition of five genera. Four of the five genera are native to Wanuskewin Heritage Park and are recorded as having important nutritional and medicinal properties. Although seasonality of individual flora can be determined, its applicability in an archaeological setting is often irrelevant as berries and herbs would have been dried and kept over long periods of time. Nevertheless, insight into subsistence and health care can be obtained.

5.5.1 Identified Species

Of the five identified seed genera, four belong to the family Rosaceae and the fifth belongs to the family Brassicaceae. The most common seed identified (34 specimens) is long-spined hawthorn (family Rosaceae: *Crataegus succulenta*). Found within wooded ravines along tributaries it has uses as both medicinal and culinary uses (Kerik 1984). The berries may have been used as a jam or jelly as well as dried, ground, and mixed into pemmican. Ethnographic studies have recorded that among some native groups, hawthorn may cause a stomach ache unless a promise was made to deliver an offering to the plant in return (Kerik 1984:13). Hawthorn is recorded as a mild sedative or diuretic. The texture of the

berries is grainy and would not normally have been considered a luxury, but rather a survival food.

Also recovered from the hearth were 11 seeds of the *Rosa* genus (family Rosaceae), most consistent in form with wild or Wood's rose. It is considered to be one of the most important herbal wound remedies for the Northern Plains people. The roots and leaves could have been steeped for treatment of diarrhea, influenza, dysentery, and even worms. The fruits could have been eaten fresh or dried or ground into pemmican (Kerik 1984:21-22). Rose hips could be used to ease open sores while poultices could be mixed to soothe burns and insect bites and ease the pain of childbirth.

A single charred chokecherry pit (family Rosaceae: *Prunus virginiana*) was also identified in the analysis of the hearth contents. Also recognized as both a nutritional and medicinal source, the fruit would have been used in pemmican, stews, and soups, or brewed to ease sore eyes (Kerik 1984:7). The roots, bark, and small twigs were also used as coagulates, to reduce fever, and to treat diarrhea, dysentery, and canker sores according to ethnographic sources.

Finally, one sample each of wild candytuft (family Brassicaceae: *Iberis amara*) and antelope bitterbrush (family Rosaceae: *Purshia tridentata*) have been recorded. Their ethnographic uses are less often recorded although both are edible fruit-bearing plants. Wild candytuft is a bitter plant that can also be used to aid in digestion and treat asthma and bronchial infections as well as create a red dye (Kerik 1984:3). Bitterbrush is also used to treat bronchial infections as well as fever, rashes, and irritating skin ailments including insect bites, chicken pox, and measles. Bitterbrush, however, is an extralimital resource. It has not been recorded in Wanuskewin, or, for that matter, on the Northern Plains. As only one seed was recovered, its presence at this time cannot be explained.

5.6 Seasonality

The sources for determining seasonality of Level 1a and Level 1b at the Dog Child site are limited. The amount of foetal and immature bone is minimal and no avian bones have been recovered. As was previously mentioned, although the identified fruits ripen in the late summer, they may be prepared and stored in order to last throughout the year. It is likely that these were warm weather occupations, but at this time, their seasonalities cannot be determined.

5.7 Artifact Distribution and Features

Concentrations of debitage and pottery sherds can clearly be identified within each level. These concentrations suggest that individuals utilized specific areas for either flintknapping and cooking or disposal of the stone tool debitage and broken vessels. In Level 1 (Fig. 5.11) there is a clear concentration of debitage in the southeast section of Block 1. A smaller accumulation of debitage exists in the northeast region. Two small accumulations of sherds are present in units #19S9E and 20S11E. Two pottery concentrations also appear to exist in Level 1a. Units #20S12E and 18S8E (and surrounding units) both contain significant amounts of sherds. Also in Level 1a (Fig. 5.12), the eastern boundary of Block 1 is heavily littered with lithic debitage. This is in contrast to the western boundary in which few pieces of shatter and flakes were recovered. Similarly, Level 1b (Fig. 5.13) contains significant debitage density in its eastern margin, particularly in unit #19S12E. Pottery sherd density increased in units #19S12E (associated with the hearth) and 17S7E (small accumulation).

Extrapolation of the faunal remains associated with Level 1 suggests that there are two separate concentrations (Fig. 5.15). Densities in unit #20S10E and the northeast section are composed of large quantities of unburned bone. These concentrations can be more accurately evaluated through the interpretation of Level 1a and Level 1b faunal materials. In Level 1a (Fig. 5.16) there is a large

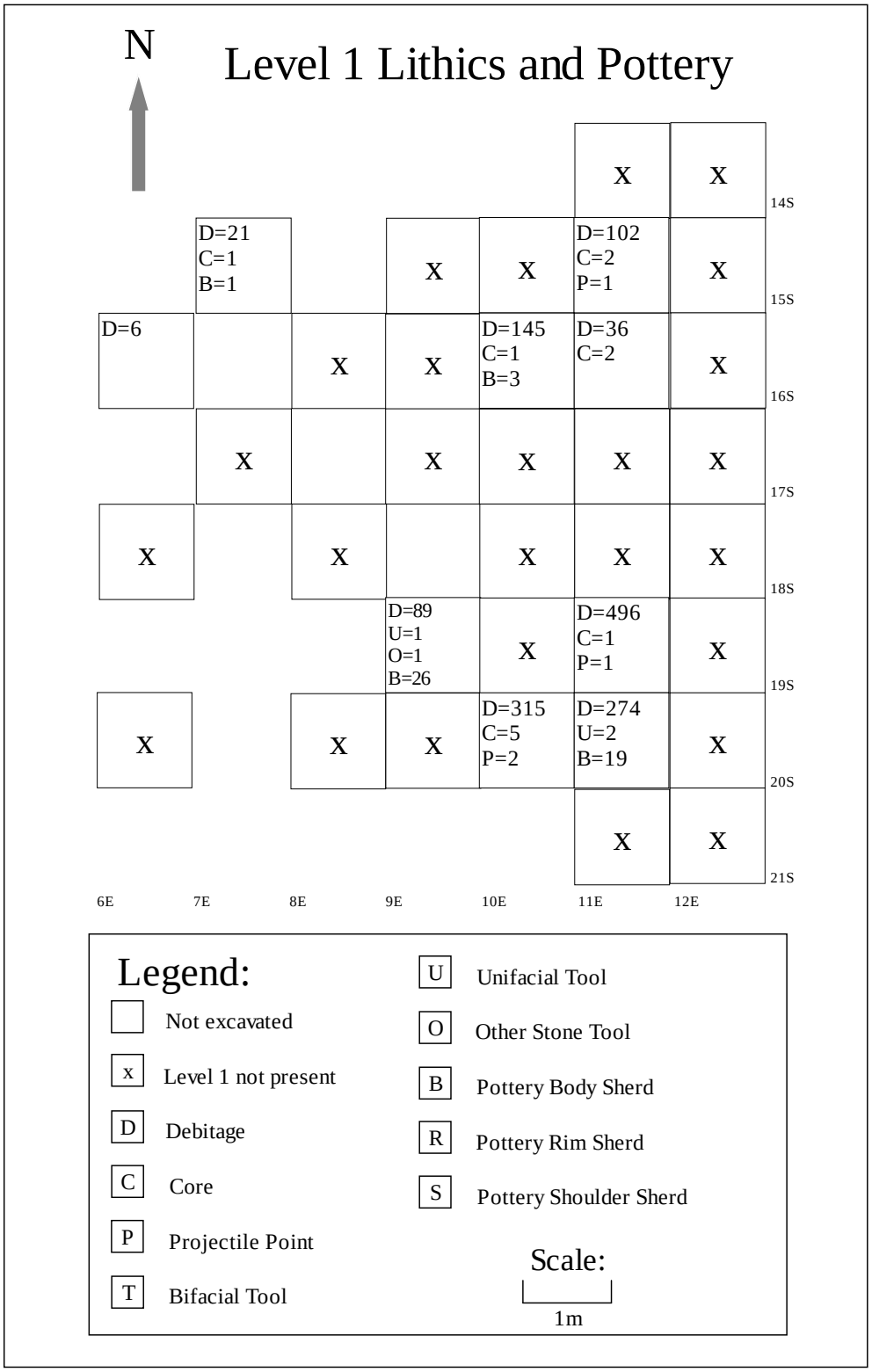

Figure 5.11: Lithic and Pottery Distributions in Level 1

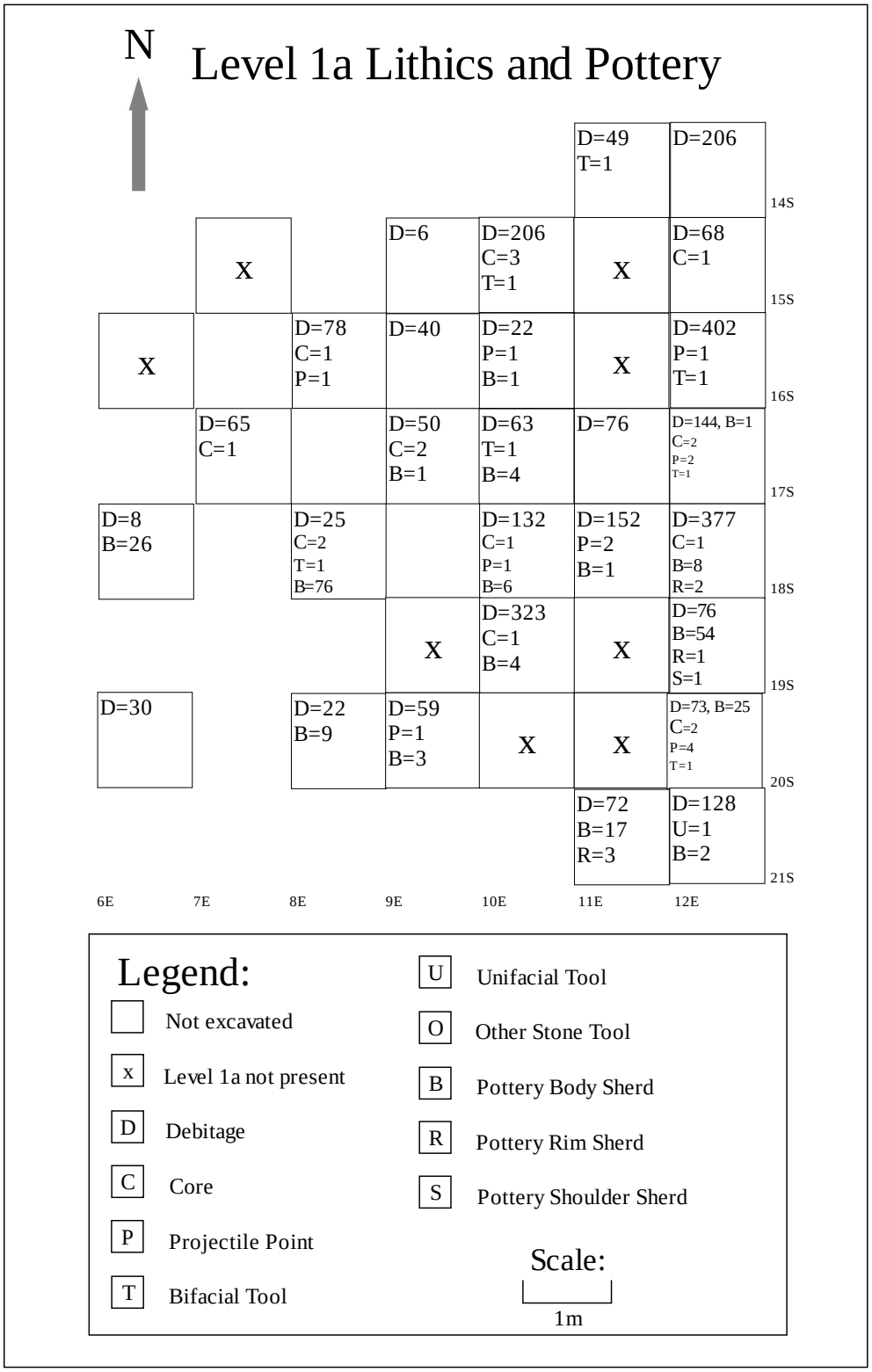

Figure 5.12: Lithic and Pottery Distributions in Level 1a

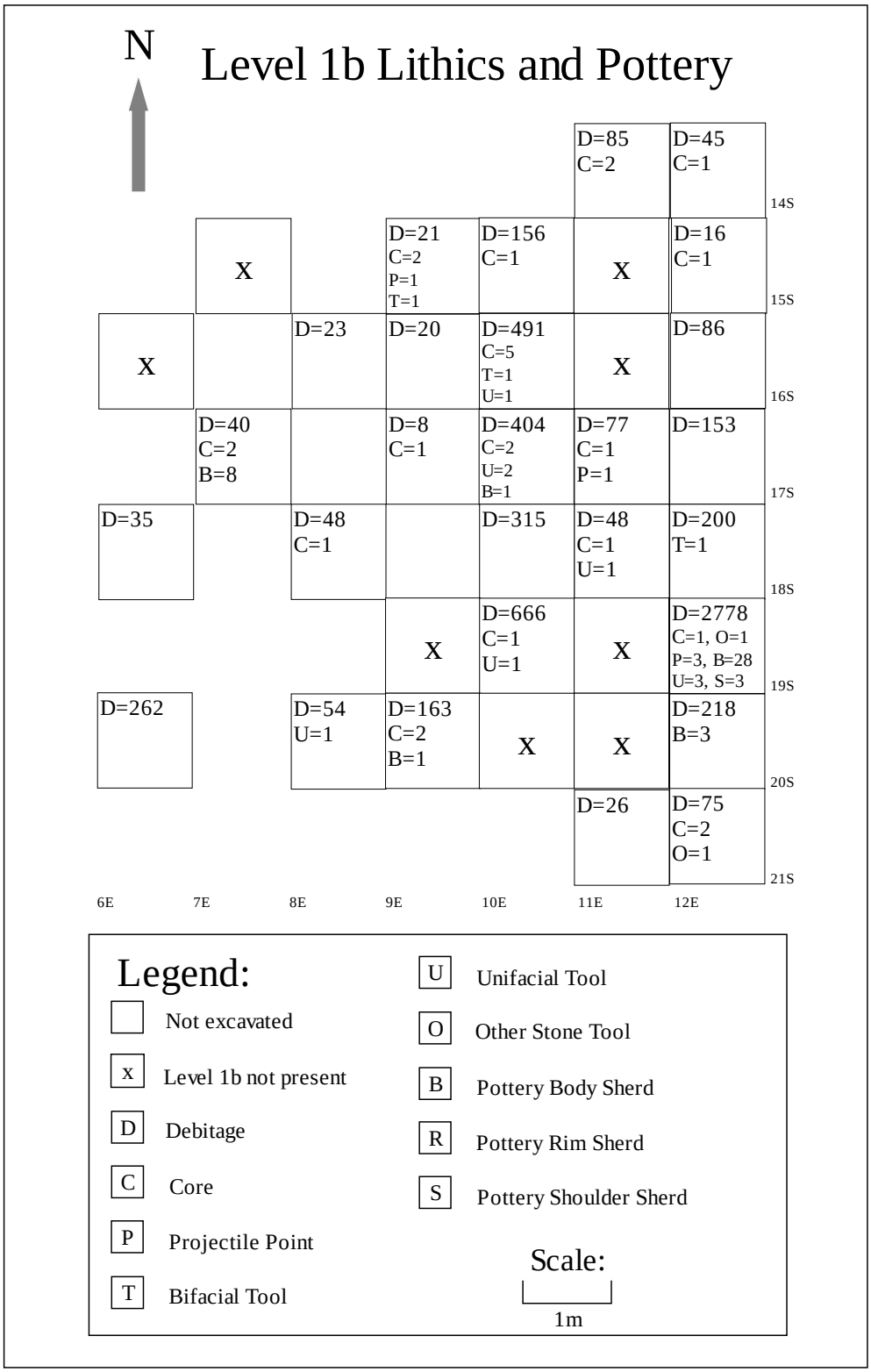

Figure 5.13: Lithic and Pottery Distributions in Level 1b

frequency of faunal remains in the northeast section of Block 1, accounting for some of the concentration witnessed in Level 1. A density of faunal artifacts also exists in the northeast section of Level 1b, however (Fig. 5.17). In fact, the majority of the Level 1b units are heavily littered with fragments. This deposition is in large part due to the presence of the hearth in unit #19S12E.

This hearth is not the only feature observed throughout the excavation of Level 1b. Evidence of bioturbation or rodent burrowing was seen throughout the entire excavation of the site (Fig. 5.15). A burrow entrance was located in Level 1 within the boundaries of the excavation, contributing to a portion of the network. In Level 1a, the presence of a charcoal cluster was mapped in unit #16S9E. Large cobbles and boulders were found adjacent to this cluster in a semi-circle to the north, east, and south. There is no evidence of fire alteration of or any cultural purpose for these boulders however and it is more probable that they were deposited by geological processes.

With respect to Level 1b, the remains of at least five features can be seen. The dominating feature was the hearth located in unit #19S12E which has been mentioned previously (Fig. 5.14). Situated in the centre of this unit and ranging from a depth of 10 cm to 39 cm, this hearth contained pot sherds, fire-altered rock, highly fragmented burned and calcined bone, a large lithic sample which included not only flakes and shatter but two identifiable projectile points and two end scrapers, identifiable charred seeds, and a more than sufficient charcoal sample to radiocarbon date the level. This hearth was basin-shaped and all of the associated soil was water-screened in order to recover the micro-artifacts. Surrounding the hearth, four features were located and are believed to be associated. In unit #21S11E and extending into the southern wall was a basin of oxidized soil. In unit #14S11E there was a cluster of fire-cracked rock, burned bone, and charcoal. In units #15S12E and 17S11E were two areas of charcoal concentrations. These features would likely have been used in conjunction with the larger central hearth. Changing wind direction, wind speed, or temperature may have resulted in the formation of smaller hearths surrounding the larger one. It is also possible that

three of the four areas (excluding the oxidized basin) may have been disposal areas resulting from build-up in the large hearth. Several boulders are present in Level 1b as well. However, the pattern appears to be random and is likely not a result of human activities.

Figure 5.14: Unit #19S12E Hearth in Level 1b

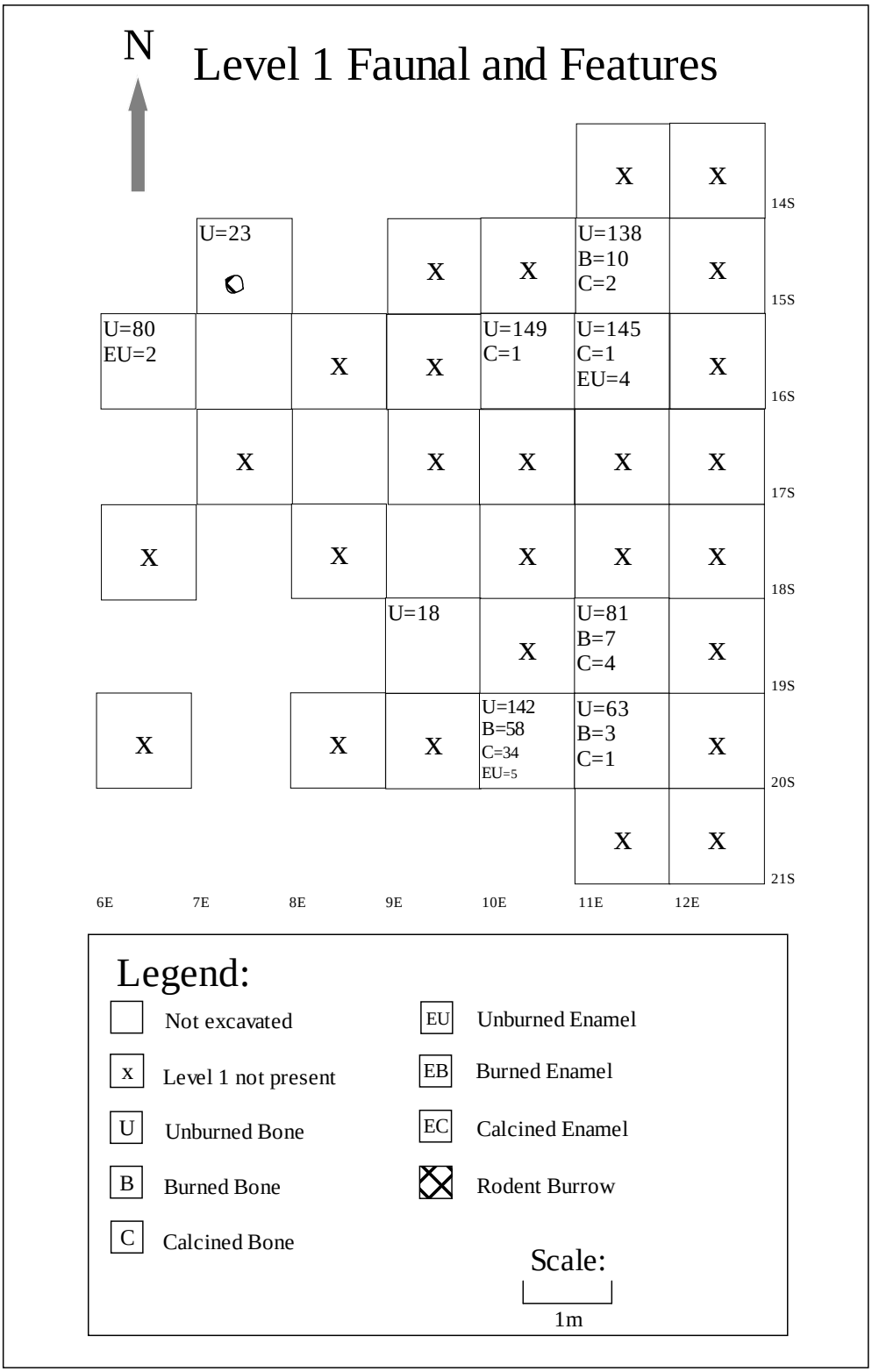

Figure 5.15: Faunal Distribution and Features in Level 1

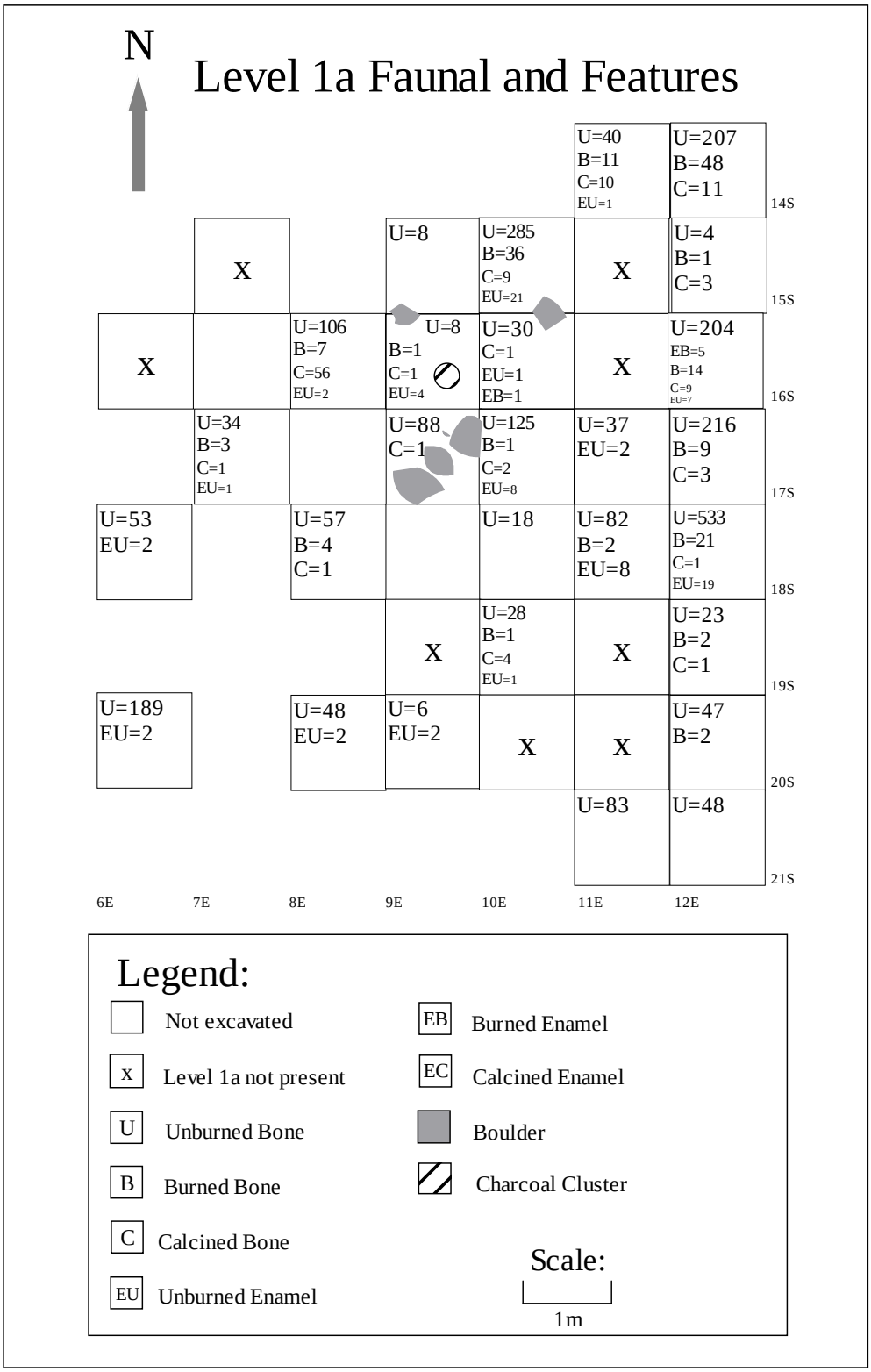

Figure 5.16: Faunal Distribution and Features in Level 1a

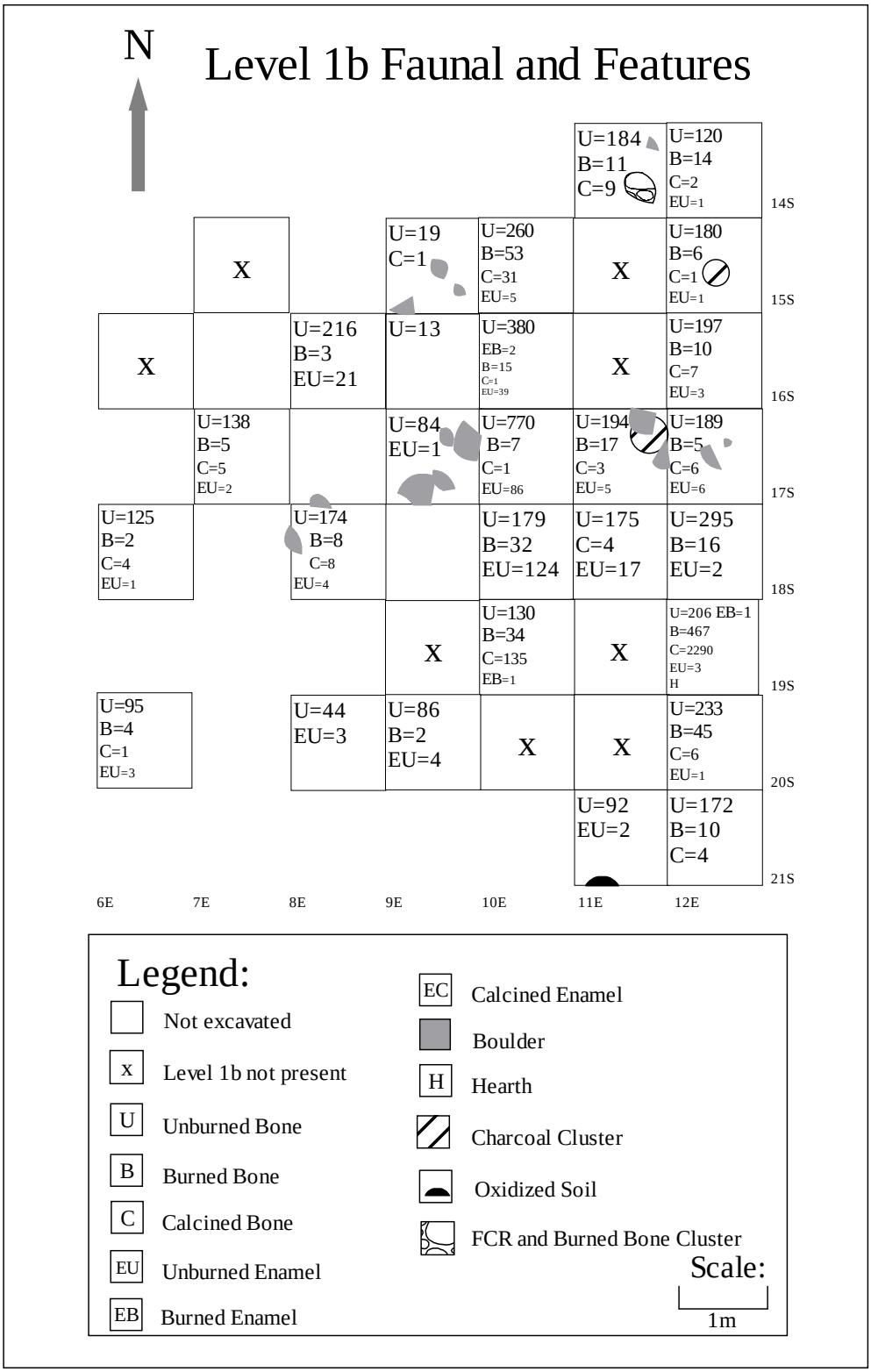

Figure 5.17: Faunal Distribution and Features in Level 1b

5.8 Summary

Occupation Level 1a contains artifacts consistent with the late precontact period. Projectile points are dominantly of Plains Side-Notched morphology. Rim and lip decoration on the few sherds recovered is consistent with Mortlach complex pottery. The association of both diagnostic artifact types is consistent with Walde (2003) and Malainey (1998). The occupants of this late period campsite expressed a reliance on both local lithic materials as well as bison procurement. With the exception of one large-sized canid, *B. bison* is the only identified species present within the excavated boundaries of Level 1a. Due to the lack of identifiable foetal and avian bone, seasonality of this occupation cannot be demonstrated.

Artifacts excavated from Level 1b are similarly indicative of a late precontact habitation occupation. Pottery surface finish is consistent with the Mortlach complex. A timeframe can be established for this occupation based on these sherds as well as on the presence of at least two Prairie Side-Notched arrow points found in association. This period of occupation is supported by the radiocarbon age obtained via a charcoal sample from the hearth. Examination of the lithic assemblage concludes that, again, there was a reliance on local materials. *B. bison* continues to dominate the identifiable faunal collection but does not represent the entire recognizable assemblage. A minimum of three alternative species have also been identified including one snowshoe hare, one ground squirrel, and one large-sized rodent. In addition, a minimum of five species of flora were identified in a charred material recovered from the hearth in unit #19S12E. It is believed that all five species would have been used as food sources. The caching potential of dried food, however, results in an indefinite length of preservation for these food sources, thereby making season of occupation inconclusive. The lack of appropriate bone in Level 1b further evades the determination of seasonality.

Chapter 6

Occupation Level 2 (2a, 2b) Assemblage

6.1 Introduction

Occupation Level 2 was excavated below a sedimentary layer of sand and a thin lens of small gravel. Similar to Occupation Level 1, three sets of materials must be analyzed in the discussion of Level 2. Separation of Level 2a and Level 2b is apparent in 23 units and partially represented in three (units #17S12E, 18S11E, and 20S10E). Alternatively, Level 2 is inseparable in nine units and partially expressed in the three aforementioned units. There does not appear to be a clear pattern to the separation of occupation levels or lack thereof (Fig. 6.1). When separable, Level 2a has been classified as a Duncan/Hanna occupation level based on diagnostic projectile point recovery. A radiocarbon sample consisting of a left bison metacarpal was submitted for this occupation. The calibrated age obtained was 3.700 ± 0.045 ka BP (BGS 2660, Table 3.2). For Level 2b, two samples were combined: one was a metacarpal shaft and the second was a left distal bison radius. The radiocarbon age is calibrated at 4.27 ± 0.05 ka BP (BGS 2661, Table 3.2). The diagnostic artifacts recovered from the excavation coincide with the age of the sample suggesting an Oxbow complex occupation. The interpretation of these entities was completed through the thorough analysis of both lithic and faunal remains.

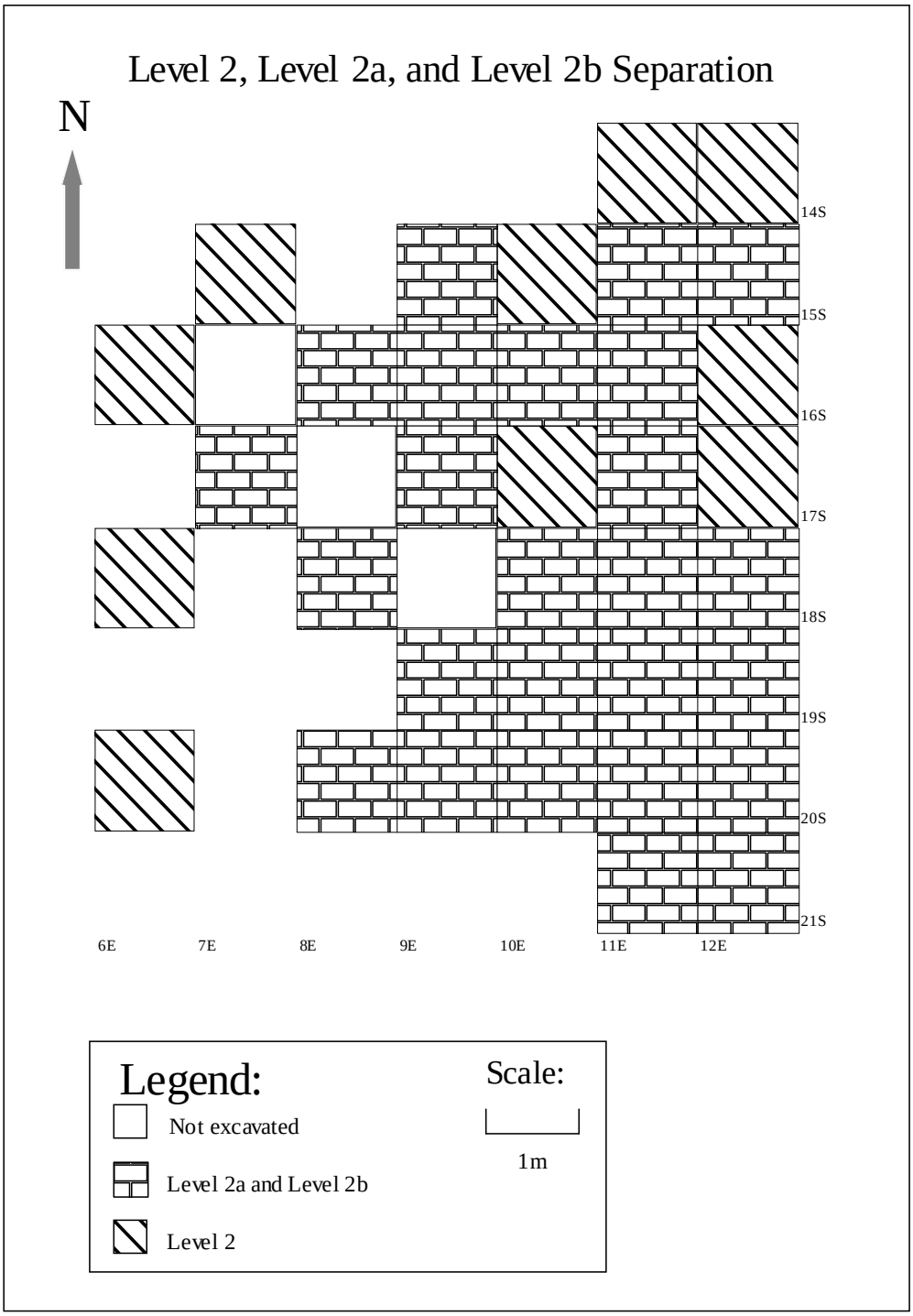

Figure 6.1: Separation of Level 2a and Level 2b Occupations

6.2 Lithic Assemblage

6.2.1 Debitage

Lithic materials utilized in Level 2, Level 2a, and Level 2b are immediately recognized as local. There is a heavy reliance on Swan River chert, quartzite, quartz, and chert in all of the levels at the Dog Child site. Level 2 yielded a total of 613 flakes and pieces of shatter (Table 6.1). Swan River chert continues to be the dominant lithic material, representing 70.3% (431 pieces) of the sample. Forty-nine per cent has been heat-treated. Quartz is the second most common raw material, accounting for 9.0% of the sample. The remaining 12 lithic materials chronicled in Table 6.1 represent the final 20.7% of the lithic assemblage. A total of 74.4% of the debitage count are shatter (456 pieces), 22.0% are secondary flakes (135 pieces) and 3.1% (19 flakes) and 0.5% (three flakes) are tertiary and primary flakes respectively.

Table 6.1: Occupation Level 2 Debitage Counts

Material	Shatter	Primary Flake	Secondary Flake	Tertiary Flake	Total	Percent (%)
Swan River Chert	311	3	101	16	431	70.3
Quartz	47	0	8	0	55	9.0
Quartzite	38	0	5	1	44	7.2
Chert	27	0	12	0	39	6.4
Basalt	9	0	2	0	11	1.8
Chalcedony	8	0	2	1	11	1.8
Silicified Peat	3	0	1	1	5	0.8
Silicified Wood	4	0	0	0	4	0.6
Limestone Chert	4	0	0	0	4	0.6
Gronlid Siltstone	3	0	1	0	4	0.6
Knife River Flint	1	0	1	0	2	0.3
Fused Shale	0	0	1	0	1	0.2
Silicified Siltstone	1	0	0	0	1	0.2
Feldspathic Siltstone	0	0	1	0	1	0.2
Total	456	3	135	19	613	100%
Percent (%)	74.4	0.5	22.0	3.1	100%	

Analysis of Level 2a has disclosed a total of 2051 debitage fragments (Table 6.2). Of these, 1167 (56.9%) are composed of Swan River chert, 381 (18.6%) of

quartz, 233 (11.4%) of quartzite, 170 (8.3%) of various cherts, and the remaining 100 pieces (4.8%) are divided between 12 other lithic materials. At least 59.5% of the Swan River chert sample has been heat-altered. Consistent with Level 2, the majority of the debitage is shatter, constituting 70.8% of the assemblage. Secondary flakes account for 19.2%, tertiary for 9.8%, and primary for a minute 0.2%, representing only four pieces out of the total sample.

Table 6.2: Occupation Level 2a Debitage Counts

Material	Shatter	Primary Flake	Secondary Flake	Tertiary Flake	Total	Percent (%)
Swan River Chert	887	3	194	83	1167	56.9
Quartz	213	0	81	87	381	18.6
Quartzite	157	0	63	13	233	11.4
Chert	124	1	36	9	170	8.3
Chalcedony	10	0	5	4	19	0.9
Silicified Peat	14	0	2	1	17	0.8
Limestone Chert	11	0	5	0	16	0.8
Knife River Flint	6	0	4	3	13	0.6
Silicified Wood	12	0	0	0	12	0.6
Gronlid Siltstone	4	0	4	1	9	0.4
Basalt	7	0	0	0	7	0.3
Silicified Siltstone	2	0	0	0	2	0.1
Sandstone	2	0	0	0	2	0.1
Fused Shale	1	0	0	0	1	0.1
Agate	1	0	0	0	1	0.1
Jasper	1	0	0	0	1	0.1
Total	1452	4	394	201	2051	100%
Percent (%)	70.8	0.2	19.2	9.8	100%	

Lithic remains in Level 2b are composed of 3295 pieces of shatter and flakes (Table 6.3). Swan River chert is the primary material, constituting 75.5% of the collection (35.4% of which have been heat-treated). Quartzite (6.6%), quartz (5.9%), and cherts (5.3%) represent the second, third, and fourth most common materials with comparable amounts. The balance is composed of 12 other materials. Again, a major proportion of the debitage is shatter (69.9%) while secondary flakes (19.6%), then tertiary flakes (10.3%), followed by primary flakes (0.2%) succeed.

Table 6.3: Occupation Level 2b Debitage Counts

Material	Shatter	Primary Flake	Secondary Flake	Tertiary Flake	Total	Percent(%)
Swan River Chert	1720	5	474	290	2489	75.5
Quartzite	174	0	38	4	216	6.6
Quartz	154	0	28	12	194	5.9
Chert	110	0	53	12	175	5.3
Knife River Flint	24	0	14	12	50	1.5
Chalcedony	28	0	10	6	44	1.3
Limestone Chert	16	1	10	0	27	0.8
Silicified Wood	26	0	1	0	27	0.8
Basalt	18	0	7	0	25	0.8
Silicified Peat	8	0	4	1	13	0.4
Gronlid Siltstone	9	0	2	1	12	0.4
Fused Shale	6	0	4	0	10	0.3
Jasper	4	0	0	1	5	0.2
Silicified Silstone	4	0	1	0	5	0.2
Sandstone	2	0	0	0	2	0.1
Agate	1	0	0	0	1	0.03
Total	2304	6	646	339	3295	100%
Percent (%)	69.9	0.2	19.6	10.3	100%	

6.2.2 Cores and Core Fragments

A total of six cores and fragments were recovered from Occupation Level 2 (Table 6.4). Of these, two are composed of Swan River chert and one each of chert, quartz, quartzite, and basalt. All except one are irregular platform cores. Both Swan River chert cores have been heat-treated and are in their final stages of processing. The grey chert core is situated within dolomite and multiple exploratory flakes have been removed in order to expel (with little success) a substantial spall of chert. The remaining three core fragments made of quartz, quartzite, and basalt have all been struck multiple times from multiple platforms.

Table 6.4: Level 2 Cores and Core Fragments

Specimen	Material	Mass (g)	Type
1	Swan River Chert	40.2	Platform
2	Swan River Chert	4.6	Bipolar
3	Chert	28.4	Platform
4	Quartz	20.6	Platform
5	Quartzite	71.9	Platform
6	Basalt	33.5	Platform

Level 2a is represented by 13 cores and core fragments: eight Swan River chert, two chert, two quartz, and one basalt (Table 6.5). Three have been flaked using bipolar techniques. Through examination of the Swan River chert cores, two appear to have been completely exhausted and another four are highly flaked from multiple platforms. It appears that the remaining two are pieces of the same core. The cortex, colour, and flaking pattern support this theory. All except two have been heat-treated. The ovoid quartz cores have been flaked multiple times although a significant amount of usable raw material still remains. Both the grey chert and basalt cores are in their final stages of flake-removal.

Table 6.5: Level 2a Cores and Core Fragments

Specimen	Material	Mass (g)	Type
1	Swan River Chert	126.0	Platform
2	Swan River Chert	103.2	Platform
3	Swan River Chert	68.5	Platform
4	Swan River Chert	59.6	Platform
5	Swan River Chert	33.2	Platform
6	Swan River Chert	30.5	Platform
7	Swan River Chert	5.3	Bipolar
8	Swan River Chert	4.5	Platform
9	Chert	3.9	Platform
10	Chert	2.1	Bipolar
11	Quartz	53.1	Platform
12	Quartz	52.9	Platform
13	Basalt	8.5	Bipolar

In Level 2b, 18 cores and fragments were identified (Table 6.6). The raw lithic materials include six chert, five Swan River chert, three quartz, two quartzite, one chalcedony, and one Gronlid siltstone core or core fragment. Five are bipolar

cores. There are two grey, two brown, and one white chert cores, all exhibiting numerous flake scars and in the final stages of flake removal. All of the Swan River chert cores have been heat-treated. Three are in the final stage of reduction while the two remaining, although exhibiting multiple flake scars, retain a substantial amount of quality material. The remainder of the cores also exhibit numerous scars. Analysis of the chalcedony sample suggests that it may be a *pièce esquillée*. This wedge could have been used to split bone or wood (Kooyman 2000:104; Keeley 1980).

Table 6.6: Level 2b Cores and Core Fragments

Specimen	Material	Mass (g)	Type
1	Swan River Chert	51.4	Platform
2	Swan River Chert	42.9	Platform
3	Swan River Chert	12.9	Platform
4	Swan River Chert	7.6	Bipolar
5	Swan River Chert	3.1	Platform
6	Chert	23.1	Platform
7	Chert	10.3	Platform
8	Chert	7.2	Platform
9	Chert	6.4	Platform
10	Chert	5.9	Bipolar
11	Chert	2.6	Platform
12	Quartz	69.3	Platform
13	Quartz	15.1	Platform
14	Quartz	6.6	Bipolar
15	Quartzite	42.2	Platform
16	Quartzite	21.7	Platform
17	Chalcedony	15.0	Bipolar
18	Gronlid Siltstone	4.0	Bipolar

6.2.3 Flaked Stone Tools

The inventory of Level 2 has disclosed a total of six flaked tools. Of these, two are unifacial tools, one is a bifacial tool, and three are projectile points. More culturally demonstrative are the flaked tools from Level 2a and Level 2b. Level 2a contains 15 flaked tools: five unifaces, three bifacial tools and seven projectile points. A smaller collection was obtained from the excavation of Level 2b. Nine flaked tools (five unifaces, one biface, and three projectile points) were recovered.

The possible *pièce esquillée* described in Subsection 6.2.2 may contribute to this assemblage as do two projectile points recovered from the intervening levels inferior and superior to Occupation Level 2b.

6.2.4 Unifacial Tools

A total of two unifacial tools were recovered from Occupation Level 2 (Table 6.7, Fig. 6.2). A triangular end scraper composed of brown chert was excavated from the bottom of Level 2, suggesting that it may in fact belong to Level 2b (Fig. 6.2, **b**). This scraper has a steep working edge that is concave and contains multiple step fractures. The second uniface is both an end and side scraper. It is made of a brown silicified siltstone pebble and is rectangular in shape (Fig. 6.2, **a**). The convex distal working edge is steeper than the flat, right working edge and contains many step fractures.

Table 6.7: Level 2, Level 2a, and Level 2b Unifacial Tools (S.R. Chert refers to Swan River chert)

Specimen	Lev.	Material	Type of Uniface	Width of Working Edge (mm)	Max. Length (mm)	Max. Thickness (mm)	Working Edge Angle (°)	Mass (g)
1	2	Brown Chert	end scraper	15.95	19.50	9.60	80	2.4
2	2	Silicified Siltstone	right side and end scraper	right=13.80 end=12.75	20.45	5.50	right=50 end=70	1.9
3	2a	Chalcedony	end scraper	18.60	14.95	5.40	75	1.7
4	2a	Knife River Flint	right side and end scraper	right=13.70 end=14.10	14.45	4.20	right=60 end=60	0.9
5	2a	Knife River Flint	end scraper	15.45	19.95	4.60	60	1.4
6	2a	S.R. Chert (heat treated)	end scraper	21.35	n/a	7.15	60	3.2
7	2a	S.R. Chert (heat treated)	scraper and graver	scraper= 24.40	24.65	5.90	60	3.4
8	2b	White Chert	end scraper	20.00	21.95	5.40	70	2.3
9	2b	Grey Chert	end scraper	17.50	15.20	5.05	70	1.4
10	2b	Jasper	end scraper	15.70	16.60	7.45	70	2.1
11	2b	Sil. Siltstone	end scraper	n/a	18.35	5.20	75	1.5
12	2b	Knife River Flint	end scraper	14.85	21.45	6.90	65	1.8

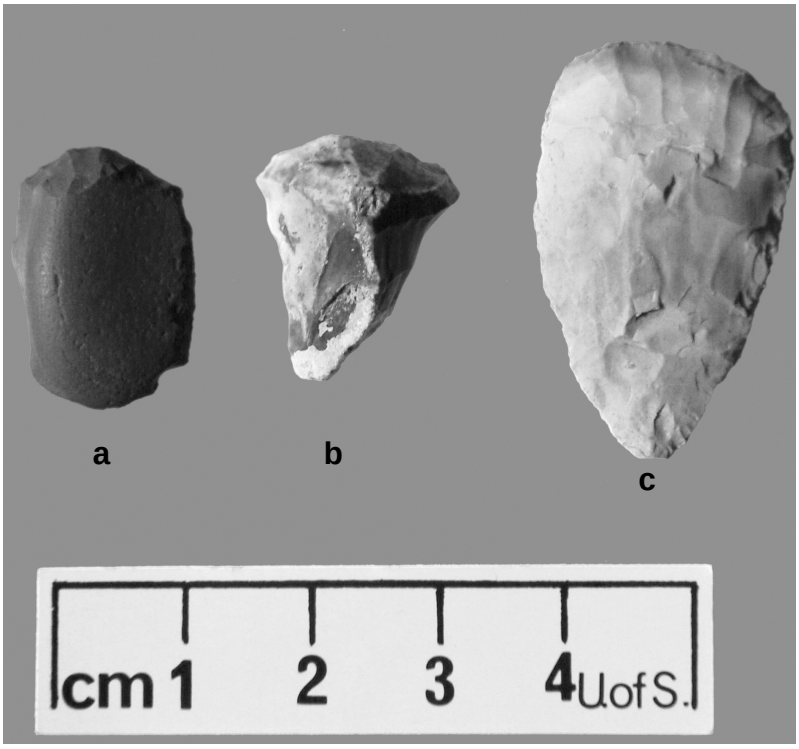

Figure 6.2: Unifacial and Bifacial Tools from Level 2

Five unifacial tools were recovered from Level 2a (Table 6.7; Fig. 6.3). All five were excavated during the 2006 season. Two complete unifaces are composed of Knife River flint: one is an end scraper and the smaller one is an end and side scraper (Fig. 6.3, **d** and **c**, respectively). Both are teardrop-shaped. A complete, ovoid, chalcedony end scraper (Fig. 6.3, **a**) and an obliquely-fractured heat-treated Swan River chert end scraper (Fig. 6.3, **b**) are also present. Finally, a multifunctional heat-treated Swan River chert scraper and graver has been identified (Fig. 6.3, **e**).

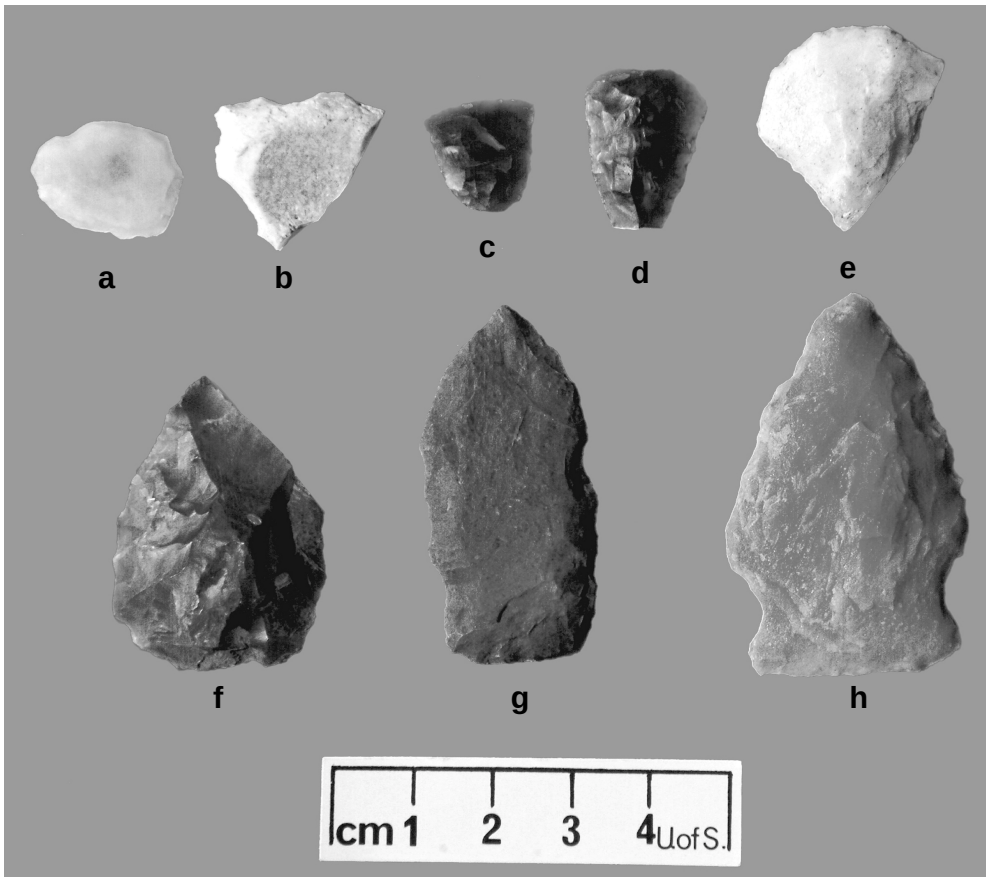

Figure 6.3: Unifacial and Bifacial Tools from Level 2a

An additional five unifaces were identified from Occupation Level 2b (Table 6.7, Fig. 6.4). Only one uniface, an end scraper, was recovered in the original two excavation seasons of Block 1 (Fig. 6.4, **a**). The working edge is concave while the lateral margins are flat (left) and convex (right). This tool is composed of Knife River flint. Specimen **8** in Table 6.7 (Fig. 6.4, **d**) is a teardrop-shaped end scraper made of white chert. It has been bifacially-flaked on the lateral margins. Three additional end scrapers have been recovered. One is trapezoid-shaped and composed of jasper (Fig. 6.4, **b**), another is ovoid and made of grey chert (Fig. 6.4, **c**), and the third is rectangular and formed on a split, brown silicified siltstone pebble (Fig. 6.4, **e**).

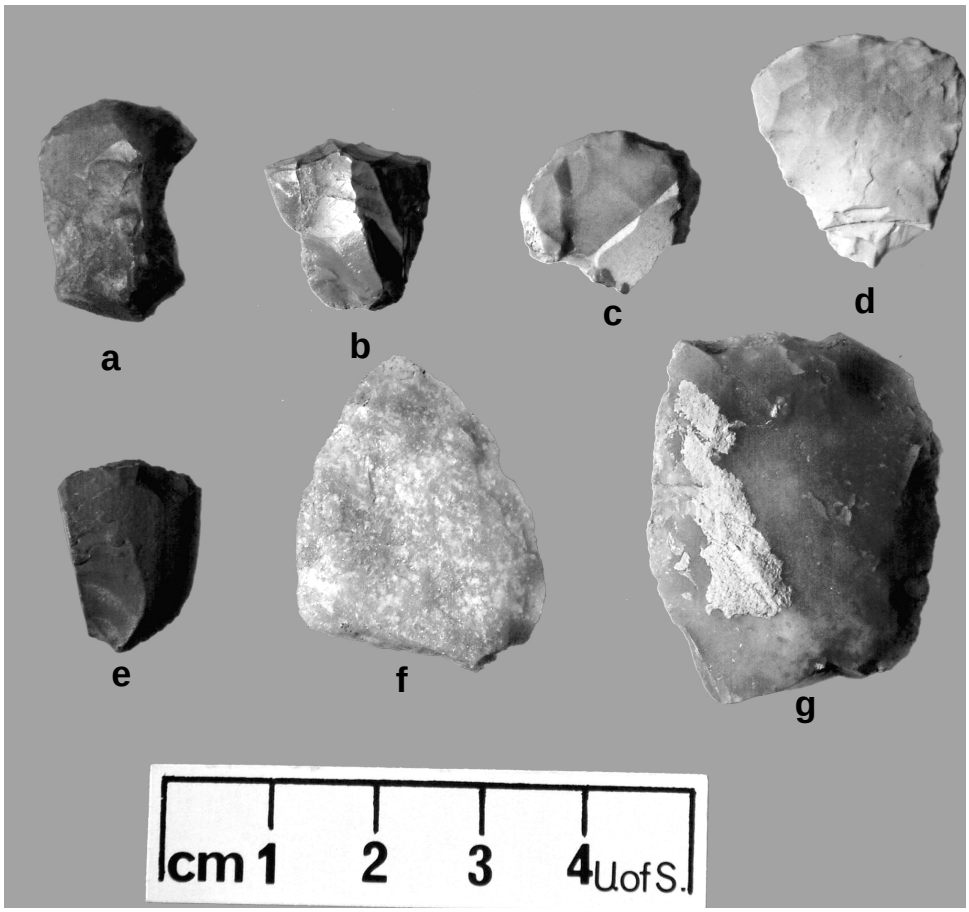

Figure 6.4: Unifacial and Bifacial Tools from Level 2b

Bifacial Tools

A fused shale tool is the only biface recovered from Level 2. The tool is teardrop in shape and has been flaked on all three of its edges on one surface and on two of its edges on the opposing surface (Table 6.8; Fig. 6.2, **c**). It may have served as a symmetric knife although the lack of flaking on the narrow edge of the tool is suggestive of a scraper with a low working angle.

Table 6.8: Level 2, Level 2a, and Level 2b Bifacial Tools (S.R. Chert refers to Swan River chert)

Specimen	Lev.	Material	Type of Biface	Max. Width (mm)	Max. Length (mm)	Max. Thickness (mm)	Mass (g)	Number of Flaked Edges
1	2	Fused Shale	knife	19.80	32.35	6.20	3.5	3
2	2a	Quartzite	hafted biface	21.15	44.70	7.90	8.9	3
3	2a	Knife River Flint	biface	26.95	n/a	9.20	8.6	3 known
4	2a	S.R. Chert (heat treated)	hafted knife	30.35	47.95	11.05	15	7
5	2b	S.R. Chert (heat treated)	biface	23.40	n/a	7.05	4.7	2 known

In Occupation Level 2a, a quartzite tool, most likely a hafted biface, was identified (Table 6.8; Fig. 6.3, **g**). The tool displays a large flaw on one side of the material which is the probable reason that the tool is not thinner. The biface has not been notched. It was either inserted as a plug into a haft or is incomplete. A heat-treated Swan River chert hafted knife was recovered during the 2006 excavation (Fig. 6.3, **h**). This tool is typical of Middle Period occupations (Walker 1992). As well, a broken Knife River flint biface most likely used as a knife, is a product of this latter excavation (Fig. 6.3, **f**).

Excavations in this field season also recovered the transversely broken remains of a biface from Level 2b (Table 6.8; Fig. 6.4, **f**). This heat-treated Swan River chert tool was most likely created as a symmetric knife. Tool **g** in Figure 6.4 is a bipolar chalcedony core that most likely has been shaped into a wedge or *pièce esquillée*.

Projectile Points

Excavation of Occupation Level 2 uncovered three projectile points (Table 6.9; Fig. 6.5). All three points are incomplete, but still maintain their diagnostic bases. They are broken transversely across the body. One point is characteristic of a Duncan point (Fig. 6.5, **a**). It is composed of grey chert. The remaining two points recovered from Level 2 (Fig. 6.5, **b** and **c**) are composed of heat-treated Swan River chert and are both believed to be Oxbow complex projectile preforms

in accordance with Dyck's research at the Harder site (FbNs-1) near Saskatoon (Dyck 1977:90-103).

Table 6.9: Level 2, Level 2a, and Level 2b Projectile Point Dimensions (S.R. Chert refers to Swan River chert)

Specimen	Level	Material	Projectile Form	Max. Length (mm)	Max. Body Width (mm)	Max. Stem Width (mm)	Inter-notch Width (mm)	Max. Thickness (mm)	Mass (g)
1	2	Grey Chert	Duncan	n/a	16.35	n/a	n/a	5.65	1.1
2	2	S.R. Chert (heat treated)	McKean	n/a	18.90	n/a	n/a	4.40	1.2
3	2	S.R. Chert (heat treated)	McKean	n/a	20.30	n/a	n/a	4.70	1.6
4	2a	Grey Chert	Hanna	n/a	n/a	15.60	12.60	5.50	1.0
5	2a	S.R. Chert (heat treated)	Hanna	n/a	21.40	n/a	14.05	8.50	5.2
6	2a	S.R. Chert (heat treated)	Hanna	27.70	18.90	15.00	12.05	7.15	3.5
7	2a	S.R. Chert (heat treated)	Duncan	25.55	17.20	14.95	14.30	6.50	2.9
8	2a	S.R. Chert	Duncan	n/a	n/a	15.30	15.05	3.75	0.7
9	2a	Red Chert	Duncan	n/a	n/a	14.30	13.20	5.95	0.9
10	2a	Silicified Peat	Duncan	n/a	n/a	18.80	17.30	6.60	1.5
11	Sterile 2a to 2b	Chalcedony	Oxbow	22.55	17.85	18.90	15.00	5.00	2.0
12	2b	S.R. Chert (heat treated)	McKean	n/a	17.20	n/a	n/a	3.95	1.6
13	2b	S.R. Chert (heat treated)	Early S-N	n/a	n/a	n/a	n/a	5.55	1.2
14	2b	Silicified Peat	preform	n/a	20.10	n/a	n/a	5.95	3.3
15	2b	Chalcedony	preform	n/a	n/a	n/a	n/a	4.20	2.3
16	2b	Grey Chert	Early S-N	24.40	19.05	16.60	14.05	5.30	2.4
17	Sterile 2b to 3a	Green Chert	Oxbow	24.70	19.90	19.65	14.80	4.70	2.0

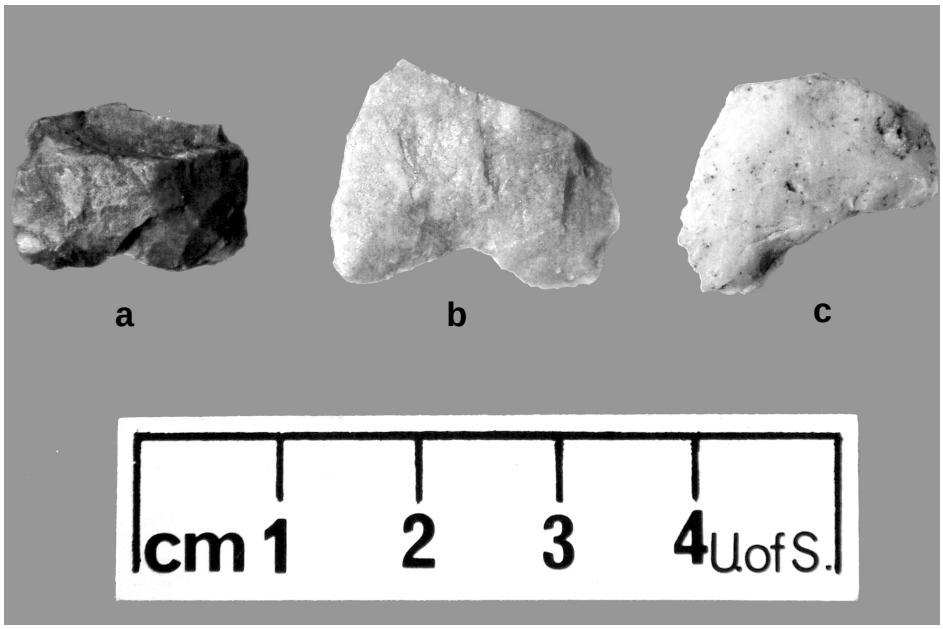

Figure 6.5: Projectile Points from Level 2

Level 2a produced seven projectiles: three of the Hanna style and four of the Duncan style. One of the Hanna points composed of heat-treated Swan River chert is complete (Fig. 6.6, **c**) while the remaining two are only partially present (Fig. 6.6, **a** and **b**). Specimen **4** (Table 6.9 Fig. 6.6, **a**) is broken transversely across the body and is composed of grey chert. Specimen **5** (Table 6.9, Fig. 6.6, **b**) is also broken, however, the body is intact as are the notches. The extreme proximal portion of the base has been transversely snapped. With regard to the Duncan projectile points, three are incomplete, represented only by their bases and notches (Fig. 6.6, **e-f**) but the fourth is complete (Specimen **7**, Table 6.9; Fig. 6.6, **d**). This complete point is made of heat-treated Swan River chert. The three incomplete points are constructed of unaltered Swan River chert, heat-treated Swan River chert, and silicified peat.

It is believed that Level 2b represents an Oxbow complex occupation. This is because of two complete Oxbow points that were found (one each) in the intervening levels above and below the occupation layer (Table 6.9, Fig. 6.8) as well as three projectile point preforms found within the occupation level (Table 6.9;

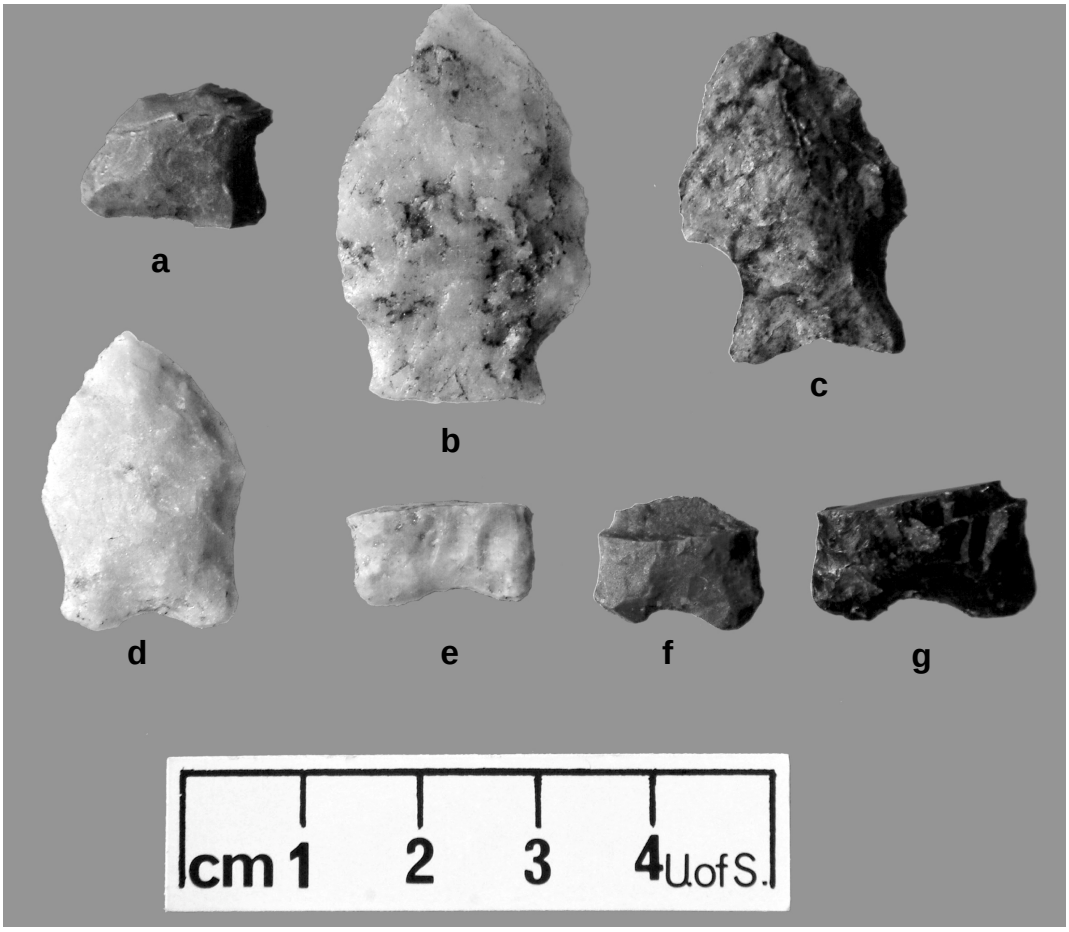

Figure 6.6: Projectile Points from Level 2a

Fig. 6.7). Three definite Oxbow points were recovered from the entire excavation. The first, mentioned in Level 1, is a black chert Oxbow "ear" that was recovered from a large root or tree trunk which spanned the majority of the northern wall of unit #20S10E. Additionally, a complete, green chert projectile point was recovered from unit #21S12E adjacent to a documented root cast in the purportedly sterile sediment below Level 2b (Fig. 6.8, **c**). A complete chalcedony point was found in unit #3S13E in the sandy level immediately superior to Occupation Level 2b (Fig. 6.8, **b**). All three of these projectiles are seemingly displaced, however, the proximity of two of them to Level 2b suggests that they are associated.

Figure 6.7 displays three bifacially-flaked lithics that are consistent in size and shape with Oxbow projectile preforms. Dyck (1977) has defined these preforms as

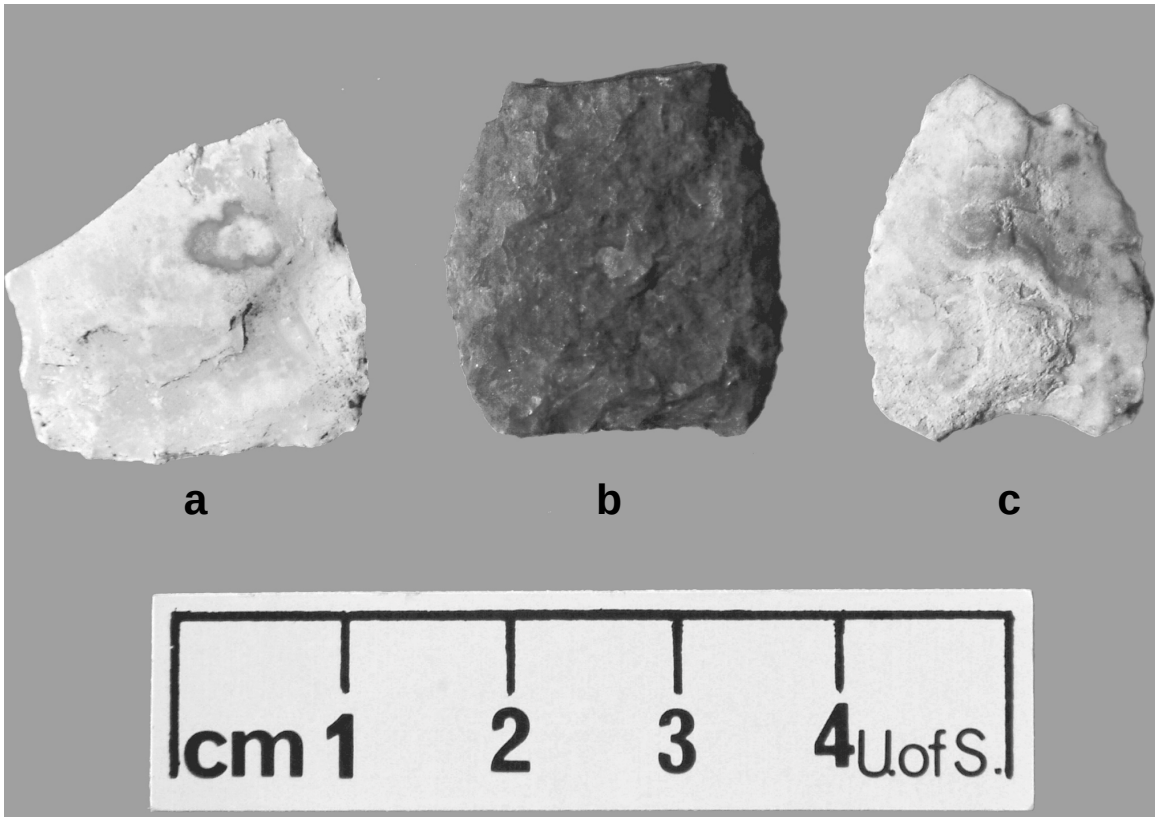

Figure 6.7: Projectile Points from Level 2b

follows:

> small bifaces with straight or slightly concave basal edge[s] and two gently curving lateral edges which converge at a tip. Preforms...lack notches[.]...The widest part of the blade is located in the lower third of a specimen near the base (Dyck 1977:90-1).

There is no evidence of notching on the lateral edges and the basal edges of all three are straight or only minimally concave. All three preforms are broken, two at the tip (Fig. 6.7, **b** and **c**) and one obliquely across the body (Fig. 6.7, **a**). Point **a** is made of chalcedony, point **b** is formed out of silicified peat, and point **c** is composed of heat-treated Swan River chert.

In addition to the Oxbow projectile points and preforms found in Level 2b, two points which can only be classified as Early Side-Notched points were excavated from unit #3S12E. One is complete and made of grey chert (Specimen

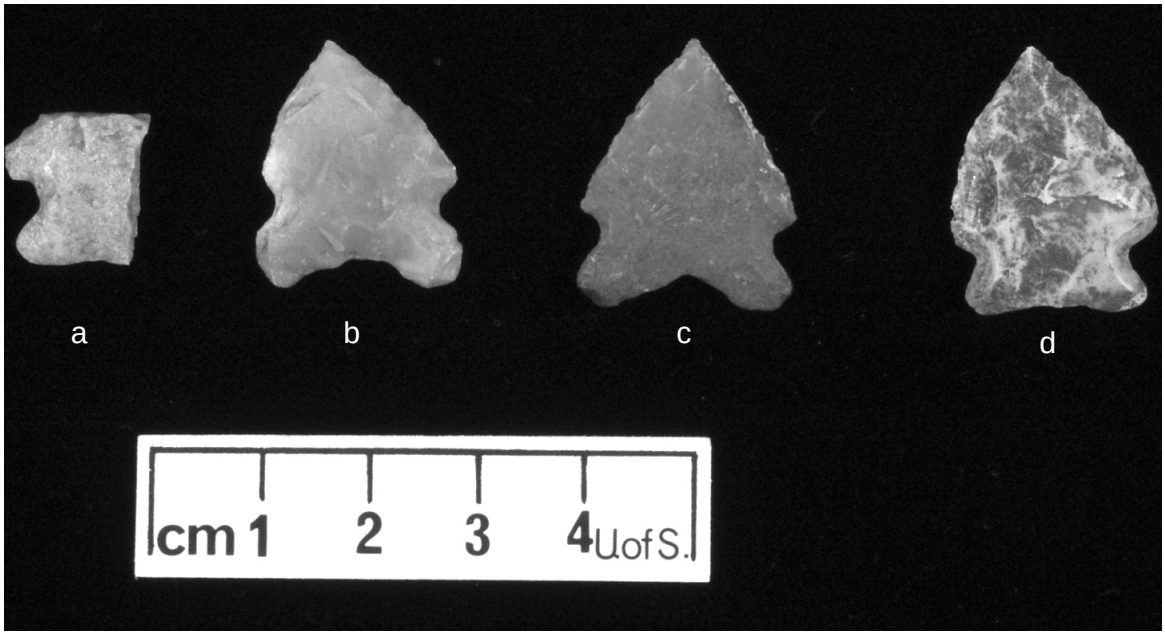

Figure 6.8: Oxbow and Early Side-Notched Projectile Points associated with Level 2b

16, Table 6.9; Fig. 6.8, **d**) while the second (Specimen **13**, Table 6.9; Fig. 6.8, **a**) is snapped longitudinally and transversely so that only one notch remains. It is made of heat-treated Swan River chert.

It is believed that the two projectile points recovered from excavations of Level 2 ((Fig. 6.5, **b** and **c**) belong to occupation Level 2b as well. Both points were located in the lower half of the Level 2 buried soil. Although this evidence is subject to protest due to the effects of bioturbation and the possibility of overlap and unequal thickness of soils, raw data support the hypothesis that these two are also Oxbow complex preforms. The depth of Level 2 in unit #15S10E extends from 16 cm to 21.5 cm below the surface. The associated projectile point preform was recovered at a depth of 20 cm below the surface (Fig. 6.5, **c**). Similarly, Level 2 in unit #16S6E extends from a depth of 11 cm to 15 cm. The preform affiliated with this occupation was located at a depth of 13.5 cm.(Fig. 6.5, **b**). Neither lithic has been notched on the lateral edges and both have been slightly flaked, basally. Although both express a resemblance to classic McKean lanceolate projectile

points, the proximity to an Oxbow occupation supports the hypothesis that these are Oxbow point preforms.

6.2.5 Fire-Cracked and Fire-Broken Rock

A total of 33 fragments of fire-altered rock were recorded in Occupation Level 2. This equates to a mass of 1401.3 g. Granite accounts for 50.9% of this collection. In Level 2a, granite remains the most common material, representing 98.9% of the sample of 37 fragments. The entire fire-altered rock mass of this level equals 6108.3 g. The fire-cracked and fire-broken rock recovered from Level 2b totals to a mass of 7188.3 g (98 pieces). Granite maintains its predominant position, representing 92.0% of the assemblage (Table 6.10).

Only one cluster was encountered: that belonging to Level 2b. This grouping was located in unit #21S11E. A hearth feature can be discerned in the southern wall profile of this unit. This cluster is likely part of a larger fire-altered rock feature not yet excavated.

Table 6.10: Level 2, Level 2a, and Level 2b Fire-Cracked Rock Counts

Level	Material	Count	Mass (g)	Percent by Mass (%)
2	Granite	10	713.3	50.9
2	Basalt	17	552.7	39.4
2	Sandstone	6	135.3	9.7
Level 2 Total		**33**	**1401.3**	**100%**
2a	Granite	32	6043.1	98.9
2a	Basalt	3	35.9	0.6
2a	Sandstone	2	29.3	0.5
Level 2a Total		**37**	**6108.3**	**100%**
2b	Granite	81	6611.5	92.0
2b	Sandstone	8	311.7	4.3
2b	Basalt	5	138.7	1.9
2b	Quartzite	3	90.8	1.3
2b	Limestone	1	35.6	0.5
Level 2b Total		**98**	**7188.3**	**100%**

6.3 Vertebrate Faunal Assemblage

A total of 3170 faunal elements, specimens, and unidentifiable fragments were recovered from the excavation of Level 2. The total mass of this assemblage is 2067.3 g (Table 6.11). Analysis has determined that 238 pieces (26.8% by mass) of this assemblage are identifiable, with 220 of them being unburned bone, two being burned bone, and the remaining 16 being unburned enamel. The majority of the unidentifiable fragments are unburned, representing 90.1% of the mass of the unidentifiable assemblage. All recovered enamel is unburned. The entire faunal assemblage exhibits evidence of taphonomic events, including butchering, root etching, and dark soil staining. To a lesser degree, some of the bones exhibit exfoliation, erosion, and diagenetic change as a result of calcium carbonate in solution in the soil. This is expressed as a white layer on the surface of all of the archaeological material, most often on the inferior surface. In addition, one of the bones contains punctures and gnawing marks delivered by a medium or large-sized carnivore. The degree of weathering on the bone is primarily Stage 3 and Stage 4.

Table 6.11: Level 2 Faunal Counts

Faunal Type	Level 2				Level 2a				Level 2b			
	Id.	Mass (g)	Unid.	Mass (g)	Id.	Mass (g)	Unid.	Mass (g)	Id.	Mass (g)	Unid.	Mass (g)
Unburned Bone	220	442.4	2314	1363.0	310	1669.1	3382	2155.5	215	1710.6	6624	3857.3
Burned Bone	2	2.7	234	48.6	0	0.0	153	46.0	0	0.0	1328	259.3
Calcined Bone	0	0.0	324	63.0	0	0.0	222	41.3	0	0.0	1922	296.1
Unburned Enamel	16	109.0	60	38.6	29	76.7	64	16.8	62	128.3	126	51.6
Burned Enamel	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	10	2.1
Calcined Enamel	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	7	0.8
Total	238	554.1	2932	1513.2	339	1745.8	3821	2259.6	277	1838.9	10017	4467.2

Excavation of Level 2a led to the recovery of a total of 4160 faunal portions, with a combined mass of 4005.4 g (Table 6.11). Unidentifiable fragments are predominate, constituting 56.4% of the combined mass of assemblage. Only 339 pieces are identifiable. Unburned bone represents 95.4% of the mass of unidentifiable fragments. Root etching, soil staining, and butchering patterns are among the most common results of taphonomic processes. There is also a minor

collection of faunal materials that exhibit exfoliation and erosional impact. Other postmortem changes include a small amount of mineralized bone and calcium carbonate sedimentation as well as one bone with canine punctures and another with evidence of insect burrowing. The majority of the faunal material has reached Stage 3 or Stage 4 of weathering although a significant number of bones have only weathered to the degree of Stage 2.

The faunal assemblage recovered from Level 2b consists of a total of 10294 pieces with a combined mass of 6306.1 g (Table 6.11). By mass, 70.8% of the assemblage is unidentifiable. The majority of the unidentifiable fragments are unburned bone (86.3% by mass). A large amount of burned and calcined bone by number are also present in Level 2b (1328 pieces and 1922 pieces respectively). However, these are highly fragmented and constitute minor percentages of the total mass (5.8% and 6.6% respectively). Taphonomic processes evident on the faunal materials are consistent with the shared processes described for both Level 2 and Level 2a. In addition, the amount of material affected by calcium carbonate is much more significant. Cutmarks are present on four bones in the assemblage while one bone contains evidence of carnivore chewing in the form of punctures, and another exhibits evidence of insect burrowing activity. The standard level of weathering is, again, Stage 3 and Stage 4. Several materials have also been weathered to both Stage 2 and Stage 5. The good preservation of most of the faunal materials in this occupation is indicative of a sedimentological event soon after the site was vacated.

6.3.1 Identified Species

Level 2

A minimum of six individuals were recovered from Level 2, encompassing five taxa (Table 6.12). As in Level 1, it cannot be determined with certainty whether the specimens are associated with Level 2a, Level 2b, or both. No less than two bison are present, represented by 26 specimens. Many more specimens were

identified from Level 2, Level 2a, and Level 2b that were not classifiable to species, although the morphology is consistent with bison. A complete list of bison landmark analysis is included in Table B.5, Appendix B. Excavation of Level 2 also included the recovery of the bones of one snowshoe hare (*Lepus americanus*), one micro-mammal, and one woodchuck (*Marmota monax*, SC2a). The snowshoe hare is represented by an anterior first phalange; the small-sized rodent by a rib; the woodchuck by a radius. Woodchucks prefer open fields and are found within the Wanuskewin area (Banfield 1974:107). In addition, two conjoinable pieces of a humerus were recovered, belonging to a small to medium-sized bird. Comparison with the University of Saskatchewan faunal collection has determined that it belongs to a small duck (*Anas sp.*). Several species of duck are hosted by the environments adjacent to the Opimihaw Creek and South Saskatchewan River (Vanner 2004:66-85)

Table 6.12: Minimum Number of Individuals (MNI) represented in Level 2, Level 2a, and Level 2b (* includes immature animals)

Level	Vertebrate	Taxon	NISP	MNI (side)
	Mammals			
2	Bison	*Bison bison*	26	2
2	Snowshoe Hare	*Lepus americanus*	1	1
2	Woodchuck	*Marmota monax*	1	1
2	Micro-Mammal (SC1a)	*Rodentia*	1	1
2a	Bison	*Bison bison*	278	3
2a	Large Mammal (SC5a)	*Canis sp.* (probable *C. lupus*)	2	2*
2b	Bison	*Bison bison*	219	3
2b	Medium/Large Mammal (SC4a)	*Canis sp.*	1	1
	Birds			
2	Small-Medium Bird (SC3b)	*Anas sp.* (small duck)	2	1
2b	Medium Bird (SC4b)	Aves (probable *Larus sp.*)	1	1
	Miscellaneous			
2	Very Large Mammal (SC6a)	Mammalia	2	n/a
2a	Very Large Mammal (SC6a)	Mammalia	43	n/a
2b	Very Large Mammal (SC6a)	Mammalia	65	n/a

Level 2a

At least five individuals have been recovered from the excavation of Level 2a, separable into three separate taxa. A minimum of three bison have been identified with a total NISP of 278. Anatomical landmark assessment of these specimens is included in Tables B.6 and B.7 in Appendix B. As well, two large-sized mammals were recovered, as evidenced by the presence of an immature and an adult specimen. A left tooth cap of M^2 indicates that the individual is immature, consistent in morphology with a wolf pup (*Canis lupus*) or immature dog (*Canis familiaris*). Also, a mature lower incisor, larger than the size of a coyote, was identified. Again, the size indicates the presence of a *Canis lupus* or *Canis familiaris* individual.

Level 2b

Excavation of Level 2b resulted in the recovery of faunal materials associated with three different taxa representing five individuals. A minimum of three bison were identified through the examination of 219 specimens. Analysis of these specimens is included in Appendix B, Tables B.8 and B.9. In addition, one left M_3 belonging to a medium or large-sized canid was recovered as well as an ulna shaft of a medium-sized bird. The morphology of this bone corresponds to the size and shape of a gull (*Larus sp.*), possibly a Franklin's gull. Multiple species of gull are found harvesting the water resources in Wanuskewin and the surrounding environment (Vanner 2004:154-157).

6.4 Seasonality

The season of occupation of the Dog Child site in Level 2a and Level 2b is, again, difficult to assess. The presence of avian bone is the most reliable source of evidence. One specimen belonging to a medium-sized bird and most consistent with *Larus sp.* or a gull was recovered from Level 2b. Based on this, a projected seasonality of the occupation is mid-spring through summer. A second element

(two conjoinable specimens) belonging to a small duck (*Anas sp.*) was also recovered, suggesting a mid-spring through summer occupation as well. However, this element was excavated out of the inclusive Level 2 and thus cannot be affiliated with either individual occupation.

6.5 Artifact Distribution and Features

There are no concentrations of debitage in Level 2 (Fig. 6.9) because of the almost complete separation of Level 2a and Level 2b. In Level 2a, an increased intensity in the number of flakes and shatter is apparent in the southern half of Block 1, particularly in unit #20S10E (Fig. 6.10). All six of the projectile points associated with Block 1 were located in this southern half. In Level 2b (Fig. 6.11), there is a considerable amount of lithic debitage throughout Block 1 with the largest densities occurring in units #21S11E and 17S11E. An exception exists in unit #18S11E where only 10 pieces of debitage were recovered. The associated cores in Level 2b are distributed throughout the entire block.

Faunal remains associated with Level 2 are well represented. Large amounts of unburned bone are present throughout the applicable units. Perhaps two separate concentrations of burned and calcined bone can be ascertained as well (Fig. 6.12). The first is in and surrounding unit #15S10E and the second is in unit #20S10E. A burned bone cluster was present in the former unit, accounting for the large values.

Level 2a is similarly well represented by faunal remains. The two largest concentrations identified from Block 1 excavations exist in units #15S11E and #16S10E, including unburned, burned, and calcined fragments (Fig. 6.13). A black, greasy soil was located in the southwest corner of unit #15S11E in direct association with these concentrations. Two boulders were also recorded in the mapping of Level 2a although their presence is not believed to be cultural but rather geological.

In Level 2b, faunal materials are, once again, distributed generously

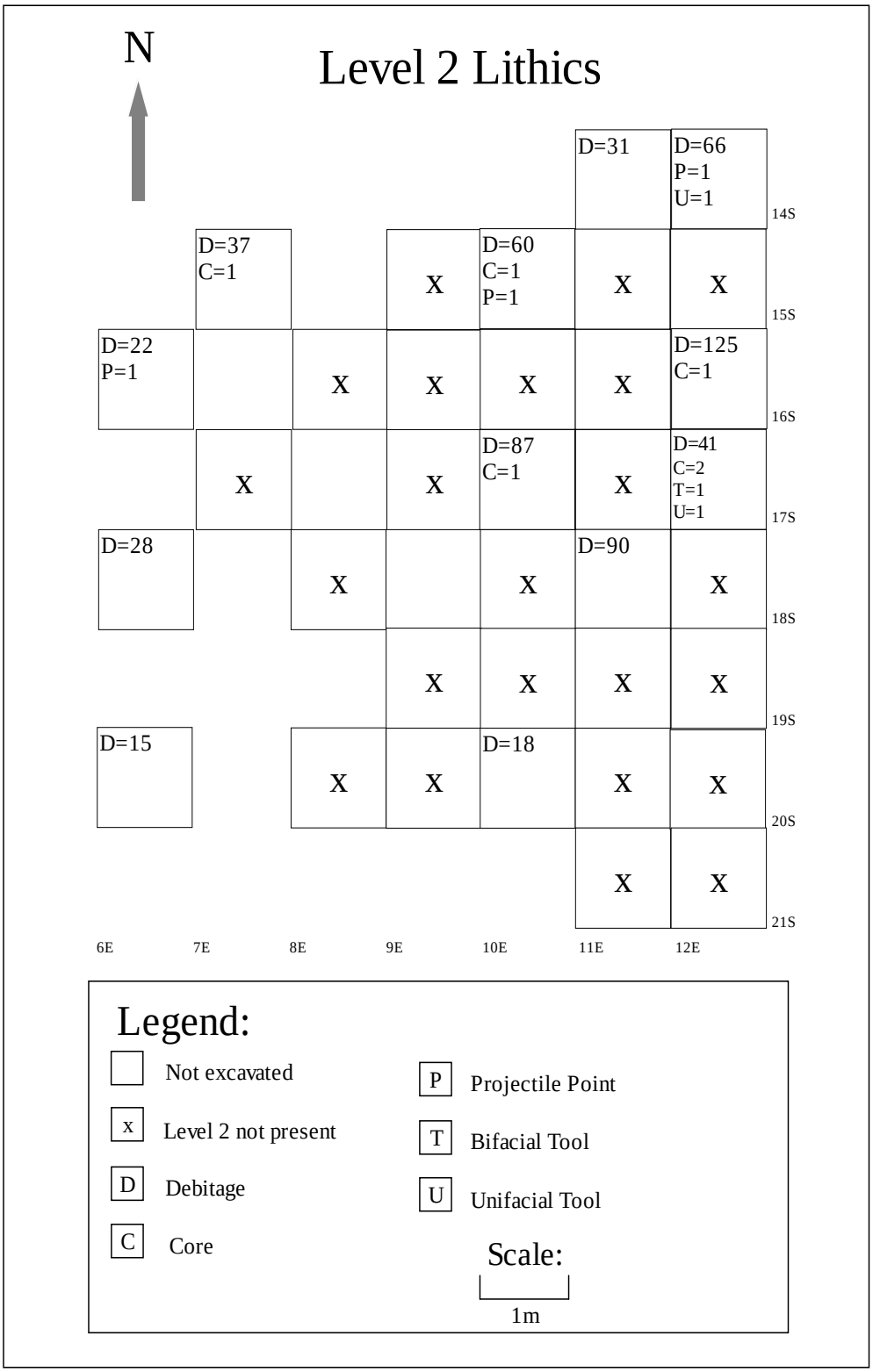

Figure 6.9: Lithic Distribution in Level 2

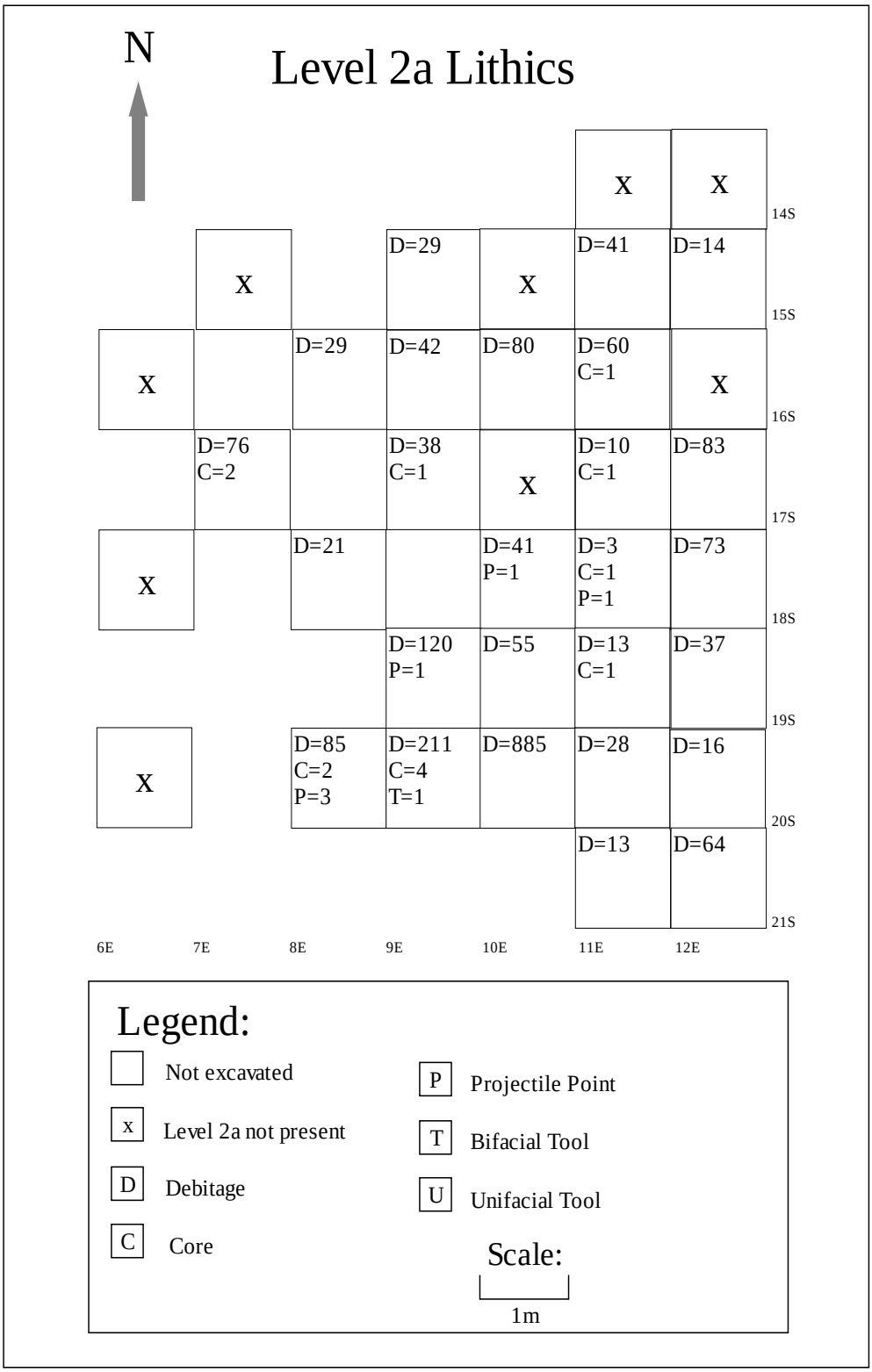

Figure 6.10: Lithic Distribution in Level 2a

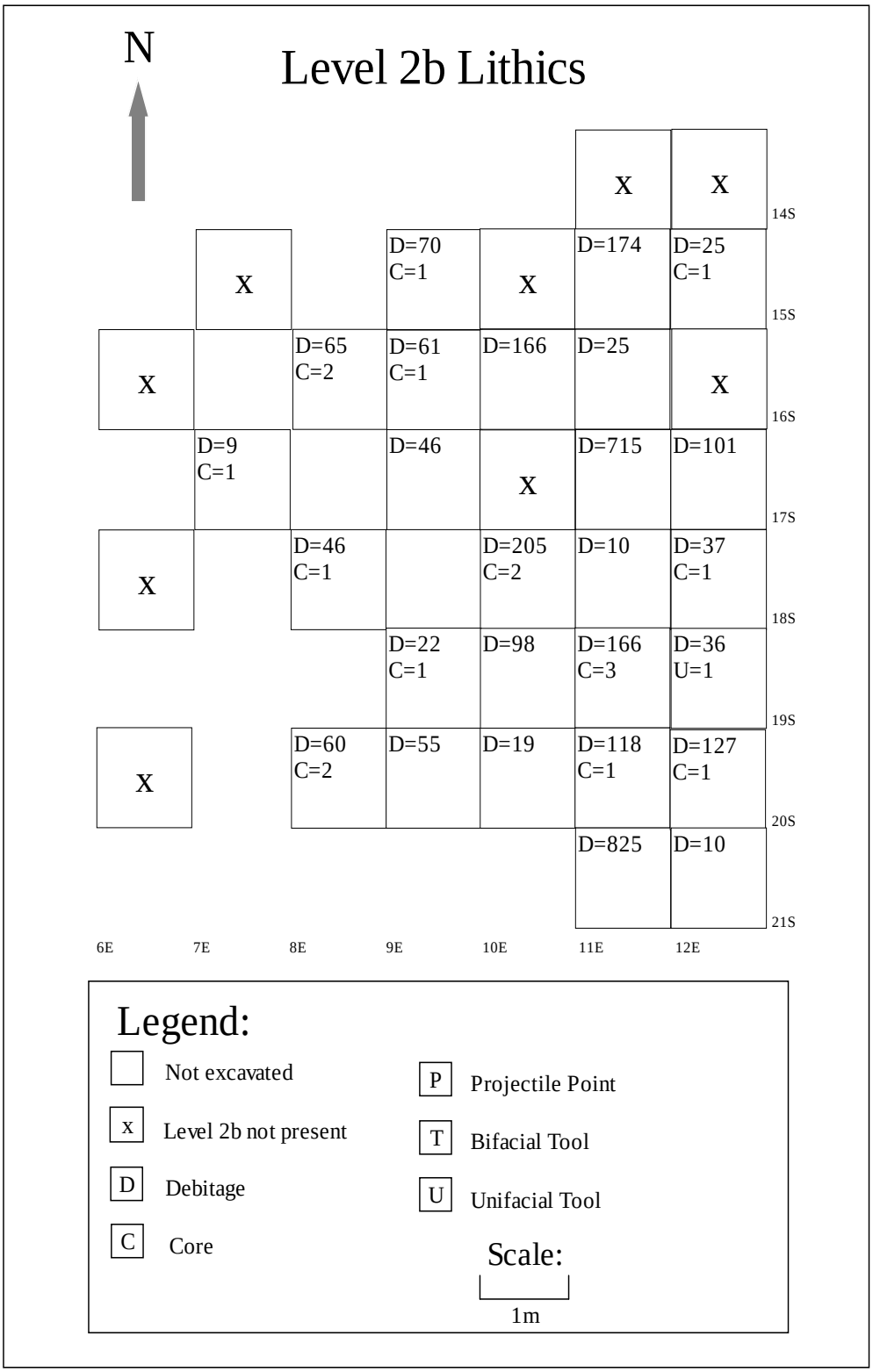

Figure 6.11: Lithic Distribution in Level 2b

throughout the excavated units of Block 1 (Fig. 6.14), with the exception of unit #18S11E. A concentration of unburned, burned, and calcined faunal remains in units #15S9E, #15S11E, and #16S9E as well as #19S11E, #21S11E and surrounding units can be clearly recognized. A burned and calcined bone cluster in the northeast corner of unit #21S11E accounts for the latter intensity of artifacts. As mentioned, very few faunal remains (five unburned bone fragments) and pieces of lithic material were recovered from Level 2b. This lack of deposition suggests the presence of an obstruction (i.e. a hide or an individual) or else a removal of the artifacts in order to clear the area. The presence of three boulders located within this unit may relate to the lack of deposition.

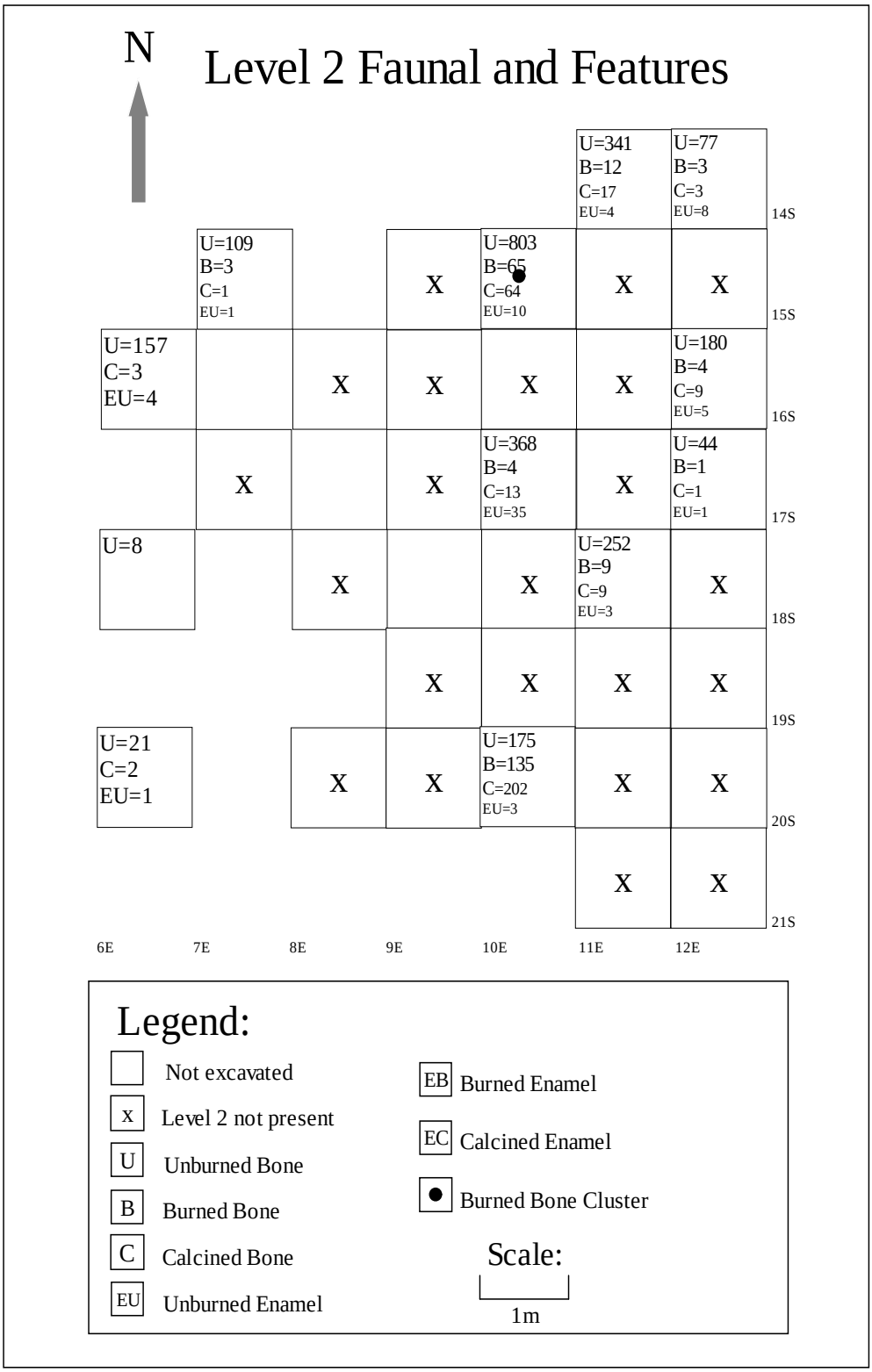

Figure 6.12: Faunal Distribution and Features in Level 2

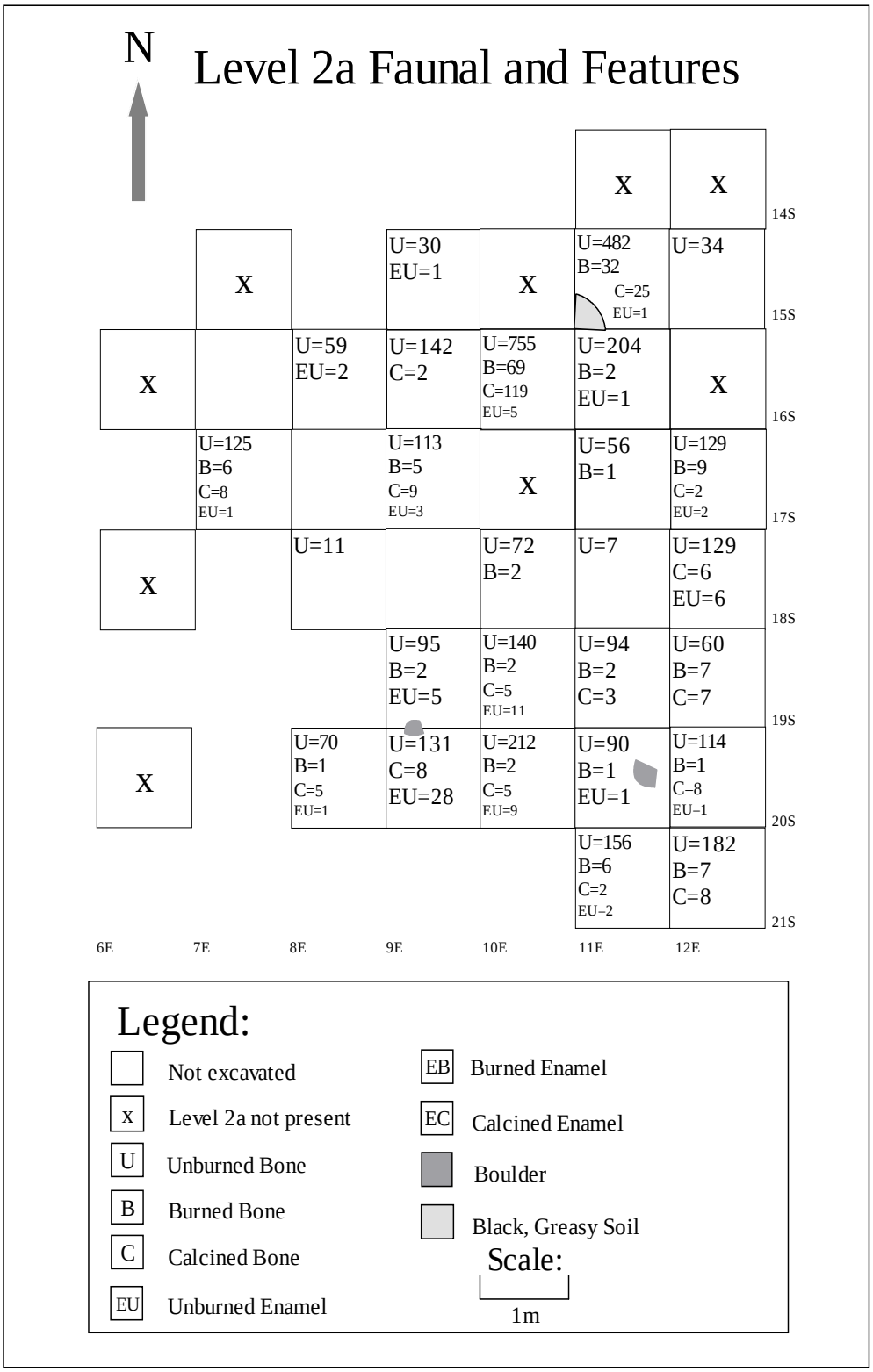

Figure 6.13: Faunal Distribution and Features in Level 2a

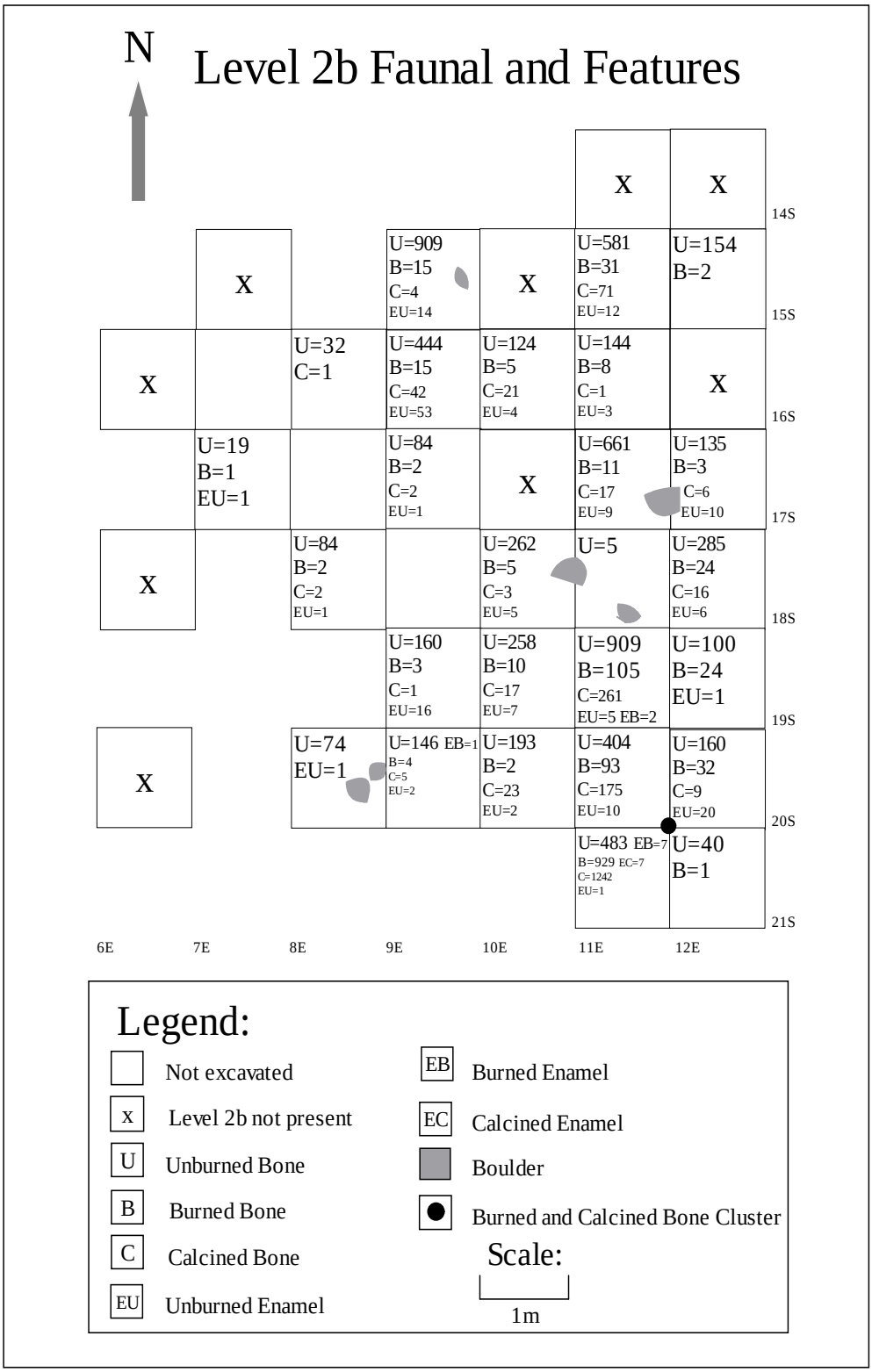

Figure 6.14: Faunal Distribution and Features in Level 2b

6.6 Summary

Diagnostic artifacts recovered from Occupation Level 2a are consistent with a Duncan/Hanna habitation level. The radiocarbon age obtained has confirmed this association. Consistently, local lithic materials were depended upon, although some materials would have been transported to the site by means of contact with other cultural populations or collection during seasonal rounds. Bison is the largest source of recognizable subsistence, constituting a minimum of three individuals. Also present is one large-size canid of undefined utility. Insufficient data were recovered to determine the seasonality of the Level 2a campsite.

Level 2b has been identified as a habitation site because of the associated artifact assemblage. Artifact recovery contains information indicating the probable seasonality. The presence of one avian specimen, consistent in size with a gull (*Larus sp.*), suggests a seasonal occupancy of anywhere between late spring and late summer. In addition to the bird specimen, a minimum of three bison and one canid were also identified. Material compositions are primarily restricted to local quarries. A submitted radiocarbon sample established an age associated with the Oxbow complex. Interpretation of the associated projectile points is evidence to support this age.

Chapter 7

Occupation Level 3 (3a, 3b) Assemblage

7.1 Introduction

Occupation Level 3 is a rich layer embedded immediately superior to and within a consistent layer of large gravel. The separation of this level is much less extensive than either Level 1 or Level 2. A total of 27 units are exclusively Level 3 while only three units are divisible into two separate occupations. In addition, unit #19S12E and unit #21S12E are only partially separable into two occupations, resulting in an overlap of level classifications. The complete separation of levels was restricted to the southeast boundary of the Dog Child site. This is consistent with the mottled compositions of the western boundary of the site and the persistent clarity of levels in the eastern units. This separation can be seen in Figure 7.1. Distinguishing artifacts in Level 3a suggests a Mummy Cave or transition Oxbow/Mummy Cave occupation, corroborated by the radiocarbon assessment calibrated to 5.31 ± 0.05 ka BP (BGS 2662, Table 3.2). Excavation of Level 3b also suggests a Mummy Cave series occupation containing a significantly larger artifact assemblage. Again, the absolute age obtained (5.53 ± 0.05 ka BP; BGS 2663, Table 3.2) confirms this early occupation. Each level was interpreted based on lithic and faunal remains.

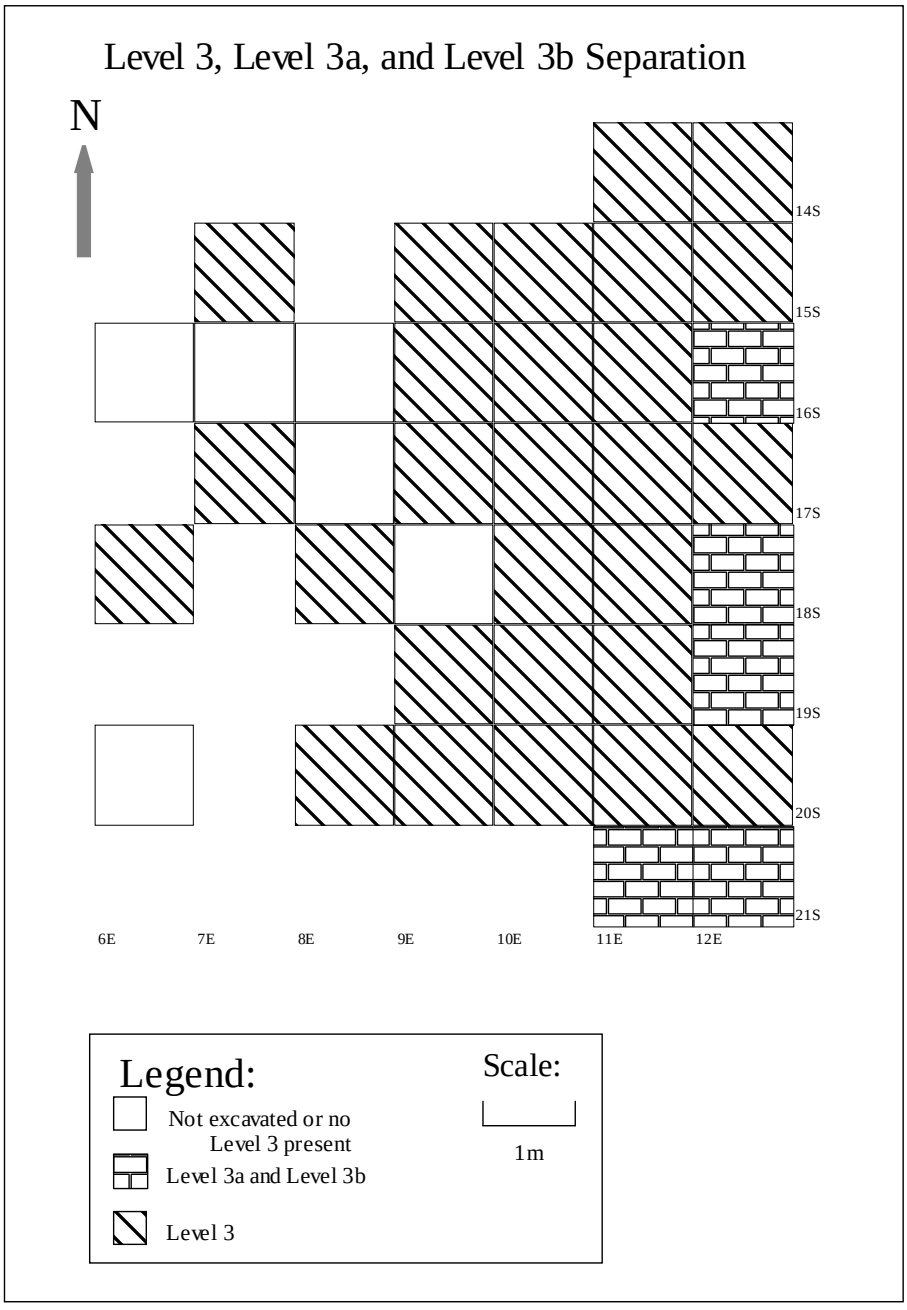

Figure 7.1: Separation of Level 3a and Level 3b Occupations

7.2 Lithic Assemblage

7.2.1 Debitage

Lithic debitage in Level 3, Level 3a, and Level 3b continues to reflect a dependence on local acquisition. The debitage remains in Level 3 are represented by 2614 flakes and shatter fragments (Table 7.1). A predominant 59.8% of the sample (1562 pieces) is Swan River chert (64.3% of which has been heat-treated). Ranking a close second and third most common are quartz (14.5%) and quartzite (13.4%). As expressed in Table 7.1, the remaining 12.3% of the assemblage is composed of 15 different lithic materials. The majority of the debitage (73.5%) is shatter while 22.7% is secondary flakes. Minimal amounts of tertiary flakes (3.4%) and primary flakes (0.4%) are present.

Table 7.1: Occupation Level 3 Debitage Counts

Material	Shatter	Primary Flake	Secondary Flake	Tertiary Flake	Total	Percent (%)
Swan River Chert	1125	5	364	68	1562	59.8
Quartz	294	1	73	10	378	14.5
Quartzite	273	3	72	3	351	13.4
Chert	101	2	37	6	146	5.5
Chalcedony	20	0	10	2	32	1.2
Silicified Peat	25	0	7	0	32	1.2
Silicified Wood	26	0	1	0	27	1.0
Limestone Chert	15	0	7	0	22	0.8
Gronlid Siltstone	11	0	8	1	20	0.8
Knife River Flint	13	0	6	0	19	0.7
Silicified Siltstone	6	0	1	0	7	0.3
Sandstone	4	0	1	0	5	0.2
Jasper	3	0	0	0	3	0.1
Fused Shale	0	0	3	0	3	0.1
Cathead Chert	1	0	2	0	3	0.1
Basalt	2	0	0	0	2	0.1
Feldspathic Siltstone	1	0	0	0	1	0.04
Argillite	1	0	0	0	1	0.04
Total	1921	11	592	90	2614	100%
Percent (%)	73.5	0.4	22.7	3.4	100%	

The debitage assemblage collected from Level 3 is significantly larger than that of Level 3a or Level 3b and similarly larger than Level 1 or Level 2. This is due to

the general lack of separation of the two unique occupations, creating a problematic analysis. After analysis, only 59 pieces of shatter and flakes could be associated exclusively with Level 3a (Table 7.2). Cataloguing of the debitage revealed that 67.8% (40 pieces) of the sample is composed of Swan River chert. A total of 82.5% of this Swan River chert sample has been heat-altered. Quartz is the second most common material, representing 10.2% of the sample. The remaining sample is composed of four material types. A total of 76.3% of the debitage is shatter, 22.0% is secondary flakes, and 1.7% is tertiary flakes. No primary flakes were excavated from Level 3a.

Table 7.2: Occupation Level 3a Debitage Counts

Material	Shatter	Primary Flake	Secondary Flake	Tertiary Flake	Total	Percent (%)
Swan River Chert	32	0	7	1	40	67.8
Quartz	4	0	2	0	6	10.2
Quartzite	4	0	1	0	5	8.5
Chert	3	0	2	0	5	8.5
Chalcedony	1	0	1	0	2	3.4
Gronlid Siltstone	1	0	0	0	1	1.6
Total	45	0	13	1	59	100%
Percent (%)	76.3	0.0	22.0	1.7	100%	

The Level 3b debitage assemblage consists of a total of 893 flakes and pieces of shatter. Swan River chert constitutes 50.2% (448 pieces) of the sample (88.2% heat-treated). Quartz is the second most common material, represented by 240 pieces (26.9%) while quartzite is third most common with 122 pieces (13.7%) associated. The remainder, 9.2%, is composed of nine various lithic material (Table 7.3). Consistent with Level 3, 70.9% of the debitage are shatter, while 24.2% are secondary flakes. A minimal 4.5% are tertiary flakes and barely expressed are primary flakes, representing only 0.4% of the sample.

Table 7.3: Occupation Level 3a Debitage Counts

Material	Shatter	Primary Flake	Secondary Flake	Tertiary Flake	Total	Percent (%)
Swan River Chert	316	1	109	22	448	50.2
Quartz	170	1	59	10	240	26.9
Quartzite	91	1	29	1	122	13.7
Chert	20	1	13	2	36	4.0
Silicified Wood	14	0	0	0	14	1.6
Knife River Flint	7	0	3	3	13	1.5
Silicified Peat	7	0	2	1	10	1.1
Chalcedony	4	0	1	1	6	0.7
Fused Shale	1	0	0	0	1	0.1
Limestone Chert	1	0	0	0	1	0.1
Silicified Siltstone	1	0	0	0	1	0.1
Gronlid Siltstone	1	0	0	0	1	0.1
Total	633	4	216	40	893	100%
Percent (%)	70.9	0.4	24.2	4.5	100%	

7.2.2 Cores and Core Fragments

Occupation Level 3 revealed at total of 20 cores and core fragments: seven Swan River chert, five quartz, four quartzite, three chert, and one chalcedony (Table 7.4). All except five of the cores are platform cores. Swan River chert, the most common material, is heat-treated in four out of seven cases. Five display high levels of flaking and have been reduced considerably. The two larger cores possess multiple platforms with several flake scars evident. Of the five quartz cores, two have similarly been greatly reduced, while the remaining three ovoid specimens still maintain a high degree of flaking potential. This is also the case of the quartzite cores as well as the chalcedony core fragment. The two grey and one brown chert cores are also small. Two still retain a large amount of cortex, suggesting that they were small pebbles.

Table 7.4: Level 3 Cores and Core Fragments

Specimen	Material	Mass (g)	Type
1	Swan River Chert	187.6	Platform
2	Swan River Chert	175.9	Platform
3	Swan River Chert	12.4	Bipolar
4	Swan River Chert	11.6	Platform
5	Swan River Chert	7.3	Bipolar
6	Swan River Chert	5.9	Platform
7	Swan River Chert	5.3	Platform
8	Chert	19.0	Platform
9	Chert	6.2	Platform
10	Chert	5.9	Bipolar
11	Quartz	31.8	Platform
12	Quartz	20.8	Platform
13	Quartz	17.0	Platform
14	Quartz	2.9	Bipolar
15	Quartz	2.9	Bipolar
16	Quartzite	342.0	Platform
17	Quartzite	118.4	Platform
18	Quartzite	90.9	Platform
19	Quartzite	52.1	Platform
20	Chalcedony	22.8	Platform

Only two cores were recovered from Occupation Level 3a. One was composed of quartz, the other of quartzite (Table 7.5). Both are platform cores. The ovoid quartz core possesses multiple flake scars originating from one of two striking platforms. The quartzite core has few exploratory flake scars and is in an early stage of reduction.

Table 7.5: Level 3a Cores and Core Fragments

Specimen	Material	Mass (g)	Type
1	Quartz	55.9	Platform
2	Quartzite	967.2	Platform

Seven cores and fragments were revealed in Level 3b: four Swan River chert, two chert, and one quartz (Table 7.6). Three are bipolar cores. Of the four Swan River chert cores, three have been heat-treated. All have been greatly reduced, exhibiting multiple flake scars. Regarding the chert cores, the grey specimen is greatly reduced while the mottled red specimen exhibits a significant amount of

cortex. Multiple flake scars crater it. The quartz core also exhibits multiple flake scars with multiple platforms present.

Table 7.6: Level 3b Cores and Core Fragments

Specimen	Material	Mass (g)	Type
1	Swan River Chert	32.9	Platform
2	Swan River Chert	19.6	Platform
3	Swan River Chert	7.6	Platform
4	Swan River Chert	7.6	Bipolar
5	Chert	68.7	Platform
6	Chert	3.7	Bipolar
7	Quartz	52.6	Bipolar

7.2.3 Flaked Stone Tools

Due to the minimal separation of Level 3a from Level 3b, there are few flaked tools that can be directly associated with either occupation. In total, 13 flaked stone implements have been identified that relate to the inclusive Level 3. Six of these are unifaces, two are bifaces, and five are projectile points. Two projectile points are associated directly with Level 3a and four are directly associated with Level 3b. Level 3a contains one miscellaneous tool and Level 3b contains one unifacial tool.

Unifacial Tools

All but one of the unifacial tools recovered from the third occupation are specifically from Level 3. In total, there are six identified unifaces in Level 3 (Table 7.7; Fig. 7.2). Four of these are end scrapers, the fifth is an end and side scraper, and the sixth is a utilized flake. The end scrapers are composed of a black silicified siltstone pebble (Fig. 7.2, **e**), grey chert (Fig. 7.2, **c**), and heat-treated Swan River chert (Fig. 7.2, **a** and **d**). Three are ovoid but the fourth (Swan River chert) is broken and therefore its shape cannot be determined. The end and side scraper is flaked on its distal and left margins. It is also composed of heat-treated Swan River chert and is rectangular in shape (Tool **b**, Fig. 7.2). The final unifacially-flaked

tool is also rectangular in shape and has been flaked on all four margins (Fig. 7.2, **f**). Composed of heat-treated Swan River chert, it may be a knife.

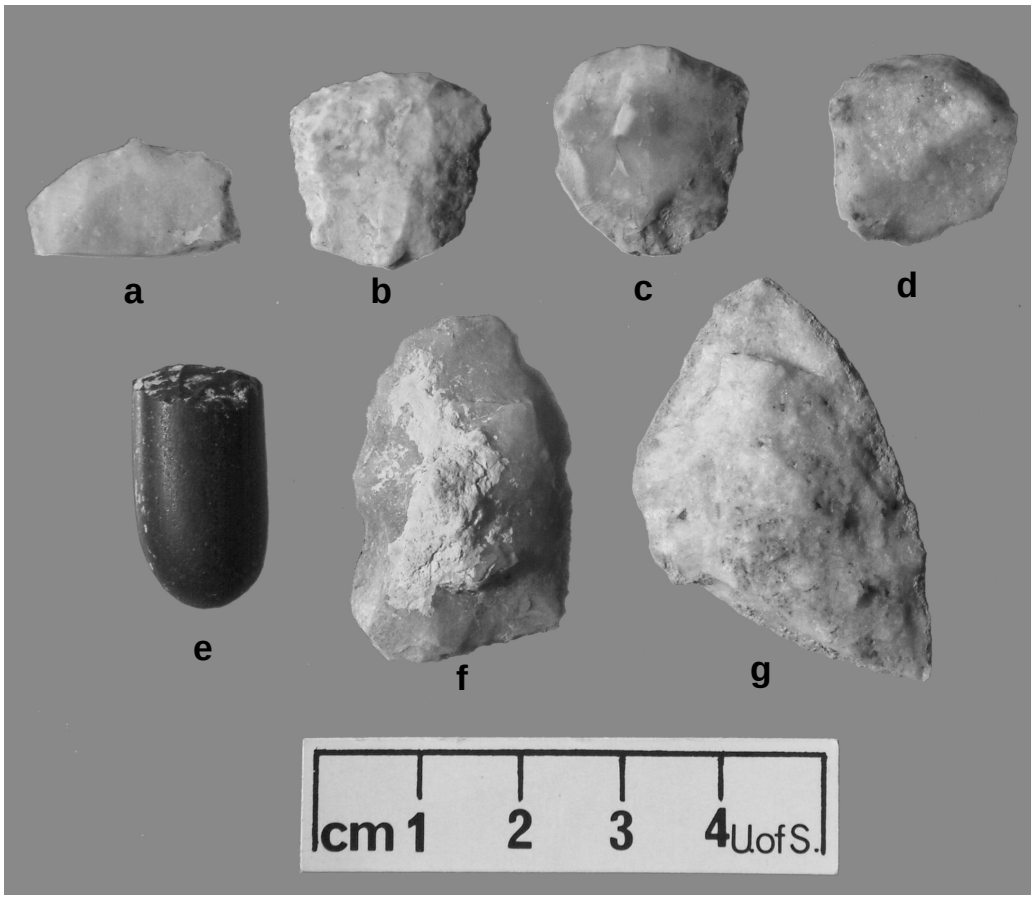

Figure 7.2: Unifacial and Bifacial tools from Level 3

Table 7.7: Level 3 Unifacial Tools (S.R. Chert refers to Swan River chert)

Specimen	Lev.	Material	Type of Uniface	Width of Working Edge (mm)	Max. Length (mm)	Max. Thickness (mm)	Working Edge Angle (°)	Mass (g)
1	3	S.R. Chert (heat treated)	left side and end scraper	left=13.20 end=19.70	19.65	4.10	left=70 end=60	2.1
2	3	S.R. Chert (heat treated)	end scraper (broken)	20.45	n/a	5.20	50	1.4
3	3	S.R. Chert (heat treated)	end scraper	19.95	18.65	5.45	70	2.2
4	3	Grey Chert	end scraper	18.90	21.10	7.25	55	3.2
5	3	Silicified Siltstone	end scraper	12.80	23.80	6.90	70	3.3
6	3	S.R. Chert (heat treated)	retouched flake (4 edges)	left=31.45 right=31.15 distal=11.95 prox.=17.15	33.70	9.75	left=40 right=40 distal=40 prox.=40	7.0
7	3b	Quartzite	reversed end scraper	52.45	59.80	29.80	70	118.6

In Level 3b, one uniface has been recovered (Table 7.7; Fig. 7.3). It is a large, quartzite, reverse uniface that has been flaked from a primary decortication flake. This morphological style has been associated primarily but not exclusively with Mummy Cave occupations. Similar items have been recovered from the Gowen sites (Walker 1992), the Below Forks site (Kasstan 2004), and other Middle Period occupations. Their characteristics will be discussed in Chapter 8.

Bifacial Tools

Analysis of Occupation Level 3 recoveries revealed two bifacially-flaked lithics (Table 7.8). Both are broken. The heat-treated Swan River chert symmetrical knife is triangular and has broken transversely. The biface composed of silicified peat is irregular-shaped and its use is speculative. Two bifacially-flaked margins remain on the specimen.

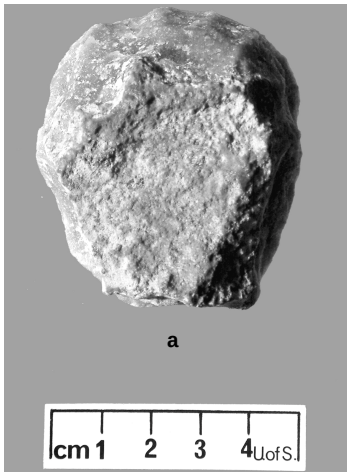

Figure 7.3: Reverse Uniface from Level 3b

Table 7.8: Level 3 and Level 3b Bifacial Tools (S.R. Chert refers to Swan River chert)

Specimen	Lev.	Material	Type of Biface	Max. Width (mm)	Max. Length (mm)	Max. Thickness (mm)	Mass (g)	Number of Flaked Edges
1	3	S.R. Chert (heat treated)	knife (broken)	n/a	n/a	8.35	8.7	2 known
2	3	Silicified Peat (heat treated)	broken	31.05	n/a	5.75	4.7	2 known

Projectile Points

Five projectile points were recovered in Level 3 excavations: four of which are Gowen points and one is only classifiable as an Early Side-Notched point (Table 7.9; Fig. 7.4). These four Mummy Cave points are sub-classified as Gowen Side-Notched points because they are typical of a morphology described by Walker (1992:44) in that they exhibit convex lateral margins, biconvex cross-sections, and pronounced basal grinding. The Early Side-Notched point is classified as such because it is missing its basal area beneath its notches (Fig. 7.4, **a**). The similarities between its body and the bodies of the Gowen points are apparent. However, without a complete base, this cannot be confirmed. Three of the Gowen points are composed of heat-treated Swan River chert (Fig. 7.4, **b-d**) and the

fourth is of silicified peat (Fig. 7.4, **e**). One of the Swan River chert points is complete while the remaining two have snapped transversely (Specimen **2**, Table 7.9) and obliquely (Specimen **3**, Table 7.9 found in 2006, unit #2S11E). The silicified peat point is complete, barring the extreme tip, and is coated in the typical calcium carbonate solution present on all materials in the vicinity of the gravel layer, immediately inferior to Level 3. The Early Side-Notched point is composed of heat-treated Swan River chert. These projectiles may be transitional Oxbow/Mummy Cave points based on stylistic characteristics currently undergoing analysis (Walker personal communication: August 24, 2006). This classification is tentative pending further investigation.

Table 7.9: Level 3, Level 3a and Level 3b Projectile Point Dimensions (S.R. Chert refers to Swan River chert)

Specimen	Lev.	Material	Projectile Form	Max. Length (mm)	Max. Body Width (mm)	Max. Stem Width (mm)	Inter-notch Width (mm)	Max. Thickness (mm)	Mass (g)
1	3	S.R. Chert (heat treated)	Mummy Cave	30.20	18.10	14.90	13.65	5.60	3.1
2	3	S.R. Chert (heat treated)	Mummy Cave	n/a	16.65	13.40	11.25	4.10	1.5
3	3	S.R. Chert (heat treated)	Early S-N	n/a	16.25	n/a	11.70	4.70	1.9
4	3	S.R. Chert (heat treated)	Mummy Cave	n/a	17.20	13.10	12.00	5.70	2.4
5	3	Silicified Peat	Mummy Cave	23.40	19.55	17.90	15.25	6.50	3.1
6	3a	S.R. Chert (heat treated)	Mummy Cave	n/a	18.00	15.25	13.00	6.50	3.6
7	3a	Silicified Peat	Mummy Cave	22.15	15.75	15.25	12.80	6.50	2.0
8	3b	S.R. Chert (heat treated)	Mummy Cave	n/a	21.20	n/a	n/a	5.40	2.9
9	3b	Pink and Grey Chert	Mummy Cave	n/a	19.75	13.50	12.05	5.95	1.6
10	3b	Silicified Sandstone	Mummy Cave	23.40	20.30	17.75	15.70	5.15	3.0
11	3b	Gronlid Siltstone	Mummy Cave	26.45	16.05	12.40	11.55	5.10	1.5

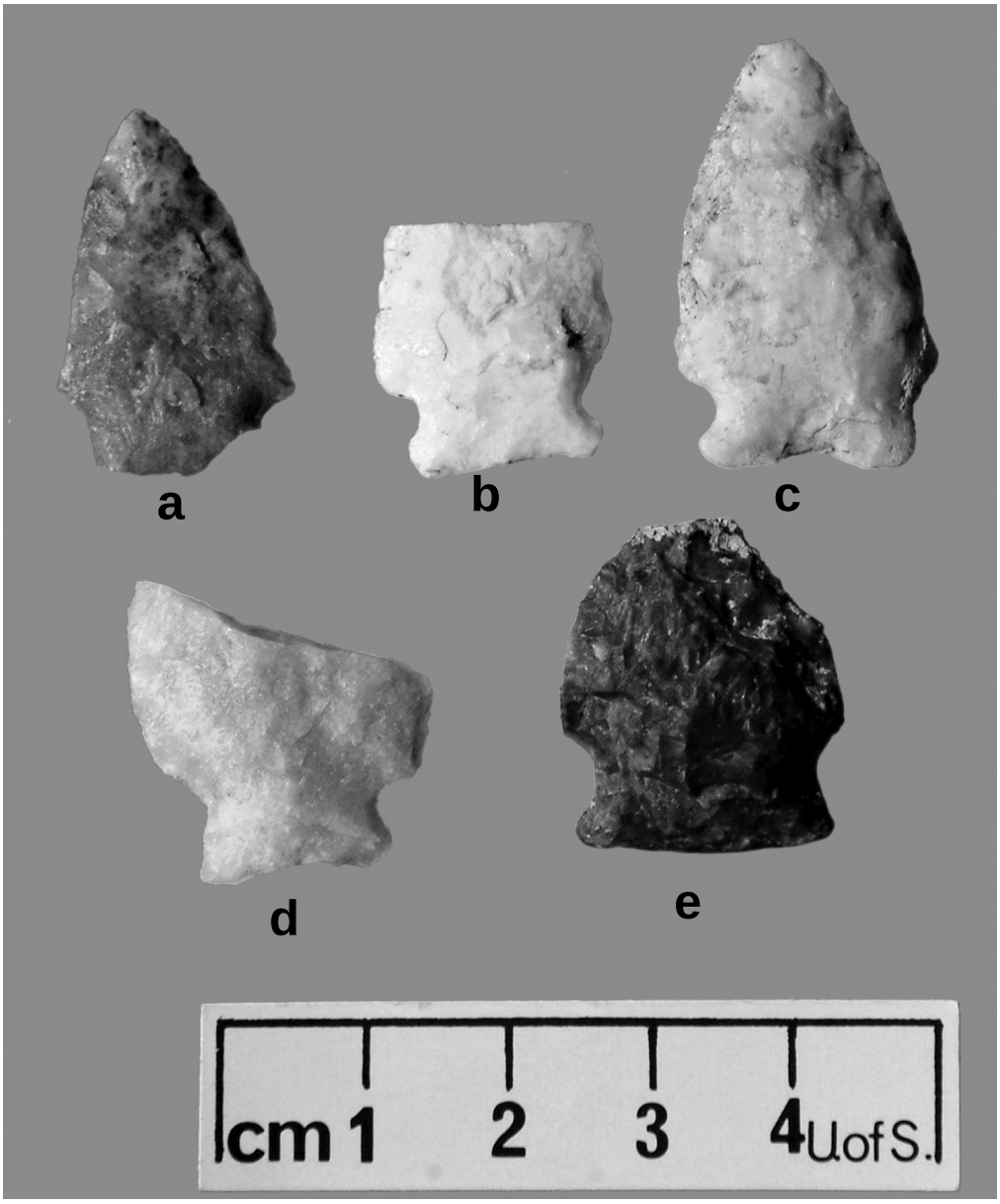

Figure 7.4: Projectile Points from Level 3

Two projectile points were recovered from Level 3a (Table 7.9; Fig. 7.5). Both are stylistically consistent with Gowen Side-Notched points. A complete point composed of silicified peat was recovered from unit #22S13E in the 2006 season (Point **b**, Fig. 7.5) and an almost complete (missing its tip) heat-treated Swan River chert point was recovered only centimetres away during the same

season from unit #21S13E (Point **a**, Fig. 7.5).

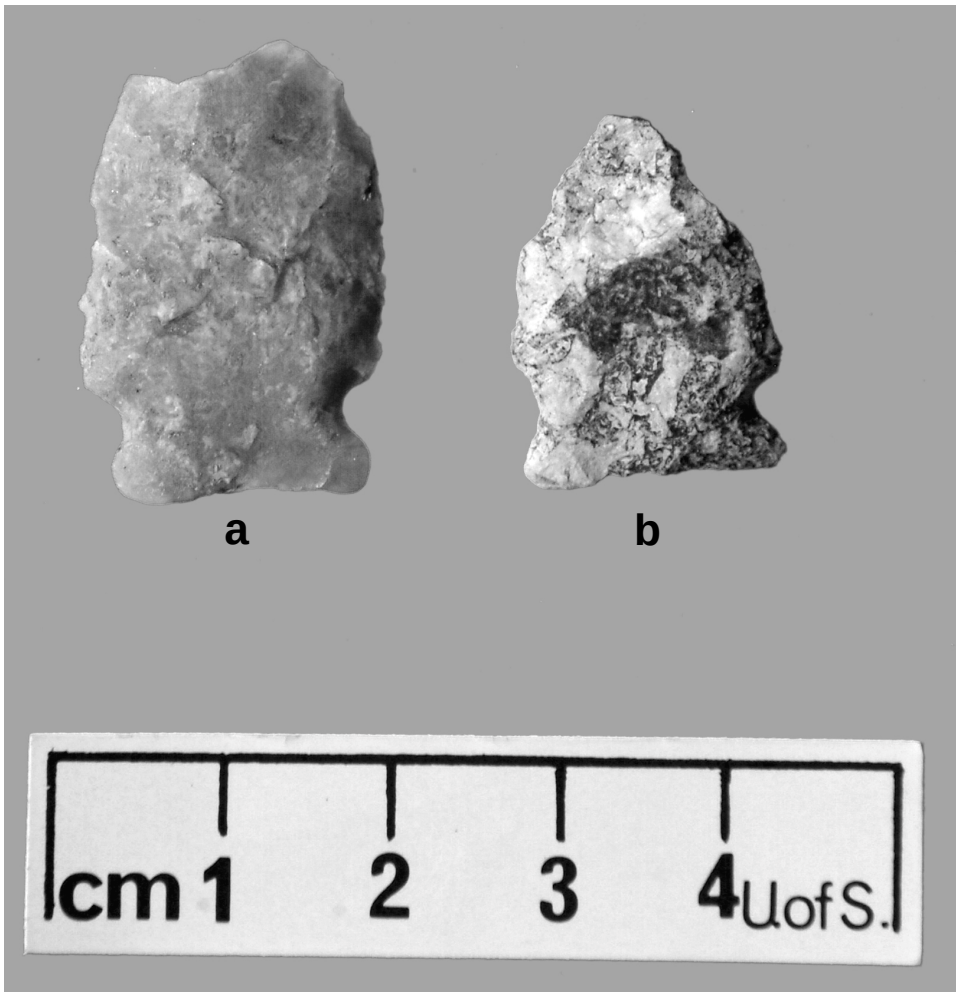

Figure 7.5: Projectile Points from Level 3a

Four diagnostic projectile points were recovered from Level 3b (Table 7.9, Fig. 7.6). All are described as Mummy Cave Gowen points. Two points (Specimens **10** and **11**, Table 7.9) are complete except for the extreme tips of both. One (Specimen **10**, Table 7.9; Fig. 7.6, **a**) is composed of silicified sandstone. The other is composed of a coarse, grey material similar to the cortex of Gronlid siltstone (Fig. 7.6, **b**). The remaining two points in Level 3b (Specimens **8** and **9**, Table 7.9; Fig. 7.6, **d** and **c** respectively) have been broken transversely along their bodies and in the case of Specimen **8**, one of the notches has broken off as well.

These two latter points were recovered in 2006.

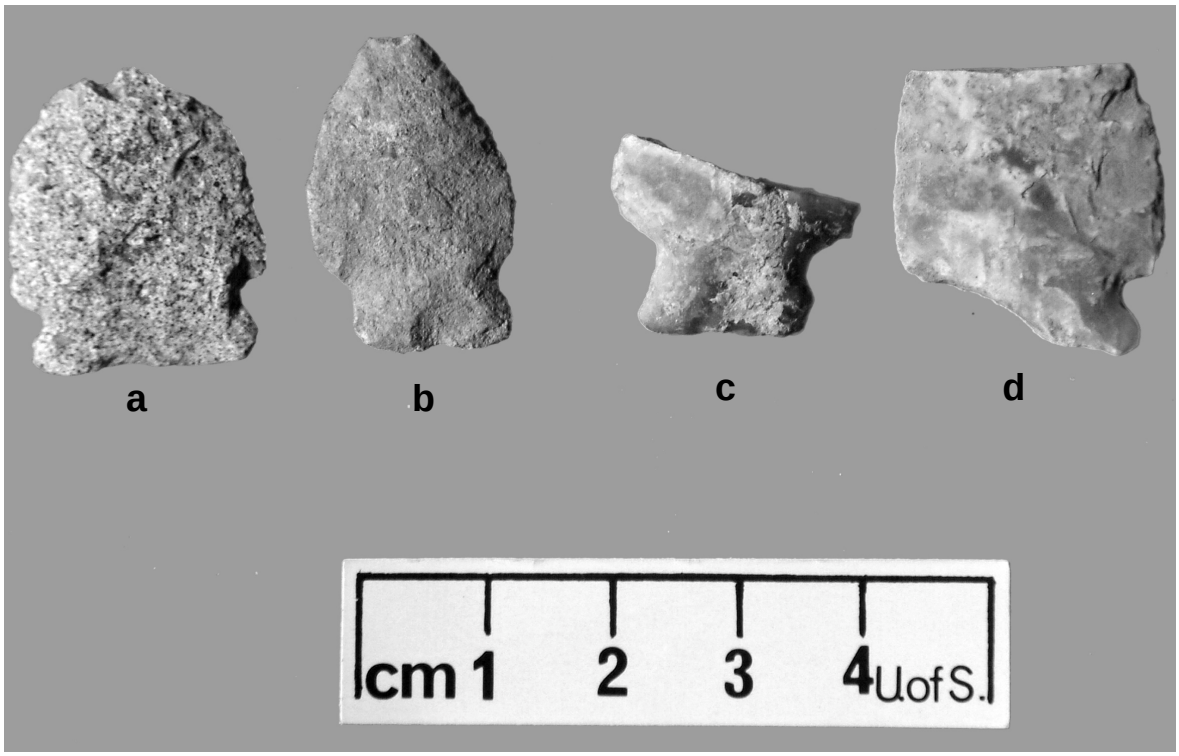

Figure 7.6: Projectile Points from Level 3b

7.2.4 Miscellaneous Stone Tools

To date, only one miscellaneous stone tool has been recorded from any Level 3 occupation unit at the Dog Child site. This tool, recovered in 2006, is a large hammerstone which was excavated from Level 3a (Table 7.10; Fig. 7.7, **a**). It is a round cobble with two distinct regions of pecking evident on one of its margins.

Table 7.10: Level 3a Miscellaneous Tool

Specimen	Level	Material	Type of Tool	Mass (g)
1	3a	Granite	hammerstone	623.7

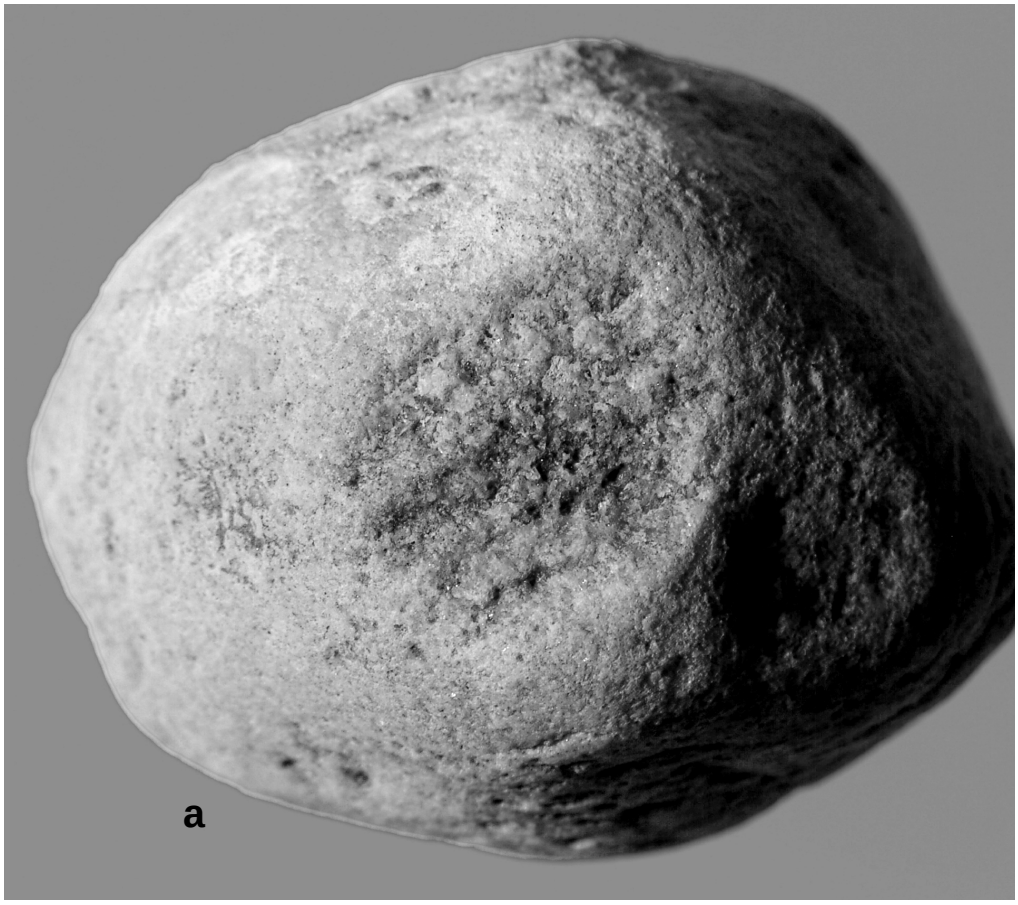

Figure 7.7: Hammerstone from Level 3a

7.2.5 Fire-Cracked and Fire-Broken Rock

A total fire-altered rock mass of 3165.3 g was recognized through excavation of Occupation Level 3 (Table 7.11). There are 26 fragments, 23 of which are composed of granite which account for 93.8% of the sample by mass. In Level 3a, only two fire-altered rocks were identified. Both are granite, equalling 286.4 g. In Level 3b, there is a slightly larger amount of fire-cracked and fire-broken rock than in Level 3a. Six pieces were recorded, totalling 654.7 g. Granite is consistently the most common material, accounting for 64.6% of the assemblage.

Thorough examination of fire-altered materials from Level 3, Level 3a, and Level 3b has not indicated the presence of any clusters. This is not to say that a

hearth or pit is not in the vicinity of the site. However, none have been excavated as of yet and the apparently random scatter of fire-altered fragments cannot be explained.

Table 7.11: Level 3, Level 3a, and Level 3b Fire-Cracked Rock Counts

Level	Material	Count	Mass (g)	Percent by Mass (%)
3	Granite	23	2968.8	93.8
3	Argillite	1	171.7	5.4
3	Basalt	1	17.4	0.5
3	Sandstone	1	7.4	0.2
Level 3 Total		**26**	**3165.3**	**100%**
3a	Granite	2	286.4	100
Level 3a Total		**2**	**286.4**	**100%**
3b	Granite	2	422.9	64.6
3b	Quartzite	3	195.9	29.9
3b	Siltstone	1	35.9	5.5
Level 3b Total		**6**	**654.7**	**100%**

7.3 Vertebrate Faunal Assemblage

In Level 3, a total of 8183 faunal specimens, elements, and unidentifiable fragments were recovered with a combined mass of 7937.0 g (Table 7.12). Of this total, 69.2% by mass are unidentifiable fragments. Unburned bone is the most common faunal category by both number and mass, representing 93.7% of unidentifiable mass. The identifiable 30.8% specimens by mass are composed of 297 unburned bone, one burned bone, and 41 unburned enamel specimens. Evidence of butchering and root etching are present on the majority of the faunal assemblage. Furthermore, a layer of calcium carbonate is present on all of the faunal material, in some instances coating only the inferior surface of the artifact, but more often settling on all surfaces. Abrasion, mineralization, and gnawing are also present but in small quantities. The degree of weathering is almost entirely Stage 3 and Stage 4.

Table 7.12: Level 3 Faunal Counts

Faunal Type	Level 3				Level 3a				Level 3b			
	Id.	Mass (g)	Unid.	Mass (g)	Id.	Mass (g)	Unid.	Mass (g)	Id.	Mass (g)	Unid.	Mass (g)
Unburned Bone	297	2262.3	7107	5148.4	94	530.0	302	343.6	188	2166.7	1331	1775.9
Burned Bone	1	0.2	209	114.8	0	0.0	6	1.9	0	0.0	35	14.0
Calcined Bone	0	0.0	425	178.5	0	0.0	12	2.7	0	0.0	198	72.6
Unburned Enamel	41	178.2	102	54.1	2	71.4	8	3.9	43	118.6	20	11.4
Burned Enamel	0	0.0	1	0.5	0	0.0	0	0.0	0	0.0	1	<0.1
Total	339	2440.7	7844	5496.3	96	601.4	328	352.1	231	2285.3	1585	1873.9

When it can be separated, the faunal assemblage in Level 3a is significantly smaller than all of the other occupation levels. A total of 424 pieces were recovered with a collective mass of 953.5 g (Table 7.12). The majority of the material by mass is identifiable, representing 63.1% of the assemblage. This is almost entirely due to 96 unburned bone specimens and two unburned enamel specimens. Of the unidentifiable fragments, 97.6% of the mass is unburned bone. Calcium carbonate deposition, root etching, and dark soil staining are among the most common taphonomic events present on this assemblage. In addition, one bone contains evidence of sand abrasion and a second appears to have been eroded by water. Materials have been weathered to Stage 3 and Stage 4 predominantly.

A total of 1816 faunal pieces (4159.2 g) have been excavated from Level 3b. Calculation of the mass has determined that 54.9% of the material is identifiable, composed of unburned bone and unburned enamel. The majority of the unidentifiable fragments are unburned, representing 94.8% of this mass. Root etching, calcium carbonate sedimentation, and butchering evidence remain the most common taphonomic processes represented. As well, one bone contains the results of insect burrowing and another has been chewed by a medium-sized carnivore. Few samples contain evidence of erosion and exfoliation and even fewer are soil stained. Stage 2, Stage 3, and Stage 4 are all frequent degrees of weathering present on the assemblage. Because the majority of the bone has been extremely well-preserved, it is probable that a layer of sediment was deposited over the occupation within a relatively short period of time after abandonment.

7.3.1 Identified Species

Level 3

A total of 10 different individuals belonging to eight taxa have been identified through the analysis of Level 3. The affiliations of these faunal specimens with Level 3a and Level 3b cannot be determined. A minimum of three bison were recovered, including an immature individual. Tables B.10 and B.11 in Appendix B include a complete summary of the specimens included in this analysis. For both Level 3 and the two separable occupations a large amount of faunal material was identifiable to specimen but not to species. The specimens belong to very large mammals (SC6a) which includes bison. Also included in the assemblage are 12 specimens belonging to a minimum of one deer (*Odocoileus sp.*) as well as two canids (one wolf or large dog-sized and one coyote-sized), one red fox (*Vulpes vulpes*), one ground squirrel, an additional rodent, and one bird. The deer specimens are all left scapula fragments. Both white-tailed and mule deer are native to the park, preferring the river valley and parkland and in the case of mule deer, avoiding open grasslands (Banfield 1974:390 and 393). However, white-tailed deer are a relatively modern addition to the western Canadian Plains and an argument can be made that, because of the early age of Occupation Level 3, these specimens belong to a mule deer (*Odocoileus hemionus*). The wolf-sized mammal was identified based on the analysis of one upper left canine (two pieces) and one upper right canine (one piece) as well as a first phalange. An additional canid first phalange was also identified in the analysis. It is significantly smaller and suggests a coyote as the most probable source. Coyotes (*Canis latrans*) inhabit the boreal forest, parkland, river banks, and many other environments including the habitats that Wanuskewin provides (Banfield 1974:288). With reference to two specimens (a right third metatarsal and a right M_1) a minimum of one red fox has been identified. Red foxes are found in lower quantities in the area surrounding Saskatoon, frequenting lake and river environments and regions not densely vegetated (Banfield 1974:300). Additionally, one specimen belonging to the genus

Spermophilus and two specimens belonging, more generally, to the order Rodentia were recovered from the excavation. A proximal radius of a ground squirrel and two cranial fragments of a medium-sized rodent may belong to the same animal. Finally, one specimen - a humerus - was identified as belonging to a medium-sized bird. This humerus is compatible with the size of a ptarmigan or grouse (family Tetraonidae), found throughout woodlands and grasslands (Vanner 2004:107-109).

Table 7.13: Minimum Number of Individuals (MNI) represented in Level 3, Level 3a, and Level 3b (* includes immature animals)

Level	Vertebrate	Taxon	NISP	MNI (side)
	Mammals			
3	Bison	*Bison bison*	144	3*
3	Large Mammal (SC5a)	*Odocoileus sp.*	12	1
3	Large Mammal (SC5a)	*Canis sp.* (probable *C. lupus*)	4	1
3	Medium Mammal (SC4a)	*Canis sp.* (probable *C. latrans*)	1	1
3	Small-Medium Mammal (SC3a)	*Vulpes vulpes*	2	1
3	Ground Squirrel	*Spermophilus sp.*	1	1
3	Small Mammal (SC2a)	Rodentia	2	1
3a	Bison	*Bison bison*	84	1
3b	Bison	*Bison bison*	100	3*
3b	White-Tailed Jack Rabbit	*Lepus townsendii*	1	1
	Birds			
3	Medium Bird (SC4b)	Aves (probable Tetraonidae)	1	1
	Miscellaneous			
3	Very Large Mammal (SC6a)	Mammalia	124	n/a
3a	Very Large Mammal (SC6a)	Mammalia	3	n/a
3b	Very Large Mammal (SC6a)	Mammalia	20	n/a

Level 3a

Due to the minimal number of faunal materials recovered from Level 3a, individual specimens and MNI are low. A total of 84 bison specimens was identified, representing a minimum of one individual. A summation of faunal elements used in this analysis are included in Table B.12, Appendix B.

Level 3b

Specimens from two taxa were recovered from the 2004 and 2005 excavations of Level 3b, resulting in a minimum count of four individuals. At least three bison (one immature: Fig. 7.8) are represented based on the analysis of 100 specimens. A complete list of faunal landmarks is included in Table B.13, Appendix B. In addition, a minimum of one white-tailed jack rabbit (*Lepus townsendii*) is represented by a distal metapodial. This species frequents short-grass prairies near wild rose bushes, sagebrush, or willow brush but avoiding heavily wooded areas (Banfield 1974:90). Excavations during the 2006 field season revealed a continuing separation of Level 3a and Level 3b. Artifact recovery from Occupation Level 3b included numerous large and identifiable bone specimens. These specimens had not undergone intense processing for the complete extraction of grease and marrow as is expected at habitation sites. The potential significance of this heavily-littered, *in situ* Mummy Cave occupation has warranted the continuation of excavations at the Dog Child site in future seasons.

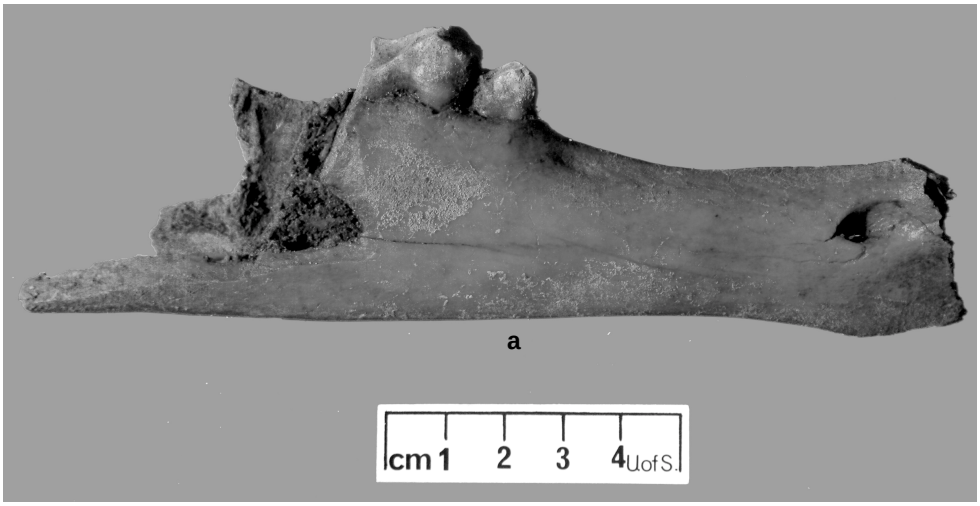

Figure 7.8: *B. bison* mandible from Level 3b (note the asymmetric wear pattern on p_3)

7.4 Seasonality

Materials recovered from the excavation of Level 3a and Level 3b include neither floral remains nor the bones of migrational avian species. Grouse and ptarmigan are present on the Northern Plains year-round and there is an insufficient collection of immature bison elements. As a result, seasonality of Level 3a and Level 3b cannot be determined.

7.5 Artifact Distribution and Features

Distributional analysis of Level 3 is more difficult than in previous occupations. Because the separation of Level 3a and Level 3b is very minimal, the artifacts of Level 3 cannot be clustered as easily and associated with either individual occupation. Lithic debitage is distributed throughout the excavated units of Level 3 with a focus in units #17S12E and #18S11E and in the northeastern section of Block 1 (Fig. 7.9). In Level 3a, the lithic assemblage is extremely small, with one unit (#21S12E) containing no lithic debitage (Fig. 7.10). The remains are much more concentrated in Level 3b, particularly in units #18S12E and #16S12E (Fig. 7.11). It is likely, therefore, that the majority of the lithic remains recovered from Level 3 are associated with Level 3b.

The lack of separation between Level 3a and Level 3b in the majority of the units of Block 1 will not only have an effect on the analysis of the lithic remains, but also the faunal materials as well as the features. Examination of the distribution of faunal remains suggests that the habitation surface was used as a disposal or processing area (Fig. 7.12). Only four of the 29 excavated Level 3 units contain less than 50 faunal fragments and specimens. The majority of the remaining 25 contain greater than 200 pieces. Two areas containing black, greasy soil were located; one in unit #15S10E and one in unit #20S11E. Both are associated with high densities of faunal materials. A minimum of 14 boulders were also mapped on the living surface of Level 3. Although it is possible that these

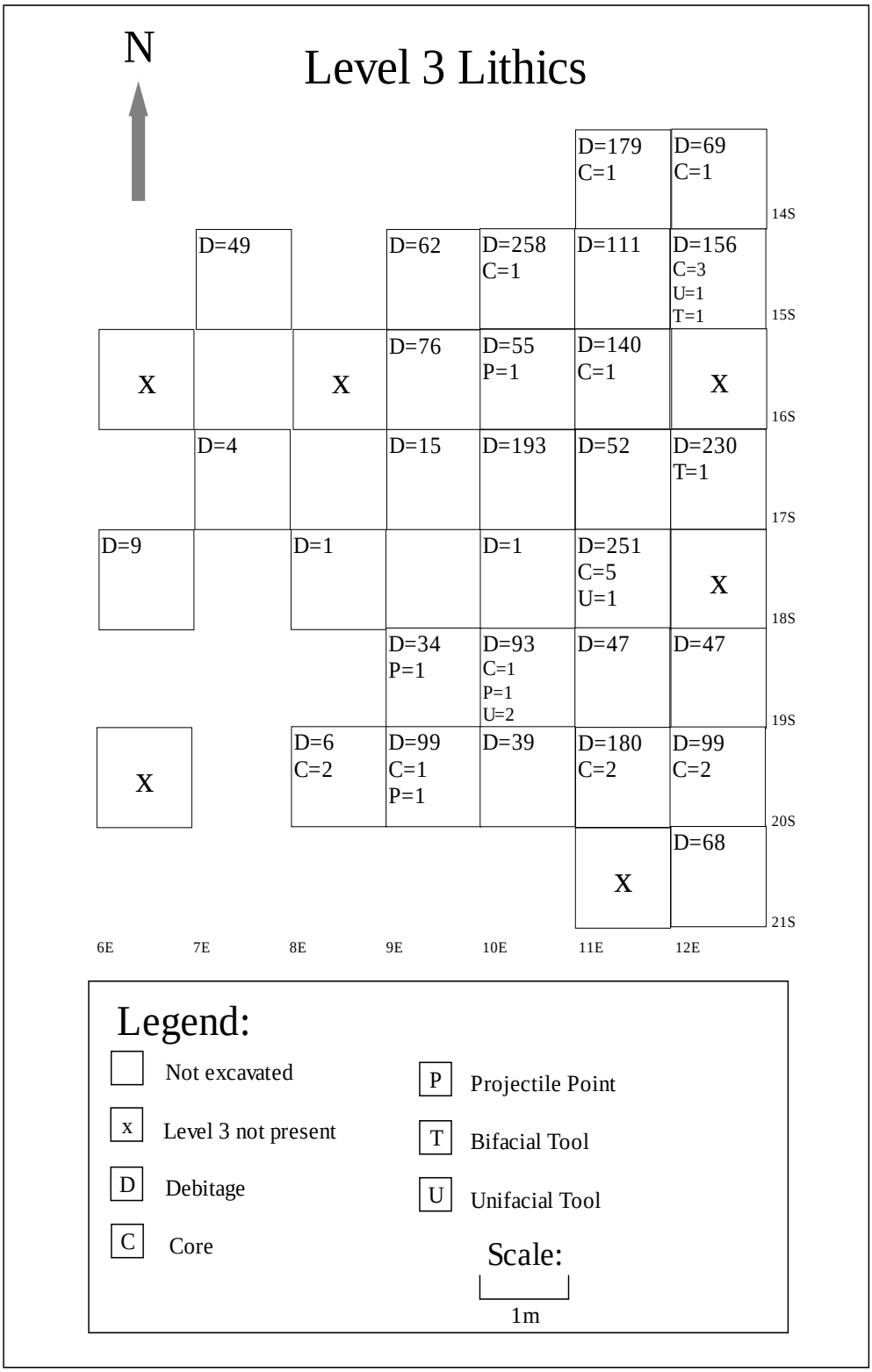

Figure 7.9: Lithic Distribution in Level 3

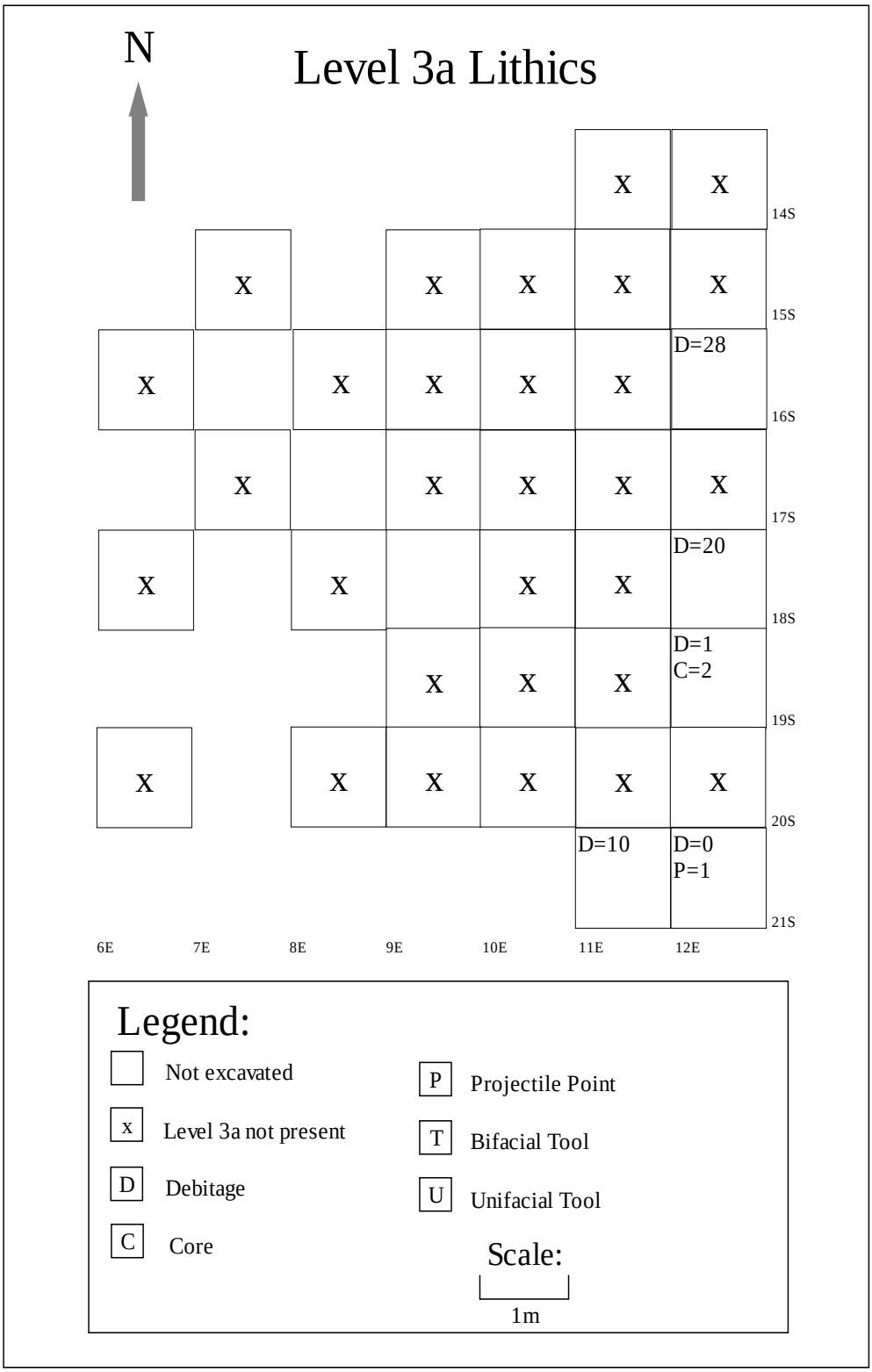

Figure 7.10: Lithic Distribution in Level 3a

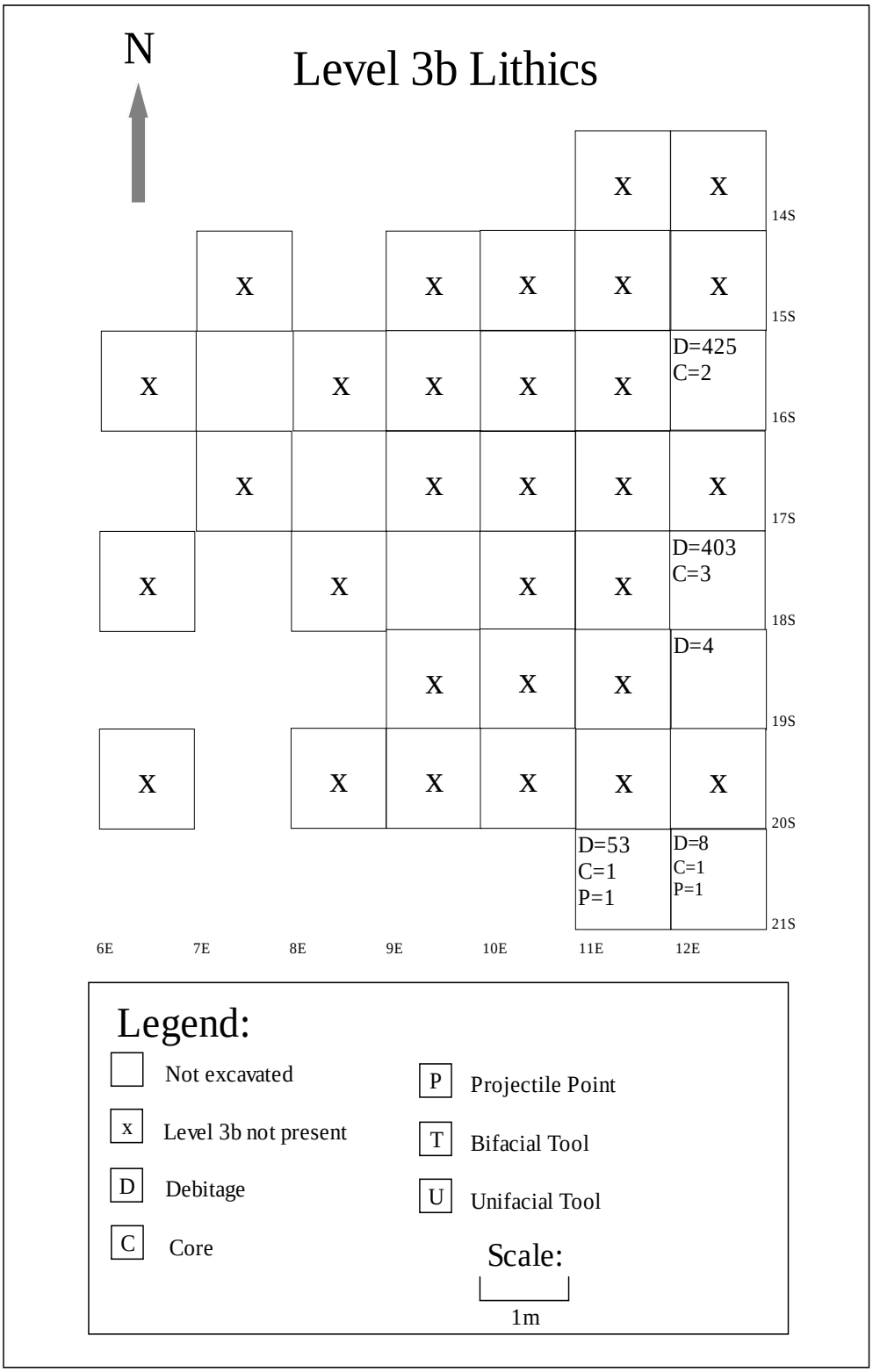

Figure 7.11: Lithic Distribution in Level 3b

had a cultural purpose, as the level was encased in a layer of large gravel and cobbles, these boulders were most likely deposited due to geological processes.

In Level 3a, faunal counts are low due to the lack of separation of the two occupations. Regardless, it would appear that two areas of high faunal frequency occur: the first in unit #18S12E, the second in unit #21S11E. One feature was identified in Level 3a (Fig. 7.13), a charcoal cluster in unit #18S12E associated with the concentration of bone, including burned and calcined bone.

Early excavations of Level 3b are also lacking large amounts of faunal remains due to the lack of separation. However, the five excavated units containing Level 3b faunal remains contained a significantly larger number than Level 3a (Fig. 7.14). These remains include many elements and specimens and the subsequent 2006 field season confirmed this observation. A bone bed containing large, unburned, identifiable bone is present in the southeast section of Block 1. Aside from this large bed, no other features could be recognized in the excavated units of Level 3b.

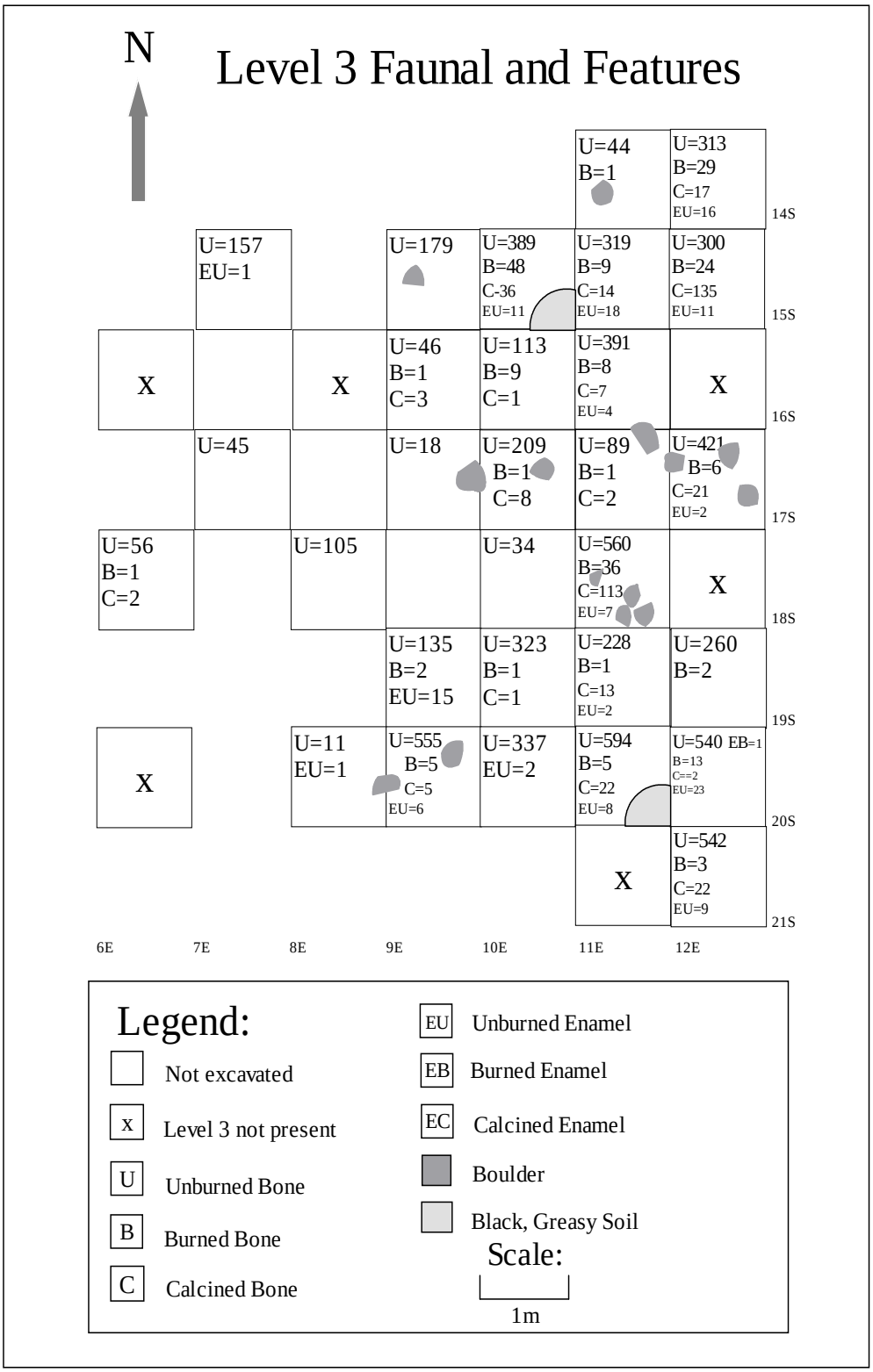

Figure 7.12: Faunal Distribution and Features in Level 3

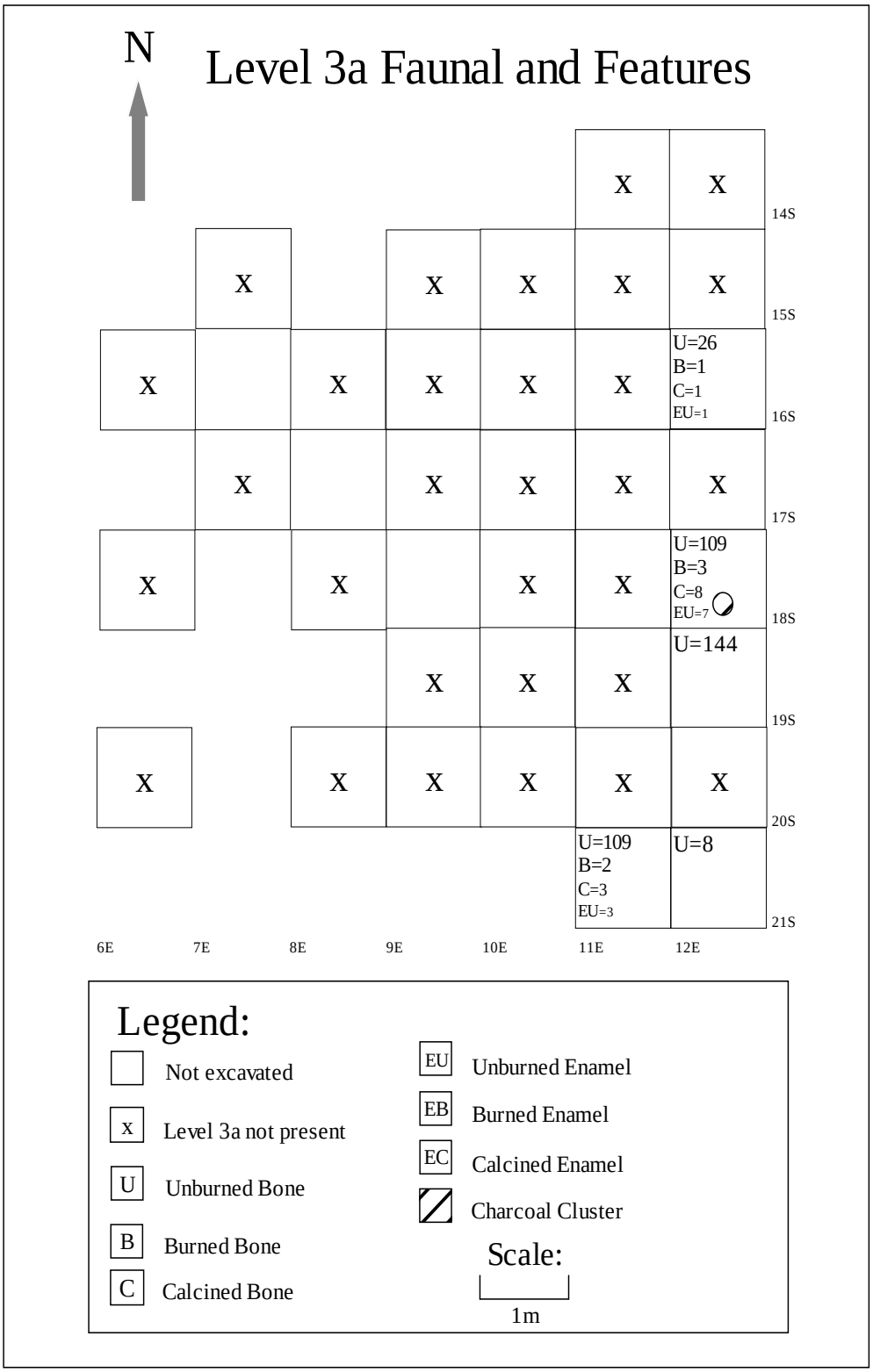

Figure 7.13: Faunal Distribution and Features in Level 3a

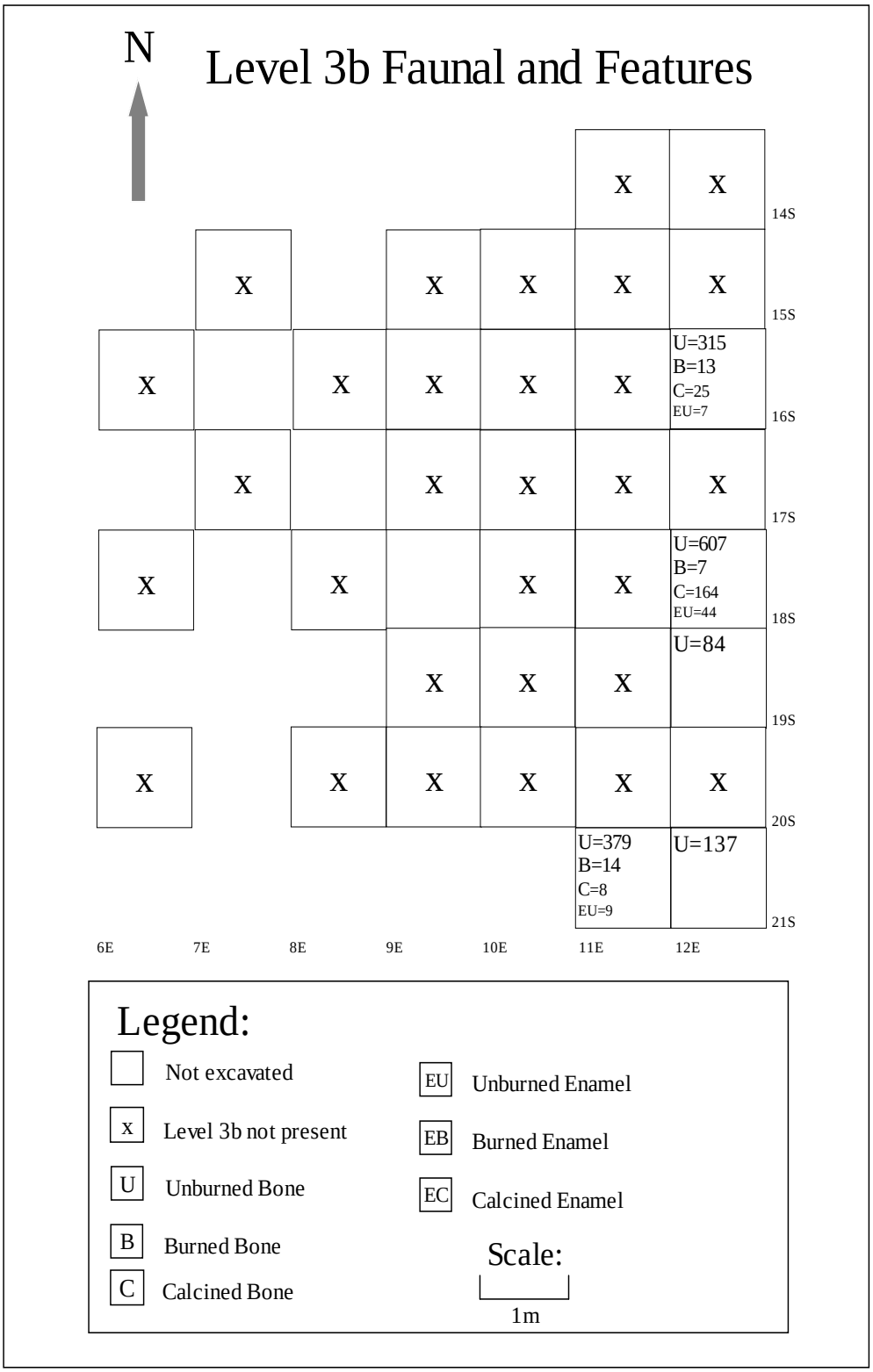

Figure 7.14: Faunal Distribution and Features in Level 3b

7.6 Summary

Level 3a contains a sparse assemblage. The artifact collection is consistent with that of a campsite. Projectile point morphology is that of the Mummy Cave series or transitional Oxbow/Mummy Cave complex. The few lithic flakes, debitage, and tools are primarily composed, once again, of materials found near the Dog Child site. A minimum of one bison individual is the extent of the identifiable faunal assemblage. An opportunity to determine seasonality has not presented itself from Occupation Level 3a.

The archaeological deposits present in Level 3b are extensive, more so than was anticipated thereby warranting supplementary research at the Dog Child site. The artifacts included in this assemblage are those consistent with a habitation site. Based on the style of the projectile points in conjunction with the radiocarbon age assessment, Level 3b is associated with a late Mummy Cave occupation. In totality, the excavated artifacts are primarily faunal remains, particularly when considered by mass. A minimum of three bison and one white-tailed jack rabbit have been identified through analysis. Based on the abundance of materials in Level 3b and apparent lack thereof in Level 3a, it can be inferred that the majority of faunal remains and species identified in the inseparable Level 3 are associated with Level 3b. The faunal remains include at least one deer (*Odocoileus sp.*), two canids, one fox, two rodents, and one grouse. The bone is well preserved, suggesting that only a short period of time elapsed before the layer was buried. The relatively complete and identifiable nature of a significant portion of the bone suggests that there was no need or time to collect more meat, grease, and marrow at the time of site abandonment. At present, the seasonality of these remains cannot be determined.

Chapter 8

The Mummy Cave Series Manifestation

8.1 Introduction

Research into the extent of occupation on the Northern Plains during the Mid-Holocene Climatic Optimum is an evolving study. The supposed abandonment of the Northern Plains as a result of an episodic increase in temperatures and decrease in precipitation (Bryson and Wendland 1967; Wendland 1978) is no longer an acceptable explanation. However, the Mid-Holocene Climatic Optimum did span a significant amount of the Plains temporal span (7.0 to 4.7 ka BP). Palaeoenvironmental indicators suggest that the grasslands had expanded north, possibly as much as 70 km beyond their current margins (Ritchie 1976). As a result of this shift in vegetation, animal ranges would have adapted as well. Mummy Cave populations would have had to modify their subsistence and seasonal rounds to these new conditions and seek refuge areas known to be productive through times of stress. The northern, eastern, and western fringes of the Plains may have provided larger amounts of resources at this time as would dependable water sources (Walker 1992:125; Hurt 1966). It is perhaps not a surprise then that many of the *in situ* Mummy Cave series occupations are situated on terraces adjacent to large, permanent water sources (Running 1995) and along the margins of the Rocky Mountain/Plains transition zones (Walker 1992:125). In the case of Saskatchewan, the majority of the sites have been located near the South Saskatchewan River and its tributaries.

It is clear, however, that Mummy Cave series archaeological sites are less common than later complexes. Were there truly very few Early Middle Period

occupations in the Northern Plains, or is it rather a matter of erosion or accumulation of alluvium resulting in either the levels being scantily redeposited or too deeply buried to locate? Reeves (1973) believes that this may be one of the answers to the apparent scarcity of archaeological deposits. He also postulated that it may be a matter of insufficient testing (Reeves 1973). Changing water courses or other geological factors may in fact distract the research from sampling regions that were previously viable but seemingly unappealing under modern inspection. Morlan (1993) has suggested that the "evolution of [the] modern landforms was somewhat delayed downstream along the Saskatchewan system and...modern geomorphology had not yet been achieved in central Saskatchewan by Mummy Cave time " (Morlan 1993:37). River courses have altered over the past 7000 years as have the shorelines of lakes (Schweger and Hickman 1989). As methodologies and technologies become more refined an increase in site recognition is likely to ensue. Geoarchaeological, geophysical, and palaeoenvironmental research are among the multiple disciplines necessary to expand on the understanding of this elusive period.

8.2 Identity of the Mummy Cave Series

The Mummy Cave series is named after its type site in Wyoming along the eastern Rocky Mountains (Husted and Edgar 2002). It was discovered in 1957 and systematically excavated from 1966 to 1969 (McCracken et al. 1978). Thirty-eight occupation levels were identified, the bottom occupations of which are now recognized as Mummy Cave. The period was initially identified as a complex by Reeves (1969, 1973 in Morlan 1993:37) when little information was known about the diversity of this cultural entity. However, based on the variable projectile styles and the long temporal span, the period is now referred to as a series (Dyck 1983:92). The side-notched projectile technology diagnostic of the Mummy Cave series developed in a relatively short period of time with a large spatial distribution (Walker 1992:131). Sites are distributed throughout the Great Plains, with an

increased density along the western margins near the foothills of the Rocky Mountains. Mummy Cave origins are believed to be affiliated with the eastern Plains Archaic tradition (Buchner 1980) through the examination of artifact assemblages that include both Early Side-Notched and lanceolate projectile points. Association with the western foothills has also been proposed because of collections with mixed projectile point technology (Vickers 1986).

8.2.1 Lithic Technology

The Mummy Cave series contains the earliest side-notched and corner-notched projectile points on the Northern Plains (Frison 1991:79-111; Reeves 1983:37). A total of five different stylistic variants of the Mummy Cave series projectile points have been identified to date. These include the Bitterroot (or Northern) Side-Notched (Reeves 1973), Gowen Side-Notched (Walker 1992), Mount Albion Corner-Notched (Benedict and Olson 1978), Blackwater Side-Notched (Gryba 1976), and Hawken Side-Notched point styles (Frison et al. 1976). The variety in projectile form suggests that regional variation played a significant role in the development of the series as did time (Walker 1992:132). The Blackwater variant is associated with radiocarbon ages earlier (7.6 to 7.2 ka BP) than other varieties of the series (Walker 1992:134). This is followed temporally by the Bitterroot (7.2 to 6.0 ka BP), Hawken (6.5 to 5.3 ka BP), Gowen (6.0 to 5.2 ka BP), and finally Mount Albion (5.7 into the Middle Middle Precontact period) variants. A general trend from south to north is seen through the dispersal of the Mummy Cave series over time with the exception of the Mount Albion corner-notched style (Walker 1992:133-41). The projectile points associated with the Dog Child site are primarily affiliated with the Gowen Side-Notched morphology. Gowen points exhibit round shoulders, wide and low notches, convex lateral edges, relative biconvex symmetry, and pronounced grinding on the basal margin (Walker 1992:44; Kooyman 2000:119). Classification of these forms is not as black and white as it may initially appear, however. As identifiable as the projectile styles of the Mummy Cave series may be, a problem continues in that points found on the

surface without archaeological context are difficult to distinguish between these types and some later side-notched types (Dyck 1983:92; Vickers 1986:63).

In addition to projectile point technology, several generalizations have been recognized pertaining to other lithic attributes. Lithic assemblages of Mummy Cave occupations generally include bifacial drills, chopping tools, hammerstones, *pièces esquillées*, and large bifaces including side-notched knives (Kooyman 2000:120). Also included are large unifaces, reversed unifaces, and end and side scrapers. Typically, local lithic materials including quartzite, Swan River chert, fused shale, other cherts, and argillite are gathered locally. So, too, are Knife River flint and exotic chert varieties (Dyck 1983:95), although with a much lower frequency. Through examination of the physical quality of lithic tools, including projectile points, it has been noted that after the close of the Early Precontact period, flaking patterns are not as structured. Kooyman (2000) notes that the tools are created by "percussion thinning and shaping followed by selective, non-patterned pressure shaping." This resulted in arguably aesthetically-poorer tools relative to the earlier flaking techniques.

8.2.2 Subsistence

Determining subsistence strategies during the Early Middle Period is an ongoing research concern. Many believe that bison continued to dominate the food resources of these nomadic populations (McMillan 1988:117; Linnamae et al. 1988:160; Reeves 1973). Reeves' research at Head-Smashed-In Buffalo Jump near Fort Macleod, Alberta has played a significant role in this interpretation (Reeves 1973; Reeves 1978). With the use of the atlatl, ground-based communal hunting was an efficient means of procurement. Jumps were also utilized when appropriate geomorphological features were accessible. A variety of other utilized genera have also been identified from archaeological sites, however, including other artiodactyls, wolf, dog, coyote, and rodents (Dyck 1983:95). At the Dog Child site, this list also includes fox, leporids, and birds. Based on the data recovered thus far, it would appear that there was a continuous reliance on bison with an expressed reliance on

alternative resources as well. The diversification of food resources during the Mummy Cave series period was necessary because of the shifting climate and floral and faunal resources. Foraging likely increased in intensity. Topographic relief (arroyos, jumps) was exploited when possible but, generally, populations relied on small-scale communal hunting (Walker 1992:130). Archaeological sites situated around permanent water courses such as the South Saskatchewan River would have been occupied not only because of the abundant water and vegetation, but also for the animals, including bison, that would have used these resources as well.

8.2.3 Site Activity Areas

The primary excavated sites affiliated with the Mummy Cave series have been habitations. Burial (Dunlap-McMurry:48NA67 in southcentral Wyoming (Ziemens et al. 1976)), kill and processing (Head-Smashed-In Buffalo Jump:DkPj-1 (Reeves 1978)), rock shelter (Beaver Creek Shelter:39CU779 in Hot Springs, South Dakota (Alex 1991)), quarry (Benz:32DU452 in westcentral North Dakota (Root and Ahler 1987)), and fishing station (Narrows:DjPp-11 in southwestern Alberta (Milne-Brumley 1971)) sites have been recorded, but with lower frequency (Walker 1992:128). The open campsites all appear to have been occupied for small durations, accounting for the paucity of animal frequencies.

8.3 Intersite Comparison

The Dog Child site contains two Mummy Cave occupations with separation apparent in pockets through the southeast section of the site. The 2004 and 2005 field seasons began to reveal the potential of this excavation, inducing future research. This discussion will compare the data recovered thus far to that from a number of Mummy Cave series sites within the Northern Plains to establish a more detailed cultural framework. It will include a comparison of data recovered from both the Gowen 1 (FaNq-25) and Gowen 2 (FaNq-32) sites as well as the Norby site (FbNp-56) and the Below Forks site (FhNg-25). These sites have been chosen due

to their proximity to the Dog Child site and the high degree of archaeological deposition and preservation at each. They have also been well analyzed and documented.

8.3.1 Gowen 1 Site (FaNq-25)

The Gowen 1 site is a Mummy Cave archaeological site located within the confines of Saskatoon, Saskatchewan. It was discovered in 1977 as a result of heavy equipment operations. To salvage the archaeological remains recognized at the site, it was promptly excavated by the Department of Anthropology and Archaeology at the University of Saskatchewan (Walker 1992:1). Extensive excavations uncovered this single-component site and diagnostic artifacts consistent with a Mummy Cave occupation. Five samples were submitted for radiocarbon aging. The ages all confirmed an Early Middle Period occupation with an average age of approximately 6.0 ka BP (Walker 1992:26). A total of 112 m^2 were excavated within the main excavation block of FaNq-25.

The lithic materials recovered were most often quartzites and cherts followed by silicified wood and chalcedony (Walker 1992:65). These lithics are by and large local materials. Core preparation and utilization was predominantly bipolar as evidenced by the presence of five anvils in association with several split chert pebbles.

The assemblage of flaked stone tools recovered from the Gowen 1 site is large (226 tools), in part because of the amount of area excavated. The assemblage includes a total of 23 projectile points, one preform, four hafted bifaces, 15 bifacial knives, 35 end and side scrapers, 11 unifaces, 23 gouges (reverse unifaces), two spokeshaves, nine perforators, and 88 other retouched flakes (Walker 1992:43-61). Gowen Side-Notched projectile point morphology was first defined through the examination of the points present at the Gowen sites. The diagnostic attributes are consistent with those of several projectile points recovered from the Dog Child site. At least one scraper in the assemblage resembles a quartzite scraper recovered from the Dog Child site in that it is approximately 6 cm long and has been sharpened by

removing cortex from the dorsal surface of a large decortication flake (refer to Fig. 7.3, **a**). There are multiple working edges on some of the remaining scrapers in this assemblage. No pecked or ground tools were identified in the assemblage, however, five anvils and 15 hammerstones were recovered (Walker 1992:61-3). Finally, 10 bone tools and five incised bones were identified (Walker 1992:67).

A minimum of five genera were identified in the Gowen 1 site faunal materials. These include a minimum of seven bison, one pronghorn, two wolves, two canids of unknown species (possible overlap with wolf), one Northern pocket gopher, and one crow (*Corvus brachyrhynchos*) (Walker 1992:97-9). All species were local and accessible during the Mummy Cave period. The bone is heavily fragmented, indicating an extensive degree of processing, including grease and marrow extraction. In addition, six carbonized seeds were recovered. They were identified as belonging to the family Chenopodiceae, possibly representing goosefoot or lamb's quarters (*Chenopodium album*) (Walker 1992:103). Based on these seeds as well as interpretation of wear patterns on bison molars, seasonality of the site is proposed as late summer or autumn (Walker 1992:103).

The Gowen 1 site is believed to have been a processing area, an interpretation supported by the presence of three hearths and four pit features (Walker 1992:110-5). As well, a large concentration of artifacts, including burned and unburned bone, stone tools, debitage, and fire-altered rock was identified in the south-central section of the excavated area. This may have been the central resource processing area while the remaining features represent areas of hide preparation and final faunal processing stages (Walker 1992:115).

8.3.2 Gowen 2 Site (FaNq-32)

The Gowen 2 site was identified three years after the excavation of the Gowen 1 site, and was located 70 m west (Walker 1992:1). A total of four samples were submitted for radiocarbon age determination, all confirming the date of approximately 6.0 ka BP obtained for the Gowen 1 site. The Gowen 2 locality was also extensively excavated, producing a larger single-component assemblage than

that of the previous site. Although a slightly smaller area (102 m^2) was excavated, a larger number of units excavated were directly associated with an area of dense occupation than those excavated at the Gowen 1 site.

Lithic materials associated with the Gowen 2 site are relatively equivalent to those of the Gowen 1 site (Walker 1992:91). It is believed that both areas were host to the same activities. Quartzite is again a major resource, as are silicified siltstone (chert) pebbles. Quartzite could be found in abundance in the till deposits exposed on the river banks. Chert pebbles are not as common in the region as the assemblage would suggest however, implying that there was predetermined gathering of the material from a source not immediately local to the site (Walker 1992:92). Bipolar percussion cores (often of chert pebbles) were the most common core form excavated, while the remainder were either large irregular platform cores or cores with a prepared platform (Walker 1992:89-90).

A significantly larger number of stone tools was recovered from the Gowen 2 site (350 tools). Included are 87 projectile points, five preforms, three hafted bifaces, 23 bifacial knives, 55 end scrapers, 18 unifaces, 37 gouges (reverse unifaces), eight perforators, and 110 otherwise retouched flakes (Walker 1992:71-86). As well, one anvil and three hammerstones were found (Walker 1992:86-7). Once again, no grooved or pecked stone tools were recovered. At least 13 bone specimens were modified for tool use and another seven contain incisions not associated with food processing (Walker 1992:94-95). Projectile points from the Gowen 2 site are, once again, predominantly basally straight or slightly concave with straight or, more often, convex lateral margins. One quartzite uniface excavated from this site has been flaked on all of its dorsal margins, closely resembling Tool **f** in Figure 7.2, also composed of quartzite.

Faunal evidence recovered at the Gowen 2 site confirms the presence of at least 14 bison, one wolf, one coyote, two medium-sized canids (possibly overlapping with coyote), one fox, one muskrat, one deer mouse, one Northern pocket gopher, and one least chipmunk (Walker 1992:104-7). All samples represent species native to the Saskatoon region during the time of occupation. The faunal remains are

heavily processed for maximum extraction. Seasonality could not be determined (Walker 1992:107-8).

The use of the Gowen 2 site is not fully understood. A total of 11 features were identified including five hearths, two ash concentrations, one isolated posthole, four postholes associated with one of the hearths, and two activity areas (Walker 1992:115-9). The first activity area is a small lithic workshop and the other consists of four postholes in a roughly rectangular orientation with associated stained soil. This may have been an area of habitation although this is not confirmed (Walker 1992:119). This site may have been the associated campsite of the Gowen 1 processing site.

8.3.3 Norby Site (FbNp-56)

The Norby kill site was discovered within the confines of Saskatoon in 1988 during residential construction. It, too, is a single-component site Mummy Cave series site. This is confirmed by diagnostic artifacts as well as the results of three chronometric age assessments, indicating an approximate age of 5.7 ka BP (Zurburg 1991:1). Excavations were conducted by both the University of Saskatchewan as well as King George Elementary School in Saskatoon, covering $50\,m^2$ (Zurburg 1991:32).

Preferred lithic materials at the Norby site are primarily local materials. This includes a focus on Swan River chert while quartzites and cherts are also commonly represented. Knife River flint was also present, although it is not a local resource (Zurburg 1991:62).

Given the nature of the Norby site, few lithic remains were present. A total of 176 lithic artifacts were recovered, including debitage, cores, and stone tools. Four identifiable projectile points, two preforms, five bifaces, 10 unifaces, and one dual anvil/hammerstone (Zurburg 1991:47-61) represent the tool kit excavated at the site. Two projectile points are identified as Gowen Side-Notched points and the remaining two are one each of a stemmed Manitoba and an Early Side-Notched point. The latter is comparable to a Gowen Side-Notched point except for a lack

of basal grinding and a different notching style (Zurburg 1991:51).

An astonishing 96.7% of the faunal remains at this site were identifiable. The assemblage includes a minimum of 26 bison, one wolf, and two rabbit species (Zurburg 1991:89-93). The individual bison were analyzed and determined to be primarily mature males (Zurburg 1991:173). Specimens belonging to the order Rodentia were also encountered. However, such bones were viewed as intrusive and were not included in the analysis.

Specifying individual features at the Norby site is difficult. A total of three features were easily recognized: two are processing hearths, the third is a stained soil area (Zurburg 1991:113). The entire site, however, was littered in bone, representing the remains of a large bison kill. In areas of higher bone concentration (by mass) there were several bones in articulation. In the areas with smaller concentrations, none of the bones were articulated and more evidence of butchering was apparent (Zurburg 1991:104). Seasonality of the kill has been determined to have occurred between January and February based on dental attrition (Zurburg 1991:171). Lack of topography and seasonality suggest that a snow trap may have been the method by which the herd was procured (Zurburg 1991:174).

8.3.4 Below Forks Site (FhNg-25)

The Below Forks site was first discovered in 1980 during a survey of the regions adjacent to the confluence of the South and North Saskatchewan Rivers (Wilson 1982:839). It is located 2 km east of the confluence and was found because of erosional activity on the bank. Several test units were explored within the confines of the site beginning in 1980 and full-scale excavations were conducted from 2000 through 2002 as part of the SCAPE (the Study of Cultural Adaptations in the Prairie Ecozone) research project (Meyer 2002 in Kasstan 2004). In total, 53 m^2 were excavated from three blocks: an eastern (22 m^2), a central (27 m^2), and a western locality (4 m^2) (Kasstan 2004:4). Three separate occupations were identifiable at this site and radiocarbon age assessment was conducted in order to determine the cultural affiliation. The lower occupation level is aged to the Early

Side-Notched Mummy Cave series period and was superseded by an early Oxbow complex occupation and then a late Oxbow complex occupation (Kasstan 2004:43).

The inhabitants of the lower occupation at the Below Forks site maintained a strong reliance on local lithics. Swan River chert accounts for the vast majority of raw material by both number and mass (Kasstan 2004:51). Quartzite was the second most common material recovered. A significant majority of the materials had been thermally-altered prior to flintknapping (Kasstan 2004:54). Although proportionally less common, the core assemblage associated with this occupation includes several bipolar cores. Out of a total of 85 cores, 18 are bipolar. These bipolar cores are of Swan River chert rather than chert pebbles.

A relatively small tool kit was identified in the Mummy Cave series occupation. At least three projectile points are associated with the site, two of which are Early Side-Notched points whereas the third is broken longitudinally and no longer maintains diagnostic notching (Kasstan 2004:98). A fourth projectile was recovered from the eroding cut bank and, based on its morphology, it too is believed to be a Mummy Cave series projectile point. Three of the points are symmetrically biconvex in cross-section and the remaining is "asymmetrically twisted" (Kasstan 2004:98). These points are "tentatively identified as Gowen-like points" (Kasstan 2004:112) because of both their likeness to and differences from the defined projectile style. In addition, 10 bifaces, two hammerstones, one anvil, one multipurpose tool, one chithos-like implement (abrasive disc used to prepare hides), 10 unifaces, 22 retouched flakes, and one utilized flake were recovered (Kasstan 2004:100-6). Finally, one *pièce esquillée* composed of black chert was recovered (Kasstan 2004:98). The multipurpose tool is believed to be a hammerstone, abrader, and chopper. Four of the 10 unifaces are reverse unifaces composed of quartzite (two), chert, and Swan River chert (Kasstan 2004:105). Two faunal tools (one pin, one antler pressure flaker) contributed to the tool kit assemblage as well (Johnston 2005:179).

Within the confines of the central block excavation, the majority of the faunal remains excavated from the site are unidentifiable. When mass is taken into

account, however, this ratio is reversed, suggesting that the majority of the identifiable bone is large and often complete (Johnston 2005:136). A minimum of seven taxa were identified from this assemblage. This includes a minimum of three bison, one cervid (antler specimen), one large-sized canid, one canid of indeterminate size, one medium-sized canid, one snowshoe hare, one white-tailed jack rabbit, one beaver, and one Northern pocket gopher (Johnston 2005:136-42). It was determined that this Mummy Cave level was occupied between late winter and early summer, based on immature bison development (Johnston 2005:145).

In the eastern block, the majority of faunal remains were unidentifiable and burned (Johnston 2005:156). An additional minimum of 10 taxa were recovered including two bison, one large-sized canid, one snowshoe hare, one beaver, one northern pocket gopher, one ground squirrel, one deer mouse, one meadow vole, one catfish, one minnow-sized fish, and one indeterminate-sized fish (Johnston 2005:156-64). The season of occupation can only be limited to spring through fall based on the presence of fish remains (Johnston 2005:166). Finally, a minimum of two bison were identified from the faunal remains recovered out of the initial test block performed in 1980 (Johnston 2005:167). No other taxa were identified, although this is most likely due to the small sample area. Seasonality could not be determined (Johnston 2005:169).

The artifact assemblage in the central block of the Below Forks site is consistent with that of a campsite based on the variety of tools present and the highly fragmented bone (both burned and unburned) (Johnston 2005:177). In the eastern block of the site there is a significant number of cores and debitage, as well as several tools. This suggests that the area may have been used as a lithic tool production station (Kasstan 2004:45; Johnston 2005:180).

8.4 Interpretations

The archaeological sites compared in this survey are all located along the banks of the South Saskatchewan River or Saskatchewan River. Mummy Cave

cultural levels at the Dog Child site and the Below Forks site are well stratified beneath several later archaeological occupations. At the Gowen 1, Gowen 2, and Norby sites, however, the Mummy Cave series occupation is the only identified archaeological layer. This can be attributed to locality. The two well-stratified sites are located in similar conditions but have not been affected by agricultural activity and urban development. This is obviously not the case for the three sites which are located within the boundaries of Saskatoon. A significant archaeological record may have been removed with modern construction and there is no record to indicate the documentation of later occupations.

During the Mid-Holocene Climatic Optimum, survival would have been dependent on permanent fresh water sources. Palaeoenvironmental evidence discussed by Ritchie (1976) supports the expansion of the grasslands north of their current position, placing all of the sites within the same environmental conditions. The South Saskatchewan River valley and Saskatchewan River valley would have provided strategic havens for the occupants during this climatic episode. This period will continue to be better understood as more archaeological sites are documented accurately and in greater detail. The advancements of research in palynology, gastropod research, and other palaeoenvironmental indicative studies, as well as the refinement of site identification methodologies and the geomorphological changes that the Northern Plains have undergone since the Mummy Cave period will serve to further develop this understanding.

8.4.1 Lithic Technology Comparison

Lithic technology of the sampled sites is fairly consistent. Lithic resources are focused on but not limited to local resources. Swan River chert, quartzite, and chert are consistently prevalent at each site with perhaps the exception of the Gowen 1 and Gowen 2 sites in which Walker (1992) references only the use of the latter two resources. Knife River flint, agate, and other chalcedonies, as well as exotic cherts have also been recovered with lower frequency. These materials are not limited to formed tools, but also appear as debitage, suggesting that the raw

material was traded or quarried from a distant source rather than only the finished product.

Core technology among the sample is not limited to one type but, rather, include amorphous, bifacial, bipolar, and indeterminate forms. The archaeological assemblage of the Norby site, being a kill site, does not include cores and therefore is not included in this comparison. For the purposes of this thesis, only bipolar and irregular platform cores were included, defining the difference between anvil technology versus handheld percussion flaking. Occupation Level 3a contains no bipolar cores but, given the small size of the assemblage, this is not surprising as only two cores were recovered. Occupation Level 3b contains seven cores: four are platform cores and three are bipolar (42.9%). Occupation Level 3 (non-separable) contains 20 cores and five of these (25%) are also bipolar. The bipolar cores of the Dog Child site are equally composed of Swan River chert, chert, and quartz. The Below Forks site also contains a significant percentage of bipolar core technology (21.2%). These are composed primarily of Swan River chert. The Gowen 1 and Gowen 2 sites are best at describing this tendency as 75 bipolar cores and 58 bipolar fragments were excavated. These cores are limited to black chert pebbles and quartzite. At each site except the Dog Child site anvils were present in the excavated assemblages. Lithic materials of these bipolar cores varies between each site, but it is their frequent presence that is notable in the Mummy Cave series occupations.

The great majority of the excavated projectile points in this study have been identified as Gowen Side-Notched projectile points, with the exception of one Manitoba point (Norby site), some points that are broken and thus only delineated as Early Side-Notched, and the projectiles from the Below Forks site that Kasstan (2004) is hesitant to affiliate because of stylistic variations.

The presence of reverse unifaces is an interesting area of discussion. These are seemingly a Early Middle period phenomenon which has been witnessed at the Dog Child site as well as the Below Forks and Gowen 1 and 2 sites of this survey. At the Gowen 1 and Gowen 2 site, Walker (1992) refers to reverse scrapers as gouges.

Kasstan (2004) notes that they have also been excavated from the East Village Access site (Kasstan 2003) (in the Batoche National Historic site in central Saskatchewan) and at the Anderson site (Quigg 1984) located in southeastern Alberta. The radiocarbon ages associated with these tools are presented in Table 8.1, which has been adapted from Kasstan (2004:109). A large collection was also obtained from the shores of Lake Diefenbaker, including EgNp-63, EgNq-18, and EgNr-2 although none of them have been aged (Johnson 1994; Stevenson 1992).

Table 8.1: Accumulated Mummy Cave Series Radiocarbon Ages of Sites Containing Reverse Unifaces (Modified from Kasstan 2004)

Site	Sample Number	Calibrated Age (ka BP)	Error (+/-)	Rererence
East Village Access	S-2739	6.825	95	Kasstan 2003
East Village Access	S-2737	6.635	185	Kasstan 2003
East Village Access	S-2738	6.480	100	Kasstan 2003
Gowen 1	S-1457	6.230	110	Walker 1992
Gowen 2	S-1971	6.160	160	Walker 1992
Gowen 1	S-1488	6.150	260	Walker 1992
Below Forks	TO-9354	6.100	140	Meyer 2000
Below Forks	TO-9355	6.010	80	Meyer 2000
Gowen 2	S-1970	6.000	130	Walker 1992
Gowen 2	S-2036B	5.990	170	Walker 1992
Below Forks	TO-11027	5.920	60	Kasstan 2004
East Village Access	S-2740	5.740	90	Kasstan 2003
Gowen 2	S-2037	5.670	110	Walker 1992
Anderson	GX-6130	5.540	160	Quigg 1984
Dog Child	BGS-2663	5.530	50	this volume
Below Forks	TO-10083	5.520	60	Kasstan 2004
Gowen 1	S-2036A	5.160	150	Walker 1992
Gowen 1	S-1526	4.810	130	Walker 1992
Anderson	GX-6129G	4.805	150	Quigg 1984

None of the associated sites were located as far north as the boreal forest (Kasstan 2004:108). The majority of these tools have been constructed from quartzite and are recognizable because they are large decortication spalls which are then flaked on the dorsal side to remove portions of the cortex. These tools may have been used for hide preparation. Their large size is curious when compared to end and side scrapers. They are an anomaly that may be a result of either function or availability and preference of lithic material. No reverse unifaces were

recovered from the Norby site, most likely because of the site activity. The hides would have been removed at a kill site but likely not processed. This would have been an activity preferably conducted at processing areas or occupation areas.

It is interesting, finally, to note the complete absence of grooved or pecked stone tools within the excavated assemblages of all of the sites in this survey. Several tools which have been pecked as a result of use were noted including hammerstones, anvils, and abraders (chithos-like tool). However, the impact scars are not as a result of preparation but rather use-wear. This gap in the archaeological tools kits of these Northern Plains occupations may be a result of either sampling or, frankly, necessity.

8.4.2 Subsistence Comparison

The proximity of the Gowen 1 and 2, Norby, Below Forks, and Dog Child sites to the South Saskatchewan River and Saskatchewan River implies a relatively consistent resource base. That being said, a comparison of the animal species utilized at each site has revealed trends. Foremost in these trends is a dominant reliance on bison. At each site, bison remain the most common species represented. A minimum of seven bison were identified through excavation of the Gowen 1 site, 14 from the Gowen 2 site, 26 from the Norby site, three from the central block of the Below Forks site, two from the eastern block at the same site, one from the small occupation Level 3a at the Dog Child site, and three from occupation Level 3b. Occupation Level 3 of the Dog Child site also contained a minimum of three bison, but as the separation is not complete, the count cannot be added to either individual level with certainty.

Bison are supplemented by other artiodactyls common on the Northern Plains. At the Dog Child site one deer of unknown species (presumably *Odocoileus hemionus*) was identified. A pronghorn was recovered from the Gowen 1 site. As well, one cervid of unknown genus and species was recovered from the Below Forks site. This individual was represented by a single specimen: an antler tine. Whether this individual was procured as a food source is not known as there is

only the single specimen identified. The tine may have been collected from a cast antler and brought to the site as a pressure flaker (Johnston 2005:138).

Another trend viewed by intersite comparison is the secondary dependence on canid species. It is uncertain as to the entire utility of wolves, dogs (feral or domestic), and coyotes within each individual populations' subsistence, defensive, and ideological framework. However, the high frequency as well as the documented burning and cutmarks on some of the canid specimens (Johnston 2005:203) suggest that in some instances, at least, canids served as an alternative food source.

Small animals are also significant resources which frequently occur in the archaeological record of Mummy Cave series sites on the Northern Plains. Various species of leporids, birds, and rodents are present at each of the occupation sites, with the exception of the sparse Dog Child site Level 3a collection. At the Below Forks site fish are also present in the assemblage constituting a diverse resource base.

The apparent lack of plant foods is made obvious by the analyses of this comparative survey. Floral remains are documented from only one of the five Mummy Cave series archaeological sites (six occupation levels): that being the Gowen 1 site. The six recovered seeds from that site were carbonized, thereby helping to prolong their preservation. This absence in the archaeological record is an unfortunate occurrence that is most likely in direct response to insufficient screening methods. Standard procedure at each site in the comparison used a 6 mm mesh screen during normal excavation with the exception of the Below Forks site which implemented a 3 mm mesh screen for excavation of the Early Side-Notched period (Kasstan 2004:7). The opportunity to recover floral specimens by use of a 6 mm screen is extremely limited. More sensitive screening was only performed at the remainder of the sites when an area of sensitivity was encountered such as a charcoal accumulation, micro-debitage concentration, or hearth feature. Unfortunately, even though hearths are one of the most probable environments for floral preservation due to the carbonization of the seeds, one was not encountered in every level. The true role that plant foods would have played

in the Northern Plains during this period has not yet been determined. It is clear, however, that due to bison availability in addition to the availability of alternative food sources (and perhaps simply appetite preference), bison were used in conjunction with alternative resources throughout the Northern Plains during the Early Middle Period.

8.4.3 Activity Areas Comparison

The Norby site is the only site whose archaeological assemblage suggests activity consistent with that of a kill site. Based on the variety in tool kits, the large amounts of debitage, and the absence or rarity of certain faunal elements including cranial specimens, the remaining sites in this survey have been identified as habitation sites, one with an associated processing area (Gowen 1 site). The seasonality of Level 3a and Level 3b at the Dog Child site and the Gowen 2 site could not possibly be determined, but the remaining occupations in the comparison group were occupied during a variety of seasons. The Below Forks site is associated with a spring through autumn occupation, the Gowen 1 site is affiliated with a late summer, early autumn occupation, and the Norby site is believed to have been a January or February kill. This suggests that not only were the Saskatchewan Plains occupied during the Mid-Holocene Climatic Optimum but, as well, they were occupied throughout the year. Not all groups sought refuge in the protection of the Boreal Forest, Rocky Mountain foothills or Eastern Plains, but rather stayed through the year, adapting to both the drought and colder conditions.

8.4.4 Discussion of the Level 3 Projectile Point Analysis

The case for the presence of a transitional Oxbow/Mummy Cave occupation at the Dog Child site is one that should be considered. The number of projectile points recovered from Level 3, Level 3a, and Level 3b is small (five, two, and four respectively). Based on their metric attributes, however, a suggestion can be made that stylistically, there are differences between those of the upper occupation (Level

3a) and those of the lower occupation (Level 3b). In Figure 7.4, Chapter 7, Points **b, c,** and **d** have bases that are slightly concave with notches that are obviously asymmetric left to right. One notch is narrow while the other is broader and extends farther down than its counterpart. These traits may exhibit the beginnings of the classic "ear" trait of the Oxbow complex, suggesting a transition into the latter projectile technology. These projectile points are all from Level 3 but are stylistically similar to Points **a** and **b** in Figure 7.5, associated with occupation Level 3a. Examination of the depths at which the three aforementioned points in Level 3 were found suggests that they may, in fact, belong to Level 3a. Point **b** (Fig. 7.4) was found at a depth of -26 cm with a level depth range of 25 cm to 29 cm below the surface. Point **c** was located at a depth of 33 cm with a range of depth of 33 cm to 39 cm. Point **d** was found at a depth of 33.5 cm with a range of between 31.5 cm and 40 cm. All three artifacts are located well within the upper half of the thickness of Level 3.

Alternatively, Point **e** in Figure 7.4, Chapter 7, greatly resembles Point **a** in Figure 7.6, Chapter 7. Both are short and broad projectiles with a relatively flat basal margin and a greater degree of basal grinding than the projectiles discussed in the preceding paragraph. Point **e** was found at a depth of 37 cm with a range of depth between 30.5 cm and 44 cm. The point was located at the midrange between the upper and lower margins of Level 3. However, given the significantly larger artifact assemblage of Level 3b when compared to Level 3a, it is reasonable to suggest that this point is associated with Level 3b.

These stylistic differences are a starting point in the discussion of the hypothesis of an *in situ* development of the Oxbow complex out of a Mummy Cave predecessor. The projectile style associated with Level 3a may be an early expression of the beginnings of the Oxbow complex. The projectile points recovered in Level 3, Level 3a, and Level 3b at the Dog Child site may aid future research regarding the terminal Mummy Cave series period on the Northern Plains.

Chapter 9

Conclusions

The research focus of this thesis involved a detailed look at the faunal, floral, pottery, and lithic artifacts in conjunction with observed features of the Dog Child site in order to advance the understanding of past occupation on the Northern Plains. This is a multicomponent site whose occupation levels are neither deeply stratified nor consistently separable. The archaeological and geoarchaeological information obtained from excavation of the site, however, has provided confirmation of and further insight into the current perception of the cultural history of the Northern Plains.

This thesis was formulated to present interpretations beyond a catalogue of the archaeological assemblage. Considerable energy was expended in ensuring that a maximum number of artifacts were recorded using three-point provenience. As well, detailed mapping, photography, and stratigraphic correlation were maintained in order to ensure the integrity and the feasibility of the research at a site where the occupations are compressed and difficult to separate. Three objectives were sought through analysis. The first was to determine the archaeological and geological sequence of the site, thereby identifying all of the cultural layers. The available technologies, food source exploitation within each level, as well as the site purpose and season of occupation were then studied. Finally, a comparative survey of six Mummy Cave series occupations on the Northern Plains was explored. The analyses were revealing.

After careful excavation, a total of six archaeological levels were found to be present at the Dog Child site. Each occupation contains artifacts associated with habitation sites and the activity areas which would have been performed at the

site, including lithic work stations and food processing and cooking areas. The upper level (Level 1a) is associated with a Plains Side-Notched occupation based on diagnostic artifacts recovered, including projectile points and pottery sherds. Level 1b is associated with a Prairie Side-Notched complex, although it contains Mortlach complex pottery and several projectile points are identified as Plains Side-Notched. It is not uncommon to have overlap of the two projectile forms in archaeological sites. Level 1b has been radiocarbon aged to 0.30 ka BP. Level 1a has not been radiocarbon aged, but relying on the Law of Superposition which states that under normal circumstances inferior deposits are associated with earlier periods than superior deposits, Level 1a is more recent than Level 1b. Occupation Level 2a is an occupation of the Duncan/Hanna period, as indicated by the associated projectile points. An absolute age of 3.70 ka BP has confirmed the occupation. Level 2b is believed to be an Oxbow occupation, supported by projectile point technology and the chronometric age of 4.27 ka BP. Occupation Level 3a is very sparse but did contain enough of a faunal sample to radiocarbon age. This age (5.31 ka BP) in addition to the Gowen projectile point morphology confirm one of two Mummy Cave series occupations or a transitional Mummy Cave/Oxbow level. The second of these is Level 3b which also contains Gowen Side-Notched projectiles and was aged to 5.53 ka BP. The submitted samples of each level can be reviewed in Chapter 3.

The inconsistency in separation of occupations due to erosional and other nondepositional events, however, makes the opportunity to separate each excavation unit into six divisible occupations remote. It was found that separation was clearer in the eastern section of Block 1, further advancing as units were opened more to the south. The western margins of Block 1 are extremely convoluted and collapsed, making further excavations in the area unattractive. Future excavations at the Dog Child site will continue to focus south of the present excavation zone. The specific geological processes that are acting and did act on the site locality are currently being studied. It is expected that the majority of recent deposition is a result of hillslope sedimentation and that earlier deposition

was in direct response to an ancient path of the Opimihaw Creek. The vertical separation of the terrace and creek elevation is too large to have had a significant effect on surface deposition for several centuries if not millennia.

An interpretive survey of several Mummy Cave series occupations on the Northern Plains has confirmed hypotheses associated with this period. The Gowen 1, Gowen 2, and Norby sites are all located in Saskatoon and the Below Forks site is located near the confluence of the North and South Saskatchewan Rivers. All of the sites are located adjacent to the South Saskatchewan River or Saskatchewan River and all appear to have relied on bison as the most abundant food source. Canid remains as well as small mammals are also prevalent. The true extent of plant food utilization within these sites cannot be determined, which is attributed to insufficient data recovery rather than assuming that the populations did not use plant resources. Lithic tools are composed predominantly of local resources within each Mummy Cave occupation surveyed. Projectile styles within the study area are almost exclusively Gowen Side-Notched with few exceptions. Reverse unifaces were present at four of the five sites, and it has been noted that these are predominantly a Middle Period phenomena (Walker 1992; Kasstan 2004). The apparent lack of grooved and pecked stone tools should be studied further as more sites of this period are excavated.

The documentation and analysis of the Dog Child site involved a considerable artifact assemblage and an intriguing geoarchaeological framework. There is a three thousand year stretch for which there is no archaeological data. Were the artifacts displaced during an erosional event, was the surface uninhabitable, or is there another reason this lack of occupation? It is a testament to the holistic nature of archaeological research that this will one day be answered and our knowledge of early survival and relationships on the Northern Plains will continue to advance.

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Appendix A
Projectile Point Metric Attributes

Table A.1: Level 1 and Level 1a Complete Projectile Point Measurements

Spec.	Lev.	Type	Mat.	Body Length (mm)	Stem Length (mm)	Max Length (mm)	Max Body Width (mm)	Max Stem Width (mm)	Inter-notch Width (mm)	Max Thick. (mm)	Left Notch Depth (mm)	Right Notch Depth (mm)	Left Notch Width (mm)	Right Notch Depth (mm)	Distance L Notch From Basal (mm)	Distance R Notch From Basal (mm)	Basal Edge	Depth of Conc. (mm)	Cross-Section	Mass (g)
1	1	tip	SRC (h.t.)	n/a	n/a	n/a	n/a	n/a	n/a	3.65 (est.)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	asym. biconvex	0.6
2	1	Late S-N	SRC (h.t.)	n/a	6.30	n/a	22.65	17.10	16.35	9.15	3.30	2.00	5.90	3.95	2.75	2.45	conc.	1.85	asym. biconvex	3.1
3	1	tip	Black Chert	n/a	n/a	n/a	n/a	n/a	n/a	4.10 (est.)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	asym. biconvex	0.3
4	1	Oxbow	Black Chert	n/a	n/a	n/a	n/a	n/a	n/a	3.90 (est.)	n/a	n/a	n/a	n/a	7.40	n/a	conc.	3.65	biplano	0.5
5	1a	tip	SRC (h.t.)	n/a	n/a	n/a	n/a	n/a	n/a	3.35 (est.)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	biconvex	0.5
6	1a	Plains S-N	SRC (h.t.)	n/a	7.10	n/a	15.20	n/a	10.65	4.90	1.25	n/a	4.05	n/a	1.95	n/a	flat	n/a	asym. biconvex	1.4
7	1a	Plains S-N	SRC (h.t.)	n/a	9.55	n/a	n/a	n/a	8.65	4.20 (est.)	3.10	3.40	4.15	n/a	4.75	n/a	conc.	1.70	asym. biconvex	0.6
8	1a	Plains S-N	SRC (h.t.)	10.75	n/a	n/a	n/a	n/a	n/a	2.25 (est.)	2.40	n/a	3.50	n/a	3.95	n/a	n/a	n/a	plano-triangular	0.3
9	1a	Plains S-N	SRC (h.t.)	n/a	5.55	n/a	9.20	10.60	6.55	2.50	1.85	1.90	3.30	3.55	2.65	3.95	conc.	0.95	plano-convex	0.3
10	1a	Plains S-N	SRC (h.t.)	n/a	n/a	n/a	n/a	12.40	8.45	2.95 (est.)	2.15	2.95	n/a	n/a	4.45	4.35	flat	n/a	biconvex	0.3
11	1a	Plains S-N	SRC (h.t.)	11.10	6.55	17.65	14.00	14.65	11.10	3.65	1.30	1.60	3.30	2.70	3.25	4.85	conc.	1.05	biconvex	0.9
12	1a	Duncan	SRC (h.t.)	n/a	n/a	n/a	n/a	28.70	n/a	4.40 (est.)	n/a	n/a	n/a	n/a	n/a	n/a	conc.	0.90	concave-convex	1.0 0.5
13	1a	body	chert	n/a	n/a	n/a	n/a	18.80	n/a	3.45 (est.)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	biplano	1.1
14	1a	Plains S-N	Silt-stone	8.65	5.65	14.30	9.40	12.30	9.20	2.95	0.90	1.10	3.85	2.65	3.65	3.70	flat	n/a	biplano	0.5
15	1a	Preform	K.R. Flint	n/a	n/a	n/a	n/a	14.60	n/a	3.40 (est.)	3.00	n/a	n/a	n/a	2.35	n/a	flat	n/a	plano-convex	0.5
16	1a	Plains Triang.	Sil. Peat	14.95	n/a	14.95	11.10	n/a	n/a	3.40	n/a	n/a	n/a	n/a	n/a	n/a	conv.	n/a	asym. biconvex	0.5
17	1a	Plains S-N	Sil. Peat	9.65	7.05	16.70	12.25	13.95	10.45	3.55	1.40	2.15	3.30	3.45	2.75	4.05	flat	n/a	plano-convex	0.8
18	1a	Prairie S-N	Sil. Peat	n/a	3.40	n/a	12.95	11.20	9.95	3.55	1.35	1.00	1.60	2.00	2.10	1.90	conc.	0.40	plano-convex	0.7
19	1a	Plains S-N	Chalc-edony	n/a	n/a	n/a	13.95	n/a	9.75	3.15	2.85	2.75	3.15	n/a	3.90	n/a	n/a	n/a	plano-convex	0.5
20	1a	body	Agate	19.70	0.00	19.70	12.50	n/a	n/a	2.50	n/a	n/a	n/a	n/a	n/a	n/a	flat	n/a	biplano	0.7

Table A.2: Level 1b Complete Projectile Point Measurements

Spec.	Lev.	Type	Material	Body Length (mm)	Stem Length (mm)	Max Length (mm)	Max Body Width (mm)	Max Stem Width (mm)	Inter-notch Width (mm)	Max Thick. (mm)	Left Notch Depth (mm)	Right Notch Depth (mm)	Left Notch Width (mm)	Right Notch Depth (mm)	Distance L Notch From Basal (mm)	Distance R Notch From Basal (mm)	Basal Edge	Depth of Conc. (mm)	Cross-Section	Mass (g)
21	1b	tip	SRC (h.t.)	n/a	n/a	n/a	n/a	n/a	n/a	4.85 (est.)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	concave-convex	1.8
22	1b	Prairie S-N	SRC (h.t.)	11.35	9.75	21.10	12.70	13.85	9.30	4.95	1.90	2.05	5.15	4.70	3.90	2.80	conv.	n/a	asym. biconvex	1.2
23	1b	Plains S-N	Black Chert	12.35	6.80	19.15	11.20	n/a	9.55	2.50	1.95	1.70	3.40	n/a	3.15	n/a	flat	n/a	convcave-convex	0.5
24	1b	tip	Black Chert	n/a	n/a	n/a	1.75	n/a	n/a	2.10 (est.)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	plano-convex	0.3
25	1b	Prairie S-N	Brown Chert	11.60	8.70	20.30	15.40	11.15	7.70	4.20	3.30	2.30	7.10	5.75	1.60	2.60	conv.	n/a	asym. biconvex	1.0
26	1b	Besant	Sil. Peat	13.85	14.55	29.40	22.35	20.20	17.90	6.85	1.85	1.75	10.50	7.90	2.65	4.50	flat	n/a	plano-convex	4.2

Table A.3: Level 2, Level 2a, and Level 2b Complete Projectile Point Measurements

Spec.	Lev.	Type	Mat.	Body Length (mm)	Stem Length (mm)	Max Length (mm)	Max Body Width (mm)	Max Stem Width (mm)	Inter-notch Width (mm)	Max Thick. (mm)	Left Notch Depth (mm)	Right Notch Depth (mm)	Left Notch Width (mm)	Right Notch Depth (mm)	Distance L Notch From Basal (mm)	Distance R Notch From Basal (mm)	Basal Edge	Depth of Conc. (mm)	Cross-Section	Mass (g)
1	2	Duncan	Grey Chert	n/a	n/a	n/a	16.35	n/a	n/a	5.65 (est.)	n/a	n/a	n/a	n/a	n/a	n/a	conc.	1.65	asym. biconvex	1.1
2	2	Oxbow Preform	SRC (h.t.)	n/a	n/a	n/a	18.90	n/a	n/a	4.40 (est.)	n/a	n/a	n/a	n/a	n/a	n/a	conc.	2.95	biconvex	1.2
3	2	Oxbow Preform	SRC (h.t.)	n/a	n/a	n/a	20.30	n/a	n/a	4.70 (est.)	n/a	n/a	n/a	n/a	n/a	n/a	conc.	3.70	asym. biconvex	1.6
4	2a	Hanna	Grey Chert	n/a	n/a	n/a	n/a	15.60	12.60	5.50 (est.)	.45 (est.	3.65	n/a	n/a	2.40	n/a	conc.	1.45	asym. biconvex	1.0
5	2a	Hanna	SRC (h.t.)	25.55	n/a	n/a	21.40	n/a	14.05	8.50	4.60	2.75	n/a	n/a	n/a	n/a	n/a	n/a	asym. biconvex	5.2
6	2a	Hanna	SRC (h.t.)	14.80	12.90	7.70 (edge)	18.90	15.00	12.05	7.15	2.10	3.35	8.95	9.90	2.30	1.85	conc.	1.60	convex-triangular	3.5
7	2a	Duncan	SRC (h.t.)	12.80	12.75	25.55	17.20	14.95	14.30	6.50	1.00	0.75	8.80	10.70	2.15	2.95	conc.	1.45	asym. biconvex	2.9
8	2a	Duncan	SRC	n/a	n/a	n/a	n/a	15.30	15.05	3.75 (est.)	0.70	0.20	n/a	n/a	2.80	3.90	conc.	1.20	concave-convex-	0.7
9	2a	Duncan	Red Chert	n/a	8.95	n/a	n/a	14.30	13.20	5.95 (est.)	1.10	0.75	n/a	n/a	3.20	3.55	conc.	1.45	asym. biconvex	0.9
10	2a	Duncan	Sil. Peat	n/a	n/a	n/a	n/a	18.80	17.30	6.60 (est.)	1.10	1.30	n/a	n/a	1.80	2.60	conc.	1.70	asym. biconvex	1.5
11	Sterile 2a to 2b	Oxbow	Chalc-edony	13.10	9.45	22.55	17.85	18.90	15.00	5.00	1.60	1.70	4.80	3.95	5.30	5.65	conc.	2.90	biconvex	2.0
12	2b	Oxbow Preform	SRC (h.t.)	n/a	n/a	n/a	17.20	n/a	n/a	3.95	n/a	n/a	n/a	n/a	n/a	n/a	conc.	1.50	plano-convex	1.6
13	2b	Early S-N	SRC (h.t.)	n/a	n/a	n/a	n/a	n/a	n/a	5.55 (est.)	2.50	n/a	5.75	n/a	2.70	n/a	conc.	0.80	plano-convex	1.2
14	2b	Oxbow Preform	Sil. Peat	n/a	n/a	n/a	20.10	n/a	n/a	5.95	n/a	n/a	n/a	n/a	n/a	n/a	conc.	0.90	plano-convex	3.3
15	2b	Oxbow Preform	Chalc-edony	n/a	n/a	n/a	n/a	n/a	n/a	4.20 (est.)	n/a	n/a	n/a	n/a	n/a	n/a	flat	n/a	plano-convex	2.3
16	2b	Early S-N	Grey Chert	12.55	11.85	24.40	19.05	16.60	14.05	5.30	2.20	1.70	5.15	4.15	2.40	2.55	conc.	0.60	asym. biconvex	2.4
17	Sterile 2a to 2b	Oxbow	Green Chert	15.10	9.60	24.70	19.90	19.65	14.80	4.70	2.45	2.20	6.70	6.00	1.95	1.70	conc.	3.25	asym. biconvex	2.0

Table A.4: Level 3, Level 3a, and Level 3b Complete Projectile Point Measurements

Spec.	Lev.	Type	Mat.	Body Length (mm)	Stem Length (mm)	Max Length (mm)	Max Body Width (mm)	Max Stem Width (mm)	Inter-notch Width (mm)	Max Thick. (mm)	Left Notch Depth (mm)	Right Notch Depth (mm)	Left Notch Width (mm)	Right Notch Depth (mm)	Distance L Notch From Basal (mm)	Distance R Notch From Basal (mm)	Basal Edge	Depth of Conc. (mm)	Cross-Section	Mass (g)
1	3	Mummy Cave	SRC (h.t.)	22.95	7.25	30.20	18.10	14.90	13.65	5.60	1.85	0.95	4.40	6.40	1.95	1.50	conc.	1.35	asym. biconvex	3.1
2	3	Mummy Cave	SRC (h.t.)	n/a	8.40	n/a	16.65	13.40	11.25	4.10	1.50	1.55	6.05	3.55	2.25	2.60	flat	n/a	asym. biconvex	1.5
3	3	Early S-N	SRC (h.t.)	18.30	n/a	n/a	16.25	n/a	11.70	4.70	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	asym. biconvex	1.9
4	3	Mummy Cave	SRC (h.t.)	n/a	6.55	n/a	20.90	13.10	11.95	5.70	1.75	2.10	7.75	4.65	1.35	3.30	conc.	1.20	asym. biconvex	2.4
5	3	Mummy Cave	Sil. Peat	13.75	9.65	23.40	19.55	17.90	15.25	6.50	1.95	1.40	6.05	7.35	1.95	1.05	conv.	n/a	asym. biconvex	3.1
6	3a	Mummy Cave	SRC (h.t.)	n/a	6.15	n/a	18.00	15.25	12.95	6.50	1.90	1.45	4.05	3.95	2.95	2.15	conc.	0.75	asym. biconvex	3.6
7	3a	Mummy Cave	Sil. Peat	17.00	5.15	22.15	15.75	15.25	12.80	6.50	1.00	1.70	5.60	4.70	1.80	1.95	flat	n/a	asym. biconvex	2.0
8	3b	Mummy Cave	SRC (h.t.)	n/a	n/a	n/a	21.20	n/a	n/a	5.40	1.95	n/a	4.05	n/a	3.05	n/a	flat	n/a	biconvex	2.9
9	3b	Mummy Cave	Pink/Grey Chert	n/a	8.85	n/a	19.75	13.50	12.05	5.95	2.30	1.75	7.65	5.50	2.30	3.75	flat	n/a	asym. biconvex	1.6
10	3b	Mummy Cave	Sil. Sand-stone	16.75	6.65	23.40	20.30	17.75	15.70	5.15	1.60	1.80	3.10	4.20	2.65	2.50	flat	n/a	asym. biconvex	3.0
11	3b	Mummy Cave	Gronlid Siltstone	17.90	8.55	26.45	16.05	12.40	11.55	5.10	1.30	1.10	4.95	3.85	1.70	2.55	conc.	0.60	asym. biconvex	1.5

Appendix B

Bison bison Quantitative Analysis

Table B.1: Level 1 Landmark Analysis

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
1	**Metatarsal**	3	1	Tarsal 2/3 Facet	1	0.50	100.0
1	**2nd Phalange**	1	1	Distal	1	0.13	26.0
1	**Proximal Sesamoid (anterior)**	1	1		1	0.13	26.0

Table B.2: Level 1a Landmark Analysis

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
1a	**Cranium**	6	1	Petrous Temporal	3	1.50	100.0
				Molar	1	0.17	11.3
1a	**Mandible**	10	1	Ramus	1	0.50	33.3
				Alveolar Margin	1	0.50	33.3
1a				Incisor/Canine	1	0.13	8.7
1a				1st Molar	1	0.50	33.3
1a	**Lumbar Vertebra**	2	1	Ant. Articular Surface	2	0.20	13.3
1a	**Internal Carpal**	1	1		1	0.50	33.3
1a	**Radial Carpal**	1	1		1	0.50	33.3
1a	**Tibia**	1	1	Prox. Posterior Shaft	1	0.50	33.3
1a	**Lateral Malleolus**	1	1		1	0.50	33.3
1a	**Fused 2/3 Tarsal**	1	1		1	0.50	33.3
1a	**1st Tarsal**	1	1		1	0.50	33.3
1a	**1st Phalange (limb unknown)**	1	1	Distal	1	0.13	8.7
1a	**Proximal Sesamoid (anterior)**	2	1		2	0.25	16.7

Table B.3: Level 1b Landmark Analysis

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
1b	**Cranium**	169	1	Petrous Temporal	3	1.50	100.0
				2nd Premolar	1	0.50	33.3
				3rd Premolar	1	0.50	33.3
				4th Premolar	1	0.50	33.3
				1st Molar	1	0.50	33.3
				2nd Molar	2	1.00	66.7
				3rd Molar	2	1.00	66.7
				Molar	1	0.17	11.3
1b	**Mandible**	18	1	Incisor/Canine	3	0.38	19.0
				3rd Molar	2	1.00	66.7
				Molar	1	0.17	11.3
1b	**Thoracic Vertebra**	9	1	Centrum	3	0.21	14.0
				Neural Arch	2	0.14	9.3
1b	**Lumbar Vertebra**	6	1	Post. Articular Surface	1	0.10	6.7
1b	**Sacrum**	59	1		1	1.00	66.7
1b	**Radius**	5	1	Lateral Glenoid Cavity	1	0.50	33.3
				Medial Glenoid Cavity	1	0.50	33.3
				Radial Tuberosity	1	0.50	33.3
				Post. Lateral Foramen	1	0.50	33.3
				Prox. Posterior Shaft	1	0.50	33.3
				Prox. Anterior Shaft	1	0.50	33.3
				Distal Posterior Shaft	1	0.50	33.3
				Distal Anterior Shaft	1	0.50	33.3
				Radial Carpal Facet	1	0.50	33.3
				Internal Carpal Facet	1	0.50	33.3
1b	**Ulna**	49	1	Olecranon Process	1	0.50	33.3
				Anconeal Process	1	0.50	33.3
				Shaft	2	1.00	66.7
1b	**Radial Carpal**	1	1		1	0.50	33.3
1b	**Accessory Carpal**	1	1		1	0.50	33.3
1b	**Fused 2/3 Carpal**	3	3		3	1.50	100.0
1b	**Innominate**	7	2	Pubis Acetabulum	2	1.00	66.7
				Ilium Acetabulum	2	1.00	66.7
				Ischium Acetabulum	3	1.50	100.0
				Ischium Shaft	1	0.50	33.3

Table B.4: Level 1b Landmark Analysis Continued

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
1b	**Femur**	9	1	Head	1	0.50	33.3
				Supracondyloid Fossa	1	0.50	33.3
				Lateral Condyle	1	0.50	33.3
1b	**Tibia**	2	1	Prox. Posterior Shaft	1	0.50	33.3
1b	**Lateral Malleolus**	2	2		2	1.00	66.7
1b	**Calcaneus**	19	1	Coracoid Process	1	0.50	33.3
				Sustentaculum	1	0.50	33.3
1b	**Fused 2/3 Tarsal**	1	1		1	0.50	33.3
1b	**1st Tarsal**	1	1		1	0.50	33.3
1b	**Metatarsal**	48	1	Tarsal C/4 Facet	2	1.00	66.7
1b	**1st Phalange (limb unknown)**	1	1	Proximal	1	0.13	8.7
				Distal	1	0.13	8.7
1b	**3rd Phalange**	1	1	Proximal	1	0.13	8.7
1b	**Proximal Sesamoid (anterior)**	1	1		1	0.13	8.7
1b	**Proximal Sesamoid (posterior)**	8	1		8	1.00	66.7

Table B.5: Level 2 Landmark Analysis

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
2	**Cranium**	7	1	Petrous Temporal	1	0.50	33.3
				Molar	2	0.33	22.0
2	**Mandible**	2	1	3rd Premolar	1	0.50	33.3
				Deciduous Premolar	1	0.33	22.0
2	**Thoracic Vertebra**	2	1	Post. Articular Surface	1	0.04	2.7
2	**Fused 2/3 Carpal**	1	1		1	0.50	33.3
2	**Tibia**	5	1	Prox. Posterior Shaft	2	1.00	66.7
2	**Calcaneus**	1	1	Sustentaculum	1	0.50	33.3
				Calcaneal Tuber	1	0.50	33.3
2	**1st Tarsal**	1	1		1	0.50	33.3
2	**Metatarsal**	5	2	Tarsal C/4 Facet	1	0.50	33.3
				Tarsal 2/3 Facet	1	0.50	33.3
				Prox. Posterior Foramen	1	0.50	33.3
				Anterior Shaft	1	0.50	33.3
				Posterior Shaft	1	0.50	33.3
				Distal Anterior Foramen	3	1.50	100.0
				Distal Posterior Foramen	1	0.50	33.3
				Medial Condyle	2	1.00	66.7
				Lateral Condyle	2	1.00	66.7
2	**2nd Phalange**	2	1	Proximal	1	0.13	8.7
				Distal	1	0.13	8.7

Table B.6: Level 2a Landmark Analysis

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
2a	**Cranium**	16	1	Petrous Temporal	3	1.50	100.0
				2nd Molar	2	1.00	66.7
				Molar	1	0.50	33.3
2a	**Mandible**	172	1	Mandibular Condyle	1	0.50	33.3
				Coronoid Process	1	0.50	33.3
				Body	1	0.50	33.3
				Inferior Border	1	0.50	33.3
				Incisor/Canine	2	0.25	16.7
				3rd Premolar	1	0.50	33.3
2a	**Cervical Vertebra**	13	1	Neural Arch	1	0.14	9.3
				Transverse Process	1	0.07	4.7
2a	**Sacrum**	1	1		1	1.00	66.7
2a	**Scapula**	1	1	Superior Border	1	0.50	33.3
2a	**Humerus**	16	1	Teres Major Tuberosity	1	0.50	33.3
				Distal Shaft	2	1.00	66.7
2a	**Internal Carpal**	1	1		1	0.50	33.3
2a	**Unciform Carpal**	2	2		2	1.00	66.7
2a	**Fused 2/3 Carpal**	1	1		1	0.50	33.3
2a	**Metacarpal**	6	3	Carpal 2/3 Facet	2	1.00	66.7
				Unciform Carpal Facet	3	1.50	100.0
				Prox. Anterior Foramen	1	0.50	33.3
				Prox. Posterior Foramen	1	0.50	33.3
				Anterior Shaft	1	0.50	33.3
				Posterior Shaft	1	0.50	33.3
				Distal Anterior Foramen	1	0.50	33.3
				Distal Posterior Foramen	1	0.50	33.3
				Medial Condyle	2	1.00	66.7
				Lateral Condyle	3	1.50	100.0
2a	**Innominate**	4	1	Ilium Blade	1	0.50	33.3
				Pubis Shaft	1	0.50	33.3
				Pubis Acetabulum	1	0.50	33.3
2a	**Tibia**	1	1	Prox. Posterior Shaft	1	0.50	33.3
				Prox. Lateral Condyle	1	0.50	33.3
2a	**Lateral Malleolus**	1	1		1	0.50	33.3

Table B.7: Level 2a Landmark Analysis Continued

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
2a	**Calcaneus**	1	1	Tuber Calis	1	0.50	33.3
				Tarsal C/4 Facet	1	0.50	33.3
				Fibular Facet	1	0.50	33.3
				Sustentaculum	1	0.50	33.3
				Coracoid Process	1	0.50	33.3
2a	**Fused 2/3 Tarsal**	3	3		3	1.50	100.0
2a	**Metatarsal**	29	1	Tarsal C/4 Facet	1	0.50	33.3
				Prox. Anterior Foramen	1	0.50	33.3
				Anterior Shaft	1	0.50	33.3
				Posterior Shaft	1	0.50	33.3
				Distal Anterior Foramen	1	0.50	33.3
				Distal Posterior Foramen	1	0.50	33.3
				Medial Condyle	1	0.50	33.3
2a	**1st Phalange (posterior)**	1	1	Proximal	1	0.25	16.7
2a	**1st Phalange (limb unknown)**	1	1	Distal	1	0.13	8.7
2a	**2nd Phalange**	1	1	Proximal	1	0.13	8.7
				Distal	1	0.13	8.7
2a	**3rd Phalange**	2	1	Proximal	2	0.25	16.7
2a	**Proximal Sesamoid (anterior)**	1	1		1	0.13	8.7
2a	**Proximal Sesamoid (posterior)**	3	1		3	0.38	25.3
2a	**Metatarsal Sesamoid**	1	1		1	0.50	33.3

Table B.8: Level 2b Landmark Analysis

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
2b	**Cranium**	43	1	Petrous Temporal	1	0.50	33.3
				2nd Premolar	2	1.00	66.7
				3rd Premolar	1	0.50	33.3
				Molar	3	0.50	33.3
2b	**Mandible**	20	1	Incisor/Canine	3	0.38	25.3
				Deciduous Premolar	3	0.50	33.3
2b	**Axis**	2	1	Centrum	1	1.00	66.7
				Odontoid	1	1.00	66.7
2b	**Thoracic Vertebra**	1	1	Transverse Process	1	0.04	2.7
2b	**Scapula**	3	1	Glenoid Cavity	1	0.50	33.3
				Acromial Spine	1	0.50	33.3
2b	**Humerus**	2	1	Teres Major Tuberosity	1	0.50	33.3
				Anterior Mid-Shaft	1	0.50	33.3
2b	**Radius**	79	3	Lateral Glenoid Cavity	1	0.50	33.3
				Medial Glenoid Cavity	1	0.50	33.3
				Radial Tuberosity	1	0.50	33.3
				Posterior Lateral Foramen	1	0.50	33.3
				Prox. Posterior Shaft	1	0.50	33.3
				Prox. Anterior Shaft	1	0.50	33.3
				Distal Posterior Shaft	3	1.50	100.0
				Distal Anterior Shaft	3	1.50	100.0
				Radial Carpal Facet	3	1.50	100.0
				Internal Carpal Facet	3	1.50	100.0
2b	**Ulna**	5	1	Olecranon Process	1	0.50	33.3

Table B.9: Level 2b Landmark Analysis Continued

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
2b	**Unciform Carpal**	1	1		1	0.50	33.3
2b	**Innominate**	5	1	Ischium Shaft	1	0.50	33.3
2b	**Femur**	1	1	Anterior Shaft	1	0.50	33.3
2b	**Tibia**	7	1	Prox. Posterior Shaft	3	1.50	100.0
				Distal Posterior Shaft	1	0.50	33.3
2b	**Calcaneus**	7	1	Calcaneal Tuber	2	1.00	66.7
2b	**Fused C/4 Tarsal**	1	1		1	0.50	33.3
2b	**Fused 2/3 Tarsal**	1	1		1	0.50	33.3
2b	**Metatarsal**	31	1	Tarsal C/4 Facet	1	0.50	33.3
				Tarsal 2/3 Facet	1	0.50	33.3
				Anterior Shaft	1	0.50	33.3
				Posterior Shaft	1	0.50	33.3
2b	**1st Phalange (anterior)**	5	2	Proximal	5	1.25	83.3
				Distal	5	1.25	83.3
2b	**1st Phalange (limb unknown)**	1	1	Distal	1	0.13	8.7
2b	**2nd Phalange**	2	2	Proximal	1	0.13	8.7
				Distal	2	0.25	16.7
2b	**Proximal Sesamoid (posterior)**	1	1		1	0.13	8.7
2b	**Distal Sesamoid**	1	1		1	0.13	8.7

Table B.10: Level 3 Landmark Analysis

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
3	**Cranium**	11	1	Petrous Temporal	2	1.00	40.0
				3rd Premolar	1	0.50	20.0
				1st Molar	1	0.50	20.0
				Molar	1	0.17	6.8
3	**Mandible**	38	1	Mandibular Condyle	1	0.50	20.0
				Ramus	1	0.50	20.0
				Inferior Border	3	1.50	60.0
				Incisor/Canine	4	0.50	20.0
				2nd Premolar	1	0.50	20.0
				3rd Molar	1	0.50	20.0
				Molar	1	0.17	6.8
3	**Thoracic Vertebra**	5	1	Transverse Process	1	0.04	1.6
				Spinous Process	1	0.07	2.8
3	**Lumbar Vertebra**	9	1	Ant. Articular Facet	2	0.20	8.0
				Post. Articular Facet	2	0.20	8.0
				Neural Arch	2	0.40	16.0
				Neural Spine	1	0.20	8.0
				Transverse Process	1	0.20	8.0
				Centrum	1	0.20	8.0
3	**Caudal Vertebra**	1	1		1	0.07	2.8
3	**Humerus**	5	1	Teres Major Tuberosity	1	0.50	20.0
				Distal Shaft	1	0.50	20.0
3	**Radius**	2	1	Lateral Tubercle	1	0.50	20.0
				Lateral Glenoid Cavity	1	0.50	20.0
				Medial Glenoid Cavity	1	0.50	20.0
3	**Ulna**	2	1	Anconeal Process	2	1.00	40.0
				Semilunar Notch	1	0.50	20.0
				Coronoid Process	2	1.00	40.0
				Shaft	1	0.50	20.0
3	**Internal Carpal**	2	1		2	1.00	40.0
3	**Ulnar Carpal**	1	1		1	0.50	20.0
3	**Unciform Carpal**	1	1		1	0.50	20.0
3	**Metacarpal**	3	1	Carpal 2/3 Facet	1	0.50	20.0
				Anterior Shaft	1	0.50	20.0
				Posterior Shaft	1	0.50	20.0
3	**Innominate**	13	2	Ischium Blade	1	0.50	20.0
				Ischium Shaft	2	1.00	40.0
				Ischium Acetabulum	1	0.50	20.0
3	**Femur**	12	2	Anterior Shaft	4	2.00	80.0
				Lesser Trochanter	2	1.00	40.0

Table B.11: Level 3 Landmark Analysis Continued

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
3	**Tibia**	17	2	Prox. Posterior Shaft	5	2.50	100.0
				Distal Anterior Shaft	1	0.50	20.0
				Distal Posterior Shaft	1	0.50	20.0
				Medial Groove	1	0.50	20.0
				Lateral Groove	1	0.50	20.0
				Fibular Facet	1	0.50	20.0
				Medial Malleolus	1	0.50	20.0
3	**Lateral Malleolus**	1	1		1	0.50	20.0
3	**Calcaneus**	3	1	Coracoid Process	1	0.50	20.0
3	**Astragalus**	1	1	Proximal Condyle	1	0.50	20.0
				Distal Condyle	1	0.50	20.0
3	**Fused 2/3 Tarsal**	2	1		2	1.00	40.0
3	**1st Tarsal**	2	1		2	1.00	40.0
3	**Metatarsal**	1	1	Tarsal C/4 Facet	1	0.50	20.0
				Tarsal 2/3 Facet	1	0.50	20.0
3	**1st Phalange (limb unknown)**	3	1	Proximal	1	0.13	5.2
				Distal	3	0.38	15.2
3	**2nd Phalange**	2	1	Proximal	2	0.25	10.0
				Distal	1	0.13	5.2
3	**Proximal Sesamoid (anterior)**	2	1		2	0.25	10.0
3	**Proximal Sesamoid (posterior)**	2	1		2	0.25	10.0

Table B.12: Level 3a Landmark Analysis

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
3a	**Mandible**	9	1	2nd Premolar	1	0.50	100.0
				3rd Molar	1	0.50	100.0
3a	**Thoracic Vertebra**	1	1	Neural Arch	1	0.07	14.0
				Centrum	1	0.07	14.0
3a	**Scapula**	67	1	Acromial Spine	1	0.50	100.0
				Superior Border	1	0.50	100.0
				Inferior Border	1	0.50	100.0
3a	**Humerus**	2	1	Distal Shaft	1	0.50	100.0
3a	**Metacarpal**	4	1	Distal Shaft	1	0.50	100.0
3a	**Tibia**	1	1	Prox. Posterior Shaft	1	0.50	100.0

Table B.13: Level 3b Landmark Analysis

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
3b	**Cranium**	9	1	Nasal Bone	1	0.50	33.3
				Petrous Temporal	1	0.50	33.3
				Premolar	2	0.33	22.0
				Molar	2	0.33	22.0
3b	**Mandible**	29	1	Mandibular Condyle	1	0.50	33.3
				Coronoid Process	1	0.50	33.3
				Alveolar Margin	1	0.50	33.3
				Gonial Angle	1	0.50	33.3
				Ramus	1	0.50	33.3
				2nd Premolar	1	0.50	33.3
3b	**Thoracic Vertebra**	6	1	Centrum	1	0.07	4.7
				Spinous Process	1	0.07	7.7
3b	**Lumbar Vertebra**	1	1	Centrum	1	0.20	13.3
3b	**Scapula**	1	1	Blade	1	0.50	33.3
3b	**Humerus**	2	1	Distal Shaft	2	1.00	66.7
3b	**Radial Carpal**	1	1		1	0.50	33.3
3b	**Fused 2/3 Carpal**	1	1		1	0.50	33.3
3b	**Metacarpal**	6	1	Carpal 2/3 Facet	2	1.00	66.7
				Unciform Carpal Facet	1	0.50	33.3
3b	**Innominate**	17	1	Ilium Blade	1	0.50	33.3
				Ilium Shaft	2	1.00	66.7
				Ischium Shaft	1	0.50	33.3
				Ischium Acetabulum	1	0.50	33.3
3b	**Femur**	8	1	Head	1	0.50	33.3
				Lesser Trochanter	2	1.00	66.7
				Supracondyloid Fossa	1	0.50	33.3
				Patellar Facet	1	0.50	33.3

Table B.14: Level 3b Landmark Analysis Continued

Level	Faunal Specimen	NISP	MNI (side)	Anatomical Landmark	MNE	MAU	%MAU (%)
3b	**Tibia**	12	2	Pros. Posterior Shaft	3	1.50	100.0
				Distal Anterior Shaft	1	0.50	33.3
				Distal Posterior Shaft	2	1.00	66.7
				Medial Groove	1	0.50	33.3
				Lateral Groove	1	0.50	33.3
				Fibular Facet	1	0.50	33.3
				Medial Malleolus	1	0.50	33.3
3b	**Lateral Malleolus**	1	1		1	0.50	33.3
3b	**1st Phalange (anterior)**	1	1	Proximal	1	0.25	16.7
				Distal	1	0.25	16.7
3b	**1st Phalange (posterior)**	1	1	Proximal	1	0.25	16.7
				Distal	1	0.25	16.7
3b	**2nd Phalange**	1	1	Distal	1	0.13	8.7
3b	**3rd Phalange**	1	1	Proximal	1	0.13	8.7
3b	**Metatarsal Sesamoid**	1	1		1	0.50	33.3

Appendix C
Calibrated Radiocarbon Ages

Table C.1: Level 1b Calibrated Ages (Stuiver and Reimer 1993)

Charcoal Sample Number BGS 2659, Level 1b		
One Sigma Calibration Minimum (ka BP)	**One Sigma Calibration Maximum (ka BP)**	**Probability**
0.395	0.424	0.151
0.272	0.319	0.445
0.202	0.207	0.017
0.147	0.191	0.328
0.004	0.013	0.059
Two Sigma Calibration Minimum (ka BP)	**Two Sigma Calibration Maximum (ka BP)**	**Probability**
0.346	0.462	0.235
0.257	0.342	0.372
0.138	0.223	0.319
0.093	0.096	0.002
0.001	0.031	0.072
Uncalibrated = 0.241 +/- 0.050 ka BP **Calibrated = 0.300 +/- 0.050 ka BP**		

Table C.2: Level 2a Calibrated Ages (Stuiver and Reimer 1993)

Faunal Sample Number BGS 2660, Level 2a		
One Sigma Calibration Minimum (ka BP)	**One Sigma Calibration Maximum (ka BP)**	**Probability**
3.790	3.825	0.290
3.770	3.775	0.032
3.746	3.763	0.123
3.685	3.729	0.389
3.641	3.662	0.166
Two Sigma Calibration Minimum (ka BP)	**Two Sigma Calibration Maximum (ka BP)**	**Probability**
3.630	3.834	0.979
3.609	3.618	0.010
3.589	3.598	0.011
Uncalibrated = 3.460 +/- 0.045 ka BP **Calibrated = 3.700 +/- 0.045 ka BP**		

Table C.3: Level 2b Calibrated Ages (Stuiver and Reimer 1993)

Faunal Sample Number BGS 2661, Level 2b		
One Sigma Calibration Minimum (ka BP)	**One Sigma Calibration Maximum (ka BP)**	**Probability**
4.368	4.405	0.208
4.305	4.354	0.296
4.236	4.304	0.442
4.185	4.195	0.053
Two Sigma Calibration Minimum (ka BP)	**Two Sigma Calibration Maximum (ka BP)**	**Probability**
4.148	4.417	0.998
4.103	4.105	0.002
Uncalibrated = 3.867 +/- 0.050 ka BP **Calibrated = 4.270 +/- 0.050 ka BP**		

Table C.4: Level 3a Calibrated Ages (Stuiver and Reimer 1993)

Faunal Sample Number BGS 2662, Level 3a		
One Sigma Calibration Minimum (ka BP)	**One Sigma Calibration Maximum (ka BP)**	**Probability**
5.382	5.449	0.440
5.283	5.328	0.373
5.139	5.160	0.100
5.084	5.103	0.088
Two Sigma Calibration Minimum (ka BP)	**Two Sigma Calibration Maximum (ka BP)**	**Probability**
5.344	5.466	0.382
5.342	5.343	0.001
5.255	5.334	0.312
5.228	5.249	0.015
5.213	5.221	0.005
5.116	5.187	0.148
5.050	5.112	0.138
Uncalibrated = 4.597 +/- 0.050 ka BP **Calibrated = 5.310 +/- 0.050 ka BP**		

Table C.5: Level 3b Calibrated Ages (Stuiver and Reimer 1993)

Faunal Sample Number BGS 2663, Level 3b		
One Sigma Calibration Minimum (ka BP)	**One Sigma Calibration Maximum (ka BP)**	**Probability**
5.569	5.590	0.196
5.471	5.554	0.804
Two Sigma Calibration Minimum (ka BP)	**Two Sigma Calibration Maximum (ka BP)**	**Probability**
5.449	5.604	0.867
5.395	5.395	0.001
5.327	5.383	0.132
Uncalibrated = 4.780 +/- 0.050 ka BP **Calibrated = 5.530 +/- 0.050 ka BP**		