

## **Permission to Use**

In presenting this thesis in partial fulfilment of the requirements for a Postgraduate degree from the University of Saskatchewan, I agree that the Libraries of this University may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purposes may be granted by the professor or professors who supervised my thesis work or, in their absence, by the Head of the Department or the Dean of the College in which my thesis work was done. It is understood that any copying, publication, or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of Saskatchewan in any scholarly use which may be made of any material in my thesis.

Requests for permission to copy or to make other use of material in this thesis in whole or part should be addressed to:

Head of the Department of Archaeology and Anthropology  
55 Campus Drive  
University of Saskatchewan  
Saskatoon, Saskatchewan  
S7N 5B1

## **Abstract**

The Cut Arm site (FbNp-22) is a well stratified, multi-component habitation site on the Northern Plains. The Cut Arm site lies within Wanuskewin Heritage Park near Saskatoon, Saskatchewan which is centered on the Opimihaw Creek. The site was first identified in the original survey of the Wanuskewin Heritage Park area and was excavated in 2001 and 2002 by the Department of Archaeology, University of Saskatchewan undergraduate field school.

The site contains cultural materials spanning from the Historic period to the Early Middle Precontact period and occupations from the following phases: Historic period, Contact period, Plains Side-Notched complex, Prairie Side-Notched complex, Besant complex, McKean series, Oxbow complex and the Mummy Cave series. This cultural chronology is supported by five radiocarbon dates. The occurrence of all such phases within a single site is relatively rare and presents an important opportunity for expanding upon the knowledge of human occupation on the Northern Plains.

The overarching research objective of this thesis is to further the reconstruction of prehistoric subsistence and settlement patterns within the Opimihaw Creek area. A comprehensive analysis and interpretation of the archaeological assemblage was undertaken which includes both features as well as faunal, lithic, pottery, ceramic, metal and botanical artifacts to determine how, when and why the site was occupied. The Cut Arm site contains multiple Middle Precontact period occupations which are discussed in context with other sites in the Wanuskewin Heritage Park containing components from this period. A pattern of intensive utilization of the park throughout the Middle Precontact is identified and discussed in terms of the unique character of the area. The identification of this terrestrial island on the plains contributes to an archaeological understanding of human mobility, settlement and subsistence patterns on the Northern Plains.

## Acknowledgements

First and foremost I would like to thank my supervisor Dr. Ernie Walker for all of his help and guidance throughout my Master's program and thesis research. I would also like to thank the other members of my Advisory Committee: Dr. Margaret Kennedy and Dr. Alec Aitken for their support and recommendations. I am also very grateful for Dr. Ernie Walker's help with the identification of the archaeological materials from the Cut Arm site as well as Dr. Margaret Kennedy for sharing her expertise in identifying the historic artifacts from the site and Dr. David Meyer for his assistance in identifying the pottery. All other faculty and staff in the Department of Archaeology and Anthropology have offered nothing but kindness and support and have encouraged me to grow as a responsible researcher.

I would like to thank all sources of financial support including: the Department of Archaeology and Anthropology, University of Saskatchewan for departmental scholarships and teaching assistantships; the Saskatchewan Heritage Foundation and the Saskatchewan Archaeological Society with funding from Saskatchewan Lotteries for research grants; and the University of Saskatchewan Graduate Students' Association and the Saskatoon Chapter of the Multiple Sclerosis Society for academic bursaries.

I would like to thank everyone who was a part of the Cut Arm site project prior to my taking it on. Your hard work and dedication has made my work possible.

I would like to thank all of my fellow graduate students both past and present. In particular I would like to mention my lab mates: Jody Pletz, Maria Mampe and Loni Williams. Thank you for helping me work through my questions, problems, stresses and successes. I would like to acknowledge the graduate students of my year: Alison Macintosh, Jennifer Donlevy, Adam Splawinski and Karin Steuber, whom I am lucky enough to have had not only as colleagues but close friends as well. I would like to thank Ian, Derek and Brent for the many lunch breaks and coffee runs and for keeping me company on those quiet days in the building.

I would like to thank my many family members. Your constant support throughout the course of my program has meant so much. Finally, I want to thank my loving husband Jordan and my wonderful son Gavin for more than I can say. Thank you.

# Table of Contents

<b>Permission to Use .....</b>	<b>i</b>
<b>Abstract .....</b>	<b>ii</b>
<b>Acknowledgements .....</b>	<b>iii</b>
<b>Table of Contents .....</b>	<b>iv</b>
<b>List of Tables .....</b>	<b>x</b>
<b>List of Figures .....</b>	<b>xii</b>
<b>Chapter 1 Introduction .....</b>	<b>1</b>
1.1 Research Background .....	1
1.2 Research Objectives .....	2
1.3 Organizational Summary .....	2
<b>Chapter 2 Biophysical Resources and Culture History .....</b>	<b>4</b>
2.1 Biophysical Resources .....	4
2.1.1 Biophysical Overview of the Cut Arm Site Area .....	4
2.1.2 Geomorphology and Soils .....	5
2.1.3 Floral and Faunal Resources .....	7
2.2 Culture History .....	10
2.2.1 Introduction .....	10
2.2.2 Early Precontact Period .....	12
2.2.3 Middle Precontact Period .....	15
2.2.4 Late Precontact Period .....	19
2.2.5 Contact/Historic Period .....	22
<b>Chapter 3 Research Methodology and Radiocarbon Dating .....</b>	<b>24</b>
3.1 History of Research .....	24
3.2 Survey, Excavation and Laboratory Methodology .....	24
3.3 Analytical Methodology .....	26
3.3.1 Pottery and Ceramics .....	26
3.3.2 Metal .....	27
3.3.3 Botanical Specimens .....	27
3.3.4 Faunal Specimens .....	27
3.3.5 Lithic Artifacts .....	29
3.4 Stratigraphy and Radiocarbon dates .....	32
3.4.1 Stratigraphy .....	32
3.4.2 Radiocarbon Dating .....	35

<b>Chapter 4 Cultural Level 1 .....</b>	<b>38</b>
4.1 Introduction .....	38
4.2 Pottery Assemblage .....	38
4.2.1 European Ceramics .....	38
4.2.2 Precontact Pottery .....	40
4.3 Metal Assemblage .....	40
4.4 Lithic Assemblage .....	41
4.4.1 Cores and Core Fragments .....	41
4.4.2 Debitage .....	41
4.4.3 Fire-Cracked Rock .....	42
4.5 Botanical Assemblage .....	42
4.6 Faunal Assemblage .....	42
4.6.1 Order Artiodactyla .....	43
4.6.2 Order Lagomorpha .....	44
4.6.3 Order Rodentia .....	45
4.6.4 Miscellaneous Specimens .....	45
4.7 Seasonality .....	46
4.8 Features and Artifact Distribution .....	46
4.9 Interpretation of Level 1 .....	47
<b>Chapter 5 Cultural Level 2 .....</b>	<b>51</b>
5.1 Introduction .....	51
5.2 Pottery Assemblage .....	51
5.2.1 Precontact Pottery .....	51
5.3 Lithic Assemblage .....	55
5.3.1 Projectile Points .....	55
5.3.2 Unifaces .....	55
5.3.3 Retouched Flakes .....	56
5.3.4 Debitage .....	56
5.3.5 Fire-Cracked Rock .....	57
5.4 Botanical Assemblage .....	58
5.5 Faunal Assemblage .....	58
5.5.1 Order Artiodactyla .....	58
5.5.2 Order Carnivora .....	60
5.5.3 Miscellaneous Specimens .....	60
5.6 Seasonality .....	61
5.7 Features and Artifact Distribution .....	61
5.8 Interpretation of Level 2 .....	62
<b>Chapter 6 Cultural Level 3 .....</b>	<b>66</b>
6.1 Introduction .....	66

6.2 Pottery Assemblage .....	66
6.2.1 Precontact Pottery .....	66
6.3 Lithic Assemblage .....	68
6.3.1 Projectile Points .....	68
6.3.2 Bifaces .....	69
6.3.3 Unifaces .....	70
6.3.4 Retouched Flakes .....	71
6.3.5 Cores and Core Fragments .....	72
6.3.6 Debitage .....	72
6.3.7 Fire-Cracked Rock .....	74
6.4 Botanical Assemblage .....	74
6.5 Faunal Assemblage .....	74
6.5.1 Order Artiodactyla .....	75
6.5.2 Miscellaneous Specimens .....	76
6.6 Seasonality .....	77
6.7 Features and Artifact Distribution .....	77
6.8 Interpretation of Level 3 .....	78
<b>Chapter 7 Cultural Level 4 .....</b>	<b>81</b>
7.1 Introduction .....	81
7.2 Pottery Assemblage .....	81
7.2.1 Precontact Pottery .....	81
7.3 Lithic Assemblage .....	82
7.3.1 Projectile Points .....	82
7.3.2 Bifaces .....	83
7.3.3 Unifaces .....	84
7.3.4 Retouched Flakes .....	85
7.3.5 Cores and Core Fragments .....	85
7.3.6 Debitage .....	85
7.3.7 Pecked Stone Tools .....	87
7.3.8 Fire-Cracked Rock .....	87
7.4 Botanical Assemblage .....	89
7.5 Faunal Assemblage .....	89
7.5.1 Order Artiodactyla .....	90
7.5.2 Order Carnivora .....	92
7.5.3 Miscellaneous Specimens .....	93
7.6 Seasonality .....	94
7.7 Features and Artifact Distribution .....	94
7.8 Interpretation of Level 4 .....	94
<b>Chapter 8 Cultural Level 5 .....</b>	<b>99</b>

8.1	Introduction .....	99
8.2	Pottery Assemblage .....	100
8.3	Lithic Assemblage .....	100
8.3.1	Projectile Points .....	100
8.3.2	Bifaces .....	100
8.3.3	Retouched Flakes .....	102
8.3.4	Cores and Core Fragments .....	102
8.3.5	Debitage .....	104
8.3.6	Fire-Cracked Rock .....	107
8.4	Botanical Assemblage .....	107
8.5	Faunal Assemblage .....	107
8.5.1	Order Artiodactyla .....	109
8.5.2	Order Carnivora .....	111
8.5.3	Miscellaneous Specimens .....	111
8.6	Seasonality .....	111
8.7	Features and Artifact Distribution .....	112
8.8	Interpretation of Level 5 .....	113
<b>Chapter 9</b>	<b>Cultural Level 6 .....</b>	<b>119</b>
9.1	Introduction .....	119
9.2	Lithic Assemblage .....	119
9.2.1	Projectile Points .....	119
9.2.2	Expedient Tools .....	119
9.2.3	Debitage .....	121
9.2.4	Fire-Cracked Rock .....	122
9.3	Faunal Assemblage .....	122
9.3.1	Order Artiodactyla .....	124
9.3.2	Miscellaneous Specimens .....	126
9.4	Seasonality .....	126
9.5	Features and Artifact Distribution .....	127
9.6	Interpretation of Level 6 .....	128
<b>Chapter 10</b>	<b>Cultural Level 7 .....</b>	<b>133</b>
10.1	Introduction .....	133
10.2	Lithic Assemblage .....	133
10.2.1	Unifaces .....	133
10.2.2	Abrader .....	133
10.2.3	Debitage .....	135
10.2.4	Fire-Cracked Rock .....	136
10.3	Faunal Assemblage .....	136
10.3.1	Order Artiodactyla .....	137

10.3.2	Miscellaneous Specimens .....	138
10.4	Seasonality .....	139
10.5	Features and Artifact Distribution .....	139
10.6	Interpretation of Level 7 .....	139
<b>Chapter 11</b>	<b>Cultural Level 8 .....</b>	<b>143</b>
11.1	Introduction .....	143
11.2	Lithic Assemblage .....	143
11.2.1	Projectile Points .....	143
11.2.2	Unifaces .....	143
11.2.3	Debitage .....	145
11.2.4	Fire-Cracked Rock .....	146
11.3	Botanical Assemblage .....	147
11.4	Faunal Assemblage .....	147
11.4.1	Order Artiodactyla .....	148
11.4.2	Miscellaneous Specimens .....	150
11.5	Seasonality .....	151
11.6	Features and Artifact Distribution .....	151
11.7	Interpretation of Level 8 .....	154
<b>Chapter 12</b>	<b>Cultural Level 9 .....</b>	<b>158</b>
12.1	Introduction .....	158
12.2	Lithic Assemblage .....	158
12.2.1	Projectile Points .....	158
12.2.2	Debitage .....	158
12.2.3	Fire-Cracked Rock .....	160
12.3	Faunal Assemblage .....	160
12.3.1	Order Artiodactyla .....	161
12.3.2	Miscellaneous Specimens .....	163
12.4	Seasonality .....	163
12.5	Features and Artifact Distribution .....	164
12.6	Interpretation of Level 9 .....	165
<b>Chapter 13</b>	<b>Cultural Level 10 .....</b>	<b>169</b>
13.1	Introduction .....	169
13.2	Lithic Assemblage .....	169
13.2.1	Projectile Points .....	169
13.2.2	Retouched Flakes .....	169
13.2.3	Cores and Core Fragments .....	170
13.2.4	Debitage .....	170
13.2.5	Fire-Cracked Rock .....	171



13.3 Botanical Assemblage .....	172
13.4 Faunal Assemblage .....	172
13.4.1 Order Artiodactyla .....	173
13.4.2 Order Carnivora .....	173
13.4.3 Miscellaneous Specimens .....	175
13.5 Seasonality .....	175
13.6 Features and Artifact Distribution .....	175
13.7 Interpretation of Level 10 .....	176
<b>Chapter 14 Cultural Level 11 .....</b>	<b>180</b>
14.1 Introduction .....	180
14.2 Lithic Assemblage .....	180
14.2.1 Debitage .....	180
14.2.2 Fire-Cracked Rock .....	181
14.3 Faunal Assemblage .....	182
14.3.1 Order Artiodactyla .....	182
14.3.2 Miscellaneous Specimens .....	183
14.4 Seasonality .....	183
14.5 Features and Artifact Distribution .....	183
14.6 Interpretation of Level 11 .....	183
<b>Chapter 15 Wanuskewin Heritage Park: A Terrestrial Island on the Plains .....</b>	<b>187</b>
15.1 Terrestrial Islands on the Plains: Theoretical Background .....	187
15.2 Middle Precontact Period Occupation of the Opimihaw Creek Valley .....	189
15.2.1 The Amisk Site .....	192
15.2.2 The Newo Asiniak Site .....	195
15.2.3 The Dog Child Site .....	197
15.2.4 The Thundercloud Site .....	198
15.2.5 The Redtail Site .....	200
15.2.6 The Meewasin Creek Site .....	201
15.2.7 The Wolf Willow Site .....	203
15.2.8 The Cut Arm Site .....	204
15.3 The Opimihaw Creek Valley as an Island on the Plains .....	205
15.4 Chapter Conclusion .....	211
<b>Chapter 16 Summary and Conclusions .....</b>	<b>212</b>
16.1 Summary of the Cut Arm site .....	212
16.2 Future Research .....	215
<b>References Cited .....</b>	<b>216</b>

## List of Tables

Table 2.1: Cultural Chronology of the Northern Plains .....	12
Table 3.1: Mammal size classes .....	28
Table 3.2: Cultural Level depth ranges and average thicknesses .....	33
Table 3.3: Radiocarbon ages for the Cut Arm site .....	36
Table 4.1: Historic ceramics for Level 1 .....	39
Table 4.2: Precontact pottery for Level 1 .....	40
Table 4.3: Lithic debitage from Level 1 .....	42
Table 4.4: Faunal counts for Level 1 .....	43
Table 4.5: Faunal taxa for Level 1 .....	44
Table 4.6: Adult <i>Bison bison</i> quantification by element for Level 1 .....	44
Table 5.1: Precontact pottery for Level 2 .....	52
Table 5.2: Quantification of complete sherds for Level 2 .....	53
Table 5.3: Analysis of Level 2 complete sherds by type .....	54
Table 5.4: Lithic debitage from Level 2 .....	57
Table 5.5: Faunal counts for Level 2 .....	59
Table 5.6: Faunal taxa for Level 2 .....	59
Table 5.7: Adult <i>Bison bison</i> quantification by element for Level 2 .....	61
Table 6.1: Precontact pottery for Level 3 .....	67
Table 6.2: Quantification of complete sherds for Level 3 .....	67
Table 6.3: Analysis of Level 3 complete sherds by type .....	68
Table 6.4: Lithic debitage from Level 3 .....	73
Table 6.5: Fire-cracked rock from Level 3 .....	74
Table 6.6: Faunal counts for Level 3 .....	75
Table 6.7: Faunal taxa for Level 3 .....	75
Table 6.8: Adult <i>Bison bison</i> quantification by element for Level 3 .....	76
Table 7.1: Precontact pottery for Level 4 .....	81
Table 7.2: Lithic debitage from Level 4 .....	88
Table 7.3: Fire-cracked rock from Level 4 .....	89
Table 7.4: Faunal counts for Level 4 .....	90
Table 7.5: Faunal taxa for Level 4 .....	90
Table 7.6: Adult <i>Bison bison</i> quantification by element for Level 4 .....	92
Table 8.1: Lithic debitage from Level 5 .....	104
Table 8.2: Lithic debitage from Level 5a .....	105
Table 8.3: Lithic debitage from Level 5b .....	106
Table 8.4: Lithic debitage from Level 5c .....	106
Table 8.5: Faunal counts for Level 5, 5a, 5b and 5c .....	108
Table 8.6: Faunal taxa for Level 5, 5a, 5b, 5c .....	109
Table 8.7: Adult <i>Bison bison</i> quantification by element for Level 5, 5a, 5b and 5c .....	110

## List of Tables Continued

Table 9.1: Lithic debitage from Level 6 .....	121
Table 9.2: Faunal counts for Level 6 .....	122
Table 9.3: Faunal taxa for Level 6 .....	122
Table 9.4: Adult <i>Bison bison</i> quantification by element for Level 6 .....	123
Table 9.5: Lithic types in artifact-dense units .....	127
Table 10.1: Lithic debitage from Level 7 .....	136
Table 10.2: Faunal counts for Level 7 .....	137
Table 10.3: Faunal taxa for Level 7 .....	137
Table 10.4: Adult <i>Bison bison</i> quantification by element for Level 7 .....	138
Table 10.5: Lithic types in artifact-dense units .....	140
Table 11.1: Lithic debitage from Level 8 .....	146
Table 11.2: Fire-cracked rock from Level 8 .....	146
Table 11.3: Faunal counts for Level 8 .....	148
Table 11.4: Faunal taxa for Level 8 .....	148
Table 11.5: Adult <i>Bison bison</i> quantification by element for Level 8 .....	149
Table 11.6: Highest concentrations of FCR by unit in Level 8 .....	151
Table 11.7: Lithic types in artifact-dense units .....	152
Table 12.1: Lithic debitage from Level 9 .....	159
Table 12.2: Faunal counts for Level 9 .....	160
Table 12.3: Faunal taxa for Level 9 .....	160
Table 12.4: Adult <i>Bison bison</i> quantification by element for Level 9 .....	162
Table 12.5: Immature <i>Bison bison</i> quantification by element for Level 9 .....	163
Table 12.6: Lithic types by unit .....	164
Table 13.1: Lithic debitage from Level 10 .....	171
Table 13.2: Faunal counts for Level 10 .....	172
Table 13.3: Faunal taxa for Level 10 .....	173
Table 13.4: Adult <i>Bison bison</i> quantification by element for Level 10 .....	173
Table 13.5: Adult <i>Canis sp.</i> quantification by element for Level 10 .....	175
Table 13.6: Lithic types in artifact-dense units .....	176
Table 14.1: Lithic debitage from Level 11 .....	181
Table 14.2: Faunal counts for Level 11 .....	182
Table 14.3: Faunal taxa for Level 11 .....	182
Table 15.1: Radiocarbon ages for sites containing Middle Precontact period occupations in the Opimihaw Creek valley area .....	193
Table 16.1: Cultural chronology of the Cut Arm site with radiocarbon dates and diagnostic artifacts .....	213

## List of Figures

Figure 2.1: Location of the Cut Arm site .....	5
Figure 2.2: Location of Wanuskewin Heritage Park within the Prairie Ecozone on the edge of the Moist Mixed Grassland and Aspen Parkland Ecoregions in Saskatchewan .....	7
Figure 2.3: Location of Saskatoon, Saskatchewan within the Aspen Parkland vegetation type ...	7
Figure 3.1: Cut Arm site coulee .....	25
Figure 3.2: Cut Arm site map .....	25
Figure 3.3: Wall profile showing slope of the surface and stratigraphy .....	32
Figure 3.4: West wall profile of unit 70S78E and unit 69S78E .....	34
Figure 3.5: West wall profile of unit 59S71E .....	35
Figure 4.1: Relief-molded vitrified whitewear vessel .....	39
Figure 4.2: Vitrified whitewear handle .....	39
Figure 4.3: Vitrified whitewear stamped saucer .....	39
Figure 4.4: Metal projectile point .....	41
Figure 4.5: <i>Lepus americanus</i> mandible and teeth fragments .....	45
Figure 4.6: Artifact and feature distribution map of Level 1, 1 of 2 .....	49
Figure 4.7: Artifact and feature distribution map of Level 1, 2 of 2 .....	50
Figure 5.1: Interior exfoliation with brushmarks and limestone inclusions .....	52
Figure 5.2: Mortlach rim sherds .....	53
Figure 5.3: Mortlach basal sherds .....	54
Figure 5.4: Level 2 projectile points .....	55
Figure 5.5: Level 2 flaked stone tools .....	56
Figure 5.6: Pathological <i>Bison bison</i> molars .....	59
Figure 5.7: Artifact and feature distribution map of Level 2, 1 of 2 .....	64
Figure 5.8: Artifact and feature distribution map of Level 2, 2 of 2 .....	65
Figure 6.1: Level 3 Prairie Side-Notched projectile points .....	69
Figure 6.2: Basalt biface .....	70
Figure 6.3: Silicified peat biface .....	70
Figure 6.4: Level 3 endscrapers .....	71
Figure 6.5: Basalt uniface .....	72
Figure 6.6: Artifact and feature distribution map of Level 3, 1 of 2 .....	79
Figure 6.7: Artifact and feature distribution map of Level 3, 2 of 2 .....	80
Figure 7.1: Prairie Side-Notched projectile point from Level 4 .....	82
Figure 7.2: Bifacial drill .....	83
Figure 7.3: Level 4 bifaces .....	84
Figure 7.4: Endscrapers .....	84
Figure 7.5: Swan River Chert core .....	86

## List of Figures Continued

Figure 7.6: Cultural pebble of chert precipitated in limestone (CPL) .....	86
Figure 7.7: Hammerstones in Level 4 .....	87
Figure 7.8: Adult <i>Bison bison</i> mandibular fragment containing P4 and M1 .....	91
Figure 7.9: Lithic fragment imbedded in Very Large Mammal rib fragment .....	93
Figure 7.10: Artifact and feature distribution map of Level 4, 1 of 2 .....	97
Figure 7.11: Artifact and feature distribution map of Level 4, 2 of 2 .....	98
Figure 8.1: Level 5a projectile points .....	101
Figure 8.2: Broken white chert biface, separate and reconstructed .....	101
Figure 8.3: Retouched flake from Level 5 .....	102
Figure 8.4: Retouched flakes from Level 5a .....	103
Figure 8.5: Red quartzite core from Level 5a .....	103
Figure 8.6: Feature 5b-1 from unit 71S81E .....	112
Figure 8.7: Artifact and feature distribution map of Level 5 .....	115
Figure 8.8: Artifact and feature distribution map of Level 5a .....	116
Figure 8.9: Artifact and feature distribution map of Level 5b .....	117
Figure 8.10: Artifact and feature distribution map of Level 5c .....	118
Figure 9.1: Knife River Flint projectile point fragment .....	120
Figure 9.2: Quartzite cobble tool .....	120
Figure 9.3: <i>Bison bison</i> fragmented left mandible .....	125
Figure 9.4: <i>Bison bison</i> fragmented right mandible .....	125
Figure 9.5: <i>Bison bison</i> incomplete right mandible .....	126
Figure 9.6: Artifact and feature distribution map for Level 6, 1 of 2 .....	130
Figure 9.7: Artifact and feature distribution map for Level 6, 2 of 2 .....	131
Figure 9.8: Faunal and lithic concentrations in Level 6 .....	132
Figure 10.1: White chert endscraper .....	134
Figure 10.2: Grey chert uniface .....	134
Figure 10.3: Granite cobble abrader .....	135
Figure 10.4: Artifact and feature distribution map for Level 7 .....	141
Figure 10.5: Units of artifact concentration for Level 7 .....	142
Figure 11.1: McKean Lanceolate projectile point .....	144
Figure 11.2: Level 8 unifacial tools .....	144
Figure 11.3: Chert cobble .....	145
Figure 11.4: <i>Bison bison</i> right mandible with P4, M1, M2 and M3 .....	150
Figure 11.5: Feature 8-1 bone bed in unit 70S81E at 125 cm dbs .....	153
Figure 11.6: Feature 8-2 charcoal stain in east quadrants of unit 70S81E .....	153
Figure 11.7: Artifact and feature distribution map for Level 8 .....	156
Figure 11.8: Units of artifact concentration for Level 8 .....	157
Figure 12.1: Oxbow projectile point .....	159
Figure 12.2: <i>Bison bison</i> right maxilla with mixed dentition .....	162

## List of Figures Continued

Figure 12.3: Stratigraphic profile of west wall of units 69S78E and 70S78E .....	165
Figure 12.4: Artifact and feature distribution map for Level 9 .....	167
Figure 12.5: Units of artifact concentration for Level 9 .....	168
Figure 13.1: Early Side-Notched projectile point .....	170
Figure 13.2: <i>Canis sp.</i> partial forelimb .....	174
Figure 13.3: Artifact and feature distribution map for Level 10 .....	178
Figure 13.4: Units of artifact concentration for Level 10 .....	179
Figure 14.1: Orthoquartzite pebble .....	181
Figure 14.2: Artifact and feature distribution map for Level 11 .....	185
Figure 14.3: Units of artifact concentration for Level 11 .....	186
Figure 15.1: Sites with Middle Precontact period occupations in the Wanuskewin Heritage Park .....	191
Figure 15.2: Proposed boundaries of Opimihaw Creek valley terrestrial island .....	207