

**THE ARCHAEOBIOLOGY OF BEARS  
AND BEAR CEREMONIALISM IN MINNESOTA**

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### Land Acknowledgment

The area of this study as defined by the State of Minnesota is within Dakota and Ojibwe homeland. Spanning thousands of years, the archaeological sites discussed here represent events in the histories of those nations, and those of other native communities who share ancestral connections to this place.

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### Dedication

This dissertation is dedicated to the memory of my parents, Boyd and Dee Mather. It would not have been possible without them. It is also dedicated to my wife, Elizabeth Davis, and our daughter, Isabel Mather. I think they like bears just as much as I do.

## Abstract

American black bears (*Ursus americanus*) and brown/grizzly bears (*Ursus arctos*) are sacred animals to traditional members of the Dakota, Ojibwe, and other American Indian nations. This dissertation creates historic contexts for consideration of bears in Minnesota's archaeological record, to aid indigenous archaeology and heritage management, and to provide a historical perspective for management of the state's current black bear population. Archaeological sites in Minnesota contain occasional representations of bears in rock art, earthworks and portable art, and rare zooarchaeological finds of bear bones or teeth. In three cases, excavations have encountered large numbers of skull fragments representing dozens to hundreds of bears. Collectively these archaeological sites, features and artifacts are varied expressions of bear ceremonialism, within and beyond the scope described in the 1926 *American Anthropologist* article by A. Irving Hallowell.

Minnesota is one of a few areas in the continental United States where black bears survived the pressures of overhunting and habitat loss in the late nineteenth and early twentieth centuries. Grizzly bears were once present on the Great Plains, including parts of Minnesota, but the closest living population today is in Yellowstone National Park. Minnesota bear finds are summarized for the Laurentian Mixed Forest, Eastern Broadleaf Forest, Tallgrass Aspen Parklands, and Prairie Parklands ecological provinces, as defined by the Ecological Classification System utilized by the Minnesota Department of Natural Resources, within the context of each provinces zooarchaeological record. The density of archaeological bear finds is greatest along the boundary between the Laurentian Mixed Forest and Eastern Broadleaf Forest.

More detailed analysis was conducted on teeth from archaeological assemblages from the Christensen Mound (21SH1/16), Crace (21ML3) and Bear (21ML68) sites, with comparative analysis on recent black bear skulls of known life history from Chippewa National Forest. These studies allowed assessment of the age and sex structure of the bears at each site, indicating that while the assemblages appear superficially similar, different types of ceremonies are represented at each.

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### Frequently Used Abbreviations

BCE	Before Common Era (corresponding to BC in the Gregorian calendar)
BMU	Bear Management Unit as defined by the Mn/DNR
BP	Before Present (years before present); before 1950 for radiocarbon dates
BWCAW	Boundary Waters Canoe Area Wilderness
CE	Common Era (corresponding to AD in the Gregorian calendar)
CRM	Cultural Resource Management
CSO	Culturally Sensitive Object (Minnesota Historical Society term)
DNR	Department of Natural Resources
ECS	Ecological Classification System
GLIFWC	Great Lakes Indian Fish & Wildlife Commission
IBA	International Association for Bear Research and Management
IUCN/SSC	International Union for Conservation of Nature, Species Survival Commission
MIAC	Minnesota Indian Affairs Council
MLBO	Mille Lacs Band of Ojibwe
MNHS	Minnesota Historical Society
MNI	Minimum Number of Individuals (zooarchaeology)
MPDF	Multiple Property Documentation Form (National Register of Historic Places)
NAGPRA	Native American Graves Protection and Repatriation Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NISP	Number of Identified Specimens (zooarchaeology)
NRHP	National Register of Historic Places
NPS	National Park Service
OSA	Office of the State Archaeologist
SHPO	State Historic Preservation Office/Officer
THPO	Tribal Historic Preservation Office/Officer
UNESCO	United Nations Educational, Scientific and Cultural Organization

### Notes on Terminology

The native peoples of Minnesota include the Dakota, Ojibwe, and historically, other Siouan- or Algonquian-speaking nations. In our state, the terms “American Indian,” “Native American,” “Indigenous,” and “Native” are all used by, and in reference to, native people and heritage. Some use these terms interchangeably, while others have strong preferences for one or another. Throughout my career in Minnesota archaeology, I have generally used “American Indian,” following direction from Resolution 72078 of the Minnesota Indian Affairs Council, and I generally continue that practice in this dissertation. Likewise, I use the preferred tribal names of Dakota rather than Sioux, and Ojibwe or Anishinaabe rather than Chippewa, except in quotations or formal names.

Also, in current practice, Minnesota archaeologists use the term “Precontact” in reference to American Indian archaeological sites dating prior to the beginning of the fur trade in the mid- to late-1600s. This is preferable to “prehistoric” which was previously in common use and sounds like a reference to dinosaurs, but it is still unsatisfying because it implies that the historically recent arrival of Europeans was the defining event within 13,000 years of human history. The related terms “Contact” and “Postcontact” are also used in archaeological chronology, as are the archaeological classifications Paleoindian, Archaic, Woodland, Mississippian, Oneota, and Plains Village. I employ those terms here to avoid confusion because they are in standard use at the time of this writing. I hope that in the future, archaeologists and native leaders will collaboratively develop a series of chronological and cultural reference terms that are more meaningful.

For dates, I use Before Common Era (BCE) and Common Era (CE) instead of BC/AD of the Gregorian calendar. Before Present (BP) is used in the general sense of “years ago” except in reference to cited radiocarbon dates, when it refers to years prior to 1950. Last, following Lapham and Waselkov (2020; Lapham 2020a:9), I use “bear” to refer to the animal, and “Bear” when speaking of a spiritual idea or being.

## 1. INTRODUCTION

We knew it was a bear when we found the first tooth, but with the fifth canine we knew there was more than one. Our excavation was at the Bear site (21ML68 – then known as the Elders’ site), a Shakopee Phase (ca. 1300-1650 CE) archaeological site on Mille Lacs Lake in east-central Minnesota. There were two previously known sites near Mille Lacs that contained unusual concentrations of bear bones, and the eventual realization that there were eleven or more bear skulls represented by the teeth from our 1x1 meter test unit was very exciting. This was not simply a major find; it was the third of a potential pattern of ancient ceremonial sites in the region. It is difficult to describe what we all felt later, as further excavation defined the edges of a circa 4x5 meter pit feature containing hundreds of fragmented bear skulls, with outlines of many still visible in their original placement along the northern and eastern sides (Mather and McFarlane 1999; Mather 2000a). The site and the Bear Feature, as it came to be called, and the other bear sites of the Mille Lacs region will be discussed in greater detail below. For me, that project was the start of a keen interest in bears, and especially in the complex and dynamic relationships between bears and people.

I found the Bear Feature to be a captivating discovery relative to my previous research interests in Minnesota archaeology and zooarchaeology, but the Bear site investigation was particularly meaningful for other reasons as well. Most notably, all management decisions related to the Bear Feature were made by elders of the Mille Lacs Band of Ojibwe and the Mille Lacs Tribal Historic Preservation Office (THPO), in consultation with Dakota spiritual leaders. That dialog was a great benefit throughout the excavation and subsequent attempts at interpretation, and as discussed below, it significantly contributed to the research goals of this dissertation.

It was also fortunate that the broader archaeological context of the Bear Feature was relatively well known, with a century of local research to draw upon, including the work of Elden Johnson and the University of Minnesota’s Mille Lacs Research Project (e.g. Aufderheide et al. 1994; Birk and Johnson 1992; Bleed 1969; Brower 1901, Brower and Bushnell 1900; Caine 1983; Cooper 1965; Cummings 2008, 2015; Dickinson 1968;

Gibbon 1975a, 1976, 2003:23-48, 2012a; E. Johnson 1969, 1971a, 1984, 1985, 1988; Lothson 1972; Malik and Bakken 1999; Mather 1991, 2000b; Mather and Abel 2000; Rothaus 2001; Rothaus et al. 2005; Streiff 1987; Whelan 1990; Wilford 1944).

That history includes the two other sites with prominent concentrations of bear remains. The Crace site (21ML3) is located near Mille Lacs, within the Kathio National Historic Landmark District (Gibbon 1975b). The bears of the Christensen Mound site (21SH1/16) were discovered in the early twentieth century. That site is located about 45 miles south of Mille Lacs, at the edge of the Sherburne National Wildlife Refuge (Wilford et al. 1969:12-16; Winchell 1911:292-293; Mather 1999a, 2000a). Available evidence suggested that both of these sites were roughly contemporary with the Bear site, dating to the Late Woodland Tradition (ca. 600-1750 CE), with all three related to Dakota ancestry in east-central Minnesota.

When considering these finds, I was also intrigued to discover a wealth of anthropological literature related to bears, most notably A. Irving Hallowell's (1926) classic work, "Bear Ceremonialism in the Northern Hemisphere" (see also Shepard and Sanders 1985; Rockwell 1991; Zachrisson and Iregren 1974; Sokolova 2000; Berres et al. 2004; Lapham and Waselkov 2020), and Minnesota accounts recorded in the 1930s by Ruth Landes (1937, 1968a, 1968b, 1997). And finally, as I searched for information about black bear (*Ursus americanus*) biology as context for the Bear Feature, I learned that Minnesota black bears are one of the most intensively studied ursid populations in the world (e.g. Axelson 2004; Coy 1999; Coy and Garshelis 1992; Garshelis 2015; Garshelis and Noyce 2015; Garshelis et al. 2013; Kontio 1994; Noyce 2006; Noyce and Garshelis 2002; Noyce et al. 2001; Rogers 1987).

The Bear site investigation prompted me to undertake this dissertation, but my ongoing interactions with American Indian elders and resource managers, and Minnesota bear biologists, determined its scope. At the start, as a non-cemetery sacred site, the Bear site fell within an undefined middle ground in Minnesota archaeology and heritage management. In the legal context of the 1976 Minnesota Private Cemeteries Act (307.08) and the federal Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), Minnesota archaeologists were (and are) accustomed to a management

dichotomy of non-disturbance and consultation for burial-related sites, while viewing “habitation” and other non-mortuary sites as generally accessible for traditional archaeological investigation techniques. The Bear site at first glance was the latter. We soon learned, however, that it does not fit either category, and this experience opened my eyes to the potential complexity and diversity of sacred sites in Minnesota’s archaeological record. As described in Chapter 3, the Mille Lacs THPO, Minnesota Indian Affairs Council (MIAC), and Dakota and Ojibwe elders managed the Bear Feature investigation as a burial rescue intervention. The focus on bears rather than humans was natural and appropriate to them, and the Ojibwe archaeologists on the crew, but it was a new (and positive) experience for the non-native archaeologists, myself included.

Later, as I discussed the Bear site and other related archaeological finds with Minnesota bear biologists, they immediately saw the potential for application of this information in their work. They explained that one of their biggest management challenges is to determine the appropriate numbers and geographic range of black bears today, which are maintained through hunting regulations. Current wildlife management decisions are limited, they said, by a lack of information about the natural distribution and population structure of black bears in Minnesota. These conversations were primarily with Dave Garshelis, and his colleagues Karen Noyce and Pamela Coy at the Minnesota Department of Natural Resources (Mn/DNR), and ultimately led to my participation in several conferences of the International Association for Bear Research & Management (IBA).

### Historic Contexts

Drawn by the opportunity to apply archaeological data and analysis to contemporary, real-world research and management issues, my dissertation goal is to create historic contexts for bear ceremonialism and the bears themselves, rooted deep in time, through analysis and interpretation of Minnesota’s archaeological and historical record. These contexts will be developed along two separate but related tracks. The first, focused on the ritual traditions of bear ceremonialism, provides a framework that can be used in indigenous archaeology and heritage management – “archaeology as a discipline

developed with the control and influence of indigenous populations” (Watkins 2000:13). Related to this through a shared goal of bear conservation, is a historic context for wildlife biology, created to aid present-day bear management decisions. Because most (or likely all) archaeological information on Minnesota bears comes from ancient and historical practices of bear ceremonialism, it would be impossible to develop the second context without the first. That is, the historic context of bear ceremonialism is culturally intertwined with the data, and interpretation of that context is needed before the second theme, wildlife biology, can be meaningfully addressed. Also, biologists cite bear ceremonialism and other human interests in bears as the driving force for the importance of bear conservation today (Herrero 1999:4), and indigenous communities are actively involved in bear biology (such as locally through the work of the 1854 Treaty Authority and the Great Lakes Indian Fish and Wildlife Commission), so the topics are more connected than might be apparent at first glance.

Within Cultural Resource Management (CRM), historic context planning documents analyze, synthesize and organize the current state of knowledge about a subject or time period, providing an analytical framework to identify key sites and data sources, and topics for future research. As such, they provide the basis for recognition and preservation of significant historic properties. My goal for development of historic contexts here is to create an interpretive structure to aid heritage management decisions, encompassing the diversity of bear ceremonialism reflected in the archaeological record, and allowing recognition of archaeological sites and artifact datasets that are most relevant to questions of wildlife biology and conservation. For example, some sites discussed here will be argued based on zooarchaeological analyses to likely represent a cross-section of the local bear population at a particular time and place in the past. Others appear to be skulls or other remains selected in terms of the bears’ age, species, or size, and perhaps accumulated over a long period of time or large geographic area. While all are culturally and archaeologically significant as different examples of ancient rituals, the first is of greater immediate interest to ursid biology.

Historic context development is a foundational principle of the National Register of Historic Places (NRHP), and by extension, the practice of CRM in the United States.

Federal law defines a historic property as one that is eligible for the NRHP. This determination is reached through analysis of the site (or building, structure, district or object) and its historic context relative to National Register criteria. For properties that are nominated, presentation of the historic context is a key aspect of the significance statement (Andrus et al. 2002:7-10; Black and Jolly 2003:48-49; Little et al. 2000:14-16; Mather 2012a:101-102; Wyatt 2009).

The historic context framework used in Minnesota, for example, is a series of temporal and thematic overviews developed by the State Historic Preservation Office in consultation with other historic preservation professionals (SHPO n.d., 2012:9; cf. Anfinson 2006:32-33). Some are further developed as Multiple Property Documentation Forms (MPDF), which facilitate nomination of significant archaeological sites or other historic properties to the NRHP (National Park Service [NPS] 1999a). Temporal contexts categorize our ca. 13,000 years of human history into archaeological and historical periods (e.g. Arzigian 2012; Dobbs 1990; see also Gibbon 2012a). Thematic contexts address specific historic property types, such as, for example, stagecoach roads, earthworks, rock art or shipwrecks (Hybben and Hess 1990; Dobbs 1986; Dudzik 1995; Labadie 1990). Both context types can be applied statewide or within a smaller, defined geographic scope, depending on the nature of the resource and state of current knowledge. Historic contexts are always considered to be works in progress, living documents that should be periodically updated based on new discoveries and analyses.

My presentations here of bear ceremonialism and ursid archaeobiology are most similar to thematic context documents, but the findings are also organized geographically and according to temporal contexts whenever possible. For these subjects, however, I also mean “historic context” in a more general sense, as a means to simply provide a greater time depth for decision makers regarding heritage management and bear biology in Minnesota.

## *Indigenous Archaeology*

An indigenous archaeological approach starts with the recognition that professional archaeologists are not the only stakeholders in heritage management investigations and decisions. In North America, the vast majority of the archaeological record relates directly to American Indian history, and descendant communities have significant cultural and legal interests in how their heritage is protected, managed and interpreted (Watkins 2000).

As described in Chapter 2, the Minnesota archaeological sites discussed here are primarily connected to the Dakota and Ojibwe, and other historically known Siouan and Algonquian nations. Bears are sacred to all of these groups, and appropriate treatment of bear remains in archaeological sites, museums and curation facilities is an important concern. In decades of archaeological work in Minnesota, I've never seen public interest similar to that shown by Mille Lacs Band of Ojibwe community members at the meeting in 1998 when management decisions about the Bear site were made (Chapter 3).

Some of the other zooarchaeological studies in this dissertation were done in support of repatriation and reburial efforts under NAGPRA, and over time I could not help but notice a discrepancy in the treatment of bear remains, stemming from well-intentioned non-native archaeologists separating artifacts into burial or non-burial contexts, in a reasonable attempt to identify “funerary items” per the legal definitions (cf. Watkins 2000:63). For example, the bear bones excavated from the Christensen Mound (Chapter 6) in 1948 were repatriated and reburied. This was an easy decision, because they were from a mound, but other bear remains found decades earlier at the same site were not considered; they had been found nearby but not in a mound. Also, a similar assemblage of bear bones from the Crace site (Chapter 5) was not considered for repatriation, again because there was no association with human burials. On another occasion, an Ojibwe elder expressed the desire for bear bones from a nineteenth century fur post to be reburied after they were studied. This was not because of a human cemetery issue, or NAGPRA consultation, but simply out of respect for the bears. Clearly, the legislated management categories recognized by non-native archaeologists and curators

are insufficient for addressing traditional American Indian concerns about bear-related archaeological sites and collections.

Like with bioanthropological analyses before a reburial ceremony, a historic context for bear ceremonialism can provide useful information for elders, THPOs and other American Indian resource managers. Through this study, it has become apparent to me that different types of ceremonies are represented in the archaeological sites and collections discussed here, and that recognition of this diversity may be important in culturally appropriate treatment of sites and bear remains. Also, some museums have collections policies that go beyond the legal requirements of NAGPRA, such as the recognition of “Culturally Sensitive Objects” (CSO) by the Minnesota Historical Society. It is conceivable that archaeological bear remains from non-mortuary settings could be considered under the CSO category, with the historic context providing support for consultation about special curation needs or repatriation. In general, I hope that the information in this study will be useful to descendant communities for their own purposes, and as an aid to management decisions when these issues arise unexpectedly as they did with the Bear site investigation.

### *Bear Biology and Conservation*

The lack of context on Minnesota black bears previously available to wildlife biologists is understandable. Black bears were first listed as a big game species in Minnesota in 1971 (Judd et al. 1971), and the current (since the early 1990s) expansion in range and numbers has been a result of that protection. It may seem ironic that regulated hunting constitutes protection (although see Garshelis 2002:328-329), but before that, in the early and middle twentieth century, bounties were levied on black bears in an attempt to eradicate them from the state. Prior to that, in the late nineteenth and early twentieth centuries, bears were killed indiscriminately as land was logged and cleared for agriculture, mining and urban development, and as market hunters worked in the absence of any regulation. That had followed about two hundred years of the French, British and

American fur trade with the Ojibwe and Dakota, which had already affected the bear population to an unknown extent.

These centuries of anthropogenic habitat destruction and over-hunting disrupted the equilibrium that Minnesota bears had established within their environment over millennia, throughout the course of the Holocene. It also erased any meaningful point of comparison for modern biological study. However, while the historic-era impacts to Minnesota's bear populations were unprecedented in scale (particularly in the late nineteenth and early twentieth centuries), it is important to remember that people had affected the bear population long before that as well.

I assume that black bears have been hunted throughout the circa 13,000 years of human history in Minnesota. Also, bears are highly adaptable creatures, and their range, feeding habits and population structure are dynamic. Those factors, in addition to past changes in climate and environment, require the caveat that to fully assess the "natural" state of the bear population would be impossible, because technically there is no such thing. However, while all time periods are discussed here, I feel that the archaeological period of the Woodland Tradition (from approximately 3000 BP [years before present] until the early stages of the fur trade era [ca. 1750 CE]; e.g. Arzigian 2012) is a particularly useful reference point for comparison with the modern bear population. By that time, the state's climate and vegetational zones were similar to that of the historic period (Wright 1972a, 1974; Anfinson and Wright 1990), and while bears were hunted, their population had not yet been affected by the intense anthropogenic impacts described above.

### Bear Ceremonialism

Following the Bear site investigation, my original idea had been to investigate archaeological expressions of bear ceremonialism, to examine the historical implications of Hallowell's (1926) ideas. The dissertation can still be considered a Minnesota case study of this topic, but the focus is now interdisciplinary.

Bear ceremonialism is the anthropological term used to describe varied traditions of reverence for bears shared by diverse cultures around the world. These ancient beliefs

have survived longest among northern hunting peoples of Scandinavia, Asia and North America. In oversimplified terms, the central theme of Hallowell's (1926) bear ceremonialism is the bear giving itself to the hunter out of kindness. In return, the people treat the bear with great respect, in order for it to be reborn and be willing to give of itself again. They handle and process the body carefully during the feast, hold a funeral for the animal, keep the bones separate from other food waste, and protect the remains from dogs or other scavengers. This typically results in bear remains being underrepresented in archaeological sites (because their bones are not generally found in garbage middens, for example), while in rare instances the “bear graves” or other sacred places where the bear remains were placed have been accidentally encountered.

The bone assemblages of bears and other animals discussed here were largely formed through American Indian practices of bear ceremonialism, so respectful appreciation of this cultural context is needed for appropriate interpretation of the information. In the Ojibwe language, “*manaaji’iwewin* refers to the respect due all living beings, including beings that other peoples might describe only as things” (White 2007:219). It is in that spirit that I offer this research. Accordingly, it is important to recognize that within cultures for whom bears are “other-than-human beings” (Hallowell 1960:39), the bone fragments of ancient bears are still powerful and sacred, as are the accompanying stone, ceramic, and other artifacts, and the places – the archaeological sites – themselves.

In the decades since Hallowell’s writing, others have broadened the concept of bear ceremonialism, to include bear-related rituals that are not related directly to hunting, or the feast and funeral (e.g. Shepard and Sanders 1985; Rockwell 1991). These aspects include the activities of bear healers, such as Black Elk, the famous nineteenth century Oglala holy man (Neihardt 1972:106-108; Brown 1992:31-33), or bear warriors such as the medieval Scandinavian berserkers (Jones and Pennick 1995:154; DuBois 1999:53-54), for example. These and other bear-related ideas are also relevant to Minnesota’s archaeological record, and indeed, at least one site (the Bear site) appears to represent a type of ritual not known from the ethnographic literature, as cited by Hallowell or others.

Also in the time since Hallowell's overview, others have recognized that the range of bear ceremonialism is (or was) geographically and culturally much broader than was reflected in the sources available to him in the early twentieth century (e.g. Chaix et al. 1997; Paisley 2001; Paisley and Saunders 2010; Shepard and Sanders 1985). The dissertation contributes toward this as well, as the ethnographic sources cited by Hallowell included some accounts from the Ojibwe and other Algonquian peoples, but very little information was available then relative to the Dakota. These developments are useful to consider in light of Hallowell's (1926:161-163) ideas about the great antiquity of bear ceremonialism. Likewise, anthropologist Ruth Landes' early twentieth century work with the Dakota and Ojibwe within and near Minnesota provides important local accounts, most of which have not previously been incorporated in broader discussions of bear ceremonialism.

#### Archaeobiology and Applied Zooarchaeology

This is an interdisciplinary research project, connecting archaeology with the traditions of bear ceremonialism, indigenous heritage management, and modern wildlife biology and conservation. To accomplish this, the theoretical framework of archaeobiology provides an interdisciplinary analytical context that can extend the reach of modern bear research back in time. With recovery and recognition of appropriate data, it can potentially encompass all of the approximately 13,000-year intertwined history of bears and people in what-is-now Minnesota. The first goal of archaeobiology is to "analyze the relationships between humans and plants and animals and their effect(s) on each other" (Sobolik 2003:2). An archaeological approach to bear research includes data and analytical methods from archaeology, zooarchaeology, osteology, paleoecology and history, along with modern bear biology.

Sobolik (2003) emphasizes that archaeobiology is an integration of plant and animal evidence, as opposed to the traditional segregation of archaeobotany and zooarchaeology. I rely primarily on incorporation of palynological and other paleoenvironmental information to partly address the plant evidence, and consider plant macrofossil data from regional sites in the context of the Bear Food Survey used by

Minnesota bear biologists. The historic context created here also provides a framework for further research toward this goal, such as through potential future analyses of isotopes or dental microwear (e.g. Noyce 2006; Garshelis et al. 2013:16, 23; Seger et al. 2013; Fernández-Mosquera et al. 2001; see also Widga 2006).

Also, while not directly related to plants, but equally important to the archaeobiology of bears and bear research, the historic contexts developed here can help identify archaeological datasets and the appropriate scope for potential future studies of ancient DNA (e.g. Edwards et al. 2014; Mitchell et al. 2016), and analysis of past ursid age structure and reproductive history through tooth cementum analysis (e.g. Coy 1999; Coy and Garshelis 1992).

As discussed below, the nature of the available evidence requires that zooarchaeology be a focus for this stage of research (see Reitz and Wing 1999 for further information on zooarchaeological measures). Other classes of artifacts and archaeological context are considered as well, but the majority of the information is derived from study of the fragmented bones and teeth of bears that have been found in archaeological excavations. Therefore, this is in part an exercise in applied zooarchaeology (Lyman and Cannon 2004). This movement is a deliberate effort on the part of zooarchaeologists to make our research available to other fields of study, and to influence the scope and practice of wildlife biology and conservation.

It is clear that zooarchaeology can offer much to science. To become more relevant and have greater impact, zooarchaeologists need to create awareness amongst decision and policy makers. They have to convince people in other disciplines that old bones are valuable and very relevant to help solve some present day conservation problems (Plug and Lauwerier 2004:2).

For the same reason, this can also be considered a translational archaeology (Zimmerman et al. 2010) in that it is intended to make archaeological data meaningful and useful to non-archaeologists, to affect the current practices of bear biology and conservation, and heritage management, throughout the state.

## Research Questions

The research goals of this dissertation are organized around six primary themes.

### *1. Bear Species*

I begin with the most basic question: What species of bears are represented in Minnesota's archaeological record? Black bears (*Ursus americanus*) are a well known component of Minnesota's fauna, but they are not the only species to have occupied our borders. Grizzly bears (*Ursus arctos*) were observed in the Red River Valley during the fur trade (e.g. Coues 1897:121), but much of Minnesota's Prairie Parklands biome would have provided good grizzly habitat before its conversion to agricultural land in the mid-to late-nineteenth century (Hazard 1982:126). And in the late Pleistocene and early Holocene, before the megafauna extinctions at the end of the last Ice Age, giant short-faced bears (*Arctodus simus*) were likely present. Paleontology is also considered here, because it provides another important source of information about bears (e.g. Iregren 1990; Wolverton 1996, 2006; Stucchi et al. 2009). Specific research questions are:

- What species of bears are present?
- What osteological and art historical criteria are best to distinguish between American black bears and grizzly bears?
- How are grizzly bears represented in Minnesota's archaeological record?
- Are short-faced bears or other extinct bears represented in Minnesota's archaeological or paleontological records?

### *2. Bear Representation*

As Minnesota's primary bear species, how are black bears represented in the archaeological record? What body parts are present, and what is their condition? These data will allow consideration of ritual practices including potential patterns of bear ceremonialism, or recognition of natural death assemblages. Taphonomy (e.g. Lyman

1994) is a critical aspect of this question, being analysis of the cultural and natural processes that affect a bone assemblage during its creation, and once it is in the ground.

This question also addresses the relatively rare instances where bears are symbolically represented in other ways, such as effigy earthworks, rock art or unusual artifacts. Specific research questions are:

- What body parts are present in bear bone assemblages?
- How do the bone assemblages represent anthropogenic or natural taphonomic processes, or combinations thereof?
- What osteological criteria best indicate a local origin for the bear or bears, rather than trade?
- How are bears symbolically depicted in Minnesota's archaeological record?

### *3. Bear Range*

What is the former extent of the range for each species in Minnesota? It is believed that black bears were once present throughout the state, an idea supported by their former or continued presence in all of the surrounding states and Canadian provinces (Pelton et al. 1999:146; Craighead 2000:129; Dinsmore 1994:50-56; Schorger 1949; Bailey 1926:191-193; Naughton 2012:406-412; Snyder 1938:177). However, it is assumed that their distribution within the state varied through time with changes in vegetation, hydrology, and other factors. Plotting the locations of archaeological bear bone discoveries is a straightforward exercise, which can provide a preliminary assessment of the potential former range of bears in the state (e.g. Lyman 1986). Presentation of each site's archaeological context and interpretation will refine this picture. For example, single bear teeth and claws could be used as items for trade or personal adornment, so they do not necessarily reflect locations where those particular bears lived or died. Such uses of claws and teeth are reflections of bear ceremonialism, as symbols of the bear's power. Other aspects of bear ceremonialism appear to result in

under-representation of bears in the archaeological record. Specific research questions are:

- Where are sites with bear finds located within the state, relative to archaeological and ecological regions?
- What species of bear is represented by these finds?
- Which finds indicate probable local origin rather than transportation or trade? (per *Bear Representation*, above)
- How does the distribution of finds compare with the historically known and modern ranges for each species?

#### *4. Bear Chronology*

What archaeological periods are represented by the bear-related finds? Cursory examination of the known sites suggests that most of the extant bear finds date to within the Woodland Tradition (ca. 1000 BCE – CE 1750). Yet it is assumed that bears and humans have coexisted in Minnesota for the entire ca. 13,000-year human history of the state. The representation of bears (and other animals) in the archaeological record is influenced by a variety of natural and cultural factors, including past abundance and habitat, past hunting practices and ritual (or otherwise) treatment of bear remains. Equally important are taphonomic processes that affect the survival of animal bones in the archaeological record. Specific research questions are:

- What radiocarbon dates (or other absolute dates) are available for Minnesota bear finds?
- What chronological context can be added through relative dating and archaeological context?
- What is the chronological representation of bear finds, by calendar years and archaeological period?

### *5. Bear Populations*

To the extent that the nature of the faunal assemblages allows, what is the nature of the bear population at certain times and places in the past? Measurements of teeth and bones, and other analyses, can provide indications of the sex and age structure of the hunted bears. Identification and quantification of juvenile, prime adult and old bears in an archaeological site's faunal assemblage allows comparison with modern biological data from the same area. The same is true for the proportion of female to male bears. These analyses also identify good candidates (sites and artifacts) for further archaeobiological study as mentioned above, through analyses of aDNA, isotopes, dental cementum or other topics. Specific research questions are:

- What analytical methods are useful for identifying the age and sex of individual bears from fragmented bones and teeth?
- Using those results, which sites and assemblages allow consideration of local bear populations (and which do not)?
- For sites indicating bear populations, what is the age range represented?
- For sites indicating bear populations, what is the representation by sex?
- How do these patterns compare with the known age and sex structure of modern bear populations?

### Research Methods and Outline

As stated above, my goal for the dissertation is to create historic contexts for bears and bear ceremonialism in Minnesota. The source materials are primarily archaeological and paleoenvironmental data, supplemented by historical records.

The research context of the dissertation is presented in Chapter 2, encompassing the outlines of Minnesota's environmental history, archaeology and bear biology. This is followed by an archaeological case study of the Bear site (21ML68), as the inspiration for this research, in Chapter 3. Chapter 4 presents an overview of bear ceremonialism, including examples from the Siouan and Algonquian cultures most relevant to Minnesota

history. This chapter also illustrates how the diversity of bear ceremonialism can be reflected in the archaeological record.

The presence and proportional representation of bears in the archaeological record relative to other animals is assessed in Chapters 5-7, through compilation and analysis of existing zooarchaeological data. These chapters sequentially present the state's three major biomes: the largely coniferous Laurentian Mixed Forest, the largely deciduous Eastern Broadleaf Forest & Tallgrass Aspen Parklands, and the mostly treeless Prairie Parklands, defined as provinces in the Ecological Classification System developed for Minnesota by the Mn/DNR and the U.S. Forest Service. This system constitutes a management framework of the state's natural vegetation and wildlife within the broader context of North American continental and global ecology, as a tiered system defined through patterns of climate, geology, vegetation, hydrology, and other factors (Mn/DNR 2013a, 2006; Cleland et al. 1997; see also Aaseng et al. 2011; Kuchler 1964). The present discussion is organized primarily by three of the upper tiered units: Provinces, Sections and Subsections.

For each ECS province, the currently reported and significant zooarchaeological assemblages are summarized in tables. The Number of Identified Specimens (NISP) for selected categories is presented to give an overview of each assemblage, and to highlight which among the regional sites have unusual proportions of bear remains. Notable species identified from each site are summarized in the text. For current research purposes, my taxonomic summary categories are:

- Bear
- AR (Order Artiodactyla – deer, elk, bison, moose, caribou)
- CN (canid – dog, wolf, coyote, fox)
- FL (felid – mountain lion, bobcat, lynx, cat)
- FB (furbearer – beaver, muskrat, rabbit/hare, all mustelids)
- DL (domestic livestock)
- MUO (other mammals and unidentified mammals)
- B (birds)

- R (reptiles)
- A (amphibians)
- F (fish)
- S (mollusk shell)
- U (unidentified)

The tables also include site number, name and county, the archaeological region, the current Bear Management Unit (BMU) and ECS designation used by the Mn/DNR, and references for the faunal assemblage. The references include the appropriate chapter number if I conducted original analysis for purposes of this dissertation. Other references in the table or text are to previous studies. To save space, I do not cite original reports in cases where published accounts contain the relevant information and a citation for the original source or assemblage catalog. Non-faunal references for the site are included in the text but not the summary tables for the same reason.

Limitations of this exercise include comparing the results of studies conducted at different times, with different research goals and levels of precision. Also, many extant faunal assemblages have not been studied, even at a summary level. Nevertheless, it is worthwhile for the purpose of placing the identified bear remains in context, and to examine the broad trends in zooarchaeological data across the state. Particular points of interest or concern for each assemblage are discussed in the text. Excavated but potentially significant unanalyzed assemblages within a region are highlighted in this section as well. In these chapters, I include zooarchaeological data from 247 archaeological sites throughout Minnesota. This includes original analyses from 35 sites conducted for this dissertation, or updated with reference to my previous work, as well as personal examination of animal bone from other sites. In Chapters 5-7, I highlight 81 Minnesota archaeological sites as “bear finds.” Most of these are based on zooarchaeological identifications, but I also include depictions in rock art, portable art and effigy mounds.

Along with the other referenced zooarchaeological studies, these combined data will constitute a limited overview of the state’s zooarchaeology. This helps with the

current examination of bear archaeobiology, and serves as a starting point for future studies of the other animal species (and hopefully the currently unanalyzed sites too). This is only the second overview of Minnesota zooarchaeology, following Paul Lukens' (1963) dissertation, *Some Ethnozoological Implications of Mammalian Faunas from Minnesota Archaeological Sites*.

Compilation of the faunal data allows comparisons to be made between the state's ecological provinces. The discussion for each province presents the archaeological context for the bear remains – for example, a single claw; burned fragments of a bear paw within a radiocarbon dated feature; skulls under the edge of a burial mound; and so on. The compilations also highlight sites with higher numbers of bear remains. These are candidates for consideration as representations of past bear populations. With their archaeological context, some of these finds can be correlated with identifiable rituals, contributing to definition of historic property types related to bear ceremonialism.

Three of these sites are further examined as zooarchaeological case studies in Chapter 8: the Christensen Mound site (21SH1/16), the Crace site (21ML3) and the Bear site (21ML68). This involves use of the tooth measurement data I recorded from 1,318 bear teeth, as an indicator of the relative representation of male and female bears in each assemblage, through reference with tooth measurements from modern bears of known sex and age, and other life history. The archaeological assemblages are also assessed with Stiner's (1998) tooth wear index for classification of the age structure in an ursid population. The index was designed for use with cheek teeth of the extinct European cave bear (*Ursus spelaeus*). While the dimensions of cave bear teeth are much larger, their morphology is very similar to the cheek teeth of American black bears, and I have found the index to be a very useful analytic tool for the Minnesota tooth assemblages. For reference, I have also correlated the tooth wear index with the modern known-age bear skulls.

Chapter 9 concludes the dissertation by addressing the six research themes outlined above, working from the studies and information compiled in Chapters 5-8. It presents interpretive models of bear ceremonialism in Minnesota, and highlights potential topics for future research.

### Interdisciplinary Approach and Scope

This is an interdisciplinary research project, so there are multiple contexts in which the research questions, data and findings should be considered. The two primary areas are Minnesota archaeology/heritage management, and bear biology. Because these are unrelated fields, with their own specialized goals, methods and jargon, I intentionally discuss both in a more general way than might be expected in a dissertation for either topic on its own. My goal is for the archaeological data to be understandable to bear biologists, and also to introduce bear biology sufficiently for archaeologists to appreciate this example of the benefits that our research can offer to other fields of study. I also hope that the information will be usable by heritage and other resource managers who may not have a background in either field.

When I undertook this research project, I enthusiastically set out to learn all I could about bears, bear biology and the archaeology of bear ceremonialism. Over the years, I have learned so much from discussing these subjects, and the Minnesota bear sites, with Dakota and Ojibwe elders, as well as bear biologists, archaeologists and historians from different parts of the world. In this time, I've also studied many artifacts, found intriguing written references, and recorded lots of data that do not fit in this document. It took me a long time to recognize that the dissertation cannot be about everything, but rather that it needs to be about something. And the most useful "something," I came to realize, is context. The spectacular finds at the Bear site, the Christensen Mound and the Crace site are fascinating on their own, but they can be better appreciated in the broader context of Minnesota's archaeology and zooarchaeology. Therefore, with a few exceptions, Chapters 2-3, and 5-8 are focused on Minnesota. My other experiences have greatly influenced all of the research, but are most obviously incorporated in Chapter 4.

Throughout the years of looking elsewhere, the Bear site always drew my mind back to Minnesota archaeology, and to Mille Lacs in particular. That project was the experience that inspired me to undertake this research, but also, everything I learned elsewhere simply reaffirmed how unique and spectacular this site is. The bears of the

Bear site are discussed in Chapters 5, 8 and 9, but since the entirety of the research was done with this site in mind, it is appropriate to introduce it more fully before moving on to the regional overviews. Chapters 2 and 3 do this, first by expanding upon the general research context, and then the site report (Mather and McFarlane 1999) and later presentation of the radiocarbon dates (Mather 2000a).

## **2. RESEARCH CONTEXT: MINNESOTA, ARCHAEOLOGY & BEARS**

The American black bear (*Ursus americanus*) is a prominent and valued member of Minnesota's fauna. The state's black bear population is managed by the Minnesota Department of Natural Resources through biological research and hunting regulations. As stated previously, it is a goal of this research to create historic contexts in support of those efforts, as well as for indigenous archaeology and heritage management. This chapter establishes the context of the dissertation, by describing the study area (the State of Minnesota), and introducing the general practices and findings of archaeology and bear biology within it, with reference to environmental history and related topics such as ursid evolution and taxonomy. This sets the stage for Chapter 3, which presents a case study of a significant bear-related find within an archaeological research project, and then the archaeology of bear ceremonialism and regional zooarchaeological overviews in Chapters 4-7.

### Minnesota

In the Dakota language, *Mni Sota* describes waters so clear that they reflect the clouds (Westerman and White 2012:13). These words persist as names of both the Minnesota River and the State of Minnesota, and best of all, in the current renaissance of Dakota as a spoken language. The United States territory of Minnesota was organized in 1849, mostly with its present boundaries, but also extending west to the Missouri River in the center of present-day North and South Dakota. Less than a decade later, in 1858, Minnesota as it is known today was the 32<sup>nd</sup> state to enter the Union, thus creating a previously unknown political and cultural entity (Atkins 2007:57). This brief span of time (1849-present, including the territorial period) represents just 0.01% of the state's roughly 13,000 years of human history (Gibbon 2012a), but it is also a period of drastic and unprecedented anthropogenic impacts to the landscape and natural environment. These changes are the primary reason that biologists today do not have a point of reference for a "natural" bear population. Also, the various scientific disciplines that inform our understanding of Minnesota's past, such as geology, paleoecology, paleontology and archaeology, were developed during this time, and continue to be

refined today. In introducing the state, which defines the study area for this research, I present this period first because it is important to recognize that Minnesota in this altered, modern condition is our only vantage point for consideration and interpretation of its past.

Minnesota occupies 84,402 square miles (218,600 km<sup>2</sup>) near the center of the North American continent, bordering the states of Wisconsin, Iowa, and North and South Dakota. The state's northern border is the international boundary with Canada, and the adjacent provinces of Ontario and Manitoba. Minnesota is divided into 87 counties, ranging in size from Ramsey County (156 miles<sup>2</sup> / 403 km<sup>2</sup> – primarily the City of Saint Paul), to St. Louis County, which at 6,225 square miles (16,123 km<sup>2</sup>) is larger than the State of Connecticut. Data on cultural resources and wildlife populations are sometimes organized at the county level, so it is useful to be aware of this variation. As discussed below, black bears were once present throughout the state, but historically have been restricted primarily to the northeastern counties.

According to the 2010 U.S. Census, Minnesota has slightly more than 5.3 million residents. It is ranked 21<sup>st</sup> of the 50 states in population, but at an average of about 68 people per square mile, it is 30<sup>th</sup> in population density. In reality, of course, people are not spread evenly across the state. Population is overwhelmingly focused in the Twin Cities metropolitan area (about 64%), centered on the core cities of Saint Paul and Minneapolis. Major centers (40,000+ people) outside the metro area include Rochester in the southeast, Duluth to the north at the tip of Lake Superior (one of the Twin Ports with Superior, Wisconsin), Saint Cloud in central Minnesota, Mankato south-central at the big bend of the Minnesota River, and Moorhead to the northwest on the Red River opposite Fargo, North Dakota. In general, population density is greatest in southern and central Minnesota, and is significantly lower in the northern third of the state where there is more public land. Due to the location of the Twin Cities, many Minnesotans have a south-skewed conception of the state, thinking of Brainerd, for example, as “up north” when it is actually near the geographic center. This modern distribution of the human population, with increasing rural development and related land-use practices, also affects the habitat for bears and other wildlife, and the preservation or destruction of archaeological sites.

Political geography and transportation infrastructure largely dictate the view that modern-day Minnesotans have of the state, but the major aspects of physical geography predetermined its development. Most importantly, there are three major watersheds in Minnesota, all of which ultimately connect to the Atlantic Ocean. Itasca State Park in north-central Minnesota is the headwaters of the Mississippi River, which drains a large portion of the continent southward to the Gulf of Mexico. In the northeast, the St. Louis River and others drain into Lake Superior, the westernmost of the Great Lakes, through which waters flow eastward to the St. Lawrence Seaway. Also, large portions of Minnesota drain northward to Hudson Bay, via the Red and Rainy rivers along parts of the state's western and northern borders, respectively (Waters 1977; Tester 1995; Ojakangas and Matsch 1982; Wright 1972b).

The countryside of modern Minnesota is largely agricultural in the southern and central portions of the state and extending northward along the western border in the Red River Valley. North-central and northeastern Minnesota are largely forested, although much of the tree cover is secondary growth following extensive logging and mining that began in the mid- to late-nineteenth century. These patterns generally reflect Minnesota's unique biogeographical position, in that it contains significant portions of three major biomes: prairie, deciduous forest and coniferous forest. These regions, as defined by the Ecological Classification System, provide the organizational framework for my archaeological overviews in Chapters 5-7. Although some significant natural areas are preserved, most of the Prairie Parklands, Tallgrass Aspen Parklands, and Eastern Broadleaf Forest ecological provinces have been cleared and converted to agricultural or urban land uses. Much (but not all) of the state's remaining forest is within the Laurentian Mixed Forest province. As discussed below, the positions of these ecological communities shifted through the course of the Holocene in response to climatic changes. American Indian history is also intertwined with the state's ecological setting, and over millennia has influenced it to varying degrees.

Siouan and Algonquian speaking peoples have strong connections to Minnesota, most prominently the Dakota and Ojibwe, who are still resident in the state. Others with historical ties include the Iowa, Otoe, Ho-Chunk, Assiniboine, Cheyenne, Cree and Métis

(Gibbon 1994, 2003; Warren 1984; Westerman and White 2012; Schlesier 1994; Blaine 1995:15; Betts 2019; Richner 2008:40-43; Radin 1990:4; Swan 2003:21; Treuer 2015:33-35). United States government policies of ethnic cleansing against American Indians affected the area that became Minnesota before the territory was even organized, with forced removal of the Ho-Chunk from Wisconsin to the Neutral Ground in what-is-now northern Iowa and southeast Minnesota in 1825 (Peterson and Stanley 2013). Earlier, a treaty negotiated by Zebulon Pike with the Dakota led to the U.S. Army's establishment of Cantonment New Hope and later Fort Snelling at the confluence of the Minnesota and Mississippi rivers beginning in 1819 (DeCarlo 2016; Jones 1966:17-21; Westerman and White 2012:83-85; VanderVelde 2009:34-36; Mather et al., forthcoming). From the 1820s through the 1880s, a series of treaties with the Dakota and Ojibwe established ever-smaller reservations, resulting in ceded territories being opened to military expansion, Euroamerican settlers, and industries such as agriculture, logging and mining (Anderson 1997; Arnott and Maki 2019; Broker 1983:63-131; R. Meyer 1967; M. Meyer 1994; Roufs 1975:58-78). The pressures of this period contributed to the tragedy of the 1862 U.S.-Dakota War, which resulted in expulsion of most Dakotas from the state. The Ho-Chunk were not involved in the conflict but were also expelled after having been moved twice more within Minnesota following dissolution of the Neutral Ground. Some Dakota communities reestablished themselves in southern Minnesota by the late nineteenth century, but a large diaspora persists in Kansas, North and South Dakota, Montana and Canada (Meyer 1967; Westerman and White 2012:201-203; Peterson and Stanley 2013; Mather 2013a:188-191).

European presence in eastern North America began in the early sixteenth century, and settlement grew slowly, largely as agrarian societies for about two centuries (Dickinson and Young 2008:98-103; Calloway 2006:55-58; Cronon 1983:48, 79-81). During much of that time, what-is-now Minnesota was at the western periphery of the *pays d'en haut*, the middle ground of competing international fur trade interests and shifting American Indian populations and alliances (White 2011:31-34, 46-48). American transformation into an industrial economy was well underway by the time the Minnesota Territory was established, and the full force of extractive industry hit here immediately

with the beginning of Euroamerican settlement by the mid-nineteenth century, accompanied by widespread real estate speculation and fraud (Jarchow 1949:48-60; Hart and Ziegler 2008:89-93; Cronon 1991:200-206; Wills 2005).

Agriculture rapidly transformed the landscape in southern and western Minnesota after the mid-nineteenth century (Jarchow 1949; Drache 1964, 1970; Baerwald 1989:25-33) to a similar degree to that described for Iowa, our neighbor to the south, at the dawn of the twentieth century:

I have many times maintained that there is not a single mile square in the State that can be properly termed waste, no single section utterly unfit for tillage or growth of forest or some crop of value to man. What small areas of swamp originally existed have been or are being rapidly put to use, and little, if any, of this apparently poor area will remain unused.

Certain it is that every nook and corner of the State has been brought under scrutiny and the opportunity cut short for the survival of the larger animals that once roamed unhindered over the grassy plains and through the scanty timber skirting the streams. [Osborn 1905:561]

In eastern and northeastern Minnesota, the forests and the landscape itself were cleared and blasted by logging and mining. These were transformative events, which themselves are reflected in the archaeological record through reshaping of the state's landscape and waterways (Arnott et al. 2013; Reetz 2012; Birk 1998; Gronhovd 2003; Mather 2010a:161). By 1900, however, population was still sparse in the northern tier of counties from Lake of the Woods eastward (Baerwald 1989:21; Drache 1983). Not coincidentally, this was a core area where black bears survived the nationwide pressures that led to extirpation from much of their former range. Even here, however, conflicts with livestock usually led to bears being killed (Drache 1992:124).

The early to mid-twentieth century was the nadir for preservation of Minnesota's natural resources. Wildlife populations already decimated by overhunting were further pressured by increasing habitat loss coupled with unchecked municipal and industrial pollution (e.g. Fremling 2005:277). It was around that time in neighboring Wisconsin that Aldo Leopold, writing *A Sand County Almanac* in the 1940s, lamented: "Conservation is getting nowhere because it is incompatible with our Abrahamic concept of land. We

abuse land because we regard it as a commodity belonging to us" (Leopold 1968:6; see also Cronon 1983:77).

Minnesota's conservation movement began in the late nineteenth century, against steep odds, as demonstrated by the fight to establish Itasca State Park (now an undisputed Minnesota treasure) in 1891. This was the first of Minnesota's state parks, although not the first attempt to create one. Momentum for park development increased by the 1930s, with goals to create a statewide network accessible to all residents (Meyer 1991). There are now 75 state parks and recreation areas. Their conservation value is considerable but their footprint is relatively small. More relevant to wildlife was establishment of the state's Conservation Department (later the Department of Natural Resources) in the 1930s, and the systems of Wildlife Management Areas and Scientific and Natural Areas, in 1951 and 1969, respectively. Another significant area of ecological and cultural resource conservation is the Minnesota National Guard base at Camp Ripley and its Sentinel Landscape environs in central Minnesota (Dietz and Dirks 2018).

Federal land constitutes a significantly larger area. At a combined 7,142 square miles ( $18,498 \text{ km}^2$ ), Chippewa National Forest east of the Mississippi Headwaters, and Superior National Forest in the Arrowhead Region, constitute 8.4% of Minnesota's land base. These units are managed by the U.S. Forest Service within the U.S. Department of Agriculture for forest (lumber) production. Within the Superior National Forest, however, 1,703 square miles ( $4,411 \text{ km}^2$ ) was preserved in 1964 as the Boundary Waters Canoe Area Wilderness (BWCAW), adjacent to Quetico Provincial Park in Ontario. At the western edge of the BWCAW, Voyageurs National Park, established in 1975, occupies 341 square miles ( $883 \text{ km}^2$ ). Considered together, the BWCAW and Voyageurs National Park constitute the most pristine and extensive natural area in Minnesota. They represent just 2% of the state.

This relatively large amount of public land, especially when compared to eastern states, has contributed significantly to the survival and preservation of Minnesota's black bear population, and for that matter, our archaeological record. However, privately owned land is the majority of the state's land base (about 75% in 2002 according to the Minnesota Legislature), and both ecological and cultural resources can be well

represented there as well. Despite the drastic changes of the historic period, preserved natural areas reflect the structure of Minnesota's native ecology throughout the state, although undeniably, there are places where this heritage is more apparent than others.

### *Minnesota's Landscape and Environmental History*

Minnesota's geologically young landscape is a legacy of the Pleistocene glaciations, which left a complex palimpsest of rock and sediment deposited, layered and modified by overlapping ice lobe movements, rushing meltwater and vast glacial lakes. Repeated glacial advances spanning about 1.8 million years flattened, scoured, buried and reworked the bedrock, and the clay, rock, and sand drift dropped by the shifting ice. During the Pleistocene, Minnesota was overrun with ice during three major glacial periods (and revived during their intervening interglacials) before the most recent period, the Wisconsin Glaciation, covered most of it again with multiple ice advances between approximately 75,000 and 10,000 years ago (Wright 1972b; Ojakangas and Matsch 1982; Ojakangas 2009:22-33; Tester 1995:10-14; Hart and Ziegler 2008:27-41).

With the exception of the state's two lower corners, the landscape we know today began to form with the retreat of the Wisconsin glacial ice. In Minnesota's southeast corner, the so-called Driftless Area is a misnomer, because it does have older glacial drift, but it is true that it was ice-free during the Wisconsin glacial period. This is an area of steeply dissected drainages leading to the entrenched chasm of the Mississippi River, with complex limestone karst topography of caves and sinkholes. It is more appropriately known as the Paleozoic Plateau. In the southwest, the Coteau des Prairies was also missed by the Wisconsin ice, leaving a higher landform that divides the Missouri and upper Mississippi River watersheds (Wright 1972b; Prior 1991:76-97; Gibbon 2012a:26-29).

In northeastern Minnesota, the glaciers scoured the Archean bedrock, exposing some of the oldest rock in the world. Elsewhere, the ice movements created moraines and other landforms. Meltwater created tunnel valleys and vast lakes. Glacial Lake Agassiz is perhaps the best known of these, having left the flat expanse of the Red River Valley and

Agassiz peatlands in northwestern Minnesota, but there were many. In instances when their natural dams burst, the volume of rushing water blasted through drift and bedrock to carve out the deep trenches of the Minnesota, Mississippi and St. Croix Rivers in the southern half of the state (Jennings 2007; Buhta et al. 2015:23; Ojakangas and Matsch 1981:109-110; Jones 1962:5-9).

Many of Minnesota's "10,000 Lakes" are the remnants of ice blocks that were left buried in the glacial drift. Others, such as Mille Lacs, are reservoirs dammed behind a glacial end moraine (Wright 1989). After the local ice was gone, streams and rivers readjusted to the new topography. Plants began to colonize the new soil. Tundra vegetation came first behind the retreat of the glaciers, and was eventually followed by spruce and later, pine forest. This progression slowly followed the ice margins northward, and by about 9,000 years ago, prairie was established in the southwestern corner of the state. Melting of the northern hemisphere's last glacial ice destabilized the climate until about 8,300 BP. The eventual establishment of postglacial vegetational patterns left Minnesota's biomes trending in roughly northwestern-to-southeastern bands across the state, with prairie in the south and west, a thinner band of deciduous forest, and then coniferous forest in the northeast (Figure 1). The extent and position of these biomes has changed through the course of the Holocene, with prairie extending nearly to Itasca State Park in the Altithermal warm period. By about 3,000 years ago, the climate cooled and became wetter, and the biomes shifted to approximately their historically-known position (Tester 1995:16-21; Wright 1972a, 1974; Anfinson and Wright 1990; Hu et al. 1999; Hart and Ziegler 2008:43-55). Details of regional paleoecology are discussed further in Chapters 5-7.

### *Paleontology and Faunal History*

Minnesota's rich ecology is reflected in its diverse fauna. Consider, for example, the dramatic contrast between the tallgrass prairie bison habitat at Pipestone, and that of woodland caribou in Grand Portage's rocky Lake Superior conifer forest. These are our two National Monuments, near the state's southwestern and northeastern corners,

respectively. Sadly, the absence of these large, grazing animals since the mid- to late-nineteenth century reflects the impacts of overhunting and habitat loss during the historic period. Despite these prominent losses, Minnesota retains significantly more of its wild fauna than most areas of the eastern United States (e.g. Hazard 1982; Tester 1995; compare for example, with Schwartz and Schwartz 2001 for Missouri, and Hoffmeister 1989 for Illinois).

Paleontology can provide insights to animals in deeply ancient periods of time, as well as more recent history. Because bedrock is so deeply buried here under glacial drift, dinosaur and other pre-Quaternary fossils are rarely found in Minnesota, although they do exist. The paleontology that is directly relevant to this subject, however, is that of Pleistocene megafauna, because this may include bears, and it overlaps starting around 13,000 years ago with human history. Megafauna bones have likely always been a source of curiosity. It is possible, for example, that observations of large, ancient skeletons here intersected with traditional American Indian beliefs about spiritual beings such as the *Unktehi* (Westerman and White 2012:235), just as observations of extinct elephant bones around the Mediterranean Sea may have inspired ancient Greek stories of the giant, one-eyed cyclops, and cave bear bones in the Alps were once thought to be from dragons (McKay 2017:20-21; Storl 2018:37-38).

Paleontological records of Pleistocene megafauna in Minnesota began in the nineteenth century, as teeth and bones of mammoths, mastodons and other Ice Age animals were encountered in construction projects. These were mainly in southern Minnesota, but an outlying cluster of proboscidean finds centers on the Grand Rapids area of Itasca County (Winchell 1910; Hay 1924; Stauffer 1945; Mather 2008a).

The oldest local Pleistocene find to date is from Fillmore County, where preliminary exploration of Tyson Spring Cave has produced the antler fragment of an extinct moose (possibly stag-moose, *Cervalces* sp.) and multiple bones of the first scimitar-toothed cat (*Homotherium serum*) identified in Minnesota or the surrounding region. The cat was identified through aDNA analysis, and was radiocarbon dated to 22,250+130 (NZA30409 – Widga et al. 2012; Mather 2008b, 2009a, 2010a). The cave was near the margin of glacial ice at that time. Widga et al. (2012:8) describe a cold,

steppe-tundra environment. In my opinion, the karst caves of the Paleozoic Plateau offer the best potential for discovery of Pleistocene bear remains, although wetland areas such as peat deposits are also promising (for paleontological examples elsewhere, see Iregren 1990; Wolverton 1996, 2006; Graham 1991; Czaplewski and Puckette 2014).

A complete giant beaver skeleton, *Castoroides ohioensis*, was found at Hidden Falls in Saint Paul in 1938. A bone sample later provided a radiocarbon date of  $10,320 \pm 250$  BP (Erickson 1962, 1987), well within the period of human history at the beginning of the Holocene. Other finds of Pleistocene mammals in the Twin Cities area include the large claw of a giant ground sloth, and a complete giant bison skeleton unearthed during construction of Interstate 35-E (all are in the Science Museum of Minnesota collections; Erickson 1968; Mather 2009a).

Bison are a prominent aspect of Minnesota's fauna. It was long thought that the larger bison of the early Holocene on the Great Plains were *Bison occidentalis*, an extinct form of bison larger than the modern species, but aDNA analysis indicates that they were more likely a larger form of *Bison bison* (Widga 2014:263; Shapiro et al. 2004), with *B. occidentalis* restricted to north of the Laurentide ice sheet. Other taxonomists have considered the larger form to be a subspecies of modern bison (*B. bison occidentalis*). A genetic study of archaeological and paleontological bison remains from Minnesota would be a great benefit. Regardless of taxonomy, larger forms of bison were present in Minnesota from the late Pleistocene through the early Holocene. Some were hunted, such as at the famous Itasca Bison site (21CE1), while elsewhere bone assemblages have been found representing natural deaths (Hill 2016; Widga 2006, 2014). The current size range of bison was not present until approximately 6,000 BP. This diminution was the last major post-Pleistocene evolutionary change in Minnesota's fauna. (Hall 1972; McDonald 1981).

Bison were one of the state's prominent large mammal species for millennia, but they were quickly extirpated following Euroamerican settlement in the nineteenth century. Bison were rare in Minnesota by the 1830s, with occasional sightings over the next fifty years (Swanson 2007:57-61). Genetic studies by the DNR and Minnesota Zoo have shown that the captive bison at Blue Mounds State Park in southwest Minnesota are

surprisingly pure; that is, their ancestors had not been interbred with domestic cattle. This herd ranges within a vast enclosure at the park. A second herd in similar large enclosure has been established at Minneopa State Park near Mankato, and others are planned elsewhere in the state (Allen 2013; Albert 2018:13).

Deciduous forest was the primary habitat for white-tailed deer, but with changes in forest cover due to nineteenth century logging, they have expanded into northeastern Minnesota at the expense of caribou and moose. Elk were and mule deer were extirpated from the state but elk were reintroduced and a small herd survives in Kittson County (Axelson 2006; Albert 2017). The range of woodland caribou has retreated far northward into Canada, although a few animals are occasionally seen in northeastern Minnesota. Efforts to reintroduce them at Red Lake in the early twentieth century failed (Berg 1994:74-76; Mech et al. 1982). It is possible that pronghorn once ranged into western Minnesota before the loss of prairie habitat in the historic period (Hazard 1982:167). Indeed, one pronghorn bone is documented from the Itasca Bison site, in Itasca State Park (Widga 2014:256).

Attempts to eradicate predators such as black bears and timber wolves began with Euroamerican settlement. Like bears, wolves were once present throughout the state. Wolf packs occasionally prey on black bears (Chenau-Ibrahim 2015) and are perhaps their only real competitor other than humans. Other native canids include coyotes, as well as red and gray foxes. Bobcats are the most common native cat today, but lynx and cougars are once again occasionally seen.

Beaver and other furbearers were a focus of both trade and subsistence in the historic period, as seasonal rounds were adapted to accommodate the economic demands of the fur trade. Beaver pelts were the driving force of the fur trade, leading to their extirpation from much of Minnesota by the early nineteenth century, at which point the focus of trapping and trade shifted to muskrats (Spector 1993; Whelan 1987, 1993; Gilman 1970; Babcock 1939:265-266), although pelts of bears other animals were always traded as well. Their recovery in the late twentieth century with resumed reshaping of local landscapes has been a source of surprise for some urban residents moving to the north woods (Conley 2005). It is ironic and wonderful that a large beaver dam and pond

now crosses part of the Grand Portage trail itself, in Cook County, where countless voyageurs and fur traders once trod toward inland waterways in search of pelts.

Less is known about the history of Minnesota's avian fauna, because they are poorly represented in paleontological and archaeological assemblages. The state's vast wetlands, lakes, rivers and prairie potholes historically supported a diverse range of waterfowl, and migratory birds follow the Mississippi Flyway. Passenger pigeons were once prevalent during migrations but became rare in Minnesota by the 1880s, and were soon extinct. Hertzel (2004) convincingly suggests that the "parrots" Johnathan Carver (Parker 1976:95) mentioned on the Minnesota River in 1766 were the now-extinct Carolina parakeet. Extirpated species include whooping cranes, and for a while, sandhill cranes. Trumpeter swans were extirpated but successfully reintroduced (Henderson 2017). Bald eagles and other raptors have made a remarkable recovery in the decades since the pesticide DDT was banned. Wild turkeys were likely native to southeastern Minnesota, but in recent decades have been introduced throughout the state. Non-native species that are prominent in the state today include rock doves (feral domestic pigeons), house sparrows and starlings. In the nineteenth century, officer's families at Fort Snelling kept wild birds as pets, including mockingbirds imported from the southern United States (Mather 2017a). During the time of Euroamerican settlement, it appears that cardinals and perhaps some other birds expanded their range northward into Minnesota (Roberts 1938:I:73), while prairie chickens expanded and then contracted their range in response to deforestation and habitat loss (Hoch 2015; Partch 1970).

Minnesota's fish populations are largely the result of migrations into Glacial Lake Agassiz at the end of the Pleistocene from the southern, unglaciated parts of the continent.

It seems likely that the majority of fishes living anywhere in the interior of Canada and the northern United States today have ancestors that, one time or another, lived in Lake Agassiz. The lake was the hub of migration routes leading from the unglaciated southern half of the continent into most of the drainage basins once covered by the Laurentide ice sheet. Lake Agassiz received most of its immigrants from the south: first from the upper Missouri and its tributaries in the western Great Plains, to which it was linked by superglacial streams flowing across the tracts of stagnant ice

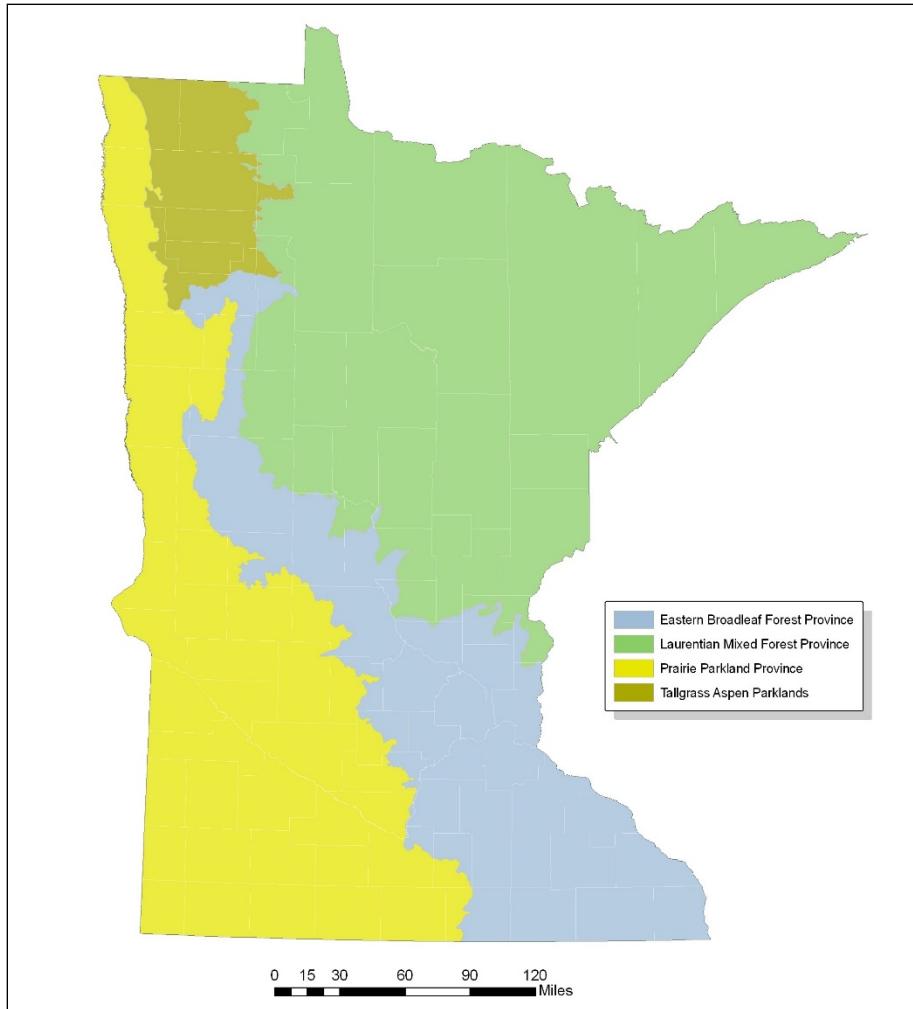
southwest of the lake in the Missouri Couteau area; and later from the Mississippi valley, to which it was joined by the Minnesota River. Moreover, Lake Agassiz was sometimes linked, through Lake McConnell, to the Beringian refugium. As a result, fish species that survived the glaciation in refugia both to the south and to the northwest of the ice are now widely spread. [Pielou 1991:195]

It is therefore likely that most Minnesota fish populations were established by the early Holocene, such as, for example, lake sturgeon in the Rainy River as it formed in the basin of Glacial Lake Agassiz about 9,000 years ago (Mather 2011a, 2015a).

Overviews of Minnesota's fauna are provided by Hazard (1982), Oldfield and Moriarty (1994), Roberts (1938), Eddy and Underhill (1974), and the appendices in Tester (1995). Zooarchaeology provides source material for faunal history during much of the human history of Minnesota. This is discussed further below, and in Chapters 5-7. Fur trade and other historical records are also important sources for faunal and other environmental history, especially by the beginning of the nineteenth century (e.g. Johnson 1969; Swanson 2007:11-20; Whelan 1993; White 2005). Such written records are cited here when possible, but a comprehensive review of those sources was beyond the scope of this study.

Millennia before Europeans came to North America, Native nations had developed a deep well of knowledge about their landscape through countless interactions with the natural world, and the complex roles of plants and animals within it. Sometimes referred to a Traditional Ecological Knowledge (TEK), this information was, and is, passed down from elders across generations, and includes aspects of native game management. TEK has been a benefit to bear biology, for example, with cooperative study between biologists and Cree elders studying polar bears in northern Ontario (Lamelin et al. 2010).

Domestic livestock and introduced species affected the ecology of Minnesota beginning in the early nineteenth century. It appears likely that Fort Snelling was ground zero for rats in Minnesota by the 1840s, via steamboat connections with St. Louis (Mather 2017a). The State of Minnesota's first laws regulating hunting and conservation were passed in the late nineteenth century (Bylander 1992:51).



*Figure 1. Minnesota's four Ecological Provinces, as defined in the Ecological Classification System*

### Archaeology in Minnesota

Archaeology is the study of the human past using physical remains of objects (artifacts) and related data. In Europe, archaeology is generally considered a subfield of history, while in the Americas it is one of the four subfields of anthropology (along with cultural anthropology, linguistics and physical anthropology). Archaeology by its nature is interdisciplinary, drawing on the methods of geography, geology, biology, paleontology and art history (and anthropology and history), among other fields. Chapter 3 presents a Minnesota case study of site-specific archaeological research, with examples

of typical artifact types recovered at local sites, and the standard types of analyses that have been done here.

Minnesota archaeology began with antiquarian explorations in the late nineteenth century, and has progressed from the 1930s to the present day with systematic research projects led by universities, the development of state and federal protective laws and agencies, and in response, Cultural Resource Management studies of proposed development projects conducted by consulting archaeologists under contract (Gibbon 2013, 2014b; Gibbon and Anfinson 2015; Anfinson et al. 2015:99-101). There have been substantial contributions to the discipline from each of these types of investigations, but collectively, our understanding of the state's past is still fragmentary and uneven, in terms of both geography and chronology.

Antiquarian explorations in the nineteenth century included mapping and sometimes digging in burial mounds, and collections of artifacts made in the absence of context. Mapping surveys, by Theodore Lewis, Jacob Brower, and others, documented thousands of earthworks at hundreds of sites, many of which have since been destroyed. Some of this information is presented in Brower's *Memoirs of Explorations in the Valley of the Mississippi* (e.g. Brower 1901; Brower and Bushnell 1900), and Newton Winchell's (1911) compilation, *The Aborigines of Minnesota*. Arzigian and Stevenson (2003) present a very useful overview (see also Keyes 1928). The first classification of archaeological sites and artifacts occurred with Lloyd Wilford's (1937) dissertation at Harvard University. Wilford conducted excavations with a small crew of students each summer from 1932 to 1959, ranging across the state and occasionally in adjacent areas of North and South Dakota (Johnson 1974). Cultural Resource Management (CRM) became a major force in Minnesota archaeology in the 1970s, with consulting archaeologists working under contract to identify sites that would be affected by construction projects, and sometimes conducting large excavations to mitigate impacts.

The Minnesota Private Cemeteries Act (307.08) was passed in 1976, to prevent damage from construction and preserve ancient and historic cemeteries, on both public and private land. In the decades since then, archaeological investigations of mound and other cemetery sites have focused on minimally invasive ways to identify burial areas for

protection, increasingly aided by advances in remote sensing technology. In the 1990s, renewed examination of curated archaeological collections occurred at large institutions such as the University of Minnesota, the Science Museum of Minnesota and the Minnesota Historical Society following passage of the Native American Graves Protection and Repatriation Act (NAGPRA). These studies largely focused on human remains and related artifacts from excavations of burial mounds in the mid-nineteenth century into the early 1970s. The bear finds described in Chapters 5-7 are derived from all of these types of investigations – antiquarian surveys, university-led research excavations, CRM projects, and NAGPRA consultation.

### *Chronology and Scope*

Minnesota archaeology spans approximately 13,000 years of human history, the vast majority of which is Native history prior to first European contact here in the late seventeenth century. This brief summary draws generally on statewide and regional overviews (Gibbon 2012a; Anfinson 1997; Arzigian 2012; Arzigian and Stevenson 2003; Budak 1995; Dobbs 1990; Fleming 2009; Johnson 1988; LeVasseur 2000; Mather 2000b; Richner 2008; Schirmer 2002; Theler and Boszhardt 2003) and other sources as cited. Table 1 correlates the general archaeological periods currently recognized in Minnesota with climatic episodes, and the bear species potentially present.

American Indians were already present in North America as the Wisconsin glacial ice was melting, and presumably entered what-is-now Minnesota soon after (Buhta et al. 2011). People of the Paleoindian Tradition were nomadic hunters and gatherers who coexisted for centuries with Pleistocene megafauna. They are best known archaeologically for their finely crafted lanceolate spear points, the oldest of which were thinned (fluted) at the base. These points were both works of art and the killing tips of darts thrown with an atlatl. They were effective weapons against bears, as well as significantly larger prey such as mammoths, mastodons, and giant bison (Loy and Dixon 1998).

Confirmed Early Paleoindian (13,200-12,500 BP) sites are rare in Minnesota. Late Paleoindian sites are a bit better known, and include quarries of local stone, such as Knife Lake Siltstone at Mille Lacs and in the Boundary Waters (e.g. Malik and Bakken 1999; Clayton and Hoffman 2009; Muñiz 2013; Wendt and Mulholland 2013). Other stone tools from this period include trihedral adzes that were used to make dugout canoes (Cook 2015; Harrison and Redepenning 1995:76-83). The classic image of Paleoindian people is that of nomadic big game hunters, focused on megafauna and giant species of extinct bison. There is truth to this, as attested by kill and butchering sites on the Great Plains (Frison 1998), but Paleoindian peoples were also attuned to their local environments, relying on a wide range of resources including a variety of plant species, small mammals, turtles and fish (Mulholland 1995:135). For example, the Late Paleoindian – Early Archaic component at the Deadman Slough site (47PR46) in northwestern Wisconsin includes deer, porcupine, bird, turtle, fish, and freshwater mussel remains, and possibly a black bear canine, within an assemblage of 1,415 bone fragments (Kuehn 1998:466).

Starting around 8,000 BP in the early Holocene, people of the Archaic Tradition continued a hunting and gathering lifestyle, but with greater focus on local resources. In Minnesota, the earliest part of the Archaic overlaps with the Late Paleoindian Tradition (Gibbon 2012a:49-55). Elsewhere in the eastern United States (e.g. see Stoltman 1997 for Wisconsin), the Archaic is typically divided into three periods (Early, Middle and Late). The quality of flaked stone tools is generally less during this period, especially when compared to Early Paleoindian spear points, but this is largely because poorer, locally available, lithic raw materials were more frequently used for toolstone. Such materials are more difficult to knap. The Itasca Bison site (Shay 1971; Widga 2006, 2014) at the headwaters of the Mississippi River dates to this period.

By the Late Archaic, copper tools were made and used in Minnesota, although in lesser quantities than are known farther east in Wisconsin and Michigan (Gibbon 1998). Copper artifacts include finished tools such as spear points or ulu knives, as well as waste copper left from working raw copper. Some tools were brought or traded from Isle Royale or the Upper Peninsula of Michigan, where large surface pit mining sites reflect

the volume of material removed (Ferone 1999). Drift copper has been found in glacial subsoil of eastern Minnesota, particularly Pine County. Petaga Point (21ML11) at Mille Lacs is a rare example of a site with copper found in archaeological excavation (Bleed 1969; Cummings 2008).

The Archaic Tradition ends prior to the generally-accepted presence of cultivated plants in this part of the continent, but there is a domesticated squash seed (*Cucurbita pepo*) identified from the King Coulee site (21WB56) at Lake Pepin, from a Late Archaic component radiocarbon dated to  $2,530 \pm 60$  BP, and another seed may be from a provenience dated to  $3450 \pm 70$  BP (Perkl 1998:282-285). Few wet sites such as the Itasca Bison site or King Coulee have been excavated, so recovered artifacts from most Paleoindian and Archaic tradition sites are primarily stone, with rare preservation of faunal or plant remains (e.g. Kuehn 1998). Other organic materials that surely would have been used, such as wood, fiber and hide, are not preserved in the archaeological record except under exceptional circumstances.

Starting around 3,000 BP, the Woodland Tradition marks the introduction of ceramic technology, mound building, and domestic plants such as corn, and an intensification of horticulture. By the Middle Woodland Tradition, these changes were largely through participation by local American Indian groups in the nearly continental-scale trade network of the Hopewell Interaction Sphere, based in present-day Ohio. One of the most archaeological visible aspects of this trade is an increase in Knife River Flint, a high quality toolstone from western North Dakota (Clayton et al. 1970), at Minnesota sites although it is certainly represented in other time periods as well (Clark 1984; Bakken 2011). Artifacts from the Woodland Tradition include stone and pottery, and more frequent preservation of faunal and plant remains. The increased population of this time is credited to intensive use of wild rice, and domesticated crops. Evidence of maize in Minnesota is seen at Laurel sites beginning ca. 500 CE (Boyd and Surette 2010).

Ceramic technology is a hallmark of the Woodland Tradition, and there is a wide range of pottery styles defined in Minnesota. Like projectile points, diagnostic potsherds (usually rim or other decorated sherds) can be diagnostic markers of archaeological periods. The earliest pots, from Early and Middle Woodland traditions, were made from

rolled coils of clay and had a pointed base (Budak 1985, 1995). They were relatively thick walled, and tempered with grit or sand. Brainerd Ware is among the oldest pottery styles known in the state, beginning at approximately 2750 BP (Hohman-Caine et al. 2012:75). This pottery has distinctive diamond-shaped markings from fish nets that were pressed into the wet clay, in unique representation of fiber technology in the archaeological record. The Sandon vessel (Skaar et al. 2014) is unique example of a Middle Woodland vessel from the Minnesota River. On the Rainy River, Hannaford Ware is an example of a transitional ware between the Middle and Late Woodland Traditions, with aspects of conical vessels merged with the later form of a shouldered pot with outlaring rim (Gonsior 2018).

Starting around 2,000 to 3,000 years ago, wild rice (*Zizania palustris* or *Z. aquatica*) expanded dramatically in Minnesota. It was always here, as indicated by pollen diagrams, but in many wild rice lakes, that is the approximate time that it became plentiful (McAndrews 2000; Huber 2000). It is possible that climatic cooling and the millennia of lacustrine ecological changes since the glacial retreat combined to create exceptionally favorable conditions for wild rice at that time. It is also likely, in my opinion, that people purposefully spread wild rice seed to expand the crop, a practice known from the historic period and which continues today (White 2000; Mather 2017b). Just as wild rice had always been present, people likely always ate it, but it changed native societies around the beginning of the Late Woodland Tradition as the people developed technology to preserve and store the grain. Populations grew and seasonal rounds explicitly included wild rice camps in the late summer (Gibbon and Caine 1980; Valppu 2000a; Mather and Thompson 2000). Wild rice was (and is) managed like a domesticate, and thus conveyed the same benefits of food stability, although the plant itself has not exhibited the morphological changes that are the hallmark of domestic species.

Starting around 1050 CE, a colony from Cahokia (a World Heritage Site in Illinois near present-day St. Louis) was established at Trempealeau, on the Wisconsin side of Lake Pepin (Pauketat et al. 2015; Green and Rodell 1994). Although short-lived, this movement occurred within a period of longer Mississippian influence in Minnesota,

most obviously at Red Wing, and the Cambria site on the Minnesota River. Platform temple mounds were constructed during this period and are occasionally found among hundreds of conical mounds at sites, such as at the Silverdale and Bryan sites at Red Wing (Gibbon 1991; Winchell 1911:150-154). Myster (2001) describes a bioanthropological continuity from the Paleoindian into the Woodland Tradition, but a measurable change with Mississippian and Oneota presence in southern and western Minnesota.

Significant changes in material culture occurred at this time, and are especially evident in the form of thin-walled, shell-tempered pottery vessels. Projectile points were small triangles, as were those used by Late Woodland groups; they were effective for hunting large game such as bison with the bow and arrow. Agricultural villages were established in southern and western Minnesota, leaving archaeological traces in substantial house features and storage pits, and distinctive artifacts such as bison scapula hoes (Holley and Michlovic 2010, 2013; Knudson 1967; Anfinson 1997:89-120).

When considering the general time period of the Late Woodland, Mississippian, Plains Village and Oneota traditions, it should be noted that there is no credible evidence of Europeans visiting Minnesota during the fourteenth century. The Kensington Rune Stone, which claims Norse exploration here in 1362, is a fraud perpetrated amid a nationwide trend of archaeological and scientific hoaxes in the late nineteenth century (cf. Blegen 1968; Michlovic 2010; Krueger 2015). The first European contact here occurred in the late seventeenth century, when the Dakota established trade relationships with French explorers and *coureurs de bois* (Anderson 1997:29-36; Birk and Johnson 1992; Gibbon 2003:48-51; Mather forthcoming-a; Westerman and White 2012:34-59; Wingerd 2010:16-20).

Much of Minnesota's archaeological record spanning the last 2,000 to 3,000 years is the legacy of a combination of Siouan and Algonquian cultures (e.g. Gibbon 1994, 2003, 2012a; Schlesier 1994). Prior to that, throughout the Paleoindian and Archaic traditions, we cannot confidently link defined American Indian archaeological "cultures" (based on artifact typology) with historically known American Indian societies, although genetic and cultural connections are presumed to exist. As bear ceremonialism is known

ethnographically and historically from both Siouan and Algonquian peoples (see Chapter 4), it seems reasonable to expect that it was practiced in various forms in Minnesota's archaeological past. Indeed, several of the archaeological sites discussed here demonstrate conclusively that it was.

The Dakota continued the practice of mound building into the historic period, as late as the nineteenth century, and maintained knowledge of sacred and culturally important places even during the reservation and exile periods (Arnott et al. 2013; Maki and Arnott 2019:16; Mather 2004a; Winchell 1911:170-171). Sites representing the archaeology of the fur trade and historical native communities include the Dakota planting village at Little Rapids on the Minnesota River (Spector 1993; Whelan 1987). In the Boundary Waters, dendrochronology and analysis of culturally modified trees has added a new dimension to the historical archaeology of the fur post at L'Anse aux Sable, the Handle of Sand (Johnson et al. 2018). Other sites of this period include networks of fur posts such as Grand Portage and Old Wadena (Allard 2016; Birk 1999, 2005, 2008; Hayes 2013, 2014; Gibbon and Wynia 2010), as well as traces of the trade and transportation routes that connected them (Birk 2007; Gibbon 2006; Wheeler et al. 1975; Mather 2007a, forthcoming-b).

Historical archaeology combines the written historical record (and sometimes oral history) with traditional archaeological techniques. This provides useful insights to the fur trade but a more comprehensive base of comparison for more recent history, in the Minnesota Territory and early decades of statehood. Investigations have ranged from urban archaeology of Twin Cities (e.g. Abel et al. 1998a, 1998b; Bakken 2007; Mather 2012a:102-105; Terrell and Vermeer 2011; Zimmerman 2004) to changing patterns of settlement and land use in smaller towns and the countryside (Justin et al. 2003; Mather 2004b; Michlovic 2003; Rothaus and Gold 2002), as well as military sites such as Fort Snelling (Johnson 1970), or conflicts such as the battlefields of the U.S.-Dakota War (Terrell 2009a; Mather 2010:166-170).

Underwater archaeology in Minnesota has primarily focused on shipwrecks in Lake Superior and the inland lakes and rivers (Anfinson 1996; Labadie 1990; Merriman and Olson 2012, 2015; Mather 2009b, 2012a:110-114), although as indicated by finds of

dugout canoes, the potential certainly exists for the precontact period as well (Merriman and Olson 2014). Industrial archaeology applies an interdisciplinary archaeological perspective to industrial sites, landscapes, structures, ruins, artifacts and archives, often to a greater degree than other types of archaeological research. Investigations in Minnesota have focused primarily on mining and milling sites (e.g. Gronhovd 2003; Terrell 2009b, 2011; Mather 2011:91-95; Tumberg 2019).

### *Methods and Artifacts*

Analysis of any subject through archaeological data, including this one, requires recognition that archaeological research is conducted through sampling (Figure 2), so the finds (whether sites or artifact types) are randomly encountered and do not necessarily represent meaningful patterns. While earthworks and structural ruins are sometimes readily visible, most archaeological sites in Minnesota consist of artifacts and “features” (observable traces in soil left from human activity, including remnants of a fire hearth, a decomposed wood post, or a pit full of bear skulls, for example), buried beneath the ground surface. Finding sites involves methods such as shovel testing, with small-diameter holes (ca. 40 cm diameter) dug by hand and the soil passed through a ¼-inch mesh shaker screen. The tests are typically dug on a 15-meter grid. The distribution of tests producing artifacts is plotted to define the limits of the archaeological site. This survey method became standard practice in Minnesota in the late 1970s (cf. Birk and George 1976).

In a plowed agricultural field with good surface visibility, a site can be identified and defined simply by mapping artifacts seen on the ground. In some situations, however, such as river valleys, the potential artifact-bearing levels may be far deeper than can be reached through hand digging, so geological methods such as backhoe trenching or coring are used. Archaeological survey always requires a prerequisite understanding of the study area’s physical geography and geological history.

Archaeological excavations are labor-intensive, so most are small. The dig illustrated in Figure 2 was relatively large by current standards. Because excavation is

inherently destructive, it is preferable for a site to never be dug in its entirety. Recognizing that technology will continue to advance, along with research questions and methods, the best practice is to preserve sites in place to the greatest extent possible. The exception to this rule is when significant sites will be destroyed by construction projects, but even then, it is typical for only a representative sample to be excavated.

The use of non-destructive investigative methods has increased exponentially in the last two decades. Geophysical survey technology such as ground-penetrating radar and related methods can reveal aspects of the subsurface structure of archaeological sites without excavation, or allow targeted ground-truthing through small excavations (Arnott and Maki 2019; Arnott et al. 2013b; Mather 2015b).



*Figure 2. Cumulative phases of archaeological excavation at Wigwam Bay (21ML81) of Mille Lacs Lake. The site was found by shovel testing (one test location left from a 15-m grid outlined in yellow); Phase II evaluation involved 1x1 meter units (two outlined in blue) excavated in 5-cm levels; the large cumulative block (red outline) was excavated on a 1-meter grid. The dark layer of soil and rock is the focus of the dig, a ca. 2000-year-old village surface (2004 photo, modified from Mather et al. 2005)*

As of November 23, 2019, there were 20,143 archaeological sites recorded in the Minnesota Office of the State Archaeologist's inventory, which does not include all sites

known on federal land (primarily Chippewa and Superior National Forests). This may sound like a lot, but only about nine percent of these have been “intensely excavated,” meaning that they have been the subject of an academic research dig, or combined Phase II and III investigation in the CRM process (Anfinson 2013:11-12). It is this small subset of investigations that provides the best chance for recognition of bear remains (or information for any specific research question), because more artifacts are recovered from these projects, and they are more likely to be analyzed and reported in detail than for Phase I surveys.

### *Zooarchaeology*

Zooarchaeology is the study of animal bones from archaeological sites. As previously stated, it is a primary method of research in this dissertation, and it is therefore useful provide some background on zooarchaeology as practiced in Minnesota to place these data in context.

Animal bones were usually not considered, or systematically collected, in antiquarian or early archaeological investigations. Notable exceptions included the identification of loon and other bone tools associated with Minnesota Woman, and consideration of the newly discovered Itasca Bison site in the 1930s (Jenks 1936:168, 1937). Through the first half of the twentieth century, animal bones were generally not identified or described in site reports except in unusual circumstances where the faunal remains clearly indicated a ritual context. Examples include the headless articulated skeleton of a bison calf excavated from the Fingerson Mound (21PO2) in 1938, and the hundreds of black bear mandibles found at the edge of the Christensen Mound (21SH1/16) in 1948, which are discussed in Chapter 6 (Wilford et al. 1969:12-16, 41-42; Mather 2004b; Powell 1948). An example of significant faunal remains being overlooked is the 1946 excavation of the Slininger Mound (21NR1), discussed in Chapter 7, where bear and other animal bones were incorrectly assumed to be the intrusive remains of burrowing animals and dismissed in the original analysis (Wilford 1951).

In the mid-twentieth century, zoology and paleontology curators at the Science Museum of Minnesota identified animal bones from archaeological sites, including the assemblage Powell (1948) collected from the Christensen Mound. Another prominent find was the fauna of Lee Mill Cave in Dakota County, with abundant small mammals including raccoons and woodchucks, and a large fish assemblage with freshwater drum and catfish (Taylor 1955a, 1955b). Paul Lukens (1963) examined 22 assemblages of animal bone for his dissertation at the University of Minnesota, from excavations conducted by Lloyd Wilford in the early and middle twentieth century. This was an important contribution because the datasets were from the same sites and investigations upon which the cultural history of Minnesota archaeology was built (Wilford 1937, 1944, 1949, 1950a, 1950b). Since then, regional studies have included sites on the Rainy River, the Mille Lacs locality, the Red River Valley and the Mississippi Headwaters (e.g. Lukens 1973; Webster 1973; Michlovic 1986, 1987; Mather 2005a, 2005b; Mather et al. 2000; Whelan 1990). Zooarchaeology in Minnesota has generally been limited to ecological questions and identification of species, often with a sole focus on mammals. Examples include the representation of hoofed mammals at sites near the prairie-forest ecotone in western Minnesota, including bison, elk, and deer (Shay 1971, 1985; Watrall 1985; Mather 2002a, 2006a; Mather et al. 1998).

Birds are often poorly represented at Minnesota archaeological sites, with significant exceptions at the Big Rice Lake site in Superior National Forest, and the Officers' Latrine feature at Fort Snelling (Penman 1984; Mather 2017a). Fish bones have not received the attention they deserve in Minnesota zooarchaeology, given the prominent role of the lakes and rivers in the state's history. A few detailed studies have occurred on the Rainy River and near the Mississippi headwaters, where large assemblages of spring spawning fish have been identified, including lake sturgeon and white suckers (Morey et al. 1996; Mather 2005; Terrell 2012).

Analysis of ancient DNA from animal remains holds great potential for zooarchaeology and paleontology, but so far has not been extensively utilized in Minnesota. Bone samples from the Silvernale site (21GD3) at Red Wing were included in a genetic study, producing identifications of elk, deer, bison, mouse, and human

(Alveshere 2012). As mentioned above, aDNA analysis allowed paleontological identification of a Pleistocene scimitar cat from southeast Minnesota (Widga et al. 2012). Also, as described in Chapter 5, genetic analysis of a bear bone sample from the Animoosh site (21BL305) was attempted to confirm the visual identification of *Ursus arctos*, but unfortunately in that case, the DNA could not be sequenced. As seen in the zooarchaeological overviews (Chapters 5-7), the vast majority of bone fragments in most zooarchaeological assemblages cannot be identified to species based on preserved morphology. Genetic analysis has the potential to exponentially broaden the number and scope of such identifications, and for species within morphologically similar taxonomic families such as ducks and geese.

*Table 1. General chronology of climatic episodes, archaeological traditions and potential bear species in Minnesota*

Years BP (ca.)	Climate	Potential Bears	Traditions	Archaeology
? -12,800	Late Glacial (very cold) Pleistocene megafauna	<i>Arctodus simus</i> <i>Ursus americanus</i> <i>Ursus arctos</i>	Early Paleoindian (begins ca. 13,200 BP)	Nomadic hunter/gatherers Low population Fluted spearpoints; exotic stone
12,800-10,400	Pre-Boreal (rapid warming) Megafauna extinctions	<i>Arctodus simus?</i> <i>Ursus americanus</i> <i>Ursus arctos</i>	Early Paleoindian Late Paleoindian	Nomadic hunter/gatherers Non-fluted lanceolate points
10,400-8,700	Boreal (Younger Dryas, colder)	<i>Ursus americanus</i> <i>Ursus arctos</i>	Late Paleoindian Early-Middle Archaic	Nomadic hunter/gatherers Lanceolate and notched points, trend toward local stone
8,700-5,000	Atlantic Modern bison species	<i>Ursus americanus</i> <i>Ursus arctos</i>	Middle Archaic	Nomadic hunter/gather Notched spearpoints, local stone
5,000-2,950	Sub-Boreal	<i>Ursus americanus</i> <i>Ursus arctos</i>	Late Archaic	Nomadic hunter/gatherers Stone, copper tools
2,950-1,600	Sub-Atlantic	<i>Ursus americanus</i> <i>Ursus arctos</i>	Initial (Early) Woodland	Mound-building begins Ceramics, horticulture Continental trade network
1,600-1,250	PSA Scandic	<i>Ursus americanus</i> <i>Ursus arctos</i>	Initial (Middle) Woodland Terminal (Late) Woodland	Hunt/Fish/Gather Increased population Bow & arrow technology
1,250-800	PSA Neo-Atlantic (Medieval Warm Period)	<i>Ursus americanus</i> <i>Ursus arctos</i>	Terminal (Late) Woodland Mississippian Plains Village	Hunt/Fish/Gather (N) Agricultural villages (S) Tribal societies
800-450	PSA Pacific (cooler)	<i>Ursus americanus</i> <i>Ursus arctos</i>	Terminal (Late) Woodland Oneota	Hunt/Fish/Gather (N) Agricultural villages (S)
450-160	PSA Neo-Boreal (Little Ice Age)	<i>Ursus americanus</i> <i>Ursus arctos</i>	Terminal (Late) Woodland Oneota European Fur Trade	Hunt/Fish/Gather (N) Agricultural villages (S) Villages, trading posts
160-90	PSA Neo-Boreal (continued)	<i>Ursus americanus</i>	MN Territorial/Statehood	Historical/Industrial
90-present	PSA Modern	<i>Ursus americanus</i>	MN Statehood	Historical/Industrial

PSA = Post-Sub-Atlantic Sub-Episode; N = Northern Minnesota (generally), S = Southern Minnesota (generally)  
Chronology of climatic episodes from Bryson (1998) and Gibbon (2012a); archaeological traditions generalized from Gibbon (2012a), Arzgian (2012), Anfinson (1997), Budak (1995), Dobbs (1990), Johnson (1988), Richner (2008), Mather (2000b)

## Bears

*Ursus americanus* is Minnesota's familiar American black bear, but it is just one of at least three ursid species that have likely lived here (Figures 3 and 4). Archaeological and historical evidence presented in later chapters indicates that the range of grizzly bears (*Ursus arctos*) once included our state. Also, it can be assumed that the North American giant short-faced bear (*Arctodus simus*) lived here prior to its extinction at the end of the Pleistocene. This was larger than any of the extant bears, with large males reaching about 1,700 pounds (700-800 kg), or even exceeding one ton in weight (Christiansen 1999).



Figure 3. The American black bear (*Ursus americanus* – right) and brown/grizzly bear (*Ursus arctos* – left); Minnesota Zoo habitats, August 2014

Worldwide, other living bear species include polar bears (*Ursus maritimus*), Asiatic black bears (*Ursus thibetanus*), sloth bears (*Ursus ursinus*), sun bears (*Ursus malayanus*), spectacled bears (*Tremarctos ornatus*) and giant pandas (*Ailuropoda melanoleuca*). These, along with brown bears (including grizzlies) and American black bears, are the eight extant members of the Ursidae, or “true bear” taxonomic family. Carnivorous, arctic-dwelling polar bears are the largest, with maximum weights exceeding 2,200 pounds (ca. 1,000 kg) and reaching twelve feet in length. Sun bears are the smallest (ca. 100 lbs; 45 kg), living in the Asian tropics. They are largely arboreal and nocturnal, eating insects, small animals and plants. Bears are generally omnivorous, searching out plant and animal foods in a seasonal round. The spectacled bears of South America and the bamboo-eating giant pandas of China are less closely related than the other true bears (Craighead 2000; Domico 1988; Shepard and Sanders 1985:20-55;

Stirling 1993; Ward and Kynaston 1995). It is worth noting that the koala “bear” of Australia is a marsupial, so it is not actually a bear at all.



Figure 4. Size of the American black bear, grizzly bear and (extinct) short-faced bear, with 8-year-old human for scale; Los Angeles Museum of Natural History exhibit, March 2013

### Bear Taxonomy

There are currently 16 recognized subspecies of *Ursus americanus* (American black bears), including the most widespread, *Ursus americanus americanus*, which is resident in Minnesota (Larivière 2001). This taxonomic binomial (genus-species) classification system is a foundation of biological study, officially adopted when the first International Congress of Zoologists met in Paris in 1889 (Allen 2009:127). Although a matter of common usage now, and important because it is the framework by which we understand global biology, its development was a source of confusion and occasional controversy over the course of several centuries. Linnaeus himself named the brown bear

of his native Sweden, with the genus *Ursus* (Latin for bear) and species *arctos* (Greek for bear). Thus, in terms of scientific taxonomy, the brown bear is the touchstone for comparison of all other bears. The name is attributed to the tenth edition of the *Systema Naturae* (Linnaei 1758), which also includes reference to the polar bear.

At that time, biological taxonomy could overlap with political and ethnocentric disputes, and the differences between black and brown bears were not immediately recognized. For example, an eighteenth century contemporary of Linneaus and a preeminent natural historian of the time, Georges-Louis Leclerc, Compte de Buffon, invoked the American black bear as an example in his theory of continental degeneracy. Not recognizing that they are a separate species, Buffon began his argument by stating that “the bears of Illinois, of Louisiana, etc., seem to be the same with ours [the brown bear of Europe]; the former being only smaller and blacker” (translated quote by Dugatkin 2009:24). Buffon’s theory, in essence, was that the American continents were intrinsically unhealthy since nature had not been historically “subdued” here as it had been in Europe, preventing life forms from thriving and stunting plant and animal growth. Thomas Jefferson saw this idea as an economic threat. He refuted it in his *Notes on the State of Virginia*, including reference to the bears of the two continents (Jefferson 1787:81-83), and citing Buffon’s (1777:327-334) discussion on bears. Dugatkin (2009) presents a fascinating overview of the “degeneracy” debate. It is useful to note that geographically, Buffon was referring to areas of New France that encompassed much of the North American mid-continent, not the states of Illinois and Louisiana as they are known today.

Taxonomic identification of the American black bear (*Ursus americanus*) is attributed to the *Spicilegia Zoologica* by Peter Simon Pallas (1780:5-6). Pallas published the fourteen-volume work in his home city of Berlin, and like Linnaeus, he wrote in Latin. The section on bears focuses on polar bears and the brown bear of Europe, but Pallas refers to having seen American black bears at the Tower of London that he considered an obviously separate species, and he quotes at length about bears from John Brickell’s (1737) *Natural History of North-Carolina*. This is the reason that the species’ type locality is designated “eastern North America” (Larivière 2001:1).

Brickell gives us an illustration of the American black bear (Figure 5), which must be among the earliest European depictions of this animal (examples of older American Indian depictions are described in Chapters 4 and 7). He also (Brickell 1737:110-114) presents a remarkable passage on black bears in what-is-now the southeastern United States, with particular reference to how good they taste:

The young Cubs are a most delicious dish, as most of the Planters testifie, who prefer their flesh before *Beef, Pork, Veal* or *Mutton*, and it looks as well as it eats, their Fat being as white as Snow, and the sweetest of any Creature in the World; for, if any Person drinks a Quart of it melted, it never rises in the Stomach, as other Oils and Fats are subject to do, and is preferr'd above all things for frying Fish, &c. [Brickell 1737:110]



Figure 5. An American black bear as depicted in *The Natural History of North-Carolina* (Brickell 1737)

In 1820, Henry Rowe Schoolcraft described a bear his Ojibwe guides had killed in the Upper Peninsula of Michigan as “the common black bear of naturalists, (*ursus niger*,)

[sic] which is frequent in the United States" (Williams 1992:127). In 1841, Dr. George Douglas stood beside a stuffed black bear in the Literary and Historical Society of Quebec to lecture "On the Natural History of the 'Ursus Americanus'" which had long been "confounded with the black Bear of Europe" (Douglas 1843:56). Writing in the first *Mammals of Minnesota*, Clarence Herrick (1892:146-150) identified the black bear as "*Ursus americanus* Pallas." He concluded that they were still abundant in Minnesota at that time, because they were occasionally sold in the food markets of the Twin Cities. He also did not discount an unusual folk belief regarding bears:

Many country people believe in the existence of another species of bear known as "The Ranger", which, like the man-eating tiger, is blood-thirsty, and always gaunt and hungry. This form should be distinguishable by a star or crescent in the breast, and does not hibernate. [Herrick 1892:149]

It is ironic that Buffon's degeneracy debate seems to have run its course by the time the Corps of Discovery returned with the type description of the grizzly bear from the Missouri River in 1806 (Schullery 2002:196-197). It was later recognized that although they are larger, grizzlies belong to the same species as the brown bear of Europe (*Ursus arctos*). The original range of brown bears extended across Europe, North Africa, the Middle East, Asia and parts of North America. While ursid taxonomy was once a frenzy of "splitting" (cf. Merriam 1918), it is now generally agreed that the majority of the brown bears native to North America belong to the subspecies *Ursus arctos horribilis*, also known as the grizzly bear (Pasitschniak-Arts 1993).

Worldwide, *Ursus arctos* exhibits the greatest diversity in size and color of all bear species:

The grizzly, a parkland, steppe and chaparral race of North America, is but half that size in its arctic form but, as the golden bear of California, can reach 680 kilograms. The Syrian brown bear, found northeast of the Mediterranean, weighs only one-fourth as much as the Siberian, and the races of Europe and other parts of Asia fall between. Brown bears are blue-black in Tibet, shimmering silver-tipped in America, reddish in China, and running to yellow, tan, buff,

and chocolate in different parts of the world. [Shepard and Sanders 1985:21]

The first scientific description of the North American grizzly bear, by George Ord in 1815, was based on a written description by Meriwether Lewis, and a specimen the Corps of Discovery obtained in northeastern Montana (Coues 1979:842; Craighead 1979:3; Schullery 2002:50-57; McCracken 2003:68). In *The Beast that Walks Like Man*, McCracken quotes from the Lewis & Clark journals:

Captain Clark and one of the hunters met this evening the largest brown bear we have seen. As they fired he did not attempt to attack, but fled with a most tremendous roar; and such was his extraordinary tenacity of life that, although five balls passed through his lungs and he had five other wounds, he swam more than half way across the river to a sand-bar, and survived twenty minutes. He weighed between 500 and 600 pounds at least, and measured 8 feet 7½ inches from the nose to the extremity of the hind feet; 5 feet 10½ inches around the breast; 3 feet 11 inches around the neck; 1 foot 11 inches around the middle of the foreleg; and his talons, five on each foot, were 4¾ inches in length. [McCracken 2003:79-80; see also Gilman 2003:182; Coues 1979:297-298]

C. Hart Merriam (1918) referred to Ord's grizzly as *Ursus horribilis horribilis*, the "Big Plains Grizzly." The Lewis and Clark specimen described by Ord was also the type specimen used by Merriam for the subspecies. McCracken (2003:293) adds that this bear was "sometimes referred to as 'the huge buffalo-killing grizzly of the Great Plains.'" Unfortunately for consideration of the Plains Grizzly, Merriam's splitting of North American brown bears into 86 proposed species has left a poor taxonomic legacy. Merriam's taxonomy, based primarily on skull dimensions, "amazingly and absurdly" (Schullery 2003:14) was able to split littermates into supposedly separate species. Despite this "formidable and confusing" synonymy (Pasitschniak-Arts 1993:2), there are 16 subspecies of brown bears currently recognized by biologists. Nine of these are from North America. The so-called Plains Grizzly is not identified as one of them.

The Plains Grizzly, whatever its taxonomic status, is important to the current discussion because it is presumably the type of grizzly that would have been present in

Minnesota (see Chapters 5-7). It is also likely the type represented by many Great Plains ethnographic grizzly claw necklaces. Feder and Chandler (1961:13) note that white or yellow front claws were preferred by Plains Indians over other colors for making necklaces. “In all probability the claws of an animal known as the Big Plains Grizzly (*Ursus horribilis horribilis* Ord) were the type commonly used, and unhappily this animal is now ‘nearly or quite extinct.’”

The terms subspecies, variety, race, form and ecotype are used to describe definable physical variability within a species. Subspecies is the only of these categories with taxonomic status (Reitz and Wing 1999:36). Frank Craighead (1979:2) described the Plains Grizzly as an ecotype, “about which little is known.” In recent centuries, the range of grizzlies and other brown bears has been drastically reduced due to excessive hunting and habitat loss. The grizzly has not existed on the Great Plains since the late nineteenth century, at the latest. The range of resources in that habitat was once ideal for the great bears:

Generally ... the bears were found feeding on buffalo carcasses, which were often plentifully distributed in the quicksand or along the river banks by floods and breaking ice. Apparently the Missouri River Valley with its great abundance and variety of large game, wild fruit, and berries, bulbs, tubers, roots, and underground beans, was a paradise for those bears before the days of the rifle. [Bailey 1926:196-197]

In recent decades, genetic analysis has been used to address longstanding taxonomic debates, and refine the relationships of known subspecies (Waits et al. 1999). For example, genetic analysis has shown that while the giant panda is the most distantly related of the living bear species, it is a true bear rather than a member of the raccoon-like Procyonidae (Lumpkin and Seidensticker 2002:41-43; O’Brien 1993). Also, the Isabelline bear of central Asia has recently been shown to be an ancient subspecies of *Ursus arctos*, and related to the rare Gobi bear of Mongolia (Galbreath et al. 2007). In my opinion, future genetic analysis of archaeological and ethnographic collections would be a useful means to examine the historical and taxonomic status of the Plains Grizzly.

Nondestructive aDNA sequencing has been accomplished with archaeological bear bones dating to the nineteenth century (Kennedy et al. 2018:138) following methods described by Bolnick et al. (2012), but it seems unlikely that this approach would currently work with fragile and complex ethnographic objects. When the technology allows, any such studies should only be conducted in consultation with descendant communities (particularly in the case of sacred objects like grizzly claw necklaces).

### *Bear Evolution*

While taxonomy has been the structural framework for biology since Linnaeus, evolution through natural selection has been its organizational principle since the writings of Charles Darwin (2004:301) and others in the early nineteenth century. Consideration of ursid evolution includes both extinct bears and the biology of extant species.

The first animal that can be considered a bear separated from the canids and other carnivorous mammals during the sub-tropical Miocene epoch of the Tertiary period of earth history, about 20 million years ago. This small creature was the “dawn bear,” *Ursavus elmensis*. While retaining slicing premolars, its molars had taken on the grinding, omnivorous form characteristic of all later bears. The genus *Ursus* emerged in the temperate climate of the Pliocene, about 5 to 6 million years ago, with *Ursus minimus* as identified in southern France. This was the ancestor of *Ursus etruscus*, which appeared about 2.5 million years ago. *U. minimus* was small, around the size of a present-day sun bear, while *U. etruscus* was about the size of a black bear. *U. minimus* was also present in North America, and is thought to be the ancestor of the American and Asiatic black bears of today (Kurtén 1976:31-38.)

Ursid paleontology has focused on the cave bear of Europe, understandably owing to the great wealth of material, and its occasional connection with early human presence. The first clear evolutionary step toward cave bears was *Ursus savini*, about 1 million years ago, followed by *Ursus deningeri*, with the true cave bear (*Ursus spelaeus*) present by about 300,000 BP (Kurtén 1976:39-41). The long coexistence of cave bears and hominids in Eurasia is an interdisciplinary subject of interest among archaeologists,

paleontologists and bear biologists. The sheer volume of cave bear bones has prompted many studies, which have debated the cultural roles of bears for early modern humans and Neanderthals in the Paleolithic (e.g. Chase and Dibble 1987; Germonpré 2004; Germonpré and Hämäläinen 2007; Stiner 1999; Wojtal et al. 2015) or focused on ursid paleobiology and evolution (e.g. Bocherens et al. 2011; Cvetkovic and Dimitrijevic 2014; Stiller et al. 2013; Stiner et al. 1998). Of these, Mary Stiner's (1994:325-327; 1998) development of a tooth wear index to identify age classes for cave bear bone assemblages is of most direct interest to this dissertation, because I have applied it to both black bear cheek teeth from Minnesota archaeological sites and recent bears of known age (Chapter 8).

The short-faced bear (*Arctodus simus*) was the largest carnivore known in North America. It became extinct at the end of the Pleistocene, after the point when humans were present on the continent (e.g. Gillette and Madsen 1992; Schubert 2010).

Judged by measurements of its carnassial teeth, the short-faced bear, *Arctodus simus*, was larger than any living bear, even the polar bear. The Florida cave bear, *Tremarctos floridanus*, while smaller than *Arctodus*, was much larger than its living relative, the spectacled bear, a vegetarian that survives in South America. [Martin 2005:38]

No short-faced bear remains have been found to date in Minnesota. The closest discovery site is southwest Iowa (Dietz 2012), but other *Arctodus* remains have been found across North America (e.g. Shubert and Wallace 2009; Gillette and Madsen 1992; Donahue et al. 2013). There is a deep paleontological record of tremarctine bears in South America (Mitchell et al. 2016).

### *Bear Biology*

Programs of biological study specific to bears began in the mid-twentieth century, as cultural values slowly began turning toward conservation – rather than extermination or apathy – as an appropriate goal for large carnivores. The modern practice of bear biology seeks to understand bear populations for purposes of protecting threatened

species, the determination of appropriate hunting regulations, or both, for the benefit of both bears and people. Examples of the interrelated topics studied by bear biologists include:

- bear behavior (e.g. Ditmer et al. 2018b; Bridges et al. 2004)
- population size (e.g. Garshelis and Noyce 2006; Garshelis and Visser 1997)
- reintroduction and translocation (e.g. Smith and Clark 1994; Puckett et al. 2014)
- diet and seasonal abundance of foods (e.g. Noyce and Garshelis 1997; Noyce et al. 1997; Smith et al. 1994; Wyman 2002)
- denning ecology and dormancy (e.g. Maxwell et al. 1988)
- reproductive status and history (e.g. Alt 1983; Brooks and McRoberts 1997; Coy 1999, Coy and Garshelis 1992; Noyce et al. 2002)
- causes and rates of mortality
- home range size and changes (e.g. Howe et al. 2013; Signer et al. 2015)
- dispersal and migration (e.g. Noyce and Garshelis 2011, 2014; Ditmer et al. 2018a)
- habitat and habitat loss (e.g. Velez-Liendo et al. 2014)
- health, veterinary medicine and pathology (e.g. Mendez-Angulo et al. 2014)
- body size and growth (e.g. Brooks et al. 1998)
- physiology (e.g. Harlow et al. 2001; Hellgren et al. 1993; Solá et al. 2006), and
- genetics (e.g. Csiki et al. 2003; Van Den Bussche et al. 2009)

Statistical population modeling can combine multiple aspects of these studies (Fieberg et al. 2010; Fieberg and Ditmer 2012). In addition, biologists are interested in human attitudes toward bears, and how these affect bear populations (e.g. Adamakopoulos 1997; Balčiauskas and Kazlauskas 2012; Lescureux et al. 2011).

The establishment of hunting regulations and restrictions connects bear biology to cultural attitudes and beliefs about bears. Poaching is one of the primary threats to the survival of bears and other large carnivores. Game management and regulated hunting

are effective means to reduce poaching. Big game hunters seek to display physical evidence of the bear's power through trophies, while traditional Asian medicine values the perceived health benefits of bear bile and other body parts (Maas 2000). In 2018, for example, a smuggled shipment was intercepted in Indonesia containing 99 claws and 36 canine teeth from sun bears (*Balikpapan Pos* 2018).

Bears are large and potentially dangerous wild animals (cf. Herrero 1985). They are also generally solitary and secretive. These qualities present obvious challenges to those who wish to study living bears in their natural habitat. To do so, biologists make use of technology and physically demanding fieldwork. In Minnesota and elsewhere, bears have been initially captured in baited barrel-traps, where they could be sedated and fitted with radio-collars, and more recently, with GPS satellite collars. The collars allow tracking of bear movements and estimates of home range or dispersals. Later, bears can be found through the collar at winter dens (Figure 6). Annual visits there allow additional examination, and cubs can be fitted with collars in their second winter, before they disperse from their mother the following spring. In this manner, the Mn/DNR bear study has continued through generations of bears since 1981 (Garshelis and Noyce 2013; Garshelis et al. 2013; Dietz and Dirks 2018:51-54). Earlier bear studies were conducted in Superior National Forest, from 1969 to 1985 (Rogers 1987), and the independent non-profit Wildlife Research Institute in Ely conducted research with wild bears under permit from the Mn/DNR until 2014. Unconventional methods used there including hand-feeding of bears resulted in revocation of research permits, and subsequent lawsuits (Fienberg 2014; Kraker 2015).



Figure 6. Biologist Dave Garshelis adjusts the radiocollar of a sedated female black bear, Chippewa National Forest (March 2001)

One of the original bears in the Mn/DNR study (#56) died of natural causes in 2013, and at 39 years of age was the oldest known wild bear in the world (Mn/DNR 2013b). Whenever possible, the skulls and other remains of deceased collared bears are retrieved. This practice has been a great benefit to this dissertation, because it has provided a collection of black bear skulls of known sex, age and life history for comparison with the archaeological remains (see Chapter 8).

Physical examination of the bears at their dens allows assessment of their health. Data are collected, for example, on skin-fold thickness and bone prominence, body fat using bioelectrical impedance analysis, along with standard measures of length and weight, tooth wear and general body condition (Garshelis et al. 2013:4). It is difficult getting large, sedated animals in and out of their dens. Methods for doing so, along with assessments of safe levels of veterinary drugs, are also topics of study for bear biologists. Volunteers sometimes help the biologists, which is particularly important when newborn cubs are present. The cubs are born in the den, and are awake through the first winter while their mother hibernates. They keep warm from the heat of her body, so when she is

taken from the den for examination, volunteers hold the cubs in their coats to keep them warm (Figure 7). Cubs are also examined (weight, condition, etc.) and fitted with ear tags.



*Figure 7. A yawning bear cub has many admirers in northwest Minnesota (March 2011); bear biologists Mark Ditmer and Karen Noyce are second and third from left*

A key question for bear biologists is how to extrapolate from their study sample to the bear population at large. Reliable estimates of total population (and rates of reproduction and mortality) are essential for determination of appropriate hunting quotas. One way to do this is to place tetracycline-laced bait for bears in barrel-traps, then tranquilize, collar and study the captured bears, and then later look for traces of the marker in the teeth of hunted bears. In Minnesota, hunters are required to turn in one of the vestigial premolars of the bears they kill (these are nonfunctional teeth about the size of a pencil tip). These are thin-sectioned and analyzed by Mn/DNR staff. The proportion of teeth with tetracycline markers within the total number of hunted bears allows estimation of the total population relative to the study sample, for example. The thin-section data are also used to determine the age of the hunted bears through, and the

reproductive history of females, both reflected in the annual rings of cementum within the tooth (Coy 1999, Coy and Garshelis 1992, Rogers 1978).

With advances in genetic analysis and other technology starting in the 1990s, noninvasive methods for studying bear populations have increased. These include collecting samples of dung or hair, from which DNA can be extracted to identify individual bears. Remote cameras can also provide data to establish species presence in an area and even estimate numbers. Computer population modeling is also an important technique (Fieberg et al. 2010; Bridges et al. 2004).

American black bears are more abundant and accessible to researchers than most of the other living bear species. For this reason, the experience of Minnesota bear biologists has been valuable to the study of bears in other parts of the world (Weflen 2002:3). For example, while the use of radiocollars, and more recently, satellite GPS collars, has long been standard practice here, the first two spectacled bears were collared in Bolivia in the 1990s, in a dissertation study that combined bear biology and cultural anthropology (Paisley 2001). Paisley later collaborated with archaeologist Nicholas Saunders, in a study of Andean iconography and representation of spectacled bears (Paisley and Saunders 2010). Another interdisciplinary partnership is Bett et al. (2015), with bear biologist Ian Stirling helping to interpret Dorset polar bear effigies in terms of the bears' seal hunting behavior.

Especially within the last two decades, scientists studying bears have focused on the ursine quality that have fascinated humans since ancient times – their ability to remain immobile and asleep for months without ill effects, despite being so similar to humans in other ways. Minnesota bear biologists have teamed with medical scientists from the University of Minnesota and Medtronic in research aimed to help human patients in long-term care (e.g. Ditmer et al. 2012; Laske et al. 2010; Solá et al. 2006; see also Lohuis et al. 2007; Harlow et al. 2001).

### *Ursus arctos* in North America

The brown bear (*Ursus arctos*) originated in Asia. It expanded westward to Europe about 250,000 years ago, where it eventually displaced the larger cave bear, which became extinct at the end of the Pleistocene (Kurtén 1976:45). Brown bears had a “substantial range expansion during the Late Pleistocene–Holocene” including colonization of North America around 15,000 years ago (Galbreath et al. 2007:130).

North American brown bears (grizzly bears) are now seen as a western and mountain species, but this is actually a restriction of their natural range in response to human pressures. The full Holocene range of grizzlies in North America is not known, however, and is a topic of some confusion. For example, their native range is depicted differently in two related sections of the IUCN/SSC Bear Status and Conservation Action Plan (Servheen et al. 1999). In Canada (McLellan and Banci 1999:47) the “extirpated range” is shown extending east into Manitoba to Lake of the Woods (i.e., immediately adjacent to northwest Minnesota), while in the section on the United States (Servheen 1999:51), the eastern edge of the “Pre 1800 Distribution” is shown approximately at the Missouri River, significantly west of Minnesota.

Earlier evidence for grizzly presence in eastern North America during the Late Pleistocene is seen by finds of bones at Lake Simcoe, Ontario (skull and associated postcrania), as well as in Kentucky (a maxilla and additional canine tooth) and Ohio (a skull). The Ontario and Ohio finds were in glacial gravels. The Kentucky specimen was found in a cave (Guilday 1968). Later studies have identified mid-Wisconsinan and early Holocene grizzly bones from the eastern Great Lakes in southern Ontario, and in northern Quebec (Harington et al. 2014). Fur trade records indicate that grizzlies persisted into the historic period in the eastern sub-arctic regions of Canada (Elton 1954), with supplemental evidence from historical archaeology and analysis of historical photographs (Spiess 1976; Spiess and Cox 1976; Loring and Spiess 2007; see also Mattheus et al. 1994). In the 1940s, a grizzly bear skull was found in southern Manitoba near Austin, west of Winnipeg (Brownlee 2018:57).

### *Ursus americanus* in Minnesota

The entire State of Minnesota was once within the range of the American black bear. *Ursus americanus* evolved in North America, probably from *Ursus abstrusus*, after 4.3 million years ago based on analysis of molecular divergence (Krause et al. 2008). Based on paleontological finds, Björn Kurtén (1976:36-37) had previously suggested that the species arose approximately 2.5 million years ago from *Ursus minimus*.<sup>1</sup> Prior to drastic overhunting and habitat loss in the historic period, black bears were present throughout the continent.

The thick, glossy hair of a black bear pelt is beautiful, often so dark that it seems tinged with blue. While most black bears are indeed black, there are regional color phases that include cinnamon/brown and white. The white bears are the Kermode bears known in the Pacific Northwest (Marshall and Ritland 2002; Reimchen and Klinka 2017), but the reddish-brown cinnamon color phase is known in Minnesota, especially toward the western part of the state's black bear range but becomes more frequent in western North America (Rounds 1987).

Black bears in Minnesota typically range from 150 to 500 pounds in size, although they can get much bigger. For example, a 648-pound bear was killed near Hudson, Wisconsin, in 2011, near the edge of the Twin Cities metropolitan area (Adams 2011). It is likely that sizes of individual bears today trend smaller than what it would have been in the historic or precontact periods, because due to hunting pressures, the modern bear population consists of primarily younger animals. Black bears can live for decades if they survive young adulthood.

Historical records indicate that black bears were present in populated areas in the nineteenth century, including one in 1861 that ate all the sweet corn in W.D. Washburn's garden at the corner of Fifth Street and Eighth Avenue in Minneapolis (Morris 1976:154). This is the approximate location of U.S. Bank Stadium today. Overhunting and habitat loss caused the range of black bears to contract substantially, but they survived in the forests of northern Minnesota while being extirpated from much of the rest of the

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<sup>1</sup> McLellan and Reiner (1994:91-92) state that *Ursus minimus* and *Ursus abstrusus* may be conspecific.

country. They became rare even there, however, by the early twentieth century. Taxidermist Jenness Richardson spent the entire fall of 1925 searching the North Shore of Lake Superior for bears to create the diorama at the Bell Museum of Natural History, before finally acquiring them near International Falls (Leaf 2013:167)<sup>2</sup>. A few years earlier, Cahn (1921:70) stated that the black bear was “very nearly extinct in Itasca County.” The population recovered following the end of bounties and start of regulated hunting, with bears expanding geographically across the approximate northeastern third of the state. Landscape modeling indicates that this area still contains some of the most favorable habitat for black bears in the Midwest (Smith 2013).

Observations of wintering bears were occasionally reported in the 1930s by Civilian Conservation Corps workers and others. For example, Marius Morse (1937) wrote from CCC Camp S-51 in Brimson to the *Journal of Mammalogy* with dated descriptions of events at two bear dens in the Cloquet Valley State Forest, ranging from discovery of the dens in January until after the bears had awakened and left at the end of May. Walter Breckenridge of the Bell Museum photographed the hibernation sites. These reports were the beginnings of bear biology in Minnesota, along with more formal study at Norris Camp north of Red Lake (Anderson 1993:S8:28). Norris Camp was part of a federal New Deal-era relief effort to resettle people from failing cutover farms in the Agassiz peatlands, and restore the natural environment. A failed attempt was made there to save the last remnants of Minnesota’s native woodland caribou. Studies of bear, caribou, elk, deer, moose, sharp-tailed grouse and snowshoe hares were conducted to provide management recommendations to the state’s Conservation Department.

In Minnesota and elsewhere, human interactions with bears were increasingly subjects of public interest in the early twentieth century. An example is the black bear cub “Mr. B” in the Pacific Northwest, and his relationship with writer Irving Petite, who first became aware of the cub by observing the den.

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<sup>2</sup> Interestingly, the setting of the diorama is still the North Shore, perhaps as a more picturesque or culturally expected location for Minnesota bears.

‘Our’ bear family rarely slept at all, and in daily walks past the den we heard the cubs caterwauling, bubbling, yowling, and making other peaceful domestic noises such as we had never known bears to be capable of. Their farthest-out noise was a low-pitched buzzing, like that you hear just before disturbed hornets or yellow jackets burst forth from a concealed nest. Only once or twice were they utterly silent – napping, or perhaps alerted to an alien presence outside. [Petite 1963:22-23]

Such interactions contributed to a growing movement to protect black bears by classifying them a game species (e.g. Shoemaker 1921), rather than as nuisance animals to be eradicated. This effort was ultimately successful in Minnesota in 1971 (Moehlman 1971; Judd et al. 1971).

Preferred black bear habitat and food has been a focus for DNR bear biologists. When black bears emerge from their winter dens, carrion is an opportunistic food source, supplemented with green emergent vegetation in spring, fawns, and ants, especially *Lasius umbratus* (Noyce et al. 1997; Noyce 2007). Trees and shrubs that provide important bear foods for the mid-summer and autumn, including chokecherries and pincherries (*Prunus* spp.), dogwood (*Cornus* spp.), blackberries and raspberries (*Rubus* spp.), blueberries and cranberries (*Vaccinium* spp.), and juneberries or saskatoons (*Amelanchier* spp.). The fruit species are available starting in mid-summer, with acorns (*Quercus* spp.) increasingly prevalent into the fall. Sarsaparilla and spikenard (*Aralia* spp.) are also important, and arrowwood (*Viburnum rafinesquianum*) (Kontio 1994:4-5).

Other topics in Minnesota bear biology include litter size and reproduction, and population size and trends. Recent estimates place the total population of Minnesota black bears at about 15,000 to 20,000, down from a maximum of approximately 20,000 to 30,000 from around 1996-2004 (Garshelis and Noyce 2013), although there have been increasingly common encounters between humans and bears in the Twin Cities and elsewhere (Nelson 2019). That rising trend of population and range expansion in the late 1990s was a key factor in determining the scope of this dissertation.



*Figure 8. Clients of a bear hunting guide service in east-central Minnesota, September 2003 (Mille Lacs Messenger newspaper, September 10, 2003)*

Bear hunting is a big business in Minnesota (Figure 8). Hunting is allowed throughout the state, in an annual season lasting six weeks, from September 1 through the middle of October. The use of bait is allowed, but hunting with dogs is not. For purposes of hunting regulations, approximately one-third of the state, in northeast and north-central Minnesota, is divided into a series of Bear Management Units (Figure 9), with restrictions on the number of bears that may be taken there. In western and southern Minnesota, there is no limit on the number of bears that can be taken, although each hunter can take only one per season. In this way, the modern bear range is artificially maintained in the state's primarily forested areas, keeping them largely out of the areas of agricultural production. "Nuisance bears" that damage crops or livestock can be killed at any time, provided that the bear is registered with the Mn/DNR.

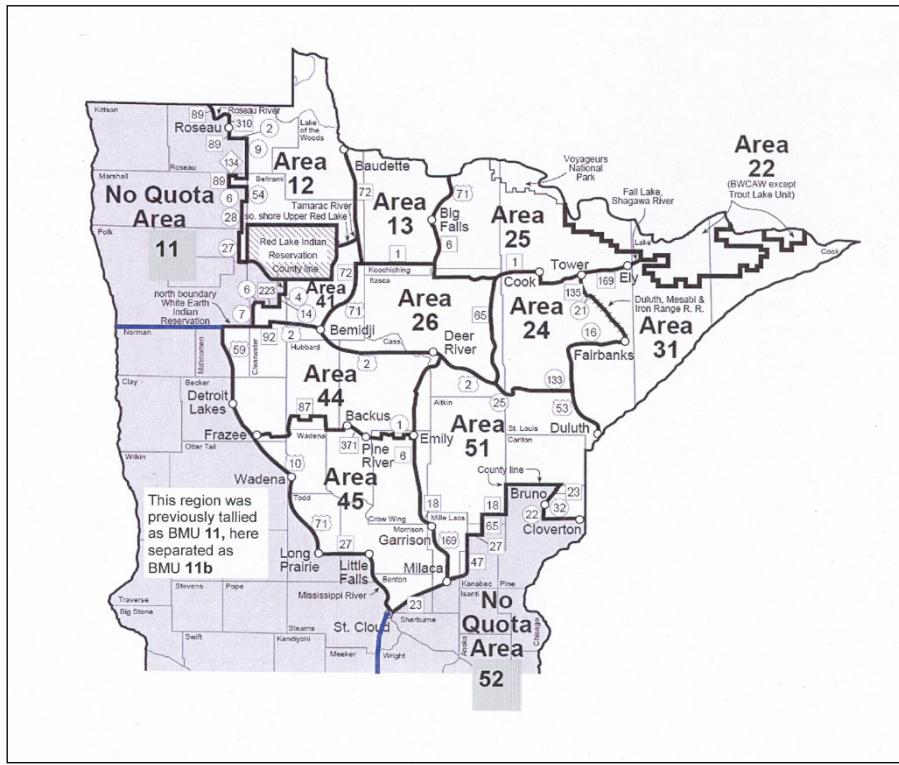


Figure 9. Bear Management Units established by the Minnesota Department of Natural Resources (Garshelis and Noyce 2013a; Mn/DNR 2013b)

The Mn/DNR bear biologists focus on four primary study areas (Figure 10).

Chippewa National Forest in Itasca County was the original focus of black bear research, and remains an area of heavy hunting pressure. Voyageurs National Park, on the northern border of the Arrowhead Region, is within the area where black bears survived the pressures of overhunting and habitat loss in the historic period. Camp Ripley in Morrison County is at the southern edge of primary black bear range. The study there is conducted in cooperation with the U.S. Army National Guard, and was initiated following a rash of nuisance bear reports, which were determined to be from a small number of the bears living there. The most recent focus of study has been in the No-Quota Area of northwest Minnesota, in Kittson, Roseau and Marshall counties, where black bears have been successfully expanding their range into agricultural areas (Ditmer 2014; Ditmer et al. 2012).

Black bears have been a regulated big game species in Minnesota since 1971. Harvest quotas were established in 1982, and modified in 1987 with a “no quota” area

around the periphery of the primary bear range to reduce depredation of agricultural crops (Moehlman 1971; Judd et al. 1971; see also Judd 1972:24; Kinsey 1965; Kontio 1994:1). The Mn/DNR's ongoing bear study was initiated to provide information for managers to use in setting appropriate regulations. These decisions are based on biology, especially the reproductive rate and success of the species in different habitats. The long-term goals of the study include assessment and monitoring of reproduction and cub survival, assessment of body condition and health (including healing and heart function), evaluation of habitat quality and use, in addition to bear movements and dispersal (Garshelis et al. 2004; Dietz and Dirks 2018:51).

Minnesota's present bear population is the product of wildlife management decisions made within the last fifty years. The foundation of these decisions is bear biology, which was relatively poorly known at the beginning of this time. Since then, Minnesota has become an international leader in baseline studies of bear biology. Wildlife management, however, also reflects cultural values and political considerations. "At bottom, wildlife management in our society uses biological knowledge to implement individual values as they are expressed through our political system" (Lott 2002:110). As such, management decisions can be more complicated when they apply to large carnivores such as bears.

Planning and implementation of successful conservation action is fundamentally a problem-solving art requiring political support. Biological information, which is assumed to be objective is a major influence on the development of the action planning process, but is not the sole determinant of whether individuals or groups will support policies to conserve bear populations. Those decisions are based on cultural beliefs, values, economics, threats (either real or perceived as a result of the action), and political considerations. [Pelton et al. 1999:8-9]

As previously stated, one goal of this dissertation to add a historical dimension to management of the state's bear population, by extending the considering of bear biology into the past. It also contributes to the historic context of human feelings about, and interactions with, bears. In Chapter 3, the Bear site is presented as a dramatic illustration

of how bears can be represented in the archaeological record, and an example of heritage management within indigenous archaeology.

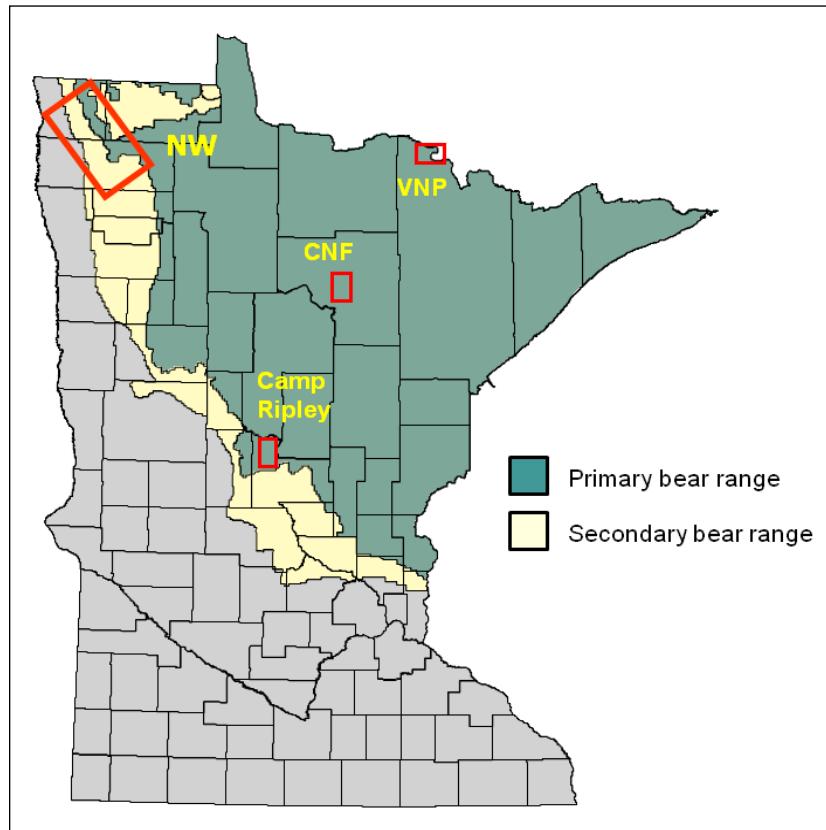


Figure 10. Areas of long-term bear studies by the Minnesota Department of Natural Resources (Garshelis and Noyce 2013a; Mn/DNR 2013b)

### 3. THE ARCHAEOLOGY OF THE BEAR SITE (21ML68)

The Bear site is a sacred place preserved on Shah-Bush-Kung Bay of Mille Lacs Lake in east-central Minnesota, on land owned by the Mille Lacs Band of Ojibwe.

Understandably, they do not consider it to be a suitable place for public visitation, and for that reason I do not discuss the location precisely here. Figure 11 provides a general sense of the regional landscape.



*Figure 11. The regional landscape of the Bear site (21ML68), the Mille Lacs Band of Ojibwe community at Vineland, and Mille Lacs Kathio State Park; Mille Lacs Lake is across the horizon in the background, with Ogechie Lake and the Rum River in the foreground (photo courtesy of Mille Lacs Kathio State Park)*

In a way, this chapter is a second introduction for the dissertation. As mentioned previously, the Bear Feature was the inspiration for this research project, and it is therefore appropriate to present it first on its own, rather than have it simply included among other sites in later chapters. In the format of a full site report (unlike the later site summaries), this chapter also presents an example of the general processes of archaeological research in Minnesota, and the nature of archaeological evidence. These subjects were introduced in Chapter 2. That said, however, this is by no means a typical archaeological site.

This Bear Feature may not be the only one intact at Mille Lacs, or elsewhere. For that reason, I believe that other resource managers and archaeologists need an

opportunity to know that things like this exist so that if they encounter one, they will hopefully not struggle with the same challenges that we did in 1998, or need to rely on luck to protect something so important. Opinions vary in native communities about whether sacred sites such as this should be discussed at all, especially by outsiders. With that in mind, I apologize to any who take offense at this presentation, and I ask for their indulgence. My intention is to protect this and similar sites, both now and in the future.

Also, while I have referred to the field notes, reports and other site records to compile the history of investigations outlined here, it is important to acknowledge that it is presented from the memory and perspective of just one person – that of one of the archaeologists involved in the project. Others who were there may recall it differently or emphasize other aspects that were more meaningful to them. So this is not an “official” record or interpretation. It is simply mine, and I hope this archaeological information is useful to members of the Dakota communities and the Mille Lacs Band of Ojibwe, who with traditional knowledge will be able to tell the story of the Bear site in a more complete way. Archaeology is one way of connecting with the past, which by itself can only provide a limited picture.

As described below, the team of archaeologists was very fortunate in 1998 that input from the Mille Lacs elders and THPO, Dakota leaders and others allowed us to stop and preserve the Bear Feature in place. This was a Cultural Resource Management investigation, conducted because of a proposed construction project, and usually at such a late stage in that situation it is simply not an option to change course. I clearly remember our struggle in the field to understand this remarkable find, working late in the year as the ground was starting to freeze. I remember how complex and fragile it was, and how subtle the clues were – the pit feature was filled with bear skulls, but this was not at all obvious because the skulls had mostly decomposed over the centuries to just stains, bone fragments and teeth in the sandy soil. The realization of what we were uncovering occurred gradually. We had been hired to completely remove the Bear Feature, but as we learned more about its size and nature, we became convinced that it would be impossible to responsibly excavate it.

### Site Discovery (Phase I Survey)

The site was discovered in 1997, through a Phase I archaeological survey conducted by ARW Archaeological Services (Westover 1997a). The Mille Lacs Band of Ojibwe had hired them to investigate a parcel of lakeshore where construction of an assisted living facility for the Mille Lacs elders was planned. Because the elders had chosen the location, the site was referred to as the Elders' site at that time. It has since become known at Mille Lacs as the Bear site, so I use that name here.

The goal of a Phase I survey is to determine the presence or absence of an archaeological site(s). The archaeologists dug 63 shovel tests at regular intervals across the parcel, in 10-cm levels, and screening the soil through ¼-mesh. They found a variety of artifacts including lithic debitage (flaking debris from making stone tools), flaked stone projectile points in side-notched and triangular forms, and sherds of broken pottery. As described below, these artifacts date to the time of Dakota presence at Mille Lacs, prior to ca. 1750 CE. There were also historic-age artifacts (glass, metal, etc.) from more recent Ojibwe presence at the site, as well as earthen berms from one or more possible former structures of that time period. Artifacts from all three phases of archaeological research at the Bear site (Westover 1997a; Mather and McFarlane 1999) are summarized in Table 2 and discussed further in the artifact analysis sections below.

The Mille Lacs lakeshore is an area of high archaeological potential, so it was not a big surprise to find a site here. The ARW crew had also been working on an archaeological site a short distance along the lake to the north, and they considered the Bear site to be part of this same larger site (Westover 1997a:16-17, 1997b, 1998), designated 21ML68 in the Smithsonian trinomial system used here (21= Minnesota; ML= Mille Lacs County; 68= 68<sup>th</sup> recorded site). The present discussion focuses on what could be called the “Bear site subarea” of 21ML68, defined by the parcel where the Assisted Living complex was proposed.

### Physical Setting and Landforms

Artifacts were found at the Bear site from three primary landforms – a broad terrace along the shoreline of Mille Lacs Lake, a higher, narrow sand beachridge at its

edge, and behind that, a lower area bordering an inland wetland complex. These landscape features were formed through centuries of wave action from the vast, 51,891-hectare lake.

Sand beach complexes such as this at Mille Lacs appear to date mainly to within the last three thousand years, as indicated by primarily Woodland Tradition archaeological components close to the present-day shoreline. Along the lake's western shore, the large bays – Vineland, Shah-Bush-Kung, Wigwam and St. Alban's – all have expansive wetland complexes inland from the beachridges, and older shorelines far back from those, abandoned when an ice dam at the outlet of Ogechie Lake burst approximately 8,000 years ago, significantly lowering the level of Mille Lacs and establishing its outlet along the present course of the Rum River (Anderson 1998). Joe McFarlane has illustrated this higher lake level for Shah-Bush-Kung Bay relative to an archaeological survey that included some of the old shoreline (Mather et al. 2001a:8).

Observations of landscape formation at the Wigwam Bay site (21ML81) are helpful in interpreting the landforms of the Bear site. At Wigwam Bay, deep excavation for a sewer lift station in 2004 revealed approximately 1 meter of sand with primarily Woodland Tradition archaeological remains, underlain by approximately two meters of wave-deposited sand (with no artifacts) covering an ancient peat bog. The buried peat horizon spans about three millennia at the end of the Pleistocene glaciation, and contains preserved wood of spruce and perhaps other trees. Calibrated radiocarbon dates from the base of the peat range from 13,494 to 13,156 BP, and those at the top range from 10,577 to 10,220 BP. While older components are represented within the 21ML81 site limits, which encompass most of the bay, at this location they are not represented in the soil profile (Goltz 2005; see also Florin 2012; and Kolb 2000 for regional geomorphology). Similarly, at the Bear site, the sand beachridge contains Woodland Tradition artifacts, without the presence of older archaeological periods.

Findings from the three landforms at the Bear site are discussed further below. While the lakeshore terrace is the largest portion of the site (ca. 60%), archaeological investigation ultimately focused on the ridge after the Bear Feature was identified there.

### Phase II Site Evaluation and Discovery of the Bear Feature

In 1998, I worked for a consulting firm called Loucks & Associates, Inc., in the Minneapolis suburb of Maple Grove. The Mille Lacs Band of Ojibwe hired us that summer to conduct a Phase II investigation of the Bear site. The goal of this stage is to evaluate the historical significance of an archaeological site, by determining if it meets the criteria of eligibility for the National Register of Historic Places. Phase I and II investigations are standard procedures in CRM in the United States (although the terminology varies from state to state).

Fieldwork for the Phase II investigation took place in July and August 1998, and included the excavation of 19 formal units. Each measured one square meter. They were configured in 1x1 and 1x2 meter blocks, and were excavated in 5-cm levels. All soil was screened through ¼-inch mesh.

On behalf of the THPO, Elissee Aune was in the field with us nearly every day. Joe McFarlane and Tim Tumberg were the Field Directors. The crew included Mille Lacs Band members Roger Dorr, Henry Sam, Jr., Dale Wind and Perry Benjamin (some of whom also worked on the previous ARW survey), with occasional assistance from other Loucks archaeologists. I was the Principal Investigator for the project. I had been working on archaeological projects in the Mille Lacs area since the late 1980s, and this was the first of many studies that this team did for the Mille Lacs Band. Later, from 2002-2006, I served as the Consulting Archaeologist for the Mille Lacs Tribal Historic Preservation Office, until I started in my current position at the Minnesota State Historic Preservation Office.

Each unit revealed a thin topsoil horizon (ca. 5 cm) of dark sandy loam over sand, with artifacts extending to an approximate depth of 50 to 60 cm. The artifacts included fragments of cord-marked pottery indicative of Sandy Lake and perhaps other Late Woodland wares (Cooper and Johnson 1964; Arzigian 2012:126-147; Thomas 2000:12-14; Mather 1991:34, 2000b:65; Justin and Schuster 1994; Participants 1988). Stone used at the Bear site for making tools was overwhelmingly quartz (74%). Other prominent materials include Knife Lake Siltstone and Tongue River Silica (see below).

These artifact types strongly indicate a primarily Late Woodland, and more specifically a Shakopee Phase (ca. 1300-1650 CE – Johnson 1984; Mather 2000b, and see below) age for the Precontact (i.e. pre- European fur trade, prior to ca. 1650 CE) component of the Bear site. Bakken's (2000) "Q-Pattern" encompasses all of the Late Woodland Tradition at Mille Lacs, with use of quartz predominant (typically 60-80% in lithic assemblages). This pattern holds for not only the Shakopee Phase, but also the preceding Wahkon Phase (ca. 1000 – 1300 CE), and likely the later Bradbury Phase as well (ca. 1650-1750 CE). These phases were defined by Elden Johnson (1984; see also Mather 2000b; Cummings 2015) specific to the Mille Lacs region.

The soils of the Bear site are sandy and acidic. This type of local environment is not conducive to preservation of organic materials such as bones or seeds. Little bone was found in the Phase II investigation except for Test Units 9 and 10, which encountered the edge of the Bear Feature.

Dale Wind and Joe McFarlane began the excavation of TU 9, discovering the Bear Feature, and expanded with TU 10 adjacent to the south, confirming that TU 9 was the southern edge of the feature (the edge was approximately at the boundary of the two units). They were soon joined by the rest of us as the other units were completed. The first tooth they found was just below the ground surface, in the topsoil. It was readily identifiable as a black bear (*Ursus americanus*) molar, but it was not clear at first if it was old, or perhaps a road-killed bear from the nearby highway. As more teeth were found, however, along with organic stains in the sand, we became certain that they were archaeological in origin. This was further confirmed when we found the fifth canine, requiring the presence of at least two skulls to account for the teeth.

Within each 5-cm level, concentrations of teeth and fragmented bone were mapped and photographed (Figures 12-13), and removed in sections. Some concentrations were bagged with surrounding soil matrix, and which was later screened in the lab. The soil was retained, along with other samples, for archaeobotanical analysis (see below).

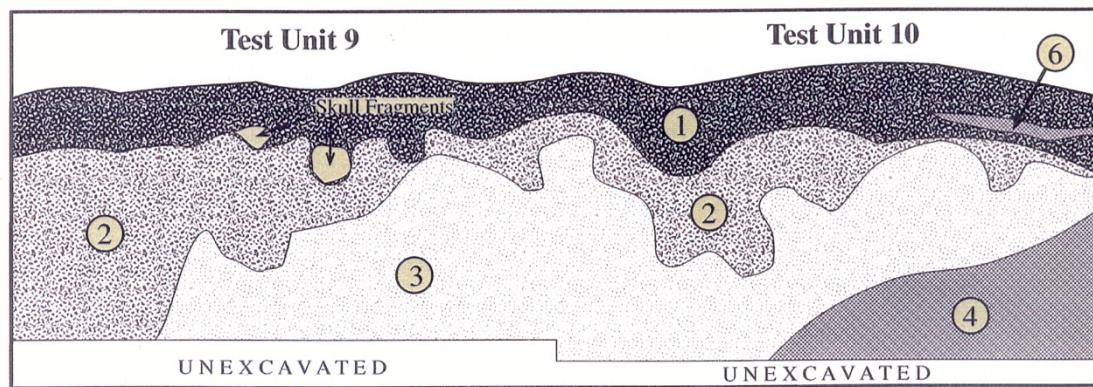


Figure 12. Discovery of the Bear Feature in Test Units 9 and 10, August 1998; (L-R) Joe McFarlane and Dale Wind.

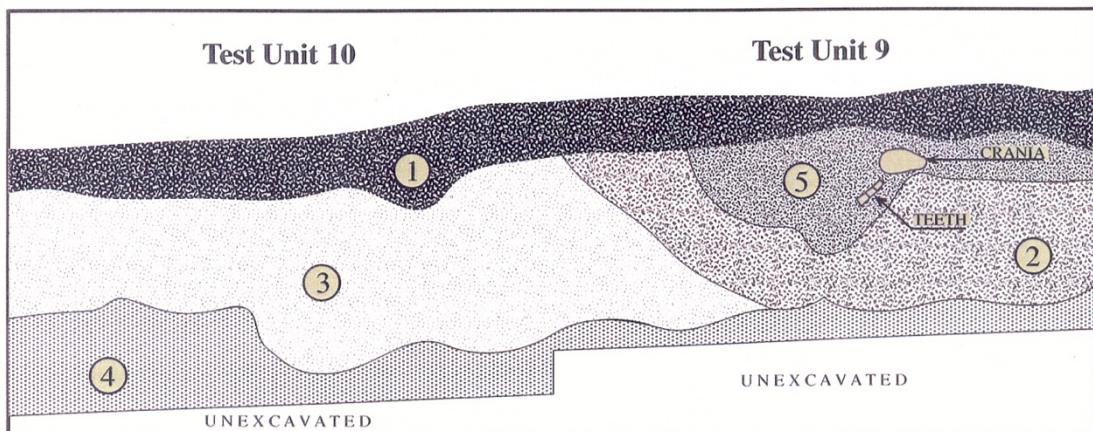


Figure 13. Definition of the Bear Feature in Test Units 9 and 10, 15 cmbd, August 1998, with natural subsoil (tan sand) outside the feature edge to the south (right side of photo).

### East Wall Profile



### West Wall Profile



- (1) SANDY LOAM (10YR 2/2)
- (2) FINE TO MEDIUM SAND, MIXED (10YR 3/4 - 3/5)
- (3) FINE TO MEDIUM SAND, UNMIXED (10YR 3/6)
- (4) FINE TO MEDIUM SAND, UNMIXED (10YR 3/4)
- (5) SANDY LOAM (10YR 2/2) MIXED WITH FINE TO MEDIUM SAND (10YR 3/4)
- (6) SANDY LOAM (10YR 2/2) MIXED WITH COARSE SAND (10YR 3/5)

0cm 50cm

Figure 14. Profile of Test Units 9 and 10 at the edge of the Bear Feature, 21ML68 (by Joe McFarlane, from Mather and McFarlane 1999).

Completion of this 1x2 meter unit revealed a good profile of the feature edge (Figure 14), consisting of “swirly” dark, organic stains within the sand matrix of the beachridge, extending to about 20 cm below the ground surface. This was the end of the fieldwork for the Phase II study. The site was clearly significant, meeting the criteria of eligibility for the NRHP. The artifacts were quickly cataloged (Table 2), and analysis of the bear teeth indicated a minimum number (MNI) of 11 black bears. These were nearly all upper teeth, with only one tooth from the mandible.

#### Consultation and Plan for Phase III Excavation

Normally in the CRM process, a “data recovery” (Phase III) archaeological excavation is done to mitigate damage to a NRHP-eligible site from a construction project, unless the site can be protected after all, such as through shifting construction limits or changing the design. In this case, the size of the proposed building did not allow moving it within the parcel away from the Bear Feature. This was a matter for the THPO and the tribal government to discuss. We recognized that this was a highly unusual find, and wondered what the decision would be.

Later that year, the tribal government hired us to excavate the Bear Feature. The THPO had consulted with the Minnesota Indian Affairs Council (MIAC) and representatives of the Dakota communities. The Ojibwe settled at Mille Lacs around 1750 CE, so much of the area’s archaeological resources are derived from the Dakota, who had lived at Mille Lacs for thousands of years before that (Buffalohead and Buffalohead 1985:13-16; Warren 1984:156-162; Westerman and White 2012:24-25; Gibbon 2003:23-46, 2012a:185-201; Mather 2000b). With the presence of Sandy Lake pottery and other Late Woodland Tradition artifacts, the Bear site is certainly a Dakota site. The Mille Lacs THPO regularly consults with the Dakota about significant archaeological finds. In this case, Dakota leaders told the THPO that the Bear Feature could be excavated. They made this decision out of respect for the Mille Lacs Ojibwe elders, knowing that they had picked this location for the assisted living complex.

The idea for the Phase III excavation was to treat it as if it were a “burial rescue.” This is a rare type of project for Minnesota, sometimes done in instances where an

ancient or historical cemetery site has been inadvertently damaged by construction, or its setting is considered to be so compromised that it cannot be reliably protected in place. In such a case, archaeologists conduct an excavation under the direction of American Indian spiritual leaders and the MIAC. Information from the archaeological finds and the osteological analyses (numbers of people represented, and their age and sex, for example) is used by the spiritual leaders and others in caring for the human remains, and in the reburial ceremony. Coincidentally, we were also involved in such a project at that time, at the Lincoln Mounds site (21HE7) in the Twin Cities suburb of Bloomington (Mather 1998a; Mather et al. 2003), and the Bear site team moved back and forth between the two sites until well into December 1998, after which we had the honor of taking part in a healing *inipi* (sweat lodge) ceremony near Sisseton, South Dakota. The Lincoln Mounds site is discussed further in Chapter 6.

The term “rescue archaeology” is sometimes used in elsewhere the world, referring to the general practices we call Cultural Resource Management (CRM) in the United States. A burial rescue, despite the similarity in name, is nothing like this. Burial rescues are not academic or bureaucratic exercises, and they can be quite stressful for everyone involved (especially so if a site has already been disturbed). The rescue is an uncertain transition, where the identifiable features of a sacred place are essentially discovered through disassembly in an ongoing and cumulative triage involving archaeological excavation, consultation, analysis and interpretation. Moreover, the site and remains are exposed to further risk of intrusion until the process is completed with ceremony and reburial. As in all archaeological work, you never know what you’ll actually find until it is being uncovered and examined, but in a burial rescue the emotional stakes are much higher because of the subject, and because the process is considered by many of the participants to be spiritually dangerous.

At the Bear site, it was bears, rather than people, that were the focus of the rescue, but this is only a meaningful difference from a Euroamerican cultural perspective. Bears are sacred animals to both the Dakota and Ojibwe, and the Bear Feature was obviously created through a ritual of some kind. Joe Williams, one of the Dakota elders who advised us on the project, said that the bears were revealing themselves at that time for a

reason, but also that they were put there to protect something, and the need for that still exists.

In this case, the “rescue” was not needed because the site was disturbed or compromised. Rather, as stated above, the Dakota leaders recommended this process out of respect for the Ojibwe elders. The plan was to excavate the Bear Feature in its entirety, and to conduct standard analyses to provide information to the spiritual leaders, and for the archaeological report. After the building was constructed, the bear remains would be reburied with proper ceremony on site, where they would fulfill their original intent and in turn be protected by the presence of the Mille Lacs elders.

### The Bear Feature

The project team was the same for the Phase III excavation, with the exception of Perry Benjamin. Elisse Aune was again with us daily on behalf of the THPO. The excavation was conducted in October through December, 1998. During this time, the site was occasionally a busy place, with visits by members of the Mille Lacs tribal government, Dakota leaders, representatives of the MIAC and the Minnesota Historical Society, and other archaeologists. There were also occasional class visits from Nay-Ah-Shing school and Central Lakes College, and the site was the subject of a Minnesota Public Radio feature (Enger 1998).

The first step for the archaeologists, however, was simply defining the extent of the Bear Feature. We had hit the southern edge in Test Units 9 and 10, so we laid out a line of four contiguous 1x1 units northward from there, designated TU's 20, 21, 22 and 23. Excavation began in TU 20, which was immediately north of TU 9 (Figure 15-16). The top ca. 5-cm level (to 10 cm below datum) was removed by shovel skimming and the soil screened. The feature datum was established at the NW corner of TU 9, with an elevation of 7 cm above the ground surface at that location. Hand excavation continued by trowel and smaller tools until bone concentrations were exposed. At this point, excavation was suspended in TU 20 and the process repeated in TU 21 immediately to the north. This process of removing the overlying non-feature material one unit at a time continued until the northernmost edge of the feature was defined in TU 23. Once the thin

topsoil had been removed, the edges of the pit feature were clearly visible as dark, organic soil contrasted against the natural light brown sand of the beachridge.

The same procedure was used to define the eastern and western edges of the Bear Feature through excavation of TU's 24, 27 and 28 eastward from TU 21 (the center of the feature along the north-south axis), and TU's 25, 26 and 30 to the west. With the surface of the feature exposed in the excavated areas, and a general feature outline established as an oval measuring approximately 4x5 meters, hand troweling resumed to more accurately define feature components.

*In situ* bone concentrations revealed clear spatial patterns within the Bear Feature. Working on the eastern edge in TU 24, Joe McFarlane first realized that although the bear skulls were fragmented, they were actually whole skulls that had decomposed in place. Until this point, I had thought the fragmented bones in the Bear Feature were perhaps the remains of a feast, ritually deposited away from other food waste (see Landes 1968a:187 for a Dakota example, discussed further in Chapter 4). While this idea couldn't yet be ruled out, the realization that all these skulls had been placed intact into the pit feature greatly increased its complexity. McFarlane showed us the eastern edge of the feature that he had just uncovered, with sagittal crests of the bear skulls lined up (Figure 17), indicating that they had been stacked at least three-deep at that location, and all facing into the pit.

We had brought a modern black bear skull to the site so all the crew could refer to it during the excavation. With the realization that we were dealing with decomposed complete crania, we used the modern skull as a template for mapping. Reference points were observable among the fragmented bone and stained sand, such as the sagittal crest, the zygomatic arches, auditory bulla, and canine teeth (Figure 18). Aligning the modern skull over such a point was an effective means of recognizing associated fragments that were less individually diagnostic. The boundaries of these identified skulls were drawn as ovals in the site notes, and in Figure 16.

Bear teeth and fragmented cranial bone were exposed in all the units within the feature, but in heavier concentrations on the east and north sides. These materials were left in place to the greatest extent possible.

The bear skulls were facing inward from the east and north sides, but this position was not apparent on the west and south. Also, it appeared that the density of skulls was less on these sides. Therefore, the bear skulls did not appear to be in a circle, as the feature has sometimes been described. Instead, the skulls seemed to be placed so that they were collectively facing toward the southwest. The beachridge is a natural pathway, and in this position the bears could be considered to confront someone as they approached, following the ridge along the shore from the bay. This interpretation is speculative on my part, and it should be remembered that only a portion of the top of the feature was revealed. Nevertheless, it seems reasonable to believe that the surrounding landscape features are relevant to the structure of the feature.

A minimum of 57 individual bear crania were positively identified during the Phase III excavation, and it is probable that at least 15 additional individuals are represented in the other observed remains (see below). Combined with the 11 (MNI) identified from TU 9, the minimum number of identified individual skulls within the Bear Feature is 68. It is important to remember that, except for TU 9, this number is derived from uncovering only part of the very top of the feature. The actual number of skulls is undoubtedly greater.

A rough estimate of 500 skulls for the Bear Feature can be reached extrapolating from the count of 20 skulls revealed at the top of the feature in TU 24. We know that the bone concentrations in TU 9, at the southern edge of the Bear Feature, extended to 35 cm in depth. In TU 24, it could be seen that the bear skulls were stacked at least three deep at the east edge of the feature. A conservative estimate for the possible total in TU 24 alone could be 40 skulls. Forty skulls multiplied by 20 square meters, based on the approximate 4x5 meter dimensions of the feature, equals 800 individual bear skulls. Many of the units did not contain the density of skulls seen in TU 24, however, and placing the estimate at 500 seems like a safe reduction (there were hundreds, certainly). The actual number of

skulls will likely never be known. The simple point of this exercise is to demonstrate that a remarkable number of bear skulls are present, whatever the exact count.

The units outside the Bear Feature (TU's 27-30, and portions of TU's 26 and 28) were excavated to culturally sterile subsoil. This allowed a partial profile of the east, west, and north margins of the feature, without excavating the feature matrix itself. The east margin in TU 24 best illustrates the construction of the Bear Feature. The feature wall sloped inward from the top. This vertical interface could not be followed to the base of the feature without undercutting the intact bear crania at the edge. This was a knife-sharp contact, and it was apparent that the back of the skulls had been placed flush with the edge of the pit.

Deeper excavation in the units peripheral to the feature edge also provided other information. First, notable quantities of fire-cracked rock were observed inside but at the margins of the Bear Feature, although not at the upper level where most of the feature definition occurred. This suggests that the pit was partially lined with glowing hot stones prior to placement of the bear skulls. Also, two apparent postmolds (small, circular areas of darker soil, suggesting that a wooden post had decomposed there) were encountered outside the feature, to the east and west in TU's 27 and 30, respectively. The stain in TU 30 contained wood charcoal. These postmolds suggest that a structure of some sort was associated with the Bear Feature (also see radiocarbon dates, below).

As the Bear Feature was being defined, we immediately began to wonder about how the skulls of so many bears could have been gathered. Bears are not herd animals, obviously, so it was shocking to imagine so many of them being killed in a short span of time. I later found historic accounts of such things happening, as will be discussed further below, but in the field our focus was on the feature itself. The source of the bear skulls was an important question because the Bear Feature itself appeared to represent a single event. The primary reason for this conclusion was the unstable beach sand soil of the site. If, for example, the Bear Feature was left open for years as skulls were accumulated and added, the walls of the pit would have slumped in. This did not appear to be the case, because the edge of the pit feature was a clear contact between dark, organically enriched loamy sand, and the natural beach sand of the surrounding, undisturbed subsoil. As

discussed below and in Chapter 8, zooarchaeological analysis of the bear remains provides more insight to the nature of the bear skulls.



Figure 15. The Bear Feature at the Bear site (21ML68) at the end of the Phase III excavation, with part of the top of the feature exposed, view to northwest.

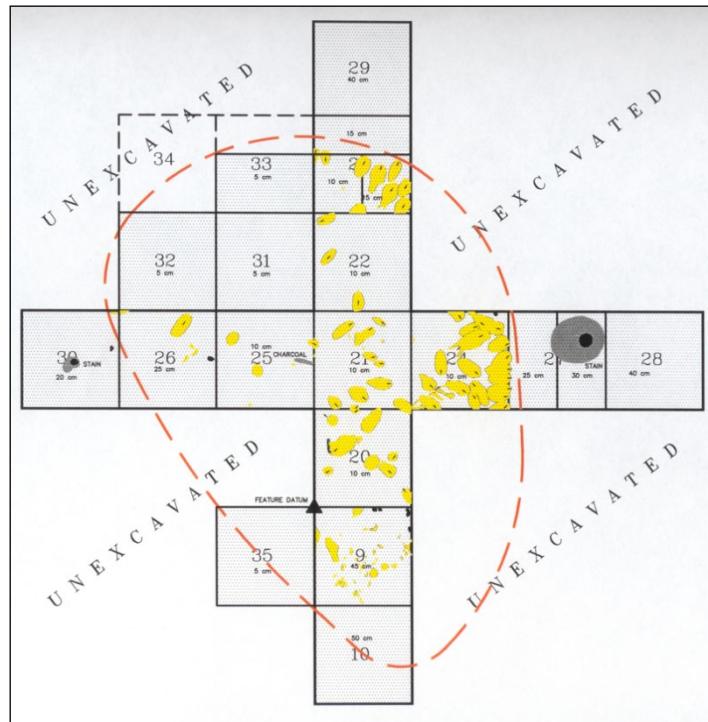


Figure 16. Planview of the Bear Feature excavation at the Bear site (21ML68); mapped bear skulls and bone fragments are in yellow.



Figure 17. Bears skulls in TU 24 at the eastern edge of the Bear Feature.

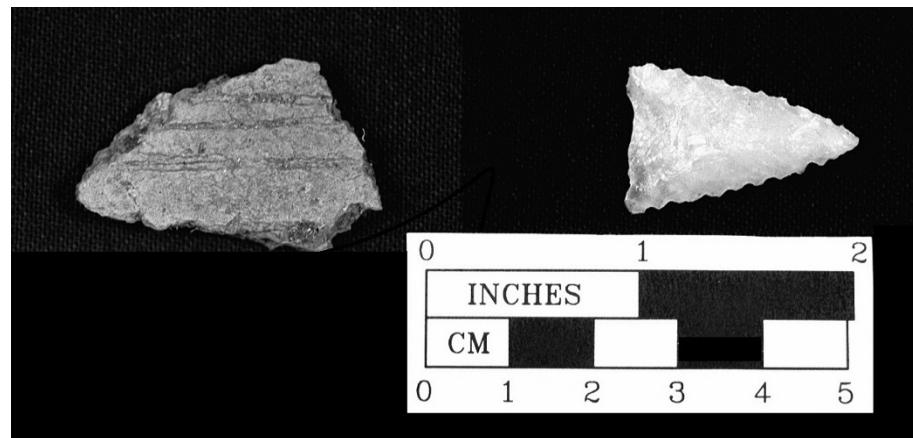


Figure 18. Use of a modern bear skull to map the Bear Feature, TU 23 at the northern edge.

As we were uncovering this top level of part of the Bear Feature, we found that the complexity and fragility of the archaeological remains were overwhelming. We could tell that we were at the tip of the iceberg, so to speak, and that the feature would get only more complicated with depth. For example, in TU 23 at the northern feature edge, only

two bear skulls were visible at the base of the first level. We excavated an additional 5-cm level in the three of the unit quadrants and then could see six bear skulls in the SE 50x50 cm alone.

Five additional units were laid out (TU's 31-35). The first four were placed in the northwest corner of the original cruciform trench (Figure 16). The fifth (TU 35) was placed directly west of TU 9. Little excavation occurred in these units (see below). One diagnostic point was recovered from TU 35, however. It is a complete quartz projectile point, with serrated edges and a thinned base (Figure 19).



*Figure 19. Diagnostic artifacts from the vicinity of the Bear Feature.*

All of the skulls in the Bear Feature were decomposed and fragmented bone with teeth and a few other diagnostic parts identifiable. The skulls were interbedded among one another and crosscut our arbitrary excavation levels. It did not seem appropriate (or archaeologically responsible) to just slice through them, and we became convinced that standard field excavation methods could not adequately address the feature's intricacy and significance. In this case, the circumstances of the find stymied the goal of "data recovery," and we feared that, instead, we would simply be destroying the Bear Feature without achieving the level of documentation it deserved. Complicating this situation, we were working within a limited construction schedule and budget, and beyond that, we were racing against the weather as the temperature dropped below freezing for increasing

portions of the day. We covered the excavation with tarps and hay at night and for a while the daytime sunlight helped keep the sandy soil from freezing.

We appealed for help from the THPO and MIAC. Paul Storch, a conservator at the Minnesota Historical Society, visited the site in response to our question about whether it could be possible to somehow encase and lift the Bear Feature out. This had been done at smaller “bear graves” in Sweden, allowing delicate excavation under laboratory conditions (Zachrisson and Iregen 1974). We weren’t optimistic about this possibility due to the large size of the Bear Feature, and the answer was no, short of some sort of extraordinary effort of structural engineering.

The Mille Lacs Band of Ojibwe hosted a meeting about the Bear Feature attended by the Mille Lacs elders, and representatives of the THPO, tribal government staff, the MIAC and Dakota communities, the Minnesota Historical Society, and the archaeological team working on the site. As word had spread of the meeting, many MLBO community members were present. The meeting was at the old school building, which at that time still stood in the parking lot in front of Grand Casino. At the start of the discussion, the Mille Lacs elders thanked the Dakota leaders for their kindness and consideration. The elders then said that this is a Dakota sacred site, and furthermore, that bears are sacred to both peoples. And they said that that the Bear Feature should be preserved in place. The assisted living complex would be built elsewhere.

I and the other archaeologists were relieved at the decision that we should switch gears, to stop the excavation and simply document what we had uncovered thus far. Afterward, Elisse Aune was shocked when she returned to the site and found us still excavating units that had been laid out but not previously opened. I was intrigued by the few diagnostic artifacts that we’d found (Figure 19), and hoped to find other contextual information while wrapping up the dig. Elisse reminded us that “stop the excavation” means to stop, and we did.

#### Artifact Representation and Distribution

For obvious reasons, the Bear Feature was the focus of the site report (Mather and McFarlane 1999). A summary of the other artifacts was included, but limitations of time

and budget did not allow a full analysis of these materials. In writing this chapter, I entered the handwritten catalog into an Excel spreadsheet to allow for full presentation of the site artifact assemblage. The distribution of artifact classes by landform is in Table 2.

The animal bone, ceramics and lithics are discussed below. The botanical artifacts include pieces of charcoal that were collected during the excavation phases, usually from the screen. Archaeobotanical information related to the Bear Feature is described below. Those counts are not included in the tabulation here. Historic artifacts are primarily recent in origin (bottle glass, pop tops, etc.), from the topsoil. One exception is older, although it is likely still intrusive to the Bear Feature. It is an annular lead bullet fragment, found at a depth of 10 cm in TU 23. It was found in the screen, and was not clearly associated with any of the bear crania. Fire-cracked rock was recorded by count, and its placement in the Bear Feature was described above.

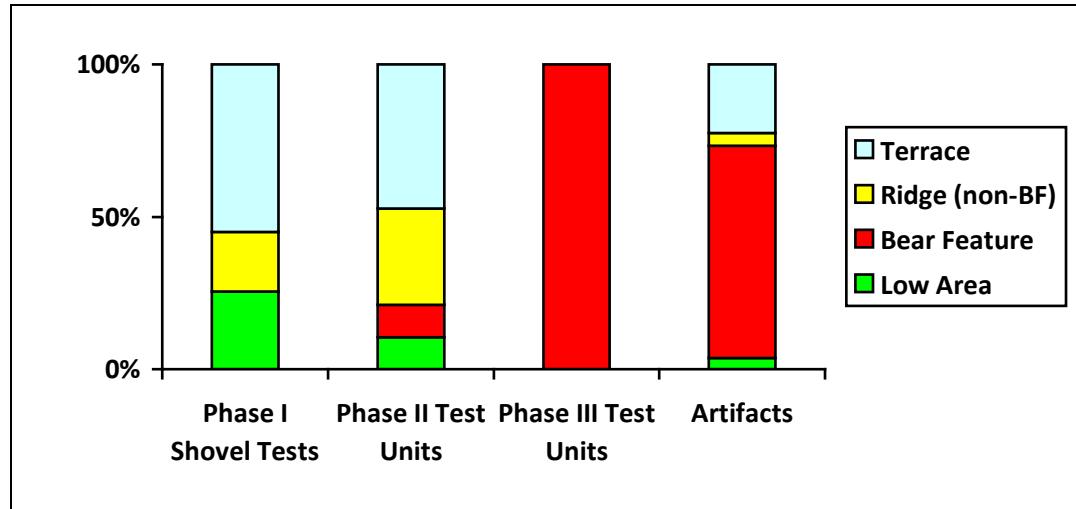
The lakeshore terrace is the largest landform of the site, comprising approximately 60% of the site area. The ridge and the low area behind it are narrow. As seen in Figure 20, the archaeological testing in the Phase I and II studies were distributed across all three landforms. After discovery of the Bear Feature in the Phase II evaluation, the Phase III excavation focused exclusively on that location. As such, the majority of the total site artifact assemblage is derived from the Bear Feature.

*Table 2. Artifact class summary by site area, from the 1997-1998 Phase I, II and III excavations at 21ML68.*

	Lakeshore Terrace	Ridge (Non-BF)	Ridge (Bear Feature)	Inland Low Area	Totals
<b>Lithic</b>	577	82	32	20	<b>711</b>
<b>Ceramic</b>	67	31	39	82	<b>219</b>
<b>Animal Bone</b>	2	8	3082	0	<b>3092</b>
<b>Botanical</b>	6	7	8	1	<b>22</b>
<b>Fire-Cracked Rock</b>	405	56	103	12	<b>576</b>
<b>Historic</b>	19	10	64	58	<b>151</b>
<b>Totals</b>	<b>1076</b>	<b>194</b>	<b>3328</b>	<b>173</b>	<b>4771</b>

Data compiled from Westover (1997a), Mather and McFarlane (1999) and artifact catalogs completed in 1998 by Amanda Gronhovd and Joe McFarlane.

Figures 21-25 present overviews of the artifact classes, showing that the majority is animal bone. This material consists almost entirely of fragments of bear skulls and teeth from the Bear Feature.



*Figure 20. Distribution of shovel tests (Phase I), test units (Phases II-III), and artifacts (Phases I-III) by landform at the Bear site (21ML68).*

While compiling these data, I was stuck by what seemed to be an unusually low density of non-faunal artifacts for a Mille Lacs site. This was particularly notable for ceramics. Out of curiosity, I compiled the artifact counts from five other local Woodland Tradition sites for comparison in Table 3. Figure 20 presents the results as percentages of ceramics, lithics and animal bone from each site. While this should be considered preliminary, the results suggest a general pattern of artifact representation at the other sites (Woodland Tradition villages), with the Bear site notably different.

Table 3 organizes the sites by size of excavation. In this data set, the Bear site (21ML68) is clearly a low outlier for ceramics especially, but also lithics, when considering the size of the excavation. Because of the Bear Feature, animal bone is an unusually large percentage of the 2ML68 assemblage (Figure 24).

The other sites show a more consistent pattern among themselves. Wigwam Bay (21ML81), like the Bear site, is located on a large bay of Mille Lacs Lake. Florin (2012)

is the definitive reference for the archaeology of this site. For purposes of this exercise, I used a subset of the total excavation data from one of the field reports, for ease of extraction and because I was certain it all related primarily to the Woodland Tradition components.

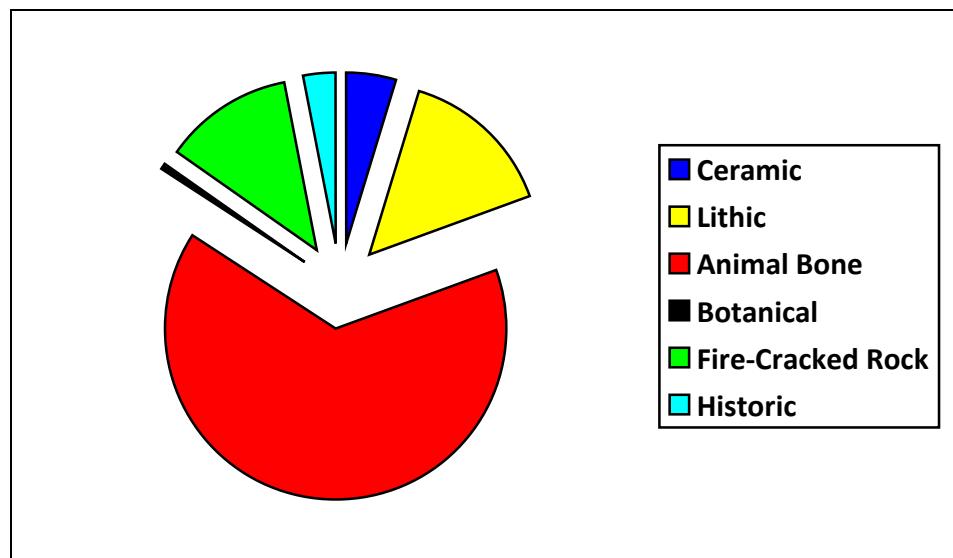


Figure 21. Artifact class summary from the cumulative Bear site excavations.

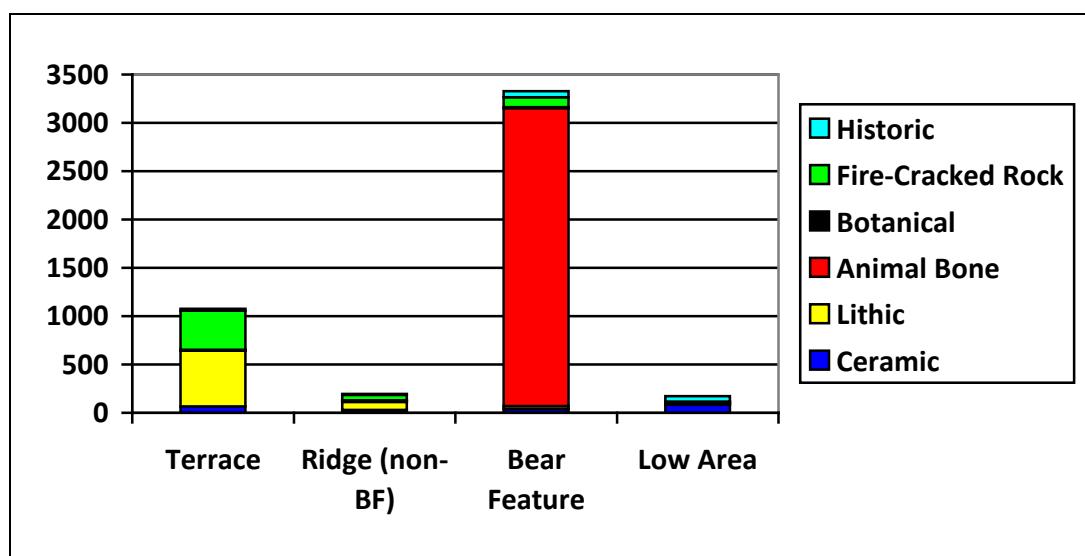


Figure 22. Artifact class summary by site area, by count, from the 1997-1998 Phase I, II and III excavations at the Bear site (21ML68).

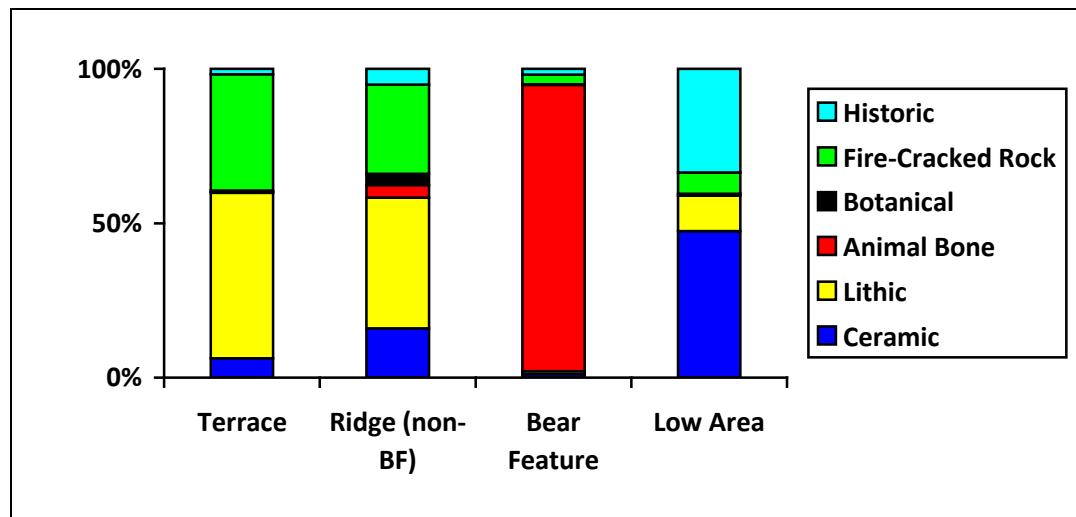
The other four sites are located along the Mille Lacs outlet lakes of the Rum River, in the Kathio National Historic Landmark District. The Cooper site (21ML9) is a Late Woodland and protohistoric fortified village and cemetery site (Johnson 1985; Gibbon 2003:39, 2012a:190-192; Aufderheide et al 1994; Lothson 1976; Whelan 1990; Emerson 2012:40). The small excavation included here (Cummings and Mather 2005) is a tiny fraction of the material previously excavated in University of Minnesota fieldschools, which is yet to be fully analyzed and reported. The Old Shakopee Bridge site (21ML20) is the location of a Late Woodland house with wild rice processing features and Sandy Lake ceramics (Gibbon 1976). The Brower site (21ML1) is a primarily Middle Woodland Tradition village and burial mound site (Gibbon 1975a). The Crace site (21ML3) is a Late Woodland site on Lake Onamia, and contains a different type of bear feature (Gibbon 1975b). It is discussed further in Chapters 5 and 8. This potential pattern is seen more clearly when considering ceramics alone (Figure 25), although it is complicated by inclusion of the Brower site, the only single component Middle Woodland site in the sample. An explanation for this may be lower population density and ceramic production during the Middle Woodland Tradition. I believe that the Cooper site value is artificially high, because our excavation was at a visible edge of the palisade line, and it appeared that the builders had piled earth (containing artifacts) here from elsewhere in the site (Cummings and Mather 2005).

*Table 3. Comparison of selected artifact classes from primarily Woodland Tradition components at six Mille Lacs sites: Cooper site palisade (21ML9), Crace site (21ML3), Bear site (21ML68), Old Shakopee Bridge site (21ML20), Wigwam Bay (21ML81) and Brower site (21ML1).*

	<b>Excavation Size (m<sup>2</sup>)</b>	<b>Ceramics</b>	<b>Lithics</b>	<b>Animal Bone</b>	<b>Totals</b>
<b>21ML9</b>	5 m <sup>2</sup> (Cummings and Mather 2005)	1,886	1,064	111	<b>3,497</b>
<b>21ML3</b>	12 m <sup>2</sup> (Gibbon 1975b)	831	989	239	<b>2,059</b>
<b>21ML68</b>	35 m <sup>2</sup> (this chapter)	219	711	3,092	<b>4,598</b>
<b>21ML20</b>	36 m <sup>2</sup> (Gibbon 1976)	3,799	2,322	315	<b>6,436</b>
<b>21ML81</b>	48 m <sup>2</sup> (Mather et al. 2005)	5,617	9,010	1,058	<b>304,558</b>
<b>21ML1</b>	51 m <sup>2</sup> (Gibbon 1975a)	627	2716	26	<b>3369</b>

It may be that 21ML20 and 21ML81, and perhaps 21ML3, represent a more typical artifact pattern for Late Woodland sites in this area. This remains to be seen. What is certain, however, is that 21ML68 is different. The Bear site has been prime real estate

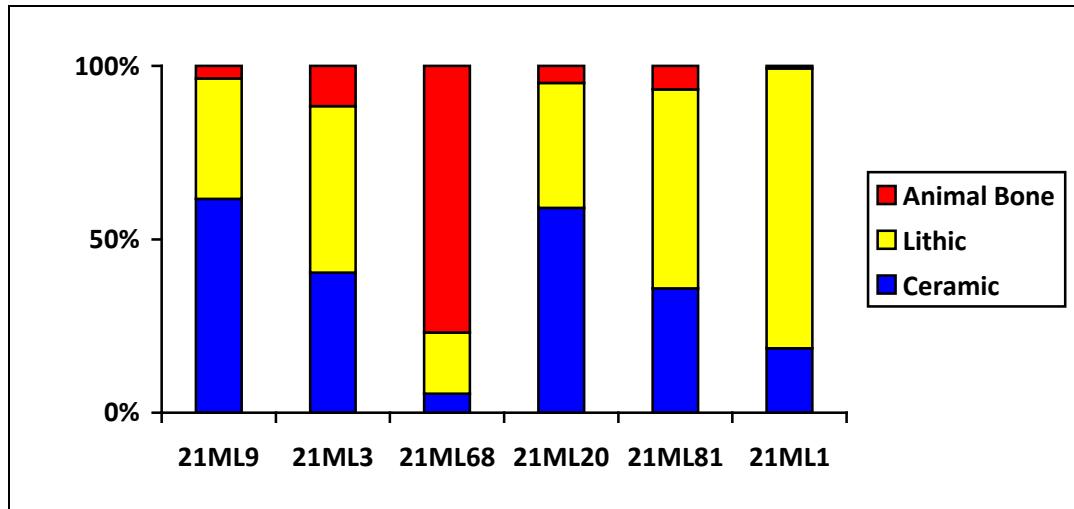
on the Mille Lacs shore for as long as the landform has existed. If counts of ceramic sherds can be considered a general proxy for population density during the Late Woodland (a question that is beyond the scope of this study), then it does not appear that many people actually lived at the Bear site despite its favorable location. I had always thought of the Bear site as a sacred place because of the Bear Feature – essentially that it became sacred when the feature was created – but perhaps it's the other way around. Maybe the Bear Feature was created at the Bear site because it was already considered a sacred place for other reasons. Archaeology cannot answer this question, but it can show that the Bear site is different from the archaeologically known contemporary village sites in the region.



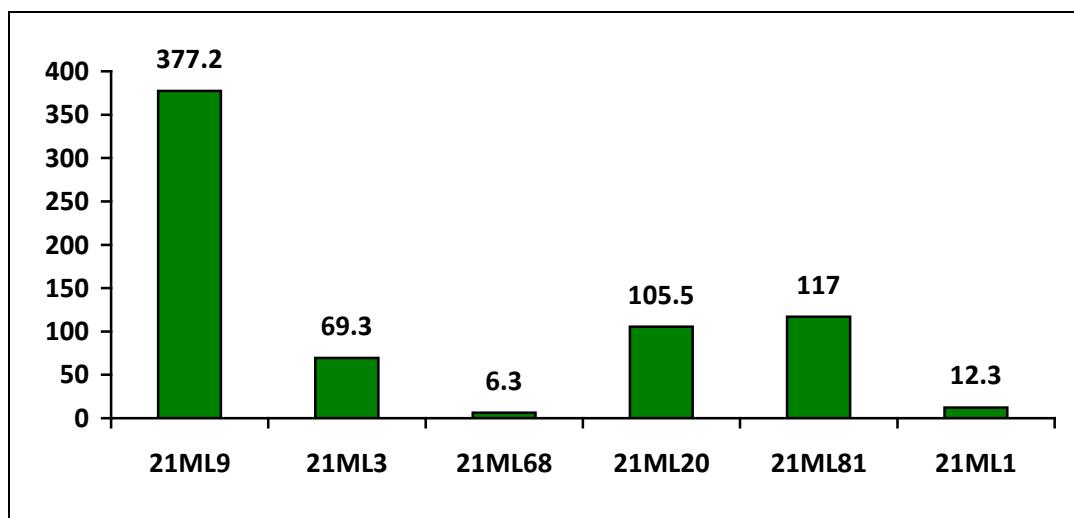
*Figure 23. Artifact class summary by site area, by percentage, from the 1997-1998 Phase I, II and III excavations at the Bear site (21ML68).*

### Zooarchaeology

Zooarchaeological analysis is typically conducted to assess subsistence practices and past environmental conditions. In the case of the Bear site, however, zooarchaeology provides important insights into the ritual and structure of the Bear Feature.



*Figure 24. Comparison of selected artifact classes from primarily Woodland Tradition components at six Mille Lacs sites: the Cooper site palisade (21ML9), and the Crace (21ML3), Bear (21ML68), Old Shakopee Bridge (21ML20), Wigwam Bay (21ML81) and Brower (21ML1) sites.*



*Figure 25. Ceramic density per square meter at six Mille Lacs sites: the Cooper site palisade (21ML9), and the Crace (21ML3), Bear (21ML68), Old Shakopee Bridge (21ML20), Wigwam Bay (21ML81) and Brower (21ML1) sites.*

Table 4 presents the taxonomic identifications from the Bear site as a whole. This information is organized by the zooarchaeological measures of Number of Identified Specimens (NISP – the count of bone fragments identifiable in each taxonomic category), and Minimum Number of Individuals (MNI – analysis of how the identified bone fragments would relate to a complete skeleton of that animal). These numbers are

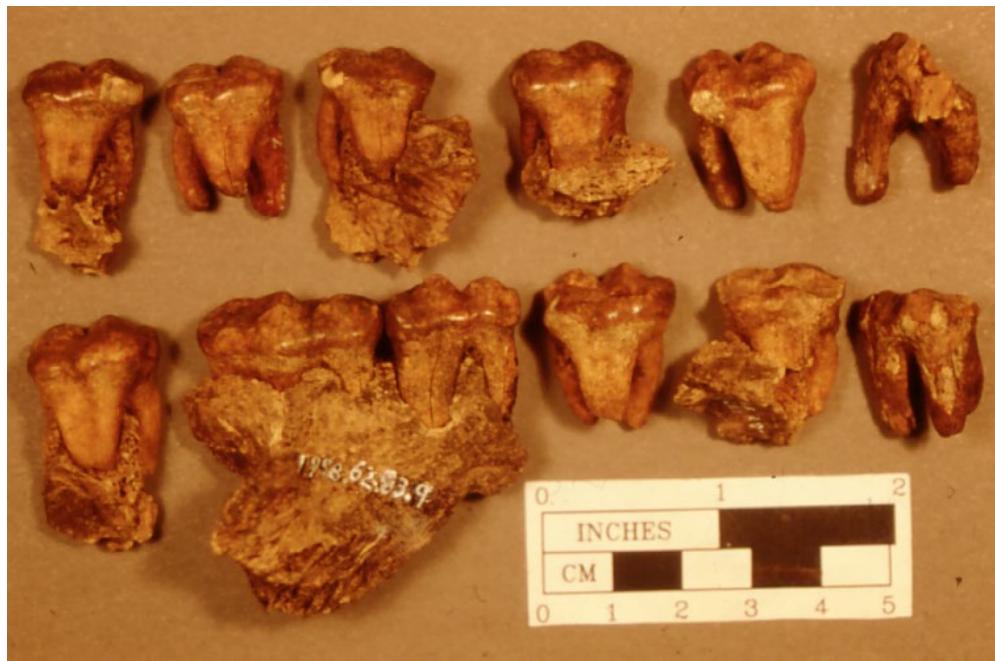


Figure 26. Examples of black bear maxilla fragments and upper molars from the Test Unit 9 at the Bear site (21ML68).



Figure 27. Examples of black bear canines from Test Unit 9 at the Bear site (21ML68).

reference points; they do not represent the actual number of animals once present at the site. They can be considered a maximum and minimum, respectively, for the identifiable portion of the animal bone assemblage, keeping in mind that much of the bone has deteriorated away, and only a small sample of any site is excavated (e.g. Reitz and Wing 1999; Lyman 1994).

All of the identifiable bone is from the Bear Feature (Figures 26-27). One fragment of a beaver (*Castor canadensis*) molar is the only non-bear identification from the feature. Because of the context, and the molar measurements (see below), I am certain that all of the bear bone fragments are from black bear skulls. The taxonomic categories in Table 5, however, present the assemblage as they would be identified as individual fragments without consideration of this context. All of the teeth and skull fragments identified with comparison to the reference skull are listed as *Ursus americanus*. Other pieces of bear skull are listed in the generic category of *Ursus* sp. A few other pieces are tentatively identified as bear (cf. *Ursus* sp.). Only 14 fragments (6 mammal and 8 unidentified) were recovered from other parts of the site. Outside of the Bear Feature, there is poor preservation of faunal remains at the Bear site, which is more typical of what is expected in the acidic soils of the Mille Lacs area. The “anthrosed” soils of the major village sites are a welcome exception to this pattern (Whelan 1990; Mather 2012b; Mather et al. 2000).

*Table 4. Zooarchaeological identifications from the Bear site (21ML68).*

<b>Taxonomy</b>	<b>NISP</b>	<b>MNI</b>
Mammals		
<i>Ursus americanus</i> (black bear)	554	68
<i>Ursus</i> sp. (bear, undifferentiated)	2,518	--
cf. <i>Ursus</i> sp. (probably bear)	5	--
<i>Castor canadensis</i> (beaver)	1	1
Mammal, undifferentiated	6	--
Unidentified	8	--
<b>Totals</b>	<b>3,092</b>	<b>69</b>

Data compiled from Westover (1997a), Mather and McFarlane (1999) and artifact catalogs completed in 1998 by Amanda Gronhovd and Joe McFarlane.

Table 5. Ursid body part identifications from the Bear Feature at 21ML68.

<b>Body Part</b>	<b>NISP</b>
<b>Crania</b>	
Upper 1 <sup>st</sup> incisor, left	1
Upper 1 <sup>st</sup> incisor fragment, left	2
Upper 3 <sup>rd</sup> incisor, left	1
Upper incisor, undifferentiated	2
Upper canine, left	4
Upper canine, right	3
Upper 2 <sup>nd</sup> premolar, left	1
Upper 4 <sup>th</sup> premolar, left	14
Upper 4 <sup>th</sup> premolar right	14
Upper 4 <sup>th</sup> premolar, undifferentiated	1
Upper 1 <sup>st</sup> molar, left	10
Upper 1 <sup>st</sup> molar, right	10
Upper 2 <sup>nd</sup> molar, left	9
Upper 2 <sup>nd</sup> molar, right	11
Maxilla fragments, tooth row complete with M1, left	2
Maxilla fragments, tooth row complete with M2, left	2
Maxilla fragments with P1, left	1
Maxilla fragments with P4, right	1
Maxilla fragments with M1, left	2
Maxilla fragments with M1, right	3
Maxilla fragments with M2, left	2
Maxilla fragments with M2, right	2
Maxilla fragments, left	15
Maxilla fragments, right	11
Maxilla fragments, undifferentiated	15
Orbital fragments, right	1
Post-orbital process fragments, right	1
Parietal fragments, left	1
Parietal fragments, right	3
Parietal fragments, undifferentiated	22
Jugal fragments, left	1
Jugal fragments, right	2
Jugal fragments, undifferentiated	6
Zygomatic arch fragments	12
Squamous fragments, left	1
Squamous fragments, right	1

*Table 5 (continued)*

<b>Body Part</b>	<b>NISP</b>
<b>Crania (continued)</b>	
Styloid(?) fragments, left	1
Styloid(?) fragments, right	1
Sagittal crest fragments	2
Temporal fragments, right	1
Temporal fragments, undifferentiated	1
Auditory bulla fragments, left	2
Auditory bulla fragments, right	2
Auditory bulla fragments, undifferentiated	19
Occipital condyle fragments, left	6
Occipital condyle fragments, right	7
Occipital condyle fragments, undifferentiated	2
Cranial fragments, undifferentiated	2,694
<b>Upper Cranial Subtotal</b>	<b>2,926</b>
<b>Mandible</b>	
Lower 2 <sup>nd</sup> molar, left	1
Lower 2 <sup>nd</sup> molar, right	1
Lower 3 <sup>rd</sup> molar, left	2
Lower 3 <sup>rd</sup> molar, right	2
Mandible fragments, right?	5
Mandible fragments, undifferentiated	54
<b>Mandibular Cranial Subtotal</b>	<b>65</b>
<b>Indeterminate Cranial</b>	
Canine fragments	50
Molar root fragments	9
Tooth fragments	25
<b>Indeterminate Cranial Subtotal</b>	<b>84</b>
<b>Postcranial Remains</b>	<b>0</b>
<b>Totals</b>	<b>3,075</b>

Data compiled from Mather and McFarlane (1999) and artifact catalogs completed in 1998 by Amanda Gronhovd and Joe McFarlane.

We observed in the field that the bear skulls in the feature were notably larger than the modern skull we used for reference, which was from a young adult black bear.

This, and the size of the canines, led to speculation about whether the skulls were from grizzly bears (*Ursus arctos*). The size of the molars, however, definitively demonstrated that all of the skulls were from black bears (*Ursus americanus*). Grizzly bear molars are significantly larger, and all of the Bear site teeth corresponded to upper range of the measurements reported by Gordon (1977) for black bears. Further consideration of the tooth measurements and tooth wear is presented in Chapter 8.

As seen in Table 5, few mandibles and mandibular teeth are represented in the assemblage (far fewer than the upper jaws and attached portions of the skull), and there are no postcranial remains. This demonstrates that the bear skulls were already skulls (defleshed) when they were placed in the pit feature.

### Ceramics

Pottery sherds from archaeological sites are an important source for relative dating, through identification of defined wares. In Minnesota, ceramic technology is a hallmark of the Woodland Tradition, and variation in ceramic styles allows more precise seriation than is generally possible for older archaeological periods. Most ceramic sherds are from cooking vessels, and may also contain paleoenvironmental data from charred food residues.

Table 6. Summary of ceramic traits from the 1997-1998 Phase I, II and III excavations at the Bear site (21ML68).

	Rim	CM Body	CM Neck	S Body	S Neck	S/CM Body	Exf/ (?)	Totals
Grit-Temper	3	40	6	18	1	16	107	191
Sand Temper	-	2	-	5	-	-	-	7
Shell Temper	-	-	-	12	-	-	-	12
Temper (?)	-	3	-	6	-	-	-	9
<b>Totals</b>	<b>3</b>	<b>45</b>	<b>6</b>	<b>41</b>	<b>1</b>	<b>16</b>	<b>107</b>	<b>219</b>

CM=cordmarked; S=smooth; S/CM=smoothed over cordmarked; Exf=exfoliated; (?)=unknown

Data compiled from Westover (1997a), Mather and McFarlane (1999) and artifact catalogs completed in 1998 by Amanda Gronhovd and Joe McFarlane.

As previously noted, the ceramic assemblage from the Bear site investigation is unusually small for a Woodland Tradition site at Mille Lacs. Table 6 presents a summary by temper, surface treatment and vessel position. Grit temper is most prevalent, present in both cordmarked and smooth sherds. Sand and shell temper are represented only in

smooth-surfaced sherds from the immediate vicinity of the Bear Feature, including the two decorated (single twisted cord impressions) sherds seen in Figure 19. These sherds fit the description of Ogechie Ware (Thomas 2000; Ready 1979; Arzigian 2012:126), which is known from the Shakopee and Bradbury phases at Mille Lacs. There are no diagnostic pieces such as rim sherds, however, so in the report (Mather and McFarlane 1999:12) we described pottery types in an “Oneota/Ogechie/Sandyota” continuum (cf. Gibbon 2012a:189-190).



*Figure 28. Sandy Lake pottery from 21ML68 (left) and the nearly complete vessel from 21ML33 (upper right and detail, lower right); scale varies.*

Best represented is a portion of a Sandy Lake vessel from TU 16, on the back side of the beachridge (Figure 28). The curve of the rim indicates that the vessel diameter would have been approximately 22.5 cm, about the same as that from a nearly complete Sandy Lake pot found at the Crosier site (21ML33), near Mille Lacs on Lake Onamia.

Wood charcoal associated with the Crosier pot produced a corrected date of  $540 \pm 110$  radiocarbon years BP, or approximately AD 1300–1520 (Beta-35179; Mather 1991:34).

Westover (1997a:11-12) reports a concentration of 17 burned sherds on the lakeshore terrace landform. Among the rest of the assemblage, he identifies one rimsherd with a series of impressions, and one rolled rim. He describes the 21ML68 assemblage as a whole (beyond the Bear site subarea) as containing Late Woodland wares including Onamia, Kathio and Sandy Lake.

### Lithics

Stone tools and the lithicdebitage (debris) from making them comprise another important source of archaeological evidence. The tools can be diagnostic of particular time periods and illustrate the tasks of daily life at a site. The debitage itself tells more about the function of a site (for example, through resharpening of tools as might be expected at a village site, or initial fracturing of stone at a quarry site). Identification of the raw materials in a lithic assemblage can provide information about trade connections in the past, and can even be a source of relative dating when compared to other site data sets of known age (e.g. Bakken 2000, 2011).

The lithic profile of the Bear site is informative, and presented in Tables 7-8, and Figure 29. These are mostly (89.1%) stone types that are locally available in Bakken's (2011) West Superior Resource Region and the glacial till of the Mille Lacs moraine, such as quartz, Knife Lake Siltstone, Tongue River Silica and materials of the Animikie Group. The exceptions are Knife River Flint, which is from western North Dakota, and Prairie du Chien Chert, which is found in southeastern Minnesota and southwest Wisconsin (Bakken 1997, 2000, 2011; Clayton et al. 1970; Klawiter 2001).

A few comments are useful in discussion of the lithic data. First, Westover (1997a) identified stone artifacts from the Phase I survey as cores (blocks of stone from which flakes have been struck) and undifferentiated flakes. Debitage from the Phase II and III investigations was identified by flake type. Primary flakes are the initial stage of reducing

*Table 7. Lithic raw material profile for the 1997-1998 excavations at the Bear site (21ML68), with regions and terminology following Bakken (2011).*

	Count	Percent
<b><u>West Superior Resource Region Materials</u></b>		
Gunflint Silica*	4	0.6
Jasper Taconite*	3	0.4
Kakabeka Chert*	1	0.1
Knife Lake Siltstone	97	13.6
Lake Superior Agate	6	0.8
Quartz	523	73.6
<b><i>subtotal</i></b>	<b><i>634</i></b>	<b><i>89.1</i></b>
<b><u>South Agassiz Resource Region Materials</u></b>		
Swan River Chert	3	0.4
Tongue River Silica	31	4.4
<b><i>subtotal</i></b>	<b><i>34</i></b>	<b><i>4.8</i></b>
<b><u>Hollandale Resource Region Materials</u></b>		
Prairie du Chien Chert	4	0.6
<b><i>subtotal</i></b>	<b><i>4</i></b>	<b><i>0.6</i></b>
<b><u>Exotics</u></b>		
Knife River Flint	12	1.7
<b><i>subtotal</i></b>	<b><i>12</i></b>	<b><i>1.7</i></b>
<b><u>Other</u></b>		
banded chert	1	0.1
gray chert	2	0.2
red chert	1	0.1
chert (undifferentiated)	5	0.7
red chalcedony	5	0.7
tan chalcedony	4	0.6
quartzite	3	0.4
rhyolite	4	0.6
unidentified	2	0.2
<b><i>subtotal</i></b>	<b><i>27</i></b>	<b><i>3.8</i></b>
<b>Total</b>	<b>711</b>	<b>(100)</b>

\*combined as Animikie Group by Bakken (2011:100-103)

a cobble or core, and have cortex from the geologically-weathered exterior surface of the stone. Secondary flakes are the next step, and retain a small amount of cortex. Tertiary flakes have no cortex. They are the flakes from finishing or sharpening a flaked stone tool. “Shatter” is just what it sounds like: the broken pieces of stone that are not flakes. Consideration of these traits can allow identification, for example, of locally available

resources (more cortex and cores), and exotic materials that were traded in (mainly tertiary flakes).

*Table 8. Lithic materials by artifact type from the cumulative Bear site (21ML68) excavations.*

	Core	Primary Flake	Secondary Flake	Tertiary Flake	Flake (undiff)	Shatter	Tool	Totals
<i>Identified Materials</i>								
<b>Quartz</b>	4	7	21	136	225	124	6	<b>523</b>
<b>Knife Lake Siltstone</b>	1	1	9	51	23	9	3	<b>97</b>
<b>Tongue River Silica</b>	-	1	1	25	-	3	1	<b>31</b>
<b>Knife River Flint</b>	-	2	-	6	1	2	1	<b>12</b>
<b>Lake Superior Agate</b>	-	-	1	4	-	1	-	<b>6</b>
<b>Prairie du Chien Chert</b>	-	-	-	4	-	-	-	<b>4</b>
<b>Gunflint Silica*</b>	-	1	-	2	-	1	-	<b>4</b>
<b>Jasper Taconite*</b>	-	-	-	1	-	2	-	<b>3</b>
<b>Swan River Chert</b>	-	1	-	2	-	-	-	<b>3</b>
<b>Kekabeka Chert*</b>	-	-	-	1	-	-	-	<b>1</b>
<i>Unidentified Materials</i>								
<b>banded chert</b>	-	-	-	-	1	-	-	<b>1</b>
<b>gray chert</b>	-	-	-	1	-	-	1	<b>2</b>
<b>red chert</b>	-	-	1	-	-	-	-	<b>1</b>
<b>Chert (undiff)</b>	-	-	-	-	4	1	-	<b>5</b>
<b>red chalcedony</b>	-	-	-	5	-	-	-	<b>5</b>
<b>tan chalcedony</b>	-	-	2	2	-	-	-	<b>4</b>
<b>Quartzite</b>	-	-	-	2	-	1	-	<b>3</b>
<b>Rhyolite</b>	-	-	-	3	-	1	-	<b>4</b>
<b>Unidentified</b>	-	-	-	-	-	1	1	<b>2</b>
<b>Totals</b>	<b>5</b>	<b>13</b>	<b>35</b>	<b>245</b>	<b>254</b>	<b>146</b>	<b>13</b>	<b>711</b>

\*combined as Animikie Group by Bakken (2011:100-103)

Next, artifacts identified as basalt by Westover (1997a) have been tabulated as here Knife Lake Siltstone, which is locally available as cobbles in the glacial till (Malik and Bakken 1999; Bakken 1997, 2011 – see Clayton and Hoffman 2009 and Muniz 2014 for higher quality siltstone from bedrock sources on the Canadian border). Basalt is not a stone that can typically be knapped, although there are exceptions. One unusual assemblage from the Cooper site palisade (21ML9) includes a few flaked pieces of basaltic rock, “broadly construed to include all dark, grainy, poor quality rock” (Bakken 2005:46). The amount ofdebitage identified as basalt in the Westover’s (1997a) report,

as well the presence of flaked tool fragments, makes it clear that Knife Lake Siltstone is what was meant.

Last, Fat Rock Quartz had not yet been recognized as a resource type when the Bear site artifacts were cataloged, so Fat Rock and other quartz are undifferentiated in this assemblage. Fat Rock Quartz is a high quality bedrock source of quartz found near the Mississippi River at Little Falls, and is a primary resource of the Quartz Subregion (which includes the Mille Lacs area) in Bakken's (2011:87-88) West Superior Resource Region. At Petaga Point (21ML11), Jim Cummings and I have identified both Fat Rock Quartz from Little Falls, and "regular" quartz from glacial cobbles in the Mille Lacs Moraine in our excavation of a Bradbury Phase earthlodge (Mather and Cummings forthcoming). I believe it is likely that both types are also represented in the Bear site assemblage.

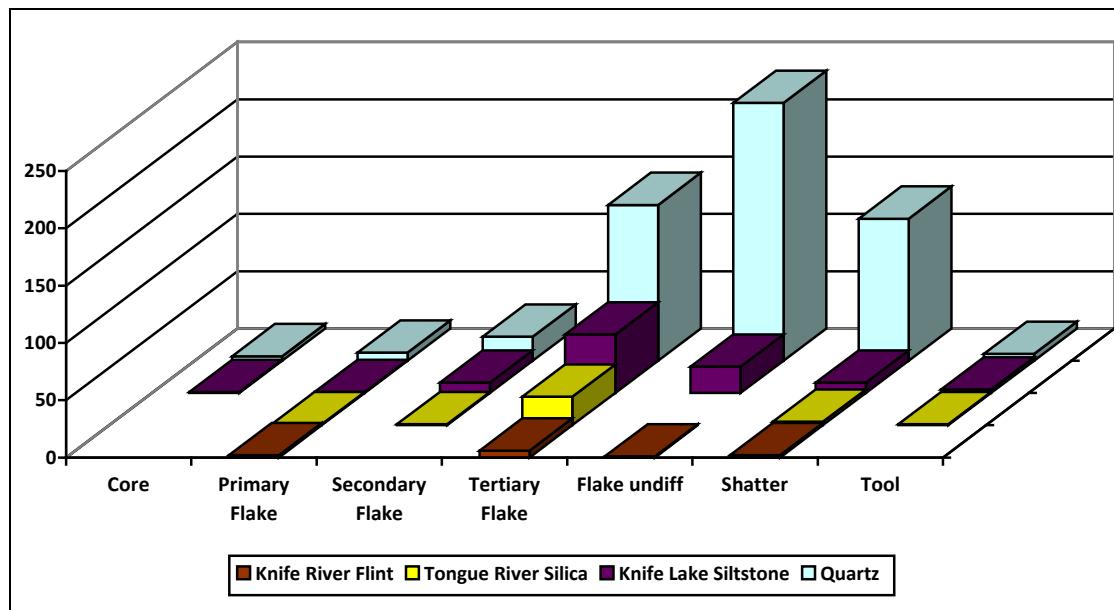


Figure 29. Lithic artifacts from the Bear site (21ML68).

Lithic debitage at the Bear site is overwhelmingly quartz (73%), with Knife Lake Siltstone a distant second at 13.6%. Next is Tongue River Silica at 4.4%, and Knife River Flint at 1.7%. The other 15 materials represent less than one percent of the assemblage

each. Artifact types represented by the four most prominent stone types are illustrated in Figure 29. The assemblage represents mostlydebitage (rather than finished stone tools). Tertiary flakes are the largest group among the identifieddebitage, indicating that resharpening and late stages of stone tool production were the focus of stone use at the Bear site.

### Archaeobotany

Archaeobotany is the study of plant remains from archaeological sites. In November 1998, archaeobotanist Seppo Valppu visited the Bear site excavation, and at our request took a series of column samples (10x10 cm) from the northeast corner of TU 29. This is the northern edge of the excavation block that contains the Bear Feature, but outside the Bear Feature itself. We also had bags of feature matrix from TU 9, from the discovery of the Bear Feature in the Phase II excavation. These samples were saved after soil containing piece-plotted concentrations of bear bone was screened in the lab. Seppo had worked with us on a number of projects (e.g. Valppu 2000), and I wanted to hire him to analyze this material. Unfortunately, this was beyond the capacity of the project budget. I sought other sources of funding, but was not successful.

In 2000, Seppo kindly volunteered to process some of the samples enough to provide material for radiocarbon dates (see below; Mather 2000a). He told me then that he observed some macrofossils of white pine (*Pinus strobus*) and goosefoot (*Chenopodium* sp.). The 21ML68 samples were still in Seppo's lab when he passed away in 2011. I later retrieved them and consulted with the Mille Lacs THPO, who agreed that, if possible, the analysis should occur as originally intended. Thankfully, Dr. Ron Schirmer of Minnesota State University-Mankato is a specialist in archaeobotany (e.g. Schirmer 2002, 2012), and he offered to direct the analysis as a student research project. Unfortunately, there were no identifiable botanical remains found in the samples. It is possible that the materials Seppo had noticed were of recent origin, as indicated by the radiocarbon dating results (below).

### Radiocarbon Dates and Chronology

Early in 2000, after the site report was completed, the Minnesota Office of the State Archaeologist kindly provided funding for radiocarbon dates from the Bear site and the Christensen Mound site. Three of the four samples were from the Bear site (Table 9). Sample BEAR-1 was from the center of the Bear Feature, in TU 25. Sample BEAR-2 was from a postmold west of the Bear Feature, in TU 30. Sample BEAR-3 was from southern edge of the Bear Feature, in TU 9 (Mather 2000a:116-118). The Christensen Mound site (21SH1/16) date is discussed in Chapter 6.

*Table 9. Radiocarbon dates from the Bear site (21ML68), calibrated with Calib 7.10.*

Lab# / Sample#	Sample	Radiocarbon Age	Calibrated Dates 1-Sigma (68.3%)	Calibrated Dates 2-Sigma (95.4%)	Median Probability
Beta-133838 BEAR-1	Wood charcoal from Bear Feature	340 ± 60 BP	Cal AD 1484-1528 1544-1634	Cal AD 1445-1653	1554
Beta-133839 BEAR-2	Wood charcoal from postmold	290± 70 BP	Cal AD 1490-1603 1611-1663	Cal AD 1447-1683 1735-1806 1930-1950	1587
Beta-133840 BEAR-3	Plant macrofossils from Bear Feature	(recent)	(recent)	(recent)	(recent)

The radiocarbon dates support the age of the Bear Feature as suggested by the artifacts recovered from the site but provide more detail. The 2-sigma ranges of the two good dates overlap closely, indicating with a 90% probability that the feature was created between AD 1435 and 1680. The 1-sigma result (68% probability) for BEAR-1 was Cal AD 1460-1645 (Cal BP 490-305). The 1-sigma range for BEAR-2 was Cal AD 1550-1660 (Cal BP 450-290). The BEAR-3 sample did not provide a reliable date, unfortunately. This sample consisted of plant macrofossil fragments from TU 9, and the combined materials presumably increased the chance of contamination.

The overlap of the two wood charcoal dates, from the Bear Feature and one of the nearby postmolds (Figures 30-32), provide support for our suspicion that there was once a structure of some sort over the Bear Feature. In the limited amount of Phase III excavation, we found two postmolds approximately equidistant from the feature, but we could not interpret much about the structure, other than that two apparent support posts

were positioned close to the pit containing the skulls. The structure may have been simply an arbor covering the pit, or it could have been more extensive.

The radiocarbon dates range from the second half of the Shakopee Phase into the beginning of the Bradbury Phase, and support the relative age of the site as assessed from the artifact assemblage. The beginning of the Shakopee Phase (ca. A.D. 1300) at Mille Lacs follows soon after the start of the Psinomani archaeological complex as defined by Gibbon (2012a:189-192), at ca. CE 1250 (and ca. CE 1100 in the Mississippi Headwaters). *Psinomani* means “wild rice gatherers” in Dakota, and this complex marks the consolidation of historically-known Dakota people into a tribal society, although Dakota ancestry at Mille Lacs and elsewhere goes back much farther in time (Schlesier 1994:340-346; Gibbon 1994:147). Arzigian (2012:144-145) includes the Bear site as a principal site of the Psinomani period. She notes that it “might be a special use ceremonial site.” In my opinion, it definitely is. It is intriguing to imagine the Bear Feature as a reaction to the social forces within, and external to, the Dakota world at Mille Lacs in this pivotal period of history. This is discussed further in Chapter 9.

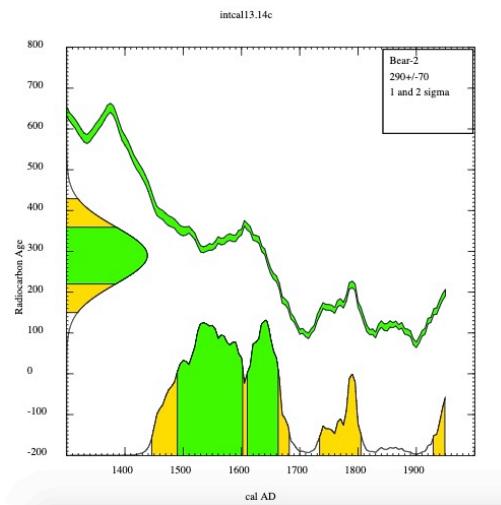


Figure 30. Radiocarbon results for sample Bear-1.

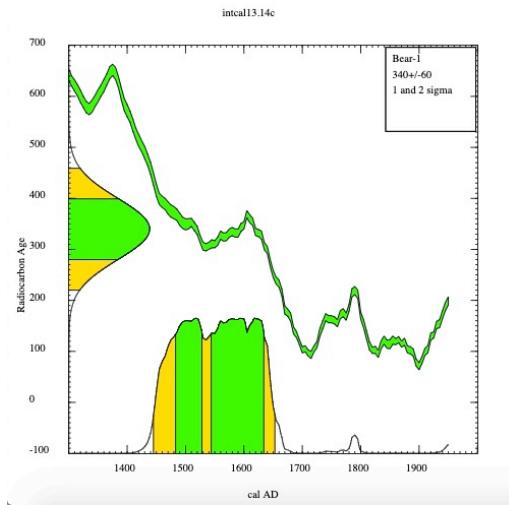


Figure 31. Radiocarbon results for sample Bear-2.

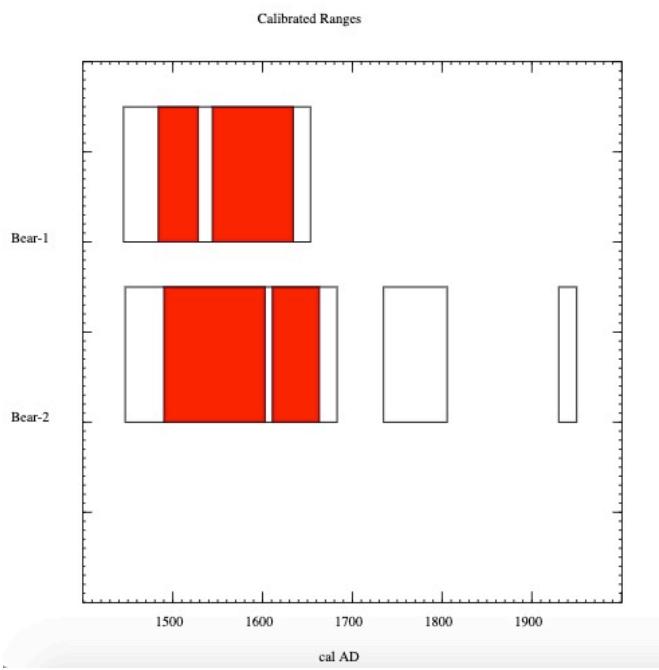


Figure 32. Radiocarbon results for samples Bear-1 and Bear-2.

Last, it is useful to note that my discussion of the dates presented here includes a minor change for the Shakopee to Bradbury phase transition, which was originally defined as ca. AD 1680. The Bradbury Phase has been essentially considered a continuation of the Shakopee Phase with the addition of French trade goods (Birk and

Johnson 1992; Johnson 1984; Gibbon 2012a:195-198; Mather 2000b:68-70). Daniel Greysolon Sieur du Luth was with the Dakota at Mille Lacs in 1679, and Father Louis Hennepin was there in 1680 (Shea 1880:225-237, 374-376; Westerman and White 2012:40-45). I believe that the arbitrary estimate of 1650 better encompasses the historic record, as well as allowing a few decades for trade goods to have reached Mille Lacs prior to the French themselves, or through undocumented visits by *coureurs de bois* (cf. Quimby 1966:4; Dickinson and Young 2008:41-42). Also, recent radiocarbon dates (Emerson 2012) from the Cooper site (21ML9) palisade and Petaga Point (21ML11) earthlodges raise the possibility that there may be other archaeological features unique to the Bradbury Phase after all (Mather 2014a).

### Consultation and Reburial

In the summer of 2000, the bear remains were reburied at the Bear site within TU 9, with a ceremony conducted by Lakota spiritual leader Renaldo Dodge. In the time since the decision to preserve the Bear Feature, the Dakota leaders had consulted amongst themselves and others about the site. Before the reburial, Dallas Ross briefly referred to their consensus, that the Bear Feature represents an ancient type of ceremony, which very few people today know much about. Lakota elder Alameda Rocha also said this in 2007, after consulting with her spiritual advisors about the Bear site. Not anticipating reburial following the Phase II excavation, we had followed then-standard archaeological lab procedures, including writing catalog numbers on the bear teeth and bone fragments. At the time of the reburial, Dallas also told me that a grizzly bear should write numbers on my skull someday. I could not argue with that, and still regret the numbers.

Years later, in one of many enjoyable discussions about the Bear site, Dakota elder Tom Ross said that while the Bear Feature is incredibly mysterious and complex, he believed that at its core is the idea of creating a sacred space. Whatever else it is, he told me, if you think of it in that way, you wouldn't be wrong.

In the site report (Mather and McFarlane 1999), I interpreted the Bear Feature largely in terms of bear ceremonialism, primarily imagining the bear feast and funeral as described by Hallowell (1926), and fur trade-era accounts of American Indian bear hunts

in the winter where hundreds of animals were killed (e.g. Blair 1996:129). Later, as I studied bear remains from other archaeological sites, I realized that the similarities to published accounts were only superficial ('many bears/skulls' and that my initial interpretation was wrong. During the excavation, we had noticed that the bear skulls were big – notably larger than the young adult modern skull that we used as a reference. As described in Chapter 8, later analyses showed that the bears represented by the skulls in the Bear Feature are old, large black bears, and they are possibly all male. While these bears were hunted, this accumulation of skulls is not the product of a single hunt. Rather, they were selected, and perhaps kept for a period of time. As the Dakota elders had said during the excavation, the Bear Feature was created for a different purpose.

#### **4. TOWARD AN ARCHAEOLOGY OF BEAR CEREMONIALISM**

The concept of bear ceremonialism encompasses widespread spiritual beliefs about bears, and a diverse range of ritual practices. A. Irving Hallowell's (1926) original definition in the *American Anthropologist* journal focused on activities related to the bear hunt, feast and funeral in the circumpolar north, and drew intriguing connections between the seemingly ancient traditions of hunting peoples across Scandinavia, Eurasia and North America. Others have since broadened the concept to include different but related beliefs, such as gifts of spiritual power by bears to human healers and warriors. In this chapter, I examine the anthropological concept as it has evolved over the last century, and include contributions from Ruth Landes' Minnesota fieldwork in the 1930s that have been largely overlooked in other treatments of this subject. I then turn to archaeological finds to construct a theoretical context for bear ceremonialism in the archaeological record.

This chapter sets the stage for assessing the representation of bears in Minnesota archaeological sites, in Chapters 5-8, and interpretive models of the these finds in Chapter 9. Since beginning this research, I have worked under the assumption that bear ceremonialism was practiced here in the past. Indeed, some of the finds, such as at the Bear site (Chapter 3) demonstrate that it unquestionably was, but we should not also assume that bear ceremonialism was static, constant or ever-present throughout the circa 13,000 years of Minnesota's human history.

##### A. Irving Hallowell's Bear Ceremonialism

"Bear Ceremonialism in the Northern Hemisphere" was the topic of A. Irving Hallowell's (1892-1974) PhD dissertation at the University of Pennsylvania, completed in 1924 under the direction of Frank Speck (Hallowell 1926:1; Brown and Gray 2009:18). Written at a turning point in American anthropology, it has been described as "perhaps the last" of the major Boasian cross-cultural, distributional studies (Darnell 1977:14). It was primarily a library project, a "broad comparative survey" (Hallowell 1926:23) and analysis of bear-related cultural traditions as described in the published literature available at that time. Other than its connections to circumpolar traditions and Algonquian cultures, the topic played only a minor role in Hallowell's later career, which

instead focused on Ojibwe culture and psychological anthropology (e.g. Hallowell 1934, 1940, 1955, 1971, 1992, 2010; Berens and Hallowell 2009; Wallace 1980:198). I was glad to learn that beyond his research, Hallowell was a long-time friend to the Berens River Ojibwe community in Manitoba, where the elders have remembered him as *Midewigima* (Brown and Gray 2009:21-23).

At the time of Hallowell's dissertation research, anthropological and other literature included references to special treatment of bears by varied cultures around the world. He noted that Frazer's *The Golden Bough* in particular contains "a rather scattered but very suggestive collection of data" (Hallowell 1926:21, citing Part V, Vol II:224). Frazer and other authors, Hallowell wrote, called attention, "more than once, to the prominent role which the bear plays in the customs and beliefs of certain peoples of North America, Asia and Europe." Hallowell quoted from *The Golden Bough*: "The reverence of hunters for the bear which they regularly kill and eat, may thus be traced all along the northern region of the Old World, from Bering Strait to Lapland. It reappears in similar form in North America" (Hallowell 1926:21; Frazer 2011:691). Furthermore, these sources indicated that bears were treated differently than other animals.

[T]hese observations serve to draw attention to the very significant fact that many of the native tribes of North America, Asia, and Europe do exhibit toward the bear an attitude which, in contrast to that manifested toward other creatures, is more or less unique in character. Testimony to this effect is available in the accounts of explorers, travelers and ethnologists who have sojourned with these peoples and there is a surprising agreement in the statements of those who have had only the most superficial contacts with the natives and of those who give us accounts based on lengthy residence and intensive study. Of course the terms used to describe the psychological attitude of these aborigines toward the bear vary considerably. Some describe it as respect, others as reverence, veneration, or worship, but one and all are in agreement that, among the animals, bears are held in special esteem. To this extent Frazer's statement is well supported. [Hallowell 1926:22]

Hallowell rejected the Victorian view of animism as an early evolutionary stage of human spirituality, and instead sought to explore bear ceremonialism as a psychological

attitude shared by some cultures toward bears, which he assumed developed from the requirements of subsistence hunting. His focus was on northern, hunting peoples, whose organizational thought he sought to understand on their own terms.

If we are to understand the *Weltanschauung* of peoples who entertain such notions, therefore, we must rebuild the specific content of these categories upon the foundation of their beliefs, not ours. The truth or falsity of the categories is not at issue but simply the inapplicability of our concepts of them as a point of departure for a comprehension of primitive thought. [Hallowell 1926:9-10, emphasis in original]

I dislike the word “primitive,” but its presence here is a useful reminder of the relationship between anthropologist and subject as perceived in the early twentieth century. Later in his career, Hallowell (1992:63) used the term “world view” in reference to the cultural perspective in which people see themselves and their surroundings. He cautioned that “we cannot impose distinctions and classifications of phenomena derived from another world view upon them if we seek to comprehend their outlook.”

To move beyond lists of intriguing but anecdotal accounts when considering bear ceremonialism, Hallowell focused on certain aspects of human-bear interaction in order to provide a “more tangible basis of approach” (1926:23). These were the:

- manner of hunting
- handling of the carcass
- consumption of the bear; and
- treatment of the bones

The literature available at the time of his study indicated that the similarities of these traditions offered the most promising connections, and a potential basis for “grouping of peoples.” Hallowell’s stated goal, then, was …

… to survey bear ceremonialism in its widest aspects among the peoples of both North America and Eurasia, with a view to determining the geographical distribution of genuine similarities in customs and beliefs, as well as to indicate the significant differences which are found in the various tribes and culture areas. [Hallowell 1926:23]

Therefore, while the geographical scope was broad, it was not global, and Hallowell's analysis was limited to aspects of the bear hunt, feast and funeral, considering the *psychological* aspects of each, yes, but still focused on subsistence hunting, which is arguably the most *utilitarian* (these were the poles of his dichotomy) area of human-bear interaction (Hallowell 1926:4, 6). This is important to recognize, because there's been a temptation among later researchers, perhaps especially archaeologists, to invoke "bear ceremonialism" to mean any bear-related thing with an appearance of ritual. Perhaps that is not wrong – as discussed below, the term is now legitimately used in a broader sense, in my opinion, but the scope of Hallowell's own "introductory survey" was relatively restricted (1926:23-24).

Hallowell (1926) presented his survey data for traits sequentially by topic (for example, "Disposal of the Remains"), beginning with northeastern North America for each, and working his way westward to Scandinavia. In North America, he organized his presentation by cultural and geographical areas. I've summarized these here, with the terminology and spelling that he used. Areas and cultures in regular font were discussed in greatest detail in the body of his text and supplemented by footnotes. Those in italics were mentioned only in footnotes (these include a few where Hallowell noted a lack of evidence for an aspect of bear ceremonialism). Where possible, I've also organized the North American summary by language family groups, added in brackets.

- Eastern Woodlands –
  - Northern Algonkian – Abenaki, Micmac, Wabanaki, Montagnais-Naskapi, Malecite, Timiskaming Algonquin, Penobscot, Northern Saulteaux, Eastern Cree (including Eastmain, Mistassini and Tête de Boule), *Delaware* [Algonquian]
  - Central Algonkian – Ojibway, Ottawa, Sauk, Fox, Forest Potawatomi, Miami and Menomini, *Prairie Potawatomi, Kickapoo, Nansamund* [Algonquian]
  - Iroquois, *Mohawk, Seneca* [Iroquoian]
  - Winnebago [Siouan]

- Southeastern Area
- Plains Area –
  - Plains Cree, Plains Ojibway, Blackfoot, *Cheyenne* [Algonquian]
  - Assiniboine [Siouan]
- Southwest Area –
  - *Hopi* [Uto-Aztecán]
  - *Tewa* [Tanoan]
- California and Great Basin –
  - Miwok [Yok-Utian]
  - Wailaki [Athabaskan]
  - *Maidu* [Penutian]
  - *Ute* [Uto-Aztecán]
  - *Pomo* [Pomoan]
- North Pacific Coast Area –
  - Shasta [Shastan]
  - Tlingit, *Tahltan*, *Tinneh*, *Siuslaw* [Athabaskan]
  - *Kwakiutl*, *Nootka* [Wakashan]
  - *Tsimshian*, *Alsea* [Penutian]
  - *Coos* [Coosan]
  - *Kalopuya* [Kalapuyan]
  - *Quileute* [Chimakuan]
- Plateau Area –
  - Lillooet and Thompson River, *Shuswap* [Salishan]
  - Carrier, Chilcotin [Athabaskan]
  - *Kutenai* [Kutenai]
  - *Molala* [Penutian]
- Mackenzie Area –
  - Loucheux, Tinneh, *Dog Rib*, *Yellow Knives* [Athabaskan]
- Eskimo [Eskimo-Aleut]

For Eurasia, he continued from east to west, and distinguished between Paleo-Siberians (Koryak, Chukchi – including *Maritime Chukchi* and *Reindeer Chukchi* – Ainu, lower Amur peoples, and Gilyak), and Neo-Siberians (Yakut, Tungus, Ostyak), and ended in Scandinavia with the Lapps (again, I'm quoting Hallowell's terminology and spelling). He also discussed some of the same groups within culture groupings, including:

- Siberia generally – Kamchadal, Yukaghirs, Ainu, Lamut, Gilyak, Ostyak (Ugrian, including *Ugrian Ostyaks*, *Samoyedic Ostyaks* and *Yenisei Ostyaks*), Koryak (*Maritime Koryak* and *Reindeer Koryak*), Manyarg, Gold, Oltscha, and *Orotchi*
- Ural-Altaic Peoples – Yakut, Tungus, Finno-Ugrian groups, Ostyak, Vogul, Votyak, Finns, Estonians, Lapps, ancient Hungarians, *Samoyeds*
- Indo-European Peoples – Swedish peasants, Slavik Hazules, *Ruthenians*
- “Miscellaneous” – Luiseno, Tsimshian, Tahltan
- Asiatic Eskimo

This summary indicates that while Hallowell's overview was indeed circumpolar in scope, the evidence available to him was clearly weighted toward northeastern North America, and especially Algonquian speaking peoples. It was there that his advisor Frank Speck was still deeply involved in his own research. The only apparent fieldwork in Hallowell's study was with Speck, in 1924 in Quebec, where he learned firsthand of the Naskapi custom of lighting a pipe for the slain bear (Hallowell 1926:64). Speck (1935:24) later mentioned in *The Journal of American Folklore* that his “earlier Penobscot information concerning the hunter's treatment of the bear” was presented by Hallowell (1926).

Hallowell prefaced his survey of cultural traits with short discussions of the geographical distribution of bears – “The close relationship of the species inhabiting Eurasia and North America since Pleistocene times is specially worthy of note” (1926:25) – and folk beliefs regarding hibernation. The apparent ability of bears to transcend death during their winter dormancy is unquestionably a source of wonder among many cultures. Hallowell pointed out a widespread explanatory (but incorrect) belief, that bears gain nourishment in hibernation by sucking on their paws. He cited fur trade-era accounts

from northeastern North America, a roughly contemporary account from the Lapps in Europe, and nineteenth century records regarding the Kamchadal and Ainu in Asia. Of the latter, he quoted missionary John Batchelor (1901:472): “Some of the Yezo aborigines claim that when bears come out in the spring their feet are so tender that they cannot move far from their dens. Others deny this. … They lick their feet when awake during the winter months … and so keep themselves alive and fat” (Hallowell 1926:30). He tentatively connected this belief to bear ceremonialism:

As will appear in the course of this study, there is a rough correlation between the distribution of this bit of folklore and the occurrence of bear ceremonialism; that is to say, although the belief in question is not reported from *all* the regions where the latter is found, it is *only* recorded from the general districts where some practices are found *and nowhere else*. [Hallowell 1926:30, emphasis in original]

Hallowell was incorrect in this assertion. Hesiod, and Pliny the Elder (Shepard and Sanders 1985:137; Bostock and Riley 1855:306; Brown 2000:180), for example, both made statements of this belief from the ancient Mediterranean. This is a minor point, although perhaps of interest as an illustration of Hallowell’s thought process in his analysis. Incidentally, a Minnesota bear biologist has also commented on this folk belief, noting that the bears’ calloused foot pads will slough off in their winter dens and are sometimes ingested by the bears (Rogers 1974).

The cultural traits Hallowell selected are discussed more broadly below, with potential archaeological connections, but I briefly summarize them here first to provide a sense of the scope of his work. First described was the bear hunt, with an emphasis on taking the animal in its winter den, most commonly using a spear, axe, or club. “The favorite time to hunt the beast is toward the end of the winter, or in the early spring, while snow is still on the ground” (Hallowell 1926:32). Circumlocutions were used during, and in preparation for the hunt, in place of the word “bear.” This was done to avoid offending the animal, or to prevent warning it that hunters are coming. Terms used instead include names such as Old Man of the Woods, Honey Paws, or Black Food (Hallowell 1926:43-53).

At the winter den, the hunters would speak to the bear, often using kinship terms such as Grandmother or Grandfather to call the bear outside. The bear was killed as it emerged, but the practice of speaking to it continued before or after death (or both). The hunters might apologize to the bear for needing to take its life, and explain that their families were hungry, or in need of fur. They might ask the bear to not be offended, and promise to show their gratitude with gifts. Other times the hunters would tell the bear that it died through some other cause, and ask it to not blame them. Hallowell (1926:57) quotes from Czaplicka's (1916:139) *My Siberian Year*, for one example: "It was not I, Grandfather; it was the Russians (i.e. any European) who have killed you through me. I am grieved, I am truly grieved. Be not angry with me." This type of speech might occur at the kill site, or other times at the feast (Hallowell 1926:53-58). Respect was shown to the bear before and after it was killed, in order to appease the "spiritual controller or 'soul spirit' of the bear in order that a ready supply of similar game may be available in the future" (Hallowell 1926:62).

Tobacco or other offerings would be given to the bear after it was killed. The carcass was transported to the place where the feast would be held, and if brought into a structure, sometimes using a special door. The feast was an "eat-all" event in order to not offend the bear, and typically involved gender taboos due to the animal's potent spiritual power (Hallowell 1926:64-66). Care was taken when butchering the animal to not cut or break the bones. Following the feast, the physical remains were kept away from other food waste and out of the reach of dogs. The people might give the bear additional gifts such as beads or blankets, and food, so that the animal's spirit would feel it was treated well and thus encourage other bears to come. The physical remains of the bear, often with a focus on the skull, were then prepared and placed in a special location where they would be safe from harm. Hallowell's (1926:135-144) overview of "Disposal of the Remains" refers primarily to the skull, which was placed or hung from a tree, or a pole, and sometimes painted with pigment or ochre. Other types of repositories are described by other writers, as described below. The respectful care with which the remains were treated, and the repository for the bones, have been described by others (myself included)

with the anthropogenic terms “funeral” and “grave.” Hallowell did not use these terms himself except in quotations.

Hallowell (1926:148-163) considered several options for the results of his survey. He rejected psychological and economic hypotheses (his terms), and instead favored the idea of a single source for the widespread similarities of bear traditions among otherwise different cultures, a “historico-geographical interpretation.” He wrote, “Neither the psychological nor the economic hypothesis, for example, throw any light whatsoever upon the reason why the Ainu celebrate bear festivals while the Chukchi have very simple ceremonies” (Hallowell 1926:153). He noted the closest similarity of traditions among the boreal hunting peoples of Asia and North America:

In particular, the outstanding customs which are associated with the bear throughout this vast region include *the performance of post-mortem rites and the disposal of the skull of the animal in a conventional way, conciliatory addresses, a varied synonymy for the bear usually accompanied by a specific taboo upon the use of the generic term, the belief that the animal sucks its paws for nourishment during hibernation, and the use of thrusting and striking weapons at close quarters in the hunt*. On the subjective side the idea seems to be widely prevalent that the bear is under the guidance of some sort of spiritual controller. The seeking out of the animal in its winter den is of wider provenience, as is an attitude of respect or veneration for the bear. [Hallowell 1926:154, emphasis in original]

He then proposes an ancient, common source for these traditions. This is a potent idea, with provocative implications for archaeological research.

In short, I think it more than likely that a bear cult was one of the characteristic features of an ancient Boreal culture, Old World in origin and closely associated with the pursuit of the reindeer. Later, it became intercontinental in scope, extending from Labrador to Lapland. As this culture spread, due perhaps to the necessity of following the migrations of the animal which was the chief source of subsistence, its original traits, including a veneration of the bear and simple rites associated with hunting the animal, became more and more widely diffused and radically modified in the course of time. [Hallowell 1926:161-162]

Largely because of its subject matter and evocative title, I believe, Hallowell's (1926) "Bear Ceremonialism in the Northern Hemisphere" has retained more attention than most 90+ year-old scholarly articles. It endures in citations by archaeologists as a touchstone for unusual finds of bear bones, and by others in cultural essays on bears. Its relevance to these subjects is understandable, but in at least some cases, Hallowell seems to be invoked uncritically, as a predeterminant of all human-bear connections.

After his dissertation, Hallowell's Manitoba fieldwork with the Ojibwe began in 1930, when he first met Chief William Berens at Lake Winnipeg. On the way there, he stopped briefly at Manitou Rapids on the Rainy River, and later encouraged Ruth Landes to work with elder Maggie Wilson there for her dissertation at Columbia University (Brown and Gray 2009:29; Cole 2003:61-62). As discussed below, this proved to be a significant development for the anthropology of bear ceremonialism in Minnesota.

In an essay in *Culture and Experience*, Hallowell returned briefly to concepts of bear ceremonialism in the context of Ojibwe world view:

Bears may be spoken to and are expected to respond intelligently; the bones of animals that are killed have to be disposed of with care. Although the Ojibwa are hunters and depend on the killing of wild game, nevertheless cruelty is not only frowned upon but may be penalized by subsequent sickness. [Hallowell 1955:109-110]

That summary connects to the concept of other-than-human-persons, which is another important anthropological legacy of Hallowell's career (Hallowell 1960; Brown and Gray 2009:21). To the Ojibwe and other native cultures, in North America and elsewhere, beings other than humans – whether animals such as bears, or spirits of stones, waters or places, or supernatural beings – are seen as persons, with social power and agency (Martin 2001:33). In this world view, as the ritual practices of bear ceremonialism demonstrate, humans and bears are not in a hunter-prey relationship. Rather, they, and perhaps a spirit master of animals, are involved in reciprocal and respectful social exchanges that involve serious responsibilities and consequences. This recognition is

important as a foundational context for the consideration of bear ceremonialism in the archaeological record.

#### Ruth Landes and Bear Ceremonialism in Minnesota

Ruth Landes (1908-1991) was a cultural anthropologist best known for her pioneering studies of gender (Cole 2003). She was a student of Ruth Benedict and Franz Boas, and a contemporary of Hallowell, and spent portions of her early career as a cultural anthropologist within and near Minnesota. For her dissertation fieldwork in 1932, she came to the Manitou Rapids Reserve on the Canadian side of the Rainy River (Minnesota's northern border). She chose Manitou Rapids based on Hallowell's recommendation (Cole 2003:71), and that work was the beginning of her famous collaboration with Maggie Wilson, an elder of Ojibwe, Cree and Scottish ancestry. In the early 1930s, Landes spent periods on the Rainy River thrice, and continued a lengthy correspondence with Wilson that primarily formed the basis of *The Ojibwa Woman*, one of Landes' best known books (Cole 2003:92-96; Landes 1997; Wilson 2009). She also spent time at Red Lake and Cass Lake in northern Minnesota, working with Midé elder Hole-in-the-Sky, and later at Prairie Island in southeastern Minnesota with the Mdewakanton Dakota in 1935. After this, in 1936, she went to Kansas to work with the Potawatomi (Landes 1937, 1968a, 1968b, 1970, 1997; Cole 2003:109-110).

So Landes' Minnesota research was conducted at the beginning of her career, when she was quite young. It was also conducted relatively quickly, especially considering that the information filled so many books. The books themselves are culture-specific ethnographies, and Landes' work in Brazil just before World War II for *The City of Women* (Landes 1994) eventually overshadowed her Minnesota studies. Landes has been criticized for her ahistorical approach, and her apparent insensitivity to issues of personal privacy and confidentiality in her writings. The charges against her by Lovisek et al. (1997) related to her Canadian work seem sharply personal as well, and some of them are difficult to reconcile with the largely sympathetic image of Landes in Cole's (2003) biography (I do agree that her ahistorical approach in *The Ojibwa Woman* is confusing). My focus here is on Landes' work with the Ojibwe and Dakota within and

near Minnesota, which recorded important accounts of bear ceremonialism that are largely overlooked in the literature on this subject. For this reason, I present them here as a significant complement to, and an initial step beyond, Hallowell's (1926) conception of bear ceremonialism.

Landes' dissertation, *Ojibwa Sociology* (1937), is based on her first visits to the Rainy River, and in it Landes contributes a compelling summary of local bear ceremonialism, on the feast for the spirit of the slain bear:

A man can give the feast only when he has shown power enough to kill a bear, for the bear manido is considered the greatest of all spirits except the Thunderbird. The successful hunter makes a rich feast of berries, maple-sugar, [wild] rice, jam, good parts of the bear (head, heart, tongue, feet, breast, fat, intestines). When his guests eat this, it is as though the spirit of the slain bear returned with the food to the chief manido of the bears. The chief is pleased with the offering and therefore restores the bear to life, that it may be slain again by the one who made the offering. If a successful hunter neglects to make the offering, he will be punished supernaturally, for he will meet a bear who will maul him or kill him in revenge. [Landes 1937:137]

*The Ojibwa Woman* was originally published the following year, in 1938. When I first read it, I appreciated the book's broader contribution as a pioneering study of gender (Cole 1997:x-xii, 2003:88-89), but because of the circumstances of my own career, I was also struck by the women's stories as remarkable and fascinating local history. The Rainy River of Minnesota and Ontario is an incredibly significant cultural region. Maggie Wilson's accounts (Landes 1997; Wilson 2009) provide a native perspective on a broad regional scale, reaching deep in time, and are an important bridge between oral history and archaeological studies. For example, the seasonal round Wilson's family followed in her childhood (Cole 2003:81-82) generally reflects the archaeological record of known sites and inferred seasonality of zooarchaeological assemblages around Rainy River and Rainy Lake, dating back 2,000 years or more, with spring fishing at spawning grounds, late summer wild rice camps, and winter hunting. One of these sites, 21SL898 in Voyageurs National Park, contains cremated paw bones from an adult and juvenile black bear (likely a mother and cub – see Chapter 5).

Wilson's stories in *The Ojibwa Woman* provide diverse perspectives on bears: for example, as helpers to those in need, as agents of supernatural retribution, as subjects of hunting in the spring, and as hungry raiders of logging camps in the muskeg (Landes 1997:92, 145-147). But she also provides important insights into gender roles and the contributions of women to the bear feast and other aspects of bear ceremonialism, which are generally described by anthropologists as activities of men alone.

[The returning hunter] smokes and tells them about his adventures. Perhaps he has killed a bear. Great event! For a bear 'is just like a human being, and must be honored like a guest from foreign parts'; then the spirit master of the bears will clothe the skeleton of this one with new meat and fur and send it again to the lodge. The bear is honored with a ritual feast conducted by the men of the lodge and neighborhood, and by having its bleached skull adorned with bright paint and ribbons from the Hudson's Bay factor. *It is the women who make these preparations*; the sister paints the skull for her brother, the wife paints it for her husband; likewise each woman prepares the food for the feast celebrating the enterprise of her brother or husband. After this the hunters leave the lodge again, each to return to his individual trapping trails; the grandmother, mother, daughter and young children remain together working at the meat, furs and hides left by each of the men. [Landes 1997:15, emphasis added]

In 1933, Landes came to northern Minnesota to work with Ojibwe shaman Hole-in-the-Sky (Will Rogers) at Red Lake, and returned to the Rainy River to continue her collaboration with Maggie Wilson. From these visits, she wrote of bear symbolism in the spiritual secret society of the *Midéwiwin*, and the other aspects of bear rituals beyond the bear feast and funeral. For example, Wilson told Landes (1968a:28) of bear visionaries (herself included), who can prophecy with the aid of a tiny bear that lives inside their body. This account is also another insight to bear feast and funeral (Hallowell's bear ceremonialism), as bear visionaries must eat bear meat at ritual feasts or lose the favor of the bear manido. Female bear visionaries can avoid this requirement, however. Wilson told Landes that she "had the tiny bear in the back of her neck (she showed it to me). She said that when she ate bear, her neck-creature swelled in size and activity, from distaste" (Landes 1968a:28). Wilson learned of her Bear manito from a sucking curer (that is, one

using a sucking tube; see Grim 1983:140-144; Rohrl 1981:94; Landes 1968a:47), who treated her for an illness.

When Maggie fell ill and called in the curer, he noticed a lump in her neck and sucked the Bear out: it looked like a tiny black worm. He replaced it and she was well. The doctor explained that she was a Bear protégé (unwittingly, until then) and had sickened the manito in her by violating a food tabu, probably. [Landes 1968a:38-39]

Wilson also described a bear sweat lodge, a “terrible ordeal” of 80 stones that are continually reheated, with participants required to stay inside:

Emulating the manito’s great strength, the visionaries exposed themselves to excesses of steam heat. Where other lodges, observing curing procedures apart from the Bear cult, employed four to sixteen burning stones, a Bear lodge employed eighty and continually reheated them. Where other lodges were only moderately blanketed in, a Bear lodge was swathed in tiers of birchbark and blanket. Where elsewhere the sweat-bathers could poke out their heads briefly from under the walls, a Bear lodge forbade it. ... Bear visionaries in the lodge maintained constant rituals; anything less was an admission of inadequacy or of false claims. Each man invoked his protector, mumbled his dream in the ceremonial, rapid, half-intelligible way, and sang the songs revealed to him. There developed a kind of vision-matching. Women were not admitted to a sweat lodge, because of lochial tabus, but the woman visionary stood outside and gave tobacco to an occupant to sing for her. [Landes 1968a:26-27]

In the lengthy trial of the ritual, the participants were spiritually transformed into bears. They “assumed fierce aspects of bears, and the lodge itself came to resemble the cavernous insides of a great bear” (Landes 1968a:27). Everyone, including the bear visionaries themselves, were fearful of the lodge.

Significantly, Bear is an important figure in the origin of the *Midéwiwin*, or Grand Medicine Society (Landes 1968a:95-113). This is a secret society focused on healing and spirituality that includes tiered levels of initiation. Landes (1968a:112) noted that accounts of the *Midéwiwin* from her visits to Manitou Rapids and Red Lake in the 1930s differed from those reported by Hoffman (1891) from northern Minnesota. Likely

because of intense anthropological attention and publications from the late nineteenth and early twentieth centuries, the current practice of the *Midéwiwin* is very private. Working in Ojibwe communities today, I cannot imagine asking anyone about it, and would not do so. For present purposes, for me it seems sufficient to know that bear power and imagery have connections to some of the secret practices in the society. Bear was also a spirit who occasionally appeared in the divining lodge, or shaking tent, and spoke with a deep voice (Landes 1968a:48-49).

In 1935, Landes was with the Dakota at Prairie Island, on the Mississippi River near Red Wing in southeast Minnesota (Landes 1968b), where she worked with Moses Wells and Grace Rouillard. Significantly for Minnesota archaeology, this is the most detailed account in the anthropological literature of bear ceremonialism among the Dakota (Hallowell does not mention them), including accounts of the winter bear hunt and feast, placement of bones beside a tree out of respect for the bear's spirit, and divination for future success in hunting. As presented in Chapters 5-7, many of the archaeological examples of bear ceremonialism in the state are from sites and time periods indicating cultural connections with the Dakota.

As an example of traditional hunting, Landes was told of John Smith, a Dakota shaman and hunt leader who died near Red Wing sometime between 1925 and 1935. The story was of a bear hunt on the Wisconsin side of the Mississippi River, near the northern end of Lake Pepin, probably in the late nineteenth century:

John Smith foretold that before sundown they would get a bear. The women were putting up tipis, the men were in the woods hunting, when John called that he had sighted the bear. He waited for the others to come, to allow someone else the privilege of shooting the precious animal. They found the bear in a den just large enough for him to stir in, filled with leaves blanketing him completely. The man who first reached the spot, at John's call, prepared a long stick for shoving out the leaves; poking, he wakened the bear, which sat up, whereupon the hunter aimed and shot him in the den. (In those days, Wells commented, they never pulled a bear out of the den as they did in 1935.) A 'warrior' climbed to the top of a nearby tree where he tied a rawhide rope, and then slid down the rope, which pulled down the treetop. The one who shot the bear tied the rope around the animal in the den and let the rope go; so the bear was swung out of

the den by a derrick. John gave the bear to the one who had shot it, then proceeded on for more. There were many bears then. John gave the first of whatever animal species he found to his people. [Landes 1968b:51-52]

Hunting was a matter of survival, and was often a communal exercise. Deer hunting was more common, and provided more stable support. Bears were an important resource, however, and finding a hibernating bear could be a life-saving event in times of hardship. Landes' work provides the only published account that I'm aware of, of a Dakota bear feast:

Always after a successful bear hunt the killer was obliged to give a sacred feast for the Bear spirit and all the hunters. It was called *waxlā·yks itca yüldwi ?tcaila* (bear feast) and also *pildā·wo?hā?pi* (thanks feast). ... The host did not eat, but distributed gifts to the guests if he could afford it. The meat was cooked with fat, and guests were to eat all they were served. People brought wooden dishes and seated themselves in a circle. The host was not to touch the meat with his hands but to fork it with a stick. He also dished out bear soup. He called the hunt leader to the center of the circle to thank the Bear spirit, invoke the "six directions" of the north, south, east, west, earth, and sky, and ask for more good fortune. [Landes 1968b:186]

Landes also described the contribution of women in the Dakota bear feast, while noting gender-related prohibitions:

Women prepared food and looked on but could not eat at this feast. (Eating was a Bear-communion, which female bloods defiled.) The wife of the hunter receiving the bear's head singed the head and cooked it, for her husband to invite two shamans to feast on it with him, in praise of Bear. As in the north, all bones were gathered carefully and buried near a tree. [Landes 1968b:187-188]

Moses Wells told Landes of a bear skull used after the feast. "The shaman laid medicine on the bear skull and prayed for a certain number of deer. As the boys now obeyed him, he secured all he asked, and saved his hunters from starving" (Landes 1968b:177). This short passage on divination by Dakota hunt leaders indicates that more than one type of

ceremony involved bear bones, and therefore holds important implications for interpretation of the Minnesota archaeological sites discussed below.

In her Minnesota work with the Dakota and Ojibwe, Landes contributed greatly to studies of bear ceremonialism. She highlighted important aspects of women's contributions to the bear feast and funeral, and significantly broadened the anthropological scope of bear-related rituals to include healing, spirituality, divination, and visions, and provided detailed accounts from the Dakota that are otherwise absent.

### Bear Ceremonialism beyond Hallowell

As we have seen, Hallowell's definition of bear ceremonialism was quite specific. His research question was equally specific, however. It focused on the previously reported traditions of the bear hunt, feast and funeral, and did not encompass all ritual interactions between bears and people. Furthermore, even within that defined scope, Hallowell did not consider his study to be comprehensive:

In a broad comparative survey such as this, there are, of course, inherent difficulties and limitations. Perhaps the most outstanding of these is the unevenness of the data available for different regions. This makes any interpretation of the evidence from a broad historico-geographical standpoint exceedingly tentative. At the same time it must be borne in mind that the customs and beliefs under review have suffered, in some regions, a total eclipse by the rapid diffusion of European ideas in the last few centuries. In many cases this reduces our sources of information to literary records, which can no longer be supplemented by field inquiry. [Hallowell 1926:23]

However, as Lydia Black (1998) points out, more recent discussions of bear ceremonialism have been restricted in scope:

In the United States and Canada, no attention has been paid to bear ceremonialism in cross-cultural perspective since Hallowell's preliminary study in 1926. We know much less about the significance of *Ursus* as a symbolic vehicle among Native Americans than about the customs of the peoples of Eurasia. While most specialists reject independent and convergent emergence of identical or strikingly similar complex structures, the question of a

single origin and diversification, linkages, or diffusion, remains an unresolved challenge. [Black 1998:346-347]

As just discussed, Ruth Landes added tremendously to accounts of bear ceremonialism specific to Minnesota and northwestern Ontario. Unquestionably, there are many bear-related traditions recorded in her work, unrelated to the bear hunt, feast and funeral that are nonetheless best described as “ceremonial.” Other writers further broadened the conceptual scope of bear ceremonialism in the late twentieth century. Foremost among these were Paul Shepard and Barry Sanders, whose *The Sacred Paw* (1985) is a wide ranging exploration into bear symbolism, ritual and history. Likewise, David Rockwell’s *Giving Voice to Bear* (1991) describes American Indian ritual and reverence related to bears far beyond Hallowell’s scope. Areas of ceremony addressed in these works include beliefs about bear-related powers in healing and warfare, as well as personal identity as reflected in dreams or visions, family totem relationships, or membership in secret societies. These topics are discussed below, and integrated when possible with examples from the archaeological record.

#### *Broader in Range, Deeper in Time*

Bear ceremonialism in Minnesota is most clearly linked to the Dakota and Ojibwe, the American Indian tribes resident in the state at the time of European contact. It should be emphasized, however, that these cultural connections become less certain with increasing archaeological age. Historical accounts of bear ceremonialism are often short, anecdotal, confusing and sometimes contradictory. Descriptions of bear ceremonialism practiced by the Dakota are particularly scarce (Landes’ *The Mystic Lake Sioux* is a significant exception). Bailey (1926:192) noted that the nineteenth century Dakota people of North Dakota “did not hunt them unless in dire need of food, as the bears were to them semisacred.” Also, Black Elk, the famous Lakota medicine man, stated that he received his healing powers from a bear, and he was known to imitate the sounds of a bear when he was ill (Brown 1992:31-33). More detail is presented by Hallowell (1926) and others (e.g. Kegg 1993; Casagrande 1952) in accounts of bear

ceremonialism practiced by the Ojibwe and other Algonquian cultures, extending well into the twentieth century.

It is important to recognize, however, that in recent decades, aspects of bear ceremonialism have been documented in other parts of the world. Hallowell (1926) focused generally on the northernmost parts of the northern hemisphere, and as just mentioned, left parts out. His source material consisted of published accounts, which did not allow for comprehensive coverage.

Two geographically extreme examples (relative to Hallowell's focus on the circumpolar north) provide a sense of the potential breadth of bear ceremonialism in other parts of the world. In an interdisciplinary study encompassing bear biology and cultural anthropology, Susanna Paisley (2001) captured and collected the first radiocollar data from Bolivian spectacled bears. By interviewing local people, Paisley documented reverence for bears, and ritual activities such as costumed bear dancers, amid a wide range of attitudes about wildlife and conservation. In Borneo, biologists studying the trade of wildlife for traditional medicines such as bear gall have noted indications of ceremonies by tribal cultures related to sun bears. For example, there are bear skulls carved with indigenous designs and decorated with beads for sale along with other bear parts including claws and teeth. "The shop attendant did not know where these skulls originated, but apparently they were used by Dayak people in religious ceremonies" (Meijaard 1999:187).

Also, anthropologists have primarily considered bear ceremonialism among the traditions of northern hunting peoples as practiced prior to acculturation as a result of colonialism or missionary conversion (generally before the nineteenth or early twentieth centuries). However, just as some aspects of bear-related rituals persist despite these impacts, it is increasingly recognized that people in other parts of the world practiced the traditions of bear ceremonialism in the past. In these cases, aspects of ancient bear rituals are reflected in more recent folkways or festivals, sometimes in symbolic form. For example, the Germanic language words "bruin" and "bear" are circumlocutions meaning "the brown one," and in that sense are like the "honey paws" and "black food" cited by Hallowell (1926:43-53) as aspects of bear ceremonialism. "The existence of our *noa*

name [substituted word] ‘bear’ implies that ancient Germanic tribes must have held the animal in similar religious awe, a respect that reaches out from the distant past to leave its mark on modern English vocabulary” (Manes 1997:148).

Some bears greatly appreciate efforts by humans to concentrate resources through gardening, agriculture and raising livestock. It was this change on the part of humans, arising independently at different times around the world, which gradually transformed the relationship of some cultures with bears. In the Middle East and Europe, this transition occurred primarily with the Neolithic period (ranging from ca. 10,000 to 5,000 years ago spreading from east to west). With agricultural production and more settled life, bears gradually became seen more as enemies than relatives, although some of the ideas of bear ceremonialism still persist millennia later in symbolic form. Examples of this are the bear-related names of mythic figures such as Artemis and King Arthur (Shepard and Sanders 1985:115-119, 129; Storl 2018:134-135; Pastoureau 2011:52-53; Jones and Pennick 1995). An archaeological example is the medieval Frösö Church in northern Sweden, where excavations during building restoration revealed the preserved base of a tree below the floor. Around it were bones from animals in the Norse myth of *Yggdrasil*, the Tree of Life, but with them were also bones from bears (Hildebrandt 1989). This may represent three layers of a sacred place: older bear rituals incorporated into a medieval pagan site, which was then preserved (rather than destroyed) under a Christian church.

Barry Sanders (1993:166; see also Shepard and Sanders 1985:58-60) has suggested that the traditions of Hallowell’s (1926) bear ceremonialism correspond culturally and geographically to stories of the bear mother or son. These legends describe a person who becomes lost in the forest and eventually meets and marries. The new spouse and relatives eventually reveal themselves as bears, often when hunters from the person’s original community approach. At this point in the stories, the spouse may describe the expectations of the social contract of bear ceremonialism. After the bear/spouse is killed, the person and their children return to the human village. In the context of these legends, the people from that time on are literally the relatives of bears, through the integration of the bear/children into the community.

A related legend is that of the great bear constellation – the Big Dipper, Ursa major in the Western tradition – and its circuit around the North Star. In some northern cultures, the stars that follow the bear are the hunters. Among the Micmac, they are birds, one of which is the passenger pigeon (Allen 2009:111).

#### Ethnographic Objects and Museum Collections

When considering bear ceremonialism as practiced in the past, ethnographic objects offer a conceptual bridge to archaeological artifacts. The context of ethnographic materials that include bear teeth, claws or imagery (jewelry or weapons, for example), are usually better known, depending on museum records. In many cases, it is known when and where the object was collected, who owned it, and what it was used for.

Archaeological collections, in contrast, are generally fragmented, and the context needs to be reconstructed from the site analysis.

In the course of this research, I've had the opportunity to examine several bear-related ethnographic objects. A Montagnais painted bear skull (Figure 33) collected at James Bay (the lower extremity of Hudson Bay) in 1932 is painted with red and black dots and bars. This is similar to decorated bear skulls Alanson Skinner (1911; see also Speck 1977:57) described from the Cree:

The skull of the bear is cleaned, and the brains removed through an opening made by enlarging the foramen magnum. It is dried, and painted with vermillion, and is placed in a safe place (now generally on a shelf in the Hudson's Bay Company store, if the Indians are at a Post) and kept there from three to six months, when it is secretly taken by its owners and hung up on a tree in the forest. [Skinner 1911:70]

These painted bear skulls are similar to the one Ruth Landes described from the Rainy River. A skull such as this would be prepared following the bear feast.



*Figure 33. Montagnais painted bear skull collected in 1932 at James Bay, Catholic University of America (AN1996-70, Acc No. 6558), Washington, D.C.*

I have found a zooarchaeological approach to be a clear benefit when studying grizzly claw necklaces, to assess the number of bears represented by the claws. I first tried this with a necklace attributed to the Lewis and Clark expedition at the Peabody Museum (Figure 34). In that case, it appeared that a minimum of 20 bears were represented by the 38 claws, based on their color, size, and morphology. Four claws were the most from one bear, while other bears were represented with three, two, or often just one claw (Mather 2007b). A different style of grizzly claw necklace from Minnesota is part of the Whipple Collection at the Science Museum of Minnesota (Figures 34 and 35).

These ethnographic necklaces provide a conceptual bridge with archaeological finds, such as the Oneota grizzly claw necklace from Horse Thief Cave in Iowa (Figure

36), of which only the bone cores of the claws remain (Laird 1989; Alex 2002; McKusick 1964:157), and potentially other remains of claws from both grizzly and black bears.



*Figure 34. Grizzly claw necklace attributed to the Lewis and Clark Expedition, Peabody Museum, Harvard University (41-54-10/99700).*

#### Contexts and Archaeological Connections

Bears are represented in a variety of ways in the archaeological record. Perhaps the most frequent are finds of physical remains such as bear bones, including single claws and teeth. Often although not always, zooarchaeological analysis is needed to fully comprehend the nature of these finds. For example, an Illinois site contains a rich and diverse faunal assemblage a NISP greater than 2,450, and representing at least 97 species of mammals, birds, reptiles, amphibians, fish and mollusks. Of these, only 2 black bear teeth were present, and both were “painted and drilled at the root end” (Parmalee 1962:407). Likewise, bears are rare finds in the vast zooarchaeological assemblages from Woodland and Oneota sites of the La Crosse area (Theler 2000).



Figure 35. Grizzly claw necklace from Minnesota given to Bishop Whipple, Science Museum of Minnesota collections.

e Eagle that Flies in the Air" by the  
and braves of the Ioway nation.

with many wives. His favorite was  
Rantchewaime. His portrait, painted  
by Charles Bird King in Washington, D.C.,  
in 1824, is the basis for this illustration.

**Bear claw necklaces** were highly  
prized by the Ioway and Oto tribes. This  
archaeological specimen from Horse  
Thief Cave in Jones County consists  
only of preserved bone. The long claws  
of the grizzly bear have deteriorated,  
and so has the oval foundation of  
the necklace which was made of fur.

s ornament was probably a side  
the stock of the gun. The gun  
om near Iowaville is of a French  
lar to ones found on Osage  
issouri. The gun flints are  
i-made.



**Iron knives** with bone and wooden  
handles first appeared on Ioway sites  
in northeast Iowa in the 1680s.  
**Whetstones**—sharpening tools—  
also appear at this time.

The forge-made iron  
“squaw axe” or *hoe*  
efficient than their st

Figure 36. Archaeological example of a grizzly claw necklace from Jones County, Iowa (Iowa Museum of Natural History, Iowa City).

### *Cave Bears, the “Bear Cult” and Paleolithic Parietal Art*

Vast accumulations of cave bear (*Ursus spelaeus* and *U. deningeri*) bones in European caves have been noted for centuries, first by antiquarians, and more recently, paleontologists and archaeologists. Ironically, however, antiquarian fascination with cave bears and ancient humans has been a hindrance to consideration and acceptance of the anthropological concept of bear ceremonialism in general. Provocative claims about the “bear cult” as the origin of human spirituality stemmed from cave investigations in the early twentieth century that were based on sloppy field recording (Kurtén 1976:84-86).

It is useful to point out that these early cave bear investigations were very current just as Hallowell was finishing his bear ceremonialism research. Emil Bächler’s work at Drachenloch cave in Switzerland ended in 1923, the year before Hallowell completed his dissertation which was published two years later as “Bear Ceremonialism in Northern Hemisphere” – the same year Bächler (1926) published on Drachonlach. Likewise, Abel’s (1926) excavations in the Drächenohle cave in Austria occurred from 1920 to 1923, and were also published the same year as Hallowell’s article.

Hallowell (1926:162-163) cautiously allowed that “it is not impossible” for his bear ceremonialism to be connected historically to Paleolithic human-bear interactions, but he also warned against the idea of cave art reflecting “the *origins* of man’s earliest attitudes toward animals” (Hallowell 1926:4, emphasis in original). He pointed out that “thousands of years of human cultural development had preceded the development of this art,” (1926:4-5), so the Upper Paleolithic should instead be seen as a reflection of a relationship that was already ancient even then. I love that idea. Humans and bears co-evolved over millions of years. There’s no way to know how and when we first interacted, or what occurred in those encounters.

Upper Paleolithic parietal art in European caves provides the most specular archaeological evidence of early human ritual. Images of bears are relatively rare among the art at most caves, however, despite the ubiquitous presence of their bones. This changed with discovery of Grotte Chauvet-Pont d’Arc in southern France, in

1994 (Chauvet et al. 1996; Bocherens et al. 2006). The cave was designated a UNESCO World Heritage Site in 2014. Not only are there images of cave bears dated to at least 32,000 years ago, there are bear pawprints, among bear bones and skulls that are undisturbed by antiquarians. Some of the remains appear to be placed in special positions, such as with a skull on a higher stone, where it would not likely end up in a natural death assemblage. And in some other Paleolithic caves, there have been rare finds of bear bone with cut marks or traces of red ochre, clear indications of human action and because of the ochre, likely ritual in nature. Germonpré and Hämäläinen (2007) have suggested that these finds represent a proto-bear ceremonialism (see also Germonpré 2004:60). Also, a small Aurignacian bear statuette (about 5 cm) from Geißenklösterle in Germany is interpreted as representing an Upper Paleolithic tradition of shamanistic transformation. Related artifacts include other figurines made of mammoth ivory or bone depicting large terrestrial animals, including the famous lion-man from Hohlenstein-Stadel (Dowson and Porr 2001:168-172).

#### *Integration of Bear Ceremonialism and Archaeology*

In a backlash to the dramatic early twentieth century claims of a Paleolithic “bear cult,” many archaeologists and paleontologists closed themselves off to the idea of bear ceremonialism. In *Bones: Ancient Men and Modern Myths*, Lewis Binford was dismissive of the idea of Paleolithic bear ceremonialism in particular:

This idea of a special relationship between man and cave bear seems to have struck a responsive note in modern readers, for almost all literature treating the “origins of religion” cites these arguments and places particular emphasis on these “important” developments leading to our “human” status. [Binford 1981:11]

The criticisms by Binford, Kurtén (1976) and others of poor field recording and uncritical interpretation in the social sciences are justified. In my opinion, however, the reaction was severe enough in the end to be unhelpful because it was also uncritically applied, not

just to Paleolithic cave sites but extending to a general rejection of the potential for bear ceremonialism in the archaeological record.

Nevertheless, rare finds in North America, Scandinavia, and Asia increasingly pointed to clearly ritual connections between bears and people. In 1946, William Ritchie investigated an unusual assemblage of black bear bones (NISP 90, MNI 7) and pottery that had eroded from the bank of Carpenter Brook in western New York. Also identified in lesser numbers were remains of freshwater mussels, fish, deer, and a variety of small mammals including a dog.

The principal animal was therefore the black bear whose remains constituted 60% of the entire series. To this total must be added the skull and jaw fragments of two or three individuals found and retained by Mr. Mann. Thus a minimum of 9 bears, immature and adult, are represented by bones derived chiefly from the feet and head of this animal, a fact of probable significance in the interpretation of the data. [Ritchie 1947:62]

Citing Hallowell's (1926) "definitive study," Ritchie connected the finds to the anthropological context of bear ceremonialism based on the focus on head and paws, offerings with the remains, special disposition of the bones and artifacts, and indications of a communal feast (Ritchie 1947:70). A few years later, Ritchie found a pit feature with partial skeletons of two black bears within an ancient cemetery where people had also been buried in pits.

While it is impossible to account for the missing bear bones, the evidence for the ceremonial killing, eating, and disposition of the unmutilated remains, safely away from dogs or other violating agents, would seem to be unequivocally established, and these factors constitute primary considerations in the bear cult, as widely observed in the boreal regions of both the Old and New Worlds.  
[Ritchie 1950:248]

The New York finds occurred around the same time as the discovery of hundreds of bear bones at the Christensen Mound (21SH1/16) in Minnesota, as described in Chapter 6.

Also in the mid-twentieth century, pioneering zooarchaeologist Paul Parmalee (1963) discussed black bear skulls from the Bell site in Wisconsin in terms of Hallowell's (1926) bear ceremonialism. Like Ritchie's (1950) second find in New York, the skulls were complete except for damage to the temple, indicating where the animals had been struck with a club. The Bell site is a protohistoric Fox village in northeastern Wisconsin (Koziarski 2017, 2020).

The first comprehensive integration of archaeology with the anthropological concept of bear ceremonialism was *Lappish Bear Graves in Northern Sweden* (Zachrisson and Iregren 1974). In that investigation an archaeologist and an osteologist collaborated to study six Sámi bear graves that had been found in Norrland, along with reports and previously collected finds from four others. Two of the bear graves were removed in their entirety to the Västerbotten Museum at Umeå where they were excavated under controlled conditions, and those were the focus of the osteological analysis. The Sámi (Lapps) are the westernmost group in Hallowell's (1926) circumpolar progression, in northern Scandinavia. The investigators compared the archaeological evidence to historical and anthropological accounts of Sámi bear rituals. The bear graves were the special repositories for individual bear remains following a bear hunt and feast. While many of the bones had been broken open for marrow (contrary to the written accounts), the skull and paws were placed in the grave intact, and all the bones were generally arranged in the correct anatomical position. The sites were on islands or other remote locations, sometimes in the cleft of a large rock or other sheltered position. More recently, many bear graves (at least forty) have been identified in Norway and elsewhere in Scandinavia. The oldest known bear graves date to the second century CE, and historical records indicated that the practice of bear burial may have been practiced by the Sámi as recently as the nineteenth century. Other bear remains were known from "sacrificial sites" with caribou and other animal bones. These sites are often located with prominent features of the natural landscape (Zachrisson and Iregren 1974; Mulk 1994; Jennbert 2011:111-113; Hansen and Olsen 2014:120-122).

Considering the northern Rocky Mountains, Michael Ciani (2014) interprets archaeological finds of bears, including zooarchaeological remains and rock art, in the

context of ethnography. Sometimes, however, the connection between archaeology and bear ceremonialism is not acknowledged or obvious, such as with consideration of Mesolithic polar bear hunting at the Zhokov site in the New Siberian Islands (Pitul'ko and Kasparov 1996). While this is well within Hallowell's (1926) scope of the northern hemisphere, he focused on brown/grizzly and black bears but only briefly mentioned polar bears. Remains of polar bears are rare in the archaeological record, which could itself imply ceremonial treatment, but at this one site they are exceptionally plentiful (NISP 397, MNI 21), and essentially comparable to reindeer (NISP 450, MNI 20). The authors do not discuss the site in terms of ceremonialism, and rather, focus on damage to the skulls and mandibles, butchery practices, and body part representation, which is focused on the skulls and limbs, but not the paws. In comparison, they do mention that bear skulls collected from Nenet sacrificial sites have almost no damage (Pitul'ko and Kasparov 1996:20). Yet the damage to the skulls is similar to that seen in North America at the Bell site, for example, and the hole in the ascending ramus of one mandible (Pitul'ko and Kasparov 1996:21-22) appears very similar to the pierced black bear mandibles from the Great Lakes (Martin 2020). Furthermore, Hallowell's one passage on polar bears is of interest here:

A ceremony is performed over slain polar bears by the Asiatic Eskimo, which is similar to that observed by them any time a whale is killed. After being brought to the village the carcass of the bear is skinned, "but the head, the neck and the shoulders are left with the skin. This receives a "drink" before the entrance (to the hut), and a sacrifice of sausage, and is then brought into the house and into the sleeping room, where it is put on the master's side and in the place of honor." [Hallowell 1926:82, quoting Bogoras]

In the Zhokov Island archaeological site, fragments of the skull, humerii and ulnae are plentiful, while the scapulae, pelvis and bones of the rear limbs are rare (Pitul'ko and Kasparov 1996:23). At least superficially, this sounds similar to the description by Hallowell.

Several papers related to bear ceremonialism were presented at the 1999 Midwest Archaeological Conference in East Lansing, Michigan. I spoke about the then-recent

project at the Bear site, and the previous finds at the Christensen Mound and Crace sites. Tom Berres later published a review of archaeological finds relative to Hallowell's work. I contributed a short section on the Minnesota finds to the article, as David Stothers did for the eastern Great Lakes, but the bulk of the discussion was Berres' work (Berres et al. 2004). That conference was at the beginning of my dissertation research. Bookending it near the end, was a symposium at the 2017 Society for American Archaeology conference in Vancouver, organized by Heather Lapham and Greg Waselkov, on "An Other-Than-Human Being: The Archaeology of Bears in North America," with the papers then assembled in an edited volume (Lapham and Waselkov 2020; Mather 2020).

In the sections that follow, I present examples of archaeological bear finds with aspects of bear ceremonialism, or at least bear reverence, in interpretive categories conceived or inspired by Hallowell (1926), Landes (1937, 1968a, 1968b, 1997), and later writers (Shepard and Sanders 1985; Rockwell 1991; Schlesier 1987; Sokolova 2000), and blended with ethnographic accounts that were not available to Hallowell. I present Hallowell's (1926) categories first of the bear hunt, feast and funeral, followed by other aspects that I have grouped in a general category of "bear power."

#### Gii-maajaa'ind a'aw Makwa: The Bear's Funeral

The primary stages of Hallowell's (1926) bear ceremonialism are the bear hunt, feast and funeral. Access to bear meat, fur, claws, teeth, oil and bones was economically important to northern hunting cultures in what-is-now Minnesota and elsewhere, and even an immediate matter of survival in times of winter hardship. Yet obtaining this access required killing a dangerous being that was also seen as a relative. The rituals of Hallowell's (1926) bear ceremonialism provided a means for reckoning with these contradictions through a "spiritual exchange of a highly charged sort" (Martin 2001:35).

On one hand, the bear is a dangerous animal whose meat is a rare delicacy, whose fur is valuable for exchange, and whose fat is seen to have important medicinal properties. At the same time, the bear is seen as a supernatural emissary from the domain of the spirit masters. Resolving these binary tensions is central to the treatment of the bear. [Jordan 2003:115]

The most obvious archaeological expressions of bear ceremonialism are bear graves (e.g. Zachrisson and Iregren 1974), as Hallowell's (1926) last stage. It is also possible, however, for archaeology to also contribute to our understanding of the others, including the hunt and feast. For each, I present the anthropological context in the following sections, with examples of archaeological evidence. As described below, I group these aspects of bear ceremonialism under the heading, *Gii-maajaa 'ind a'aw Makwa*, as a tribute to Mille Lacs elder Maude Kegg. Within the broad traditions of bear ceremonialism, the hunt and feast are conceptually connected to the funeral, and Kegg's story by that name provided the title of the Bear site report (Kegg 1993; Mather and McFarlane 1999). While I now realize that the Bear site represents a different type of ceremony, as described in Chapters 5 and 8, in 1999 my only context for the archaeology of bear rituals was Hallowell's (1926) definition.

### *The Bear Hunt*

Ritual behavior related to bears is a constant among cultures who share the traditions of bear ceremonialism, but they are particularly focused on the hunt. This is the most physically dangerous encounter between people and bears, and the outcome is dependent upon proper behavior of the hunters, as well as others who are not directly involved. For example, as described above, the word "bear" is not spoken in preparation for the hunt, for fear of offending the animal, or warning it of their intentions. This is time when circumlocutions are used, such as "honey paws," or kinship terms such as "Grandmother" (Lot-Falck 1953:104-108; Jenks 1900:680).

From his experiences among native peoples of the western Great Lakes in the late seventeenth century, Nicolas Perrot wrote a detailed account of winter bear hunting with related rituals. Unfortunately, he did not specify which group he was speaking about in these passages, as his account, "Memoir on the Manners, Customs, and Religion of the Savages of North America," was broadly general in scope. It was written around 1717 (Wehning 2013:35), transcribed and published in French by Jules Tailhan in 1864, and

then translated to English by Emma Blair in 1911. Tailhan stated that from approximately 1665 to 1669, Perrot spent time among the Ojibwe, Dakota, Potawatomi, Menominee, Fox, Miami, Iowa, Odawa and Huron (Blair 1996:I:26), including periods in what-is-now Wisconsin and Minnesota. The hunt described took place “in the season when the elk and deer are lean.”

A war-chief will make up a party of young men, to whom he will give a feast; but note here that the givers of the feast may not eat of it; it is for them to see that the others eat enough. This chief, I say, declares before all the assembly that he desires to go on a bear-hunt, and invites them to accompany him, telling them the day on which he has decided to set out. It must be understood that this feast is sometimes preceded by a fast of eight days, without eating or drinking, in order that the bear may be favorable to the chief and those of his party – meaning that he desires to find and kill some bears, without incurring any injury to himself or his people. [Blair 1996:I:127-128]

Rituals continued during the lengthy and systemic hunt for winter dens, before and after the bears are found and killed:

The day of their departure having arrived, he assembles all his men, who, like himself, have their faces blackened with coal; and all remain fasting until evening, when they eat, but only a little. They set out the next morning, and at the start the chief of the party begins to station his men so as to make a circuit of about a quarter or half of a league, and to complete the enclosing line which was planned at the very place from which they departed. They beat up and then range through the tract of land which is thus enclosed; and they carefully examine all the trees, roots, and rocky places which are within their circuit, and kill the bears which may be found there. As soon as they kill one, they light a pipe and, thrusting it into the animal’s throat, they blow the smoke out through its nostrils. They cut the string that is under the tongue, and wrap it in a piece of cloth in order to keep it with great care. After they have carefully examined and traversed all the places within this enclosure, the chief forms still another circuit, if the weather permits; and his men search through this in the same manner as I have already described. [Blair 1996:I:128]

The hunt continues over subsequent days, sometimes for eight days or more, with processing and feasting in the evenings (see below). Returning to the hunt:

It is their custom to hunt on the next day as on the first, to blacken themselves with coal, and to observe their fasting until evening. ... They conduct this hunt with bows and arrows, and not with guns, because the noise would frighten those who were not far away, or prevent them from leaving their lairs. [Blair 1996:I:129]

I quote this account at such length because it is the oldest detailed description from near to (or possibly within) our study area. For the same reason, I'll continue with Perrot's account in subsequent sections, below. It is possible that future oral history or archival research can narrow down the location, and possibly the tribe who conducted the hunt.

In recorded accounts I've seen of traditional bear hunts, the hunters are all men. I would not assume this was always the case, although gender-based roles and restrictions are often cited. These are attributed to the potent and dangerous spiritual power of the bear. For example, Sidney Huntington, a Koyokon elder from Alaska, wrote that it would be dangerous if women even knew that a hunt was going to occur.

Early Koyokon hunters never talked about big game animals in the presence of a woman. This was a cultural taboo, and was particularly true for the brown or grizzly bear. Their respect for "the big animal," as the grizzly was always obliquely referred to, was close to fear. This is not surprising, considering that the early hunters had to face this, the largest and fiercest North American land carnivore, with nothing more than a spear or bow and arrow. [Huntington and Rearden 1993:169]

Preparations were carried out in secret, because if others heard, particularly women, the hunters could be in danger. "Sometimes a woman, learning of a hunt, warned the man. 'Don't go. We've heard of your plans.' When that happened, the hunter cancelled the hunt" (Huntington and Rearden 1993:170).

Alexander Henry the Elder accompanied an Ojibwe family on a bear hunt in what-is-now Michigan, in the early 1760s. The bear was denned in a tree, and Henry shot her. He was baffled when his companions then apologized to the bear, seeking to appease her spirit:

The bear being dead, all my assistants approached, and all ... took her head in their hands, stroking and kissing it several times; begging a thousand pardons for taking away her life: calling her their relation and grandmother; and requesting her not to lay the fault upon them, since it was truly an Englishman that had put her to death. [Quaife 1921:139; see also Quimby 1966:168-169]

While bears are accessible at all times of the year, they are most easily killed during hibernation, and this is also a time when other large mammals are depleted of fat. Finding a bear's den could be a literal matter of survival in times of cold and starvation. As Henry recorded, "The Indians remark that the bear comes out in the spring with the same amount fat he carried in in the autumn; but after exercise of only a few days, becomes lean" (Quaife 1921:141). That bear was killed in February, and the fat was six inches deep in places. "This being divided into two parts, loaded two persons; and the flesh parts were as much as four persons could carry. In all, the carcass must have exceeded five hundred-weight" (Quaife 1921:139). The Ojibwe family whom Henry accompanied preserved the bear's fat in six porcupine skins, and it was still in good condition the following summer.

In a time of winter starvation at Prairie Portage in what-is-now Manitoba, Net-no-kwa, John Tanner's adoptive Odawa mother, prayed for a medicine hunt:

"My son, last night I sung and prayed to the Great Spirit, and when I slept, there came to me one like a man, and said to me, 'Net-no-kwa, to-morrow you shall eat a bear. There is, at a distance from the path you are to travel to-morrow, and in such a direction, ... a small round meadow, with something like a path leading from it; in that path there is a bear.' Now, my son, I wish you to go to that place, without mentioning to any one what I have said, and you will certainly find the bear, as I have described to you." ... At length, I resolved to go in search of the place she had spoken of, and without mentioning to any one my design, I loaded my gun as for a bear, and set off on our back track. ... I turned off, continuing carefully to regard all the directions she had given. At length, I found what appeared at some former time to have been a pond. It was a small, round, open place in the woods, now grown up with grass and some small bushes. This I thought must be the meadow my mother had spoken of; and examining it around, I came to an open place in the bushes, where, it is probable, a small brook ran from the meadow; but the snow was now so deep that I could see nothing of it. My mother had

mentioned, that when she saw the bear in her dream, she had, at the same time, seen a smoke rising from the ground. I was confident this was the place she had indicated, and I watched long, expecting to see the smoke; but wearied at length with waiting, I walked a few paces into the open place, resembling a path, when I unexpectedly fell up to my middle in the snow. I extricated myself without difficulty, and walked on; but remembering that I had heard the Indians speak of killing bears in their holes, it occurred to me that it might be a bear's hole into which I had fallen, and looking down into it, I saw the head of a bear lying close to the bottom of the hole. I placed the muzzle of my gun nearly between his eyes, and discharged it. [James 1830:52-53]

The bear was brought to the camp, “and, as being the first I had killed, was cooked all together and the hunters of the whole band invited to feast with us, according to the custom of the Indians” (James 1830:54).

Similar to Net-no-kwa’s strategy, Dakota women were skilled observers of the natural world, and could work around gender prohibitions to help secure a bear. At Prairie Island, a woman finding a bear would not say so publicly, “probably because women were not supposed to hunt bears or have significant contact with them. But she did tell her husband, who raised the hunter’s shout” (Landes 1968b:187).

While not mentioning rituals, an Ontario Ojibwe elder in the 1920s told Paul Radin of “various uses of the bear,” referencing the seasonality of the winter hunt:

During the winter the Indian kills a bear and prepares grease out of its fat. This grease is used in the summertime. Out of its hide he makes blankets. But it is on deerskins that he lies. (After they have cooked all the bear meat, they look for some basswood strings and boil them. After they are well boiled they leave them outside to dry. Then the tie them together on the inside and they paint some red, yellow, and some black. Thus they make beautiful bags.) [Radin 1928:665]

Winter season bear hunting was also mentioned by La Potherie (Blair 1996:I:304), in his 1753 Great Lakes account, “History of the Savage Peoples who are Allies of New France.” Winter is the most common season for Khanty hunters to hunt bears in western Siberia, as their dogs find the dens in the snow (Jordan 2003:250). Summer hunting also

occurred, however, often using deadfall traps made from heavy logs (Hallowell 1955:208).

I am aware of no identified archaeological sites in Minnesota related to bear hunting. While such sites could, and presumably do, exist, any surviving evidence would likely be ephemeral at best. Bear dens themselves would leave a variable record. Caves used by bears have the best potential for preservation, although they would presumably be used repeatedly (such as the cave bear sites in Europe) by bears, humans and other animals, making it difficult for evidence of a single event such as a kill to be recognized. Many bear dens in Minnesota are relatively small, shallow holes dug into the earth by the bear. Others are simply locations, sheltered or not, where the bear just curls up on the ground. Even if artifacts were present at such a place, it is unlikely that they would be found in an archaeological survey. Therefore, barring exceptional circumstances, the kill site itself will probably not be a recognized part of the archaeological record of bear ceremonialism.

Hunting implements and other artifacts are recognizable, however, although in most cases it will be hard to distinguish those related to bears from others intended for general use. A possible exception is a bear spear. These were sometimes made from the sharpened ulna or other bone from a bear, and therefore could be identifiable through zooarchaeological analysis. Sidney Huntington described the process of making a bear spear for hunting grizzly bears in Alaska, emphasizing that the wooden spear shaft was the most important part (Huntington and Rearden 1993:169-170). Enraged grizzlies would impale themselves on these spears trying to get at the hunters, and if the shaft broke the hunter would likely not survive. The wood was cut in July from slow-growing birch, and repeatedly tempered and tested for any indications of weakness.

Both the point, often made from a sharpened bone from a grizzly, and a crossbar were attached with wet rawhide. As rawhide dries, it shrinks. This tightened both the crosspiece and the point so that both were rigidly attached. The crosspiece, fastened about nine inches from the tip, acted as a stop, preventing the spear from entering the bear too far. [Huntington and Rearden 1993:170]

Huntington estimated that the last grizzly hunt there using a spear took place around 1917.

It is possible that bear hunting sites or weapon-related artifacts may be identified through future analysis of blood residues on stone tools. For example, Loy and Dixon (1998) identified grizzly bear (*Ursus arctos*) blood on Paleoindian fluted points at two sites in Alaska, based on analysis of hemoglobin crystallization and red blood cell size. If future studies in Minnesota identify lithics that were used to kill or butcher bears, further analysis could occur to examine the possibility of the sites being a possible former bear den location. Alternatively, however, tools like this could be used at a different location in preparation of the bear feast.

There is also potential for sites to be identified that are connected to rituals conducted in preparation for the hunt. For example, the Naskapi conducted sweat lodge ceremonies before bear hunts, “for it would seem that in this particular region the sweat bath has developed into a means of control over that animal” (Speck 1977:221).

### *The Bear Feast*

The most famous accounts of bear feasts are those of the Ainu in northern Japan, and neighboring peoples of northeastern Siberia, which involved keeping a captive cub while it grew and eventually was the subject of the sacrifice and feast. In this context, it is interesting to consider the find of a bear’s mandibles at a Mesolithic site in France. It exhibits wear between the first and second molars that is indicative of a halter placed at a young age, causing deformation of the bone as the bear grew (Chaix et al. 1997). Near Lake Superior in the nineteenth century, German traveler Johann Georg Kohl described the Ojibwe keeping captive bears and other animals, sometimes for food, and sometimes as pets:

The Indians frequently tame wild animals, and I have seen various instances of it. I was told that they also tamed eagles, mews, ravens, and magpies, sometimes as playthings, but also to fatten and then eat them. In the same way they are said to treat deer, foxes, and even bears, and they lug the latter along after them by a rope or chain. A

Voyageur told me that he once met an Indian carrying his bear on his back, because the brute was very tired, and its whining had moved his tender heart. [Kohl 1985:67]

Perrot's account of the large bear hunt in the western Great Lakes explains that respectful treatment of the bears at the feast is necessary for continued hunting success and physical safety in the future.

They also have the habit of washing themselves before their meal, with the notion that, if they failed to do so, they would transgress rules absolutely necessary for obtaining success in hunting bears; and they, these animals being hidden in their holes, the hunters could not discover them, or else would run great risk of being devoured by them. [Blair 1996:1:129]

On the Rainy River, Ruth Landes described the bear feast in her dissertation:

A man can give the feast only when he has shown power enough to kill a bear, for the bear manido is considered the greatest of all spirits except the Thunderbird. The successful hunter makes a rich feast of berries, maple-sugar, [wild] rice, jam, good parts of the bear (head, heart, tongue, feet, breast, fat, intestines). When his guests eat this, it is as though the spirit of the slain bear returned with the food to the chief manido of the bears. The chief is pleased with the offering and therefore restores the bear to life, that it may be slain again by the one who made the offering. If a successful hunter neglects to make the offering, he will be punished supernaturally for he will meet a bear who will maul him or kill him in revenge. [Landes 1937:137]

While searching for the route to the Mississippi River from the Great Lakes with the party of René-Robert Cavelier Sieur de la Salle in the winter of 1679-1680, Father Louis Hennepin made note of a bear feast among the Illinois: "The next morning after our public prayers, we went to the village where we found the Illinois assembled in the cabin of one of the most important who was giving a bear feast, which is a meat that they esteem highly" (Shea 1880:184). This was likely in what-is-now northern Illinois or southern Wisconsin. We can wish that Hennepin would have provided more detail, but from his brief mention it can at least be inferred that the bear feast was a significant

event. Later, in April 1880, Hennepin described a bear feast by the Dakota in or near southeast Minnesota, at Lake Pepin:

During one of these nineteen days of our very painful navigation, the chief of a band by name Aquipaguetin, resolved to halt about noon in a large prairie; having killed a very fat bear, he gave a feast to the chief men, and after the repast all the warriors began to dance.

Marked in the face, and all over the body, with various colors, each being distinguished by the figure of different animals, according to his particular taste or inclination; some having their hair short and full of bear oil, with white and red feathers; others besprinkled their heads with the down of birds which adhered to the oil. All danced with their arms akimbo, and struck the ground with their feet so stoutly as to leave the imprint visible. [Shea 1880:215]

Speck (1977:103-106) describes a Naskapi bear feast with a diagram of the lodge he observed at Lake Michikamau, Quebec (Figure 37). The feast was held by two families. The bear was prepared and served by the married women, on bark trays.

The bear's head was laid at one end of the tent facing inward, while during and after the feast the company at times danced as the line in the diagram indicates. The head was passed around the assembly in a birch-bark dish, and they ate from it without using knives. This procedure was continued all night until the entire animal was devoured. The bones were then all thrown into the fire. [Speck 1977:104]

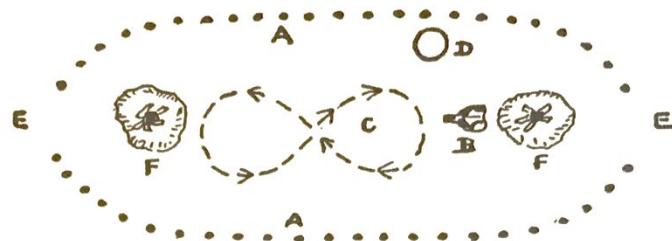


FIGURE 6  
Diagram of feasting lodge (*cabətowa'n*) from native drawing by man of Michikamau band. (A) Spectators' seats; (B) bear skull, when feast celebrates eating of bear meat; (C) direction taken by dancers; (D) tambourine drum hung from roof poles; (E) entrances at ends of lodge; (F) fires on flat stones.

Figure 37. Diagram of a Naskapi lodge used for a bear feast (Speck 1977:104).

Not all meals of bear meat were formal feasts, and it is important to also consider these when considering the archaeological record. One example relevant to our area is George Duffield's (1903) childhood memory from 1837 in southeast Iowa. He had spent a day swimming and fishing with Mesquaki boys, and returned with them to their village where he was invited to eat.

Hanging near one of the teepees was the carcass of a large bear, the skin still on, and none of the meat seemed to have been taken out. The odor from the kettles and from the fragments which dropped into the fire started the saliva in our mouths, and caused us to accept the invitation with unanimous voice. Of course the visiting "skin-aways" were favored guests, and my Indian companion brought to me a fresh clean piece of bark on which lay a steaming piece of that big bear. My hands almost trembled in hungry and appreciative expectancy. Then I saw that I was offered a whole unskinned, unscraped foot of the bear. I put it from me; but my companion threw away the bark, took the hot paw in his dirty hands, pulled off the nails and hair with his teeth and spit them out, then ate that foot. I had not noticed the cooking process till now. One of the kindest and most active of the squaws sat in the door of her teepee rapidly drawing into the kettle at her left the entrails of the bear, as with her right hand she stripped out their contents. [Duffield 1903:209]

From his friend's reaction, it seems clear that the bear paw was given as a special dish, and it is unfortunate that George was not able to better appreciate this honor. He mentioned that this event occurred during the last years of Meskwaki residence in southeast Iowa, just before the Black Hawk War. This was less than a century after the Meskwaki were forced from the Bell site (47WN9), their Grand Village in central Wisconsin (Koziarski 2017:42, 2020).

Archaeological traces of a bear feast may potentially be identified through hearths, earth ovens or other cooking features, although it may be difficult to differentiate these from similar (or the same) features used for other cooking. Bear fat can be identified in lipid analysis (Malainey 1997; Skibo et al. 2016), and this type of study holds great potential for the archaeology of bear ceremonialism. Also, consideration of bear feasts can benefit from the archaeological context of feasting in general (Russell

2012:413), although this often comes down to the presence of unusual animals, features, or both. For example, I suspect an atypical faunal assemblage from Sleeping Bear Dunes National Lakeshore in Michigan is related to a Woodland Tradition feast. It includes calcined and fragmented bear bones from the front and back paws (NISP 17, MNI 1), as well as beaver, snapping turtle and fish (Mather 2003a). The anthropological model of bear ceremonialism suggests that bear bones should not be present at the feast site because they are respectfully buried or placed elsewhere, but it is possible that archaeologically identifiable traces could still be present. In Chapters 5 and 9, I discuss archaeological evidence that I believe relates to bear feasts in Minnesota, including the not uncommon presence of calcined bear paw fragments.

The archaeological record also offers the potential to recognize special objects used in a bear feast or festival. For example, cast bronze artifacts dating to the first century BCE in Siberia depict a bear in the ritual placement still used in the Ob'-Ugrian bear festival. The head and paws of the bear are shown facing forward, oriented toward possible food dishes or other offerings. “The appearance of the bear figures in ‘ritual posture’ probably refers to the initial stage of the bear cult rituals, when the bear is a ‘guest’ at the festival: he is seen as an extremely strong man transformed into an animal, and in this form is ‘invited’ to the festivities” (Fedorova 2001:63). A similar object is the bronze ring found at Ust-Polui in northern Siberia in 2013, which also depicts the bear in the ritual posture. The diameter of the ring is too long and narrow for a human finger, and the archaeologists have suggested that it was instead intended for a bear’s claw (Liesowska 2013). This is plausible because the bear in question would be the brown bear/grizzly, whose long, nearly round and curved claws could indeed fit a ring such as this.

### *The Bear’s Funeral*

The primary title of the Bear site CRM report (Mather and McFarlane 1999) was *Gii-maajaa ’ind a ’aw Makwa*, Ojibwe for “The Bear’s Funeral.” This was a tribute to Mille Lacs elder Maude Kegg (Figure 38), and her remarkable story by that name:

Long ago when we were living at Portage Lake, all of a sudden, I don't know who, came over.

"It's going to be over there. They are going to have a meeting over there," my grandmother said. "There's going to be a funeral," she said. I didn't understand what she was saying.

There wasn't any man around. Just my uncle was there. He wasn't well. I was the one who hitched up the horses. She wanted to leave early in the morning, so I went and hitched up the horses to the sleigh and we left for over here, driving for a long time, I don't know how many hours, with the horses running for a long time until late in the evening we arrived at the point.

There was one wigwam, either a wigwam or a house, I don't know which, where the Indians were going in. I started going along with my grandmother. I was scared about what they were going to do. Well, as we went in, there was a man holding a stick and pointing out where the people could sit, and as we went in the door, he pointed out where we too could sit.

Then I looked the other way and there it was, a bear's head. The bear was just huge and was all decorated with ribbons. There were a lot of dishes around in there. An old man spoke, but I don't remember what he said. It was just like somebody died, a regular funeral. That's what they did long ago. [Kegg 1993:173-175]

Kegg was born in 1904, so I would guess that this event took place around the early to mid-1910s (she was young enough to not know about the ceremony, but old enough to harness the horses by herself). Wigwams were still in use at Mille Lacs in the mid-twentieth century, along with tarpaper structures and other housing (Rohrl 1981:22). The "point" where the funeral was held is likely either Shah-Bush-Kung Point (also known as Kegg's Point), or Indian Point across the bay to the south, both on the western shore of Mille Lacs Lake (Kegg 1993:viii). This is the heart of the Mille Lacs Band of Ojibwe's Vineland community, and now the location of the Minnesota Historical Society's Mille Lacs Indian Museum, where Kegg was a guide and storyteller for many years. The stories of her childhood in *Portage Lake* were recorded and transcribed in Ojibwe, and then translated into English, and are published in both languages. I am glad that we followed Kegg's title for this story in the CRM report on the Bear site investigations, although as described in Chapters 3, 8 and 9, I have since realized that the ceremony at the Bear site was not directly related to a bear's funeral. It is still connected along a continuum of

ceremonial activities to the idea of the funeral, however, which is the more expected aspect of bear ceremonialism encountered in the archaeological record.

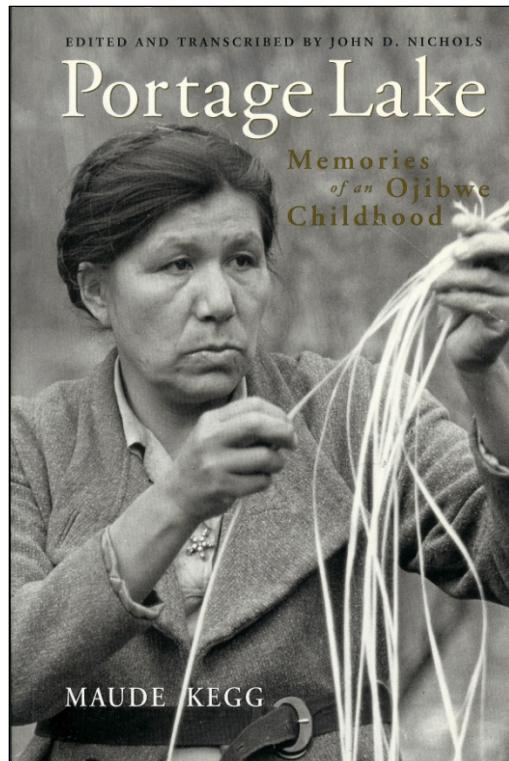


Figure 38. Mille Lacs Band of Ojibwe elder Maude Kegg, on the cover of her book *Portage Lake* (1993).

The offerings of food and presents such as beads, ribbons, blankets and other objects reflect the idea of reciprocity with bear. In gratitude for the bear giving itself, the people treat it well so that the cycle can continue once the bear is reborn. Alexander Henry described this tradition from his time with an Ojibwe family in Michigan, in the 1700s:

As soon as we reached the lodge the bear's head was adorned with all the trinkets in the possession of the family, such as silver arm bands and wrist bands, and belts of wampum; and then laid upon a scaffold, set up for its reception within the lodge. Near the nose was placed a large quantity of tobacco.

The next morning no sooner appeared than preparations were made for a feast to the manes. The lodge was cleaned and swept; and

the head of the bear was lifted up, and a new stroud blanket, which had never been used before, spread under it. The pipes were now lit; and Wawatam blew tobacco smoke into the nostrils of the bear, telling me to do the same, and thus appease the anger of the bear on account of my having killed her. I endeavored to persuade my benefactor and friendly advisor that she no longer had any life, and assured him that I was under no apprehension from her displeasure; but the first proposition obtained no credit, and the second gave but little satisfaction. [Quaife 1921:139-140].

In these ritual activities, the disposal of bones was seen as literal funeral. When considering the archaeological record, this association is strengthened with the concept of bear grave by Zachrisson and Iregren (1974).

In by far the majority of the tribes studied in northern North America and Siberia as well, a special emphasis is placed upon the preservation of the bear's skull, which is usually placed upon the branch of a tree in the woods, on a pole in some instances, or deposited in an ostensibly sacred place in the forest, sometimes along with the skulls of other animals. The treatment accorded other parts of the skeleton show a much greater variation in practice, but associated with these customs is a widespread taboo which is offered as an explanation of them among a large number of peoples. It is said that the bones of the bear, and often other game animals, must be kept out of the way of dogs. Should a dog gnaw or even touch them the "spirit" or "owner" of the animals will be offended and misfortune or poor luck in hunting will result. [Hallowell 1926:135-136]

In Labrador, bear skulls were still treated with special care in the early twentieth century: "Nearly every old summer camp of the Naskapi is marked by bears' skulls set on posts, for these Indians perform many rites to appease the spirit of this important animal" (Strong 1930:5). In Japan and Siberia, the Ainu and others traditionally placed bear skulls on altars and *inau* (Bachelor 1901; Jordan 2003).

### Bear Power

As mentioned above, there are ritual attitudes about, and actions toward, bears that are outside of the scope of bear ceremonialism as examined by Hallowell (1926).

These also have potential expressions in the archaeological record. I discuss them here under a general category of “bear power.”

### *Bear Healers*

A healer named Bear with White Paws said, “The Bear has a soul like ours, and his soul talks to mine and tells me what to do” (Brown 1992:31). Similarly, Two Shields told Frances Densmore in the early 1910s:

The bear is the only animal which is dreamed of as offering to give herbs for the healing of man. The bear is not afraid of either animals or men and it is considered ill-tempered, and yet it is the only animal which has shown us this kindness; therefore the medicines received from the bear are supposed to be especially effective. [Densmore 1992:195]

In the same period, Densmore was told by Šiya’ka:

The bear is quick-tempered and is fierce in many ways, and yet he pays attention to herbs which no other animal notices at all. The bear digs these for his own use. The bear is the only animal which eats roots from the earth and is also especially fond of acorns, june berries, and cherries. These three are frequently compounded with other herbs in making medicine, and if a person is fond of cherries we say he is like a bear. We consider the bear as chief of all the animals in regard to herb medicine, and therefore it is understood that if a man dreams of a bear he will be expert in the use of herbs for curing illness. The bear is regarded as an animal well acquainted with herbs because no other animal has such good claws for digging roots. [Densmore 1992:195]

In the archaeological record, the remarkable Wray Figurine from the Newark earthworks in Ohio appears to represent a shaman or possibly a healer wearing a bearskin, spiritually transforming into a bear (Dragoo and Wray 1964; Lepper 124-131). Also in Ohio, a bear skull mask was recovered from a Burial Feature 8, a complex multiple burial context at the Williams Cemetery site (33WO7a), on the Maumee River in northwest Ohio (Stothers and Abel 1993:68-70). I have provisionally included it in this section because it shares

with the Wray Figurine a theme of a person disguised as, or transforming into, a bear. Abel et al. (2001) interpret the site as a gathering place for trade at the transition from the Late Archaic to the Early Woodland Tradition. The mask was made from the frontal portion of the bear skull with the medial edges of the orbits, and the end of the maxilla with the two upper canines and all upper incisors in place. There are six drilled holes paired in sets of two, along the central plane of the mask. The central holes are largest (Abel et al. 2001:306, 315; Berres et al. 2004:14-15). Although there is much debate (Martin 2020), it is intriguing to think of the perforated bear mandibles at Great Lakes site as parts of a healer's bear costume, as suggested at the St. Ignace Mission site by Smith (1985).

In Minnesota and elsewhere, bear claws and skulls are still used by native bear healers in contemporary practice, as manifestations of a bear spirit's power (St. Pierre and Long Soldier 1995:143-145).

### *Bear Warriors*

Bears are physically powerful and dangerous animals. They are predators, and when roused or threatened, are capable of great bursts of violent aggression. This ability has been channeled by people in various ways. In the ancient Mediterranean, Arcadia was the “land of bears,” where warriors donned bearskins before battle (Pastoureau 2011:29). Perhaps most famously, the *berserkers*, bear warriors of Viking Scandinavia were fearsome in battle. They abandoned armor in favor of bearskins, fighting at the front of the battle in groups with enraged frenzy, often under the influence of hallucinogenic *Amanita* mushrooms. Their legacy in the English language is the word “berserk” (Brown 2015:22).

The sagas and tales of Norse mythology present heroes going into combat wearing the skin of the animal they have killed. This garment of fur imbues them with the power of the beast, protects them from adversity, and endows them with incomparable strength. The most fearsome of these warriors were the Berserkers, who were soldiers of Odin, the chief divinity of the Norse pantheon, a cruel, treacherous, and cynical god, secretive and omniscient. [Pastoureau 2011:44]

By the medieval period, the power of bears and bear warriors was symbolically expressed in heraldry (Jones and Pennick 1995:154). For example, Buchalczyk (1980:229, quoting an 1879 source in Polish by J. Łoziński) describes knights in eastern Europe who “wore a bear on their armour, whole skins with stuffed heads and paws set as ornaments in silver or gold.” This expression of bear power persists to the present day in the black bearskin shako hats worn by royal guards in England and Denmark. North American black bears were long a source for such hats (Swanson 2007:11-12).

It is important to also recognize that bear warriors were not always men. Near Leech Lake in northern Minnesota, Ne Zet was born into an Ojibwe community in the 1830s. During her puberty fast, she had a vision of a “great bear coming toward her.” It continued to approach, and when it reached her she became the bear. The elders told her that she would grow into a woman with “a strong heart and courage of a bear,” and as an adult she was known as Bear Woman.

Ne Zet grew up to be physically strong, married, and had children of her own. In the story that ... descendants heard all their lives, Ne Zet was with her family at Leech Lake when they were attacked by the Dakota. As her husband and other relatives were killed before her eyes Ne Zet remained courageous and strong, the bear of her vision, and saved the lives of her children. Memories of the battle include references to a fierce black bear fighting off the enemy. [Child 2012:4]

Archaeological representation of bear warriors is potentially seen in artifacts (including weapons), and in symbolic or representational art. Such imagery may not always be strictly of bears, however. For example, there are many petroglyphs, including representations of bears and bear tracks, at Deer Medicine Rocks in Montana, a National Historic Landmark associated with Sitting Bull and the Great Sioux War of 1876-1877. The rock art includes images from that time, including depiction of a Sun Dance held by Sitting Bull, and his prophecy of victory just before the Battle of Little Big Horn. These images include war regalia in the form of bear claws, as well as a mirror and eagle bone whistles. As interpreted by Cheyenne elders, these objects represent a warning to the

Custer and his soldiers, “what you’re doing to us, you’re doing to yourself” (Greene and Kasper 2010:6-7). In this general area of the northern Great Plains, bear warriors made knives out of the mandible of a bear, with the teeth part of the handle (Ciani 2014:36-39).

Of the twelve rooks (nine of walrus ivory and three of whale tooth) in the famous chess pieces found on the Isle of Lewis in northwest Scotland, four are depictions of berserkers biting their shields. “The army these chessmen represent is clearly a Norse one – a *late* Norse one, with queens, Christian bishops, and Viking berserks for rooks (Brown 2015:22, emphasis in original). Finds of bear claws with medieval burials in Europe have been interpreted as berserkers interred in bearskin cloaks (Kirkinen 2017; Jones and Pennick 1995:154; O’Regan 2020:268). In situations of remarkable preservation, bear fur may be preserved in archaeological contexts. For example, aDNA analysis has determined that the famous 5,300 year old “Ice Man,” Ötzi, from the Tyrolean Alps was wearing a bear fur hat (O’Sullivan et al. 2016:6).

### *Bear Societies*

Non-kinship themed societies served many roles in traditional Plains Indian cultures. They were groups of spiritual leaders “united to work their supernatural power collectively and to train novices, their successors from the next generation, in the ways of the spirits” (Gelo 2019:109). The focus of a bear society would be bear power, and like other societies, it might practice rituals and traditions that while unknown to other members of their communities, may nonetheless leave traces in the archaeological record.

While not strictly a “bear society,” bear symbolism and power are important elements of the Midewiwin, or Grand Medicine Society among the Ojibwe (Figure 39). In some cases, the bear’s paw is seen as symbolic of the Great Spirit’s hand, and Bear is the messenger who guided the people on their westward journey centuries ago from the Atlantic coast (Vennum 2009:181; Landes 1968a:106-108; Kohl 1985:73). Objects made from bears were used in the ceremonial rites, including “bears’ paws full of claws” (Kohl 1985:77). In the late seventeenth century, a Jesuit missionary mentioned the use of bear claws as symbolic weapons, along with other objects, in the Huron ceremony of initiation

for an “*arendiwane* (‘master sorcerer’),” possibly related to the Grand Medicine Society (Kinietz 1940:159-160).

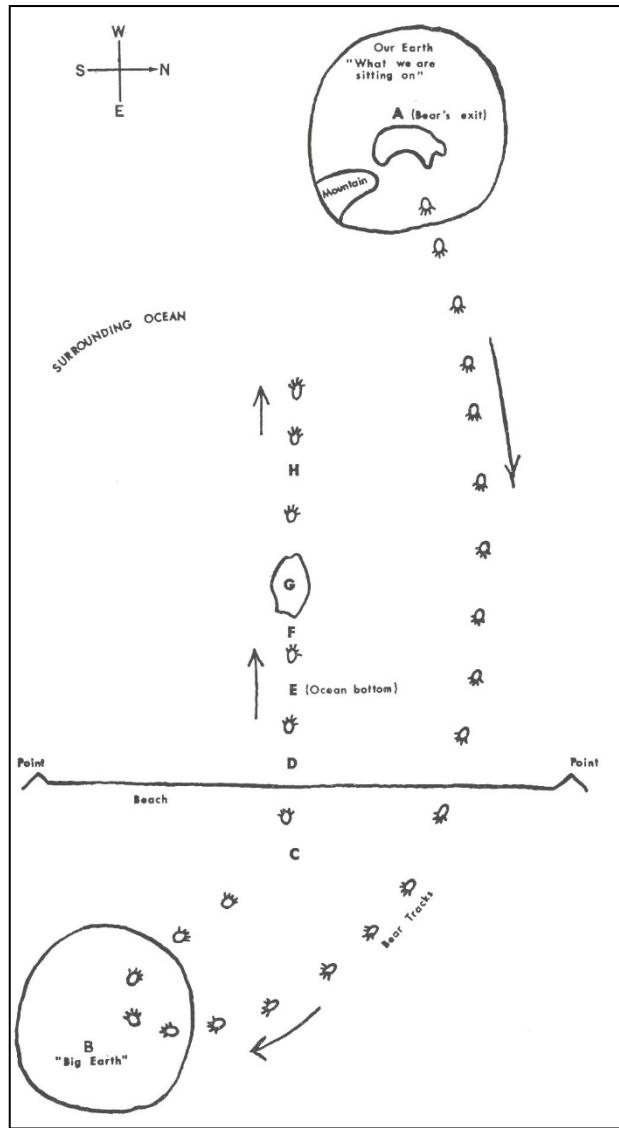


Figure 39. Hole-in-the-Sky's depiction of Bear's journey (Landes 1968b:107).

Bear societies served a variety of purposes in their respective communities, but a common theme is secrecy. Activities and rituals performed by the group are largely unknown to non-members. In the archaeological record, artifacts or features related to a bear society may be superficially similar to other bear-related beliefs, such as teeth or

claws, concentrations of bones or artistic representations. In Chapter 8, I argue that bear features at two Minnesota sites may be related to the activities of bear societies in the Late Woodland Tradition.

### *Bear Clans*

Clans or totems relate to family relationships, but they also have spiritual and often ceremonial connections. Three examples are from Siouan speaking tribes with historical connections to southern Minnesota. The origin story of the Otoe bear clan describes four brothers who clawed their way up onto the earth. “While they were beneath the earth they were bears; when they came out on the earth they were men” (cited by Tooker 1971:368-369). Likewise, members of the Ho-Chunk bear clan are descended from “four ancestral bear-beings” (Radin 1990:274). Speaking of the bear clan at the recent Midwest Archaeological Conference in Mankato, Lance Foster (2019), the Tribal Historic Preservation Officer of the Iowa Tribe of Kansas and Nebraska said, “We started as bears and became human beings.” In the early twentieth century, Jones (1911) described the deep connections between bears and members of the Meskwaki bear clan:

Bears are present at all gatherings of the Bear people; they are not always visible, but yet they are there, and their presence is always felt. Bears, and people of the Bear name, are still brothers and sisters. That is the way the manitou willed it in the beginning, and that is the way it shall always be. Fathers with a Bear name shall call their children by something peculiar to a bear; this shall they do till the end of time. [Jones 1911:216]

The Ojibwe word *doodem* is the source for the anthropological term “totem,” referring to patrilineal clans, expressed through individual or family ties to an animal (Child 2012:29). Speaking of the Red Lake Ojibwe, Treuer (2015:14) writes, “Red Lake was settled by warriors, and warrior clans dominate the membership of Red Lake even today, especially marten and bear.” Ruth Landes was told of four divisions of the bear gens among the Ojibwe on the Rainy River at Minnesota’s northern border, including the head, the hind legs, the body and the whole animal, and that members of the bear clan

lived at Emo, Manitou Rapids, Little Fork and Long Sault Rapids (Landes 1937:32-34). The latter area is now the location of the Kay-Nah-Chi-Wah-Nung Heritage Centre, operated by Rainy River First Nations. At Grand Portage, the band was historically scattered in a series of settlements along the shore of Lake Superior, with the bear clan centered at Beaver Bay (Gilman 1992:110).

Historically, people were depicted in picture writing by their totem animals, as a means of remote communication (Figure 40). John Tanner described one example:

In the Assiniboin river, at one or two days above the Prairie Portage, is a place called Ke-new-kau-neshe way-boant, (where they throw down the gray eagle,) at which the Indians frequently stop. Here we saw, as we were passing, some little stakes in the ground, with pieces of birch bark attached to them, and on two of these the figure of a bear, and on the others, those of other animals. Net-no-kwa immediately recognized the totems of Pe-shau-ba, Waus-so, and their companions. These had been left, to inform us that Pe-shau-ba had been at this place, and as directions to enable us to find them.  
[James 1830:60]

On rare occasions, picture writing was made in a medium that survives in the archaeological record. For example, an eighteenth century silver fur trade brooch found in the Rainy River (Mather 2007a) was modified with picture writing that may include clan symbols (although not of bears).



FIG. 19.—Native drawing. A message containing a warning

Figure 40. Bear imagery in Ojibwe picture writing (Densmore 1979:178); the bears and other animals represent people of those clans.

Stone artifacts in Finland and Lithuania have been interpreted as clan symbols. These are curved (rounded slight crescent-shape) groundstone objects, sometimes with a hole in the center, and the carved shape of an animal's head on one end. Many either represent bears or moose. It is thought that the hole would be to allow the stone to be placed atop a wooden staff or pole (Shepherd 1995:30-32). It has been suggested that effigy mounds may also reflect clan identities, although this is a matter of debate (Birmingham and Rosebrough 2017).

#### *Bear Dreamers*

For the northern Sakha in Siberia, shamanic helper spirits include bears, among many types of animals. Stronger shamans have a bear or eagle as a mother beast (Balzer 1996:308-309). Near Lake Superior in the mid-nineteenth century, Kohl (1985:399) was told of the importance of imagery to commemorate dreams. The man who told him was named Makwa (Bear), but the dream image in that case was a star (not a bear).

#### *Bear Sorcerers*

Sorcery or conjuring using bear power takes a variety of forms, including divination for hunting or other purposes, or committing magical attacks against other people. The latter includes witches or bearwalkers, who take the form of a bear to carry out bad intentions. Bearwalkers could use their bear form to resurrect or gather secrets from the dead. They were usually active at night, when observers might see a bear with fire or light coming from its mouth, which was the soul of the bearwalker (Hallowell 1955:176-178, 253; Dorson 1952:26-37; Salzer 1972). In northern Wisconsin, items in a Potawatomi bearwalker's medicine bundle included two black bear canines that would be used to cast a spell causing another person to be attacked by bears. When a bearwalker bundle was disposed of, it would be placed in the forest far from where people lived (Salzer 1972:123-124, 135).

In the Upper Peninsula of Michigan, Alec Philemon spoke about bearwalkers in 1946, and about how traditional knowledge could be acquired through dreams:

In the dream they claim the bear is bad stuff. He learns you how to kill somebody. This man in the dream has some part of him like a bear, a little claw, or a tooth, or an ear, or a little bear hair. And you say to it, “I want to be a bear.” And he has the power, in his medicine bag, to make you a bear. Then if you got some enemy you want to kill you can do it, see. That’s what they call bearwalking. [Dorson 1952:34]

The Meskwaki also described witches that disguised themselves as bears (Jones 1911:217).

Among the Kutenai, “both the black bear and the grizzly are said to enter the conjurer’s lodge to give aid to the seer, if he has power from those animals” (Shaeffer 1966:8). Conjuring was used by some Algonquian cultures to find game, including bears. Fur trader George Nelson described successful conjuring by Ojibwe hunters in northern Wisconsin in a time of winter starvation. “This is so strange, and so out of the way that I will ask no one to believe it. Those who will not believe the Gospel will still less credit this; yet **I say it is true**, believe who may. We had a Splendid feast at night, for they [the bears] were very fat” (Brown and Brightman 1988:9, emphasis in original).

The Naskapi used scapulimancy, with a shoulder blade of an animal heated over a fire until cracks in the bone created a map that directed the hunter to desirable prey. Larger animals were more spiritually powerful, and their bones were only used by experienced conjurers. Elders whom Speck (1977:149, 152) spoke with in the early twentieth century would not consider using a bear scapula, although a bear’s patella (knee bone) was commonly used for this purpose:

This insignificant bone is often seen among the paraphernalia of the hunters, in their tool bags, for instance. To put it into operation the bone is warmed a little, then placed on a heated flat rock if the place happens to be in the bush, or on the top of a stove if one is near. It is placed with the rounded side down. As soon as it is affected by the heat it will respond according to its “disposition,” under the control of the hunter’s soul-spirit. The divination is performed to find out

whether any game will be gotten in the next hunting excursion. A shaking motion is affirmative. [Speck 1977:167]

Aspects of such hunting-related divination could be recognizable in the archaeological record through zooarchaeological analysis, although the activity would likely be at a residential site rather than the location of the hunt.

### *Bear Initiates*

Perhaps because of the bear's seeming transcendence of death during its winter hibernation, bear imagery has a role in some initiation rituals. In Greek mythology, Artemis famously punished the nymph Kallisto by transforming her into a bear. The story was significant in ancient Athens, as indicated by its portrayal on the Acropolis and at Delphi. Eva Keuls (1985:312) describes a painting on a vase that depicts the nymph seated on a rock with a child, who may be the offspring of her rape by Zeus. "Kallisto looks with horror at her left arm, which is being transformed into a hairy paw with claws for fingers. Her right ear has already taken on animal form." Pottery sherds found at Brauron, the cult center of Artemis on the eastern coast of Attica, have partial images that appear to be priestesses wearing bear masks, and a procession of girls dressed as bears ("Little Bears") approaching an altar (Keuls 1985:312-315, 320).

In early nineteenth century Minnesota, missionary Samuel Pond wrote of a Dakota ceremony called "Making a Bear":

This performance, like many other things done by the Dakotas, seemed to partake of the nature both of a diversion and of a religious solemnity. The man who represented the bear constructed his den by digging a hole in the earth about two feet deep, with paths leading out from it toward the four cardinal points. The den was inclosed with a slight fence, and the bear stayed by it a day or two, going through a certain formula of ceremonies. To lengthen his arms so that he could walk on all fours, he carried hoops in his hands which he used as paws.

On the last day of the play a number of young men gathered around him, having their guns loaded with powder only. When they drew near the den, the bear rushed out and chased them, trying to catch them by clapping the hoops over their heads. This was repeated

until he been out by three of the paths which led from the hole. The fourth time he was chased by the hunters, who fired very near him till he fell, and the farce was ended. [Pond 1986:103]

I recalled Pond's passage in 2004, when I saw a program by Leonard Wabasha at Mille Lacs Kathio State Park. Among several objects he displayed on a table, there was a bearskin laid on a buffalo robe. He told me after the program that it was a young boy's dance costume, made by his uncle about thirty years prior. It was a full black bear hide with pieces of wood on the inside of the paws. There were designs on the wood in red paint, and other designs painted on the inside of the hide, which were the artist's signature. Cloth strips were sewn on to attach the costume to the dancer's body. The head of the bear was a taxidermy mount on a homemade wooden base, which was painted. The bear's upper incisors were simulated with rectangular pieces of crystal or glass. The tongue was a painted cut-out of paper or hide.

I cannot say if that dance costume has a connection to the type of ceremony Pond described, but it is clear from his language that he (and other missionaries) did not have the cultural background to comprehend the significance of ceremonies they witnessed. The description makes me think of a rite of passage, perhaps for the young men, and I have provisionally included it in this section for that reason, and it is described as such by Rockwell (1991:39-41).

#### *Bear Attacks and Retribution*

This last aspect of bear ceremonialism, by my reckoning, differs from the others in that it encompasses revenge against one more bears by people. All aspects of bear ceremonialism acknowledge the spiritual power of bears, and the cultural belief that this power can be dangerous, just as encounters with bears can be physically dangerous. Attacks are a real concern for all people in bear country. In North America, grizzly bears are the most aggressive and powerful, but black bears can also easily kill or main a person (Herrero 1985).

In Siberia, Nivkh traditions included ceremonies for victims of bear attacks, including retribution against the offending bear (or other bears), that were the inverse of

the respectful treatment shown to hunted bears (Black 1973:261-265). This included the use of sharp tools to butcher the animal, and roasting rather than boiling of the meat. Rather than the eat-all feast, the meat would be spat out in disgust. In such cases, the remains of the slain bear were interred below the person, enclosed by a palisade similar to the corrals where live bears would be kept for ritual purposes. Similarly, Canadian explorer David Thompson described a horrific grizzly bear attack that occurred near the beginning of the nineteenth century, and the response by the Piegan Blackfoot:

A few days after our arrival, the death cry was given, and the Men all started out of the Tents, and our old tent mate with his gun in his hand. The cry was from a young man who held his Bow and Arrows, and showed one of his thighs torn by a grizzled Bear, and which had killed two of his companions. The old Man called for his powder horn and shot bag, and seeing the priming of his gun in good order, he set off with the young man for the Bear, which was at a very short distance, and they found him devouring one of the dead, the moment he saw them he sat up on his hind legs, showing them his teeth and long clawed paws. In this, his usual position, to defend his prey, his head is a bad mark, but his breast offers a direct mark to the heart, through which the old Man sent his ball, and killed him. The two young men who were destroyed by the Bear, had each, two iron shod Arrows, and the camp being near, they attacked the Bear for his skin and claws, but unfortunately their arrows struck the bones of his ribs, and only irritated him; he sprung on the first and with one of his dreadful fore paws tore out his bowels and three of his ribs; the second he seized in his paws, and almost crushed him to death, threw him down, when the third Indian, hearing their cries, came to their assistance and sent an arrow, which only wounded him in the neck, for which the Bear chased him, and sligh[t]ly tore one of [iv.279] his thighs. The first poor fellow was still alive, and knew his parents, in whose arms he expired. *The Bear, for the mischief he had done was condemned to be burnt to ashes, the claws of his fore paws, very sharp and long, the young man wanted for a collar but it was not granted those that burned the Bear watched until nothing but ashes remained.* [Moreau 2009:299, editing in original, but emphasis added]

This type of event would certainly leave archaeological remnants, likely including calcined bone fragments that would be taxonomically identifiable.

A rock art image potentially related to this theme is present at Deer Medicine Rocks in Montana. Among many petroglyphs is a bear with long, curving claws.

Cheyenne elders have interpreted the image as a grizzly that has eaten a man, with an arrow that has struck the animal but was purposefully not shot deeply so as not to strike “the man inside, who was later reborn as a boy” (Greene and Kasper 2010:7).

### Archaeological Context and Finds

Within the aspects of bear power, there is considerable overlap of my provisional categories. For example, dreams could be an important part of bear hunting, and a source of inspiration and information for bear healers. Pastoureau (2011:45) argues that the frenzy of bear warriors is similar in nature to the shamanic trance of Siberian and North American cultures.

### *Bear Imagery*

Bears and bear power are invoked by imagery of bears in a wide range of formats. Effigies might be large and constructed at the scale of landscapes, such as with the bear-shaped mounds of Wisconsin, northeast Iowa and southeast Minnesota. During the Late Woodland Tradition, bear mounds were constructed singly, or in large formation including the Marching Bear groups at Effigy Mounds National Monument.

Conversely, bear effigies might be small, personal ornaments. Those carved from stone, bone, antler or ivory are most likely to be preserved in the archaeological record, but it is reasonable to assume that wood or other materials were also used in the past.

### *Teeth, Claws, and Other Bear Finds*

Bear claws and teeth, particularly canines, are recognizable yet portable symbols of the bear’s power. When bear bones are present in an archaeological faunal assemblage, these are the most commonly represented – or at least are most immediately recognizable – body parts. They are sometimes found with drilled holes, indicating that they were incorporated into jewelry or other personal adornments. In some cases, they may be mementoes of a bear hunt or feast. For example, Hallowell described a practice of Cree hunters:

If an Eastmain hunter is alone when he kills a bear, he cuts off the middle toe and claw of the right forefoot. Upon returning to camp he gives this token to the person who is to carry the body from the woods, usually his wife, if the hunter is married. This individual takes a companion and fetches the carcass. The claw is “wrapped in cloth, beaded or painted, or both, and kept as a memento of the occasion” [Hallowell 1926:68, quoting Skinner 1911:69]

Archaeological bear claws and teeth are also found without indication of modification. It is possible that some of these objects could be from medicine bundles, or be used for other personal or ritual purposes.

In an 1837 letter to his friend, cartographer and explorer Joseph Nicollet, Chagobay of the Leech Lake Ojibwe (in Minnesota) provides a rare personal insight into what a group of bear claws meant to him:

My friend I think of you so much. I shake hands with you. I send these bear claws which I take from my heart that you may remember me. When I was young I loved what I send you. When I was young I dreamed, if I kept this little animal’s skin I should live long, for now I send it to you that you may remember me. We will be friends while we live and meet in that good place and be friends after we die.  
[Bray 2008:175]

It is not clear if the bear claws were strung on a necklace, or if they were in another form. Chagobay’s reference to “this little animal’s skin” brings to mind preserved bear paws used in Midewiwin ceremonies (sometimes the skin of a bear cub’s paw, with claws attached), the spiritual society of which Chagobay was a member (Bray 2008:176). But he says “bear claws,” which seems like it would be more the claws themselves.

Bear canines might have drilled holes, and were sometimes themselves duplicated in other media such as copper or wood, such as at Middle Woodland sites in the Hopewell heartland of Ohio or the Sonota Complex of North and South Dakota (Greber and Ruhl 2000:175-183; Neumann 1975; Zimmerman 1985:67). Some bear canines drilled with multiple holes through the body of the tooth appear to have been adornments, but the number and configuration of holes suggest that their use in jewelry is unlikely. For example, ten drilled canines from a Hopewell mound in southwestern Ohio were

found around the hips and lower legs of a burial (an adult male). Of these, five were at the left pelvis, two in the center, and one on the right side. One was from near the right foot (Tankersly and Tench 2009:204). Similar canines were found at the Blasky site in North Dakota (Mather 2008c; Chapter 7). The holes are drilled through the flat part of the root, rather than the more brittle enamel. I am speculating, but these types of holes seem appropriate for sewing the teeth flat onto the surface of clothing or other personal furnishings (such as a quiver or bag, for example). A single hole would allow use as a pendant, but multiple holes such as these would hold the tooth firmly, while allowing it to be a readily recognizable symbol of the bear.

Not all bear bones indicate the practices of bear ceremonialism. For example, polar bear bones at a medieval farmstead in Greenland are interpreted as preparation of furs for European trade (McGovern et al. 1996:114). Bear bones and claws are sometimes used today by New Age and neopagan practitioners (Mar 2015:130)

Finds of bear bones, teeth, effigies, imagery or artifacts can be provocative, but context is needed for interpretations of ritual. This is what the following chapters seek to provide for Minnesota (Chapters 5-7).

## **5. MINNESOTA'S LAURENTIAN MIXED FOREST ECOLOGICAL PROVINCE**

As can be seen in any local gift shop, modern-day Minnesotans (and tourists) view black bears as symbols of the North Woods, along with moose, wolves and pine trees. This is the habitat where we are most accustomed to seeing bears – or at least being aware of bears, since even here they are not often seen.

The Laurentian Mixed Forest ecological province is the largest of the four in Minnesota, encompassing approximately 43% of the state. It includes the Boundary Waters Canoe Area Wilderness within Superior National Forest, as well as the Rainy River flowing west to Lake of the Woods, the Big Bog around Red Lake, the Mississippi Headwaters area and Chippewa National Forest, and the Mille Lacs Lake region and upper St. Croix River. This part of the state is home to 6 of the 11 federally recognized American Indian tribes in Minnesota, including the Grand Portage, Fond du Lac, Bois Forte, Red Lake, Leech Lake and Mille Lacs Ojibwe communities. Modern population centers include Duluth, the Iron Range cities, Brainerd/Baxter, Bemidji and International Falls.

### Landscape and Ecological Setting

The landscape of the Laurentian Mixed Forest Province is diverse, ranging from the rocky shores of Lake Superior to the vast peatlands of the Glacial Lake Agassiz basin. The border lakes and rivers from Grand Portage to Lake of the Woods were the famous Voyageur's Highway of the fur trade. The Laurentian Divide is a prominent landscape feature that separates the Lake Superior and Hudson Bay watersheds. In Ojibwe, it is the *Misabe Widjiu* named for the path made by the giant who later lay down to sleep in Lake Superior at Thunder Bay, Ontario. Minnesota in general has a rich paleoecological record, but this ecological province stands out due to its vast numbers of lakes and peat-filled wetlands.

### Historical Records of Bears

This biome has more extensive historical records of bears than other parts of the state. Examples are presented here in roughly chronological order, and range from the fur

trade into the early twentieth century. They also trend geographically through time toward the northeast, because this is the primary area where bear populations survived. The earliest written account for this biome is the mention by Father Louis Hennepin in 1680 of a bearskin rug in a Dakota lodge at Mille Lacs, and of the use of bear's oil there (Shea 1880:226).

Fur trade records provide information about bears at a broad regional level. In some cases, related documents are good sources for more local detail. For example, John Sayer's diary from the North West Company fur post near present-day Pine City focuses on provisions provided by Ojibwe traders. Bear is mentioned between the end of November and the beginning of February (Table 10). This record corresponds to the zooarchaeology of 21PN11 (see below).

*Table 10. Every mention of bears in John Sayer's fur trade journal (Birk 1989).*

24 Nov 1804	Men came back with the meat of 1 Bear Only
10 Dec 1804	came for 2 Men to fetch the Meat of a Deer & a small bear
11 Dec 1804	they [the Indians] have Killd 2 bears & several Deers
12 Dec 1804	sent 3 Men to the Court Orellies Lodge for the meat of a Bear
13 Dec 1804	Hunters ... came back having Killd 9 Deers & 4 Bears
22 Dec 1804	got a Bear Skin from the Borgne ["One-eye"] for [some] Medecines
24 Dec 1804	Bouché & Le Blanc came with a load of Bears Meat from Pierro ... they [the Indians] have Killd 4 Bears
26 Dec 1804	went to Pierro['s Band] in Order to get their Bear Skins
28 Dec 1804	came back with only 1 Bear Skin. The others were not [yet] Stretchd.
31 Dec 1804	Le Blanc & Bouché brot some Meat & 3 Bear Skins
5 Jan 1805	Bouché came with 2 Bears from Pierros Band. They complain of hunger
14 Jan 1805	Bouché arrived with the meat of a Bear
1 Feb 1805	traded a 9 Galln Keg of Bears Grease for Rum

Near present-day Grand Rapids, in the vicinity of Pokegema Falls on the Mississippi River, Dr. Douglass Houghton noted the abundance of bears and other animals during the Schoolcraft expedition of 1832:

June 23, Saturday. ... The Indians fired a salute upon our arrival & soon after came together & I vaccinated at one sitting 241. They have a wonderful dread of the Small Pox. ... This post is productive of great numbers of otter & bear. The whole number of packs collected from the whole country west of this under the direction of Mr. [William] Aitkin is 162 packs – Including beaver, otter, muskrat, mink, martin, fisher, bear. They are put up weighing 90 pounds each. The French voyageur[s] had a dance in the evening. [Houghton 1993:244]

The German ethnologist Georg Johan Kohl (1985:405-407) describes Ojibwe and voyageur accounts from 1855 regarding one such location, the “Passe à l’Ours” on the St. Croix River, on the eastern border of central Minnesota. The southern shore of the river was prairie at this place, and the northern shore thickly wooded. Kohl was told that bears arrived nearly every day through the month of October, when people would avoid the southern shore so as not to alarm the animals. The hunters would wait in canoes under cover on the north side:

The northern shore is thickly clothed with wood, for a spur of the great northern forests runs down to that point. The south shore, on the contrary, is a fine open prairie. On this bears arrive almost daily in the month of October, to swim through the water, and then creep into the forest thickets. In order not to disturb them in this, all the travelers and traders quit the south shore of the St. Croix during this period, and give similar directions to their people, although the trail along the south shore is far more convenient than that on the other bushy and swampy side. The bears would immediately notice the footsteps of men and become shy. The hunters who await the bears here, and give them chase, naturally also keep on the northern shore, where they lie in the little forest bayous in their canoes. The bears usually arrive in the night. The night is fine and calm, the moon shines brightly, the water is clear as a mirror. Suddenly the hunters hear a trampling in the reeds, on the shore, and the dry grass. Here’s Bruin! Away the animal splashes into the water, and paddles along, snorting violently; only its black head is visible on the moon-illuminated waters. The hunters aim at this, and usually give the bear a mortal wound. They hurry up in their canoes and pull the beast alongside with iron hooks. If it is dead, these prevent it sinking, while, if living, they drag the bear to the north shore, lest the body float down and the scent of blood cause an alarm among the following bears. This bear migration at Passe à l’Ours is said to last three to four weeks. [Kohl 1985:406-407]

As context for the story, Kohl describes reports of seasonal “wanderings” by bears. He was told that bears migrate south during the warm seasons to gain access to richer fruit and other plant foods. They then return to the north to hibernate. The migrations were heavier in some years. He cites 1811 as an example of “a perfectly extraordinary bear year.” It is possible that regional food shortages were a causal factor in large-scale bear movements, such as failure of the blueberry crop, although there also descriptions of bear migrations elsewhere in North America.

Trapper Ira Cook described a rare encounter with a hibernating bear in the Boundary Waters north of Ely at the beginning of the twentieth century:

On my regular route, before the snows came, I had noticed an uprooted tree that seemed to collect an unusual quantity of dry leaves in the hollow beneath it. Each trip the leaves piled higher, and I suspected they had not all blown in with the wind. The snows had come, and as I passed the symmetrical mound that blanketed my tree, I stopped to investigate. A faint wisp of steam curled from the small aperture at its apex, which partially confirmed my suspicions. My gun was at the cabin, but I found a long dry branch and poked it down through the snow to the center where I had seen the pile of leaves. There was a low gutteral growl and I hastily backed away down the trail. I tipped my hat in mock apology and said in a low whisper, “Beg your pardon, old-timer, beg your pardon all to hell. Sorry to have disturbed you,” and kept on going. I promised myself a nice bear rug when conditions were more in my favor, and planned on carrying my rifle on the next trip around. The exigencies of the traplines kept me and my mind occupied, and I never did get around to carrying a rifle on that route. Bruin slept on through his hibernation to a happy awakening in the warm spring sunshine.  
[Cook 2000:121]

Also around that time, Cahn (1921) reported that there were almost no bears in Minnesota (Chippewa) National Forest. This is a drastic contrast with the present day, with Itasca and Cass counties being some of the most productive areas in the state for black bears.

In one of the early efforts at public interpretation of Minnesota’s natural heritage, the Bell Museum of Natural History created its Black Bear diorama with the North Shore

as the setting. The bears themselves, however, came from trappers working near International Falls (Roberts 1939). Bears were still common in the vicinity of the Rainy River then, including the cinnamon color phase black bears (Snyder 1938:177).

In 1920, Charles Johnson and his wife vacationed in the area around the North Kawishiwi, Isabella, Perent and Island rivers in the Superior National Forest. Previously, from 1912-1915, he had studied the ecology of this area for the University of Minnesota, sponsored by James Ford Bell. He wrote a summary of his observations from the 1920 trip for the December 1920 issue of the Bulletin of the Minnesota Fish & Game Department, *Fins, Feathers and Fur*:

Signs of bear were frequently found from the South Kawishiwi and Gabro [sic] Lake region to the furthest point reached by us. A near view of two very healthy looking cubs was observed in the latter part of August, on the Island River. Two trappers whose territory included parts of the region visited did not consider bear especially common, but my own observations of tracks and other signs lead me to believe that, especially in the more outlying districts, they are distinctly more so than they were four or five years ago. [C. Johnson 1920:3].

In the 1930s, CCC workers in northern Minnesota occasionally reported observations of hibernating bears (Morse 1937), and more frequently encountered them as the bears were attracted to the camp kitchens and dump (Unger 1941; Surber 1941). Observations from this time marked the beginnings of bear biology in Minnesota.

#### Zooarchaeology of the Laurentian Mixed Forest

My recent review of the archaeological literature has identified 119 reports of sites with analyzed faunal assemblages. Those with NISP figures greater than 100 (58 sites) are summarized in Table 11 and Figures 41 and 42, including 9 sites for which I conducted original zooarchaeological analysis related to this dissertation. Sites with bear finds that not zooarchaeological, or where the total NISP is less than 100, are presented in the text but not the tables.

Significant trends include sites with evidence of spring spawning fish such as lake sturgeon or suckers, especially on the Rainy River and in the Mississippi Headwaters. These spawning runs begin early in the spring, and provided a critically important resource at the end of long, northern winters. In some cases, places where spring fishing had occurred during the Archaic Tradition became burial mound centers with the Initial Woodland (Morey et al. 1996; Terrell 2012; Terrell et al. 2009; Hohman-Caine and Goltz 1998; Mather 2005a, 2011a, 2015a).

One significant assemblage that is too small (NISP=89) to include in Table 12 is from 21MO216 at Camp Ripley. It is a Late Woodland feature containing fragmented white-tailed deer bone and fire-cracked rock, possibly related to processing the bone for marrow or grease (Scott and Benn 2009:25-27).

#### *Faunal Assemblages Recommended for Further Study*

There are many reported sites with significant faunal assemblages that have not yet been analyzed (Figure 43). These are summarized in Table 13. They include a series of sites with Paleoindian components on the St. Louis River Reservoir (Mulholland et al. 2005). Also, there are several Woodland Tradition sites in Carlton County with concentrations of calcined bone.

Grand Portage (21CK6) is a site with rich potential for historical zooarchaeology. The only analysis conducted to date is from the kitchen excavation at the NWC depot (Woolworth 1975). It includes identification of domestic species including beef and pork, as also indicated in historical records, but there are questionable identifications of wild species. For example, southerly species such as elk, white-tailed deer and cottontail rabbit are listed as present, but not the related species (moose, caribou and snowshoe hare) that should be expected from ecological setting of Grand Portage. Also curious is the identification of wild turkey, and an ocean species of drum fish. I recommend that this

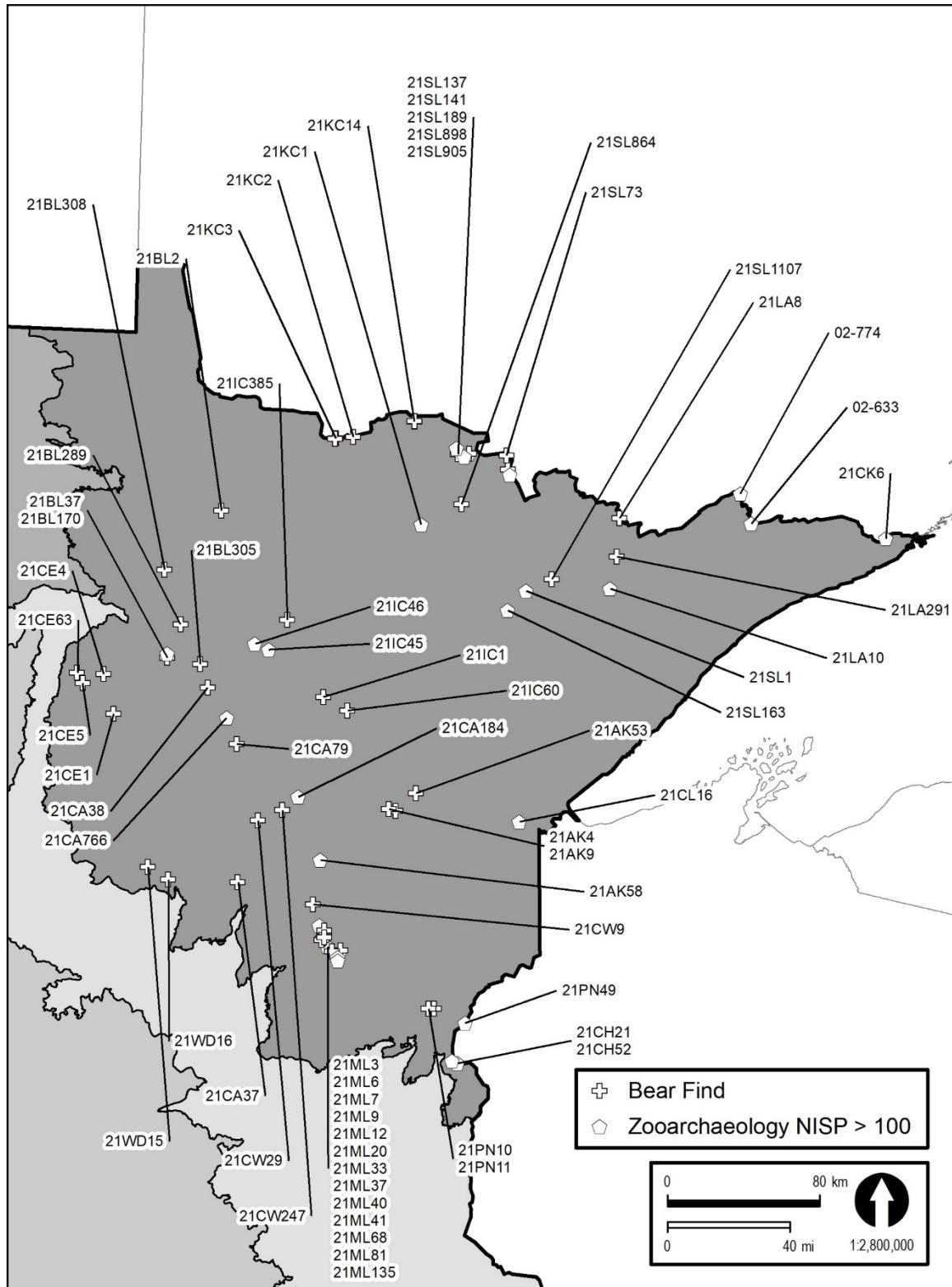


Figure 41. Bear finds and zooarchaeological assemblages with NISP > 100, Laurentian Mixed Forest Ecological Province.

Table 11. Sites with fully or partly analyzed zooarchaeological assemblages, NISP >100.

Site	County	ECS	BMU	REG	Reference
21AK53	Aitkin	212Nb	51	5e	Watral 1969; Gibbon and Willms 1985
21AK58	Aitkin	212Nd	51	5c	Allan 1993; Allan and Hoffman 1991
21BL2	Beltrami	212Mb	13	7w	Gonsior and Radford 2005
21BL5	Beltrami	212Na	28	5c	Wells and Olmanson 2014a
21BL37	Beltrami	212Na	26	5c	Baker and Theler 2005
21BL170	Beltrami	212Na	27	5c	Adams et al. 2007
21BL289	Beltrami	212Na	41	5c	Terrell et al. 2009
21BL305	Beltrami	212Na	28	5c	Wells and Olmanson 2014b; Olmanson and Wells 2010
21BL308	Beltrami	212Mb	RL	7w	Florin and Lindbeck 2011
21CA37	Cass	212Nc	45	4w	Mather 1998b; Chapter 5
21CA38	Cass	212Na	47	5c	Mather 2002a
21CA184	Cass	212Nc	51	5c	Keaveny 1995; Mather 1995
21CA766	Cass	212Na	47	5c	Magner and Allan 2015:53
21CE1	Clearwater	212Nc	44	5c	Shay 1971; Jenks 1937; Widga 2014
21CE5	Clearwater	212Na	46	5w	Bakken 2006:46-47
21CE_SR	Clearwater	212Mb	RL	7w	Chapter 5
21CH21	Chisago	212Kb	NQ	4e	Connor et al. 1985
21CH52	Chisago	212Kb	NQ	4e	Connor et al. 1985
21CK6	Cook	212Lb	31	9n	Woolworth 1975:V2
02-633	Cook	212La	22	8	Mather 2003b
02-774	Cook	212La	22	8	Mather 2014a
21CL16	Carlton	212Kb	51	9s	Fetterolf and Scherer 1999
21CW9	Crow Wing	212Kb	45	4e	Trocki and Hudak 2003
21IC1	Itasca	212Na	46	5c	Lukens 1963
21IC45	Itasca	212Na	28	5c	Brew 1985
21IC46	Itasca	212Na	28	5c	Mather 2005a
21IC385	Itasca	212Na	28	5n	Wells and Olmanson 2013
21KC1	Koochiching	212Ma	25	8	Lukens 1963
21KC2	Koochiching	212Ma	13	7e	Lukens 1963; Morey et al. 1996
21KC3	Koochiching	212Ma	13	7e	Lukens 1963; Lugenbeal 1976
21KC13	Koochiching	212La	25	8	Bozell 1986; Mather 2006a, 2008b; Monk 1985
21KC14	Koochiching	212La	25	8	Mather 2006a
21KC25	Koochiching	212Ma	13	7e	Rapp et al. 1995
21LA10	Lake	212La	22	8	Peters et al. 1983:134-137
21LA291	Lake	212La	22	8	Mather 2003b
21ML3	Mille Lacs	212Kb	45	4e	Gibbon 1975b; Chapter 5
21ML6	Mille Lacs	212Kb	51	4e	Rothaus et al. 2005
21ML7	Mille Lacs	212Kb	51	4e	Whelan 1990; Chapter 5
21ML9/16	Mille Lacs	212Kb	45	4e	Whelan 1990; Cummings and Mather 2005
21ML12	Mille Lacs	212Kb	45	4e	Whelan 1990; Fleming et al. 2019
21ML20	Mille Lacs	212Kb	45	4e	Gibbon 1976
21ML33	Mille Lacs	212Kb	45	4e	Mather 1996
21ML37	Mille Lacs	212Kb	45	4e	Mather 1996
21ML40	Mille Lacs	212Kb	45	4e	Mather 1996
21ML41	Mille Lacs	212Kb	45	4e	Mather 1996

*Table 11 (cont.)*

21ML68	Mille Lacs	212Kb	51	4e	Chapter 3
<b>Site</b>	<b>County</b>	<b>ECS</b>	<b>BMU</b>	<b>REG</b>	<b>Reference</b>
21ML81	Mille Lacs	212Kb	45	4e	Mather 2012b
21PN11	Pine	212Kb	NQ	4e	Birk and Murray 2002
21PN49	Pine	212Kb	NQ	4e	Connor et al. 1985
21SL1	St. Louis	212La	25	8	Lukens 1963, 1973
21SL84	St. Louis	212La	25	8	Colburn 1987
21SL141	St. Louis	212La	25	8	Falk 1984
21SL163	St. Louis	212La	25	8	Penman 1984
21SL898	St. Louis	212La	25	8	Chapter 5
21SL905	St. Louis	212La	25	8	Mather 2006a
21SL1107	St. Louis	212La	25	8	Chapter 5
21WD15	Wadena	212Nc	45	4w	Allard 2016
21WD16	Wadena	212Nc	45	4w	Hayes 2014

\*ECS=Ecological Classification System subsection, BMU=Bear Management Unit, REG=Archaeological Region

material should be reanalyzed. Domestic chicken is identified. If correct, this would be the earliest instance in Minnesota, but this should also be checked.

#### Bear Finds: Northern Superior Uplands (212L)

This ecological section is roughly the “Arrowhead Region” of northeastern Minnesota, a triangle bordered by Lake Superior on the south and the Canadian border on the north. The section also roughly corresponds with the 1854 Treaty area, and includes the Grand Portage, Bois Forte and Fond du Lac Ojibwe communities, each of whom have established their own Tribal Historic Preservation Offices. It contains Cook, Lake and much of St. Louis counties, as well as parts of Koochiching and Itasca counties. Much of the section is public land. Logging and mining are major industries. The City of Duluth is at the tip of Lake Superior in the section’s southeast corner. Other modern population centers include International Falls and Ely. The popular public image of this region is the sparkling water, ledgerock and lofty pine mosaic of the Boundary Waters Canoe Area Wilderness (part of the larger Superior National Forest) and Voyageurs National Park, as well as the tourist attractions and fishing villages of the Lake Superior North Shore. We think of this area as classic bear country. It still holds a substantial bear population, but it was actually part of the northern refuge to which bears retreated during the 120+ years of overhunting in the late nineteenth and early twentieth centuries. It is because of this

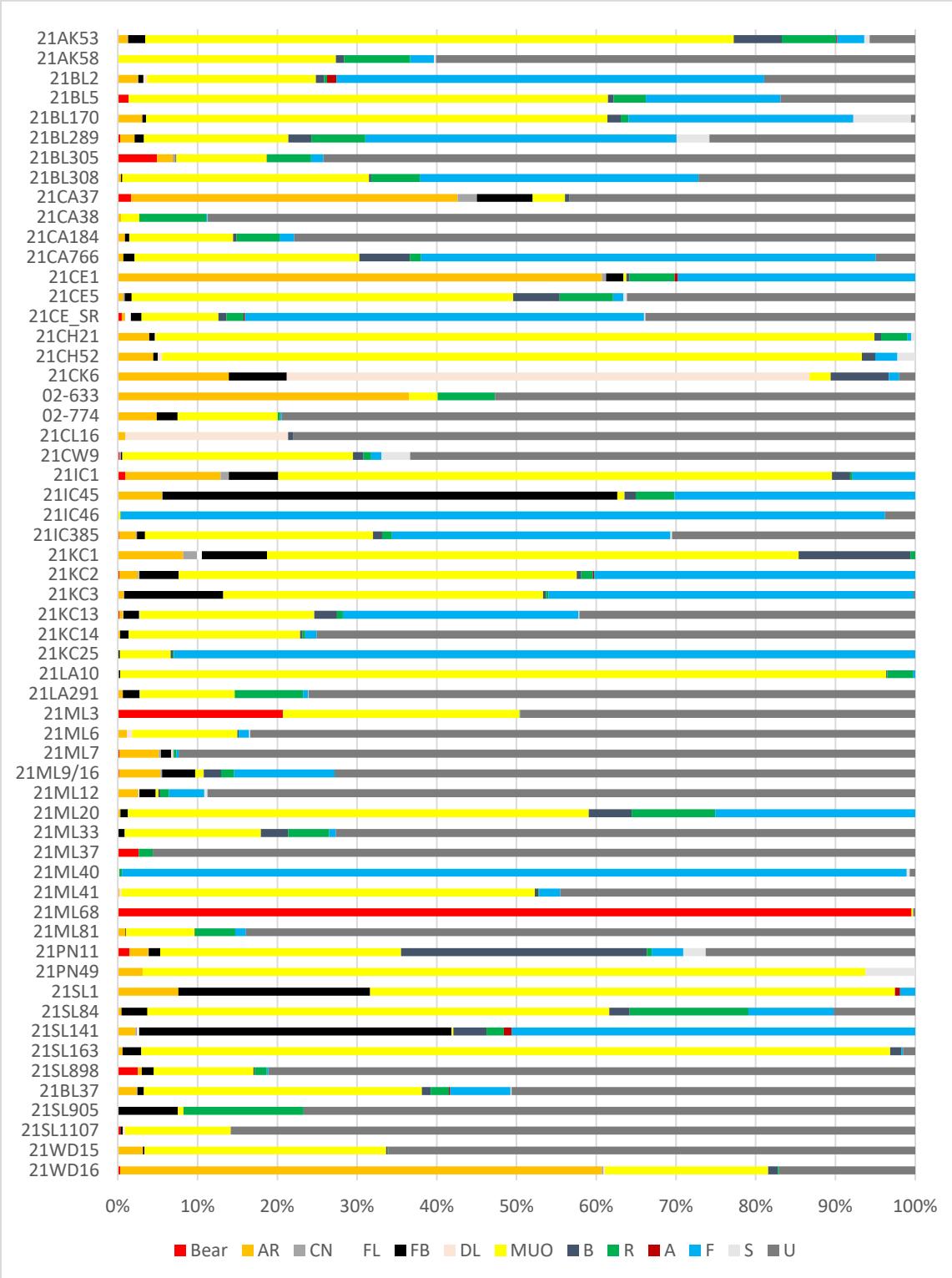


Figure 42. Percent NISP of sites with NISP > 100, Laurentian Mixed Forest Ecological Province.

Table 12. Summary of zooarchaeological data, NISP >100, Laurentian Mixed Forest.

Site	Bear	AR	CN	FL	FB	DL	MUO	B	R	A	F	S	U	Total
21AK53	1	17	1	0	31	0	1073	88	99	2	49	10	83	1454
21AK58	0	0	0	0	0	0	1337	51	404	0	147	13	2938	4890
21BL2	1	79	1	0	20	16	665	33	11	37	1689	0	596	3148
21BL5	2	0	0	0	0	0	89	1	6	0	25	0	25	148
21BL37	11	539	22	0	188	4	8105	258	535	36	1762	26	11780	23266
21BL170	0	35	0	0	5	0	657	19	11	0	320	82	6	1135
21BL289	8	50	0	0	32	0	501	80	187	0	1080	114	713	2765
21BL305	80	32	6	0	1	0	185	1	90	0	25	0	1209	1629
21BL308	1	3	0	0	2	0	330	3	65	0	373	0	290	1067
21CA37	9	222	13	0	38	0	22	3	0	0	0	0	0	235
21CA38	3	18	0	0	0	0	111	1	409	0	8	2	4345	4897
21CA184	0	139	0	0	83	0	2037	64	846	0	287	0	12160	15616
21CA766	0	1	0	0	2	0	40	9	2		81	0	7	142
21CE1	2	4957	43	0	178	0	29	35	462	31	2432	0	0	8169
21CE5	0	3	1	0	4	0	221	27	31	0	6	2	167	462
21CE_SR	34	29	3	48	95	0	681	71	152	12	3535	10	2390	7060
21CH21	0	33	0	0	6	1	758	7	28	0	4	4	0	841
21CH52	0	8	0	0	1	1	158	3	0	0	5	4	0	180
21CK6	0	21	0	0	11	99	4	11	0	0	2	0	3	151
02-633	0	61	0	0	0	0	6	0	12	0	0	0	0	88
02-774	0	30	0	0	16	0	77	0	2	0	1	0	488	614
21CL16	0	6	0	0	0	135	0	4	0	0	0	0	0	515
21CW9	1	0	1	0	1	0	153	7	5	0	7	19	335	529
21IC1	14	171	15	0	89	0	997	33	4	0	113	0	0	1436
21IC45	0	43	1	0	446	0	7	11	38	0	236	0	0	782
21IC46	0	13	1	0	49	0	183	28	19	5	73986	6	2916	77206
21IC385	5	71	4	0	34	0	956	38	41	0	1167	7	1019	3342
21KC1	0	14	3	1	14	0	114	24	1	0	0	0	0	171
21KC2	57	670	52	3	1435	0	14512	166	423	55	11691	0	0	29064
21KC3	4	70	4	0	1228	0	3963	37	29	0	4530	0	17	9882
21KC13	11	27	2	1	121	4	1329	173	44	0	1794	6	2554	6066
21KC14	1	5	0	0	22	0	447	6	7	0	30	0	1559	2077
21KC25	P	47	1	0	158	0	4989	205	150	0	73000	0	0	78550
21LA10	0	3	0	0	5	0	2653	3	89	0	8	0	0	2761
21LA291	1	14	0	0	51	0	289	0	207	0	15	1	1842	2420
21ML3	663	0	0	0	1	0	950	2	0	0	1	0	1586	3203
21ML6	0	7	0	0	0	4	81	1	0	0	8	1	512	614
21ML7	3	74	4	0	19	4	0	1	5	0	4	0	1384	1498
21ML9/16	10	329	13	0	265	1	68	138	103	0	801	0	4633	6361
21ML12	1	67	2	3	55	0	9	6	30	0	119	11	2393	2696
21ML20	0	1	0	0	3	0	182	17	33	0	79	0	0	315
21ML33	0	0	0	0	1	0	20	4	6	0	1	0	85	117
21ML37	6	0	0	0	0	0	0	0	4	0	0	0	0	219
21ML40	0	0	0	0	0	1	0	0	2	0	568	2	4	577
21ML41	0	3	0	0	0	3	707	6	1	0	36	0	607	1363

*Table 12 (cont.)*

Site	Bear	AR	CN	FL	FB	DL	MUO	B	R	A	F	S	U	Total
21ML68	3077	0	0	0	1	0	6	0	0	0	0	0	8	3092
21ML81	0	17	1	0	1	0	159	1	94	0	25	0	1556	1854
21PN11	104	169	5	0	104		2168	2216	43	0	283	204	1886	7182
21PN49	0	4	0	0	0	0	117	0	0	0	0	8	0	129
21SL1	0	12	0	0	38	0	104	0	0	1	3	0	0	158
21SL84	0	2	0	0	14	0	249	11	64	0	46	0	44	430
21SL141	0	9	1	1	161	0	1	17	9	4	208	0	0	411
21SL163	0	29	0	0	116	0	4668	69	1	0	9	0	76	4968
21SL898	25	5	0	0	15	0	125	2	15	0	2	0	812	1001
21SL905	0	0	0	0	11	0	1	0	22	0	0	0	112	146
21SL1107	1	0	0	0	1	1	43	0	0	0	0	0	279	325
21WD15	15	790	0	3	56	0	7840	52	2	3	9	0	17089	25859
21WD16	3	652	2	0	0	2	221	13	2	0	0	0	184	1079
<b>Sum</b>	<b>4154</b>	<b>9601</b>	<b>202</b>	<b>60</b>	<b>5228</b>	<b>276</b>	<b>65397</b>	<b>4056</b>	<b>4845</b>	<b>186</b>	<b>180610</b>	<b>532</b>	<b>81749</b>	<b>356896</b>

\*AR=artiodactyla, CN=canine, FL=feline, FB=furbearer, DL=domestic livestock, MUO=mammal undifferentiated/other, B=bird, R=reptile, A=amphibian, F=fish, S=mollusk (shell), U=unidentified

region that Minnesota still has a black bear population, and this area was the focus of the state's first biological studies, in the Superior National Forest near Ely (Rogers 1987). Bear finds from this section are summarized here.

#### *Border Lakes (212La)*

#### **21KC13 and 21KC14**

21KC13 and 21KC14 are multiple component sites near the western edge of Voyageurs National Park, within the NRHP-listed Gold Mine Sites Historic District (Richner 2017). Bear remains include bones from the paw and a tentative identification of a canine (Mather 2006b, 2008d). These sites include Initial and Terminal Woodland Tradition components as well as historic Ojibwe and the late nineteenth century gold mine boom town.

#### **21LA8, Painted Rock Cliff**

The Painted Rock Cliff site contains two bear images among other rock art. The bears are about 5" high, and were new discoveries in 1974 (Birk 1974). The site is also reported by Dewdney and Kidd (1962). The cliff is on the American side of the Basswood River, at the international boundary with Canada.

### **21LA291, No Beard**

The No Beard site is a multicomponent Archaic and Woodland site on Fall Lake, in Superior National Forest (SNF 05-264). Twenty square meters of excavation conducted from 2000-2002 produced a large but highly fragmented faunal assemblage (Mather 2003c), including one canine tooth fragment that could be either black bear (*Ursus americanus*) or a large canid such as wolf or domestic dog (*Canis* sp.). It is included here as a possible bear find. The investigation was conducted as a Passport in Time project by Superior National Forest, and a University of Minnesota-Duluth fieldschool.

### **21SL73**

21SL73 is a Woodland Tradition habitation site on Namakan Lake, in Voyageurs National Park. There is a small faunal assemblage (NISP=13), of which 5 elements are identified as black bear. Other animals identified in the assemblage include moose and beaver (Falk 1984:354). The proximal fragment of a bear femur was found in Level 1 of Test 3. In Level 1 of Test 5, three loose teeth (right fourth premolar, and first & second molars) were found with the right condyle of a bear mandible. Pottery from the test units that produced the bear remains is Initial and Terminal Woodland in age. Historic-era artifacts are also present, but in a different area of the site from where the faunal remains were found (Lynott et al. 1984:150-159; Richner 2008:201).

### **21SL137**

21SL137 is located on Williams Island in Namakan Lake, Voyageurs National Park. Terminal Woodland Tradition and fur trade components are present (Lynott et al. 1984:195-203; Richner 2008:203). In the top level of a test unit (21-22S, 10-11W), there was a burned fragment of a black bear mandible, and a fragment of a metacarpal or metatarsal. Other animal remains from this site include beaver, muskrat, fish and turtle (Falk 1984:356).

### **21SL191**

21SL191 is an island site in Voyageurs National Park. It is a multicomponent Woodland Tradition site, with identification of 8 bear remains (Birk and Richner 2004:28-32; Richner 2008:204; Colburn 1987).

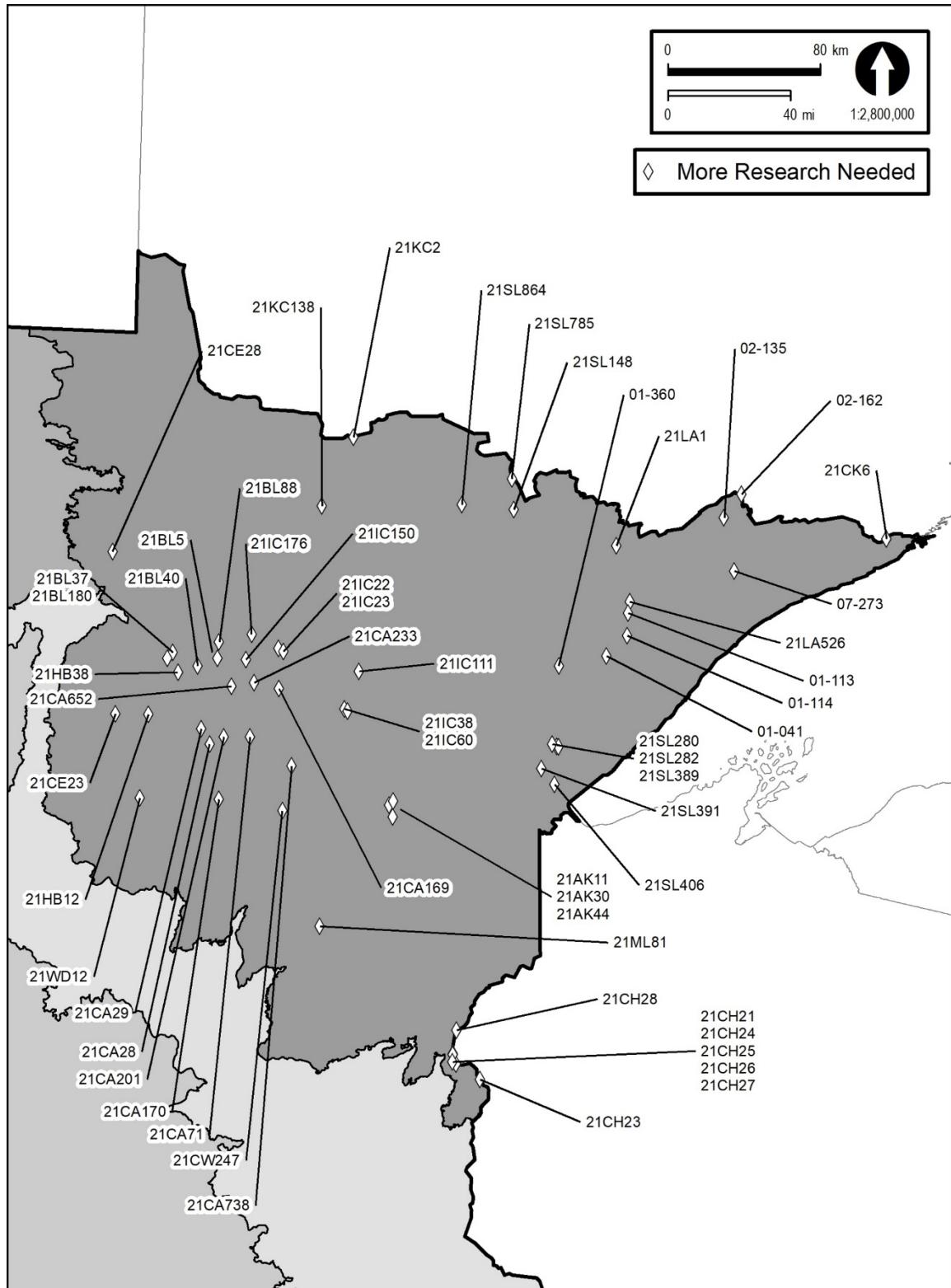


Figure 43. Sites with potentially significant faunal assemblages recommended for analysis, Laurentian Mixed Forest Ecological Province.

*Table 13. Sites with significant faunal assemblages recommended for analysis, Laurentian Mixed Forest Ecological Province.*

Site	County	Reference	Comments
21AK11	Aitkin	Harrison 1987	identifiable fauna listed in report, "including deer, beaver, hare, small rodents and turtle"
21AK30	Aitkin	Quilty 1983:39, 56-59	Fish and mammal bones recovered from flotation
21AK44	Aitkin	Gibbon and Leistman 1984	Possible human or bear bone; "2 burnt bone fragments (one of which may be a burnt human medial phalange)" - ID should be checked; also 1 fish scale
21BL5	Beltrami	Kluth and Kluth 1995	Mammal, turtle, bird and fish bones, and mussel shell fragments; later assemblage reported by Wells and Olmanson (2014a)
21BL37	Beltrami	--	Faunal remains from 1988 burial rescue and later excavations should be analyzed
21BL40	Beltrami	Hohman-Caine et al. 1988:4	Identifiable faunal remains including bison
21BL88	Beltrami	LeVasseur et al. 1988:30	Large assemblage with freshwater mussel shell and large mammal bone
21BL180	Beltrami	Skaar et al. 1998:36	Small assemblage including mammal and fish bone
21CA201	Cass	Hohman-Caine et al. 1993:20	Large assemblage with fish, mammal, turtle and bird bone fragments
21CA28	Cass	Hohman-Caine et al. 2011:43	Radiocarbon date from bone
21CA29	Cass	Peterson and Yourd 1984:82	Large animal bone assemblage (NISP 2,041)
21CA71	Cass	Peterson and Yourd 1984:76	Large animal bone assemblage (NISP 3,224)
21CA169	Cass	Lindbeck 1997	Assemblage including turtle and mammal bone, and shell
21CA170	Cass	Emerson 1993:74	Fish bone concentration from pit feature
21CA233	Cass	O'Connell et al. 1993:20	Animal bone assemblage (162)
21CA652	Cass	Emerson and Magner 2004:53	Assemblage >200 bone fragments
21CA738	Cass	Hohman-Caine et al. 2011:45	Radiocarbon date from bone
21CE23	Clearwater	Streiff 1981	Assemblage with mammal, turtle, and fish bone fragments; fish scales
21CE28	Clearwater	Peterson et al. 1988:49	Large unanalyzed assemblage (8,292 from test units; 140 from shovel tests)
21CH21	Chisago	Fitting et al. 1977:82	Assemblage containing fish and animal bone fragments; later assemblage reported by Connor et al. 1985
21CH23	Chisago	Finney 2004:191-192	Shell midden
21CH24	Chisago	Fitting et al. 1978:96	Shell midden

Table 13 (cont.)

Site	County	Reference	Comments
21CH25	Chisago	Fitting et al. 1978:94; Finney 2004:191	Shell midden
21CH26	Chisago	Finney 2004:191-192	Shell midden
21CH27	Chisago	Fitting et al. 1978:93	Shell midden and burned bone
21CH28	Chisago	Perry 1986:118	Assemblage (NISP 150) with deer, porcupine, canid, fish and mammal bone
21CK6	Cook	Woolworth 1962:17, 1963, 1968, 1975; Hoffman 1969	Mammal skeleton in pit feature, possibly horse; bone from trenching excavation of palisades; kitchen area has been identified but should be re-analyzed
02-135	Cook	Okstad & Woodward 2000:61-75	Large unanalyzed assemblage (4,153 including burned mammal bone)
02-162	Cook	Okstad et al. 2001:177	Large unanalyzed assemblage (568)
07-273	Cook	Okstad et al. 2007:25-26	Bone fragments; NISP 327 from Unit 3 and hearth feature
21CL22	Carlton	Florin and Perkl 1997; Florin 1998	Calcined bone assemblage in activity areas including hearth; large assemblage
21CL25	Carlton	Emerson and Magner 1997:31	Calcined bone assemblage including small mammals and birds
21CW247	Crow Wing	Hohman-Caine et al. 2011:29	Large unanalyzed assemblage including bear, large herbivore
21HB12	Hubbard	Peterson et al. 1991:212	Assemblage (NISP 122) of burned and unburned bone fragments
21HB38	Hubbard	Kluth and Kluth 1994:107	Assemblage (NISP 693) of mostly burned bone
21IC22	Itasca	Johnson et al. 1977:61	Assemblage (NISP 131) of worked bone from surface collection
21IC23	Itasca	Johnson et al. 1977:71	Assemblage (NISP 162) of animal bone
21IC38	Itasca	Johnson 1978:192	Assemblage (NISP 114) of animal bone fragments including mammal teeth
21IC60	Itasca	Johnson 1978:216-217	Small assemblage (NISP 45) but found with "bear canine amulet"
21IC111	Itasca	Radford and George 1991:128-132	Assemblage of animal bone (NISP 312) with hearth feature
21IC150	Itasca	O'Connell et al. 1993:26	Assemblage of animal bone (NISP 493) including mammal, bird and fish
21IC176	Itasca	LeVasseur et al. 1997:27	Feature containing fish bone
21KC2	Koochiching	Peterson and Yourd 1984:116	Assemblage (NISP 122) from highway investigation, and large assemblage from 1985 riverbank stabilization; previous assemblages reported by Lugenbeal 1976 and Lukens 1963

Table 13 (cont.)

Site	County	Reference	Comments
21KC138	Koochiching	Mulholland 2019	Burned and unburned animal bone from multiple Woodland and possibly Archaic components
21LA1	Lake	Birk 1996	Burned and calcined mammal and fish bone from hearth feature
01-114	Lake	Okstad and Woodward 2000:122-124	Faunal assemblage (NISP 488) including burned bone
01-113	Lake	Okstad et al. 2007:21-22	Faunal assemblage of fragmented bone, mostly burned
21LA526	Lake	Schoen 2004	Historical assemblage with meat cuts, wild mammals and birds
21ML81	Mille Lacs	Trocki and Hudak 2003:233	Large faunal assemblage from Phase I/II studies; later assemblage reported by Mather 2012b
21SL148	St. Louis	Harrison 1980:102	Unanalyzed assemblage (NISP 88) including antler and bird bone
21SL280	St. Louis	Mulholland et al. 2005	Unanalyzed assemblage (NISP 1673)
21SL282	St. Louis	Mulholland et al. 2005	Unanalyzed assemblage (NISP 190)
21SL389	St. Louis	Mulholland et al. 2005	Unanalyzed assemblage (NISP 123)
21SL391	St. Louis	Mulholland et al. 2005	Unanalyzed assemblage (NISP 257)
21SL406	St. Louis	Mulholland et al. 2005	Unanalyzed assemblage (NISP 627)
21SL785	St. Louis	Magner and Emerson 2000	Unanalyzed assemblage (NISP 279) including small mammals, turtle and fish; mostly calcined or burned
21SL864	St. Louis	McFarlane and Mather 2000:33	Unanalyzed Phase II assemblage (NISP 523), including bear and moose, possibly caribou
01-041	St. Louis	Peters et al. 1983:66	"large quantity of fragmented animal bone"
01-360	St. Louis	Okstad et al. 2001:192; Okstad and Woodward 2000:108	Unanalyzed assemblage from multicomponent site including in association with hearth feature
21WD12	Wadena	Peterson et al. 1994:437	Unanalyzed assemblage with hundreds of mussel shell fragments; bone and tooth fragments (NISP 275)

### 21SL864, Jordan

The Jordan site is an island in Elephant Lake near Orr. Evaluation of the site by the Bureau of Land Management in 2005 produced a faunal assemblage that includes bear remains associated with Blackduck pottery, and possibly caribou. This assemblage has not yet been fully analyzed.

## **21SL898**

21SL898 is a Woodland Tradition site in Voyageurs National Park (Richner 2008:99, 206), on the north shore of Kabetogama Lake. The faunal assemblage consists primarily of small, calcined fragments (96%). The total NISP is 1001, with a weight of 387.2 grams (Table 14). I originally recorded preliminary identifications from this assemblage for the Midwest Archeological Center and Voyageurs National Park (Mather 2006b). Because of the significance of the bear remains, I later completed the analysis for purposes of this dissertation. I am grateful to the National Park Service for making the assemblage available for further study.

*Table 14. Summary of animal bone from 21SL898, Voyageurs National Park*

<b>Taxonomic Identification</b>	<b>NISP</b>	<b>Weight (g)</b>	<b>MNI</b>
<i>Mammals (subtotal)</i>	170	181.7	---
Black bear ( <i>Ursus americanus</i> )	17	10.9	2
probably black bear (cf. <i>Ursus americanus</i> )	8	5.5	---
Beaver ( <i>Castor canadensis</i> )	2	0.6	1
probably beaver (cf. <i>Castor canadensis</i> )	12	9.6	---
Moose ( <i>Alces alces</i> )	1	22.4	1
Hoofed mammal, undifferentiated (Artiodactyla)	4	0.4	---
Rabbit or hare (Lagomorpha)	1	0.1	---
Large-size mammal	9	35.2	---
Medium-size mammal	4	2.1	---
Small-size mammal	6	1.8	---
Mammal, undifferentiated	106	93.1	---
<i>Birds (subtotal)</i>	2	1.8	---
Bird, undifferentiated	2	1.8	---
<i>Reptiles (subtotal)</i>	15	3.4	---
Pond and river turtles (Emydidae)	15	3.4	---
<i>Fish (subtotal)</i>	2	0.2	---
Fish, undifferentiated	2	0.2	---
<i>Unidentified (subtotal)</i>	812	200.1	---
<b>Total</b>	<b>1001</b>	<b>387.2</b>	<b>4</b>

At least of two black bears are represented by 25 bone fragments, mostly from bones of the paws, including a mature bear and a cub as indicated by epiphyseal fusion

and element size (Table 15). It is likely that these bones represent a mother bear and at least one cub (Figure 44). In Minnesota, bear cubs are born in the den in January. They are awake while the mother hibernates. The cubs stay with her during the year, and den with her again the following winter. Given the small size of this cub's bones, it seems likely that it died during the first few months of its life, perhaps in late winter.

Table 15. Bear remains from 21SL898, Voyageurs National Park (all calcined fragments)

Identification	Body Part	Comments
Black bear <i>Ursus americanus</i>	1 <sup>st</sup> phalanx, proximal fragment	Adult
	1 <sup>st</sup> phalanx, distal fragment	Adult
	2 <sup>nd</sup> phalanx, distal fragment	Adult
	Phalanx, indet, distal fragment	Adult
	Metapodial, medial fragment (3)	Adult
	1 <sup>st</sup> phalanx, proximal fragment (3)	Cub; epiphysis unfused
	1 <sup>st</sup> phalanx, distal fragment	Cub (size)
	2 <sup>nd</sup> phalanx, proximal fragment	Cub; epiphysis unfused
	2 <sup>nd</sup> phalanx, proximal epiphysis (2)	Cub; unfused
	3 <sup>rd</sup> phalanx, nearly complete	Cub; epiphysis fusing
Probably black bear cf. <i>Ursus americanus</i>	3 <sup>rd</sup> phalanx, proximal fragment (2)	Cub; epiphysis fusing
	1 <sup>st</sup> phalanx, distal fragment	Adult
	Metapodial, medial fragment (3)	Adult
	Metapodial, proximal fragment	Cub; epiphysis unfused
	Metapodial, medial fragment (2)	Cub; epiphysis unfused
	Incisor	Cub (size)



Figure 44. Black bear cub paw fragments from 21SL898 with comparative specimens from an adult bear.

## **21SL1107, Armstrong Bay**

The Armstrong Bay site is located within Lake Vermilion State Park. The site was immediately recognized as significant upon its discovery in 2010, due to the large quantity of obsidian flakes recovered (155 flakes – by far the most found at any Minnesota site). This volcanic glass is rarely found in Minnesota, and the source was later established as Obsidian Cliff in present-day Yellowstone National Park (Radford 2014:15-16; Gonsior et al. 2012). A 1x2 meter unit was excavated to evaluate the site. In addition to the obsidian, this produced a small assemblage of calcined bone fragments, and a side-notched point. I analyzed the faunal assemblage to aid in selecting a calcined bone sample for radiocarbon dating, and to see if any identifications could be made. I was delighted to find one distal fragment of a black bear 2<sup>nd</sup> phalanx (Table 16, Figure 45). Fragments of unidentifiable bone from Unit 2 (10-15 cm) were radiocarbon dated to 580±30 BP (Beta 290838).

*Table 16. Summary of animal bone from 21SL1107, Lake Vermilion State Park*

<b>Taxonomic Identification</b>	<b>NISP</b>	<b>Weight (g)</b>	<b>MNI</b>
<i>Mammals (subtotal)</i>	46	22.18	---
Black bear ( <i>Ursus americanus</i> )	1	0.30	1
Beaver, probably (cf. <i>Castor canadensis</i> )	1	0.25	---
Medium-size mammal	2	0.54	---
Mammal, undifferentiated	41	16.70	---
Domestic pig ( <i>Sus scrofa</i> )*	1	4.39	1
<i>Unidentified (subtotal)</i>	279	22.52	---
<b>Total</b>	<b>325</b>	<b>44.70</b>	<b>2</b>

\* recent bone from separate part of the site

### Bear Finds: Northern Minnesota and Ontario Peatlands (212M)

This ECS section is at the central portion of Minnesota's northern border. It includes the cultural landscape of the Rainy River, connecting Voyageurs National Park to Lake of the Woods and the waterways leading eventually to Hudson's Bay. South of the river, much of this section consists of the vast peatlands of the Glacial Lake Agassiz basin. Lake of the Woods and Red Lake (upper and lower) are living remnants of that giant meltwater lake. (Wright 1992; Mather 2010b, 2011a). The peatlands and the Rainy

River valley were formed by the eastern, or Beltrami arm of the glacial lake. Most of the identified sites (and zooarchaeological assemblages) are from the Rainy River. There has been relatively little archaeological survey inland, especially in the peatlands.



Figure 45. Calcined fragment of bear 2nd phalanx from 21SL1107, with comparative specimen.

#### *Littlefork Vermilion Uplands (212Ma)*

##### **21KC2, McKinstry**

The McKinstry site is a stratified floodplain fishing village at the confluence of the Little Fork and Rainy rivers. Identified components date to the Archaic, Initial Woodland and Terminal Woodland traditions. There are two large burial mounds at the site. One is at the edge of an upper terrace. The other is in the floodplain, closer to the present-day water level (Stoltman 1973, 1974; Thomas and Mather 1996; Gibbon 2012a; Ready and Johnson 1992; Wilford 1950b). In their study of the zooarchaeological assemblage from this site, Morey et al. (1996) made a methodological advance for the quantification of sturgeon bone, counting identifiable elements that can be used for

calculation of MNI, in contrast with the generic by recognizable fragment of sturgeon scutes (designated ID vs. NONID bone fragments, respectively).

Paul Lukens (1963) lists four grizzly bear claws (Figure 46) from Mound 2:

Four ungual phalanges from the manus of [*Ursus arctos*] were recovered from the McKinstry Mound No. 2 in Koochiching County. The corresponding bones of the black bear and of the pes of the grizzly are much shorter. My identification has been corroborated by David H. Johnson of the United States National Museum. All four claws, from different locations in the mound, were found in association with cremated human fragments and showed signs of having been worked (Lukens 1963:73).

The claws appear to be cut or carved, but they are not drilled, so they don't appear to have been part of a grizzly claw necklace. It is not possible to say if the Rainy River was source for the claws, meaning that a grizzly bear lived there, although it is possible that this was the case. Individual teeth and claws are easily portable, obviously, so finds like this do not necessarily indicate the local presence of the animal.

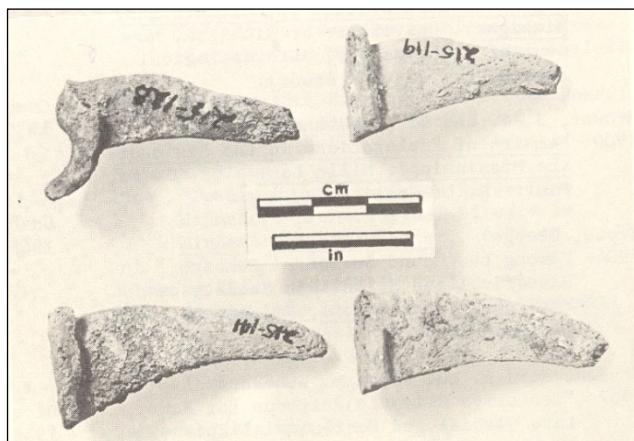


Figure 46. Grizzly claws from the McKinstry site (from Stoltman 1973).

Black bear remains are also present, from the Phase III data recovery excavation for the bridge replacement over the Little Fork River (Morey et al. 1996) and the previous excavations at Mounds 1 and 2 (Lukens 1963).

### **21KC3, Grand Mound**

Grand Mound Historic Site is also known as the Smith site. Originally listed in the NRHP in 1972, it was awarded the higher designation of National Historic Landmark in 2011. The site is located at the confluence of the Big Fork and Rainy rivers, the U.S.-Canada border. The ceremonial center of Grand Mound and the Smith site (21KC2) is on the east bank of the Big Fork. Grand Mound is the largest burial mound in Minnesota, and is an effigy that may represent a muskrat, the Earth Diver of ancient legend and Middle Woodland burial mound symbolism (Mather 2006b, 2011b:87-91, 2015). It is one of five mounds at the site, surrounded by stratified floodplain deposits containing Laurel (Initial Woodland) and Blackduck (Terminal Woodland) ceramics. Above the floodplain on the uplands to the south in Archaic Tradition component (Budak 1995; Lugenbeal 1976, 1978a, 1978b; Stoltman 1973; Birk and George 1976; Mather 2006b; Gibbon 2012a:123-128). Lukens (1963) reports a canine and partial right ulna from Mound 4.

### **21KC25, Hannaford**

The Hannaford site is a Late Woodland fishing site located directly across the Big Fork River from Grand Mound. Excavations prior to a highway bridge replacement in 1992 produced a large faunal assemblage from multiple Late Woodland (Blackduck) components. Zooarchaeological analysis by Orrin Shane III demonstrates that the focus of this area was the procurement of spring spawning fish, particularly lake sturgeon (*Acipenser fulvescens*) and redhorse suckers (*Moxostoma* spp.). As seen in Figure 42, this site assemblage is similar in composition to 21IC46 and 21BL289, which are Late Woodland spring fishing sites near the Mississippi River headwaters, also with Blackduck components (Hohman-Caine and Goltz 1998; Mather 2005; Terrell 2012).

Black bear is listed among the identified species at Hannaford, but the Phase III report and appendices do not provide NISP counts or related information. The report focused on five site areas, designated A-E. Faunal remains were also identified from other site areas, but fragments from disturbed contexts were not included in the analysis. Presumably, these fragments included those identified as bear. Shane notes, “Large terrestrial mammals, particularly whitetail deer, elk, moose, and bear, are conspicuous by

their scant trace occurrences" (Rapp et al. 1995:207). For this reason, "P" is entered in Table 12 for 21KC25, indicating that bear is present.

One black bear mandible fragment was recovered from Area A-North, Unit 16, in the vicinity of a cremation feature in Unit 32 that contained ash, calcined bone and shell fragments, and a cruciform shell pendant. Natural soils surrounding the feature were discolored from heat. Within the feature, there were larger calcined bone fragments. One unburned phalange from the edge of the feature appeared to be human, and it was identified as such by osteologists at Hamline University (Hohman-Caine and Goltz 1994:77-78). A cache of ochre was found in the same unit as the bear bone. Other artifacts in this area include sherds of miniature (mortuary) pots, and a piece of sheet mica. Animal bone from the feature included calcined fragments of lake sturgeon, moose, beaver, rabbit and grouse, and remnants of worked bone including at least one harpoon (Rapp et al. 1995:200-201).

Rapp et al. (1995:235, 238) seem sharply skeptical of the idea that this was a ritual area, or that the artifacts are associated. I find this puzzling because these types of artifacts are clearly unusual and are not what would be expected in a domestic (non-ritual) context. Further, although it was certainly also a fishing village, the entire Hannaford site is in a ritual setting, adjacent and directly across the Big Fork river from Grand Mound and the other earthworks of the Smith site. The Smith site was itself also a fishing village (Budak 1995; Lugenbeal 1976; Mather 2015).

The bear bone is illustrated in Rapp et al. (1995:354). It is a fragment of a right mandible including the canine, 4<sup>th</sup> premolar, and 1<sup>st</sup> and 2<sup>nd</sup> molars. The molars are very worn, indicating that this was an old bear when it died. It is difficult to be certain from the photograph, but there may be cut marks on the mandible near the broken edge.

#### *Agassiz Lowlands (212Mb)*

#### **21BL2, Waskish**

The Waskish site is located along the Tamarac River at the eastern shore of Upper Red Lake, within the Big Bog State Recreation Area. The river entrance was historically

known for spring runs of spawning fish, particularly walleyes, but also northern pike and suckers (Gonsior and Radford 2005:26). There is one bear canine in the Evans collection from this site. About ten miles upstream from Red Lake, the Tamarac River leads to a portage to the Sturgeon River, thus connecting the Red River watershed (westward) with the Rainy River and Boundary Waters to the north/northeast.

### **21BL308**

21BL308 is located on the south shore of Lower Red Lake, east of the Mud River. Phase I and II investigations consisting of shovel testing and 28 excavation units documented Late Archaic and multiple Woodland Tradition components, including ceramics that are Laurel or possibly an undefined Initial Woodland ware. One bear claw (XU 3A, 10-20 cmbd) was identified among the faunal assemblage, which was primarily fish. The artifact catalog includes descriptions of burned or calcined bone, but the bear claw appears to have been unmodified (Florin and Lindbeck 2011).

### **21CE\_, Sandy River**

The Sandy River site is located on the east bank of that river where it enters the southern shore of Lower Red Lake, within the Red Lake Nation. The site was discovered when the highway bridge was proposed for replacement. There are multiple Woodland components represented by Brainerd and other ceramic wares, and historical archaeology of historic Ojibwe presence. There is relatively little known about the archaeology of the Red Lake area, so despite some previous disturbance, data recovery investigation was conducted by the Red Lake Tribal Archaeologist and Soils Consulting prior to construction. Of the 27 square meters of formal excavation, all but 5 units were in one contiguous block.

Grant Goltz and I identified the animal remains in 2009 using the extensive comparative collection at the Soils Consulting laboratory (Table 17). Black bear bones were a prominent identification within the large and significant faunal assemblage. Other notable finds include a diverse range of furbearers, fish and waterbirds, including loons. Also, the assemblage includes a burned scapula fragment of mountain lion (*Puma concolor*), which I believe is the first zooarchaeological record of that species in Minnesota. Of the 3,535 fish bones and fragments, close to two-thirds (2,014) are

vertebrae. Of these, two may have been modified to be beads, similar to those I've illustrated elsewhere (Mather 2008d:55).

#### Bear Finds: Northern Minnesota Drift and Lake Plains (212N)

This section encompasses the Mississippi Headwaters area, including the major lakes in Chippewa National Forest and the Leech Lake Band of Ojibwe reservation.

##### *Chippewa Plains (212Na)*

###### **21BL5, Pug Hole**

Pug Hole, or Roy's House/Fort, is a multicomponent Woodland Tradition and fur trade site on the north shore of Cass Lake, where a flowage enters from a chain of lakes. Two fragments were identified as bear within a small (NISP=148) faunal assemblage consisting primarily of mammal bone (Wells and Olmanson 2014a). A previous unanalyzed assemblage also contains fish, bird, and turtle bone fragments, and freshwater mussel shell (Kluth and Kluth 1995).

###### **21BL37, Midway**

The Midway site is located in the City of Bemidji where the Mississippi River leaves Lake Bemidji. Henry Schoolcraft described this general area in 1832 as the location of an "Image Stone," or "*Shingaba Wossin*" in his transcription of the Ojibwe name. It was a large stone, known to Schoolcraft's guides, that had been stood upright and colored with a ring of red paint. There may have been carvings on it. Schoolcraft notes that the soil, "at this spot, appeared to be rather rich, bearing a growth of elm, soft maple and white ash" (Mason 1993:28-29).

21BL37 is also known as the Pamida site, for the burial rescue that occurred when that store was expanded in 1988. The rich soil that Schoolcraft described was evident there, as black, highly organic sandy loam that stained the hands of the excavators. Later investigations occurred when Trunk Highway 197 was expanded (Leech Lake Heritage Sites Program 2002; see also Hohman-Caine et al. 2012:42), which included zooarchaeological analysis by Theler and Baker (2005). There are 10 bone fragments of black bear identified, plus one probable identification. As seen in Table 12, the

Table 17. Faunal Identifications from the Sandy River site (21CE\_), Red Lake Nation

<b>Taxonomic Identification</b>	<b>NISP</b>	<b>MNI</b>
<i><u>Mammals</u></i> (subtotal)	890	20
Black bear ( <i>Ursus americanus</i> )	31	3
Black bear, probably (cf. <i>Ursus americanus</i> )	3	---
Mountain lion ( <i>Puma concolor</i> )	1	1
Bobcat ( <i>Lynx rufus</i> )	1	1
Bobcat or lynx ( <i>Lynx</i> sp.)	1	--
Domestic cat ( <i>Felis catus</i> )	45	1
Domestic dog ( <i>Canis familiaris</i> )	2	1
Dog family (Canidae)	1	---
Bison ( <i>Bison bison</i> )	3	1
Moose ( <i>Alces alces</i> )	6	1
Elk ( <i>Cervus elephas</i> )	2	1
Deer ( <i>Odocoileus</i> sp.)	5	1
Deer, probably (cf. <i>Odocoileus</i> sp.)	2	---
Caribou, possibly (Cervidae, cf. <i>Rangifer tarandus</i> )	1	---
Deer family (Cervidae)	1	---
Hoofed mammal (Artiodactyla)	9	---
Beaver ( <i>Castor canadensis</i> )	72	3
Beaver, probably (cf. <i>Castor canadensis</i> )	1	---
Muskrat ( <i>Ondatra zibethicus</i> )	14	3
Otter ( <i>Lontra canadensis</i> )	2	1
Fisher ( <i>Martes pennanti</i> )	1	1
Rabbit/Hare family (Leporidae)	5	---
Woodchuck ( <i>Marmota monax</i> )	24	1
Large-size mammal	81	---
Medium-size mammal	9	---
Small-size mammal	17	---
Micromammal, undifferentiated	27	---
Mammal, undifferentiated	523	---
<i><u>Birds</u></i> (subtotal)	71	7
Dabbling ducks subfamily (Anatinae)	15	3
Dabbling ducks, probably (cf. Anatinae)	1	---
Common loon ( <i>Gavia immer</i> )	8	2
Canada goose ( <i>Branta canadensis</i> )	2	1
Double-crested cormorant ( <i>Phalacrocorax auritus</i> )	1	1
Sandhill crane, probably (cf. <i>Grus canadensis</i> )	1	---
Large-size bird	2	---
Medium-size bird	1	---
Small-size bird	1	---
Bird, undifferentiated	39	---
<i><u>Reptiles</u></i> (subtotal)	152	1
Painted turtle ( <i>Chrysemys picta</i> )	1	1
Painted turtle, probably (cf. <i>Chrysemys picta</i> )	2	--
Pond/river turtle family (Emididae)	149	--
<i><u>Amphibians</u></i> (subtotal)	12	---
Pond frogs ( <i>Rana</i> sp.)	1	---
Amphibian, undifferentiated	11	---

**Table 17 (cont.)**

<u>Fish (subtotal)</u>	3,535	35
Walleye/ sauger ( <i>Stizostedion</i> sp.)	64	23
Northern pike/ muskellunge ( <i>Esox</i> sp.)	104	8
Freshwater drum ( <i>Aplodinotus grunniens</i> )	32	4
Sucker family (Catostomidae)	3	---
Fish, undifferentiated	3,332	---
 <u>Mollusks (subtotal)</u>	 10	 ---
Freshwater mussel family (Unionidae)	7	---
Snail class (Gastropoda)	3	---
 <u>Unidentified</u>	 2,390	 ---
 <b>Total</b>	 <b>7,060</b>	 <b>63</b>

is dominated by artiodactyls and furbearers. The artiodactyls comprise an interesting and diverse assemblage on their own, with white-tailed deer (NISP 354, MNI 6), moose (NISP 23, MNI 2), elk (NISP 3, MNI 1) and caribou (NISP 1, MNI 1). This is one of the rare identifications of caribou (*Rangifer tarandus*) in Minnesota's zooarchaeological record. Baker and Theler (2005:109) illustrate some of the bear canines in their Figure 4. Findings of their analysis follow:

The nine bear bones found at Midway are consistent with those of a black bear. They are a left maxilla, a right and left canine, an incisor, four metatarsals, and an astragalus. An MNI of two individuals is based on two upper canines. Although one is a right and one is a left, the two teeth differ significantly in size and obviously came from two individuals. Another damaged canine from the redeposited A horizon was identified as probable bear. An additional cranial fragment, an occipital condyle, also came from the redeposited A horizon material. [Baker and Theler 2005:112]

### **21BL289, Three Island Park**

The Three Island Park site is a Late Woodland fishing village that was listed in the NRHP in 2012. It is located adjacent to a stream where suckers and other fish spawn in the spring, and fish bones were found in a pit feature with a largely intact Blackduck pot (Terrell 2012; Terrell et al. 2009). Fragments of bear bone were identified in the faunal assemblage (NISP=8). It is reasonable to assume that bears, like people, would be attracted to fish spawning runs and this proximity would result in opportunities for bear

hunting. Based on the archaeological context, it is likely that bears identified at this type of site were killed in the spring.

### **21BL305, Animoosh**

The Animoosh site is a particularly exciting bear-related find, because it provides the most compelling evidence that grizzly bears (*Ursus arctos*) are native to Minnesota. Colleen Wells of the Leech Lake Heritage Sites Program has conducted the zooarchaeological analysis for this site (Wells and Olmanson 2014b; Olmanson and Wells 2010). I am grateful to her for the opportunity to consult about the bear bones found in the 2009 Phase II and 2013 Phase III investigations, and to include a summary of the results here.

The site has Paleoindian and Archaic components, with a fluted lanceolate point of Hixton Silicified Sandstone recovered in the Phase II investigation. Among other faunal remains, a partial phalanx from a large bear was recovered from Unit 7, 50-60 cmbs (Figure 47). Phase III excavation encountered a pit feature with a significant amount of fractured bear bone (Figure 48).



Figure 47. Phalanx from a large bear found in the Phase II excavation at 21BL305, photos by Thor Olmanson, from Olmanson and Wells (2010).



Figure 48. Feature with bear bone at 21BL305, photo from Wells and Olmanson (2014b).

Within the assemblage, most of the bear bone was from the Unit 19 pit feature which contained bone fragments of both forelimbs, but without the paws. The morphology of the radius and ulna (Figures 49-50) in particular appears consistent with an identification of *Ursus arctos*. When Wells and I examined the assemblage, we had a comparative specimen of black bear, and good illustrations of *U. arctos* skeletal elements (Schmid 1972). The morphology of diagnostic pieces matched the illustrations, and was visibly different from the *U. americanus* comparative specimen. Genetic analysis attempted in

2015, but unfortunately the bone sample did not have DNA that could be sequenced (Dolynskyj and White 2015). Bear bone in the pit feature included:

- 2 bear humerus proximal fragments, left (refit)
- 1 bear humerus distal fragment, right
- 2 bear radius proximal fragments, left (refit)
- 1 bear radius proximal fragment, right
- 1 bear radius distal fragment, right
- 1 bear radius distal fragment, left
- 2 bear ulna proximal fragment, right (refit)
- 1 bear ulna proximal fragment, left
- 1 bear ulna distal fragment, left
- 65 likely bear diaphysis fragments, spiral fracture
- 11 large mammal diaphysis small fragments
- 1 medium mammal diaphysis small fragment, calcined



Figure 49. Lateral and medial views of a proximal bear radius from feature at 45-60 cmbs, Unit 19, 21BL305 (photos by Thor Olmanson, from Wells and Olmanson 2014b).



Figure 50. Anterior view of a proximal bear ulna from feature at 45-60 cmbs, Unit 19, 21BL305 (photo by Thor Olmanson, from Wells and Olmanson 2014b).

Other bear remains include a heavily worn third molar from Unit 13, 70-80 cmbs, and from Unit 19, 15-20 cmbs, a calcined distal fragment of a metacarpal.

Other identified faunal remains include porcupine, turtle and fish. Canid fragments are calcined, and are likely domestic dog (*Canis familiaris*). One mandible fragment identified in the Phase II investigation exhibits tooth crowding that appears consistent with dog (Olmanson and Wells 2010:30). *Animoosh* is the Ojibwe word for dog.

#### 21CA38, South Pike Bay

The South Pike Bay site contains some of the oldest documented bear remains in Minnesota. Listed in the NRHP in 2014 (Foss 2013; see also LeVasseur and Yourd 2002; LeVasseur 2003; Mather 2015), this site contains Woodland and Archaic tradition components. The faunal assemblage is mostly calcined (Mather 2002b), with identifications of turtle, beaver, bison and fish (Table 18). There are calcined bone fragments from a bear paw that were found in levels dated to about 8,000 BP based on radiocarbon dates of phytoliths in the soil.

Table 18. Summary of animal bone from 21CA38, Chippewa National Forest

Taxonomic Identification	NISP	Weight (g)	MNI
<u>Mammals</u> (subtotal)	132	81.6	-
Black bear ( <i>Ursus americanus</i> )	2	1.2	1
Black bear, probably (cf. <i>Ursus americanus</i> )	1	0.5	-
Bison, probably (cf. <i>Bison</i> sp.)	1	0.5	-
Deer ( <i>Odocoileus</i> sp.)	2	11.0	-
Deer, probably (cf. <i>Odocoileus</i> sp.)	2	1.2	-
Deer Family (Cervidae)	13	0.8	-
Rodent, undifferentiated (Rodentia)	2	1.4	-
Mammal, undifferentiated	109	65.4	-
<u>Birds</u> (subtotal)	1	0.1	-
Bird, undifferentiated	1	0.1	-
<u>Reptiles</u> (subtotal)	409	30.5	-
Turtle (Testudines)	409	30.5	-
<u>Fish</u> (subtotal)	8	0.6	-
Sunfish Family (Centrarchidae)	1	0.1	-
Fish, undifferentiated	7	0.5	-
<u>Mollusk</u> (subtotal)	2	0.1	-
Mollusk, undifferentiated	2	0.1	-
<u>Unidentified</u> (subtotal)	4,345	240.2	-
<b>Total</b>	<b>4,897</b>	<b>353.7</b>	<b>1</b>

### 21CE1, Itasca Bison

The famous Itasca Bison Kill site is located near the source of the Mississippi River, in the valley of Nicollet Creek. This is a rare example of wet site archaeology in Minnesota, and shows the great untapped potential of this resource type. The site was discovered in 1937 during road construction through the peat-filled valley (Jenks 1937). Major excavations were undertaken in 1963-1965 (Shay 1971), and the site was listed in the NRHP in 1970. The assemblage was reanalyzed by Widga (2006, 2014) with a focus on the bison remains. There are two black bear bone in the assemblage: a third phalanx (claw) and the medial portion of a metacarpal or metatarsal, likely from a young bear. Both are stained dark brown from the peat.

### **21CE4, Upper Rice Lake**

Cumulative excavations at the Upper Rice Lake site (Gibbon 2012b:85) have produced a large faunal assemblage. There is one identification of black bear in 1989 assemblage (total NISP=650), and one in the combined 1959 and 1967 assemblage (total NISP=1,670). Other identified taxa include moose, elk, dog, beaver and muskrat.

### **21CE5, Lower Rice Lake**

The Lower Rice Lake site (Bakken 2006:63) includes a bear canine from Unit 3, Level 5.

### **21CE63**

21CE63 is a site at the Rice Lake Dam on the White Earth Reservation. The faunal assemblage includes a lower third molar from a black bear (Florin 2005).

### **21IC1, White Oak Point**

The White Oak Point site was listed in the NRHP in 1972. Among the curated archaeological collections from the University of Minnesota, now housed at the Minnesota Historical Society, is a stone bear effigy found at this site (Figure 51). The accession number is 236-3 (ZKD 125). This is a remarkable and unique artifact. The effigy appears to have been carved from a naturally rounded river pebble (a fine grained siliceous material) with relatively little modification. I speculate that the maker saw the bear in the stone's natural form and proceeded from there. The shape of the bear was enhanced by grinding portions of the pebble's surface. This modification is apparent along the neck and back, which includes a shoulder hump. Grinding is also present on the belly and edges of the legs. Shallow notches accentuate the ears, as well as the triangular-shaped tail. The feet are notched in from the bottom. Much of the two sides are unmodified, as demonstrated by the reddish cortex still present on the right flank. The left side's cortex is lighter in color, but the white scuff marks are part of the unmodified pebble surface. The back legs are longer than the front, and the next is long (almost suggesting a polar bear's shape, although I assume this is not what was meant). These dimensions appear to reflect the original size and shape of the pebble. The eyes are the most complex part of the effigy. They appear to be inlaid native copper, bluish green in color with oxidation. It would be useful to confirm this, and to determine the source of

the metal (from Minnesota or the Upper Peninsula of Michigan, for example). The copper eyes are flush with the surface of the stone.



Figure 51. Stone bear effigy from the White Oak Point site (21IC1).

Measurements of the stone bear are as follows:

- Total length, nose to tail: 56.08 mm

- Width at shoulder: 11.66 mm
- Width at hip: 10.65 mm
- Height back legs: 23.59 mm
- Height front legs: 20.79 mm
- Length of face: 12.72 mm
- Length of carved tail: 8.23 mm
- Groove width front legs: 2.63 mm
- Groove width back legs: 1.85 mm
- Eye (left) diameter: 2.16 mm
- Eye (right) diameter: 1.52 mm

Fourteen fragments of bear bone are also present in the faunal assemblage from White Oak Mound (Lukens 1963).

#### **21IC385, Anchor Camp**

The Anchor Camp site is a Woodland Tradition habitation located on the channel between Rice and Little Sand lakes. Phase III data recovery excavation prior to a highway bridge replacement produced a large and well preserved faunal assemblage, with five identified fragments of black bear bone including a scapula fragment from Unit 16. Ceramics found at the site include Brainerd, Laurel, Blackduck and Sandy Lake. A few fur trade artifacts were also found, including an English trade axe and ceramic bead in Units 15 and 16, respectively (Wells and Olmanson 2013).

#### *St. Louis Moraines (212Nb)*

#### **21AK4, Brown's Point**

The North West Fur Company Post at Brown's Point is a significant late fur trade site (Gibbon and Wynia 2010). I have conducted a partial analysis of the large assemblage, and it includes a black bear mandible, along with large numbers of fish and bird remains. This area of Sandy Lake is currently built up with lakeshore residences, which have impacted the site to an unknown extent (Cummings 2018:8).

### **21AK9, Battle Island**

Battle Island is a significant site on Big Sandy Lake. The curated collection contains a black bear mandible from a young animal, possibly a yearling. I have not been able to examine this assemblage further, but it warrants full analysis.

### **21AK53, Savanna Portage**

The Savanna Portage is a fur trade-era portage trail listed in the National Register of Historic Places. It connects the East and West Savanna rivers, within the Lake Superior and Mississippi River watersheds, respectively. The portage extends eastward into ECS subsection 212Nd, the Tamarack Lowlands. Archaeological investigations have focused on the trail itself, and associated cabin and logging camp sites (Gibbon 2006; Watrall 1969). A large faunal assemblage was recovered from the Trader's Cabin area, that includes one molar fragment listed as "human, pig, or bear" (Gibbon and Willms 1985:83). This identification should be checked, but it is listed here as a likely bear find. Human molars, while sharing the grinding cusps, are much smaller than bear or pig. No other domestic livestock are listed in the identified fauna from the cabin, making pig less likely, although it is known that pigs, oxen and horses were present at the Weyerhauser Logging Camp (Watrall 1969:37-41). The cabin site is significantly earlier in date than the logging camp.

The setting of the historic portage, within Savanna Portage State Park, is good bear habitat. I saw fresh bear scat on the portage trail in August 2019 (Figure 52). It contained undigested wild cherries – either pin cherries or chokecherries (*Prunus* sp.). There was also wolf scat on the trail, a short distance away (field identifications later checked with reference to McDougall 2004:94, 194).

### **21IC60**

21IC60, a site identified in a shoreline survey of the Mississippi Headwaters reservoir lakes, produced one bear canine ornament and small assemblage (NISP 45) of animal bone (Johnson 1978:216-217).



Figure 52. Bear scat on the Savanna Portage trail, August 2019; left – with U.S. 25-cent coin for scale; right – broken open to reveal undigested *Prunus* fruit.

#### *Pine Moraines and Outwash Plains (212Nc)*

##### **21CA37, Gull Lake Mounds**

The Gull Lake Mounds is a NRHP-listed site in southern Cass County (Johnson 1967). I examined animal bone from the mounds before it was repatriated (Table 19). The assemblage included bear remains, as well as domestic dog, and moose mandible fragments (Mather 1998b). The latter had been originally identified as bison.

##### **21CA79, Pipe Island**

Pipe Island is near the southern shore of Leech Lake. Elden Johnson (1978:108) reports one bear tooth and one bison bone from a shoreline survey.

##### **21CW29, North West Company Post**

The North West Company Fur Post on Whitefish Lake is known from historical research and a study of artifacts in private collections (Birk 2008). A bear pendant is made from trade silver, and may have been modified locally to that shape from another object. There is also a black bear claw with a drilled hole (Figure 53).

Table 19. Identified animal remains from funerary contexts at the Gull Lake Dam Mounds: NAGPRA study (Mather 1998b).

<b>Taxonomic Identification</b>	<b>NISP</b>	<b>MNI</b>
<u>Mammals (subtotal)</u>	304	12
Black bear ( <i>Ursus americanus</i> )	9	2
Domestic dog ( <i>Canis familiaris</i> )	13	2
Otter ( <i>Lontra canadensis</i> )	1	1
Beaver ( <i>Castor canadensis</i> )	37	5
Moose ( <i>Alces alces</i> )	3	1
Deer ( <i>Odocoileus</i> sp.)	8	1
Hoofed mammal, undifferentiated (Artiodactyla)	211	--
Large mammal	20	--
Medium/large mammal	1	--
Medium mammal	1	--
<u>Birds (subtotal)</u>	3	--
Bird, undifferentiated	3	--
<u>Unidentified:</u>	235	--
<b>Total</b>	<b>539</b>	<b>12</b>

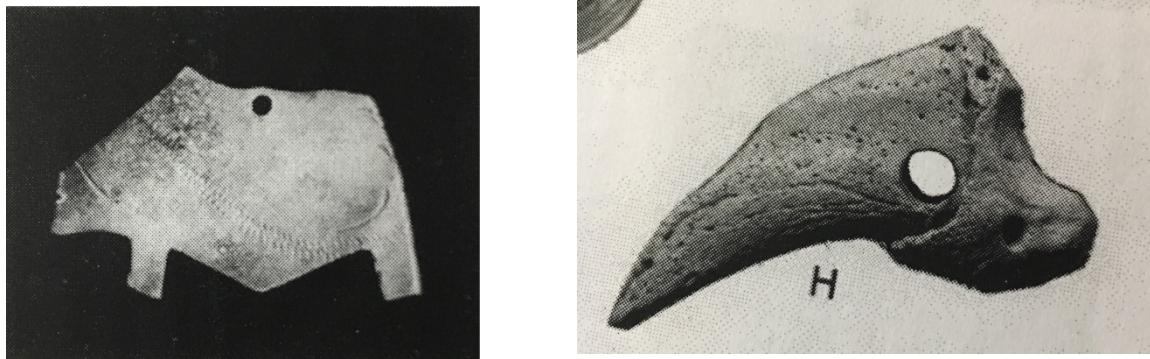


Figure 53. Bear finds from 21CW29: portable art and zooarchaeology, from Birk (2008).

### 21CW247, Levesque

The Levesque site contains Paleoindian, Woodland and historic components. Bear remains including calcined fragments of paw bones are present in unanalyzed assemblage. Large herbivore bone is also present. Sample from the faunal assemblage have been included in a context study of dates for Brainerd ceramics. (Hohman Caine et al. 2011:29). Full analysis of the faunal assemblage is currently underway.

### **21WD15, Réaume's Fur Post**

Réaume's Fur Post was listed in the National Register of Historic Places based on Doug Birk's investigations. Amélie Allard (2016) returned to the site for her dissertation research, and identified a significant amount of black bear bone within a rich faunal assemblage. There are 9 bear identifications, and an additional 6 tentative identifications, within a total assemblage of 8,703 animal remains.

### **21WD16, Little Round Hill**

Little Round Hill is also listed in the NRHP as part of the Old Wadena Historic District. Located at the confluence of the Partridge and Crow Wing rivers, Little Round Hill was a fur trade encampment in the late eighteenth century, where French traders led by Ah-wish-to-yah (Blacksmith) stayed with a small band of Pillager Ojibwe. As recorded by nineteenth-century historian William Warren (1984:275-278), the group successfully defended themselves against a larger force of Dakota.

The faunal assemblage from Birk's 1991 excavation (NISP >1,200) has not been analyzed. However, the faunal assemblage from the 2009-2010 University of Minnesota investigations directed by Kat Hayes has been studied, and it contains three bear remains (Hayes 2014:27). The assemblage is primarily deer, with elk, and smaller numbers of canid, bird and small mammal remains. The bear elements are a tibia (21-3601), ulna (39-3774) and metatarsal (17-3516). The tibia and ulna were both recovered from Unit N478/E533, toward the eastern side of the site, a few meters south of a large surface depression that may be the remains of a structure. The metatarsal is from Unit N494/E507, in the more intensively excavated northwest area of the site. The ulna is from a large bear, and it would be useful to check it with a comparative specimen of *Ursus arctos*.

#### Bear Finds: Western Superior Uplands (212K)

The extent of this ECS section is the same as the Mille Lacs Uplands (212Kb) subsection. It contains all of Pine and Kanabec counties, nearly all of Mille Lacs County, large portions of Morrison and Benton and Chisago counties, parts of Aitkin, Crow Wing Carlton and Isanti counties, and very small portions of Sherburne and Washington

counties. This large area contains the Kathio Archeological District on the western shore of Mille Lacs, which was designated a National Historic Landmark in 1964, in recognition of the deep ancestry of the Dakota represented by the archaeological sites here, and the initial contact between the Dakota and French explorers Daniel Greysolon Sieur du Luth and Father Louis Hennepin in 1679 and 1680 (Streiff 1987; Johnson 1984; Mather 2000b). Because the Mille Lacs area has been a focus of archaeological research over many decades, and for clarity of presentation, I present sites from within the NHL first, and then other Mille Lacs sites that are near to, but outside the district boundaries. As will be seen, this area has a significant concentration of bear finds. I then present bear finds from other areas of the Mille Lacs Uplands ECS subsection.

#### *Mille Lacs Uplands (212Kb), Kathio National Historic Landmark*

At the Rum River's outlet of Mille Lacs Lake, the Kathio National Historic Landmark was designated in 1964, for the significance of its archaeological sites in the ancestry of the Dakota nation, and for their meeting there with explorers Du Luth and Hennepin in the late seventeenth century. The district includes the entirety of Mille Lacs Kathio State Park, as well as Indian Point within the Mille Lacs Band of Ojibwe's Vineland community.

#### **21ML3, Crace**

The Crace site (Gibbon 1975b) is one of Minnesota's three principal bear sites, and is also discussed further in Chapters 8 and 9. The site is located on the northwest shore of Lake Onamia, which is the third outlet lake on the Rum River as it leaves Mille Lacs. It is a shallow lake, supporting dense stands of wild rice (Mather 2017a). Although within the statutory boundary of Mille Lacs Kathio State Park, the Crace site is on private land.

Guy Gibbon led the University of Minnesota excavation at Crace in 1972, and investigations at the nearby Brower and Old Shakopee Bridge sites (Gibbon 1975a, 1975b, 1976). The Crace site is identified as a Late Woodland Tradition site based on a small ceramic assemblage and lithics including notched and triangular points. The primary find of the investigation was a dense layer of fragmented bone. Examination of

the material by Robert Bright identified the find as a bear feature, with many teeth from black bears (*Ursus americanus*).

Bright's analysis identified the bear teeth, mostly mandibular teeth, allowing estimation of a minimum number (MNI) of 32 bears in the feature. A summary of other bone fragments in the feature are presented by weight. I reanalyzed the Crace faunal assemblage for this dissertation, to compile NISP data that allows integration of the site in the ECS and statewide zooarchaeological summaries. This also provides more detail about the assemblage (Tables 21 and 22). My analysis identified 388 black bear fragments (NISP), with an additional 275 tentative identifications, and also produced a MNI estimate of 32 bears, based on the right lower 2<sup>nd</sup> molar.

Two radiocarbon dates were obtained from the bear feature. One was funded by the Council for Minnesota Archaeology, and the other was part of a Legacy-funded study in the Statewide Survey program. I selected two teeth for the samples in 2019. Both are lower right third molars:

- Sample 21ML3-A measured 15.42 x 12.23 mm. The root was broken but it appears that the root had fused before the animal died.
- Sample 21ML3-B measured 16.47 x 12.52 mm. The root was unfused.

The third molar is the last adult tooth to erupt, and both samples are from young bears (wear stage 3). Therefore, of this assemblage, these are among the teeth that erupted closest to the time of death, which is when the bear feature would have been created.

*Table 20. Radiocarbon dates from the Crace site (21ML3).*

Lab# / Sample#	Sample	Measured Radiocarbon Age (RCYBP)*	Conventional Radiocarbon Age (RCYBP)*	Calibrated Dates 1-Sigma (68.3%) P	Calibrated Dates 2-Sigma (95.4%) P
21ML3-A	Tooth (3 <sup>rd</sup> molar)	--	--	--	--
UGAMS 42790 21ML3-B	Tooth (3 <sup>rd</sup> molar)	830 ± 20 BP	830 ± 20 BP	AD 1191-1199 AD 1203-1247	AD 1169-1246

\*Radiocarbon years before present ("present" = AD 1950)

The Crace site bear assemblage is superficially similar to that from the Christensen Mound site (see Chapter 6), in that it consists primarily of cranial remains

with a much smaller proportion of postcranial fragments. However, the representation within the cranial remains is different. Nearly all of the fragments at Crace are from the mandibles, with a few notable exceptions. The most significant difference, however, is the taphonomy. Of the major bear sites known in Minnesota, Crace is the only one with appreciable amounts of burned bone. This includes many of the fragments identifiable as black bear, including fractured pieces of mandibles, and individual teeth. Some of these pieces are charred black, while others are more “scorched” – that is, blackened more than unmodified bone, but not to the degree that might automatically be recognized as burned. A small amount of bone fragments, including the only bone fragments of bear paw in this assemblage, are calcined. Taphonomy of the Crace site faunal assemblages is illustrated in Figures 54-55.

*Table 21. Summary of animal bone from 21ML3, Kathio National Historic Landmark*

Taxonomic Identification	NISP	Weight (g)	MNI
<i>Mammals (subtotal)</i>	1614	2009.36	---
Black bear ( <i>Ursus americanus</i> )	388	676.76	32
Black bear, probably (cf. <i>Ursus americanus</i> )	275	473.38	---
Beaver, probably (cf. <i>Castor canadensis</i> )	1	0.25	---
Large-size mammal	1	13.49	---
Mammal, undifferentiated	949	845.48	---
<i>Birds (subtotal)</i>	2	1.13	---
Swan ( <i>Cygnus</i> sp.)	1	0.86	1
Bird, undifferentiated	1	0.27	---
<i>Fish (subtotal)</i>	1	.02	---
Fish, undifferentiated	1	.02	---
<i>Unidentified (subtotal)</i>	1586	389.25	---
<b>Total</b>	<b>3203</b>	<b>2399.76</b>	<b>33</b>



Figure 54. Disarticulation marks on bear mandible fragment from 21ML3.



Figure 55. Cut marks and burned/scorched bone from 21ML3.

Table 22. Ursid body part identifications from the Crace site (21ML3).

<b>Body Part</b>		<b>NISP</b>
<b>Crania</b>		
Upper 1 <sup>st</sup> incisor fragment, left		1
Upper 1 <sup>st</sup> incisor, right		1
Upper 1 <sup>st</sup> incisor fragment, right		1
Upper 2 <sup>nd</sup> incisor, left, fragment		1
Upper 2 <sup>nd</sup> incisor, right		2
Upper 2 <sup>nd</sup> incisor, right, fragment		2
Upper 3 <sup>rd</sup> incisor fragment, left		5
Upper 3 <sup>rd</sup> incisor fragment, right		15
Upper 3 <sup>rd</sup> incisor fragment, indet fragment		11
Upper canine fragment, right		1
Upper 4 <sup>th</sup> premolar fragment, left		1
Upper 1 <sup>st</sup> molar fragment, left		2
Upper 2 <sup>nd</sup> molar fragment, right		1
<b>Upper Cranial Subtotal</b>		<b>44</b>
<b>Mandible</b>		
Lower 1 <sup>st</sup> incisor, left		2
Lower 1 <sup>st</sup> incisor fragment, left		2
Lower 1 <sup>st</sup> incisor, right		3
Lower 1 <sup>st</sup> incisor fragment, right		1
Lower 2 <sup>nd</sup> incisor, left		3
Lower 2 <sup>nd</sup> incisor fragment, left		3
Lower 2 <sup>nd</sup> incisor, right		3
Lower 2 <sup>nd</sup> incisor fragment, right		6
Lower 4 <sup>th</sup> premolar, left		1
Lower 4 <sup>th</sup> premolar fragment, left		6
Lower 4 <sup>th</sup> premolar fragment, right		5
Lower 4 <sup>th</sup> premolar fragment, indet side		7
Lower 1 <sup>st</sup> molar, left		3
Lower 1 <sup>st</sup> molar fragment, left		22
Lower 1 <sup>st</sup> molar, right		1
Lower 1 <sup>st</sup> molar fragment, right		20
Lower 1 <sup>st</sup> molar, indet side		5
Lower 2 <sup>nd</sup> molar, left		8
Lower 2 <sup>nd</sup> molar fragment, left		18
Lower 2 <sup>nd</sup> molar, right		18
Lower 2 <sup>nd</sup> molar fragment, right		14
Lower 3 <sup>rd</sup> molar, left		16
Lower 3 <sup>rd</sup> molar fragment, left		5
Lower 3 <sup>rd</sup> molar, right		8
Lower 3 <sup>rd</sup> molar fragment, right		14
Lower 3 <sup>rd</sup> molar, indet side		9

**Table 22 (cont.)**

Lower canine fragment, left	1
Lower canine fragment, right	2
Mandible fragments, left	17
Mandible fragments, right	15
Mandible fragments, indet side	2
<b><i>Mandibular Cranial Subtotal</i></b>	<b>240</b>
<b>Indeterminate Cranial</b>	
Canine fragments	49
Molar crown (juvenile) fragments	4
Molar fragments	8
Incisor fragments	17
Tooth root fragments	4
Vestigial premolar fragments	6
<b><i>Indeterminate Cranial Subtotal</i></b>	<b>88</b>
<b>Postcranial Remains</b>	
1st phalanx, indet side	1
2 <sup>nd</sup> phalanx, left	1
3 <sup>rd</sup> phalanx, indet side	1
Metacarpal/Metatarsal, indet side	2
Radius fragment, left	2
Ulna fragment, left	1
Ulna fragment, right	1
Distal radial epiphysis, nearly complete, left (unfused)	1
Scapula fragment, left	3
Scapula fragment, right	1
Femur, proximal fragment, left	1
Humerus, distal fragment, left	1
<b><i>Postcranial Subtotal</i></b>	<b>16</b>
<b>Totals</b>	<b>388</b>

### **21ML6, Indian School**

The Indian School site encompasses an area at the north side of Vineland Bay that includes the Mille Lacs Band of Ojibwe Government Center, the Mille Lacs Indian Museum, other tribal facilities and residences. The school that inspired the name during Lloyd Wilford's excavations the 1940s is no longer there. The site is bisected by Highway 169. The museum grounds include buildings from the former Ayer trading post, dating to the early twentieth century. Excavations conducted in the early 1990s before the

current museum was built produced artifacts dating to the Woodland Tradition and the historic period, including non-local Middle Woodland artifacts such as galena. Most of the historic artifacts appear to be derived from the trading post and boat works, but there is also a light-colored gunflint that may be French. This is the general area where it is believed that Daniel Greysolon Sieur du Luth met with the Dakota in 1679 (Rothaus et al. 2005, 2007; Halloran and Mather 2000; Mather 2000b:49; Lothson 1972; Streiff 1987; Jenkins and Aulwes 2013).

There are six black bear canines in the Ayer collections housed at the Minnesota Historical Society. They are notably small compared to archaeological examples from the area, particularly those from the Bear site (21ML68). The Ayers were eclectic collectors of artifacts and other materials, and it is likely that this is the source of the bear teeth. A display of local points was once featured at that trading post. A few sherds of southwestern Pueblo pottery have been found at this site, which I suspect (but cannot prove) the Ayers used to salt the site as a practical joke on their friend Lloyd Wilford (Rothaus et al. 2005:19-20, 33, 89-90).

The Indian School site is on the opposite side of Indian Point from the Bear site. Since the configuration of the Bear Feature suggested that the bear skulls were placed to confront someone who approached the point from Shah-Bush-Kung Bay, perhaps to protect it or Robbins Island, I have often wondered if there might be a corresponding feature on Vineland Bay. However, there is no indication of archaeological bear remains in the extant faunal assemblages I have examined from 21ML6.

### **21ML7, Vineland Bay**

The Vineland Bay site is located to the south of the Rum River outlet, near the shore of Mille Lacs Lake. The site was the focus of archaeological excavations by the University of Minnesota in 1949 and 1967 (Dickenson 1968; Wilford 1949). Wilford reports the discovery of a complete bear skull, without mandibles or incisors. It was found above a historic feature related to Mille Lacs Band of Ojibwe use of the site.

At the south end of the trench was a firehearth dug shallowly into the subsoil, and containing charcoal. The earth beneath the charcoal was burned to a reddish color. At the eastern edge was a circular pit, pit 2, whose base

was one foot below the floor of level 5. It contained bits of charcoal. Evidently the dressed scapula, the wad of cloth or yarn, an old boot, etc., had been in this pit. ... Another circular pit was at the western edge of the excavation. When the cast iron object was uncovered it proved to be a reservoir that had formerly been part of a wood-burning kitchen range. The bear's skull had been directly above this pit. Both pits were doubtless dug by the Chippewa [Ojibwe], so the bear skull, dressed scapula, copper bell, etc., can be attributed to them. [Wilford 1949:36]

I examined this bear skull as part of the NAGPRA review process in 1999, and later examined portions of other bear skulls that do not appear to have been included in other analyses. Whelan presented only Late Woodland assemblages from the 3 sites, including black bear at Vineland Bay: 3 NISP, 1 MNI (Whelan 1990:67)

### **21ML9/16, Cooper**

The Cooper site is a fortified Dakota village and cemetery dating to the Late Woodland and the period of French contact (Shakopee and Bradbury phases). There is also a later Ojibwe component, and possibly other historic-era components. Located on a strategic peninsula at the midpoint of Ogechie Lake, the site is a featured stop on the Landmark Trail is Mille Lacs Kathio State Park. The Cooper site was the focus of extensive excavations by the University of Minnesota from 1965-1969 and 1974 (Johnson 1984; Aufderheide et al. 1994; Lothson 1972; Mather 2000:12-15). The faunal remains were analyzed by Mary Whelan (1990:60-61), who reports 10 fragments of black bear bone, for a MNI calculation of 1. This is within a large faunal assemblage (Table 12), and the bear bones account for 0.2% of the total site assemblage. There has not been a comprehensive site report prepared of these excavations, however, so the relationship of the bear and other animal remains within the site is not currently known.

Jim Cummings and I conducted a small (5 square meters) investigation at Cooper in 2002, to assess the nature and age of the palisade. We found a series of postmolds and the builder's trench, but unfortunately, our radiocarbon dates were inconclusive (Cummings and Mather 2005). The project produced a significant amount of archaeobotanical evidence (see below) and an enormous assemblage of ceramics, lithics, animal bone and fire-cracked rock (3,504 artifacts). Fortunately, Patricia Emerson (2012:38) was later successful in obtaining three consistent radiocarbon dates for the

palisade from samples curated from the University of Minnesota excavations, showing that it dates to the Bradbury Phase (late 17<sup>th</sup> to early 18<sup>th</sup> century). These and other dates from Dakota archaeology at Mille Lacs are of interest relative to the timing and formation of the Bear site (21ML68). This subject is discussed further in Chapter 9.

### **21ML12, Wilford**

The Wilford site is a Late Woodland village interpreted as containing the archaeological remnants of one or more Dakota bark lodges. It is located near the Cooper site, on the same side of Ogechie Lake but closer to the outlet of Mille Lacs. Like the Cooper site, it was the focus of extensive archaeological excavations by the University of Minnesota (1974-1976), and currently lacks a comprehensive report of the results.

Archaeobotanical remains have been the focus of study by Schaaf (1981), Bailey (1997), and Koncur (2019) as discussed further below. Mary Whelan (1990) has studied the large faunal assemblage. This is very useful information, but until there is a site report, the environmental evidence cannot be integrated with the archaeological context. More recent historical (19<sup>th</sup> and early 20<sup>th</sup> century) components within and near the Wilford site have been reported by John Anfinson (1980) and Rothaus (2001).

Currently, the Wilford site is featured in a broad study of radiocarbon dates. Scott Anfinson is analyzing artifacts from the site, and the archaeology of the residential architecture is being examined by John Reynolds at St. Cloud State University. These projects will greatly enhance our understanding of this important site.

There is only one black bear bone (<1%) reported from the Wilford site faunal assemblage, which is dominated by white-tailed deer, painted turtle, beaver and muskrat (Whelan 1990:64-65). The bear bone is a 2<sup>nd</sup> metacarpal, as identified in Whelan's unpublished research notes from the study (on file at the Archaeology Department, Minnesota Historical Society).

### **21ML135, Rum River Lift Station**

The Rum River Lift Station site is located near the Vineland Bay site at the outlet of Mille Lacs Lake. It was recently the focus of a Phase III data recovery excavation by the Mille Lacs Band of Ojibwe. Additionally, a layer of previously disturbed soil was screened, because it was found to contain fragmented human remains. I examined the

animal bone fragments in the field as a new mound was being constructed for reburial, in October 2015. The small assemblage includes a black bear claw (third phalanx) that is completely calcined. There is a medial fragment of a large canine tooth that is also consistent with *Ursus americanus*, and a fragment of a mandible that could be bear. It appears that the animal suffered from a tooth infection, which deformed the bone. Other bones include walleye (*Stizostedion canadense*) and fragments from one or more large birds.

#### *Mille Lacs Uplands (212Kb), Near the Kathio NHL*

Other Mille Lacs sites with bear remains are outside of the Kathio NHL boundaries.

#### **21CW9**

21CW9, on the northwest shore of Mille Lacs Lake, has one bear canine from Phase I shovel test survey, and a larger faunal assemblage from Phase II evaluation (Trocki and Hudak 2003:107-109, 162). The assemblage has not been the subject of full zooarchaeological analysis.

#### **21ML37, Van Grinsven**

The Van Grinsven site is a Middle Woodland habitation on the northeast shore of Lake Onamia, on a portion of the lake that is now a wetland complex rather than open water. Malmo pottery has been recovered from the site, along with fired sherds of a pinch pot that appears to have been made by a child. The faunal assemblage includes bones from a bear's paw (Mather 1991; Mather et al. 2000).

#### **21ML68, Bear**

The Bear site is one of the principal bear sites in Minnesota, and the inspiration for this dissertation. It was the focus of Chapter 3, and is discussed further in Chapters 8 and 9.

*Mille Lacs Uplands (212Kb), Outside the Kathio NHL*

**21PN10, Pokegama Outlet**

The curated collection from the Pokegama Outlet site consists of surface collected artifacts including a single bear canine fragment. Other fauna includes beaver and white-tailed deer, but no formal analysis completed to date.

**21PN11, the Snake River Fur Post**

The Snake River Fur Post (formerly the North West Company Fur Post), is a historic site operated by the Minnesota Historical Society. Chuck Diesen was part of the excavation crew under the direction of Leland Cooper in 1963. He told me of a feature skeletal remains outside the stockade wall that they initially believed was a human burial, although it had no head or hands/feet. However, an osteologist identified the bone as bear. I have not yet had the opportunity to examine this material, although I have worked on portions of the faunal assemblage. Black bear is present, along with white-tailed deer and fish. The faunal assemblage has been summarized by Birk (1999, 2004) in the context of historical records and the seasonality of the fur trade. A zooarchaeology report by Birk and Murray (2002) presents partial data from the curated assemblage. This assemblage warrants full analysis.

Ursid Archaeobiology of the Laurentian Mixed Forest

Bears are well represented in the zooarchaeological assemblages of the Laurentian Mixed Forest, although the vast majority are from only two sites: the Bear site (see Chapter 3) and the Crace site. These are discussed further in Chapter 8.

In terms of geographic distribution, most of the sites are clustered at Mille Lacs, the Mississippi Headwaters, on the Rainy River, and the fur trade sites at Wadena. However, bear is well represented at Red Lake, especially when considering how little archaeological investigation has occurred there. The lack of bear finds on the North Shore is not due to a lack of bears, in my opinion. Rather, this relates to a lack of identified archaeological sites with analyzed faunal assemblages.

The vast majority of the bear finds in this province are American black bear, although grizzly is identified at sites on the Rainy River, the Mississippi Headwaters, and

possibly Wadena. The Animoosh site (21BL305) provides the most compelling evidence that grizzly bears were native to Minnesota, because bone fragments representing the entire forelimbs of the bear are present, contrasting with the McKinstry site (21KC2) with only claws.

## **6. MINNESOTA'S EASTERN BROADLEAF FOREST AND TALLGRASS**

### **ASPEN PARKLANDS ECOLOGICAL PROVINCES**

The Tallgrass Aspen Parkland and Eastern Broadleaf Forest ecological provinces constitute a relatively narrow band of deciduous forest stretching from nearly the northwest corner of the state, across the center and trending toward the southeast, where it broadens into the historically known Big Woods, and borders the Mississippi River bluffs along Lake Pepin (Figure 6.1). This ecological setting is prime habitat for black bears, as reflected in earlier reproduction and larger litter sizes than observed for bears in the Laurentian Mixed Forest (Coy 1999). In Minnesota's bear hunting regulations, the No Quota Zone begins approximately at the border of the deciduous forest provinces. This artificially maintains the modern bear range to the north and east, because “no quota” means there is no limit on bear hunting in that area.

The Tallgrass Aspen Parklands is Minnesota's smallest ecological province, encompassing only about 6% of the state. The Eastern Broadleaf Forest is still small compared to the other provinces, at about 22% of the state.

#### Ecology and Natural History

While ecologically distinct, the deciduous forest provinces are a transition between the tallgrass prairie of the eastern Great Plains and the Laurentian Mixed Forest. The prairie-forest border has long been a focus of interest in paleoecology and archaeology (McAndrews 1966; Shay 1971; Johnson and Spector 1985; Watrall 1976; Mather 2002a, 2006a; Mather et al. 1998). Many of those examinations were centered on the thin strip of deciduous forest in Otter Tail County and northward from there. In the southeast, Eric Grimm (1981) has examined the historically recent expansion around of the deciduous forest known as the Big Woods, in south-central and southeastern Minnesota. In northwestern Minnesota, the Tallgrass Aspen Parklands are primarily deciduous forest but are dominated by broadleaf aspen (popple) trees (Sather and Dana 1999; Axelson 2006).

### Historical Records of Bears

The Eastern Broadleaf Forest is the setting for the state's earliest written records of bears. Approaching or entering what-is-now southeast Minnesota by the Mississippi River in 1680, Father Louis Hennepin described bears and other wildlife:

We had considered the river Colbert [Mississippi] with great pleasure, and without hindrance, to know whether it was navigable up and down: we were loaded with seven or eight large turkeys, which multiply of themselves in these parts. We wanted neither buffalo nor deer, nor beaver, nor fish, nor bear meat, for we killed those animals as they swam across the river. [Shea 1880:204]

Later, Hennepin described the Dakota bear feast quoted in Chapter 4 (Shea 1880:215). That “very fat bear” in a “large prairie” was likely encountered in the Eastern Broadleaf Forest ecological province, probably near the Mississippi River in southeast Minnesota, “during one of these nineteen days of our very painful navigation” that extended from Lake Pepin to Mille Lacs.

There is a fine river on the north side of the Mississippi 70 leagues [120 miles] from the La Prairie du Chine in the entrance of Lake Papan [Pepin], runs near north and south, the current very strong, serpentines very much, as it's an enemies country; there is plenty of animals, such as stag, deer, bears & buffeloes, of which we killed every day one sort or other. [Goddard 1976]

This is the Chippewa River in western Wisconsin, near Lake Pepin. Bears and other game were particularly abundant because it was a contested zone between Indian tribal territories. The area was not settled, and rarely hunted, out of fear of enemy attack. Although perhaps more extreme, modern parallel is abundance of wildlife in the demilitarized zone between North and South Korea.

In September 1805, Lt. Zebulon Pike saw three bears swimming across the Mississippi River in what-is-now St. Paul, two miles upstream from the Dakota village of Kaposia, which he describes as “situated at the edge of an island just below a ledge of rocks” (Coues 1895:76). This was likely in the vicinity of the present-day Wabasha Street

Bridge and High Bridge<sup>3</sup>. Later, in mid-October, he saw a large bear feeding on a deer carcass, likely in present-day Stearns County. Pike remarked that this and the earlier three bears were the only bears they had seen since leaving St. Louis (Coues 1895:102-103).

Lawrence Talliaferro, the Indian Agent at Fort Snelling, recorded in 1835 that ten bears were killed in the cornfields at Cloud Man's village, at Bde Maka Ska in present-day Minneapolis. The same year, bears were also seen elsewhere within what-is-now the Twin Cities metropolitan area (Westerman and White 2012:95). During the winter of 1840-1841, “many bear” were killed in the upper reaches of the Cedar River (near the present-day Iowa border), along with more than 2,000 deer, 60 elk, and a few bison (Gilman 2004:75). This is near the Iowa border, and is believed to be the vicinity of Horace Austin Park, in present-day Austin, Mower County (Meyer 1991:44).

In 1875, bears were seen in the Red Wing area, in the Cannon River floodplain and near Wacouta (Angell 1978). At Prairie Island, Moses Wells described historical Dakota bear hunting to Ruth Landes in 1935 (see Chapter 4), stating, “there were many bears then,” and comparing reference to methods used at that time and in the past. This suggests that bears were still present in that area of southeast Minnesota in the 1930s, although less than there had once been (Landes 1968b:51-52).

In the geographic order of this summary, I initially skipped over the Twin Cities, with the exception of records from before the cities were established. As the most intensively altered portion of the state, it has not been an area where we are accustomed to seeing bears. This began to change in the late 1990s as the recovering black bear population began to disperse into parts of its former range, and in 2011 and 2012, bears were killed by police in the Dayton's Bluff and Frogtown neighborhoods of Saint Paul (Greder 2012; Minnesota Public Radio News 2011). Not surprisingly, city dwellers in the nineteenth century encountered bears more often. This was often at meat markets, as market hunters provided wild game for sale (Swanson 2007:39-41; Herrick 1892:146;

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<sup>3</sup> It is difficult to be certain of the location. In the first passage, Pike says the bears were seen two miles above Kaposia, which Coues (1895:76) places approximately at Dayton's Bluff. Later, however, Pike refers to them being “three miles below St. Peters,” (Coues 1895:103), referring to the confluence of the Minnesota and the Mississippi rivers, where Fort Snelling would later be built. There are about seven river miles between these locations.

Williams 1983:274). But live bears were here too, raiding summer kitchens and cornfields (Morris 1976:154), and in 1851, the Saint Paul *Democrat* newspaper reported that “The country is full of bears. A band of Sioux Indians killed, in two days, in the vicinity of Rice Lake, 25 bears. Two were seen, within a mile of our office, on Saturday” (Williams 1983:316). By the 1890s, black bears were featured in the first zoo in Minnesota, established by “Fish” Jones near Minnehaha Falls in Minneapolis. There was a bear in the zoo menagerie, along with bison, several deer, five eagles and three elk (Roise and Gardner 2000:25).

#### Zooarchaeology of the Tallgrass Aspen Parklands Province

My recent review of the archaeological literature has identified only 2 reports of sites with faunal assemblages in this province (the Eastern Broadleaf Forest province has many, and is discussed below). Those with NISP figures greater than 100 (1 site) are summarized in Table 23 and Figure 56. Both of the reported studies indicate a focus on bison hunting. I examined some of the faunal remains from one of the sites, Lake Bronson (21KT1), but did not conduct a full analysis. In Red Lake County, Buhta et al. (2012) also report bison bones from private artifact collections and from Phase I archaeological surveys.

#### *Faunal Assemblages Recommended for Future Study*

Because there are so few extant faunal assemblages from this small ecological province, there are few obvious assemblages in need of study (Table 25, Figure 58). One is 21MA62 at Middle River in Marshall County (Emerson and Magner 1998:115-116, 1999:117-121). As discussed below, it may also be useful to conduct a more comprehensive analysis of the Lake Bronson site assemblage. The Kittson County Historical Society in Lake Bronson has a large collection of animal remains, including bison and elk bones. Some of these may be archaeological. Inventory and analysis of that collection would be a benefit to our understanding of paleoecology in the Tallgrass Aspen Parklands ecological province.

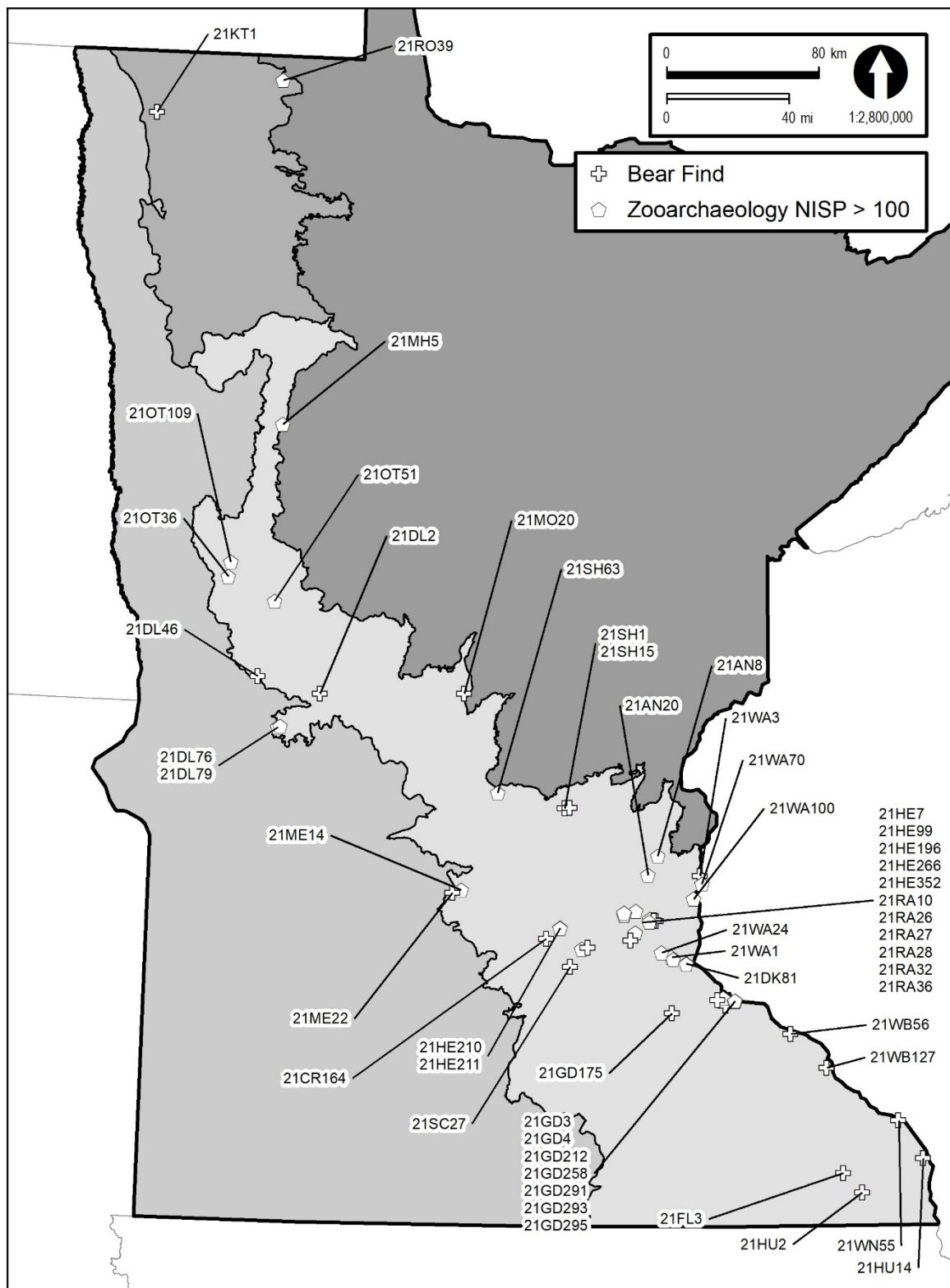


Figure 56. Bear finds and zooarchaeological assemblages with NISP > 100, Tallgrass Aspen Parklands and Eastern Broadleaf Forest Ecological Provinces.

Table 23. Sites with analyzed faunal assemblages with NISP >100, Tallgrass Aspen Parklands and Eastern Broadleaf Forest Ecological Provinces.

Site	County	ECS	BMU	REG	Reference
21AN8	Anoka	222Mc	NQ	4e	Magner and Allan 2014
21AN20	Anoka	222Mc	NQ	4e	Wendt 1988a
21CR146	Carver	222Mb	NQ	4s	Koski 2018; Blondo et al. 2017
21CR155	Carver	222Mb	NQ	4s	Florin et al. 2015; Florin et al. 2013
21DK2	Dakota	222Md	NQ	3e	Taylor 1955
21DK81	Dakota	222Md	NQ	3w	Terrell 2017
21DK87	Dakota	222Md	NQ	3w	Terrell 2017
21DL2	Douglas	222Ma	NQ	4w	Gonsior et al. 1999; Dobyns 1975
21DL76	Douglas	222Ma	NQ	2n	Martin and Richmond 1992
21DL79	Douglas	222Ma	NQ	2n	Martin and Richmond 1992
21DL46/ 21GR41	Douglas & Grant	222Ma 251Ba	NQ	4w	Mulholland et al. 2011
21FL3	Faribault	222Lc	NQ	3w	Lukens 1963
21GD3	Goodhue	222Lc	NQ	3e	Kuehn 2003
21GD4	Goodhue	222Lc	NQ	3e	Lukens 1963
21GD212	Goodhue	222Lc	NQ	3w	Mather 2004a
21GD291	Goodhue	222Lc	NQ	3e	Terrell 2015
21GD293	Goodhue	222Lc	NQ	3e	Terrell 2015
21GD295	Goodhue	222Lc	NQ	3e	Terrell 2015
21HE7	Hennepin	222Mc	NQ	4s	Bakken et al. 2006; Mather et al. 2003
21HE99	Hennepin	222Mc	NQ	4s	Mather 2017
21HE196	Hennepin	222Mc	NQ	4s	Martin et al. 1996
21HE210	Hennepin	222Mb	NQ	4s	Thorpe 2014
21HE211	Hennepin	222Mb	NQ	4s	Thorpe 2014
21HE266	Hennepin	222Mb	NQ	4s	Bailey et al. 1996
21HE352	Hennepin	222Mc	NQ	4s	Schirmer 2008
21HE419	Hennepin	222Mb	NQ	4s	Kaeding et al. 2018
21HU2	Houston	222Lc	NQ	3w	Theler 1990
21KT1	Kittson	223Na	NQ	6n	Anfinson et al. 1978
21ME14	Meeker	222Mb	NQ	4s	Mather et al. 1998
21MH5	Mahnomen	222Ma	NQ	5w	Mather 2006a
21OT36	Otter Tail	222Ma	NQ	4w	Watrall 1976
21OT51	Otter Tail	222Ma	NQ	4w	Michlovic 1979
21OT109	Otter Tail	222Ma	NQ	4w	Mather 2002b
21RA26	Ramsey	222Md	NQ	4e	Coil 2015
21RA32	Ramsey	222Md	NQ	4e	Mather 1998c
21RA36	Ramsey	222Md	NQ	4e	Mather 1998d
21RO39	Roseau	223Na	NQ	6n	Jones 2013
21SC27	Scott	222Mb	NQ	2e	Whelan 1887, 1990
21SH1/16	Sherburne	222Mc	NQ	4e	Chapter 6
21SH63	Sherburne	222Ma	NQ	4e	Vermeer 2009
21WA1	Washington	222Md	NQ	4e	Withrow et al. 1987
21WA3	Washington	222Md	NQ	4e	Gibbon 1973; McLaughlin 2014; Rempfert 2014; Fleming et al. 2019
21WA24	Washington	222Md	NQ	4e	Birk 1973

*Table 23 (cont.)*

21WA70	Washington	222Md	NQ	4e	Bozell 2010
21WA100	Washington	222Md	NQ	4e	Kloss 2005

Bear Finds: Lake Agassiz, Aspen Parklands Section (223N)

The boundary of this section is the same as that of the Minnesota portion of the Tallgrass Aspen Parklands ecological province as a whole. It contains all of Red Lake County and most of Pennington County, in northwestern Minnesota, as well as significant portions of Kittson, Roseau, Marshall, Polk, Beltrami and Clearwater counties.

*Aspen Parklands (223Na)*

**21KT1, Lake Bronson**

The Lake Bronson site was the first place where cremated bones from a bear's paw were recognized in Minnesota's archaeological record. As described below (Chapter 9), I propose that cremated bear paws are part of a ritual pattern within the broader traditions of bear ceremonialism, and a likely indicator of a place where a bear feast occurred. Anfinson et al. (1978) identified the 15 bear bone fragments from the 1976 excavations as *Ursus arctos*, the grizzly bear.

All but one of the 15 grizzly bear elements are charred and appear to be from a single paw. It is difficult to determine which paw this is due to the lack of a good comparative specimen and the fact that the paw elements are extensively fragmented. There were no third phalanges evident, however, with just first and second phalanges and metapodial fragments. There was also the charred fragment of what appears to be an occipital condyle of a grizzly bear skull (Anfinson et al. 1978:33,39).

This was an exciting identification, because it would be the first archaeological find of grizzly from Minnesota, and the Lake Bronson investigators correctly noted Alexander Henry the Younger's journal (Coues 1897) as a source for grizzly being a potential species in the site area. However, when I examined the Lake Bronson bear bone fragments in the curated collection, I found one third phalanx (claw) fragment that has distinctive curve of black bear (*Ursus americanus*), which is also native to the site area,

Table 24. Zooarchaeological assemblages with NISP >100, Tallgrass Aspen Parklands and Eastern Broadleaf Forest Ecological Provinces.

Site	Bear	AR	CN	FL	FB	DM	MUO	B	R	A	F	S	U	Total
21AN8	0	2	0	0	3	0	36	0	28	0	19	0	58	146
21AN20	0	21	1	0	38	0	26	23	0	0	93	0	1770	1972
21CR146	1	35	0	0	18	5	259	92	51	0	121	28	58	668
21CR155	0	36	0	0	3	0	1708	2	2	0	0	10	86	1847
21DK2	0	14	0	3	763	0	157	1	4	0	1000	4	0	1946
21DK81	0	6	0	0		388	1630	416	3	7	493	1	572	3516
21DK87	0	1	0	3	1	658	587	305	0	0	380	6	185	2126
21DL2	1	16	2	0	5	0	383	50	7	2	166	13	320	965
21DL76	1	10	0	0	28	5	37	3	14	5	221	41	56	421
21DL79	0	0	0	0	3	0	2	0	1		34	175	2	217
21DL46/GR41	1	71	7	1	1863	15	3736	751	2705	0	1500	37	2905	13592
21FL3	1	251	1	0	8	0	1813	11	0	0	0	0	0	2085
21GD3	0	41	1	0	24	0	56	14	1	0	39	0	13	189
21GD4	1	299	10	0	274	0	922	323	92	0	250	0	0	2171
21GD212	0	0	0	0	0	76	179	82	0	11	107	4	565	1024
21GD291	0	0	0	0	0	4	24	12	0	0	12	73	26	151
21GD293	0	4	0	0	0	8	43	6	0	0	10	1	54	126
21GD295	0	0	0	0	0	4	91	1	0	0	4	2	31	133
21HE7	1	0	0		48	16	336	9	33	15	390	24	1416	2288
21HE99	0	27	216	4	1	194	286	485	5	0	329	16	105	1668
21HE196	0	0	21	156	38	1615	67578	2839	0	1	7927	18	257	80450
21HE210	0	1	2	0	0	0	35	0	5	0	15	15	61	134
21HE211	0	46	8	0	26	0	318	43	344	4	1095	263	781	2928
21HE266	0	0	0	137	2	841	3180	1310	0	0	1095	6	3095	9666
21HE352	0	2	0	4	0	68	54	200	0	0	3	0	1363	1694
21HE419	8	24	0	0	15	13	305	5	99	0	1	24	109	603
21HU2	1	44	1	0	35	0	1161	44	2	0	695	27	143	2153
21KT1	15	56	0	0	3	0	0	0	0	0	0	0	0	74
21ME14	0	36	0	0	10	0	255	29	349	0	210	400	126	1415
21MH5	0	97	6	0	118	0	641	21	92	0	254	1	1220	2450
21OT36	0	501	19	0	26	0	21	0	91	0	731	35	12696	14120
21OT51	11	62	12	0	65	10	4888	772	1	0	33737	6052	0	45610
21OT109	0	49	2	0	60	0	1503	60	138	7	1409	17	1380	4625
21RA26	0	0	0	0	0	33	30	21	0	0	0	0	47	131
21RA32	0	0	0	0	0	27	653	300	2	13	151	1	140	1287
21RA36	0	0	0	0	0	50	328	186	0	0	13	0	48	625
21RO39	0	77	0	0	0	0	1616	2	1	496	1	229	4244	6666
21SC27	1	1	496	60	1	1090	15	29	340	1417	0	912	0	4362
21SH1/16	2263	13	0	3	3	3	219	37	0	0	0	0	14	2555
21SH63	0	1	0	0	0	4	84	37	0	0	2	0	123	251
21WA1	0	6	0	0	6	0	162	2	1	0	0	0	9	186
21WA3	35	804	108	0	556	0	4947	465	1036	2	2848	2769	3001	16571
21WA24	0	0	131	0	0	0	0	0	0	0	0	0	0	131
21WA70	0	61	1	0	5	0	2	3	33	1	71	0	551	728
21WA100	0	0	6	9	0	20	164	65	1	0	71	0	0	336
<b>Sum</b>	<b>2341</b>	<b>2715</b>	<b>1051</b>	<b>380</b>	<b>4049</b>	<b>5147</b>	<b>100470</b>	<b>9056</b>	<b>5481</b>	<b>1981</b>	<b>55497</b>	<b>11204</b>	<b>37630</b>	<b>237002</b>

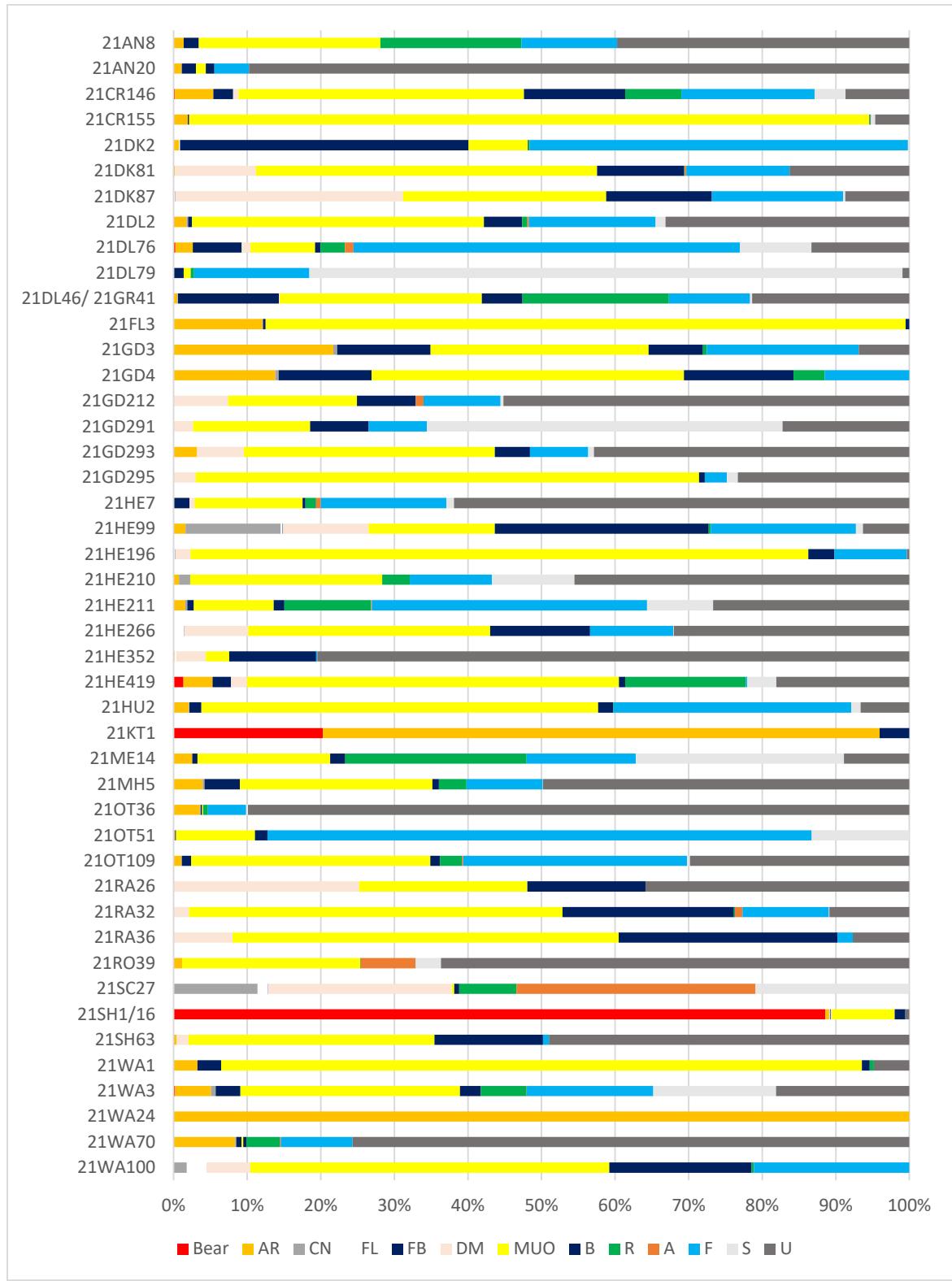


Figure 57. Percent NISP of sites with NISP > 100, Tallgrass Aspen Parklands and Eastern Broadleaf Forest Ecological Provinces.

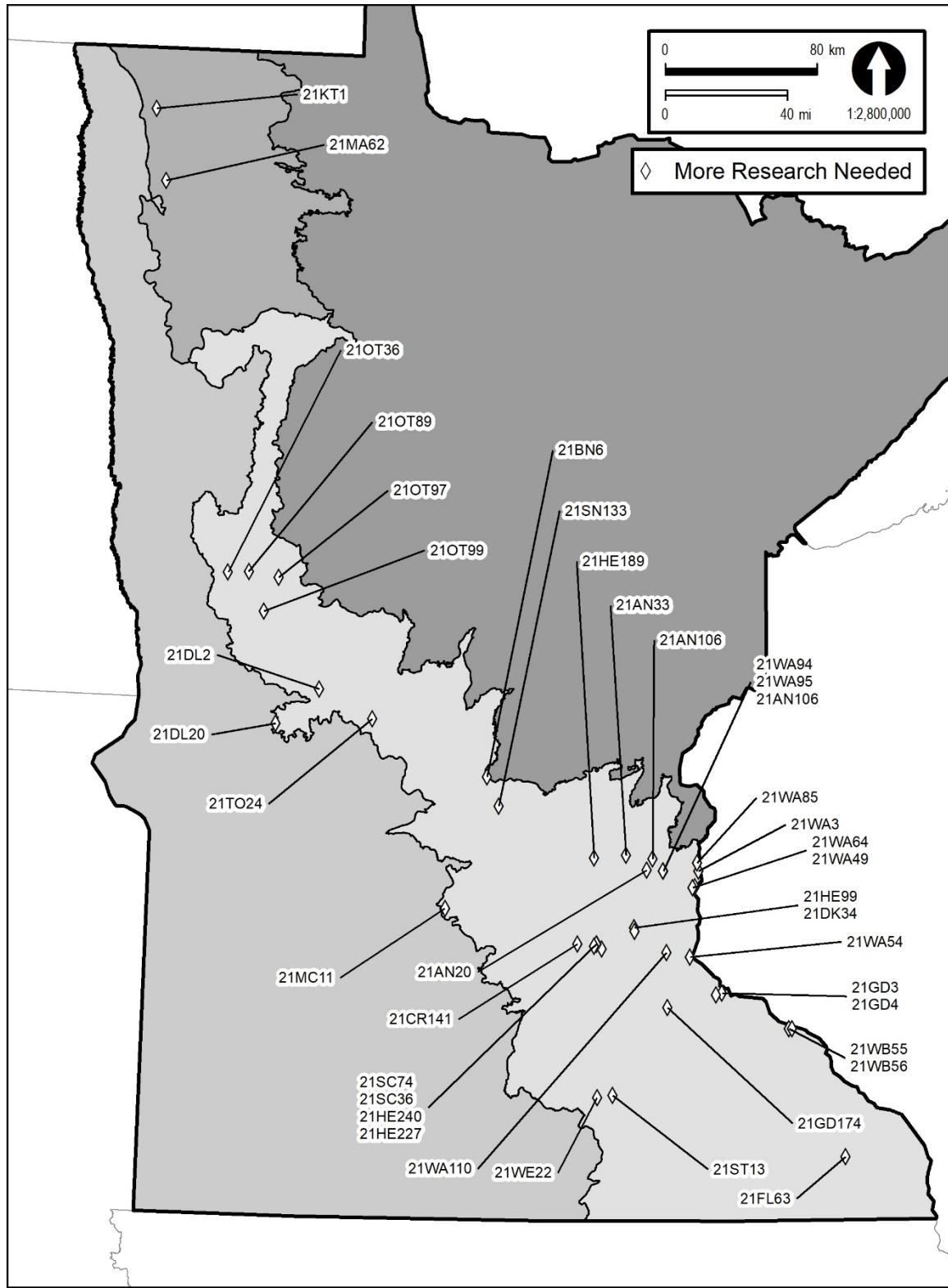


Figure 58. Sites with faunal assemblages recommended for analysis, Eastern Broadleaf Forest and Tallgrass Aspen Parklands ecological provinces.

Table 25. Sites with faunal assemblages recommended for analysis, Tallgrass Aspen Parklands and Eastern Broadleaf Forest ecological provinces.

Site	County	Reference	Comments
21AN20	Anoka	Dobbs et al. 1990	Large unanalyzed assemblage from 1989 excavation (>10,000 fragments)
21AN33	Anoka	Florin and Lindbeck 2008:24	Faunal remains from possible bison kill site
21AN106	Anoka	Forsberg and Dobbs 1997	Faunal remains (408) from Middle Woodland site; report suggests little research value but given single component, it may warrant another look
21BN6	Benton	BRW, Inc 1994	Animal bone and shell fragments (291) including turtle; unusual in Paleoindian assemblage
21CR141	Carver	Schoen 2006:68	Assemblage including bison, deer, small mammal, turtle and bird
21DK34	Dakota	Radford and George 1990:183	Possible shell midden
21DL2	Douglas	Radford et al. 1997:64-67, 76	Large unanalyzed assemblage from 1963 UMN excavation and 1996 State Parks excavation
21DL20	Douglas	Peterson et al. 1990:138-139	Unanalyzed assemblage (NISP 299)
21GD3	Goodhue	Fleming and Taft 2018:28-29	Large unanalyzed assemblage (NISP=18,430) from village site multiple excavations in the 1970s, with mammal, turtle, fish bone and mussel shell
21GD4	Goodhue	Nystuen 1971:55; Dobbs 1984:51-52	Large assemblage including bison, deer, dog, fish, turtle, mussel shell, and other small animals
21GD174	Goodhue	Anfinson and Peterson 1988:82-84	Assemblage containing mammal, turtle and fish bone fragments
21HE99	Hennepin	Mather 2017	Very large assemblage; Officers' latrine feature is the only part that has been analyzed (Mather 2017); OL is ca. 2% of entire assemblage
21HE189	Hennepin	Find ref MULT-00-14:64	Assemblage (NISP 470) including deer, muskrat and fish bone
21HE227	Hennepin	Vogel et al. 1994:95-96	Shell midden
21HE240	Hennepin	Vogel et al. 1994:96-97	Shell midden (site destroyed; not clear if sample was collected)
21KT1	Kittson	Anfinson et al. 1978	Report identifies bison and bear; present study indicates black bear rather than grizzly. Not clear if faunal assemblage was fully analyzed
21MA62	Marshall	Emerson and Magner 1998:115-116, 1999:117-121	Assemblage with hundreds of bone and tooth fragments, including possible moose antler
21MC11	McLeod	McFarlane and Mather 2000:15	Assemblage from island site (NISP 222) including mammals and fish
21OT36	Otter Tail	Vernon et al. 1979:109; Radford and George 1991:80	"abundant faunal remains" (Vernon et al. 1979) from Middle & Late Woodland site, including from storage pits (Radford and George 1991)
21OT89	Otter Tail	Peterson and Yourd 1987:107	Unanalyzed assemblage (NISP=294)

*Table 25 (cont.).*

21OT97	Otter Tail	Emerson 1989:48-49	Unanalyzed assemblage (NISP=401) including deer mandibles and teeth
21OT99	Otter Tail	Emerson 1989:55	Unanalyzed assemblage (NISP=687) including fish and turtle
21SC36	Scott	Johnson 1992:10	Unanalyzed assemblage (NISP=444)
21SC74	Scott	Radford et al. 2003:203	Shell midden with possibly hundreds or thousands of shells; at least 7 native species represented; south bank of Minnesota River
21SN133	Stearns	Bielefeldt 2002:31	Calcined bone assemblage (NISP=77) from Middle Woodland component
21ST13	Steele	Halvorson et al. 1998:100	Unanalyzed assemblage (NISP=360) from historical farmstead
21TO24	Todd	Skaar et al. 2002b:100	Unanalyzed assemblage (NISP=476) including bison
21WA3	Washington	Gibbon 1973	Analyzed fauna summarized above is from 1959-1960 excavations; fauna from 1951 & 1955 excavations not fully analyzed, and Gibbon (1973:18) recommends further analysis of full site assemblage
21WA94	Washington	Justin et al. 2003:121	Small assemblage (NISP 45) from French Canadian residential site
21WB55	Wabasha	Peterson et al. 1988:174	"substantial quantities" of fish and mammal bone in stratified deposits
21WB56	Wabasha	Perkl 2002:83-88; Peterson et al. 1988:179; Skaar 1996:301	Preliminary identifications from 1987 artifact cataloging presented by Perkl 2002, 1995 assemblage unanalyzed; good research potential for full analysis of stratified deposits, including shell midden
21WE22	Waseca	Olmanson and Radford 1991:8; Skaar 1997:229	Unanalyzed assemblage (NISP 188) with mammal, fish, bird and turtle remains

and was more common at the time of Henry's observations as described in Chapter 7.

The other pieces, being small fragments of calcined bone, do not allow independent assessment of species, but they are within the size range of black bear (Figure 59). For this

reason, I believe that the species represented by the calcined paw bone fragments at Lake Bronson is the American black bear. As one of a small number of cremated bear paws documented in the state, the find is an intriguing example of bear ceremonialism, in this case potentially dating to the Initial Woodland tradition, as the area of the site that produced the bear bone also had Laurel ceramics. NISP from the Lake Bronson site reported by Anfinson et al. (1978) include 15 bear, 56 artiodactyl including bison, and 3 beaver.

While the primary reasons for caution regarding the identification of the Lake Bronson remains as *Ursus arctos* are their burned/calcined condition and the lack of a comparative specimen in the initial identification, equally important are frequent reactions elicited by black bear specimens of notably large size. An example is the largest bear skull from Mound 21BS16 (Chapter 7). This site is also located in the prairie environment of western Minnesota, potentially former grizzly territory. The large size and robust muscle attachments on that skull indicate that it came from a massive animal, leading to increasing speculation from more than one archaeologist that it was a grizzly bear. It is a black bear, however, albeit a very large one. Interestingly, the teeth of this animal are well within the limit of *Ursus americanus* as defined by Gordon (1977; Graham 1991), and were exceeded by the teeth of the smaller skulls from the same mound. As these were also large, adult black bears, this observation suggests that tooth size cannot serve as a direct correlation for the size of the original animal. Likewise, osteological size alone (especially when dealing with burned, fragmented bone) cannot be considered an accurate basis for species identification.



Figure 59. Calcined bear bone fragments from the Lake Bronson site (21KTI), including the black bear third phalanx.

Identification of black bear and grizzly bone fragments is challenging, because the bone morphology is similar, and the two species overlap in size. Moreover, at the time of the Lake Bronson identification, there was only one comparative specimen of *Ursus arctos* available in Minnesota, at the Bell Museum. Now there is another, from Alaska, in the Anthropology Department comparative collection at Hamline University. I examined the Bell Museum specimen in 2004 to compare with a bear bone I suspected was grizzly from 21HE7. I realized then that the Bell's *Ursus arctos* specimen was small for the species, and comparable in size to the American black bear. It was identified as a male bear that had died of old age in a zoo.

#### Zooarchaeology of the Eastern Broadleaf Forest Province

Recent review of the archaeological literature has identified 80 reports of sites with faunal assemblages from this province. Those with NISP figures greater than 100 (43 sites) are summarized in Table 23 and Figures 56-57, including 3 sites for which I conducted original zooarchaeological analysis for purposes of this dissertation.

There is a natural early Holocene bone bed of *Bison occidentalis* found in peat near archaeological site 21AN30 (Wendt 1988b). Finds like this are also known from other parts of the state, particularly in wetlands (e.g. Mather 2008a). They offer good potential for identification of bear remains, from natural deaths, and may be the most likely locations for future discoveries of grizzly or short-faced bear remains. Related to bison, it is useful to note that in the Archaic component at 21CR155, the identification of *Bison occidentalis* is made based on the assessed age of the component, and the presence of *B. occidentalis* in the Upper Midwest until ca. 4,500 B.P. (Florin et al. 2015:38; Hill et al. 2014:217).

At Beaver Lake (21ST4) in Steele County, bones from a bison cow and calf recovered underwater. Grand Meadow Chert projectile point embedded in bison vertebra. Middle Woodland age based on the style of the point, similar to Pelican Lake points that date to approximately 500 BC-AD 500 (Oothoudt 1979; Gronhovd et al. 2013:45-46). Gibbon (1980) describes bone tools from Humphrey and Vosberg sites in the Center Creek Archaeological District, including bison scapula hoes. In the Twin Cities

metropolitan area, faunal assemblages have been recovered from both historical and pre-contact contexts, including nineteenth century urban archaeology.

Although unrelated to Minnesota bears, it is interesting that a Norwegian “bear gun” was fired to test the strength of the earthen ramparts at Fort Juelson in Otter Tail County, which was built in 1876 in the panic following Custer’s defeat at Little Bighorn. The bear gun is part of an exhibit at the Otter Tail County Historical Society. Fort Juelson is listed in the NRHP (Arnott et al. 2013b; Mather 2015b). As mentioned previously, near this area of Otter Tail County are several important zooarchaeological studies related to the prairie-forest ecotone, including the Maplewood site (Watrall 1976).

#### *Faunal Assemblages Recommended for Future Study*

This ecological province has a rich zooarchaeological record, and there are many unanalyzed assemblages that warrant study. Foremost among them, in my opinion, are Fort Snelling and the nearby sites at *Bdote*, the confluence of the Minnesota and Mississippi rivers. These sites hold significant potential for studying the precontact ecology of the Twin Cities metropolitan area before it was changed by Euroamerican settlement and urbanization. Also significant is the Dead River site (21OT51) at the prairie-forest border (Michlovic 1979). That assemblage should be fully analyzed. The Red Wing collections include large faunal assemblages, and these too should be studied. I expect that there will be many more bear remains identified when that happens, and consideration of those finds would be a useful regional case study.

#### Bear Finds: Minnesota and NE Iowa Morainal Section (222M)

This section is a band of varying thickness trending southeast from Polk County in northwest Minnesota to the borders of Wisconsin and Iowa in the southeast (Figure 56), and includes the Twin Cities metropolitan area.

*Hardwood Hills (222Ma)*

**21DL2, Lake Carlos Beach**

The Lake Carlos Beach site is a large Woodland Tradition site near Alexandria.

Dobyns (1975:24) lists the probable identification of a black bear based on an “upper jaw with teeth.” Given that the maxilla and teeth would be diagnostic, I assume that Dobyns was certain that it is a bear, but was leaving the species identification as probable. I have not examined this find myself. Other animals represented in the faunal assemblage include white-tailed deer and larger hoofed mammals, canids, beaver, bald eagle, waterfowl, mollusks and fish. Dobyns (1975) ascribes this assemblage to a Late Woodland (1300-1700 CE) habitation in the spring or early summer season.

**21DL46/21GR41, Christina/Pelican**

The Christina-Pelican site was reported by the Minnesota Statewide Archaeological Survey in 1981, and examined again in the late 1980s for a water access project. Survey over a larger area was conducted in 2009 related to a proposed restoration project by Ducks Unlimited to lower the level of Lake Christina, west of Alexandria. Phase II and III excavations recovered an extensive faunal assemblage, of which it was possible to analyze a sample of about 14,000 fragments for the final report (S.L. Mulholland et al. 2011; Rothaus and Aymond 2009). The majority of the site is in Douglas County, but it also extends into Grant County to the west. The site located on an isthmus between the lakes for which the site is named. It is also located at the prairie-forest border, literally at the boundary between the Hardwood Hills subsection of the Eastern Broadleaf Forest, and the Minnesota River Prairie subsection of the Prairie Parklands. I have included it in this chapter because the character of the site is more consistent with deciduous forest, but the faunal remains include species that would be expected in both biomes.

The site contains Woodland Tradition and Historic components. The identified fauna include bison, elk, white-tailed deer, beaver, muskrat, and other wetland species. A remarkable array of bird remains includes swans, geese, ducks, great blue heron, cormorants, and a range of terrestrial species including prairie chicken, hawks, eagles, perching birds and both passenger pigeon and rock dove. Domestic livestock and chicken

and also present, and historical records indicate that the site area was used as a bird hunting resort. The report includes summary information on faunal remains from proveniences that could not be analyzed, and this includes Unit A, NE, Level 8, with one mandible of black bear (*Ursus americanus*): “Left with second and third incisor; canine; first, third and fourth premolar; first and second molar (broken at ascending ramus anterior to condyle)” (S.L. Mulholland et al. 2011:89). For present purposes, I added the one bear identification to Table 24, but did not otherwise tally up the observations from the unanalyzed proveniences.

### **21OT51, Dead River**

The Dead River site is located at the outlet of Otter Tail Lake. Components at the site are Middle and Late Woodland, and include Laurel, Brainerd, and Blackduck ceramics. Excavations there in 1977 prior to county highway construction produced a large and diverse faunal assemblage that is overwhelmingly fish. While terrestrial animals from prairie and forest settings are also well represented, Michlovic (1979:6) recognized that the site was “before anything else, a fishing place.” Bison, elk and white-tailed deer are present, along with beaver and muskrat. Eleven fragments of black bear bone were identified, although the body parts and their context are not discussed. This assemblage is very important for consideration of the paleoecology of the prairie-forest border, and it warrants additional study.

### *Big Woods (222Mb)*

### **21CR164, Coney Island of the West**

Coney Island of the West is a large, 32-acre island in Lake Waconia. It became a tourist destination in the 1880s, with hotels, cottages, a dining hall, pavilion and related infrastructure. This use continued into the twentieth century, but ended in the 1960s. The island was listed in the National Register of Historic Places in 1976 for the significance of the remaining buildings. In 2016, the island was acquired by Carver County for development as a park. The buildings had collapsed by this time, and archaeological investigation was conducted by Blondo Consulting to determine if the island was still eligible for the NRHP. Phase I survey identified historical archaeological remains related

to tourist use, but also Middle and Late Woodland Tradition ceramics and lithics. Shovel Test 125 produced one phalanx with cut marks (Figure 60), identified as black bear (*Ursus americanus*). Other bone fragments in this test include unidentified mammal and bird (Blondo et al. 2017).



Figure 60. Black bear phalanx with cut marks from 21CR164.

Little more can be said about the bear at this time, but it is interesting to note that the island is about one-half mile distant from the nearest shore. Black bears are good swimmers, so it could have lived on the island. It seems less likely that a bear paw would have been brought there from elsewhere.

#### 21HE419

21HE419 is one in a complex of sites investigated recently prior to reconstruction of County Highway 61 in the southwestern Twin Cities suburbs. The sites overlook the Rice Lake wetland complex on the north side of the wide Minnesota River floodplain, in the present-day suburb of Eden Prairie and across the river valley from Shakopee.

Faunal analysis for 21HE419 and nearby sites was conducted by Kathryn Hunt of The 106 Group. Eight fragments of bear bone were identified from 21HE419, among an

assemblage of 603 total animal remains. These include a “shaped bear tibia repeatedly exposed to heat on one end” (Kaeding et al. 2018:229, 231). There is extensive rodent gnawing on the fragment, but the pointed end and the apparent heat treating are interesting. They remind me of Huntingdon’s description of making a bear spear quoted in Chapter 4. I don’t know if that’s what this is, but it is certainly an unusual faunal artifact. Presumably due to the taphonomy, the species of bear is not identified in the report.

Hunt’s analysis also included adjacent sites 21HE430, 21HE431, 21HE432, and 21HE434. These assemblages were smaller than 21HE419 (<100 NISP). They include bison and other fragmented mammal bone, turtle bone and freshwater mussel shells, but bear remains were not identified. Site 21HE430 had a high density of freshwater mussel shells.

### **21ME22, Lake Stella**

The Lake Stella site is located at the edge of the historically known prairie-forest border, in Meeker County. Diagnostic artifacts date to the Late Woodland Tradition, and there is possibly an Archaic component. The site was originally recorded in 1979 by archaeologists from St. Cloud State University. More recently, avocational archaeologist Bob Munter led an effort to document private collections from sites in this area. There is a bear canine tooth in the collection from 21ME22, illustrated in a binder of artifact photographs at the Dassel Area Historical Society & Ergot Museum. It is from a fully-grown bear, because the root of the tooth is closed.

### **21SC27, Little Rapids**

The Little Rapids site is a historic Dakota planting village on the Minnesota River, and listed in the NRHP. Investigation of this site in the 1980s was the first major effort at indigenous archaeology in Minnesota, with involvement with the descendant community, and oral history combined with traditional archaeological excavation. A Woodland Tradition component is also present at the site, including burial mounds (Spector 1993). Mary Whelan (1987, 1990) analyzed the extensive faunal assemblage for her dissertation, identifying a fur trade economy heavily reliant on muskrat, a wide range of birds including passenger pigeons, fish, turtles, domestic livestock, and 1 bear bone.

*Anoka Sand Plain (222Mc)*

**21MO20, Fort Duquesne**

21MO20 is a fur trade site in the Little Elk Heritage Preserve, which is now part of Lindbergh State Park (Birk 1991). Terry Martin has examined this assemblage, and told me that it contains black bear remains. The site is Fort Duquesne, a French fur post that is listed in the NRHP. This is an important assemblage, and it warrants full analysis. All of the archaeological collections from Little Elk, including the 21MO20 fauna, have recently been transferred to St. Cloud State University where they will be available to researchers and for student projects.

**21SH1/16, Christensen Mound Site**

The Christensen Mound site is one of Minnesota's three principal bear sites. The Christensen Mound was the largest conical earthwork in a group of thirty linear and conical mounds on the western shore of Elk Lake, in Sherburne County. The site produced the first discovery of archaeological bear ceremonialism in Minnesota, through a concentration of bear bones found in 1907 by Newton Winchell (1911:293). The bears of Elk Lake gained more widespread attention, however, from another discovery made about forty years later. The landowner at that time, Mr. Hans Christensen, encountered a large concentration of bear bones as he began to destroy the mound (Figures 61-64). Louis Powell of the St. Paul Science Museum was called to the scene, and he made a collection and record of the find, which included animals such as bison, lynx, eagle and crane in addition to the bear remains. The animal bone was concentrated in an area of dark, organic soil under the edge of the mound (Powell 1948).

Professor Lloyd Wilford of the University of Minnesota was alerted to the find by Powell, and sought permission to excavate the mound in light of its imminent destruction. Wilford first cleaned the area of the bear remains back to a clean profile, and excavated a large block in the center of the mound. A number of secondary burials were encountered, but associated finds were few. Wilford ascribed the mound to his Kathio Focus (Late Woodland) based on secondary burial mode (Wilford et al. 1969; Wilford 1944). A Late Woodland period date for the mound is supported by radiometric analysis of one of the

bear mandibles (Table 26; Mather 2000a:116-118).

As shown in Tables 27-29, the Christensen Mound bear remains consist primarily of mandibles and fragmented cranial bones. The mandibles alone suggest that more than 100 black bears are represented in the Mound 1 assemblage, although a more conservative minimum number of 63 is provided by the upper right second molar, the most numerous individual tooth. In addition to the large number of bears represented, the notable discrepancy in representation of the cranial (1348) vs. postcranial (38) remains is of particular importance. Three atlases are the only vertebrae present. Only one rib fragment was identified, and no paws, humerii or bones of the rear limbs were found. This pattern of body part representation clearly demonstrates that the bone fragments are not from complete bears. Rather, it appears that bones had been gathered from another location (or locations) and buried under the edge of the burial mound. This position suggests that the bear remains were interred either at the time the mound was constructed, or earlier. The bears of the Christensen Mound were treated in a manner consistent with people buried in the same mound. The main difference is that collection of the bear remains for burial seems to have focused mainly on the head.

Investigations at three adjacent habitation sites (21SH13, 21SH32 and 21SH41) on Elk Lake documented Brainerd, Howard Lake or Malmo, St. Croix, Onamia, Blackduck, and Kathio ceramics (Arzgian et al. 1999), and at one of the sites, a Late Archaic component. The diagnostic artifacts indicate that these places were used at the same time as the Christensen Mound site, and very likely by the same people who conducted the bear ceremonies there. Very few faunal remains were found at the habitation sites, and none were bears.

At the time of its discovery in 1890 by Theodore Lewis, the site consisted of an impressive array of 30 linear and conical earthworks. The Christensen Mound itself, Lewis' Mound 1, is the largest, originally recorded as 15 feet in height and 82 feet in diameter. The site as a whole has been the focus of archaeological research only intermittently, albeit over a span of more than a century. Its research potential remains largely unexplored, and yet concentrations of bear remains representing hundreds of animals have been encountered twice during the course of these investigations.

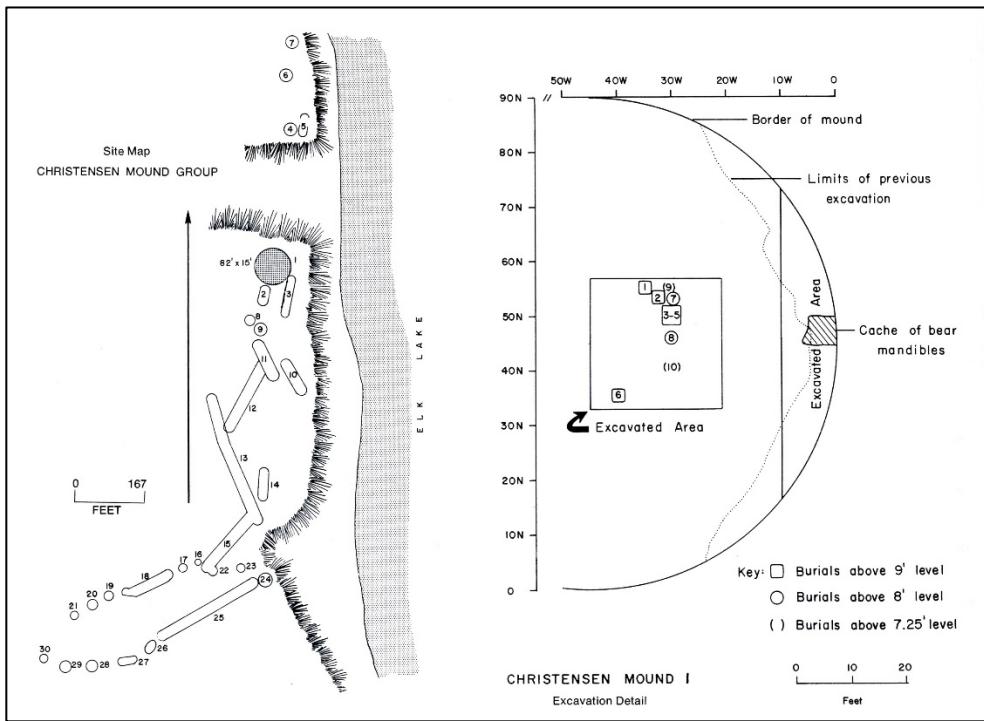


Figure 61. The Christensen Mound site (21SH1/16 and details of the 1948 excavation at Mound 1 (Wilford et al. 1969), courtesy of the Minnesota Historical Society.



Figure 62. Louis Powell (right) with Han Christensen examining the bear find at the edge of Mound 1 in 1948, courtesy of the Science Museum of Minnesota.



Figure 63. Detail of bear mandibles and teeth, and other animal bone, from Christensen Mound 1 in 1948, courtesy of the Science Museum of Minnesota.



Figure 64. Detail of bear cranium, mandibles and teeth found at Christensen Mound 1 in 1948, courtesy of the Science Museum of Minnesota.

Table 26. Radiocarbon date from 21SH1, the Christensen Mound (Mather 2000a).

Lab# / Sample#	Sample	Conventional Age (RCYBP)*	2 Σ Calibrated Ages (BC/AD)	First Intercept
Beta-133841 BEAR-4	Bear mandible	840 ± 70 BP	Cal. AD 1025-1290 (Cal. BP 925-660)	Cal. AD 1210 (Cal BP 740)

Table 27. Faunal Identifications from Christensen Mound 1 (21SH1/16), combined Science Museum of Minnesota and University of Minnesota collections from 1948.

Taxonomic Identification	NISP	MNI
<i>Mammals</i> (subtotal)	2,265	67
Black bear ( <i>Ursus americanus</i> )	512	63
Bear, undifferentiated ( <i>Ursus</i> sp.)	871	---
probably bear (cf. <i>Ursus</i> sp.)	652	---
Lynx or bobcat ( <i>Lynx</i> sp.)	3	1
Raccoon ( <i>Procyon lotor</i> )	3	1
Bison ( <i>Bison</i> sp.)	1	1
probably bison (cf. <i>Bison</i> sp.)	10	---
Pig ( <i>Sus scrofa</i> )*	3	1
Hoofed mammal (Artiodactyla)	2	---
Large-size mammal	14	---
Medium-size mammal	2	---
Small-size mammal	1	---
Mammal, undifferentiated	191	---
<i>Birds</i> (subtotal)	37	6
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	15	4
Sandhill crane ( <i>Grus canadensis</i> )	1	1
Canada goose ( <i>Branta</i> sp.)	1	1
probably Canada goose (cf. <i>Branta</i> sp.)	1	---
Large-size bird	19	---
<b>Total</b>	<b>2,302</b>	<b>73</b>

Table 28. Faunal identifications from Winchell's 1907 surface collection at the Christensen Mound site (21SH1/16)

Taxonomic Identification	NISP	Weight (g)	MNI
<u>Mammals</u> (subtotal)	239	250.2	---
Black bear ( <i>Ursus americanus</i> )	218	1930.48	9
Black bear, probably (cf. <i>Ursus americanus</i> )	10	4.9	---
Small carnivore	1	0.27	---
Mammal, undifferentiated	10	30.20	---
<u>Unidentified</u> (subtotal)	14	2.8	---
<b>Total</b>	<b>253</b>	<b>253.00</b>	<b>9</b>

Winchell's personal investigations at 21SH1/16 in 1907 seem to have been inspired by Theodore Lewis' 1890 description of the site, and his map of 30 linear and conical earthworks. Winchell spent most of his time on excavations within the linear mounds, but he also noted a concentration of bear cranial bones eroding from the side of a wagon road approximately 50 feet south of Mound 3.

The teeth found were perhaps 150 in number, all tusks, while in the jaw-bones were usually a nearly perfect set of smaller teeth. Some of the bones and some of the teeth had been blackened by fire. Here were found also a clay pipe, similar to the "Winnebago pipe" of Fillmore County, but smaller, some stone chippings and potsherds, a hollow, squared, small bone about 1½ inches long and about one-third of an inch in diameter, with ends cut square off, and a small triangular white-quartz arrow-point. There were no long bones, nor any bones or teeth of other animals (Winchell 1911:293).

In 1948, Louis Powell of the St. Paul Science Museum made a collection and record of the find.

In a peripheral portion of the mound on the east side, Mr. Christensen encountered a black root choked area crowded with bone fragments. This bone filled area extends from the east edge of the mound into the mound for 8 feet. The bone layer is at the old surface upon which the mound was built lying at 6 inch depth (below this level) on brownish sand and is roughly circular (about 8 feet in diameter). The entire depth of the bone filled sand (black root filled area) is about 1½ feet. Thus, the bone pile was under the mound at one edge (Powell 1948:3).

Table 29. Ursid body part identifications from the Christensen Mound (21SH1).

<b>Body Part</b>	<b>NISP</b>
<b>Cranium</b>	
1 <sup>st</sup> molar, upper, left	36
1 <sup>st</sup> molar, upper, right	36
2 <sup>nd</sup> incisor, upper, left	1
2 <sup>nd</sup> molar, upper, left	54
2 <sup>nd</sup> molar, upper, right	63
3 <sup>rd</sup> incisor, upper, right	1
4 <sup>th</sup> premolar, upper, left	6
4 <sup>th</sup> premolar, upper, right	5
Cranium (fragment)	119
<b>Upper Cranial subtotal</b>	<b>321</b>
<b>Mandible</b>	
1 <sup>st</sup> molar, lower, left	44
1 <sup>st</sup> molar, lower, right	40
2 <sup>nd</sup> molar, lower, left	55
2 <sup>nd</sup> molar, lower, right	53
3 <sup>rd</sup> molar, lower, left	39
3 <sup>rd</sup> molar, lower, right	44
4 <sup>th</sup> premolar, lower, left	19
4 <sup>th</sup> premolar, lower, right	16
Mandible (fragment)	69
Mandible, left (medial fragment)	3
Mandible, left (fragment)	102
Mandible, right (fragment)	101
Mandible, right (medial fragment)	2
<b>Mandibular Cranial Subtotal</b>	<b>587</b>
<b>Indeterminate Cranial</b>	
Canine	123
Canine (fragment)	144
Canine, lower, left	6
Canine, lower, right	3
Incisor	6
Incisor (fragment)	21
<b>Indeterminate Cranial Subtotal</b>	<b>303</b>
<b>Postcranial Remains</b>	
Atlas	3
Ilium, left (fragment)	7
Ilium, right (fragment)	5
Ischium, right? (fragment)	1
Rib, right, nearly complete	1
Scapula, left, proximal fragment	2

*Table 29 (cont.)*

Scapula, right, proximal fragment	2
Radius, left, distal/medial fragment	2
Radius, left, distal fragment	1
Radius, left, nearly complete	3
Radius, left, proximal/medial fragment	2
Radius, left, proximal fragment	2
Radius, right, distal epiphysis	1
Radius, right, proximal fragment	2
Ulna, left, proximal/medial fragment	3
Ulna, right, proximal fragment	1
<b>Postcranial Subtotal</b>	<b>38</b>
<b>Totals</b>	<b>1,249</b>

Powell (1948) attributed the bear remains to feasting by the protohistoric Dakota associated with construction of the mound. His photographs are an invaluable record of the Christensen Mound, and his memo about the site describes the fauna, which includes animals such as bison, lynx, eagle and crane in addition to the bear remains.

As described above, Professor Lloyd Wilford of the University of Minnesota was alerted to the find by Powell, and sought permission to excavate the mound in light of its imminent destruction. He and his crew arrived at Elk Lake on June 24, 1948. The four crew members were students, Merle Broberg, Robert Ernest, Glen Heckman and Elden Johnson. Johnson later went on to a distinguished career as a University of Minnesota professor and the Minnesota State Archaeologist. Wilford and the crew camped at the site, in "Mr. Christensen's park on Elk Lake of Battle Brook" (Broberg 6/24/48R). The Christensen dig was part of a series of summer excavations across the state, such as Wilford had participated in or directed since his apprenticeship with Prof. Albert Jenks in the early-1930s. This work continued through the 1950s, encompassing archaeological sites throughout the state. These cumulative investigations were the first systematic studies of Minnesota archaeology, and were the basis of Wilford's evolving definitions of the cultural history of the state (e.g. Wilford 1937, 1944). In this case, Wilford and the crew came to Elk Lake from Spring Valley in southern Minnesota, and moved on to Nett Lake in the north as their next stop.

Wilford first cleaned the area of the bear remains back to a clean profile, and excavated a large block in the center of the mound. A number of secondary burials were encountered, and associated finds were few. The excavation was abruptly ended when it was realized that Mr. Christensen had expected the crew to move the entire mound (and backfill) across the road.

The faunal remains from the Christensen Mound have been examined on several occasions, most notably by Powell (1948) as previously mentioned, and later by Paul Lukens (1963) in his overview of mammalian remains from Minnesota archaeological sites. "Represented were 151 whole or partial mandibles, 150 pieces of the skull, 174 whole or partial canine teeth, and 252 whole or fragmentary molariform teeth. There were only 28 post-cranial fragments. More than 600 unidentified other fragments from this cache were probably those of the black bear also" (Lukens 1963:71). Paul Parmalee of the Illinois State Museum assisted with the bird remains, and identified a coracoid of sandhill crane, a humerus of Canada goose and humerii, coracoids and femora of bald eagle.

Lukens was alert for indications of grizzly bears in the Christensen Mound fauna, but found only black bear. "The paucity of [grizzly] remains from archaeological sites in the Great Plains is unfortunate, for these sites provide one of the last means of determining the former range of the grizzly bear in the plains area" (Lukens 1963:75). Citing Hallowell (1926), he recommended that the Christensen fauna be studied in relation to other ceremonial bear sites.

I prepared a full inventory in September 1999 prior to repatriation of all the Christensen Mound materials under the terms of the Native American Graves Protection and Repatriation Act. Representative samples of the faunal remains were also photographed, and measurements taken of all the teeth. The results of that analysis are presented in Chapter 8. This analysis encompasses the Christensen Mound faunal collections housed at the Science Museum of Minnesota and the University of Minnesota. The UM collection had previously been transferred to the Science Museum, and thus was not included in the University's NAGPRA inventory completed in 1997. The human remains from the Christensen Mound had been repatriated and reburied previously. There

was some question at the time of the relationship of the bear feature to the mound, which delayed repatriation of the faunal remains until 1999.

Powell (1948:3) wrote that “all of the material Mr. Christensen had” was taken to the Science Museum for study (Accession #1089). There are anecdotal references that Christensen had given some of the bear bones to neighbors or visitors, but this remains unconfirmed. The finds from Wilford’s excavation of the Christensen Mound were assigned Accession #286 at the University of Minnesota. Numbers on the faunal remains belong to six proveniences, numbers 286-1 through 286-6. A description of these contexts was found in Wilford’s unpublished data. It was written on the back of a 1955 mid-quarter exam paper, and presumably was transcribed from previous field notes. The description of the six contexts is quoted here:

Christensen 286 –

1. Bear jaws, etc. in disturbed area – 3 boxes
2. Essentially the same – some jaws, – 80 canines, 6 bear jaws, 1 small carn [sic], 29 molars & premolars, 1 section brain case
3. Bear jaws from undisturbed area – 2 nearly complete mandibles, parts of 2 or 3 others, 5 canines, 4 m & pm [sic]
4. Material from level I to 9.7
5. Material from level II
6. Material from level III to 8.4 (L. A. Wilford, unpublished notes)

The most important taphonomic observation regarding the Christensen Mound fauna is that all of the bone was weathered, bleached and eroded to some extent. These conditions varied throughout the collection, but the available time did not permit the gradations to be quantified. Several general observations deserve mention, however. First, the bear mandibles from the Science Museum of Minnesota collection (Accession #1089) were noticeably less weathered than those from the University of Minnesota (Accession #286-1). While this may have been the case for the respective collections in their entirety, the discrepancy was most clearly noted when the bear mandible assemblages were laid out on tables. This accession number designates the bear bone

from the area disturbed by Christensen's digging. It seems likely that this taphonomic difference is due to the exposure of the bone from early April 1948, the time of its disturbance, to late June/early July 1948, when Wilford's crew were working at the site. This period of nearly three months in the early- to mid-summer of Minnesota would conceivably affect the condition of the bone.

The most striking aspect of the Christensen Mound fauna is, of course, the bear remains, which consist primarily of mandibles and fragmented cranial remains. The teeth from Mound 1 account for a minimum number of 63 black bears, with at least 9 more represented in Winchell's 1907 collection. Other bear remains are present as well, including ulna fragments showing a marked size range of bears. Three atlases are the only vertebrae present. Very few rib fragments were identified, and no paws, humerii or bones of the rear limbs were found. This pattern of body part representation is suggestive of secondary burial of the bear remains. This is the burial mode of the people found in the Christensen Mound, with assumption that the deceased were exposed on scaffolds or defleshed prior to interment of selected elements (usually skulls and longbones) in the mound. It is tempting to argue that burial of the bears occurred in the same manner, although it seems certain that collection of the bear remains focused on the skull.

I believe that the body part representation strongly suggests secondary burial of the bear remains, similar in some respects to the burial mode of the people buried in the same mound. While the specific details of the events cannot be known, ethnographic accounts and descriptions of bear ceremonialism by Hallowell (1926) and others provide relevant sources for analogy. Drawing from these sources and the data presented here, it is suggested that the events leading to the burial of the Christensen Mound bears included:

1. One or more mass winter bear hunt(s)
2. A bear feast, with respectful treatment of the bear remains
3. Exposure of the remains, possibly on scaffolds
4. Gathering of selected remains at a later date, and burial at the edge of Mound 1

As discussed below in Chapters 8 and 9, the 1907 assemblage collected by Winchell at the edge of Elk Lake appears to represent a different type of bear ceremony, perhaps more similar to that of the Bear site at Mille Lacs.

### **21SH15, Honker**

The Honker site is located in the Sherburne National Wildlife Refuge. One fragment of black bear is reported from Mound F. It is a left mandible including the third molar, represented by conjoining fragments. Cut- or chop-marks are visible. A second bear bone may be present in the surface collection of the associated habitation site area. It is a fragment tentatively identified as a bear ulna (White 1997). This is a small faunal assemblage that also contains muskrat, skunk and turtle bone. Diagnostic ceramics from the site are primarily Middle Woodland, including Howard Lake, Malmo/Kern, and possibly Sorg wares. The only diagnostic sherd from Mound F, which contained the bear bone, is Late Woodland, Onamia/St. Croix. (Higginbottom and Henning 1997; faunal identifications in Appendices III.2, III.3 and IV [White 1997]).

### *St. Paul Baldwin Plains and Moraines (222Md)*

### **21HE7, Lincoln Mounds**

The Lincoln Mounds site overlooks the Minnesota River in the Twin Cities suburb of Bloomington. At another Middle Woodland burial site, in the Twin Cities metropolitan area, a grizzly bear metatarsal bone was identified from the Lincoln Mounds site (21HE7). The 2004 excavation was a burial rescue, carried out under the supervision of the Minnesota Indian Affairs Council and leaders from three Dakota communities.

Theodore Lewis mapped the five earthworks of the Lincoln Mounds in 1882. At least one other had already been removed by that time. Prior to a construction project in 1998, I directed an investigation of the site to determine if any of the earthworks were left. The site had changed a lot since Lewis' day. It is now sandwiched between the Mall of America and the Twin Cities Metropolitan Airport. We didn't expect to find anything intact, but a slight topographic rise in the yard of a home on the Minnesota River bluff proved to be a remnant of Lewis' Mound 4. Under the direction of Dakota elders, we

restored that mound and built a new mound for reburial of human remains recovered from the excavation (Mather 1998; Mather et al. 2003).

Finding an intact remnant of Mound 4 in 1998 provided an anchor for Lewis' map on the modern landscape. We could then confirm that Mound 5 had been destroyed at some point in the past. We could also tell that the locations of Mounds 1, 2 and 3 were outside of the 1998 project area, to the north. This area consisted of suburban roads, parking lots and office buildings, except for once small parcel, which was a park with flower gardens and picnic tables. No above-ground mound remnants were visible there.

When the park area was to be affected by another development in 2004, the State Archaeologist and Minnesota Indian Affairs Council determined that a burial authentication investigation should be conducted. Mollie O'Brien directed a new search for human remains and mound remnants. I provided field assistance and served as the project zooarchaeologist. No above-ground portions of the mounds survived, and a geophysical investigation was inconclusive. Archaeological excavation eventually identified remnants of two sub-mound burial pits, however, which had been disturbed by the former Lincoln farm and modern landscaping. The pits contained secondary burials representing at least 55 people (Bakken et al. 2006). These were not complete skeletons – this type of burial involved exposing the body first on a scaffold or in a tree. Bones were gathered later and bundled up to be buried in the mound (e.g. Theler and Boszhardt 2003:9-11).

Few artifacts were found with the burials, but radiocarbon dates determined that the burials were approximately 2,000 years old, within the period of the Hopewell influence during the Middle Woodland Tradition. The animal bone fragments present in the burial pits included muskrat, swan, raccoon, bullheads and other tiny fish remains (Figure 65), representing food offerings and other ritual activities (Table 30).

The single bear bone was a surprise, and I almost did not recognize it in the analysis. The fragment itself is small but includes one end of the bone with a central ridge and other diagnostic features (Figures 66-67). It was found under a bundle burial. The size and curvature initially suggested a humerus of a small- to medium-sized mammal such as a badger or raccoon. But the top of a humerus is smooth, and the ridge did not fit

with those possibilities. The only bones with a ridge like this are inside the paws of five-toed mammals – animals including dogs, cats, bears, weasels and rodents. These animals have five bones inside each paw, which correspond to the bones inside a person's hands (metacarpals) and feet (metatarsals). The ridge is part of the joint with the first phalanx of the finger or toe. The problem with this piece was that the ridge and end of the bone were far too large to correlate with the metacarpals or metatarsals from any of the expected animals, based on the ecology of the site area. Badgers are the largest members of the weasel family, and they are far too small for this piece. The same went for beavers and other rodents. The paw bones from dogs are too straight and small, even those of wolves and large domestic dogs.

The bone was also much bigger than the paw bones from an adult black bear, but some of the comparative specimen's metatarsals matched it in shape and curvature. This indicated that it could be a bear, but possibly a different species. Luckily, a grizzly bear comparative skeleton was available at the Bell Museum at the University of Minnesota. The skeleton is from an old male, and the bone fragment from Mound 1 is significantly larger, but consistent in shape (Figure 67). To further illustrate the size of the Lincoln Mounds bear, this bone was similar in size to comparative specimens of a polar bear, and larger than a tiger (also in the Bell Museum collections).

Both black and grizzly bears are sacred animals to the Dakota people. The claws of grizzly bears are symbols of power, and are portable either in necklaces or as individual trade items. This bone was from inside the body of the paw, and likely the back paw, so it would not have been transported with a claw or necklace. It is possible that a complete back paw was brought to the site from elsewhere, or it is also possible that a grizzly bear was present and killed in the vicinity of the Lincoln Mounds. In either case, the presence of this small fragment among the secondary burials suggests that it may have been associated with the human remains on the funerary scaffold, and then inadvertently (or perhaps purposefully) collected when the remains were bundled for eventual burial within Mound 1.

Burial rescue operations such as this are highly unusual in the current practice of Minnesota archaeology. As in 1998, the human remains and grave goods – including the

Table 30. Summary of animal bone from the 2004 Lincoln Mounds (21HE7) burial rescue.

<b>Taxonomic Identification</b>	<b>NISP</b>	<b>Weight (g)</b>	<b>MNI</b>
<u><i>Mammals</i> (subtotal)</u>	325	166.92	---
Grizzly bear, <i>Ursus arctos</i>	1	4.52	1
Muskrat, <i>Ondatra zibethicus</i>	6	6.98	2
probably muskrat, cf. <i>Ondatra zibethicus</i>	3	0.40	---
Raccoon, <i>Procyon lotor</i>	3	0.84	1
Badger, <i>Taxidea taxus</i>	30	75.35	1
probably badger, cf. <i>Taxidea taxus</i>	6	7.49	---
Gopher, Family Geomidae	62	19.25	8
probably gopher, cf. Geomidae	41	6.94	---
Mole, <i>Scalopus aquaticus</i>	4	1.87	---
Rodents, undifferentiated	80	10.27	---
Medium-size mammal	7	6.72	---
Small-size mammal	31	2.37	---
Micro-size mammal	6	0.47	---
Mammal, undifferentiated	45	23.45	---
<u><i>Birds</i> (subtotal)</u>	9	7.43	---
Swan, <i>Cygnus</i> sp.	1	2.96	1
Bird, undifferentiated	8	4.47	---
<u><i>Reptiles</i> (subtotal)</u>	2	2.78	---
<u><i>Reptiles/Amphibians</i> (tiny vertebrae - subtotal)</u>	31	1.32	---
<u><i>Amphibians/Mammals</i> (tiny vertebrae - subtotal)</u>	60	2.71	---
<u><i>Amphibians</i> (subtotal)</u>	15	0.70	---
<u><i>Fish</i> (subtotal)</u>	390	13.50	---
Catfish or Bullhead, <i>Ictalurus</i> sp.	20	2.58	4
probably catfish or bullhead, cf. <i>Ictalurus</i> sp.	1	0.15	---
Fish, undifferentiated	369	10.77	---
<u><i>Mollusks</i> (subtotal)</u>	2	0.04	---
<u><i>Unidentified</i> (subtotal)</u>	1416	66.39	---
Total	2261	265.21	18

The animal remains quantified above are associated with the burial areas of Mounds 1 and 2. The historic component related to the Lincoln Farm produced a far greater quantity of animal bone. A brief summary of those fragments is presented here:

- |                               |  |
|-------------------------------|--|
| Horse, <i>Equus caballus</i>  | MNI three buried horse carcasses (two adults, one colt).         |
| Pig, <i>Sus scrofa</i>        | At least one buried pig carcass; also bones from pork meat cuts. |
| Cattle, <i>Bos taurus</i>     | Bones from beef meat cuts.                                       |
| Chicken, <i>Gallus gallus</i> | Chicken bones.   |
| Duck, Family Anatinae         | Duck bones. Walleye, <i>Stizostedion</i> sp. Fish bones.         |



Figure 65. Concretions of fragmented fish bones from the sub-mound burial pits at 21HE7.

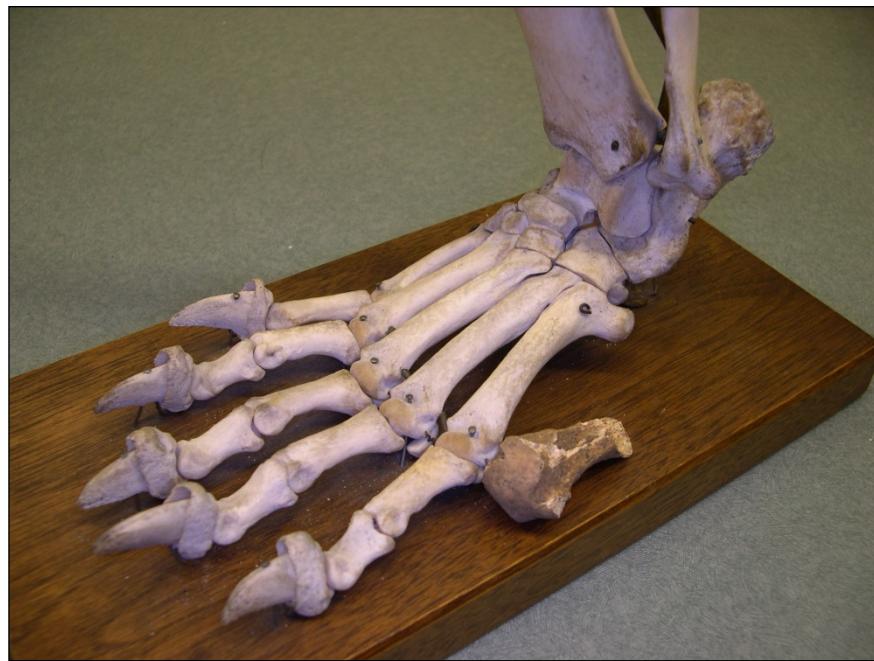


Figure 66. The grizzly bone fragment from the Lincoln Mounds next to an articulated rear paw of a black bear, at the Bell Museum of Natural History.



Figure 67. Multiple views of the Lincoln Mounds grizzly bone fragment with a metatarsal from the *Ursus arctos* comparative specimen at the Bell Museum of Natural History.

grizzly bear bone fragment – were reburied with proper ceremony, in a new mound built on the grounds of the Cerdian Corporation.

### **21HE\_, Field Site 1**

“Field Site 1” is located on the north bank of the Minnesota River in Bloomington. An artifact assemblage including a bear ulna was recovered during archaeological investigation of the proposed Minnesota Valley State Trail, but geomorphological study determined that all of the materials had been redeposited through fluvial action. For this reason, the location was not assigned a Minnesota archaeological site number. Artifacts found at the site include glass and metal fragments, animal bone, Woodland Tradition ceramic sherds and recent materials such as cellophane and foil. The geomorphologist suggested that the materials had most likely eroded from the floodplain or river channel, or from slightly upriver (Van Vleet et al. 2018:17-21). It seems likely, therefore, that the original source of the bear bone was nearby, so I have included it here as a bear find. It is not possible to assess the age of the bear bone from the archaeological context.

### **21RA10, Indian Mounds Park Mound Group**

The Indian Mounds Park Mound Group in Saint Paul was listed in the NRHP in 2014 (Arnott et al. 2013b; Mather 2015b). It is a local landmark with large burial mounds preserved. Geophysical survey conducted for the National Register nomination documented that potential burial pits or other mound-related features remain in areas where other earthworks have been leveled.

### **21RA27, *Wakan Tipi/ Carver’s Cave***

*Wakan Tipi* is a cave at the base of Dayton’s Bluff, below the Indian Mounds Park Mound Group. It is a sacred place to the Dakota. The English name of the cave is a reference to Jonathan Carver, an independent explorer from Massachusetts who visited what-is-now Minnesota in 1766 (Parker 1976). *Wakan Tipi* is eligible for listing in the National Register of Historic Places (Terrell 2003), and as of this writing, the Prairie Island Tribal Historic Preservation Office is leading discussions about preparing a nomination.

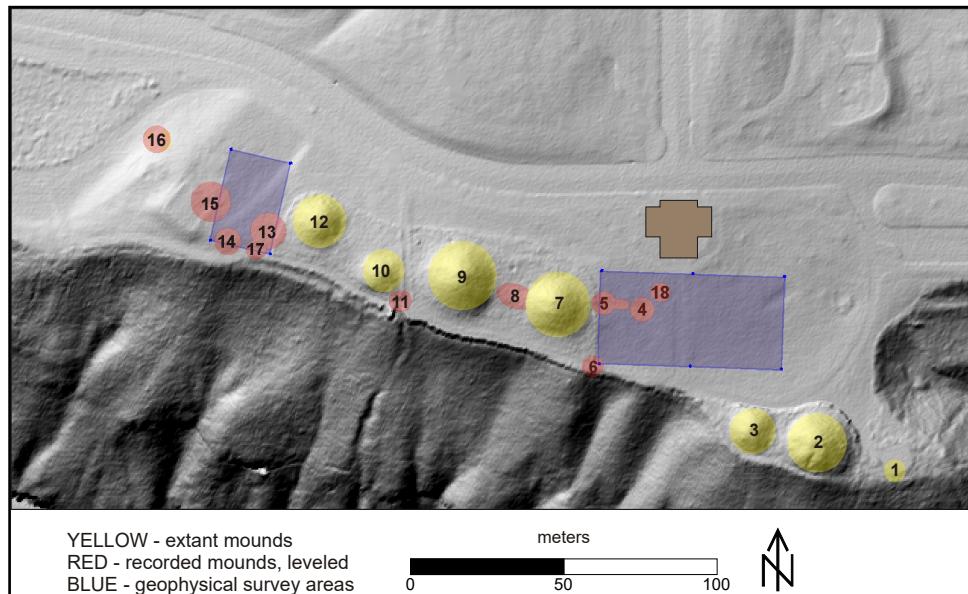


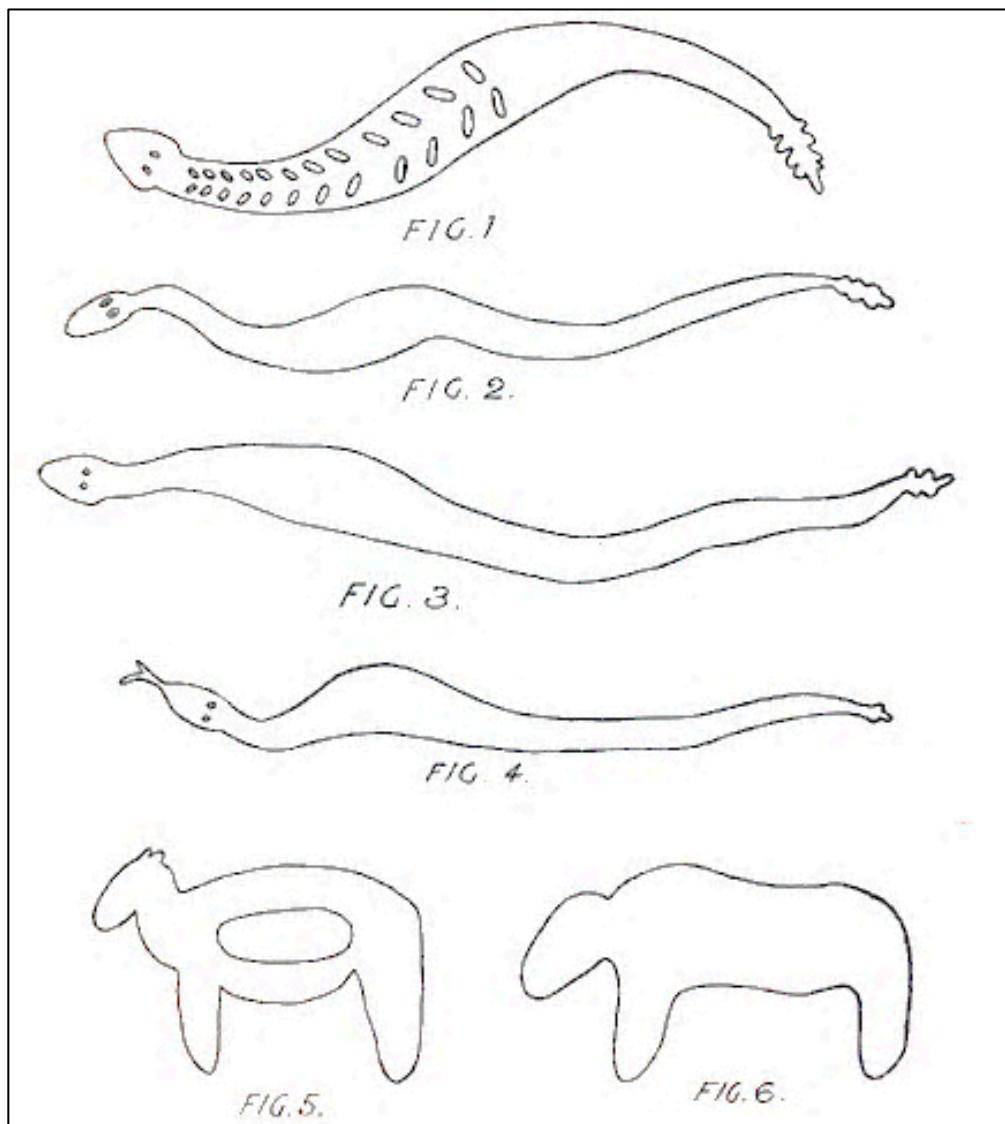
Figure 68. LiDAR map of the Indian Mounds Park Mound Group (21RA10) overlooking the Mississippi River in St. Paul, showing extant (yellow) and former mound locations (from Arnott et al. 2013b).

Carver first visited the cave on November 14, 1766:

This day arrived to the great stone cave calld by the Naudowessee *Waukon Teebee*, or in English, the house of spirits. This cave I have found to be a great curiosity, in a rocky mountain just by the bank of the [Mississippi] river. The mouth of the facing the river [is] (on an ascent near 45°,) the enterence about ten feet broad and three feet high. I went in and measured the room upwards of thirty feet broad, and about sixty feet from the enterence of the cave [to] where I came to a lake. As ‘twas dark I could not find out the bigness nor the form. [Parker 1976:91-92, editing in original]

He went on to mention that the cave is near “the burying place of the Mottobauntoway band of the Naudowessee,” (Parker 1976:92), which is probably a reference to the burial mounds on top of the bluff, including the Indian Mounds Park Mound Group (21RA10).

In the late nineteenth century, Theodore Lewis recorded rock art from the entrance of Wakan Tipi, including a bear petroglyph (Figure 69): “Fig. 6 apparently represents a bear, and was a little over 10 inches in length and about 1 inch in depth. It was located partially between the tails of Figs. 1 and 2.” These are two of the four rattlesnakes, which are described as 3 feet 7 inches long, and 3 feet 8 inches long, respectively (Lewis 1898:40-41; see also Terrell 2003:64-65). The bear image has a



*Figure 69. Rock art including a bear image at lower right, recorded at 21RA27, from Lewis (1898:41).*

distinct shoulder hump, which is a trait of grizzly bears, and not black bears (see Figure 3). Unfortunately, the front of the cave was damaged when the face of the cliff was cut back to build the railroad tracks (Brick 2009:16).

#### **21RA28, Dayton's Bluff Cave**

Dayton's Bluff Cave contained petroglyphs of human and animal figures. Number 3 as illustrated by Winchell (1911:566) has a short tail and small, upright ears. It may be a bear, but it is not as obvious as the image from Carver's Cave. For this reason, 21RA28 is included as a possible bear site.

### **21WA3, Sheffield**

The Sheffield site is an Oneota village site on the west bank of the St. Croix River, adjacent to the McKee Mound (21WA4). Gibbon (1973) interprets this as a hunting and fishing camp occupied in the summer months. A radiocarbon date for this component is  $1300 \pm 180$  (I-784). Middle Woodland, Late Woodland and early historic components are also present. The faunal identifications reported by Gibbon (1973:32-33) are from the 1959-1960 excavations. Early investigations were conducted in 1951 and 1955. Four black bear fragments are a small portion of the 1959-1960 assemblage. The mammals are primarily represented by deer and beaver. Other Artiodactyl remains include bison and elk. Other furbearers include muskrat, raccoon and otter. There is a significant representation of fish, turtles, and mussels, but few bird remains.

Additional analyses of faunal remains from the Sheffield site have been undertaken at the Science Museum of Minnesota by Mary McLaughlin (2014), Jenna Rempfert (2014) and Aaron Armstrong (Fleming et al. 2019). These investigations have identified more bear remains. I examined some of the unanalyzed fauna from Sheffield at the Minnesota Historical Society. While I could not undertake a full inventory, I did notice a bear scapula that may be modified in a similar manner to bison scapula hoes (Figure 70). In contrast to other Oneota sites, no bison or elk scapulae are present at Sheffield, but there are small apparent hoes made from deer scapulae. In this context, a bear scapula hoe may be plausible, although still not expected.

### Paleozoic Plateau (222L)

This section contains all of Wabasha, Winona and Houston counties, most of Goodhue, Olmsted and Fillmore counties, and significant portions of Dakota, Dodge and Mower counties.

*Blufflands (222Lc)*

**21FL3, Tudahl Rockshelter**

The Tudahl Rockshelter is located on a tributary flowing north to the Root River.

The large faunal assemblage contains one black bear element, a lower premolar from a surface layer (Lukens 1963:72; Perkl 2009:70-71).



Figure 70. Possible bear scapula hoe from the Sheffield site (21WA3), Minnesota Historical Society collections, with black bear comparative specimen.

**21GD4/45, Bryan**

The Bryan site is a large village and burial mound complex on the uplands overlooking the confluence of the Cannon River with the Mississippi. The site has been extensively excavated, and was greatly impacted by gravel mining and highway construction by the early 1980s (Yourd 1985; Schirmer 2002). Most of the faunal remains from the site have not been analyzed, but a “partial left mandible with four cheek teeth” has been identified from a storage pit (Lukens 1963:72).

## **21GD182, Cannon River Drive**

The Cannon River Drive site includes an effigy mound site first recorded in 1885 near Red Wing, and a Late Woodland habitation component discovered by the Minnesota Municipal and County Highway Archaeological Reconnaissance Survey program in 1987 (Anfinson and Peterson 1988:40-48). Despite an apparent discrepancy between the 1885 survey records by Theodore Lewis and the later map published by Winchell (1911), the archaeologists identified the correct landform and visible remnant of at least one mound. They also found artifacts including lithic debitage and a triangular projectile point.

[T]here has been some land alteration for a nearby development and much of the immediate area has been subjected to landfill. We would expect that most of the mounds would no longer be visible. But, based on nearby subsurface testing, it is likely that intact remnants of the mounds are extant subsurface. ... The site consisted of 7 earthen mounds, 1 to 3 feet high: 5 circular mounds 25-30' in diameter, 1 elongate mound measuring 24x36', and 1 animal effigy mound, which could possibly be classed as a bear. Winchell (1911:159) gave the length of the effigy mound as 145 feet. But Lewis' notes indicate the mound measured 45-54' x 34'. [Anfinson and Peterson 1988:46]

Aside from the quote above, the site records cautiously describe the effigy mound as a “mammal,” but in my opinion, it is likely a bear (see Figures 71-72). Mounds of this form in western Wisconsin and northeast Iowa, where effigy mounds are more common, are routinely identified as bears (Birmingham and Rosebrough 2017).

Other effigy mound sites (although not of bears) are present at Red Wing, including 21GD16 and 21GD17, and 21GD59 Prairie Island. There are serpent-like mounds at 21GD37 and 21GD38. Most Minnesota effigy mounds are either birds or inanimate objects (Anfinson and Peterson 1988:48). There are other “mammal” mounds recorded at 21WB23, 21HU11 and 21HU14, and possibly 21WN10, and across the Mississippi River from Red Wing at Mero/Diamond Bluff.

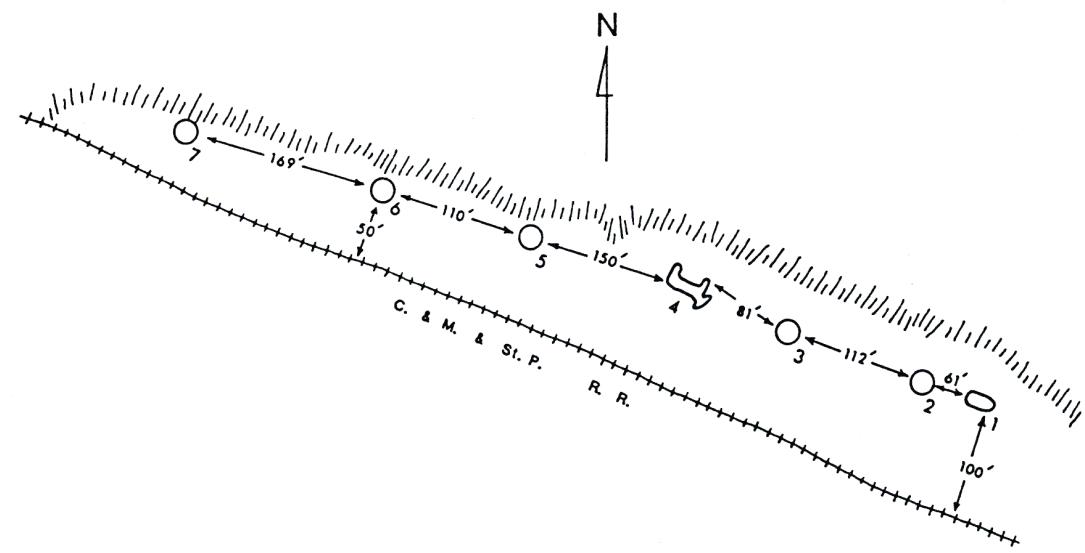


Figure 3-8. Adaptation of T.H. Lewis' map of the 7-mounds group, surveyed by Lewis on Sept. 3rd, 1885.

Figure 71. Likely bear effigy mound at 21GD182, from Anfinson and Peterson (1988).

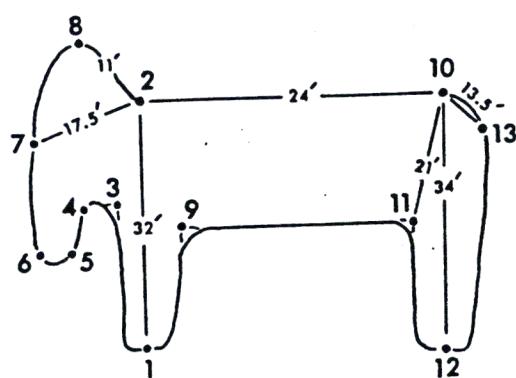


Figure 3-10. Adaptation of T.H. Lewis' sketch of mound 4 of the 7-mound group, showing survey points; selected distances added.

Figure 72. Dimensions of the likely bear effigy mound at 21GD182, from Anfinson and Peterson (1988).

### **21GD258, McClelland Site A**

McClelland Site A contains a bear phalanx with cut marks from Feature 5. The site was discovered at the southwest edge of Red Wing in 2006 through a Minnesota State University-Mankato fieldschool, and contains Archaic and Blue Earth Oneota components. This site is related a dense cluster of stone cairns (Bergervoet 2017).

### **21HU2, Farley Village**

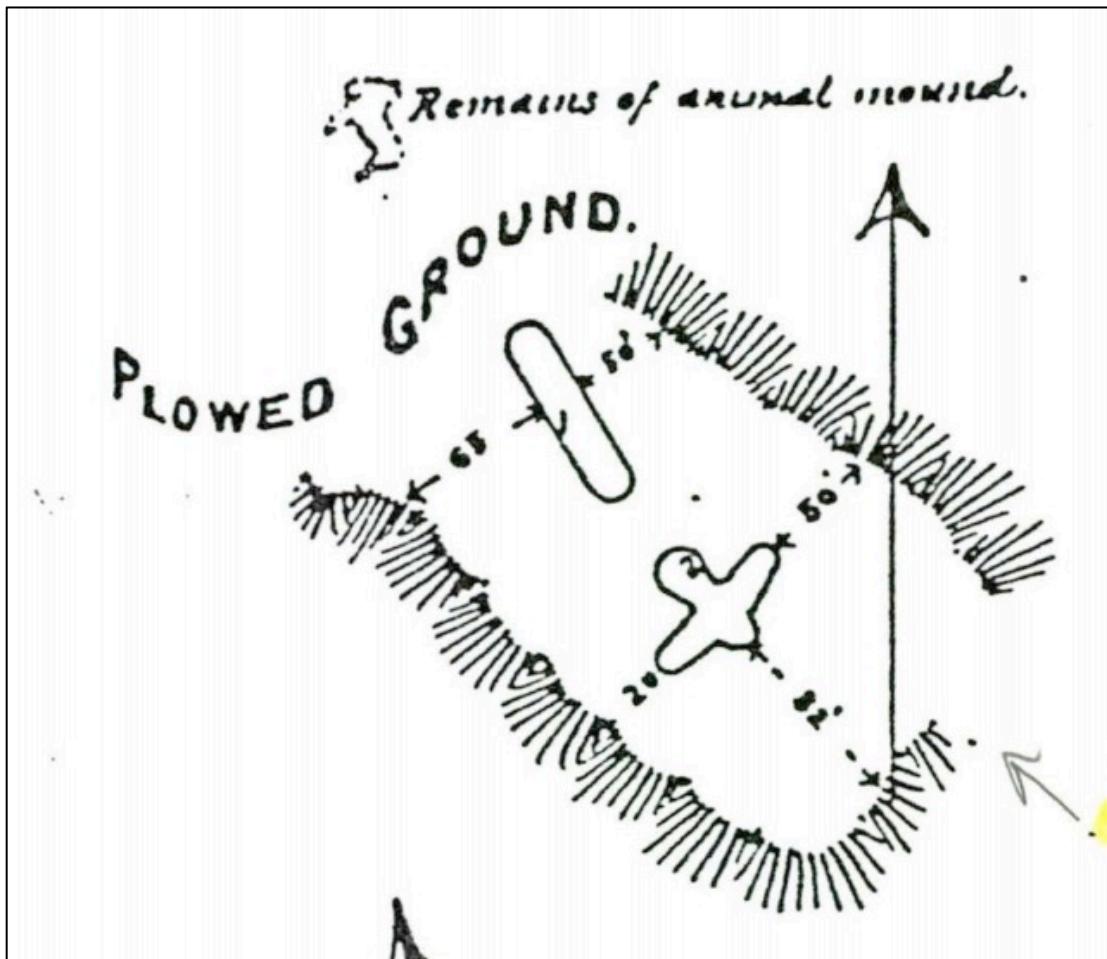
Farley Village is a Contact period Ioway/Oneota village on Riceford Creek, among a complex of related sites including the NRHP-listed Yucatan Fort site. Phase II and III investigations occurred at the site in 1989 related to county road reconstruction, recovering shell-tempered pottery, lithics, floral and faunal remains, and trade goods including glass beads, copper and brass (Gallagher 1990). Feature 2, a pit measuring 110 cm by 70 cm deep, contained Orr Phase Oneota pottery and glass beads. Charcoal from the feature produced an uncalibrated radiocarbon date of  $200\pm50$  (Wis-2173).

This pit also had a significant faunal assemblage, including one bear bone (element not specified). Other animals include passenger pigeon, red-winged blackbird, beaver, muskrat, domestic dog, raccoon, and an intriguing range of hoofed mammals (bison, elk, white-tailed deer and moose). A wild turkey bone is referred to in the text (Gallagher 1990:47), but it is not listed in the faunal table (Theler 1990:46).

Archaeobotanical analysis identified maize, beans and squash cultigens, nutshells including hickory, walnut and hazel, and wild plant species.

### **21HU14, Beranek**

The Beranek site is a mound group at the bluff edge of the Mississippi River floodplain, near Pine Creek. When surveyed by Theodore Lewis in 1884, there were two extant mounds: an oblong mound and a bird effigy. However, in a plowed field adjacent to these mounds, Lewis noted the “remains of an animal effigy” (Winchell 1911:81). I have tentatively included the site here because the outline of that mound (Figure 73) is similar to the profile bear mounds known from southwest Wisconsin and northeast Iowa, but it is important to note that neither Lewis or Winchell actually identified the mound as a bear.



*Figure 73. Record of possible bear mound at 21HU14, from Winchell (1911:81).*

The site has not been investigated other than a field check by the Statewide Archaeological Survey in 1979, when it was observed that part of the oblong mound was still visible (notes in 21HU14 site file). It is possible that subsurface portions of these mounds still exist, including the potential bear effigy. Recent investigations with LiDAR and geophysics have recognized mound remnants in similar situations elsewhere in the region (Maki et al. 2014), and this approach may be useful for assessment of 21HU14 as well.

Also in Houston County, another “animal” mound is (or was) located at 21HU11 in the town square of Hokah, on the Root River (Winchell 1911:82-83). I have not included that one as a possible bear site because the published map suggests that the effigy may have a tail.

### **21WB56, King Coulee**

King Coulee is a stratified Archaic, Woodland and Oneota site on the west side of Lake Pepin. Deep testing was conducted as part of a Phase II evaluation prior to reconstruction of Trunk Highway 61 (Peterson et al. 1988:179). Because of the site's wet conditions, organic remains were abundant, including seeds of the cultivar *Cucurbita pepo* (Perkl 1998).

A full zooarchaeological analysis has not been conducted, but there is one identified black bear upper premolar from an assemblage of 16,647 faunal artifacts and an additional (uncounted) assemblage of bivalves from a shell midden. The bear tooth is from the lower deposit in Units 5, 6 and 7. Several Woodland components are represented in this deposit, with La Moille Thick pottery, as well as Havana-like and other Middle Woodland, and Middle to Late Woodland transitional wares (Perkl 2002:79, 85-88).

### **21WB127, Burmeister Bear**

The Burmeister Bear site is a single artifact find of a pipestone bear effigy (Figure 74). It was found during surface survey in the floodplain of the Mississippi River. No other artifacts were found during examination of the site area.

Two ears, a stub tail and legs with feet have been carved. The head exhibits a forehead, outlines of the eyes and snout along with a slit carved for the mouth. A hole has been drilled through the center of the body with offset tapered openings. Shaving marks are clear beneath the chin and leg appendages and between the ears. These do not appear to have been done with a metal file. The body surfaces and back show signs of polish, although the surface has been marred by plow scratches. There are three small parallel lines near the mouth, whether or not these are intentionally carved as possible whiskers is subject to interpretation. It is just over 4 cm long and 2.4 cm tall, and nearly 1 cm thick, it weighs 10.1 grams. [Fjerstad and Boszhardt 2008:9-10]

### **21WN55, La Moille Cave**

La Moille Cave contains a variety of rock art images. In *The Aborigines of Minnesota*, Winchell (1911) presents three fold-out pages of the images. On the third panel, he identifies No. 34 as a bison. I have included 21WN55 here as a possible bear

site because in my opinion, the animal depicted looks more like a bear (Figure 75). It seems to have ears rather than horns, and it has a rounded rump and shorter legs. It is certainly different than the other three images, which reasonably appear to be bison.

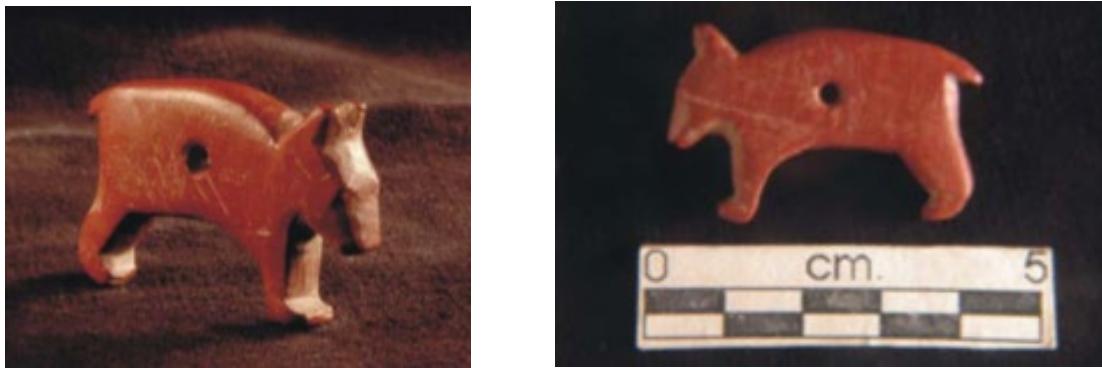
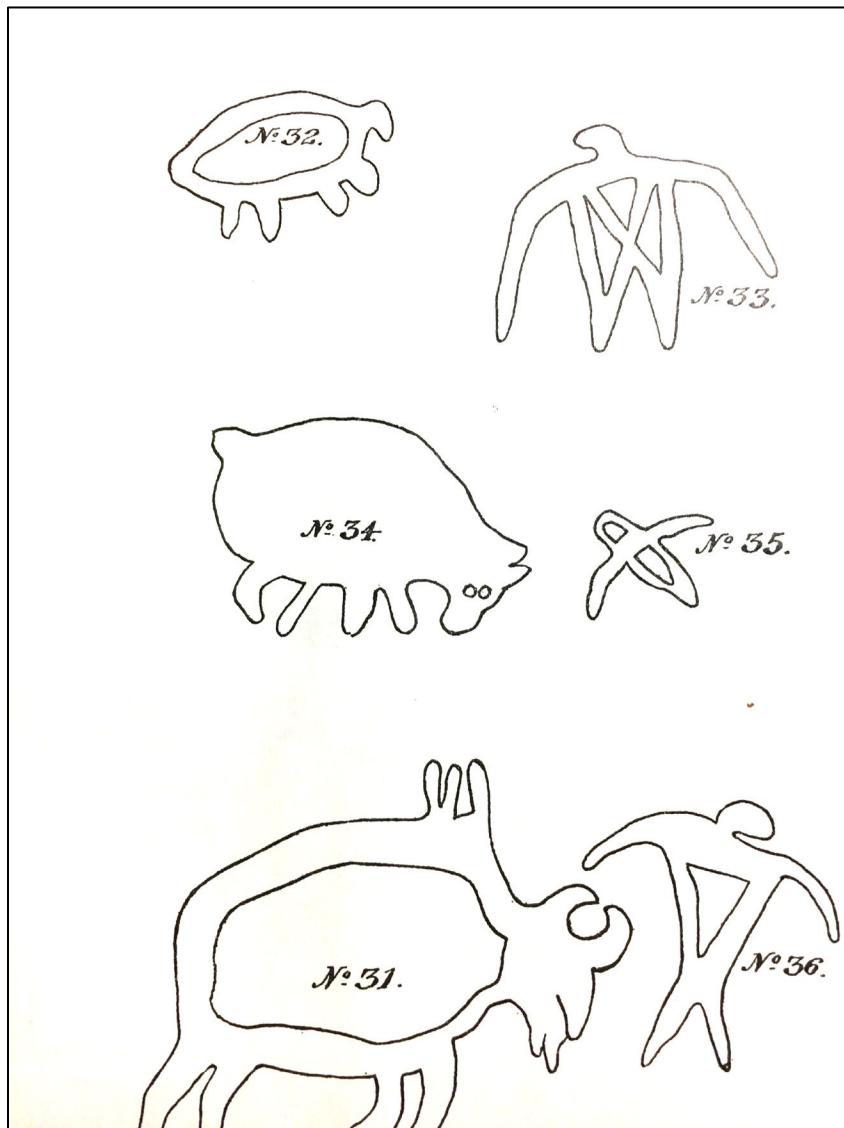


Figure 74. Pipestone effigy bear found at 21WN127, from Fjerstad and Boszhardt (2008).

La Moille is the type site for the Early Woodland pottery style, La Moille Thick, long recognized as one of the earliest ceramic wares in Minnesota (Perkl 2008; Gibbon 2012a:94-96; Arzigian 2012). Fish remains from this site are currently the subject of a radiocarbon dating study through the Statewide Survey program. Full zooarchaeological analysis of the La Moille animal bone assemblage would be a useful compliment to that research.



*Figure 75. Detail of rock art from 21WN55 including possible bear image (No. 34), from Winchell (1911).*

#### Bear Finds from Adjacent States

There are a number of bear finds from southwestern Wisconsin and northeast Iowa that are directly relevant to the Eastern Broadleaf Forest ecological province in Minnesota. First, at La Crosse, Wisconsin, there are many black bear remains identified at Woodland and Oneota archaeological sites. There is also at least one identification of grizzly bear (Theler 2000; Theler and Boszhardt 2003:198). In Iowa, zooarchaeological identifications of black bears are reported from Hadfield Cave (Benn 1980), and there are

famously bear effigy mounds at Effigy Mounds National Monument. Also, a bear effigy pottery handle has been recovered from the Mero – Diamond Bluff site complex, in Wisconsin across the Mississippi River from Red Wing. It is in the Science Museum of Minnesota collections. A bear canine ornament (Lawshe 1947; Fleming 2009:273) has also been identified at that site.

#### Ursid Archaeobiology of the Eastern Broadleaf Forest and Tallgrass Prairie Parklands

Bears are well represented in the deciduous forest zone of Minnesota, as represented by the Eastern Broadleaf Forest and Tallgrass Prairie Parklands ecological provinces. Both the density and diversity of sites appears to be greater than the Laurentian Mixed Forest province. With the Christensen Mound site, the Anoka Sand Plain is overwhelmingly represented in zooarchaeological finds, comparable to the adjacent Mille Lacs Uplands, as described in Chapter 5. In lesser numbers of bone fragments, but a greater number of sites, the lower Minnesota River and the vicinity of the present day Twin Cities metropolitan area are also well represented.

#### *Recommended Future Research on Bear Finds*

More so than with analyzed collections, I think the greatest research need regarding bears in these provinces is analysis of extant collections from southeastern Minnesota, particularly those from the Red Wing sites. I expect that these collections will have a similar representation of bears to that seen in La Crosse. Also, full analysis of the bear remains at the Dead River site (21OT51) would be a benefit.

## 7. MINNESOTA'S PRAIRIE PARKLANDS ECOLOGICAL PROVINCE

The Prairie Parklands Ecological Province, encompassing southwestern Minnesota and the Red River Valley, is the farthest part of the state from what we now think of as “bear country.” It is the second largest ecological province in Minnesota, encompassing approximately 30% of the state. Primarily tallgrass prairie, this was within the former range of bison and elk, but likely also grizzly bears. Much of the region was quickly converted to agricultural farmland by the late nineteenth century, with Euroamerican settlement quickly following the treaties of the early 1850s, and the tragic U.S.-Dakota War of 1862. Bison were already rare by that time and would soon be extirpated from Minnesota. Bears are represented in the archaeological record here, but differently from other parts of the state.

### Ecology and Natural History

With a particular fascination for Fargo, North Dakota, John Steinbeck (2012:121) saw Minnesota’s western border on the Red River as the East/West divide in America. Ecologically, the divide is farther east, at the prairie-forest border in Minnesota. Along Minnesota’s western boundary, the Red River Valley is the vast, flat plain of Glacial Lake Agassiz. The lakebed’s total extent is larger than all of the Great Lakes combined, extending into North Dakota, and far north into Manitoba, Ontario and Saskatchewan, although the glacial lake never occupied the total area at once. Instead, it moved north as the Laurentide ice sheet melted toward Hudson Bay, and periodically drained south in meltwater torrents through the valleys of the Minnesota and Mississippi rivers. The Red River of the North winds through the glacial lakebed from its source at Lake Traverse, north to Lake Winnipeg. It is prone to seasonal flooding because the surrounding terrain is so flat, and its northward flow brings spring meltwater to parts of the river that are still blocked with ice.

The glacial lake drained thousands of years before these and other burial mounds were built around its perimeter. The prominent ridges were (and are) prominent landscape features. The flat bottom of the former lake created the wandering course of the Red River, winding northward toward Hudson Bay. Western flowing rivers drain into

the Red River throughout the region, crossing the ancient beach lines of Glacial Lake Agassiz. Other than a period of spruce and conifer forest at the end of the Pleistocene, the vegetation of this ecological province has been prairie, with tree growth largely limited to river valleys and other sheltered locations. An example of this is the Great Oasis in southwestern Minnesota (Anfinson 1997:90-91).

### Historical Records of Bears

Fur trade accounts document the former presence of black bears and, occasionally, grizzly bears in this part of Minnesota. These examples are primarily from the first half of the nineteenth century, and are presented geographically beginning at the northwest corner of the state, progressing toward the south.

Around the beginning of the nineteenth century, John Tanner shot a large bear on the bank of the Red River near Pembina, around the northwest corner of what-is-now Minnesota (James 1830:80). Later, while living on the Assiniboine River in present-day Manitoba (west of Winnipeg), Tanner encountered an albino black bear and her litter with cubs of various color phases:

I killed an old she bear, which was perfectly white. She had four cubs, one white, with red eyes, and red nails, like herself; one red, and two black. In size, and other respects, she was the same as the common black bear, but she had nothing black about her except the skin of the lips. The fur of this kind is very fine, but not so highly valued by the traders as the red. [James 1830:131]

The red cub is presumably what would now be referred to as a cinnamon color phase. This coloration is most frequent near the western edge of black bear range, and it has been suggested that this is because of the overlap in native range with grizzly bears, with the coloration more similar to grizzlies providing an advantage (Rounds 1987). The Tanner account may provide support for this idea, because Edwin James, the recorder of the narrative, inserted the editorial question “[brown?]” after Tanner’s “red.” The narrative was recorded at Sault Ste. Marie at the eastern side of Lake Superior, where James was a physician at the Indian agency. He had not been to the part of the country

that Tanner described, and by his question he indicates that he was not familiar of this color phase of black bear.

On November 13, 1804, Alexander Henry the Younger noted, “My tame bear is making a hole to take up his winter quarters in.” Bears were a familiar sight near his fur post on the Red River. Some accounts of this period, from Henry and other, describe concentrations of bears at seasonal food sources. For example:

Bears make prodigious ravages in the brush and willows; the plum trees are torn to pieces, and every tree that bears fruit has shared the same fate; the tops of the oaks are also very roughly handled, broken and torn down, to get the acorns. The havoc they commit is astonishing; their dung lies about in the woods as plentiful as that of the buffalo in the meadow. [Coues 1897:101-102]

In 1835, English traveler George Featherstonhaugh (1970:I:387) visited the American Fur Company Post at Lake Traverse. “After breakfast, Mr. Brown shewed me some very rare furs he possessed, several very fine grizzly bear skins (*Ursus ferox*), one of which was a bright yellow, a rare variety.” Dakota chief Waneta’s grizzly claw necklace (Kane et al. 1978:172). caught the eye of numerous Euroamerican travelers, both in his home territory near Lake Traverse, as well as during his visits to Fort Snelling.

According to *The WPA Guide to Minnesota*, the town of Sacred Heart in Renville County received its name, indirectly, due to reverence for the bear by the Dakota. It was in this area that …

… Charles Patterson, a fur-trader, established a trading post about 1783. Because Patterson constantly wore a bearskin hat, the Indians called him “sacred hat man,” for to them the bear was sacred. With usage, “sacred hat” became “sacred heart,” and thus the town was named. [Federal Writers Project 1985:393-394]

Sacred Heart is located on Highway 212, just east of Granite Falls on the Minnesota River. It is not known if Mr. Patterson obtained his bearskin in that area, of course, but clearly the local Dakota were familiar with bears. Featherstonhaugh (1970:I:325) mentions hearing this story in 1835, of some rapids in the Minnesota River “named for a

man called Patterson, who wintered there once, and who, from wearing a bear-skin cap, was called *Wakan Apāhhah*, or ‘Bear’s head.’”

Changes in the local abundance of bears were also noted by the missionary Samuel Pond, writing of bears and Dakota bear hunts in southern Minnesota in the mid-1830s. Pond’s time among the Dakota was primarily spent along the Minnesota River, an area where bears are not currently present.

Bears were occasionally found in considerable numbers, but the hunt for them was uncertain, since they wandered about the country in search of food, having no particular place of resort, so that the Indians never knew where to look for them. In the winter, several bears were sometimes found in dens not far from each other, lying partially torpid, with their heads near the mouths of their dens, and were easily killed; but successful bear hunts were not of very frequent occurrence. [Pond 1986:29-30]

#### Zooarchaeology of the Prairie Parklands

Bison are the predominant large animal of the prairie, and they are overwhelmingly represented in the zooarchaeology of this ecological province.

Bison hunting or processing sites are well represented in the Red River Valley, including the Canning and Mooney sites (Michlovic 1986, 1987). Hunting camps have evidence of primary butchering, as indicated by the presence of vertebrae, have been identified near Nielsville and East Grand Forks in Polk County, at sites 21PL72, 21PL74, and 21PL191 (Mather 2005; Harvey et al. 2005; Kuehn 2017; Florin and Lindbeck 2017). Assemblages with at least 100 NISP are summarized in Tables 31-32 and Figures 76-77.

Bison ceremonialism is evident at the Middle Woodland Tradition Orwell site (21OT7) in the prairie portion of Otter Tail County, with portions of entire animals interred in the burial mounds (Gibbon 2008). The Alton Anderson site (21WW4) is a non-mound cemetery dating to approximately CE 600-1000, potentially related to Johnson’s (1973) Arvilla Complex, with Besant or Avonlea projectile points. Animal remains were included among the grave goods (not included in Table 32), including marine shell, with a small amount of deer bone, elk incisors, possibly a fox mandible and phalanges, and a tool made of bison bone (Lothson 1983).

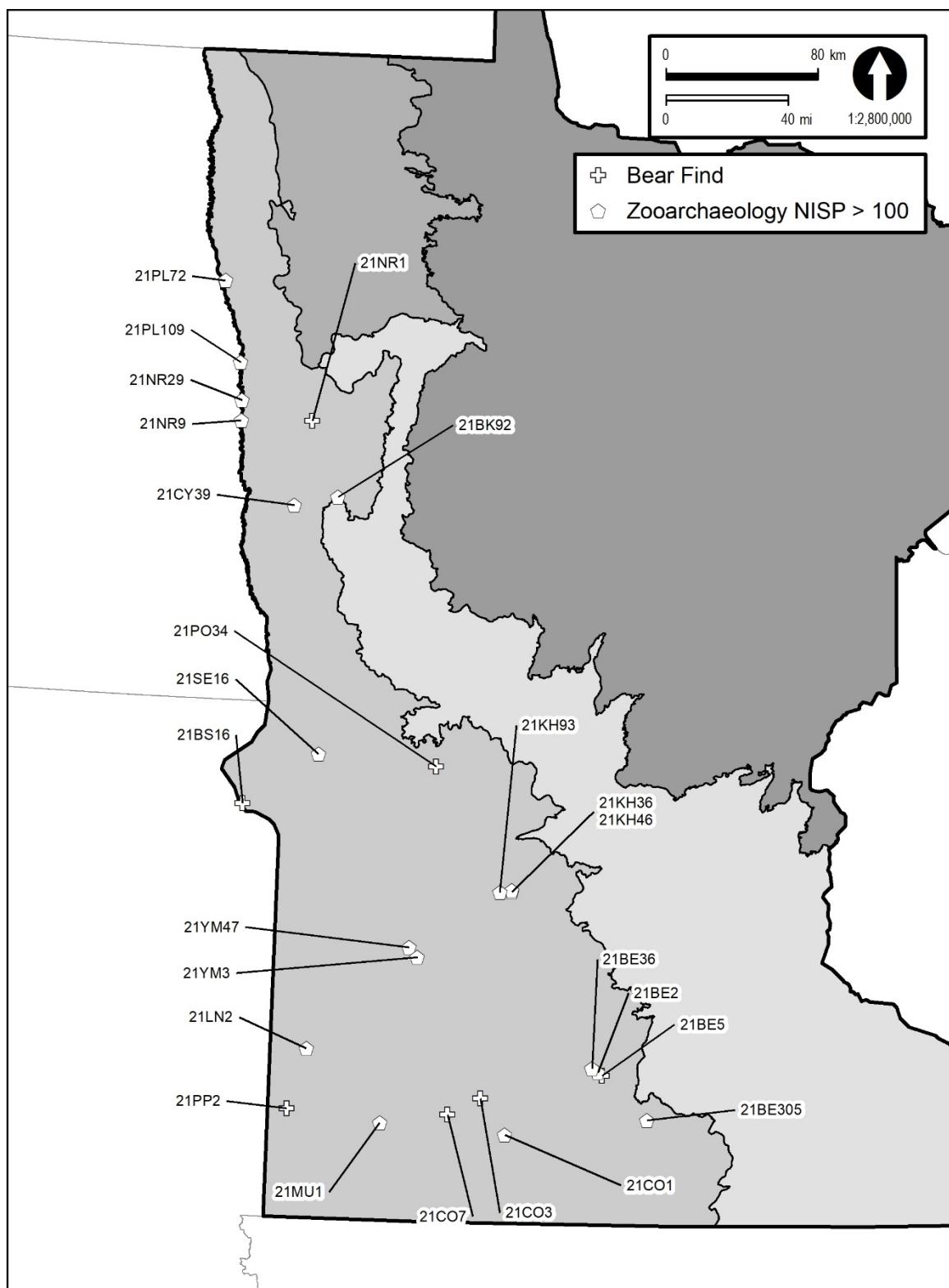


Figure 76. Bear finds and sites with faunal assemblages with NISP > 100, Prairie Parklands Ecological Province.

Table 31. Sites with faunal assemblages NISP >100, Prairie Parklands Ecological Province.

Site	County	ECS	BMU	REG	Reference
21BE2	Blue Earth	251Ba	NQ	2s	Aulwes 2016; Watrall 1967; Lukens 1963
21BE36	Blue Earth	251Ba	NQ	2s	Aulwes 2016
21BE305	Blue Earth	251Ba	NQ	2e	Kuehn 2016a
21BK92	Becker	251Aa	NQ	4w	McFarlane and Mather 2000
21CO1	Cottonwood	251Ba	NQ	2s	Shane 1982
21CY39	Clay	251Aa	NQ	6s	Michlovic 2005
21KH36	Kandiyohi	251Ba	NQ	2n	Buhta et al. 2014
21KH46	Kandiyohi	251Ba	NQ	2n	Buhta et al. 2014
21KH93	Kandiyohi	251Ba	NQ	2n	Buhta et al. 2014
21LN2	Lincoln	251Bb	NQ	2s	Shane 1982
21MU1	Murray	251Bb	NQ	2s	Anfinson 1982
21NR1	Norman	251Aa	NQ	6n	Chapter 7
21NR9	Norman	251Aa	NQ	6n	Michlovic 1986
21NR29	Norman	251Aa	NQ	6n	Michlovic 1987
21PL72	Polk	251Aa	NQ	6n	Mather 2005b
21PL74	Polk	251Aa	NQ	6n	Mather 2005b
21PL109	Polk	251Aa	NQ	6n	Kuehn 2017
21SE16	Stevens	251Ba	NQ	6s	Mather 2000c
21YM3	Yellow Medicine	251Ba	NQ	2s	Aulwes 2016
21YM47	Yellow Medicine	251Ba	NQ	2s	Kuehn 2016b

Table 32. Composition of zooarchaeological assemblages with NISP >100, Prairie Parklands Ecological Province.

Site	Bear	AR	CN	FL	FB	DM	MUO	B	R	A	F	S	U	Total
21BE2	0	563	117	0	191	0	175	79	504	79	646	0	309	2663
21BE36	0	69	18	0	58	0	1550	228	437	0	4752	0	69	7181
21BE305	0	337	0	0	54	0	1101	6	115	3	5	5	63	1689
21BK92	0	0	0	0	0	0	39	1	0	0	1	0	108	149
21CO1	0	52	4	0	9	0	4283	18	2	7	14	0	0	4389
21CY39	0	38	0	0	0	0	65	2	2	0	0	2	2892	3001
21KH36	0	1	0	0	2	0	431	0	5	0	3	0	0	442
21KH46	0	7	5	0	7	0	473	13	68	1	66	0	110	750
21KH93	0	20	1	0	1	1	737	8	0	0	18	0	116	902
21LN2	0	111	7	0	65	0	976	29	9	19	8898	0	0	10114
21MU1	0	262	21	0	99	0	647	14	40	17	1162	21	0	2283
21NR1	10	101	0	0	393	0	782	7	25	4	20	32	1195	2569
21NR9	0	25630	0	0	17	0	0	0	0	0	0	0	0	25647
21NR29	0	86	3	0	22	0	495	3	32	35	215	0	58	949
21PL72	0	574	0	0	3	0	174	0	0	0	9	0	4	764
21PL74	0	774	0	0	0	0	138	1	0	0	3	0	49	965
21PL109	0	444	16	0	24	2	18330	18	15	2	14	30	1006	19901
21SE16	0	4	0	0	0	0	100	0	0	0	0	0	138	242
21YM3	0	2	0	0	0	1	87	13	18	0	13	0	4	138
21YM47	0	3815	1	0	0	0	0	0	0	0	0	0	0	3816
<b>Sum</b>	<b>10</b>	<b>32890</b>	<b>193</b>	<b>0</b>	<b>945</b>	<b>4</b>	<b>30583</b>	<b>440</b>	<b>1272</b>	<b>167</b>	<b>15839</b>	<b>90</b>	<b>6121</b>	<b>88554</b>

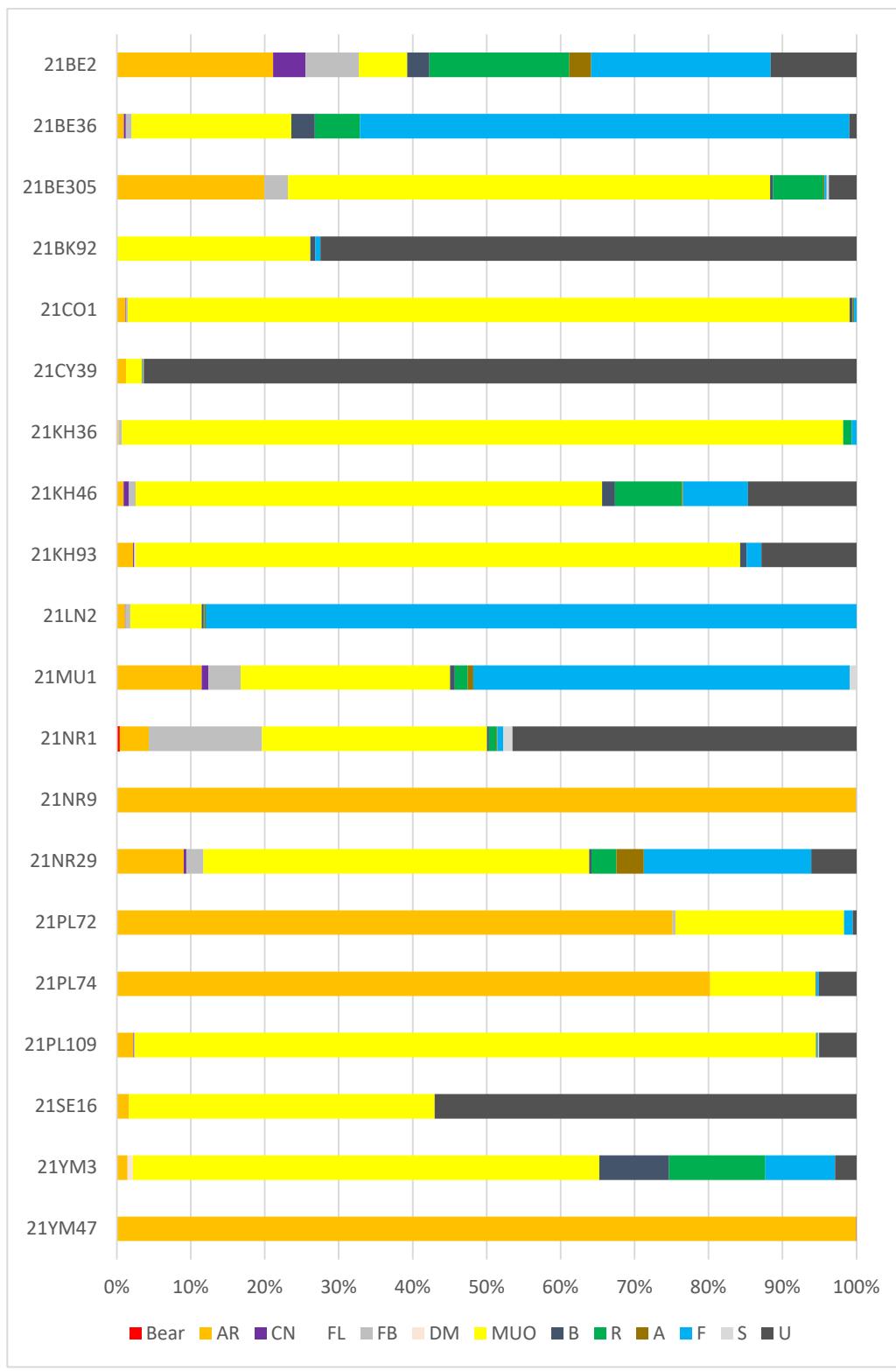


Figure 77. Percent NISP of sites with NISP > 100, Prairie Parklands Ecological Province.

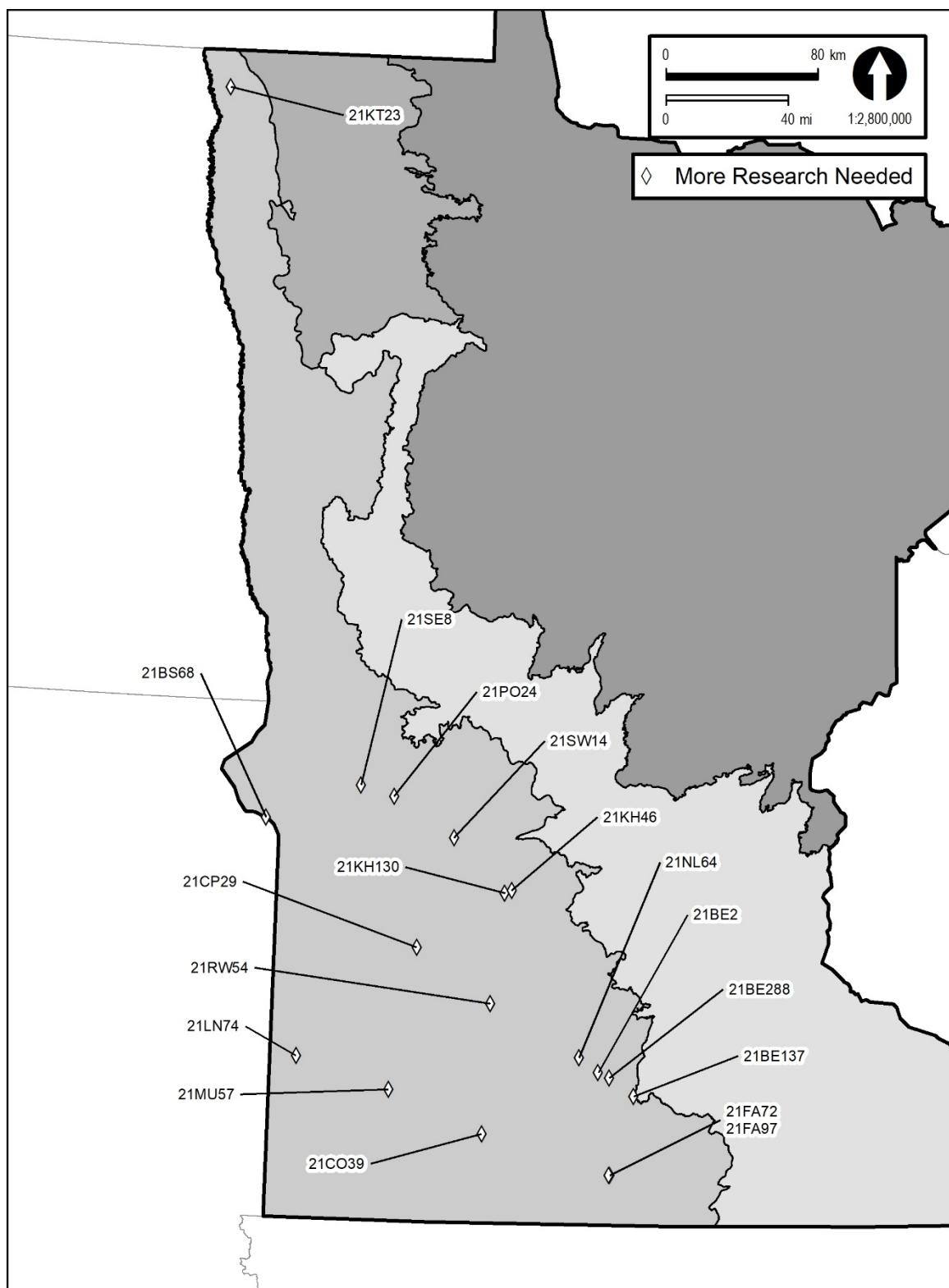


Figure 78. Sites with faunal assemblages recommended for further analysis, Prairie Parklands Ecological Province.

*Table 33. Sites with zooarchaeological assemblages recommended for analysis, Prairie Parklands Ecological Province.*

<b>Site</b>	<b>County</b>	<b>Reference</b>	<b>Comments</b>
21BE2	Blue Earth	multiple	Large assemblages of bone and shell, including scapula hoes
21BE137	Blue Earth	Skaar et al. 2014:43	Small assemblage associated with Middle Woodland pot, including burned antler fragments
21BE288	Blue Earth	Terrell and Vermeer 2009:7-13	Assemblage containing bird, mammal and fish bone fragments
21BS68	Big Stone	Magner 2018; Allan and Magner 2012	Assemblage (NISP 347) containing bird, large mammal, turtle and fish bone fragments, and bivalve shell
21CO39	Cottonwood	Skaar et al. 1998:226-234	Faunal assemblage (NISP 374) with mammal (including bison, deer, muskrat), bird, fish and reptile bone fragments, and shell
21CP29	Chippewa	Dobbs 1990b; Peterson et al. 1989:208	Faunal assemblages (NISP 425 and 208) including bison
21FA72	Faribault	Anfinson 1987:80	Oneota features with animal bone including bison scapula fragments
21FA97	Faribault	Anfinson 1987:89	Oneota pit feature with identifiable fauna including elk, gopher, fish and mussel shell
21FL63	Fillmore	Peterson et al. 1988:153	Unanalyzed animal bone assemblage (NISP 257)
21KH46	Kandiyohi	Tumberg and Larimer 2009:101	Large unanalyzed assemblage (NISP 1149); later assemblage reported by Buhta et al. 2014:121-122
21KH130	Kandiyohi	McFarlane and Mather 2001:133	Diverse assemblage from one shovel test (>200 NISP), representing at least 6 species of fish, 2 species of birds, and small mammals including muskrats
21KT23	Kittson	Cater et al. 1995:18	Faunal assemblage (NISP 509) from Phase I and II studies
21LN74	Lincoln	Terrell and Vermeer 2009:6-149	Faunal assemblage (NISP 113) including mammal bone
21MU57	Murray	Skaar et al. 2002a:147	Assemblage (NISP 413) including mammal bone
21NL64	Nicollet	Peterson et al. 1990:213	Unanalyzed assemblage (NISP 313)
21PO24	Pope	Skaar 1996:84-88	Unanalyzed assemblage (NISP 1112) including bison, deer and elk
21RW53	Redwood	Peterson et al. 1990:237, 1992:357	Unanalyzed assemblage including bison, turtle, bird and fish
21RW54	Redwood	Peterson et al. 1990:238, 1992	Unanalyzed assemblage including large mammal and bird
21SE8	Stevens	Peterson et al. 1994:196	Bison or elk bone layer (NISP 107)
21SW14	Swift	Radford et al. 2002:230	Unanalyzed assemblage (NISP 153) including large & small mammal, bird, turtle and fish

Assemblages recommended for further study are summarized in Table 33 and Figure 78.

#### Bear Finds: Red River Prairie (251A)

The boundaries of the Red River Prairie ECS section are the same as the subsection (251Aa). This area is adjacent to, and roughly parallels, the Red River in northwestern Minnesota.

##### *Red River Prairie (251Aa)*

###### **21NR1, Slininger Mounds**

The Slininger Mound site is located near Twin Valley where the Wild Rice River crosses the Campbell beach ridge of Glacial Lake Agassiz. There are five mounds at the site, of which Mound 2 was partially excavated by Lloyd Wilford in 1946. I have analyzed the animal bone from that dig because the curated assemblage includes black bear remains. I have also analyzed the faunal assemblage from a burial rescue operation conducted by the Minnesota Indian Affairs Council in 2010, after an accidental disturbance to the site by the landowner. The two assemblages differ significantly in composition, but together provide a useful sample of the zooarchaeology at this important site (Tables 34 and 35).

Wilford excavated Mound 2 in four levels, of which the upper three were mound fill (“sandy black soil filled with pebbles”), to a depth of 2.25 feet at the mound center. The fourth level was the original topsoil. Artifacts including ceramic sherds and lithics (Figure 79) were found in the mound fill. The significance of the faunal assemblage was overlooked at the time, because Wilford apparently believed the bones were from burrowing animals. “There were a number of animal bones, particularly those of small burrowing animals who had probably lived in the mound after its construction. Animal burrows were numerous and annoying” (Wilford 1951:2). He describes two pieces of cut turtle carapace that were possibly ornaments. Two copper objects were also found.



Figure 79. Diagnostic artifacts from the 1946 excavation at 21NR1.

The faunal assemblage (Table 34) is diverse and interesting, and contains 9 fragments of black bear skull or mandible, loose canines, and an additional tentative identification (medial portion of metacarpal or metatarsal), for a MNI calculation of three. One of the bears was old at death, as indicated by excessively worn teeth (Figure 80). The range of hoofed mammals is striking, with bison, elk, moose, and possibly caribou. The most prevalent identification is beave. Also present are raccoons, and an array of mustelid skulls, including fisher, striped skunk, otter and badger.

A surprise among the reptiles is a carapace fragment of Red-eared slider, *Trachemys scripta elegans*. This turtle is not native to Minnesota, and the closest portion of its natural range is Illinois and southeastern Iowa. This identification was made at the Illinois State Museum (Figure 81). It is listed as tentative in Table 34 because this site is so far out of the native range of the species, but there were no other carapaces in the comparative collection that matched.



Figure 80. Heavily worn 1st and 2nd molars on a bear mandible from 21NR1.



Figure 81. Turtle carapace fragment tentatively identified as red-eared slider, 21NR1.

Table 34. Summary of animal bone from 21NR1, Slininger Mound 2, 1946 excavation

<b>Taxonomic Identification</b>	<b>NISP</b>	<b>Weight (g)</b>	<b>MNI</b>
<u><i>Mammals</i> (subtotal)</u>	781	4035.09	24
Black bear ( <i>Ursus americanus</i> )	9	441.75	3
Black bear, probably (cf. <i>Ursus americanus</i> )	1	5.66	--
Moose ( <i>Alces alces</i> )	1	59.71	1
Caribou, probably (cf. <i>Rangifer tarandus</i> )	1	6.47	--
Bison ( <i>Bison bison</i> )	11	207.03	1
Bison, probably (cf. <i>Bison</i> sp.)	5	92.12	--
Hoofed mammal order (Artiodactyla)	25	183.63	--
Beaver ( <i>Castor canadensis</i> )	210	1530.19	8
Beaver, probably (cf. <i>Castor canadensis</i> )	115	177.23	--
Raccoon ( <i>Procyon lotor</i> )	8	41.59	3
Raccoon, probably (cf. <i>Procyon lotor</i> )	3	13.47	--
Badger ( <i>Taxidea taxus</i> )	21	119.23	3
Badger, probably (cf. <i>Taxidea taxus</i> )	9	5.53	--
Otter ( <i>Lontra canadensis</i> )	2	11.85	1
Fisher ( <i>Martes pennanti</i> )	3	15.30	1
Striped skunk ( <i>Mephitis mephitis</i> )	7	30.73	1
Woodchuck ( <i>Marmota monax</i> )	2	19.10	1
Pocket gopher ( <i>Geomys bursarius</i> )	1	0.48	1
Rodent order (Rodentia)	6	0.41	--
Small mammal, undifferentiated	1	0.08	--
Medium mammal, undifferentiated	54	117.70	--
Large mammal, undifferentiated	29	266.40	--
Mammal, undifferentiated	257	689.54	--
<u><i>Birds</i> (subtotal)</u>	3	1.3	--
Spruce grouse, probably (Galliformes, cf. <i>Falcipennis canadensis</i> )	1	0.72	--
Dabbling ducks subfamily, undifferentiated (Anatinae)	1	0.27	--
Bird, undifferentiated	1	0.31	--
<u><i>Reptiles</i> (subtotal)</u>	17	54.96	1
Snapping turtle ( <i>Chelydra serpentina</i> )	4	24.58	1
Red-eared slider, probably (Emydidae, cf. <i>Trachemys scripta elegans</i> )	1	2.53	--
Pond/River turtle family, undifferentiated (Emydidae)	9	21.37	--
Turtle order, undifferentiated (Testudines)	3	6.48	--
<u><i>Fish</i> (subtotal)</u>	1	0.16	--
Fish, undifferentiated	1	0.16	--
<u><i>Mollusk</i> (subtotal)</u>	15	136.46	2
Fatmucket ( <i>Lampsilis siliquoidea</i> )	3	110.19	2
Freshwater mussel family, undifferentiated (Unionidae)	12	26.27	--
<u><i>Unidentified</i> (subtotal)</u>	93	54.11	--
<b>Total</b>	<b>910</b>	<b>4282.08</b>	<b>27</b>

Table 35. Summary of animal bone from 21NR1, Slininger Mound site, 2010 burial rescue

<b>Taxonomic Identification</b>	<b>NISP</b>	<b>Weight (g)</b>	<b>MNI</b>
<u><i>Mammals</i> (subtotal)</u>	506	2293.46	7
Moose ( <i>Alces alces</i> )	2	50.10	1
Elk ( <i>Cervus elaphas</i> )	2	148.24	1
Bison ( <i>Bison bison</i> )	3	268.32	1
Bison, probably (cf. <i>Bison</i> sp.)	4	133.14	--
Hoofed mammal order (Artiodactyla)	47	690.83	--
Beaver ( <i>Castor canadensis</i> )	12	30.84	1
Raccoon ( <i>Procyon lotor</i> )	1	2.20	1
Pocket gopher ( <i>Geomys bursarius</i> )	3	1.49	2
Rodent order (Rodentia)	47	3.23	--
Large mammal, undifferentiated	85	439.50	--
Mammal, undifferentiated	300	525.57	--
<u><i>Birds</i> (subtotal)</u>	4	0.91	--
Dabbling ducks subfamily, undifferentiated (Anatinae)	3	0.84	--
Dabbling ducks, probably (cf. Anatinae)	1	0.07	--
<u><i>Reptiles</i> (subtotal)</u>	8	8.87	--
Pond/River turtle family, undifferentiated (Emydidae)	8	8.87	--
<u><i>Amphibians</i> (subtotal)</u>	4	0.29	--
Pond frog, undifferentiated ( <i>Rana</i> sp.)	4	0.29	--
<u><i>Fish</i> (subtotal)</u>	19	3.85	1
White sucker ( <i>Catostomus commersoni</i> )	1	0.27	1
Sucker family (Catostomidae)	1	0.51	--
Fish, undifferentiated	17	3.07	--
<u><i>Mollusk</i> (subtotal)</u>	17	9.21	--
Fatmucket, probably ( <i>Lampsilis</i> cf. <i>siliquoidea</i> )	1	2.74	--
Freshwater mussel family, undifferentiated (Unionidae)	16	6.47	--
<u><i>Unidentified</i> (subtotal)</u>	1102	457.74	--
<b>Total</b>	<b>1660</b>	<b>2774.33</b>	<b>8</b>

#### Bear Finds: North Central Glaciated Plains (251B)

This is a large section of former tallgrass prairie bisected by the upper Minnesota River. It contains the modern population center of Mankato, and the Upper and Lower Sioux Mdewakanton Dakota communities.

*Minnesota River Prairie (251Ba)*

**21BE5, Jones Village**

The Jones Village site is part of the Cambria locality in the Minnesota River Valley. William Nickerson found two bear skulls and other bear teeth when excavating there in 1913. In correspondence with Newton Winchell dated July 13, he described his investigations of numerous pit features “of irregular shape and confusing intricacy” (Dyck 2016:319). One of the pits contained a large amount of fragmented animal bone, with a complete bear skull and mandibles at the bottom, at a depth of three feet. The other skull, “another bear’s skull intact” was found the following week, but the provenience was not described. Other finds mentioned include groundstone tools, points and other stone tools of flint and quartz, and bone and antler tools including a “large bone hook made from a buffalo scapula” (Dyck 2016:320; see also Aulwes 2016:34).

Pat Emerson once showed me a copy of a newspaper story from that time, that included the bear skulls with other artifacts in a photograph. From the image, they are definitely bears, and appear to be black bears. She also mentioned that the bear skulls are not in the Nickerson collection curated at the Minnesota Historical Society. She, Dan Cagley and I spent part of a day examining the collection in 2008 and while there were a few nearly complete dog skulls, there were no bears. Nickerson mentioned to Winchell that a Mr. Hughes came to the site with a group from Mankato and took photographs of the excavation (Dyck 2016:320). It is possible that he took the photo that was in the paper. The curated faunal assemblage warrants further analysis. It is possible that additional study may identify what happened to the bear skulls.

**21CO3, Jeffers Petroglyphs**

Jeffers Petroglyphs Historic Site contains rock art depictions of bear paws, some of which may be grizzlies because of their long claws (Figures 82-83). The site consists of a sloping outcrop of Sioux Quartzite on the Red Rock Ridge in southwestern Minnesota. The images can be difficult to see in direct sunlight, making the site deceptively non-dramatic. At dawn and dusk, the slanting light reveals far more images within a complex palimpsest of overlapping scenes, and new petroglyphs are often

noticed by repeat visitors (Sanders 2014). Lothson (1976) recorded images from the site in the early 1970s,

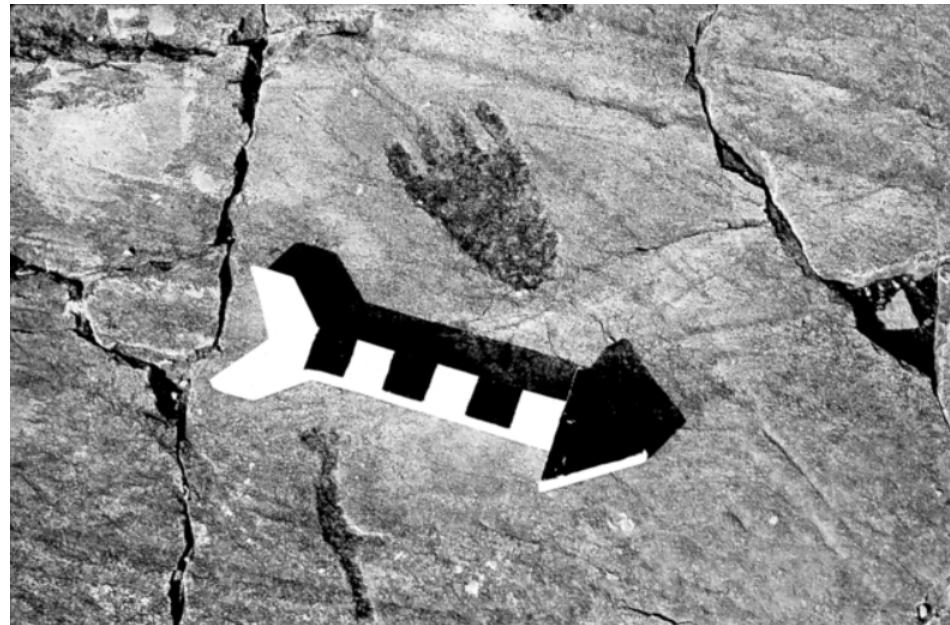


Figure 82. Bear paw image from Area 44B at Jeffers Petroglyphs; 1971 photo by Gordon Lothson, Minnesota Historical Society Collections Online and Sanders (2014).



Figure 83. Bear paw image from Area 13 at Jeffers Petroglyphs; 1971 photo by Gordon Lothson, Minnesota Historical Society Collections Online.

in the first comprehensive survey of the outcrop. Recently, the Minnesota Historical Society conducted large-scale removal of invasive lichen, a process which revealed thousands of rock carvings that had not previously been documented. A documentation project was then initiated in cooperation with the Evolutionary Anthropology Laboratory of the University of Minnesota, using white light scanning to record the images. It is possible that more bear-related carvings will be identified in the course of this project (Sanders 2014; Soderberg 2012; there are photos of the lichen removal process in Mather 2011:99-101).

### **21CO7, Jeffers West No. 7**

The Jeffers West No. 7 site consists of rock art on rock outcrops a short distance west from 21CO3 (see Figure 84). It seems likely that a 1935 record in the first issue of *The Minnesota Archaeologist* refers to this site, or somewhere in the near vicinity:

During a discussion with Paul Klammer, the writer recalled that his father had once told of having seen “Indian picture writing” on the Red Rock Ridge south of Springfield, Minnesota. These pictures included an elk, a bear, turtles, birds and buffalo. As a result of the conversation, a visit was made to the spot last May.

Attempts to gain information in Springfield as to the exact location of the “picture writing” were fruitless but after a long search, a group of more than twenty pictographs were found on a ridge south of the Red Rock Dells. Of these, the Elk and Thunderbird were the most prominent. [Arndt 1935:7]

### **21BS16**

21BS16 is a mound site near Big Stone Lake that was looted by picnickers in the early twentieth century. Afterward, they mailed some things they found in the mound to Prof. Albert Jenks at the University of Minnesota, where the collection was accessioned as #144. Three black bear skulls were included in the finds, and I examined them in 1999 as part of the NAGPRA repatriation process. For obvious reasons, little can be said in detail about the archaeological or cultural context of the find. Nevertheless, the faunal remains present a striking example of bear ceremonialism. Most prominent of the animal bones are three bear crania, one of which is painted with red ochre.

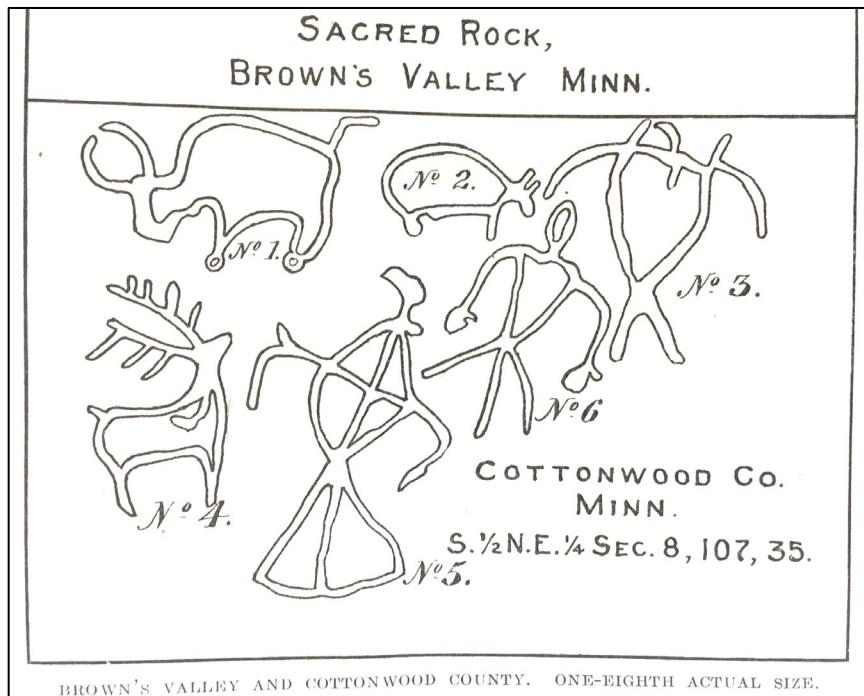


Figure 84. Bear image (No. 2) among rock art from the vicinity of Jeffers Petroglyphs, likely 21CO7, from Winchell (1911:563).

All are large adult black bears, but the one complete skull appears to represent an exceptionally large female. The most significant aspect of this skull is a hole behind the palate, on the underside of the cranium (Figure 85). This appears to have been made intentionally and with great care, as its position indicates that an accidental use of equal force would have broken the skull into pieces. While it cannot be proved beyond all doubt, this modification suggests that the skull may have been mounted on a pole for a relatively short period of time. There is no visible polish in the interior of the skull, and it does not appear to be weathered, but it seems plausible that the skull could have been displayed in such a manner through the course of particular ceremonies related to Mound 21BS16, or throughout the construction of the earthwork in its entirety. Cut marks are present in the vicinity of the ears (Figure 86) and on the lip, suggesting that the skull was defleshed and otherwise prepared (as opposed to use of a whole bear's head) prior to interment in the mound.

The other two bears appear to be male. The one with ochre (Figure 87) also clearly demonstrates that cleaned, prepared skulls were used. The third bear skull had no obvious indications of modification. No mandibles were associated with any of the bears. Other faunal remains from 21BS16 included one raccoon and one mustelid skull, possibly suggesting a connection in function or symbolism with the three bear skulls.

I should note that at the time of my NAGPRA study, it was thought that this collection was from site 21BS2. However, it was later determined that the association was with 21BS16, and the state site records for that site include reference to the digging by “Mr. and Mrs. Frank Finberg of Clinton, Minn., and by Miss Matthews, the sister of Mr. Finberg, in 1935” (Wilford 1943:29) and the correct University of Minnesota accession number. Winchell (1911:121) described the earthwork as a flat-topped mound, and 2 feet high. It was and 30 feet in diameter at the base, and 15 feet in diameter at the top. The site is now within the Bonanza Area of Big Stone State Park.

#### **21PO34, Glenwood Fish Hatchery**

A site at the Glenwood Fish Hatchery with Middle and Late Woodland, Plains Village, and possibly Late Archaic and Mississippian components, was the focus of Phase II evaluation (Magner 2015) and Phase III data recovery excavations in 2015 (Magner and Allan 2016:175-193; Allan 2019:5-6). As the large faunal assemblage was in the process of cataloging and identification, Stacy Allan showed me one black bear canine tooth fragment. It is hollow, indicating it is from a cub or yearling. Other animals represented in the assemblage include freshwater mussels, fish, turtles, various birds, muskrat and other small mammals, deer and bison.



Figure 85. Large black bear skull from 21BS16, with modified opening at base of cranium.



Figure 86. Cut marks on the large black bear skull from 21BS16.



Figure 87. Fragmented black bear skull from 21BS16 with traces of red ochre.

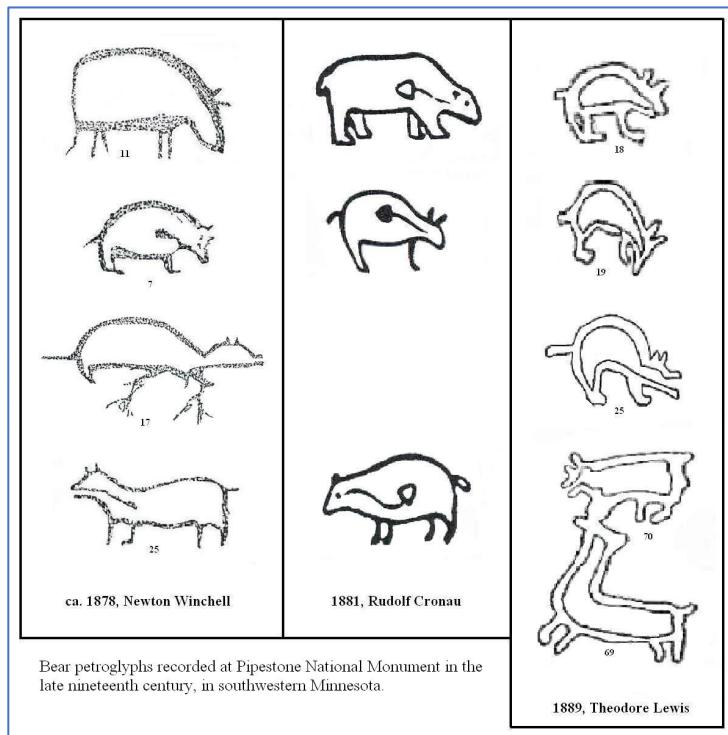
*Inner Coteau (251Bc)*

**21PP2, Pipestone**

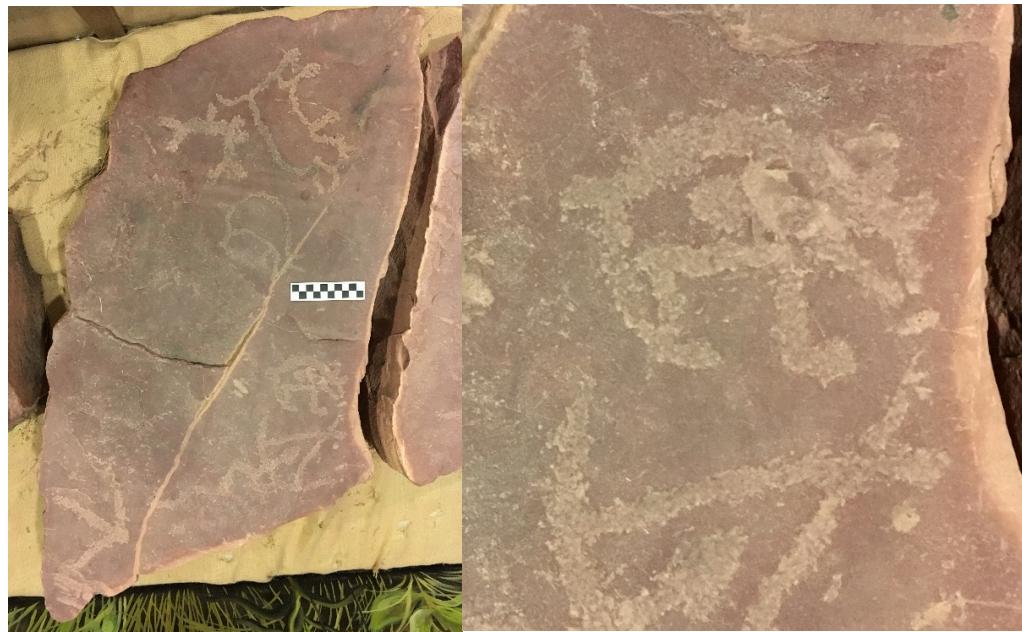
Pipestone National Monument is the neutral ground where American Indian nations have come for millennia to quarry the red stone used to make sacred pipes. The 301-acre monument is an interdisciplinary historic district that includes archaeological sites, structures and landscape features, and in my opinion, is clearly a Traditional Cultural Property. These qualities are not reflected in the current NRHP documentation, although the National Park Service is currently working on an update. The defined archaeological site, like Fort Snelling (21HE99), is a classic example of “lumping,” that includes many individual sites under one number. As of 2006, the monument contained 44 known archaeological localities, or subareas, and more have been identified since then (Scott et al. 2006).

Bear images were among petroglyphs carved into the Sioux Quartzite around the base of the “Three Maidens,” which are large granite boulders located in the valley of Pipestone creek, near the quarries. Scott et al. (2006) report that records of these glyphs were made at least seven times in the late nineteenth century (Figures 88-89). Sadly, the petroglyphs were removed from their original context in an early but misguided attempt at historic preservation (Scott et al. 2006:236, 242-243), including bear images among the petroglyphs on the Three Maidens.

Theodore Lewis traced 79 petroglyphs at Pipestone in 1889 (Scott et al. 2006:377-382; Winchell 1911:562-566). Three of the recorded petroglyphs appear to be bears (Lewis’ nos. 18, 19 and 25). The animals are depicted in profile, with rounded backs, short tails, short ears and plantigrade feet. Five others are potentially represented in records from 1878 by Newton Winchell. They have similar characteristics to the Lewis tracings, but are not obviously depicting the same glyphs. Two of the images depicted by Winchell have heart lines (Figure 88).



*Figure 88. Bear petroglyphs recorded at the Three Maidens at 21PP2, Pipestone National Monument (compiled from Scott et al. 2006).*



*Figure 89. One of the bear petroglyphs from the Three Maidens, on exhibit in the Pipestone National Monument visitor's center, May 2019.*

### Bear Finds in Adjacent States

Finds of bear remains from eastern North Dakota, South Dakota, Iowa, and Manitoba are also relevant to the zooarchaeology and ursid archaeobiology of this ecological province. At the Arvilla site (32GF1) in eastern North Dakota, four bear canines were originally thought by Jenks to be ivory replicas. Two of the canines are apparently part of a large copper breastplate from Mound 3. Arvilla is the type site for the Arvilla Complex (Johnson 1973). Bear remains were also found at the Blasky Mounds (32WA1) in 1935. The site is located on the Forest River, in Walsh County, North Dakota. It is approximately six kilometers west of the Campbell beach ridge bordering Glacial Lake Agassiz.

Four bear canine ornaments were recovered from Mound 1 at the Blasky site (Wilford 1970:9). They were found singly among the human bones. Bison bones, including teeth and jaws were also found in that mound. A large concentration of bison bone was found in Mound 2, with other human burials. The age of the Blasky Mounds is not clear. It is estimated that they were built during the Late Woodland Tradition.

I examined the bear tooth ornaments in 2008. The four teeth are relatively small and clearly from black bears. The roots of the teeth are closed, indicating that they were from fully-grown bears. Two of the teeth appear to correlate. They are the same size and have the same curvature, in opposite directions. I suspect that they are from the lower jaw of one bear. The other two canines do not conform in size or morphology. Therefore, it seems likely that these four teeth represent a minimum of three black bears (Mather 2008c). Three of the teeth have holes drilled through. One has a groove around the top. I had initially assumed that they were pendants, but the nature of the modifications does not support this idea. For a pendant to hang downward, the hole would be drilled straight through the tooth. This type of ornament is not uncommon in archaeological contexts. In two of the Blasky bear teeth, however, the two holes are on one side of the tooth, with a channel connecting them for the cord to pass through. The third drilled tooth has one hole in the side, and one in a cut surface of the root. The location of these holes, particularly in the first two examples, suggests to me that the ornament would have been sewn on to a

piece of clothing or jewelry, or perhaps another object. The fourth tooth supports, I believe, the interpretation that the ornaments were sewn onto something else, rather than strung as pendants. This tooth has a shallow groove near the base of the root. It is deep enough to hold a thin string, but it does not go all the way around the tooth. It only extends over three faces of the root, with the one flat surface unmodified. If the tooth was strung as a pendant using this groove, I suspect that the cord would easily slip off. To conclude with more speculation, I wonder if the bear tooth ornaments were attached to the bundles themselves, which probably would have been made of birchbark or leather. With secondary burials, any original jewelry or clothing probably would not have survived to be gathered and transported with the bundles.

In South Dakota, the De Spiegler site (39RO23) was located across from Brown's Valley, Minnesota, near the headwaters of the Minnesota River (Wilford 1970). I examined faunal remains from this mound in 1999 prior to NAGPRA repatriation. Along with beaver, elk, bison and possibly deer remains, there were 5 bear canines, and 14 bear claws that appear to be grizzly. They were larger than black bear claws, and 10 of them appeared to have been cut along on the lower surfaces. One is illustrated in Johnson (1973:81) but is mislabeled as an "eagle talon" (Johnson's Plate 31:b) Nine of the claws had visible remnants of reddish pigment, which I assume is red ochre. There were also three loon beaks and 14 eagle talons (one with red ochre) in the assemblage, and fragments of the carapace from a Blanding's turtle (Mather et al. 2000:17.7-17.8).

### Ursid Archaeobiology of the Prairie Parklands

Consistent with indications from historical records, there are fewer bear sites and zooarchaeological finds of bears in the Prairie Parklands ecological province than have been identified elsewhere in the state. The zooarchaeological identifications are from sites near to rivers, either the Minnesota River or the Wild Rice River as it drops to the Red. However, even in these settings the density of bears is far less, with MNI of 3 at both the Slininger Mound and 21BS16.

As indicated by the De Spiegler site, grizzly bears were present in this ecological province, and they may also be represented by the paw petroglyphs at Jeffers. However,

they are better represented in the Eastern Broadleaf Forest province, albeit still in low numbers.

## **8. BEAR TEETH & BEAR POPULATIONS: THREE CASE STUDIES**

The preceding three chapters have presented overviews of Minnesota zooarchaeology, and varying descriptions of 81 sites bear finds for each of the state's ecological provinces. Some of these descriptions include detailed analyses of materials that I studied myself, while others are simply mentions from the gray literature or other reports. In these presentations, three sites stand out by their sheer numbers of identified bear remains: the Bear site (21ML68), the Crace site (21ML3) and the Christensen Mound site (21SH1/16). All are located in east-central Minnesota, in the Mille Lacs Uplands and Anoka Sandplain, in the area where, historically, the deciduous Eastern Broadleaf Forest met the conifers of the Laurentian Mixed Forest.

The faunal assemblages from these sites contain a variety of fragmented cranial and postcranial bone, but they all contain significant numbers of black bear cheek teeth – the molars and 4<sup>th</sup> premolar. In contrast to canines which are often splintered or fragmented in archaeological deposits, the cheek teeth are compact and dense, and therefore more likely to be well preserved. Therefore, these groups of individual teeth are the most promising source of information about individual bears, and the groups of bears represented at each site. In terms of archaeological interpretation and determining a basis of comparison with present-day bears, it is useful to know if they represent a cross-section of a bear population or a subset. That is, are there females and males present? And how old were the bears when they died? Stiner's (1998) tooth wear index provides a useful relative index for age, and I hoped that tooth measurements would reveal sexual dimorphism as expressed in tooth size. First, however, I studied the recent biological specimens curated by Mn/DNR bear biologists at their laboratory in Grand Rapids, Minnesota (referred to here as the Grand Rapids Collection) because they offered a key to interpreting the archaeological remains. I became interested in this because if the cheek teeth can be used to differentiate male and female bears, the archaeological remains can be used to assess the demography of hunted bear populations at particular times and places in the past.

The goal of this chapter is to assess the zooarchaeological assemblages from Minnesota's three principal bear sites, and to compare them with the demographic structure of living the state's current bear population. A secondary goal is to highlight the potential for long-term biological research programs to contribute directly to ursid paleobiology by providing a known reference for analysis of archaeological and natural assemblages of skeletal remains. Sexual dimorphism is strongly expressed in the body size of living black bears. While body length is the same for adult males and females (generally between 130 and 190 cm), the typical weight of an adult male ranges from 60 to 300 kilograms, while that of an adult female is 40 to 80 kilograms (Craighead 2000:129). In Minnesota bears, sexual dimorphism is reflected in the respective median dressed weights reported for female and male bears. Geographic variation is evident in overall body size for both sexes, however, with bears being generally larger toward the southwestern edge of the modern bear range (Coy 1999:48-59). Also, an individual bear's body mass can change dramatically within the annual cycle of active foraging, breeding, hyperphagia and dormancy. There are clearly many variables reflected in the body size of living bears, of which sex is but one.

Figure 90 is a histogram showing the length of the upper second molar from bears of the Christensen Mound (21SH1/16) and Bear (21ML68) archaeological sites. It provides the inspiration for the current examination of tooth measurements from the Grand Rapids Collection. In hopes that sexual dimorphism would be reflected by measurements of the isolated archaeological teeth, I had tried a variety of plots of the data. The only measure that showed a separation was this histogram of upper second molar length. There is a roughly bimodal distribution, with two secondary peaks and outliers. A preliminary interpretation of this distribution suggests that the Christensen Mound bears might be males and females in roughly equal numbers, while the smaller number from the Bear site were all or mostly male (allowing for an overlap in the measurements for male and female upper second molars). This hypothesis was not contradicted by the archaeological context of each site (Chapters 5 and 6; Mather 2000a; Mather and McFarlane 1999), but it could not be tested without measuring bear teeth of known sex.

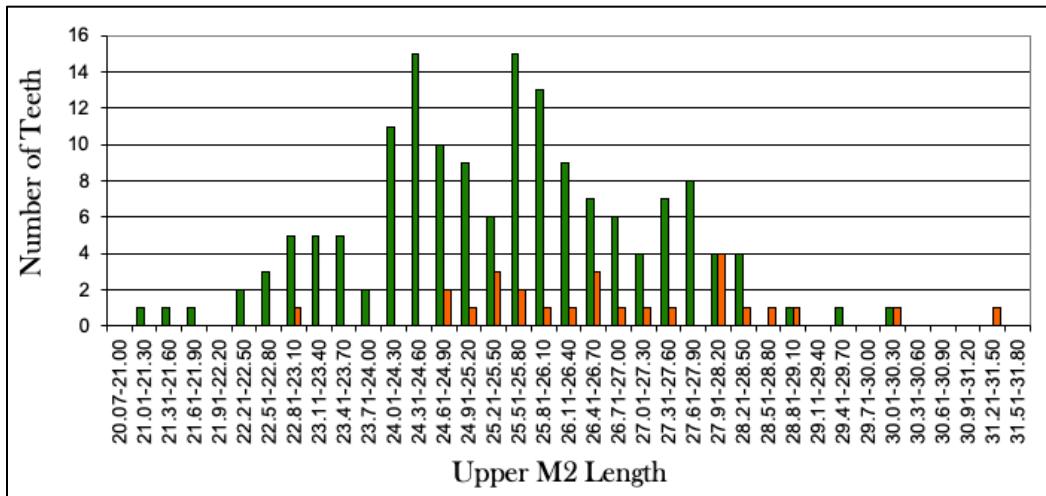


Figure 90. Preliminary plot of tooth size in mm, for 21SH1 (green) and 21ML68 (orange).

Skeletal remains provide the most direct physical evidence for consideration of ursid paleobiology. They are the focus of study for extinct bears (e.g. Kurtén 1955, 1966, 1967, 1976; Mattson 1998; Stiner 1998, 1999; Stiner et al. 1998), and the evolution of living species (Graham 1991; Iregren 1988, 1990; Kurtén 1964; Wolverton 1996; Wolverton and Lyman 1998). Not surprisingly, osteology has received relatively little attention in biological studies of living bear populations. Not only is the skeleton inaccessible in living (and recently dead) bears, the known precision of tooth cementum ageing (e.g. Coy and Garshelis 1992; Coy 1999) has bypassed the reliance on epiphyseal fusion that remains the standard for many mammalian species (Rausch 1961 is valuable pre-cementum study for black bears). Thus, an analytical gulf exists between the theoretical foundation of evolutionary and paleobiological studies, for which skeletal remains provide the primary data, and modern bear biology, for which the osteological frame of reference is underdeveloped.

Previous studies of ursid tooth size have demonstrated that canine measurements are highly correlated with sexual dimorphism, with accurate determination of sex ranging from 95 to 100% (Rausch 1961; Marks and Ericson 1966; Sauer 1966). Gordon and Morejohn (1975) also report correct identification ranging from 92% for males and 100%

for females using a cumulative measurement of the lower canine alveolus length and lower second molar width. Application of these methods to archaeological remains is hindered due to relatively greater fragmentation of canines, and the rarity of complete mandibles with teeth preserved in place.<sup>4</sup>

Björn Kurtén (1955:13) found a clear bimodal (1.7% overlap) distribution with canine measurements of cave bears, and an overlap for recent brown bears and polar bears ranging from 8 to 11%. Within the same samples, the distribution of the lower second molar length by sex overlapped by 17% for brown bears, 23% for polar bears, and 13% for cave bears (sexed on the basis of canine measurements). Nevertheless, while molars do not allow the accuracy of canine measurements, Kurtén (1955:14) reports “significant dimorphism in every sample of sufficient size” that he had studied, with dimorphism reflected more strongly in cave bears than the extant species.

Encouragement for renewed analysis of cheek teeth is provided by Wolverton and Lyman’s (1998:326) findings of sexual dimorphism in measurements of the upper second molar and lower third molar from recent, known-sex bears from Arkansas. The molar-dominated composition of the Minnesota archaeological black bear assemblages further calls for assessment of the value of the cheek teeth of this species for determination of sex. Moreover, the Grand Rapids collection meets Kurtén’s threshold for an ideal study group, “the first prerequisite” being a sample “representing a single population or closely-knit structure of populations agreeing in average characters” (Kurtén 1955:6).

Most studies of ursid molar size have focused on the questions of taxonomy and Late Quaternary diminution of body size (Gordon 1986; Graham 1991; Iregren 1988; Nagorsen et al. 1995; Wolverton 1986; Wolverton and Lyman 1998). While the basic analytical approach is similar across these studies (statistical comparison of two or more samples), the present study has the potential to produce more definitive results. This is not because it is a more important question than diminution. Rather, like taxonomy, it is a more basic one. After the taxonomy is determined, sex is one of many variables that come into play when comparing samples whose origins may span thousands of years.

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<sup>4</sup> Stiner et al. (1998) do use Marks and Ericson (1966).

With the Grand Rapids Collection, the tooth measurements are from bears of known sex, documented by field biologists within a long-term study program. These tooth measurements are from one population of black bears in north-central Minnesota, and cannot be assumed to be representative of all bears of this species. Nevertheless, the findings contribute significant baseline data for analysis of archaeological and paleoecological skeletal samples, and application toward questions such as Late Quaternary diminution.

### The Grand Rapids Collection

The basis for this study is a collection of recent black bear skulls, of known sex and known- or cementum-age. They are from radiocollared wild bears that lived much or all of their lives within an ongoing biological study conducted by the Bear Research Project of the Minnesota Department of Natural Resources, in Chippewa National Forest (Figure 10). The telemetry study was initiated through intensive trapping from 1981 to 1989, and continued through handling the yearling cubs of previously radiocollared females (1981-present). Most resident females within the study area had been captured by 1984 (Noyce et al. 2001). The skulls and other skeletal remains are those that could be recovered after individual animals died of natural causes or were killed by hunters, road accidents or other factors. Therefore, not all study animals that have died are present in the osteological collection, although it does provide a representative sample.

The Mn/DNR study area measures approximately 360 square kilometers within the Marcell District of the Chippewa National Forest, and the adjacent George Washington State Forest in north-central Minnesota. The regional landscape is a mixture of low-lying glacial moraine, outwash plains and glacial lake plains. It is approximately 95% forested, and includes many lakes of small to moderate size. Agricultural land is a minor component of the surrounding region (ca. 5% of Itasca, Cass and Beltrami counties). Within the study area, the upland forest (ca. 67% of the total) consists primarily of aspen and birch, with lesser amounts of conifers (red and white pine) and northern hardwoods (sugar maple, basswood, and red and burr oak). Lowland forest (the remaining forest area) includes spruce, tamarack and black ash. Modern land use relates

mainly to timber production and forest-related recreation. Logging roads and trails are prevalent. The annual bear harvest in this area is among the highest in the state, averaging more than six bears per 100 square kilometers. The mean age of first reproduction for bears in north-central Minnesota is 4.6 years, compared with 3.8 years in central Minnesota, and 5.5 years in the northeast (Noyce et al. 2001:212; 2002; Coy 1999:67; LeVasseur et al. 2002:11).

Black bears have presumably been present in the study area since the early Holocene, and it is likely that their population has been affected over time by a combination of anthropogenic and environmental factors. People have also inhabited north-central Minnesota since the end of the last glaciation (LeVasseur 2000). As described in Chapter 5, the earliest direct evidence for human use of bears in this region is from the South Pike Bay (21CA38) archaeological site, through calcined bone fragments from a black bear paw. Radiocarbon dates from these levels of the site range from 7,624 to 7,521 BP (LeVasseur et al. 2002:62; LeVasseur 2003:88). While these dates are not in direct association with the bear bones, it seems reasonable to conclude that they date to the early to middle Holocene.<sup>5</sup> The South Pike Bay site is located on the southern shore of Cass Lake, and contains multiple, stratified components dating to the Paleoindian, Archaic and Woodland traditions.

The general pattern of the modern vegetation and fauna was established at approximately 3,700 BP, with a climatic shift to more cool and moist conditions. Around that time, the forest composition changed from oak savanna (from the warm, dry climate of the middle Holocene) to primarily white pine and other conifers. Starting in the mid-seventeenth century, the fur trade affected the range and population structure of many animal species, a trend exacerbated by market hunting extending into the late nineteenth and early twentieth centuries. Bears were reported to be near extinction in the region in 1919. (LeVasseur et al. 2002:11-13; Coy 1999:5). While logging, mining and other historic-era land use practices have drastically altered the local environment since the

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<sup>5</sup> The three paw fragments were recovered from Unit 5, from the 30-35 cm and 40-45 cm levels. The fragments appear to be from a single paw. The radiocarbon dates are from the 40-45 and 60-65 cm levels, from phytoliths recovered from soil samples (LeVasseur et al. 2002:56, 62; LeVasseur 2003:88).

mid-nineteenth century, it is possible that the present forest composition provides more productive bear habitat than the previous old growth conifers.<sup>6</sup>

Figure 91 shows a small sample of the bear skulls in the Grand Rapids collection. They are an invaluable source of baseline data because, beyond simply age and sex, the life histories of these bears are known in great detail. Teeth from 33 female and 21 male black bear skulls were measured in this analysis. The Grand Rapids collection also includes skulls from Camp Ripley, in central Minnesota. They were not included at this time to control for possible geographic variation.



*Figure 91. Examples of recent black bear skulls in the Grand Rapids Collection.*

The metrical data presented here are but one aspect of the osteological information available from this and similar collections. My interest in the cheek teeth, rather than the canines, is based on experience with Late Holocene archaeological

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<sup>6</sup> Vegetation is only one variable affecting the health of a bear population. Even if this suggestion about the secondary growth forest is true, it was a moot point for bears until adoption of present game management practices in the late twentieth century.

collections of black bear remains from the Mille Lacs region of east-central Minnesota (e.g. Mather 2000). Single molars are the best-preserved elements in these assemblages, and measurements of length and width from each tooth constitute a substantial dataset. Interpretation of these data had been constrained, however, by the lack of reference to a known population (particularly in regard to sex and age).

### Tooth Size and Sexual Dimorphism

Measurements of length and width were recorded for the three upper and four lower cheek teeth from 33 female and 21 male bears from the Chippewa National Forest study area. Length and width were recorded for each tooth to the nearest hundredth of a millimeter, resulting in 28 measurements per skull, except in cases of missing or damaged teeth.<sup>7</sup> Sums were also calculated from these measurements in hopes that sexual dimorphism, if present, would be compounded by combining length and width. Descriptive statistics were calculated for each measure and tooth by sex, including total range, mean and standard deviation (Tables 36 and 37). The values for females and males were compared using a *t*-test (Table 38).<sup>8</sup> The statistical approach used here follows that of Wolverton (1996) and Wolverton and Lyman (1998). Length, breadth and sum of each tooth are also plotted in box plots to show the distribution of measurements, and for comparison with archaeological assemblages.

The measurements of size for each tooth show an overlapping continuous distribution between the sexes (Figures 91-98), with males generally bigger than females, but no clear division. While there is an overlap in range, statistically significant differences were found for all of the cheek teeth (Table 38). In general, the length and sum were the most valuable results. The ratio was found to not be a useful calculation in this study (those results are presented in my second prelim paper, but I have not included them here).

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<sup>7</sup> As these are paired teeth, two measurements (left and right) are included for each tooth type, per animal, except in instances of missing or damaged teeth.

<sup>8</sup> All statistics were originally calculated using SPSS, with the generous assistance of Rob Lusteck. I later recalculated with a larger dataset using Excel 2019.

*Table 36. Descriptive Statistics for Maxillary Cheek Teeth.*

<b>Tooth</b>	<b>Sex</b>	<b>N</b>	<b>Measure</b>	<b>Mean (S)</b>	<b>Range (mm)</b>
<b>4th Premolar</b>	Female	49	Length	11.51 (.68)	9.85-13.16
		49	Breadth	7.82 (.49)	6.52-8.99
		49	Sum (L+B)	19.45 (1.30)	17.00-25.17
	Male	36	Length	12.51 (.54)	11.56-13.73
		36	Breadth	8.70 (.49)	7.85-9.88
		36	Sum (L+B)	21.21 (.84)	19.85-23.14
<b>1st Molar</b>	Female	50	Length	17.50 (.96)	15.44-19.89
		50	Breadth	12.49 (.72)	10.73-13.92
		50	Sum (L+B)	29.99 (1.58)	26.61-33.76
	Male	36	Length	18.17 (.80)	15.78-19.71
		36	Breadth	13.20 (.75)	11.70-14.82
		36	Sum (L+B)	31.37 (1.45)	27.48-33.77
<b>2nd Molar</b>	Female	50	Length	25.52 (1.52)	22.11-30.70
		50	Breadth	14.03 (.68)	12.46-16.00
		50	Sum (L+B)	39.43 (2.08)	34.06-46.12
	Male	35	Length	26.97 (1.19)	25.02-29.44
		35	Breadth	14.89 (.72)	13.54-16.10
		35	Sum (L+B)	41.87 (1.70)	39.01-45.15

*Table 37. Descriptive Statistics for Mandibular Cheek Teeth.*

<b>Tooth</b>	<b>Sex</b>	<b>N</b>	<b>Measure</b>	<b>Mean (S)</b>	<b>Range (mm)</b>
<b>4th Premolar</b>	Female	48	Length	9.07 (.66)	7.62-10.23
		48	Breadth	4.94 (.33)	4.44-5.63
		48	Sum (L+B)	14.01 (.88)	12.15-15.47
	Male	33	Length	9.71 (.53)	8.21-10.49
		33	Breadth	5.23 (.21)	4.80-5.54
		33	Sum (L+B)	14.94 (.64)	13.13-15.88
	Female	51	Length	18.01 (.99)	16.28-20.35
		51	Breadth	8.54 (.54)	7.14-9.99
		51	Sum (L+B)	26.55 (1.41)	23.42-29.88
<b>1st Molar</b>	Male	31	Length	18.77 (.88)	17.13-21.63
		31	Breadth	8.98 (.52)	8.17-10.97
		31	Sum (L+B)	27.75 (1.20)	25.42-31.14
	Female	51	Length	18.85 (1.05)	17.13-21.70
		51	Breadth	11.14 (.61)	9.85-12.61
		51	Sum (L+B)	29.99 (1.55)	27.33-34.04
	Male	33	Length	19.87 (.58)	18.79-21.12
		33	Breadth	11.71 (.59)	10.32-12.69
		33	Sum (L+B)	31.58 (1.04)	29.19-33.14
<b>2nd Molar</b>	Female	51	Length	14.18 (1.35)	10.37-17.55
		51	Breadth	10.85 (.66)	9.32-12.21
		51	Sum (L+B)	25.02 (1.89)	19.69-29.69
	Male	33	Length	15.48 (.76)	14.15-17.23
		33	Breadth	11.45 (.45)	10.89-12.77
		33	Sum (L+B)	26.93 (1.05)	25.27-29.50
	Female	51	Length	14.18 (1.35)	10.37-17.55
		51	Breadth	10.85 (.66)	9.32-12.21
		51	Sum (L+B)	25.02 (1.89)	19.69-29.69
	Male	33	Length	15.48 (.76)	14.15-17.23
		33	Breadth	11.45 (.45)	10.89-12.77
		33	Sum (L+B)	26.93 (1.05)	25.27-29.50

*Table 38. Comparative Statistics for Female/Male Cheek Teeth.*

<b>Tooth</b>	<b>Measure</b>	<b>t-Statistic</b>	<b>p-Value<sup>9</sup></b>
<b>Upper 4th Premolar</b>	Length	7.266	< .001
	Breadth	8.215	< .001
	Sum (L+B)	7.099	< .001
<b>Upper 1st Molar</b>	Length	3.398	.001
	Breadth	4.454	< .001
	Sum (L+B)	4.147	< .001
<b>Upper 2nd Molar</b>	Length	4.735	< .001
	Breadth	5.605	< .001
	Sum (L+B)	5.722	< .001
<b>Lower 4th Premolar</b>	Length	4.645	< .001
	Breadth	4.427	< .001
	Sum (L+B)	5.159	< .001
<b>Lower 1st Molar</b>	Length	3.493	.001
	Breadth	3.655	< .001
	Sum (L+B)	3.948	< .001
<b>Lower 2nd Molar</b>	Length	5.091	< .001
	Breadth	4.226	< .001
	Sum (L+B)	5.162	< .001
<b>Lower 3rd Molar</b>	Length	5.051	< .001
	Breadth	4.588	< .001
	Sum (L+B)	5.283	< .001

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<sup>9</sup> P < 0.05 is significant.

Studies of ursid teeth relative to inferred body size trends by Wolverton (1986; Wolverton and Lyman 1998) and others have reported the lower third molar and upper second molar to be the most productive measurements. This was also the case in the present study, along with a pleasant surprise, the upper fourth premolar, which shows clear differences in regard to length, width and sum. It may be relevant that all of these teeth are on the end of the tooth rows, but such a suggestion is clearly speculative at this time.

The results for the lower first molar show the greatest overlap between males and females for the length, breadth and sum. This tooth is very long and slender in shape, which perhaps allows for less variation between the sexes. The upper first molar also shows less variability than the other teeth. Even for the first molars, however, the differences between males and females were statistically significant for length, breadth and sum.

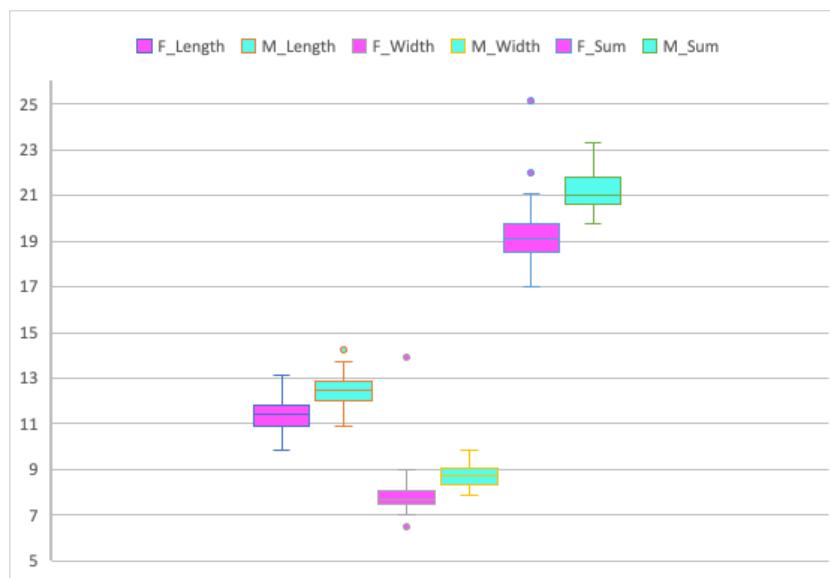


Figure 92. Box plots for upper P4 length, breadth and sum (mm), male and female.

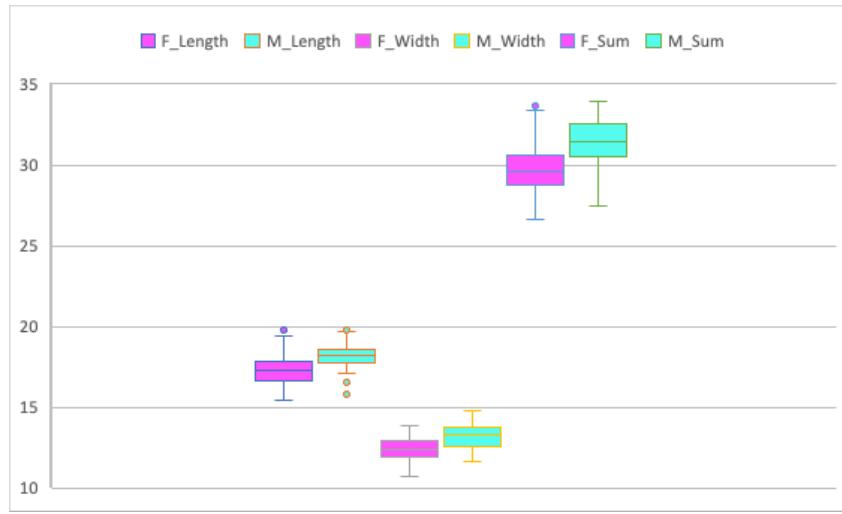


Figure 93. Box plots for upper M1 length, breadth and sum (mm), male and female.

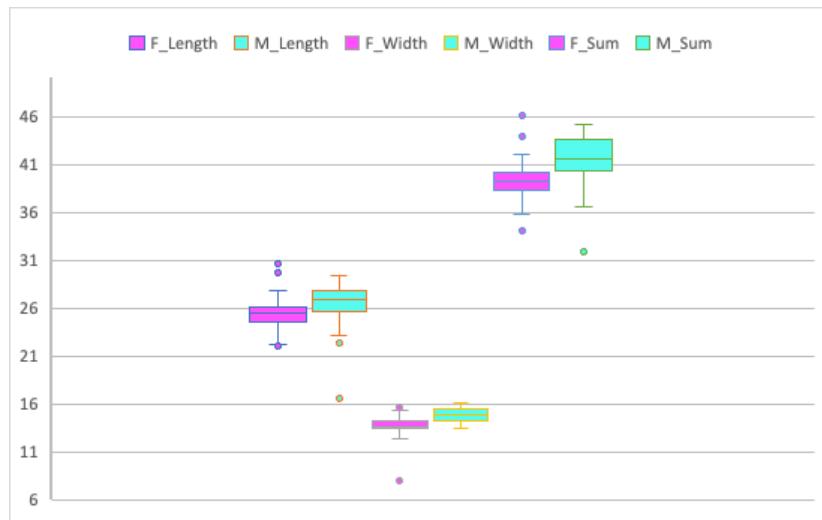


Figure 94. Box plots for upper M2 length, breadth and sum (mm), male and female.

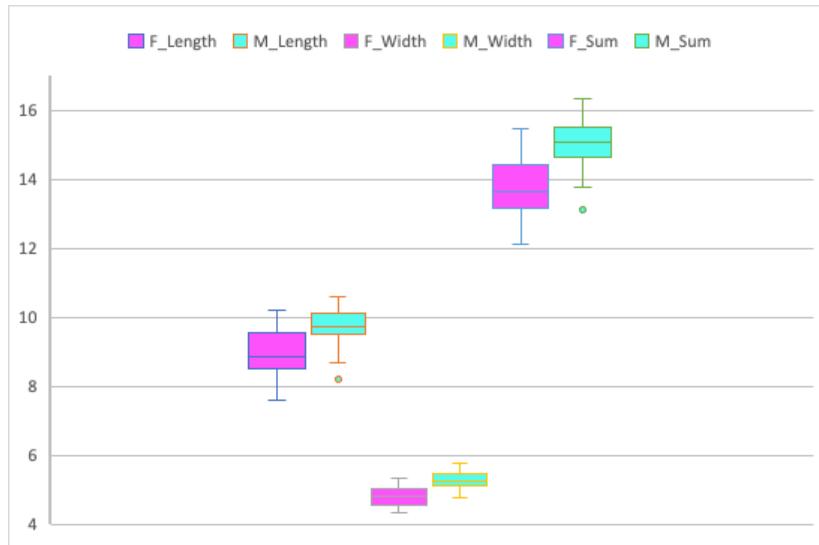


Figure 95. Box plots for lower P4 length, breadth and sum (mm), male and female.

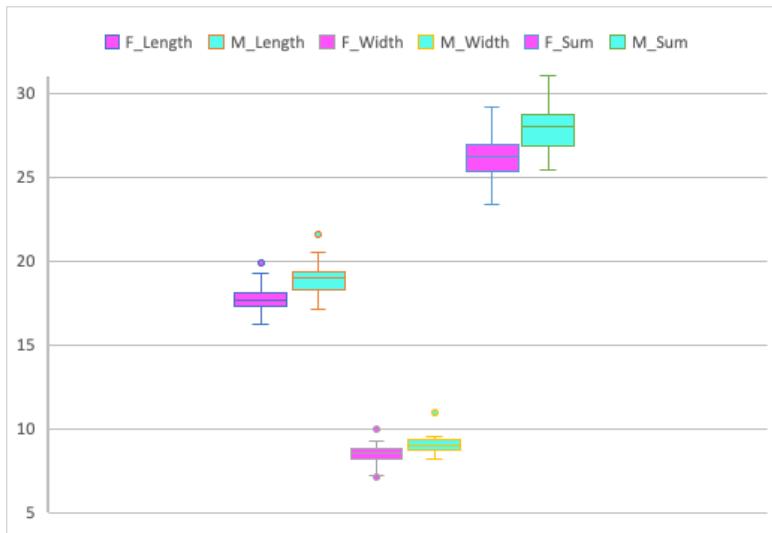


Figure 96. Box plots for lower M1 length, breadth and sum (mm), male and female.

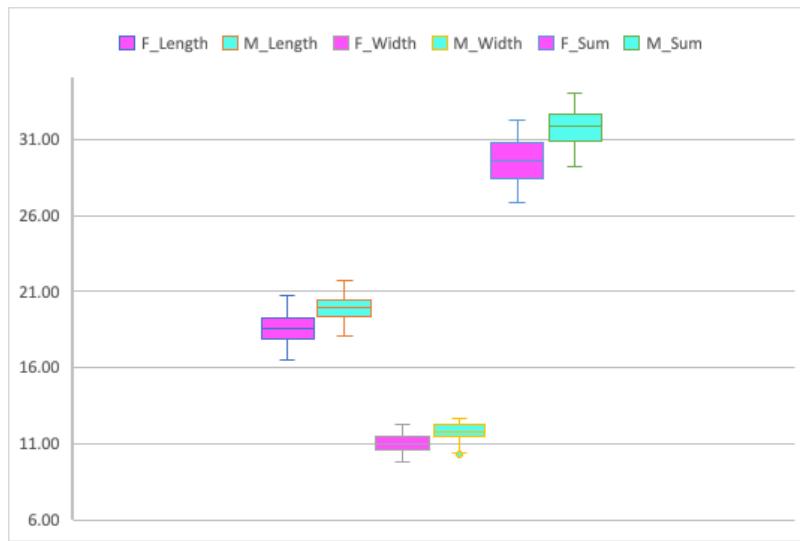


Figure 97. Box plots for lower M2 length, breadth and sum (mm), male and female.

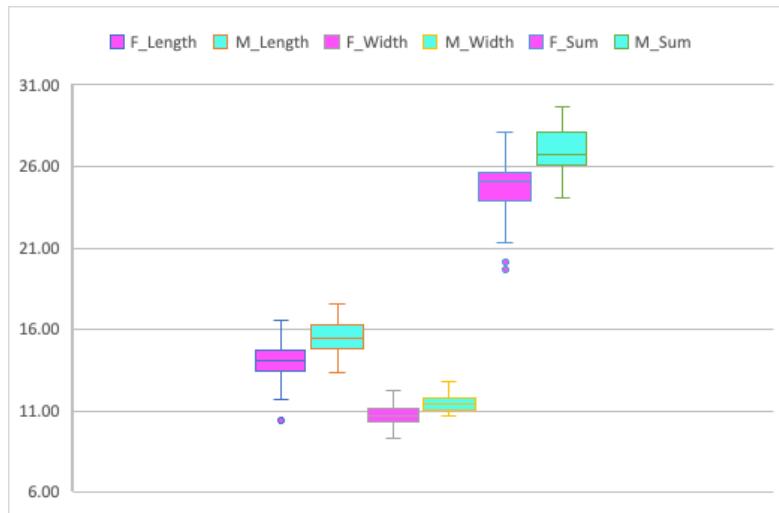


Figure 98. Box plots for lower M3 length, breadth and sum (mm), male and female.

These findings present a basis for comparison with archaeological remains, and offer a number of directions for future research. Of primary interest for me is the application of these and related data to archaeological teeth of unknown sex. With more detailed statistical analysis, it may be that a determination of confidence could be made for individual teeth of unknown sex, and there may be archaeological research questions that would benefit from that approach. However, I think this method is most useful at an assemblage level. A closely linked subject for future research is the relationship between tooth size and body size. Since the permanent dentition in bears is established in the first year of the animal's life, tooth size is clearly unrelated to the size of the animal at the time of its death. An example of this is Bear 76, a seven year-old female, shown in Figure 99 on the right. Obvious sexual dimorphism is seen in her overall skull dimensions through comparison with Bear 29, a much larger, seven year-old male. Bear 76's teeth are huge, however, relative to her skull dimensions. Her upper 2<sup>nd</sup> molar, for example is 2.78 mm longer than that of Bear 29.



Figure 99. Example of sexual dimorphism between male Bear 29 (left) and female Bear 76 (right); both were seven years old at death.

Comparisons of the archaeological assemblages with teeth of known sex are illustrated in Figures 8.11 and 8.12. For these examples, I use the sum (length+breadth) of the lower 2<sup>nd</sup> molar and upper second molar, respectively. The three archaeological sites are Crace (21ML3), Bear (21ML68) and Christensen Mound (21SH1/16). In this discussion, I split the Christensen site numbers to designate the 1948 Mound 1 assemblage as 21SH1, and the earlier 1907 collection at the edge of Elk Lake as 21SH16. I collected tooth measurements from all three sites including both sub-assemblages at Christensen. As discussed below, I collected tooth wear data from only one sub-assemblage at Christensen, 21SH16, because the Mound 1 fauna had been reburied by time I was aware of Stiner's (1998) tooth wear index. Due to the nature of the archaeological assemblages, the Crace site (21ML3) bears are represented only by mandibular teeth (Figure 101) and the Bear site (21ML68) bears are represented only by maxillary teeth (Figure 100). The Christensen Mound site (21SH1 and 21SH16 sub-assemblages) are represented in both diagrams.

The results do provide support for my earlier suspicions about the Christensen Mound and Bear site bears. The range of the 21SH1 tooth size is similar to the combined range of known females and males but is perhaps skewed more toward the females, while the range for the Bear site is consistent with the known males. Another area of encouragement is the general comparability of the total ranges of the archaeological and modern bears. This isn't terribly surprising, as the Bear site is about 500 years old, and the Christensen Mound and Crace sites are about 800 years old (Mather 2000a, and Chapters 5 and 6): nothing on an evolutionary scale of time. But it is perhaps significant that while the tooth measurements appear comparable, the archaeological samples are from an area of the state where modern bears are on average larger than the north-central Minnesota population represented by the skulls in this study (Coy 1999). This may account for the slightly larger range of the Crace site bears than the known males from Chippewa National Forest. Perhaps it is related to a potential for body size, or more likely, as suggested by Bear 76, other genetic factors. Preliminary comparison with the archaeological remains suggests that the modern teeth studied here are comparable in



Figure 100. Upper 2nd molar sum (length+width, mm) measurements from recent bears and archaeological assemblages.

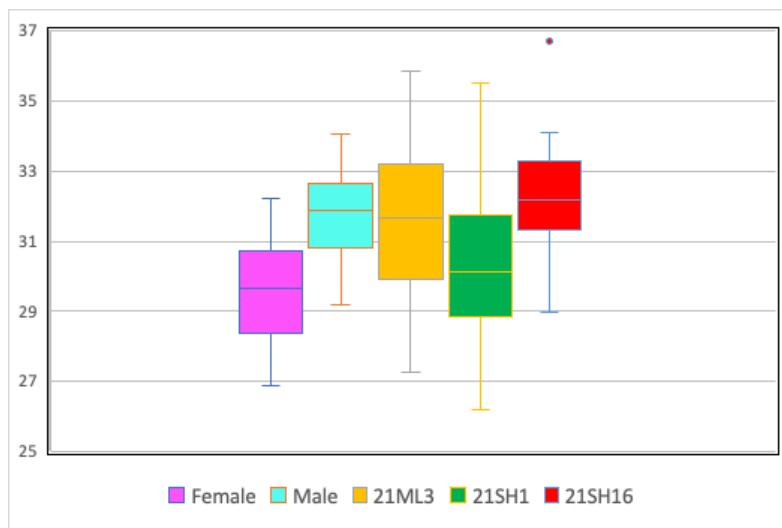


Figure 101. Lower 2nd molar sum (length+width, mm) measurements from recent bears and archaeological assemblages.

overall size with other environmental zones in Minnesota. Future analysis of the recent bear skulls from Camp Ripley would be a good source of comparative information.

The tooth measures indicate that both females and males are represented in the Christensen Mound (21SH1) and Crace (21ML3) assemblages. As discussed in Chapters 5 and 6, the archaeological context, zooarchaeology and taphonomy suggest that the Crace site bears are the remains of a feast where dozens of bear heads were cooked in an earth oven. The Christensen Mound, in contrast, appears to be the bear grave where remains were respectfully interred, but in a secondary burial mode similar to the people who were buried in the same mound. While there are differences, such as 21ML3 having more males, and 21SH1 more females, it appears that both assemblages have both, and therefore may be samples of the local bear population at that time and place in the past.

In contrast, the Bear site (21ML68) has only male bears, and in a surprise, this is also the case for the 21SH16 sub-assemblage from Christensen. This is discussed further below.

### Tooth Wear and Age

To assess relative ages of the bears at the three archaeological sites, I used the tooth wear index that Mary Stiner (1998) developed for use with the extinct European cave bear. Cave bears are much larger than American black bears, but the morphology of their cheek teeth is very similar. The index has three cohorts consisting of Juvenile (Age Classes I – III), Prime Adult (Age Classes IV – VII), and Old Adult (Age Classes VIII – IX). The age profiles generated from these records can be used, for example, to identify a natural death assemblage which will be primarily juvenile and old bears, as compared to a hunted assemblage that will have more prime adults. However, there is an important contextual difference to keep in mind when applying this method to Minnesota archaeological sites. For European cave bears, identifying natural vs. cultural cause of death is an important question because many of those bone assemblages are derived in whole or in part from animals that died of natural causes during hibernation in the caves. Our Minnesota assemblages are all unquestionably cultural, because they have been recovered from documented archaeological contexts. So it is reasonable to assume that all

of the bears in these assemblages were hunted, but the tooth wear index can still provide a quantifiable means to compare the composition of the groups.

The Grand Rapids Collection presented an interesting opportunity to collect tooth wear data using Stiner's (1998) index from black bears of known age. The recent skulls in the collection are mostly from young bears (Figure 102). About a third are from one- and two year-old bears, and 40 of the 56 skulls are from bears aged between 1 and 6 at death. The oldest was 18. Black bears can live into their 30s in the wild. The Minnesota black bear population is skewed young because it is heavily hunted, in a rich habitat that allows a high rate of reproduction.

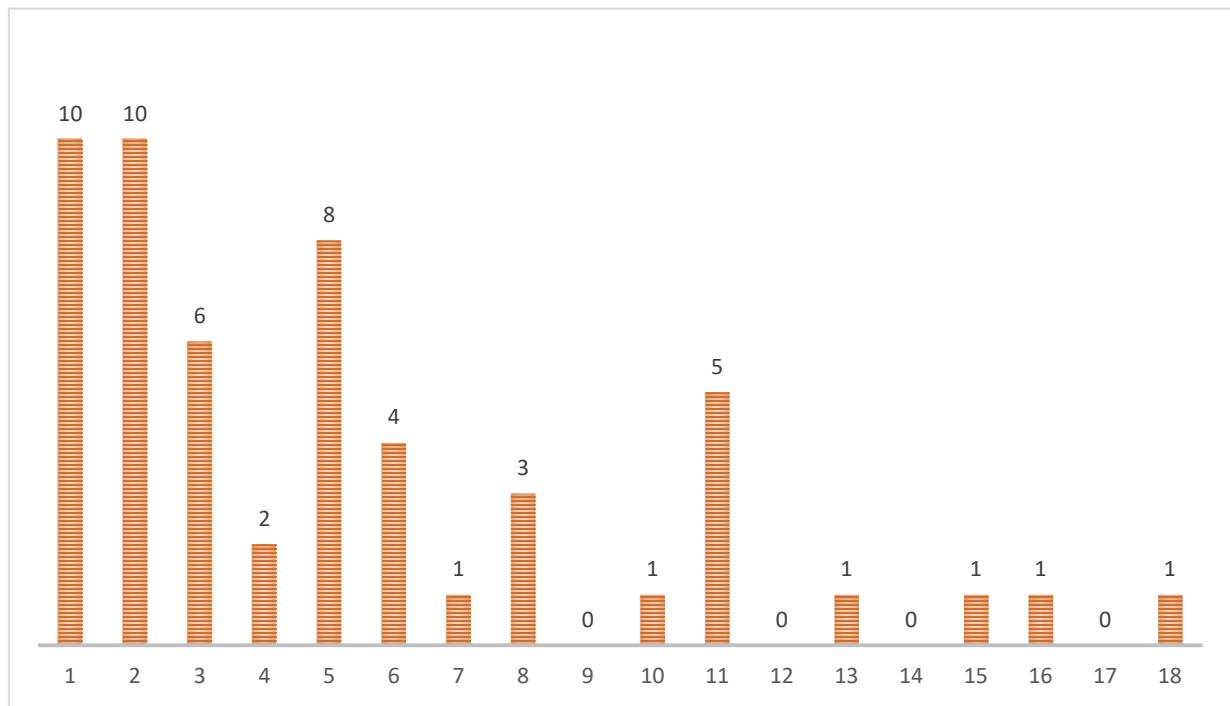


Figure 102. Recent bears (Chippewa National Forest): Number of study skulls by known age.

Tooth wear classes and cohorts following Stiner's (1998) index are summarized by known age in Tables 39 and 40, and Figures 103-106. One important observation for the comparative skulls and the archaeological assemblages is that Age Class 1 is not

represented except for one archaeological specimen from 21SH16. That class is for an erupting tooth. This would generally happen in the winter den when the cubs are born. It is also interesting to note that the Juvenile age cohort includes known-age bears as old as 7, but most are 6 or younger. Old cohort teeth are rare in the Grand Rapids assemblages, suggesting than many of the archaeological teeth with excessive wear are from bears that were older than 10-15 years at minimum. The records of these age classes from the three year-old bear appear to be from pathology that caused it to chew in an irregular manner.

Age Class records for the CNF bears and the three archaeological sites are summarized in Tables 39-44. Comparing Figures 107 and 108, it is fascinating to see that the age profile of the Crace site (21ML3) is nearly identical to that of the recent bears from Chippewa National Forest. At least from this sample, this indicates that the bear population at Mille Lacs about 800 years ago was similar to that of Minnesota today, with a robust but young-skewed and presumably heavily hunted population. In contrast, the Bear site bears are mostly from the Old Adult cohort. With the tooth size data presented above, this indicates that the Bear site bears were a selected sample of old and presumably large, male bears, while the Crace and Christensen Mound 1 assemblages were from a cross-section of ages, and both female and male bears. The 21SH16 sub-assemblage is similar to the Bear site in that it is all male, but it is not exclusive old individuals as indicated by tooth wear (Figures 107-114).

The implications of these findings are discussed more in Chapter 9. The Grand Rapids Collection has been an invaluable source of comparative data for analysis and interpretation of the archaeological assemblages. My use of the collection has focused on cheek teeth, but it holds great potential for future study of other osteological measures, such as skull dimensions and cranial suture. I encourage the establishment of skeletal collections of study animals in other areas, particularly in association with long-term telemetry studies, and analysis of such collections that already exist.

Table 39. Ursid Tooth Wear Class (Stiner 1998) for Known-Age Bear Skulls (CNF): Summary of All Cheek Teeth

Bear Age	I	II	III	IV	V	VI	VII	VIII	IX
1	--	50	57	--	--	--	--	--	--
2	--	42	78	--	--	--	--	--	--
3	--	2	53	7	4	1	1	2	1
4	--	3	8	13	--	--	--	--	--
5	--	1	52	33	8	2	--	--	--
6	--	10	26	6	6	--	--	--	--
7	--	--	--	9	2	--	--	--	--
8	--	--	6	18	6	0	4	2	--
9	--	--	--	--	--	--	--	--	--
10	--	--	--	--	12	--	--	--	--
11	--	--	7	9	15	14	7	2	1
12	--	--	--	--	--	--	--	--	--
13	--	--	--	3	3	6	--	--	--
14	--	--	--	--	--	--	--	--	--
15	--	--	--	--	--	5	6	1	--
16	--	--	--	--	10	2	--	--	--
17	--	--	--	--	--	--	--	--	--
18	--	--	--	--	--	--	--	2	9

Table 40. Ursid Tooth Wear Cohorts (Stiner 1998) for Known-Age Bear Skulls (CNF): Summary of All Cheek Teeth

Bear Age	Juvenile	Prime Adult	Old Adult
1	107	--	--
2	120	--	--
3	55	12	3
4	11	13	--
5	53	43	--
6	36	12	--
7	--	11	--
8	6	28	2
9	--	--	--
10	--	12	--
11	7	45	3
12	--	--	--
13	--	10	--
14	--	--	--
15	--	11	1
16	--	12	--
17	--	--	--
18	--	--	11

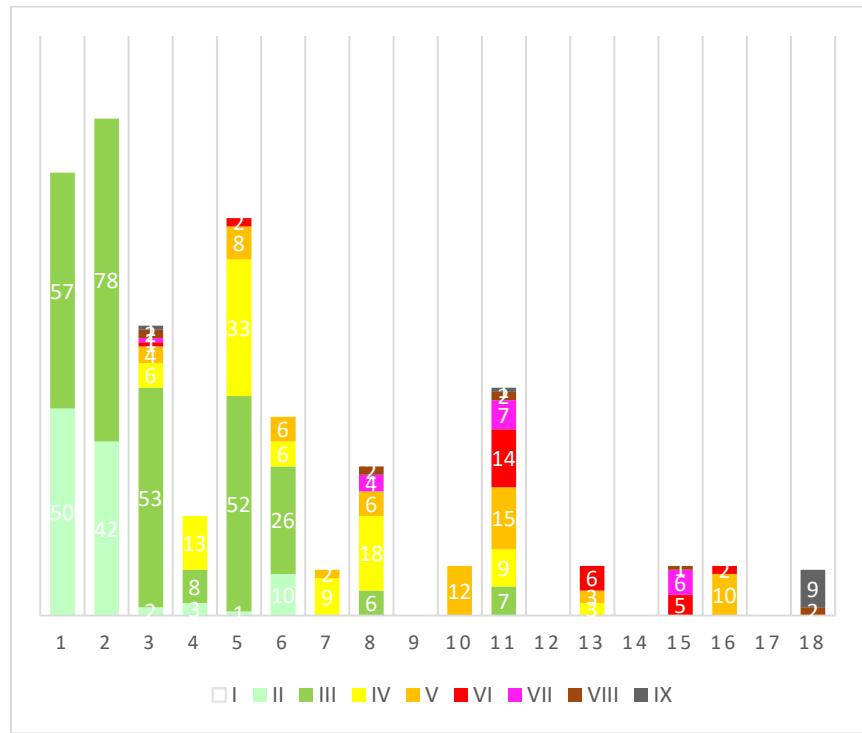


Figure 103. Recent bears (Chippewa National Forest): Tooth wear class identifications by known age.

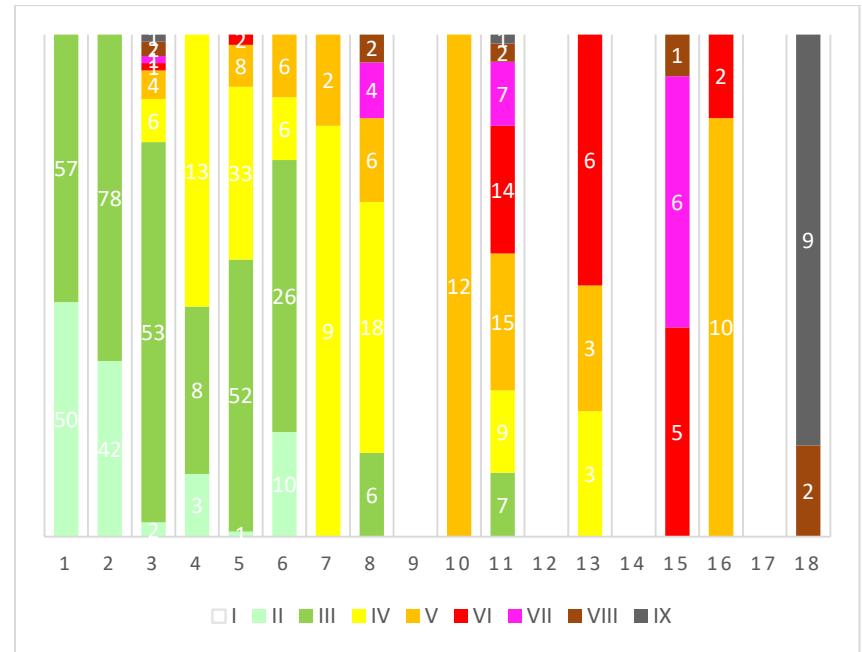


Figure 104. Recent bears (Chippewa National Forest): Tooth wear class identifications as percentage by known age.

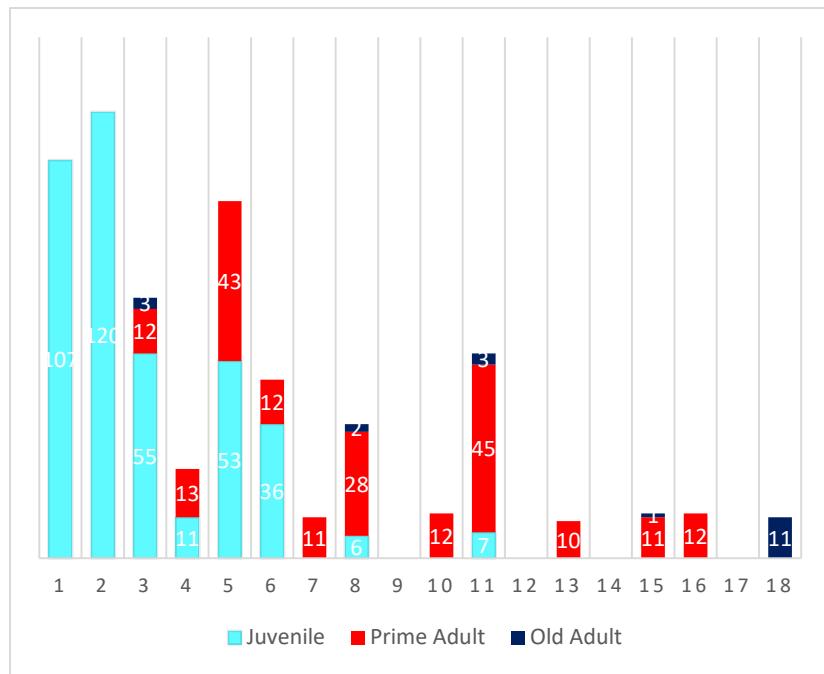


Figure 105. Recent bears (Chippewa National Forest): Tooth wear cohort identifications by known age.

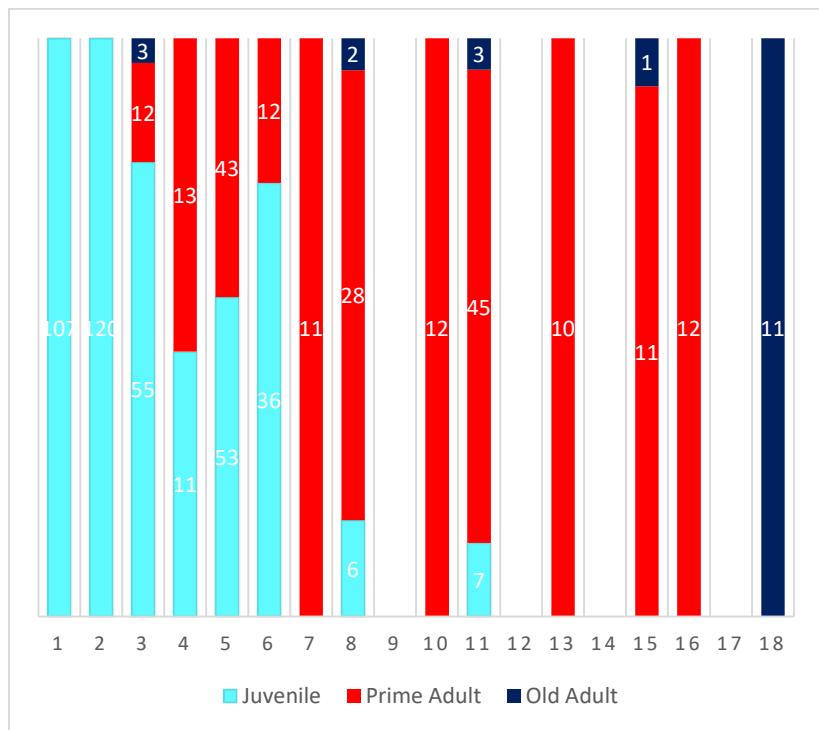


Figure 106. Recent bears (Chippewa National Forest): Tooth wear cohort identifications as percentage by known age.

Table 41. Ursid Tooth Wear (Stiner 1998) for recent and archaeological bears.

Assemblage	I	II	III	IV	V	VI	VII	VIII	IX	Total
CNF-R	--	99	271	118	66	37	18	9	14	<b>632</b>
21ML3	--	14	40	11	3	5	2	3	1	<b>79</b>
21SH16	1	4	15	6	5	4	2	4	7	<b>48</b>
21ML68	--	--	1	4	9	13	7	13	43	<b>90</b>

Table 42. Ursid Tooth Wear (Stiner 1998) for the Crace Site (21ML3)

	I	II	III	IV	V	VI	VII	VIII	IX	Total
P4	--	--	--	--	--	--	--	--	--	--
M1	--	--	--	--	--	--	--	--	--	--
M2	--	--	--	--	--	--	--	--	--	--
m1	--	2	3	2	2	1	--	--	--	<b>10</b>
m2	--	12	14	2	--	3	2	--	1	<b>34</b>
m3	--	--	23	7	1	1	--	3	--	<b>35</b>
<b>Total</b>	--	<b>14</b>	<b>40</b>	<b>11</b>	<b>3</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>79</b>

Table 43. Ursid Tooth Wear (Stiner 1998) for the Bear Site (21ML68)

	I	II	III	IV	V	VI	VII	VIII	IX	Total
P4	--	--	--	--	5	4	2	3	15	<b>29</b>
M1	--	--	--	1	2	6	3	5	7	<b>24</b>
M2	--	--	1	3	2	3	1	4	15	<b>29</b>
m1	--	--	--	--	--	--	--	1	1	<b>2</b>
m2	--	--	--	--	--	--	1	--	2	<b>3</b>
m3	--	--	--	--	--	--	--	--	3	<b>3</b>
<b>Total</b>	--	--	<b>1</b>	<b>4</b>	<b>9</b>	<b>13</b>	<b>7</b>	<b>13</b>	<b>43</b>	<b>90</b>

Table 44. Ursid Tooth Wear (Stiner 1998) for Winchell's 1907 Collection from the Christensen Mound Site (21SH1/16)

	I	II	III	IV	V	VI	VII	VIII	IX	Total
P4	--	--	--	--	--	--	--	--	--	<b>0</b>
M1	1	2	1	--	--	1	--	--	--	<b>5</b>
M2	--	--	3	1	2	--	--	1	2	<b>9</b>
m1	--	--	2	--	2	1	1	--	1	<b>7</b>
m2	--	2	4	3	1	--	1	1	3	<b>15</b>
m3	--	--	5	2	--	2	--	2	1	<b>12</b>
<b>Total</b>	<b>1</b>	<b>4</b>	<b>15</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>7</b>	<b>48</b>

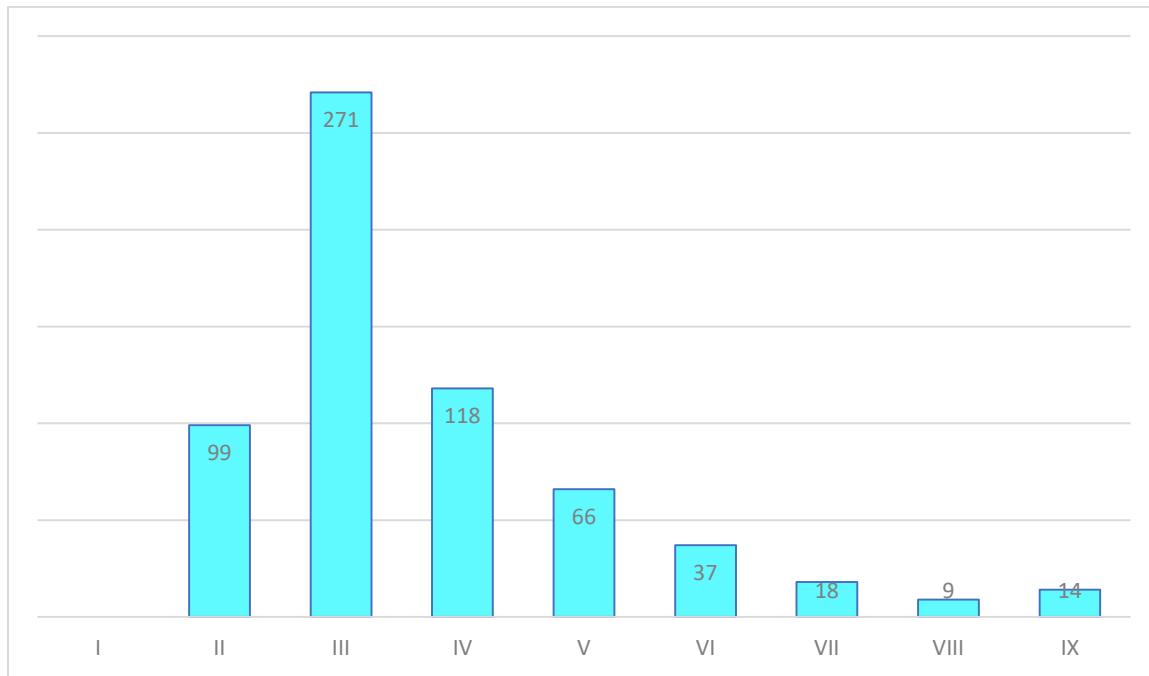


Figure 107. Recent (*Chippewa National Forest*) bear tooth wear records by age class.

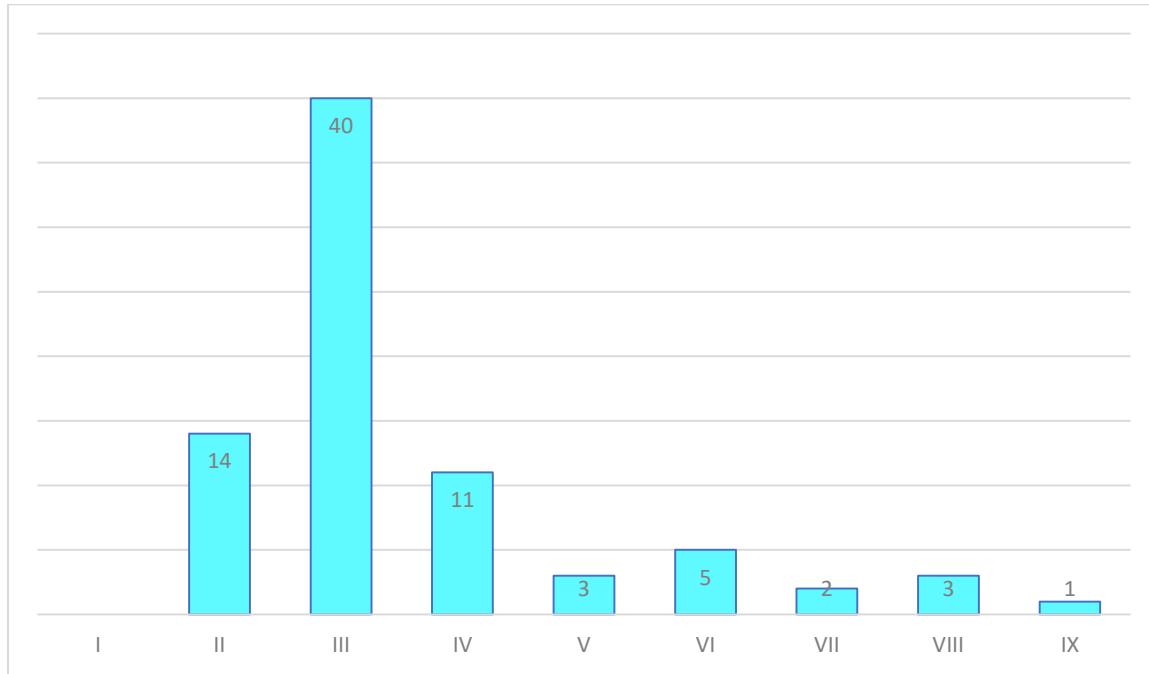


Figure 108. Crace site (21ML3) bear tooth wear records by age class.

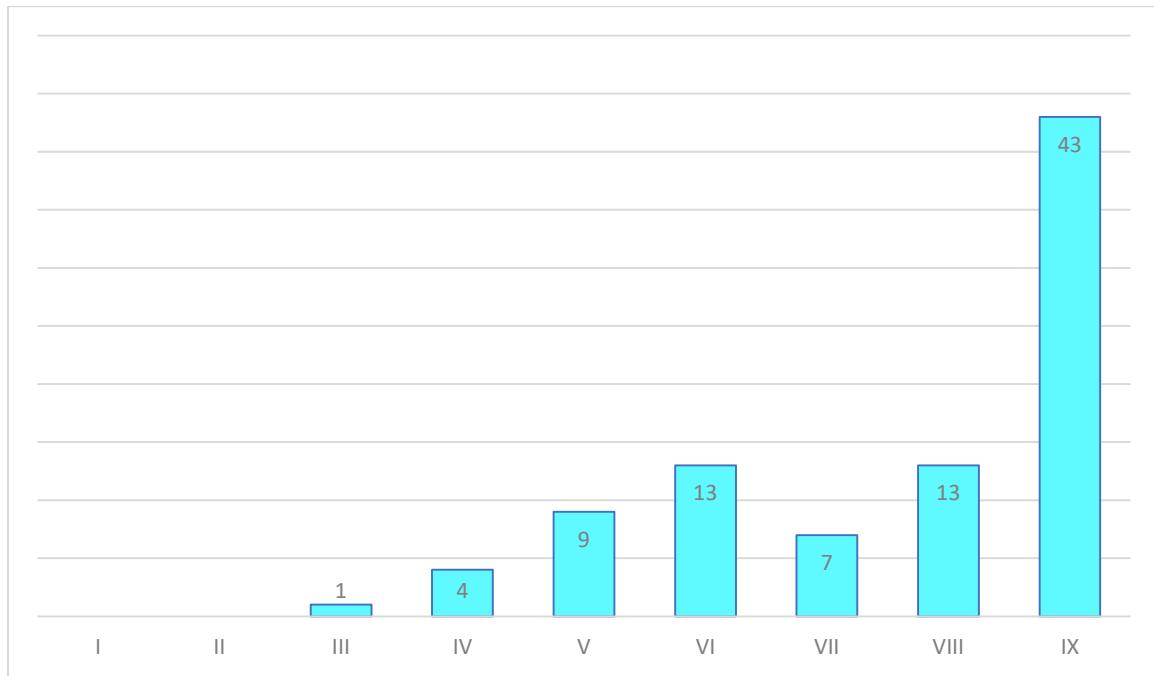


Figure 109. Bear site (21ML68) bear tooth wear records by age class.

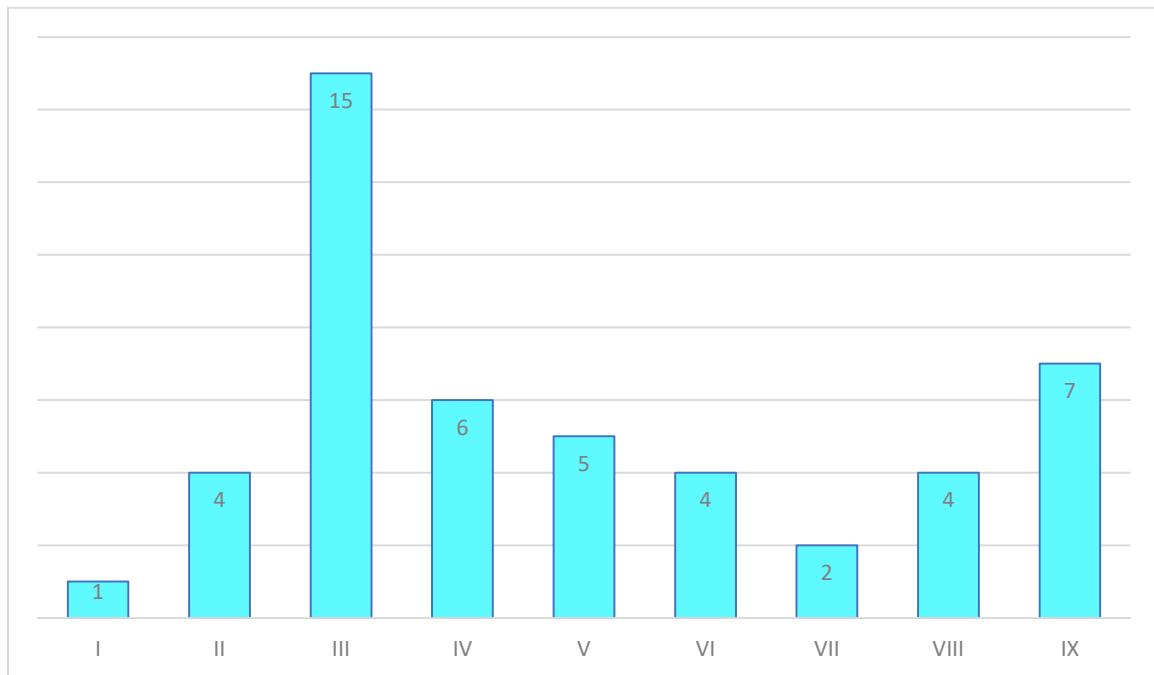


Figure 110. Christensen Mound site (21SH16) bear tooth wear records by age class.

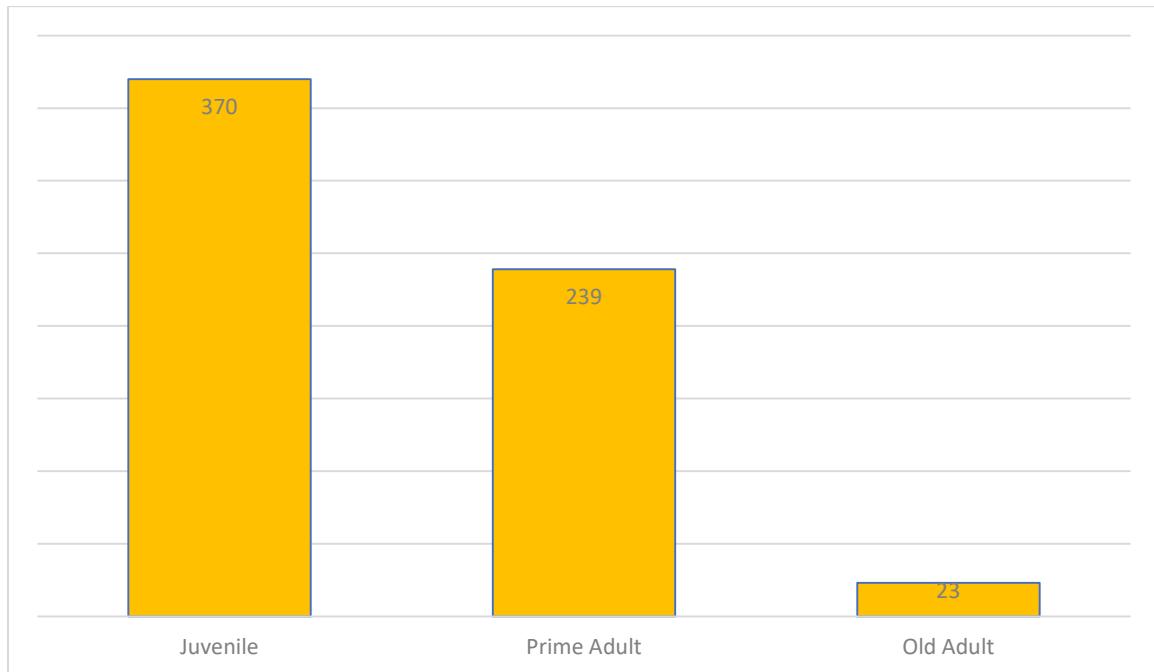


Figure 111. Recent (*Chippewa National Forest*) bear tooth wear records by age cohort.

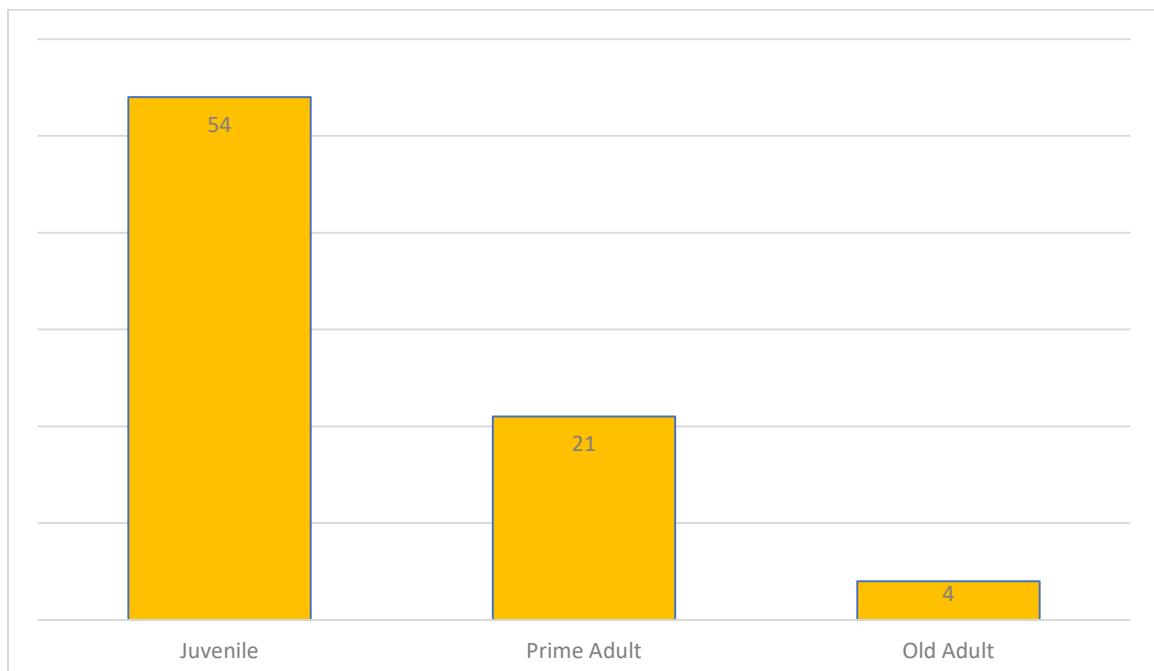


Figure 112. Crace site (21ML3) bear tooth wear records by age cohort.

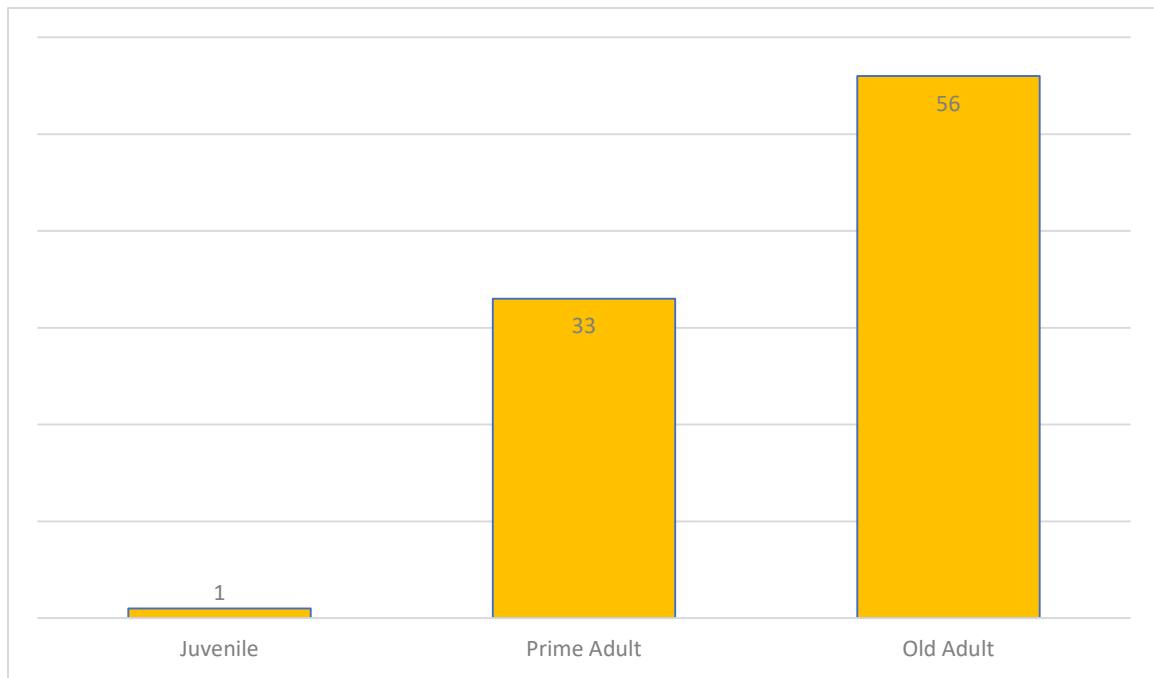


Figure 113. Bear site (21ML68) bear tooth wear records by age cohort.

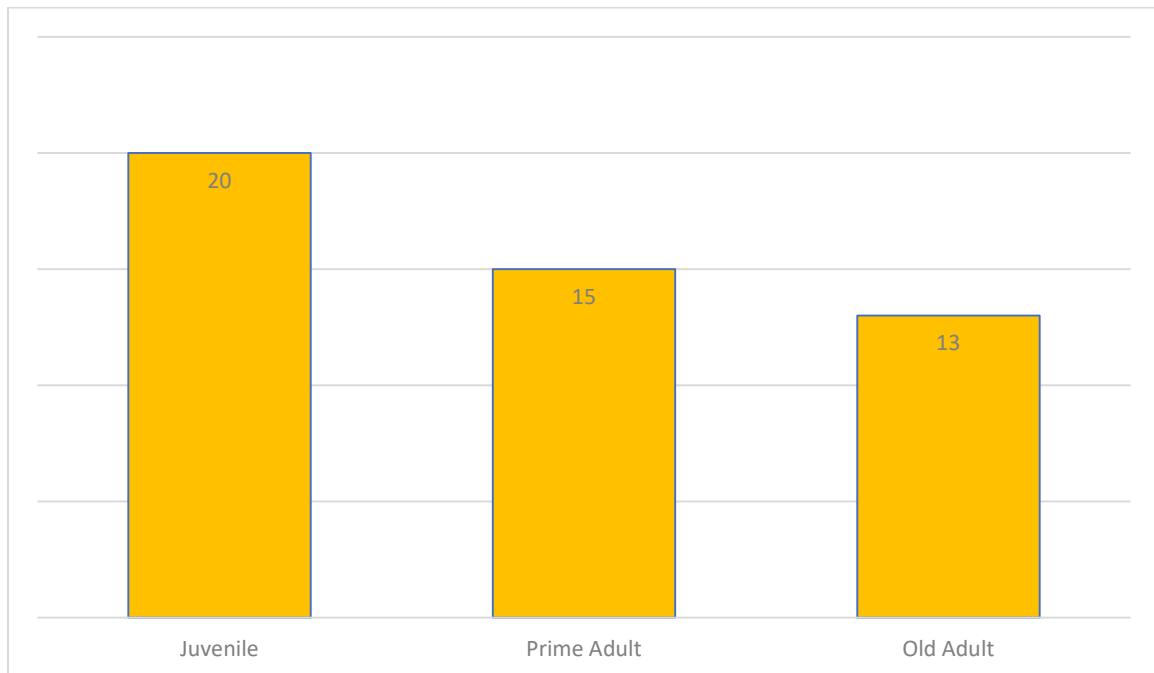


Figure 114. Christensen Mound site (21SH16) bear tooth wear records by age cohort.

## **9. CONCLUSION: URSID ARCHAEOBIOLOGY AND BEAR CEREMONIALISM IN MINNESOTA**

This dissertation has been an exercise in interdisciplinary research. The primary fields of study I've drawn upon are archaeology and zooarchaeology, bear biology, and paleoecology, supplemented with palynology and plant macrofossil analysis, and historical research. My experience in this effort has essentially been the opposite of that described by historian William Cronon (1983:13) in *Changes in the Land*, of his struggles "through alien territory in anthropology, ecology, and colonial history." Coming into this project, my previous comfort zone was Minnesota archaeology and the techniques of environmental archaeology. As such, I am confident in my conclusions in those areas (although I'm certain that there must be some zooarchaeological studies I missed), but there are gaps in other disciplines where further work by others would significantly add to the research. For example, my historical research has relied on secondary sources alone, and was limited to a supporting role. Archival research on fur trade records in particular would be a great benefit. The greatest limitation in this study, however, is the general lack of oral history with descendant communities. I am grateful for the conversations I've had with Dakota and Ojibwe elders about bears and archaeology, but this was by no means comprehensive, and it is beyond my ability to adequately represent the perspectives of traditional knowledge. Anton Treuer (2011), for example, illustrates the transformational benefits of combining archival research and oral history in *The Assassination of Hole in the Day*. I hope that others can help bring that dimension to this subject in the future.

This concluding chapter circles back to the research questions posed in Chapter 1, and uses this information to propose historic contexts for bear biology and indigenous archaeology in Minnesota. Because the subjects of bear ceremonialism and archaeobiology are inextricably linked in these contexts, I add interpretative models of bear ceremonialism based on this research, followed by recommendations for future research.

In my summaries of zooarchaeology and archaeology by Minnesota's ecological provinces, there are 81 bear-related finds<sup>10</sup>, as summarized in Figure 115, and Tables 45 and 46. These do not include sites in other states that are immediately adjacent to the state borders. Those sites are also obviously relevant, however, so they have been discussed in the text.

*Table 45. Summary of Minnesota Bear Finds by Ecological Classification System Province*

ECS Province	Zooarchaeology	Rock Art	Portable Art	Earthwork	Total
Laurentian Mixed Forest	45	1	2	--	<b>48</b>
Eastern Broadleaf Forest	19	3	1	2	<b>25</b>
Tallgrass Aspen Parklands	1	--	--	--	<b>1</b>
Prairie Parklands	4	3	--	--	<b>7</b>
<b>Total</b>	<b>69</b>	<b>7</b>	<b>3</b>	<b>2</b>	<b>81</b>

### Research Questions

My research questions from Chapter 1 are addressed below. These include the general topics of species, body part or artistic representation, bear range within the site, chronology of bear finds, and identification of bear populations.

#### *1. Bear Species*

Minnesota's archaeological record clearly demonstrates that American black bears (*Ursus americanus*) are native to the state. Grizzly bears (*Ursus arctos*) are also represented by archaeological finds, although these are notably rare compared to black bears. The two species can be most easily distinguished through cheek teeth (molars and premolars) or the claws (third phalanges). Other bones can also be distinguished when preservation allows, and at least one articulation is present, preferably an epiphyseal end of a longbone. Canine teeth can be deceptive, and I suspect that most large canines in archaeological contexts, perhaps including those identified as Hopewell trade items, are actually black bears. The cheek teeth are diagnostic by size, as described by Gordon

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<sup>10</sup> I identify 78 bear sites elsewhere (Mather 2020); I had not found the references for 21BL308, 21IC285, and 21OT51 before that edited volume went to press. As described in the text, there are possibly other bear identifications that I have missed in the gray literature, and there are certainly unidentified bear remains in extant faunal assemblages that have not been analyzed.

(1977). The bone cores of the claws (3<sup>rd</sup> phalanges) are diagnostic to species, with grizzly bear claws larger and straighter than black bears. In artistic representation, long claws and/or a shoulder hump generally indicate a grizzly bear, while black bears often have a rounded body shape and small ears.

Minnesota is at the eastern edge of the nineteenth century historical range of grizzly bears in North America. As described in Chapter 5, the most compelling evidence for grizzly bears being native to Minnesota is the Animoosh site (21BL305) with fractured bones of the front limbs in an Archaic pit features (Well and Olmanson 2014b). Grizzly bones have also been identified as the Lincoln Mounds (21HE7) and McKinstry (21KC2) sites. Rock art that appears to represent grizzlies is present at *Wakan Tipi*/Carver's Cave (21RA27) in Saint Paul, and possibly at Jeffers Petroglyphs (21CO3).

So far, no short-faced bears or other extinct bears are represented in Minnesota's archaeological or paleontological records. However, it is reasonable to expect that they were here since there are finds from adjacent areas of North America. The best potential for this may be in southern Minnesota, in settings such as where mammoth skeletons have been found near the towns of Lyle and Hollandale, or in central and northern Minnesota where paleontological (and sometimes archaeological) finds of bison and other animals are encountered in peat deposits, or perhaps in the karst caves of the Paleozoic Plateau. Secondary context finds may occur in glacial outwash gravels.

## 2. Bear Representation

The most commonly identified ursid skeletal elements are teeth, and cranial or mandibular bone fragments. Fragments of bones from the paws are also relatively common. Other skeletal elements are represented less frequently. This general pattern fits Hallowell's (1926) description of a focus on the head and paws in the traditions of bear ceremonialism. Taphonomy of bear bone assemblages represents both cultural and natural processes. Some finds are calcined bone that is likely the result of deliberate cremation. Burned bear bone is also identified but it is less common. Some assemblages are weathered, possibly from exposure prior to internment such as at the Christensen

Mound (21SH1/16), or decomposed from burial in acidic soils, such as at the Bear site (21ML68).

Identification of the origin of bear remains can be challenging, because individual teeth (particularly canines) and claws are portable and might be traded. They are often although not always pierced so they could be worn as jewelry or attached to clothing or objects. Other bear bones, including burned or calcined fragments, are more likely to represent local bears. Also, multiple elements of a single bear such as the grizzly front limbs at the Animoosh site, almost certainly represent a generally local origin for that animal, because it is less likely that large portions of a carcass would be carried a great distance.

In Minnesota's archaeological record, bears are also symbolically represented by effigy mounds (possibly two sites), and in portable art including trade silver, and the small stone bears at 21IC1 and 21WB127. Bears are also represented in rock art, both petroglyphs and pictographs, near the northern border, in the southeastern bluffs, and southwestern Minnesota on the prairie.

### *3. Bear Range*

Figure 115 shows the locations of 81 bear finds throughout the state. Most are near the boundary of the Eastern Broadleaf Forest and Laurentian Mixed Forest ecological provinces, as well as the Mississippi Headwaters and Rainy River (Figure 116). However, this distribution is also influenced by the unequal distribution of archaeological research efforts around the state. Overwhelmingly, these finds represent American black bears, although grizzly bears have also been identified in rare instances. As discussed above, bone fragments other than canine teeth and claws are more probably local, and archaeological context can add significant confidence, such as with the bear feast at the Crace site, which presumably would have required locally hunted bears. These finds are generally consistent with the historically known distribution of black bears, with greatest density in the forested portions of the state, and fewer bears in the prairie. For grizzlies, the archaeological finds extend the historically known range

considerably, from the vicinity of Pembina on the Red River as mentioned in Alexander Henry the Younger's journal, over to the Mississippi Headwaters, and southeast to the Twin Cities and southeastern Minnesota.

#### *4. Bear Chronology*

Radiocarbon dates are available from the Bear, Crace and Christensen Mound sites, along with dates in close proximity at South Pike Bay, Armstrong Bay, Sheffield and LeVesque. Both radiocarbon dates and OSL dates are available for the grizzly bear at Animoosh (21BL305). Archaeological context provides relative chronology for many other sites, although it can be difficult to separate components. Context is always important, although it can be more readily interpreted at some sites. Association with diagnostic artifacts provides more information than can be obtained with absolute dates alone.

The oldest bear find thus far is from the Late Paleoindian or Archaic component at South Pike Bay (21CA38), with Archaic finds at the Itasca Bison site and Animoosh. Cremated bear paws seem more common by the beginning of the Woodland Tradition, with 21SL898, the LeVesque site, Van Grinsven, Lake Bronson, and others. Bear skulls are present at the Mississippian Jones Village site in Blue Earth County. Bear remains are known from sites associated with the historically known Dakota at the Cooper, Wilford, Bear, Crace and Christensen Mound sites, and for the contact-era Iowa at the Farley Village (21HU2).

#### *5. Bear Populations*

While the large assemblages of bear remains at the Bear, Crace, and Christensen Mound sites are superficially similar, with an emphasis on cranial remains, the age and sex of the bears at an assemblage level can be determined. Tooth measurements of the cheek teeth are most useful for this analysis, through comparison with recent bears of known life history in biological collections. The cheek teeth are the most dense and therefore durable body parts in archaeological contexts, and are therefore well suited for this exercise.

Epiphyseal fusion of postcranial remains also provides useful information for age. Based on these studies, the Crace site (21ML3) and Christensen Mound (21SH1/16) sites provide the largest samples of what appear to be local bear populations. The Bear site does not, because it appears to consist of skulls brought from other locations. The same may be true for the 1907 assemblage from the Christensen Mound site, although the archaeological context of that find is not as well known.

At the Crace site, the bears appear to be primarily young adults, and similar in demographic structure to the current bear population. At Christensen Mound, a wider age range is present. Also, Crace and Christensen Mound have both female and male bears represented. They may be skewed toward more males at Crace, and more females at Christensen. At the Bear site and in the 1907 assemblage from Christensen Mound, the bears appear to be all male. The similarity in age structure between the modern sample and the Crace site bears is uncanny. More research is needed about the sex structure as compared to the modern population. The method I used is good for comparing assemblages, but it cannot identify the numbers of male and females in each.

#### Models of Bear Ceremonialism in Minnesota

Bear bones and teeth are generally rare in Minnesota's archaeological record, but they are represented in a diverse array of contexts. The same can be said of representational art. I propose that a range of ritual activities can be recognized with proper analysis of archaeological finds. These include bear feasts, bear graves, and other traditions related to bear power.

#### *Bear Feasts*

Ritual preparations and precautions were important aspects of the bear hunt, such as fasting beforehand and offering a pipe to the slain bear (Blair 1996:127–128; Henry 1921:139–40). Archaeological traces of these activities may possibly be identified, perhaps through distinctive weaponry or divination tools such as scapulimancy (divination using scapulae) as described by Speck (1977:149) for the Naskapi, although such sites have not yet been recognized in Minnesota. A successful hunt required a big

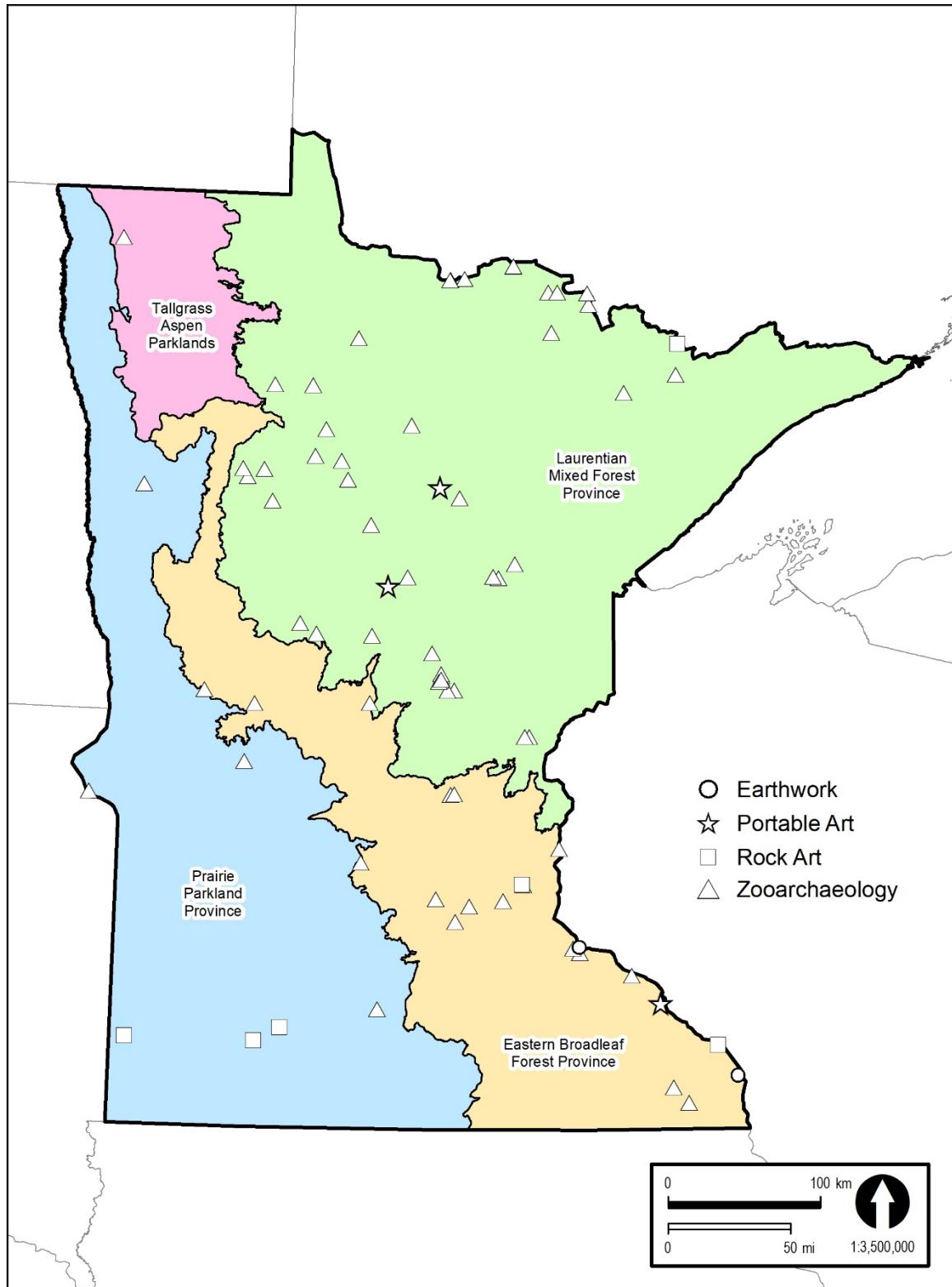


Figure 115. Bear finds in Minnesota with ecological provinces.

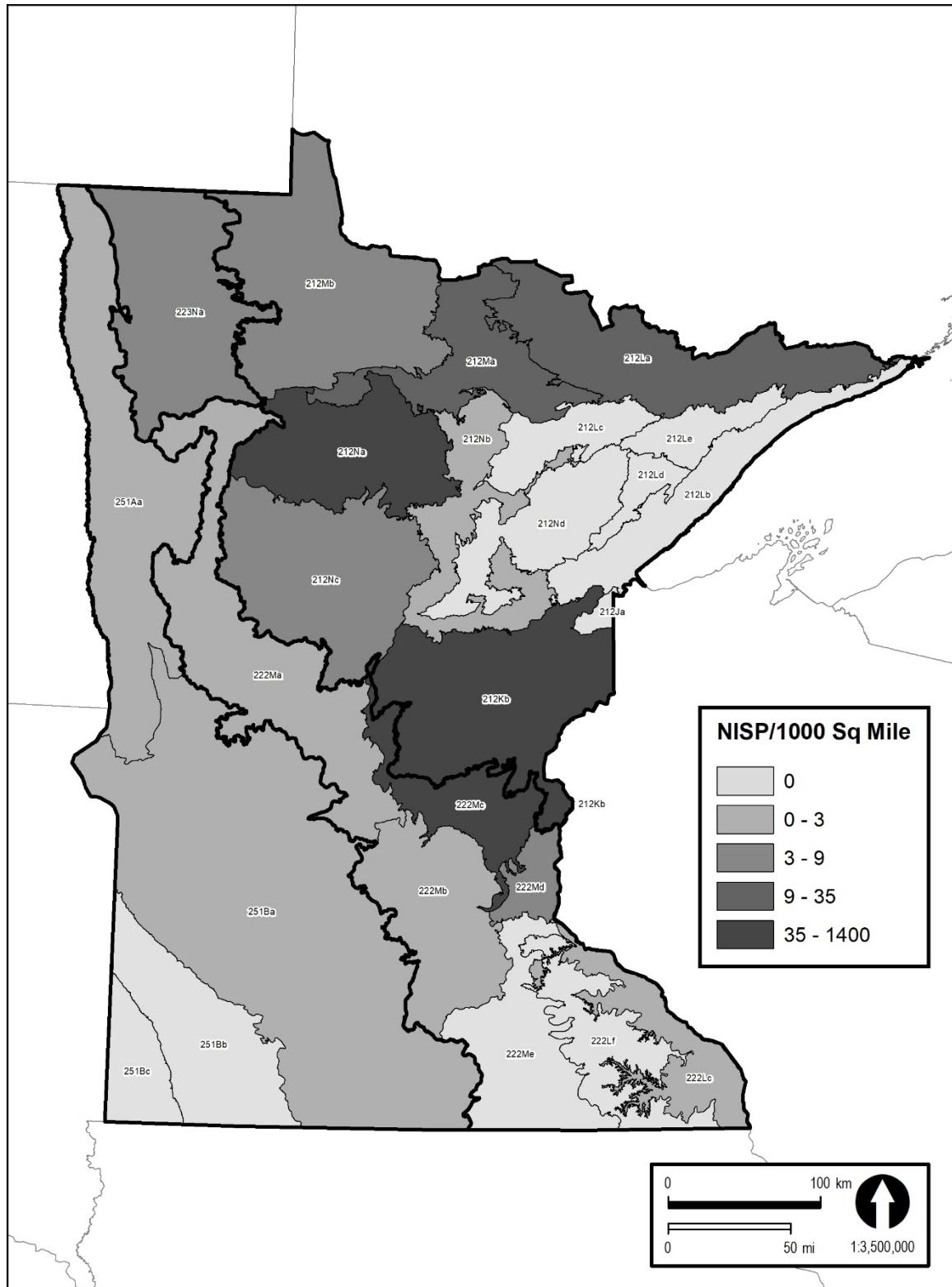


Figure 116. Density of bear finds by NISP, organized by ECS subsection.

Table 46. Details of Minnesota Bear Finds by Ecological Classification System Province.

Site	ECS Province	Type	Comments
21AK4 Brown's Point Post	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21AK9 Battle Island	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21AK53 Savanna Portage	Laurentian Mixed Forest	Zooarchaeology	Possible Bear Tooth
21BL2 Waskish	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21BL5 Pug Hole	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21BL37 Midway	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21BL289 Three Island Park	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21BL305 Animoosh	Laurentian Mixed Forest	Zooarchaeology	Grizzly Bear
21BL308	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21CA37 Gull Lake Mounds	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21CA38 South Pike Bay	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21CA79 Pipe Island	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21CE1 Itasca Bison Kill	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21CE63	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21CE4 Upper Rice Lake	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21CE5 Lower Rice Lake	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21CE- Sandy River	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21CW9 Scott	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21CW29 North West Company	Laurentian Mixed Forest	Portable Art	Trade Silver Brooch
21CW247 Levesque	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21IC1 White Oak Point	Laurentian Mixed Forest	Portable Art	Stone Bear Effigy
21IC60	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21IC285 Anchor Camp	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21KC2 McKinstry	Laurentian Mixed Forest	Zooarchaeology	Black and Grizzly Bear
21KC3 Grand Mound/Smith	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21KC13	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21KC14	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21KC25 Hannaford	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21LA8 Painted Rock Cliff	Laurentian Mixed Forest	Rock Art	Pictograph
21LA291 No Beard	Laurentian Mixed Forest	Zooarchaeology	Possible Bear Tooth
21ML3 Crace	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21ML6 Indian School	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21ML7 Vineland Bay	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21ML9/16 Cooper	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21ML12 Wilford	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21ML37 Van Grinsven	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21ML68 Bear	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21ML135 Rum River	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21PN10 Pokegama Outlet	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21PN11 Snake River Fur Post	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21SL73	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21SL137	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21SL191	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21SL864 Jordan	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21SL898	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21SL1107 Armstrong Bay	Laurentian Mixed Forest	Zooarchaeology	Black Bear
21WD15 Reaume's Post	Laurentian Mixed Forest	Zooarchaeology	Black Bear

*Table 46 (continued)*

21WD16 Little Round Hill	Laurentian Mixed Forest	Zooarchaeology	Possible Grizzly Bear
21KT1 Lake Bronson	Tallgrass Aspen Parklands	Zooarchaeology	Black Bear
21CR164 Coney Island	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21DL2 Lake Carlos Beach	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21DL46/21GR41 Cristina-Pelican	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21FL3 Tudahl Rock Shelter	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21GD4/45 Bryan	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21GD182 Cannon River Drive	Eastern Broadleaf Forest	Earthwork	Effigy Mound
21GD258 McClelland A	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21HE7 Lincoln Mounds	Eastern Broadleaf Forest	Zooarchaeology	Grizzly Bear
21HE419	Eastern Broadleaf Forest	Zooarchaeology	Bear, undiff.
21HE- Field Site 1	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21HU2 Farley Village	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21HU14 Beranek	Eastern Broadleaf Forest	Earthwork	Effigy Mound
21ME22 Lake Stella	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21SC27 Little Rapids	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21MO20 Fort Duquesne	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21RA10 Indian Mounds Park	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21OT51 Dead River	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21RA27 <i>Wakan Tipi</i>	Eastern Broadleaf Forest	Rock Art	Petroglyph
21RA28 Dayton's Bluff Cave	Eastern Broadleaf Forest	Rock Art	Petroglyph
21SH1/16 Christensen Mound	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21SH15 Honker	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21WA3 Sheffield	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21WB56 King Coulee	Eastern Broadleaf Forest	Zooarchaeology	Black Bear
21WB127 Burmeister Bear	Eastern Broadleaf Forest	Portable Art	Stone Bear Effigy
21WN55 La Moille Cave	Eastern Broadleaf Forest	Rock Art	Petroglyph
21BE5 Jones Village	Prairie Parklands	Zooarchaeology	Black Bear
21BS16	Prairie Parklands	Zooarchaeology	Black Bear
21CO3 Jeffers Petroglyphs	Prairie Parklands	Rock Art	Petroglyph
21CO7 Jeffers West No. 7	Prairie Parklands	Rock Art	Petroglyph
21NR1 Slininger Mound	Prairie Parklands	Zooarchaeology	Black Bear
21PO34 Glenwood Fish Hatchery	Prairie Parklands	Zooarchaeology	Black Bear
21PP2 Pipestone	Prairie Parklands	Rock Art	Petroglyph

event, such as a feast, to honor and give thanks to the bear. Out of respect for the bear, all parts of the animal were consumed and the bones kept away from harm by scavenging dogs.

In the archaeological record, it can be difficult to separate a single event from among the many aspects of village life, whether an occupation spanned a few seasons or centuries. Some features, such as hearths, can offer tighter chronological control.

Cooking hearths also hold great potential for archaeological information related to general subsistence as well as feasting events, including the bear feast.

In doing this research, I've come to believe that a more common example of a bear feast is also represented in Minnesota's archaeological record. Calcined fragments of bear paws are the most common form of zooarchaeological bear find. Calcination is the result of intense burning over an extended period. Cremated remains are calcined bone fragments, and it seems reasonable to suspect that this could relate to ritual disposal of physical remains. "What was left was then put into the into the fire and burned for the absent ones, - the deceased hunters" (Hallowell 1926:67). That statement refers to an example from of Montagnais passing the cooked bear's head among those present at a bear feast.

Burning food may be done as offering to spirits, for example, as Hallowell described among the Cree:

After the bear is butchered, certain parts, including a piece of the heart, are burnt ("given to the spirits to eat"). The slayer eats the rest of the heart in order to imbibe the "cunning and courage of his victim." Women are forbidden to eat of the animal's head or paws, men it's rump. [Hallowell 1926:69]

The first archaeological example of a bear feast site is subtle. Amid the fragmented animal bones of village sites, and sometimes in hearth features, there are occasional finds of calcined bone fragments from bear paws, typically metapodials and phalanges. South Pike Bay (21CA38), on Cass Lake in Chippewa National Forest, is the oldest known site to yield calcined paw fragments, which are estimated to be at least 8,000 years old based on their position in soil layers radiocarbon dated through phytolith analysis. The site contains multiple Archaic and Woodland components (LeVasseur and Yourd 2002; see also LeVasseur 2003; Foss 2013). In addition to black bear remains, the mostly calcined faunal assemblage includes bison, deer, numerous turtle, and fish specimens (Mather 2002).

Site 21SL898, a Woodland site on the north shore of Kabetogama Lake in Voyageurs National Park (Richner 2008:99), also yielded a faunal assemblage from the Initial Woodland component containing primarily small, calcined fragments (96%). Bear comprise the majority of identified mammal remains. At least two bears, an adult and a juvenile as indicated by epiphyseal fusion and skeletal element size, are represented by 25 fragments, mostly paw bones. Because of their presence together, these bones likely represent a mother bear and at least one cub. In Minnesota, bear cubs are born in January, and stay awake for the remainder of their first winter while the mother hibernates. The cubs emerge from the den in the spring and stay with their mother throughout the year, only to den with her again the following winter. Given the small size of the juvenile bones, it seems likely that the young cub was killed during the first few months of its life, perhaps in late winter along with its mother as she hibernated.

I suggest the burned bear paw finds are connected to the bear feast because of their taphonomy. Calcined bone is cremated bone, so intensely burned that only the mineral parts remain. Cremation requires bone be subjected to a very hot fire for an extended period (Lyman 1994:389). While it is possible cremation could happen by accident, it is also reasonable to think that paws, listed among the “good parts” described to Landes (1937:137) and symbols of a bear’s strength, might be ritually cremated in the same fire used to prepare the feast. The Sandy River site at Red Lake shows that burned bear paws do not have to be fully cremated, because there the bone fragments are simply burned (black). These fragments would not survive in soil conditions where faunal assemblages are primarily calcined, and this leads to an intriguing thought – that among the calcined assemblages such as Armstrong Bay in Vermilion State Park, or South Pike Bay in Chippewa National Forest, bear ceremonialism is relatively overrepresented. That is, while bears are underrepresented in general within archaeological sites due to the practices of bear ceremonialism, such traditions are more likely to be preserved as the limited faunal assemblages where only bone is preserved, because of the tradition in some areas of cremating the paws. While it has been fascinating to examine the differences among the large, spectacular bear sites, this realization about the ephemeral

evidence of cremated paws has been the most revelatory: that in all likelihood, every site with fragments of calcined paw bones represents a location where a bear feast was held.

Such a feast, even one consuming a single bear, was a large event. But sometimes many bears were killed and thus the concluding feast involved numerous animals. For example, in the seventeenth century, probably in present-day Wisconsin, French explorer Nicolas Perrot described hundreds of bears killed in a systematic hunt lasting several days (Blair 1996:126–131). The Crace site (21ML3) in Minnesota appears to be the location of a feast involving dozens of bears. Identified as a Late Woodland occupation based on pottery styles, Crace was investigated by a University of Minnesota field school in 1972. Excavations focused on a feature consisting of masses of fragmented bear bones (Gibbon 1975). The faunal assemblage of 3,410 bones contains 338 black bear and 275 likely black bear specimens (Table 28). Only four bone fragments were identified as other animals: one fish vertebra, along with bird and mammal bones tentatively identified as swan and beaver.

Intensely burned mandible fragments, including loose teeth and blocky, scorched pieces of shattered bone, comprise most of the identifiable bear elements. A minimum of 32 black bears are present, as indicated by the lower, right second molars. Some teeth and many mandible fragments are blackened, and some tooth enamel is crazed from heat; still other fragments are not fully burned, but appear scorched. I have not encountered this type of taphonomy in other Minnesota faunal assemblages, where burned (black) and calcined (gray-white) bone is more typical. In this assemblage, calcined bone is rare, apart from one calcined third phalanx (claw), suggesting that the paw was cremated while other elements received different treatment.

Some identifiable pieces of the bear cranium are present, consisting of four maxillary molar fragments, all burned, and a surprising number of upper incisors (39). Six vestigial premolars are also present, which could be from the upper or lower jaw. Due to their small size, incisors and the vestigial premolars are rarely found in Minnesota zooarchaeological assemblages. The latter are tiny, non-functional teeth about the size of a pencil tip. In wildlife management studies, biologists thin-section these teeth to determine a bear's age and reproductive history in females (Coy and Garshelis 1992).

Because of their small size, they can be removed from a live bear without harm to the animal.

Overall, there is a disproportionate number of mandibular teeth (206) compared to maxillary teeth (44), a pattern also reflected in the 32 identified mandible fragments (plus 908 mammal mandible fragments tentatively identified as black bear) versus no identified cranium bone fragments (although some cranial bone may reside in the “mammal” category). The teeth discussed previously are the only identifiable pieces of bear crania. The few postcranial specimens (21) include fragments of scapula and radius.

Large pieces of fire-cracked rock associated with the feature signify its use as an earth oven. Glacial cobbles are ubiquitous in the landscape of the Mille Lacs area and consequently are found in great numbers on sites there, ranging from fire-reddened whole cobbles to more common sharp-edged fragments broken from prolonged heating. The cobbles were super-heated in a large fire until glowing, at which point they were used in ovens for cooking, or for heating dwellings and sweat lodges.

The Crace site earth oven may have been a large, shallow depression once lined with glowing hot rocks, upon which were placed the heads of at least 32 bears. Other body parts may have been prepared nearby, but the excavation block happened to encounter the place where the heads were baked. Exposed to intense heat, some of the mandibles became charred and fragmented, and some of the thin, small teeth (incisors and vestigial premolars) fell out. The event represented by this feature must have been a large gathering of people to hunt and feast on so many bears. These zooarchaeological remains also indicate that bears were prevalent in the Mille Lacs area during the Late Woodland period, as they are today.

As revealed by scorched and burned bone, the earth oven at the Crace site is a spectacular archaeological example of a bear feast, where dozens of bear heads were cooked in a single event. Taphonomy also influences the recovery of bear remains in Minnesota’s archaeological record. Soils are naturally acidic in much of northern and eastern Minnesota, which results in poor preservation of organic remains such as bone. Since the majority of archaeological bear finds have been documented at sites in these regions, which serve as prime bear habitat today, bear remains are underrepresented in

the archaeological record for both natural (taphonomic) and cultural (bear ceremonialism) reasons.

### *Bear Funeral/ Graves*

The archaeological concept of a bear grave was first proposed by Swedish archaeologists Inger Zachrisson and Elisabeth Iregren (1974), whose study focused on rare finds where single bear skeletons had been buried by Sami people after bear feasts. To form the grave, the splintered bones were rearranged in correct anatomical position, with the unbroken skull placed at the front. Along with William Ritchie's (1950) work in New York, this was one of the first explicit attempts to connect archaeological finds with Hallowell's (1926) concept of bear ceremonialism.

In Minnesota, the idea of a bear grave seems relevant at the Christensen Mound (21SH1), where in 1948 large numbers of bear bones were found at the edge of the burial mound. A portion of the mound was excavated at that time, before the site was destroyed by the landowner (Wilford et al. 1969:12–17), long before passage in 1976 of the Minnesota state law that now protects cemetery sites. My analysis of the Christensen Mound faunal assemblage in 1999, during a Native American Graves Protection and Repatriation Act (NAGPRA) consultation prior to reburial, identified 512 black bear and 817 likely black bear remains, representing a minimum number of 63 animals based on mandible count.

At first glance, bear body part representation at Christensen Mound is similar to the Crace site. Mandibles (279) dominate, followed by cranial fragments (177), and a few postcranial remains (38 pieces of pelvis, rib, radius, ulna, and scapula). Paw bones are absent, while at Crace there was only one. However, unlike the earth oven contents at Crace, none of the bear bones from Christensen Mound are burned. Instead, the bones are weathered, with surfaces appearing dried and cracked. Sexual dimorphism is evident in the teeth and postcranial remains, and wear on the molars varies considerably. This suggests female and male bears, young and old, are represented in the assemblage,

perhaps reflecting a cross-section of the local bear population as encountered in one or more bear hunts c. 1150 CE (Mather 2000a).

The idea that this assemblage represents a bear grave derives from traditional secondary burial practices of the Dakota people, as seen in historical records, and from the archaeology of Woodland Tradition burial mounds, including the Christensen Mound itself. Dakota funerary rites took place in stages, with the deceased first placed on a burial scaffold or in a tree. Later, bones would be gathered, bundled together, and kept by a relative for an appropriate period of time, when the bundle would be buried, often in a mound (Hall 1997:24; Theler and Boszhardt 2003:9–11; Maki and Arnott 2019:17). At Christensen Mound, bears were afforded the same respect and treatment as people. After the bear hunt and feast, they were interred as secondary burials in that same place.

### *Bear Power*

The Bear site (21ML68) is unlike any other site or expression of bear ceremonialism that I've heard of since, and seemingly unlike anything described in the ethnographic literature. While fascinating in terms of the archaeology of bear ceremonialism, is not among the best sites for consideration of ursid archaeobiology in Minnesota. While it may be likely that the black bears whose skulls were placed in the Bear Feature lived in the general Mille Lacs area, this is by no means certain. Furthermore, the skulls appear to have been selected from large, old and possibly all male bears, and they were likely kept and curated by their owners for some length of time, perhaps for years or even generations. As such, they are not representative of the bear population as a whole. Historically, it is useful to consider why their owners put them in this place at that time. In considering this, I keep coming back to the general idea of bear power and Tom Ross' words about creating a sacred space.

In 2002, when Jim Cummings and I set out to investigate the age of the Cooper site palisade in the Kathio National Historic Landmark, relatively near to the Bear site, I wondered about the possibility of the two features being contemporary in age. I remembered Joe Williams's words about the bears being there to protect something.

Clearly the fortification at the Cooper site was built in response to a perceived outside threat. I had wondered if the Bear Feature might have been a spiritual response to the same threat. Unfortunately, the radiocarbon dates we obtained from the palisade were inconclusive (Cummings and Mather 2005), although we did obtain information about how the palisade was constructed. However, later dates from curated wood samples, from the 1969 excavations, demonstrated that the palisade is from approximately the early 1700s (Emerson 2012), at least a century or more after the age of the Bear Feature. Nevertheless, the idea of the Bear Feature as spiritual protection may still have merit.

North America had been drawn into a global economic system by the beginning of the fifteenth century, partly due to fishing fleets working the north Atlantic. A major factor in initial European exploration and colonialism, however, was impeded trade to Asia after the fall of Constantinople to the Ottoman Empire in 1453, (e.g. Bourque 2001:113-114; Zinn 2003:6). The search for a western trade route to Asia was famously the impetus for the voyage of Christopher Columbus, but it remained a focus even long after it was clear that another continent was in the way. European efforts ultimately shifted to trade and colonization, but the western passage remained a goal until the geography of the continent was understood, and remained unsatisfied until the opening of the Panama Canal in 1914. Interest in the interior of the continent was aggressively pursued by European powers in search of trade routes and the passage through.

In Minnesota, we tend to think of European contact in the late 1600s, with the first arrival of voyageurs and explorers including Du Luth and Hennepin. But word of European presence in North America would have reached Mille Lacs long before, as the Dakota had trade and cultural connections that extended down the Mississippi River at least to the midcontinent, westward into the Great Plains and eastward to the Great Lakes. The French and English were on the east coast long before the late seventeenth century, and the Spanish were established to the south in Florida, Mexico and the southwestern states, chronologically within the 2-sigma range of the Bear Feature radiocarbon dates. Establishment of European settlements and colonies in these areas displaced native communities, sometimes with violence, and disease would have spread into the interior of the continent far faster than trade goods or people. It is impossible to be certain of a

specific cause, but general reports and rumors of these conditions or events could have created an awareness of encroaching external threats. This may have been severe enough to require an extreme response to protect the people, perhaps through a ritual conducted by those with bear power, and perhaps by a bear society.

It is interesting to note that the 1907 bear assemblage from the Christensen Mound site may represent a historical precedent for the Bear site, in that the bears from both features appear to have been selected for a special purpose. They are all male, and older than the general population.

### Future Research

As described above, this research would be greatly advanced through integration of oral history and Traditional Ecological Knowledge. Archaeological research has allowed recognition of sites, topics and themes of ancient bear ceremonialism in Minnesota, but this subject can be more meaningfully addressed if the archaeology can be interpreted by those with traditional knowledge. It is my hope that Dakota and Ojibwe communities and heritage managers will be able to use this information for their own purposes.

It is likely that there are other sites with burned bear paws, teeth or other bear remains, both identified and not. For example, some of the zooarchaeological identifications compiled here are from reports of investigations by others, which may list a NISP figure for bear but not describe the elements present or their taphonomy. Also, it is reasonable to assume that there are additional bear remains including burned paws in currently unanalyzed faunal assemblages, and, of course, in undiscovered archaeological sites.

Following from the idea of historic contexts, it would be good to follow up with historical designation, such as listing in the National Register of Historic Places, for an appropriate site or sites. In terms of the historic preservation framework used in the United States, the Bear site unquestionably, in my opinion, merits the highest designation of National Historic Landmark (or indeed, as a UNESCO World Heritage Site). Any move to nominate it would need to be initiated by the Mille Lacs Tribal Historic

Preservation Office, in consultation with Dakota communities. Thus far, they have preferred to quietly preserve and protect the site as green space through under the tribe's zoning ordinance, and I respect their decision. Of the two other principal bear sites, the Crace site is within the Kathio National Historic Landmark, and this aspect of its significance could be addressed with an update of the NHL documentation. This is needed in general, because the current documentation does not address all known sites within the district, or the significance of landscape features such as the wild rice stands in the outlet lakes. The third bear site, Christensen Mound (21SH1/16) has been severely impacted by residential and road construction beginning in the early twentieth century. It is possible that portions of the site would retain sufficient integrity for the site to be eligible for the NRHP, but this would require a comprehensive Phase II evaluation to determine.

Considering the archaeology of bear ceremonialism, it is useful to be cognizant of the shortcomings shared by all disciplines that study the past through material remains. Charles Darwin (2004:237) described the fossil record, "as a history of the world imperfectly kept, and written in a changing dialect." A passage in the *Tao Te Ching* evokes a similar theme:

The ancients were subtle, mysterious, profound, responsive.  
The depth of their knowledge is unfathomable.  
Because it is unfathomable,  
All we can do is describe their appearance.  
Watchful, as though crossing a winter stream.  
Alert, like people aware of danger.  
Courteous, like visiting guests.  
Yielding, like ice about to melt.  
Simple, like uncarved blocks of wood.  
Hollow, like caves.  
Opaque, like muddy pools. [Lao Tsu 2012:35]

Perhaps I am overthinking this. Nevertheless, it is important for archaeologists to be aware both of the interpretive power of our data, but also the limitations of the

archaeological record. Innovative analyses can produce surprising insights, yet archaeology on its own can only provide a fragmented picture.

Due to the rich nature of the evidence related to ancient bears in Minnesota, I believe that an archaeobiological approach such as this also offers parallels to archaeozoology, the Old World focus on the animals themselves (such as physical changes associated with domestication), and bioarchaeology, the intense focus on one species that is afforded to specialists in human osteology.

While it is gratifying that aspects of the zooarchaeological record lend themselves to analyses beyond the level of subsistence and ‘laundry lists’ of species present, it should be apparent that studies of Minnesota’s ursid archaeobiology are in their early days. More investigation is clearly necessary to test the preliminary theories presented here regarding the implications of molar size and wear. If conclusions that these methods can identify bear populations are supportable, the stage is set for further scrutiny of these assemblages through other techniques. A thorough analysis of non-faunal archaeological context is of equal importance in making such determinations.

Many of the archaeological assemblages discussed here are primarily Late Woodland in age, and therefore date to within the last 1500 years. This leaves a sizable gap in Minnesota’s ca. 13,000-year human/bear history. While Minnesota is at a taphonomic disadvantage in this regard, it is presumed that bear remains from earlier periods will be discovered with additional archaeological investigation. Our obvious interest in such finds does not detract from the importance of the extant Late Holocene assemblages. These are of particular value as a bridge between the fur trade and prehistory. This is a period when Minnesota’s climate and vegetation approximate that encountered by the first European explorers in the region, but which lacks the complicating factors of historical impacts on the environment.

Most importantly, future studies of bears, whatever their species, past and present, will continue to benefit from interdisciplinary research involving methods from wildlife biology, conservation and archaeology.

### Postscript

In July 2016, I returned to the Bear site with staff of the Mille Lacs Tribal Historic Preservation Office. It had been 18 years since the dig, and although I'd worked and lived nearby for much of that time, I had not ventured out to the site since the reburial of the bear remains in TU 9. It felt good to be back. The site was largely unchanged. There is now a small stand of hazel (*Corylus americana*) growing near the Bear Feature. The hazelnuts were nearly ripe (Figure 117), and as a favorite bear food, this was gratifying to see. The bushes may have grown here on their own, or they may have started from food offerings given to the bears through ceremonies in recent years. In either case, their presence seems fitting. It is also comforting to remember that the Bear Feature is, and will remain, intact and preserved, and will continue to fulfill the purpose for which it was created.



Figure 117. Hazel thicket at the Bear site, July 2016.

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