1987

Interpretation of the archaeological record for the area in and around the Helena Valley

William B. Long
The University of Montana

AN INTERPRETATION OF THE ARCHAEOLOGICAL RECORD FOR THE AREA IN AND AROUND THE HELENA VALLEY

By

William B. Long

B.A., University of Montana, 1984

Presented in partial fulfillment of the requirements

for the degree of

Master of Arts

University of Montana

1987

Approved by

Lee C. Taylor

Chair, Board of Examiners

Dean, Graduate School

August 10, 1987

Date

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

Long, William Baylor, M.A., July 1987 Anthropology

An Interpretation of the Archaeological Record for the Area in and around the Helena Valley (146pp.)

Director: Dr. Dee C. Taylor

The settlement and subsistence practices of the prehistoric occupants of the Helena, Montana, area are not adequately understood because little research has been reported to date. I believe that configurations can be defined from the archaeological site distributions in the region. Analyses of these distributions may allow one to make inferences about changes in these practices over time and contribute to our understanding of the area's prehistory. A thorough examination of the archaeological and ethnographic information available was conducted. Six research questions were designed to examine the prehistoric sites and their relationships to the natural resources and the environment. Five of the questions were answered, but it was found that, due to the quality and condition of the existing data, rigorous testing was not possible. However, qualitative methods of analysis indicated that there was a seasonal occupation of the area and that the settlement and subsistence practices of the prehistoric occupants had changed little, if any, over the past 12,000 years.

ACKNOWLEDGMENTS

I would sincerely like to thank the members of my committee, Dr. Dee C. Taylor, Dr. Carling Malouf, and Dr. Darshan Kang, for their guidance and kindness shown to me throughout this ordeal (i.e., a severe test of character or endurance; a trying course of experience). In particular, I would like to thank Dr. Taylor for his patience and the application of his editorial skills. Dr. Malouf contributed much of his time to insure that I had an adequate understanding of the archaeology of the region in question. His familiarity was invaluable. Dr. Kang gave freely of his time, patience, and support. I especially would like to thank Dr. Kang for his observation that I would not make it as an insurance salesman.

To Sharon Rose, I give my thanks for her excellent and speedy typing skills. A word of thanks is also in order to all my friends who spent a lot of time listening, and who contributed reports and articles for my research. Many people helped, but I am responsible for this manuscript.

Finally, I would like to thank Debbie for her typing, patience, support and love, and my Dad for both moral and financial support throughout my graduate studies. Without them I could not have made it this far and may have been forced to drop out of school, get a real job and make something of myself.

TABLE OF CONTENTS

LIST OF MAPS

LIST OF FIGURES

CHAPTER I

INTRODUCTION

I have been interested in the prehistory of the Helena Valley for quite some time. I moved to the area in 1977 and soon began to realize how rich the archaeological record for the area really was. While hunting and fishing in the region, I discovered many sites and began asking around about others, which I also visited. Since then, as a student in Anthropology at the University of Montana, I have continued to visit the sites in the Helena area, trying to record new sites and update the known ones. Many of the sites have been actively looted and dug into by amateurs. This has resulted in the permanent loss of vital information concerning prehistory. Other sites are being destroyed by development, as the population has grown and the demand for housing has increased.

Now, as a concerned graduate student, I hope that this thesis concerning the prehistory of the Helena Valley and the surrounding areas will indicate the region's importance as a potential research base for those professional Archaeologists who are trying to contribute to an understanding of the prehistory of Montana. The archaeological record in the Helena Valley and its relationships to other Montana areas are poorly understood at this time. In this thesis I will attempt an

interpretive study of the region's prehistory. Because I have spent a good deal of time in the Helena area and have become familiar with the environment and the archaeological sites located there, certain patterns or recurrent associations in site distributions have become apparent to me. If such "patterns" exist I hope that they can be verified by study. At the very least, I hope to point out the region's potential as a storehouse of archaeological information which might allow significant contributions and advancements in our understanding of the prehistoric cultures that once flourished in Montana.

Research Goals

In addition to visiting most of the recorded sites in the Helena Valley I have attempted to visit known archaeological sites in surrounding regions. I have noted a similarity between the artifact assemblages, site types, and locations, and I feel there is a visible recurring configuration or pattern reflected in the archaeological record. Elsewhere, researchers have recognized settlement and subsistence patterns in past and present cultures, that resulted from subsistence strategies wherein people regularly moved around the landscape so as to be in certain regions when desirable resources were at a peak in availability (Binford 1982, 1983; Bonnichsen and Baldwin

1978; Flannery 1968; Gardner 1980; Lee 1979; Loendorf 1973; McCullough and Wilson 1982; Riches 1982; Thomas 1974, 1979). Though these studies were conducted in other areas, the site patternings they described seemed remarkably similar to those which I am suggesting for this area of Montana. Little professional work has been conducted in this region, aimed at interpretation of the archaeological record.

My goal in this thesis is to test the hypothesis that there is a seasonal settlement and subsistence pattern reflected in the archaeological record in and around the Helena Valley. I also suggest that settlement areas and subsistence activities have changed little over time. I will attempt to identify, describe, and interpret this settlement and subsistence strategy, and also attempt to bring into focus the research problems that should be addressed by future investigators.

Methodology

In preparing for research, I decided I needed to restate my hypothesis, and formulate pertinent questions that would help test this hypothesis and guide my research. The restated hypothesis is:

> The environment and natural resources available within the study area have changed little, if any, over time. Thus, the settlement and subsistence strategies practiced by prehistoric

> peoples have changed little over time. As a result, a continued stable pattern of use is visible in the archaeological record.

The inverse of this hypothesis should also be true, i.e., a change in site distribution, site types, or in activities represented by artifacts in sites, would become visible during analysis and indicate a change in exploitation practices and/or in settlement and subsistence strategies of the prehistoric peoples who occupied the study area.

In order to test the hypothesis, I decided that five questions would have to be answered. These are:

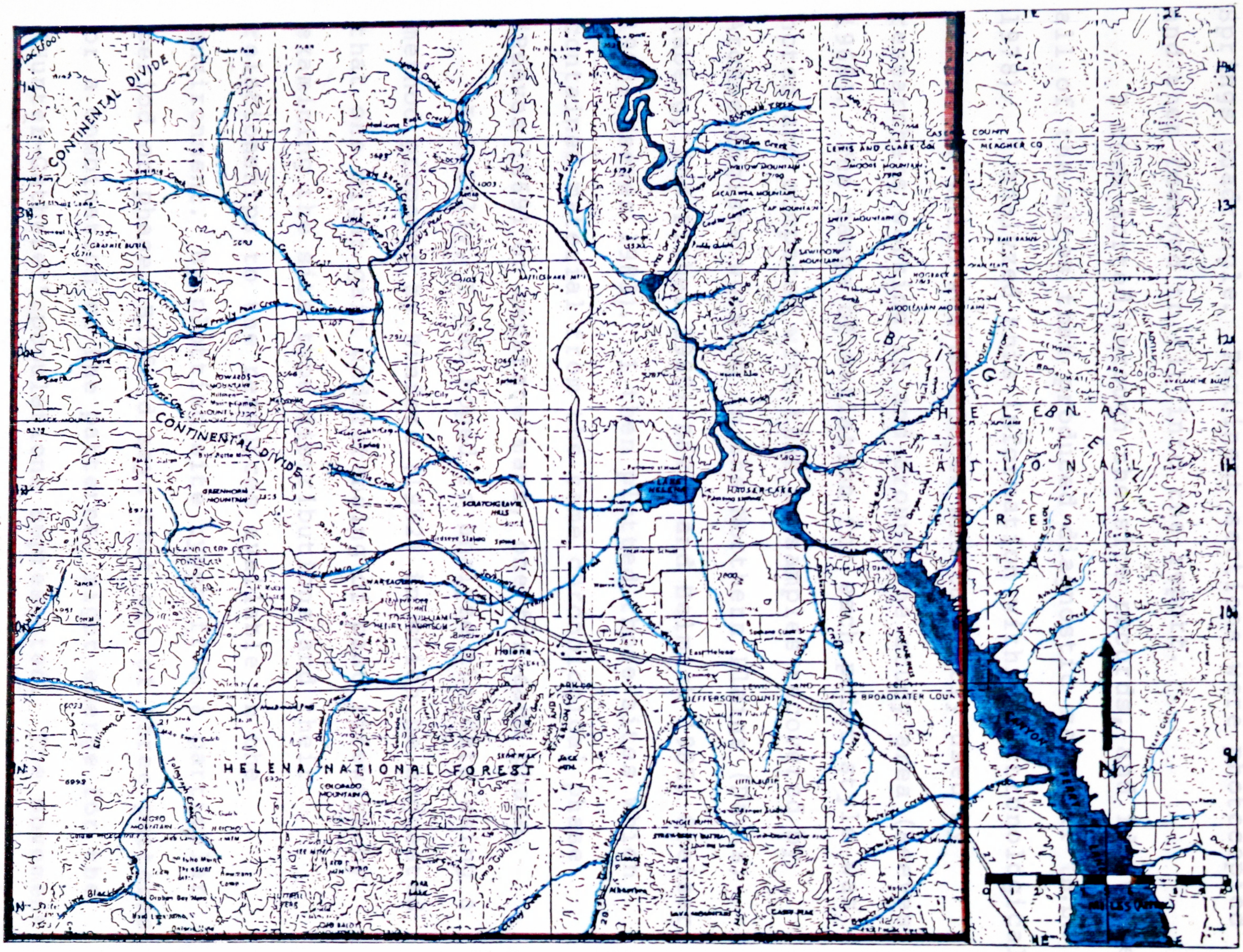
1. What natural resources, including mineral, floral, and faunal, are present in the study area that may have been utilized by prehistoric populations?
2. Based on recorded archaeological sites and the presence or absence of projectile point types or other diagnostics, during what periods or phases was the study area occupied?
3. Ethnographically, what known peoples occupied the study area and how did they utilize the area and its resources?
4. What evidence is there, archaeologically and ethnographically, that would indicate the utilization of the natural resources, and can a model of seasonal exploitation be developed?
5. If these questions can be adequately answered,

could changes in the use and occupation over time be identified? If so, what type of settlement pattern or patterns can be inferred?

To answer these questions, I began the process of building a data base. I began by expanding my study area to include the adjacent areas. The study area of my thesis includes the region located within Township 8 North to Township 14 North, and from Range 1 West to Range 7 West. This is a square that includes an area of approximately 1764 square miles (see Map 1.1).

Once I defined the boundaries of my study area, I contacted Dr. Ernestine Greene, the Regional Archaeologist for the U.S.D.A. Forest Service, to obtain permission to review and include information on sites located on Forest Service land. I then contacted the State Historical Preservation Office in Helena, Montana and requested a complete listing of all recorded archaeological sites located within the boundaries of the study area. To insure accuracy in site locations and site descriptions, I reviewed and abstracted information from all of the forms for the sites located in the study area (see Appendix). These were examined at the Montana State Archaeological Records Office at the University of Montana.

I then sorted the sites by type (see Chapter IV), and plotted each site location on a map of the area. The map



Map 1.1 Study Area

used is composed of portions of two U.S.G.S. 1:250,000 quad maps--the 1958 Butte Quadrangle and the 1958 White Sulfur Springs Quadrangle. Pertinent sections were photocopied and then reduced to fit into the report.

I then sorted through the site records, and identified all of the sites that produced diagnostic material (B.L.M. 1978). I analyzed this information within a chronological framework which was developed and currently used by researchers working in and around the study area (Reeves 1969). The range of variation for each point style was noted and compared with that in samples recovered by Archaeologists working in the Northern Plains (Davis, Aaberg, and Fisher 1980; Davis and Helmick 1982; Greiser 1983; Reeves 1983). I then plotted those sites which contained material from the same chronological phase (Reeves 1969) on separate maps, one for each phase.

Initially, I had hoped to analyze the data using a method proposed by Binford (1982) in which he suggested that one might gain understanding of past lifeways by examining the site type distributions and their relationships to the resources available in the environment. By plotting site types from a particular period or phase, Binford says that one of three patterns, or a combination of the patterns, might emerge for the "Hunter-Gatherer" populations represented. The movement

patterns he identified were labelled the "half-radius continuous" pattern, the "complete-radius leapfrog" pattern, and the "point-to-point" pattern. From these patterns of site distribution inferences can be made about social structure, movement, organization, and the subsistence and settlement strategies utilized, in an attempt to understand the processes of cultural development and change. Dr. Carling Malouf (1987) has also suggested a similar method for understanding and interpreting prehistoric lifeways. However, I had to reject rigorous application of this method because of the quality and biased nature of the existing information about archaeological sites in the study area (see Chapter IV). In addition to limiting the application of Binford's model, I also was not able to apply other methods or models to analyze site distributions and subsistence patterns because they did not fulfill minimal requirements that help to insure validity.

In the end, I analyzed site distributions and clusterings in a rather subjective manner, in an attempt to define and explain the patterns which I believe to exist and also to illustrate problems which might be addressed by future researchers. This was achieved by what might be considered as qualitative means, that is, I described the environment and the available resources, plotted the

distribution of diagnostic materials and their locations in the environment, reported the ethnographic evidence available concerning prehistoric populations in the region, and then inferred relationships between the site locations, the environments, and the evidence available for exploitation of the area's natural resources.

Previous Research

The first professional Archaeologists to work in the region were members of the Smithsonian River Basin Survey crew. Wesley Bliss and Jack Hughes conducted field research around the area to be impacted by Canyon Ferry Reservoir (Bliss 1948; Hughes and Bliss 1947). Dr. Carling Malouf (1950) continued this research during two summer seasons in 1949 and 1950, and was one of the first researchers in the Northern Plains to map stone circle sites. Both research teams visited and recorded sites which were known to local collectors but lay outside of the reservoir area.

In 1950, Richard Forbis, then one of Malouf's students at the university, conducted a survey in the Gates of the Mountain Wilderness Area. He concentrated on land owned by the Hilger Ranch Company (Forbis 1950). In 1952, Richard Forbis and John Sperry reported the results of their test excavations in a site recorded by Bliss and Hughes in 1948,

which they called the MacHaffie site (Forbis and Sperry 1952). Their excavations were jointly sponsored by the University of Montana and by Columbia University in 1951, and the results were reported in Forbis's Ph.D. dissertation (Forbis 1955). This was an important contribution to an understanding of the prehistory of Montana and the Northern Plains, because the excavations demonstrated that Scottsbluff material came after Folsom material chronologically.

The area was pretty much ignored by professionals after this time, although local amateurs continued to collect. Then in 1975, Vern Scarborough reported the results of a survey conducted around Boulder, to the south of the study area, which he had done as part of a cooperative program sponsored by the Western Interstate Commission for Higher Education Project and the Bureau of Land Management. In this report, Scarborough said that "the prehistory of the study area has been badly neglected by professional archaeologists, while amateur diggings go unsupervised and, worse yet, unpublished", and that pothunting had destroyed many key sites in the region (Scarborough 1975). His description could also apply to the area included in this study.

Since the mid-1970s, the Forest Service conducted archaeological surveys. Although scattered and very small

in scale these have produced several very helpful overviews (Knight 1977, 1979; Rominger 1976). Other small-scale surveys, to inventory cultural resources prior to some planned development, have been conducted (Davis, Aaberg, and Fisher 1980; Fredlund 1980; Greiser 1983; Hassler 1981; Herbort 1986; Light 1985; Loscheider and Greer 1979; Melton 1985; Mohler and Spencer 1984; Munday 1978a, 1978b; Novotne 1983; Schwab 1984). These reports are invaluable for designating site locations, but they have not been aimed at making detailed interpretations of the archaeological record. In 1982, Davis analyzed the Troy Helmick Collection from the Canyon Ferry area, and Greiser reexamined the artifacts in 1986, attempting to develop a regional chronology, or at least confirm prehistoric occupations during the various chronological periods (Davis and Helmick 1982; Greiser 1986).

Several other attempts have been made recently to interpret the prehistory of the region. In 1981, Dale Herbort's excavations at the Palmer Chert Quarry contributed to our understanding of prehistoric quarrying technology and processes (Herbort 1981). This site has a radio carbon date of 3450 ± 90 B.P. There it was found that the aborigines had dug pits to assist in their extraction of the chert, and that fire was used in situ to fracture the rock for easier removal.

Davis conducted research at the Pilgrim Site, south and east of the study area in the Limestone Hills, during which a large number of stone circle features were excavated (Davis, Aaberg, Wilson, and Ottersburg 1982). He reported that the site contained evidence demonstrating multiple occupations during different time periods. He suggested that the site was occupied during the spring of the year, and demonstrated the association of stone circles with cultures as early as the Pelican Lake Phase.

Ruebelmann, working for the Bureau of Land Management, prepared an overview for the Lewistown District in which his goal was to interpret the archaeological materials located on B.L.M. lands. He suggested that three types of settlement and subsistence patterns could be recognized (Ruebelmann 1983).

Finally, although he has not yet completed a final report, Davis has conducted excavations at the Indian Creek Site located south and east of my study area. His preliminary reports indicated that the site was stratigraphically intact and covered a span of time from the Folsom Phase up to the Historic Period (Davis 1984). He believed that activities represented at the lower levels included lithic reduction, lithic production, bone or wood working, tool production, and hide preparation. Seasons of occupation ranged from late winter to early spring (Davis,

Greiser, and Toth 1985), although Davis thought the site represented a spring occupation when people came to procure lithics and replenish their tool kits before moving on to other areas included in the seasonal rounds (Davis 1984).

After reviewing all of the available literature, I realized that the actual area examined by professional archaeologists was only a very small portion of the study area, that much of which had not been examined and thus the results of my analysis could be biased and not truly representative. The lack of funding for fieldwork extremely limited the scope of this study.

Summary

The goal of this study is to make a contribution to an understanding of the prehistory of the Helena Valley and the Northern Plains in general. The research is guided by a hypothesis that is drawn from my observations and a desire to ask questions designed to extract knowledge from the data available that would, in turn, help me test my hypothesis. I have reviewed previous research reports, compiled all of the archaeological data available to me, and will attempt an analysis and interpretation of this data even while recognizing that many sites and much of the data may not be known at this time.

In Chapter II, I present the information I have

obtained describing the physical environment and the natural resources available to aboriginal peoples. Here I demonstrate the study area's potential importance as a resource base. Chapter III reviews the cultural prehistory of the region, and there I present the information available concerning periods of occupations, and the area's use over time. Ethnographic summaries indicate how traditional tribes exploited the resources within my area in late prehistoric times. In Chapter IV, I discuss my attempts at analysis and the problems that I had while trying to extract cultural activities from the limited archaeological data. Finally, in Chapter V, I present conclusions and partial answers to the research questions, discuss a possible interpretation for prehistoric evidence found in the study area, and discuss problems in the data base that need to be addressed before more detailed analysis can proceed. I hope to present as much information possible that might contribute to an understanding of the archaeological record in Montana, while also suggesting the great amount of potential archaeological data yet to be found.

CHAPTER II

THE ENVIRONMENT AND IT'S RESOURCES

In North America early man relied on the resources in his environment to provide for all his needs in much the same way as we rely on our local stores. The environment was a sort of warehouse in which were present all the materials he needed for his family's survival. As with modern stores, some environments contained a more complete stock of goods than others. Paleoindians were intelligent consumers. They had to be. They selected their environmental "stores" carefully to ensure receiving the best returns for their efforts. As many anthropological researchers have shown, modern hunters and gatherers have a very informed picture of their environment and base their exploitation decisions and seasonal movements upon their knowledge of the resources in an area (Binford 1978, 1982; Lee 1979; Riches 1982; Service 1966). Under normal circumstances, hunters and gatherers do not just haphazardly move around the countryside using resources as they encounter them. To hunters and gatherers, survival requires forethought and planning so that they can be in the right location at the right time. In other words, they had to plan their movements around the landscape to coincide with resource availability. Clearly, early North Americans behaved in this manner, observing the environment

and noting resource locations, areas of concentration, seasonal availability, and regional dependability.

Other investigators have attempted to analyze areas and archaeological distributions in terms of economics in an attempt to understand how and why early man moved across the landscape (Flannery 1968; Loendorf 1973; Ruebelmann 1983; Smith 1984; Thomas 1979). In a similar manner, I hope to use previously-collected data to reconstruct a picture or model of prehistoric occupation and land use for the Helena Valley.

In this chapter, I give a general overview of the study area including its geology, geography, and climate. Also included is an outline of the natural resources available in the area, focusing on mineral, floral, and faunal resources. The data presented in this outline indicates the region's potential as an area of importance for early man.

Geological Overview

The information on the geology and geography of the Helena Valley presented here has been drawn from the reports of other research specialists who have worked there (Alt and Hyndman 1972; Denny, Carlson, and Crowley 1973). For a more thorough and detailed description, one may refer back to these reports. However, I feel that the following

generalized outline is adequate for the present needs.

The oldest geological materials in the area are from the Precambrian Era, and are represented by sedimentary and metamorphic rocks; these date from 600 million to 3 billion years before the present. These rocks are predominantly sandstones and colorful mudstones, and contain some of the oldest fossils in the world. Precambrian seaweeds are found in materials from this era. Material from the Paleozoic Era overlie much of the Precambrian materials. The city of Helena was built on Precambrian and Paleozoic limestones and mudstones. Sedimentary deposits several thousand feet thick were laid down during these periods due to periodic flooding by ancient seas. These layers are primarily white limestones, mixed with some strata of sandstones and mudstones (Denny, Carlson, and Crowley 1973). Materials from these eras are found along the Continental Divide in the Rocky Mountains along the western edge of the study area. These also occur in the hills and mountains west and south of Helena in the Spokane Hills, the Big Belt Mountains on the east, along the Gates of the Mountains towards the northeast, and in the Prickly Pear Canyon on the northern side of the study area (Alt and Hyndman 1972).

Less colorful deposits of sandstones and mudstones with pockets of limestones were laid down over the area

during the Mesozoic Era some 225 to 60 million years ago, as the oceans continued to flood the area periodically. During the Late Mesozoic Era, "what was once a uniform stratified plain became a contorted, irregular system of hills and mountains" due to the extreme pressure exerted from molten materials which began to rise under the earlier deposits (Denny, Carlson, and Crowley 1973).

The Laramide Revolution, as it is called, produced what is now known as the Boulder Batholith. The intensive heat of the volcanic activity baked some of the older sedimentary deposits, metamorphosing them, producing argillites and marble-like material. Where it erupted through the surface, it deposited volcanic materials. The batholith was created over several million years between 70 and 73 million years ago by several intrusions of molten material. Phases of volcanism are evidenced by granites that "actually looks slightly different" (Alt and Hyndman 1972). According to Davis (1987), "batholith" comes from the "Greek terms for `deep' and `rock'", and refers to a mass of rock "formed by molten lava which solidified into a wedge between other sediment layers". The initial landforms, the mountain ranges and hills, were developing during this era. There is not much agreement between researchers as to how deep or wide the batholith actually is, but its characteristic granites and volcanics are

visible all over the area. The area's mineral wealth is also a result of this formation. Outcrops of material from Mesozoic Eras are visible along the west side of Roger's Pass, since the Rockies in this region were formed at this time. The Scratchgravel Hills, the Big Belt Mountains, and the Elkhorn Mountains were also created during this era (Alt and Hyndman 1972). The Boulder Batholith is in evidence from Helena south to Butte, and due to 70 million years of erosion, it is exposed in "Grizzly Gulch . . . Stemple Pass, Marysville, Lincoln, and Avon" (Davis 1987). It is said that during this era, the area looked like Yellowstone National Park, being "a high plateau of volcanic rocks with still-molten granite magma beneath" (Alt and Hyndman 1972).

During the Tertiary Period of the Cenozoic Era, there was continued geologic activity, including a lot of "surface movement and volcanic action" (Denny, Carlson, and Crowley 1973). Granite intrusions and mineralization occurred during this period, leaving behind basalts, tuffs, quartzites, phosphoria, dolomites, and cherts.

The Quaternary Period of the Cenozoic Era saw the coming of the four Pleistocene Ice Ages; the Nebraskan, the Kansan, the Illinoian, and the Wisconsin (Jennings 1974). After the last Ice Age ended, except for recent erosion, much of the landscape looked very similar to what we know

today.

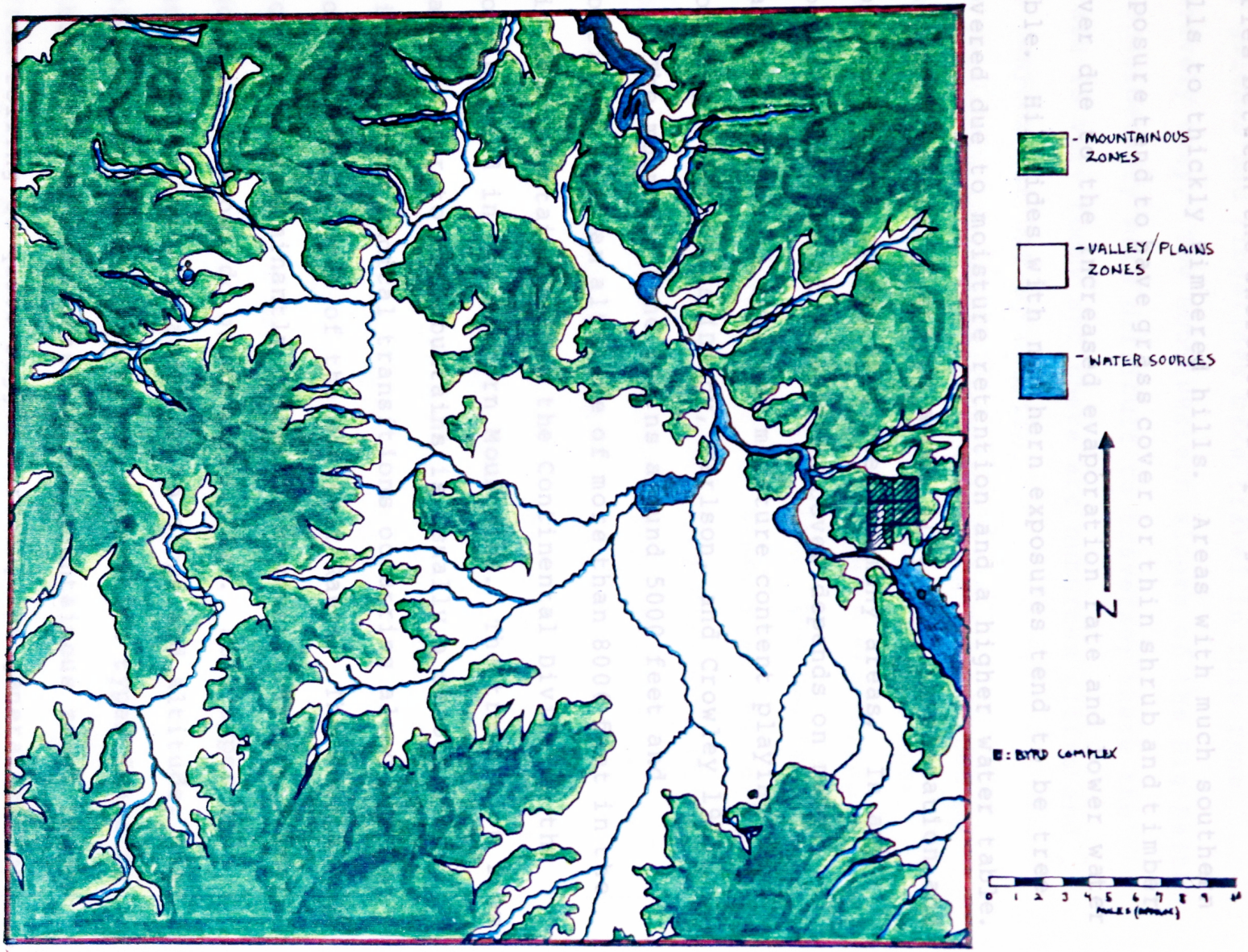
Geological activity still continues in the area today, in forms other than natural erosion due to weather. During the years 1903 to 1935, over 60 earthquakes shook the area, and this activity continues to occur right up to the present (Denny, Carlson, and Crowley 1973). Thermal hot springs are also active in the area.

Geographical Overview

The area of my concern is approximately 1764 square miles, and it is not necessary for my purposes to describe the diversity of the landscape in great detail (see Map 2.1). But a general overview of the area's geographic tendencies is in order.

In general, one could say that the lowest point in the study area is around 3600 feet in elevation; it is located on the northern periphery of the study area in the Missouri River Basin. The Helena Valley is approximately 3800 to 4100 feet above sea level. The Valley floors are usually grasslands, with clusterings of riparian vegetation types along the water courses. However, much of the Helena Valley has been impacted by agriculture, ranching and development.

It can be said that around the peripheries of the valleys, the foothills are a transitional zone between the



Map 2.1 Differentiation between Mountain and Valley Zones

mountains and the valley floors. The foothill environment varies between the extremes of open grass-covered rolling hills to thickly timbered hills. Areas with much southern exposure tend to have grass cover or thin shrub and timber cover due to the increased evaporation rate and lower water table. Hillsides with northern exposures tend to be tree covered due to moisture retention and a higher water table. This zone generally starts about 4100 feet in elevation and continues up to around 5000 feet in many areas. In any location the type of vegetation cover depends on many factors, with soil type and moisture content playing the most important roles (Denny, Carlson, and Crowley 1973).

The mountain zone begins around 5000 feet and continues up to an altitude of more than 8000 feet in the Big Belt Mountains, along the Continental Divide of the Rockies, and in the Elkhorn Mountains. The transition from valley floor to the mountains is usually a smooth slope, with the most radical transitions occurring along the southwestern slopes of the Big Belt Range. The mountainous zones are predominantly timbered, however, large and small mountain meadows do occur quite often. Soil types and moisture content, in addition to slope and altitude, also play a significant role in the vegetation types found in this zone. The character of the mountainous zones ranges from rolling to quite rugged terrain, and generalizations

are hard to make. Judging from my personal experience, the many gulches and ridgelines make travel in this zone relatively easy. The southwestern slopes of the Big Belts are considerably more difficult to traverse; there the terrain is very rocky and there are numerous cliffs and deep canyons cut out by erosion.

Travel in and out of this region is facilitated by five mountain passes over the Continental Divide that connect the study area with the valleys to the northwest and west. These passes are still used. Two routes exist in the north central region of the study area, the Prickly Pear Canyon, and the Gates of the Rocky Mountains Canyon through which flows the Missouri River. The Missouri's size and flow has been altered by historic dam construction, but this route was used by Lewis and Clark in 1803 and was open in prehistoric times. Beaver Creek and Trout Creek are currently used as access routes into the Big Belt Mountains on the northeast edge of the study area. On the east, travel is unhindered over the low rolling foothills between the Spokane Hills and the Elkhorn Mountains. Once through this low pass, travel on the relatively flat river terraces on both sides of the Missouri is easy. Several fords across the Missouri River were noted by Malouf (1950) during an earlier survey before the construction of Canyon Ferry Dam. Finally, in the

southern end of the study area lies the drainage of Prickly Pear Creek, which creates a passageway to and from the Boulder area. In addition to these major travel routes there are numerous trails entering and leaving the valley in virtually every direction. I have mentioned all of these routes to demonstrate that the study area has never been physically isolated from the surrounding regions.

I have not given detailed descriptions of particular localities within the study area. Other researchers, including Archaeologists, have divided their project areas into soil zones, vegetation zones, and landforms, but their goals and methodologies differed from mine (Davis, Aaberg, and Fisher 1980; Denny, Carlson, and Crowley 1973; Hassler 1981; Herbort 1987a; Scarborough 1975). Suffice it to say that I feel that anything beyond making generalized distinctions between mountains, foothills, and valleys and acknowledging the range of vegetational variation between them, is making an abstraction that does not reflect reality and would not contribute to my analysis. I do not deny the conceptual existence of micro-environments or the fact that there is a difference in vegetation between mountain zones and valley zones. I just think it is important to recognize that the boundaries drawn between them are abstractions and that in reality change is continuous across these zones. In fact, in reality it is

possible to walk in a straight line for an hour and cross all of these zones, sometimes more than once. Instead of separating the ecosystem of the study area into many parts, I prefer to look at the whole and the relationships along that continuum.

Water sources in the forms of creeks, springs and the Missouri River, are numerous in the study area as can be seen on any map (see Map 2.1). Availability of water was never a problem for peoples in the area.

Climate

The climatic information presented here is a generalized overview, much of which has been drawn from a land use report prepared for the Diehl Development Corporation (Denny, Carlson, and Crowley 1973) and is supplemented by my personal observations. This is a generalized description that might not hold true for all the micro-environments within the study zone.

The semiarid climate of the Helena Valley has been described as a "Modified Continental Climate" type, with the modifying factors being: 1) "invasion by maritime air masses from the Pacific Ocean; 2) cool air drainage into the valley floor from surrounding mountainous regions; and, 3) a protective mountain barrier in all directions resulting in smaller temperature changes than are normally

expected in a true continental climate" (Denny, Carlson, and Crowley 1973). Invasions of Pacific air masses result in increased precipitation normally ranging from 9 to 10 inches in the valley to 30 inches along the Divide, coming in the form of snows in fall and winter, and rain in the spring and summer. The cool air drainage into the valley floor results in cool evening temperatures in summer and winter, although during a temperature inversion, a reverse effect can result, usually during the colder months. The protective mountain barriers help protect the valley from drastic temperature changes and from severe seasonal storms. The winds are usually from the west, with seasonal shifts from the west, west-northwest, and west-southwest directions (Denny, Carlson, and Crowley 1973).

The first frost usually occurs around September, signaling the beginning of the cold season. Winter conditions begin in November and last through February, with the coldest period occurring in January. During this time, temperatures frequently drop below zero, and can hover around zero for weeks at a time. Winter snowfall is usually heavier in the mountains, with lighter amounts falling in the valley, though deep drifts may occur. However, it should be pointed out that winds and sun exposure affect the depth of snow on the ground more than does elevation (Denny, Carlson, and Crowley 1973). It

should be mentioned that chinook winds do occur in the area quite often during winter; this raises the valley temperatures significantly and at times causes most of the snow build-up to disappear overnight.

Springtime in the area is characterized by windy and cloudy days, although these may alternate with periods of snowfall, rain, and relatively warm, sunny days. Snowstorms in the mountains are not uncommon as late as June. The last frost of spring usually occurs in the valley around mid-May. Thunderstorms, particularly afternoon and evening storms, are quite common at this time, but are most active in July. Summertime is characterized by warm daytime temperatures, and because of the cool air drainage from the mountains, there is significant cooling at night. The highest temperatures, often 90 degrees Fahrenheit or above, occur between July and early September, with the warmest month being August. During August, temperatures may exceed 100 degrees. The frost-free season, or growing season, is approximately 134 days in duration (Denny, Carlson and Crowley 1973).

Climate variations do occur in the study area from year to year. There may be "T-shirt weather" in January, and relatively cold periods during the summer. For the most part, the above description does hold, particularly when viewed over a period of years. All considered, the

study area has a pleasing climate year-round; extremes in weather conditions happen rarely and last only for short periods of time when they do occur.

Natural Resources

In order to evaluate the potential importance of the area to the Paleoindians, I thought it necessary to identify the many resources that would have been available to early hunting and gathering peoples. In a yet unpublished report, Herbort's (1987a) analysis has indicated that there has been no radical change in the region's environment for the past 10,000 years or more. In that report he determined that the changes should be viewed "in terms of greater or lesser degree rather than a disappearance or introduction of species." Erosional processes have altered the landscape to some degree, and fluctuations in plant communities have occurred (Foor 1987; Herbort 1987a). That there has been a warming trend since 12,000 B.P. is apparent in the glacial deposits in the mountains around Helena (Melton 1985). However, archaeological deposits indicate that many, if not all, of the resources identified in this thesis have been available since man's earliest presence in the area (Davis 1984; Davis, Greiser, and Toth 1985; Forbis 1950).

After reviewing the literature I made an assumption

that if the environment has not significantly changed, then the availability of the resources has not changed either, although fluctuations in floral and faunal types and numbers were likely. I hoped that by making this assumption and by identifying the available resources, I could define the changes in prehistoric settlement and subsistence patterns and preferences throughout time as Thomas (1979) did in the Reese River Valley and as Flannery (1968) did in Meso-America.

The resources I focus upon in this section are those which seem to have been utilized and exploited by prehistoric peoples. I included resources in this section if some evidence was found in archaeological sites within or near the area, or if ethnographic accounts reported them to have been utilized by local prehistoric populations. Archaeological "proof" for floral resources used in the study area is very limited, sometimes nonexistent, and the reports describing faunal remains in archaeological context are relatively rare. There are a few notable exceptions (Forbis 1950). I divided the resources naturally available for native people's use into three categories: A) mineral resources; B) faunal resources; and C) floral resources.

A). Mineral Resources

The use of the majority of mineral resources here is

indicated by the presence of the material in archaeological sites--with the exception of hematite.

Hematite, or iron oxide, is a mineral used for paint pigment, and is found at various locations in and around the study area. It is included here because it is reported to have been exploited by the Flathead Indians, who obtained the mineral from a quarry or cave near Helena (Teit and Boas 1975). The exact location of this quarry is unknown. However, Malouf (1950) recorded one possible quarry site located in the Spokane Hills.

Chert "is a rock of sedimentary origin, composed of silica derived from an original precipitate or as a replacement by-product of calcium carbonate materials" (Greiser 1986). The Madison, Jefferson, and Kootenai formations contain numerous outcroppings of this material (Denny, Carlson, and Crowley 1973), and cobbles or chunks of it are found in most of the gravel deposits along water courses in the area (Stanfil 1987). Numerous archaeological quarries, especially those located in the Montana City area, have been recorded by various researchers (Fredlund 1980; Melton 1985; Munday 1978 , 1979). One of these, the Palmer Quarry, has been excavated and reported (Herbort 1981).

Some researchers have attempted to distinguish between chert types and their source locations, but this does not

seem to be possible at this time. Geologists usually do not distinguish between types, calling them all cryptocrystalline silicates. Color and texture alone are not adequate attributes that would enable exact source identification, but perhaps they do indicate the geological formation from which they came. I have seen virtually all colors of the rainbow, and all textures, in the materials available around Montana City. It would require much more work, including trace element analysis, for source identification to be possible. Currently, 15 archaeological chert quarries have been recorded in the study area (see Appendix).

Agate, also called chalcedony, has been distinguished from chert by archaeologists working in the area. Geologists tend to lump this material in with the cherts, though some forms, silicified woods for example, are the result of mineralization of organic material. Sources for agate are gravel deposits found "in the general vicinity" (Greiser 1986). Deposits of this material have been noted around Beaver Creek on Canyon Ferry Reservoir and other areas along the Missouri River (Stanfil 1987), and from the foothills around Lake Helena. One quarry site containing agate has been recorded in the study area (see Appendix).

Quartzite is "a compact granular rock composed of quartz and is derived from sandstone" as defined by the

Merriam-Webster Dictionary. Quartzite is also a silicate, although it usually has a larger grain size than chert. Quartzite cobbles are found in stream beds and gravel deposits throughout the study area (Stanfil 1987). One quarry site has been recorded in the study area (see Appendix).

Basalt is "a very common black igneous rock, most often volcanic, but also found as intrusions such as dikes and sills" (Alt and Hyndman 1972). Basalt nodules are widely available in the area (Greiser 1986), being noted in the Canyon Ferry and Missouri River gravels (Stanfil 1987), the Prickly Pear Creek drainage (Herbort 1987a), and from around Lava Mountain on the southern perimeter of the study area (Foor 1987). So far, only one quarry containing basalt has been recorded within the area (see Appendix).

Other materials from which tools can be made are available close by. These include porcellanite (Greiser 1986), silicified ash (Stanfil 1987), silicified limestones (Davis, Aaberg, and Fisher 1980), tufts (Alt and Hyndman 1972), and mudstone or platy-green chert (Greiser 1986). Many of these materials can be found in local gravel deposits. At any rate, these mineral resources are available in accessible areas in the surrounding vicinities as indicated by the quarries recorded (Stanfil 1987).

B). Faunal Resources

The faunal or animal populations in the study area appear to have remained much the same since man's earliest occupation. Several species have become extinct including mammoth, muskox, and big brown bear (Melton 1985). Bison, possibly several forms, have been identified archaeologically, as have wolves (Forbis 1950). Bison and wolves were both present historically but have since disappeared from the landscape due to hunting pressures.

Other animals are known to have been present, and their range and habitat, prehistorically and historically have been described (Lee Rue 1971). Elk, white-tailed deer, mule deer, and moose are found throughout the area. Elk can be found in the mountainous country throughout most of the year, although they come down to lower elevations during the winter. This may well be the result of years of recent hunting pressure, because early explorers reported elk herds in the plains and river bottoms (Coues 1893; Schultz 1974). White-tailed deer prefer the shelter available in river and stream bottoms, although they can be found in other densely-wooded areas in high country. Mule deer range from the high, mountainous country to the open plains and river bottoms and surrounding grasslands and sagebrush flats. Moose typically prefer the moist environments found around river and stream bottoms,

mountain lakes, and bogs or marshy areas. They do move up to higher altitudes and densely-wooded areas periodically, especially in the winter when snow and ice obscure some feeding zones. Much to my surprise, I ran into a small herd or 8 or 9 moose on the Continental Divide in late November of last year.

Bighorn sheep and mountain goats are also found in the study area, but they usually inhabit the secluded and rocky mountainous country that is not easily accessible to man. They are, however, present along the Missouri River's edge in Gates of the Mountains, and congregate around salt licks occasionally. Pronghorn antelope are usually found in the grassland environments of the valley floor and the surrounding foothills.

Large predators found in the area include grizzly bears, black bears, mountain lions, coyotes, fox, bobcats, and lynx. These animals may not have been much used as food, but their furs were most certainly in demand. The predators range all over the area, exploiting the transitional zones as they follow the game animals.

Many species of small game and non-game animals could have been sought for food and for their fur. Badgers, wolverines, weasels, river otters, beavers, muskrats, cottontail rabbits, jackrabbits, varying hares, marmots, prairie dogs, porcupines, skunks, and ground squirrels are

some of the small animals present in the area.

Birds and fish also played an important role in some hunting and gathering societies, although traditionally they were not important in Plains societies. Bird species that are reported as either food or feather sources (Smith 1984), and inhabit the area include ducks, geese, pelicans, great blue herons, grouse, sage hens, prairie chickens, golden eagles, bald eagles, several species of hawks, falcons, osprey, and owls. Native fish include whitefish, trout, and suckers. When spawning in the spring and fall, fish congregate in many of the smaller creeks and could have presented an irresistible food resource.

This is not an extensive list of the species available, only a description of those animals that are mostly used by hunting and gathering peoples.

C). Floral Resources

At this point, the use of floral resources must be inferred from ethnographic records of modern tribes whose ancestors may have occupied the area. These are the Blackfeet, Kutenai, and Flathead Indians (Hart 1976; Johnston 1969; Kidd 1986; McClintock 1968; Smith 1984). I did not include information about the Shoshones, although their ancestors may have been in the study area (Teit and Boas 1975; Turney-High 1937). This is because when

contacted and observed by early ethnographers, they no longer occupied the region covered in this thesis. Most of the information available concerns the Shoshone who had adapted to the "marginal environments" in the Great Basin; the limited information available concerning Shoshone groups in the Plains during historic times suggests their diet and resource usage was very similar to other Plains peoples.

Dale Herbort, who is currently preparing a report on the area, was kind enough to send me a list of useable plants found within a 25-mile radius of Montana City. Useable plants, as defined in Herbort's (1987b) study, include those which provide food, medicines, tools, and shelter. The list includes some 212 separate plants. Of those, 119 are reported as being edible. Using it as a guide, I crosschecked this list with information derived from the ethnographies mentioned earlier. If a plant was mentioned as being used by the various groups as a food, I included it on my list (See Figure 2.1), if not, it was not considered.

In addition to Herbort's list, I included several other plants, fungi, and lichens that reports mention as a food source, and that were available in the study area. I have included all plants used as food, whether it was considered a famine food or a desirable food. I chose to

Figure 2.1

EDIBLE PLANTS FOUND IN STUDY AREA

GRASSES AND GRASS-LIKE PLANTS	Common name	Part	Season
Oryzopsis hymenoides	Indian ricegrass	seed	-
Scirpus validus	Bulrush	root/tuber	Autumn
FORBS			
Agastache urticifolia	Nettle-leafed giant hyssop	leaf	-
Allium brevistylum	Short-style onion	bulb	Spring
Allium cernuum	Nodding onion	bulb/leaf	Spring
Allium textile	Textile onion	bulb	-
Astragalus crassicarpus	Milkvetch	root	-
Balsamorphiza sagittata	Arrowleaf balsam root	root	Spring
Camassia quamash	Camas	bulb	Spring/Summer
Cirsium foliosum	Elk thistle	root	-
Cirsium undulatum	Wavy leaf thistle	root	-
Claytonia lancelata	Spring beauty	corms	Spring/Summer
Disporum tracaycarpum	Dog feet/fairy-bells	berries	-
Erythronium grandiflorum	Glacier lily	root	Spring
Fragaria vesca	Woodland strawberry	berry	Spring
Helianthus annus	Sunflower	-	-
Helianthella uniflora	Rocky mountain helianthella	-	-
Heracleum sphondylium	Cow parsnip	stalk	Spring
Lewisia rediviva	Bitterroot	root	Spring
Liatris punctata	Blazing star	root	-
Lomatium macrocarpum	Large-fruited lomatium	-	-
Lomatium triternatum	Nine-leaf lomatium/biscuit root	root	Spring
Mentha arvensis	Field mint	leaves	-
Musineon divaricatum	Leafy musineon/evening primrose	root	-
Oenothera cespitosa	Tufted evening primrose	root	-
Oenothera villosa	Rydberg's evening primrose	root	-
Opuntia polyacantha	Plain's prickly pear	leaf	Spring
Orobanche fasciculata	Clustered broom rape	-	-
Perideria gairdneri	Yampa	root	Spring/Summer
Polygonum bistortoides	Bistort/smartweed	root	-
Potamogeton species	Pondweed species	-	-
Potentilla anserina	Silverweed	root	-
Sagittaria species	Arrowhead	tuber	-
Typha latifolia	Cattail	root/stalk/pod	-
Valeriana dioica	Marsh valeriana	root	-
Vicia americana	American vetch	root	-

Figure 2.1 (contd.)

EDIBLES PLANTS FOUND IN STUDY AREA

SUBSHRUBS	Common name	Part	Season
Arctostaphylos uva-ursi	Kinikinnick	berry	Fall
Mahonia repens	Oregon grape	berry	Summer
Rubus parviflorus	Thimbleberry	berry	Summer
SHRUBS			
Amelanchier alnifolia	Western serviceberry	berry	Summer/Fall
Cornus stolonifera	Red osier	berry	Summer/Fall
Crataegus species	Hawthorn species	berry	Summer/Fall
Prunus virginiania	Chokecherry	berry	Summer/Fall
Ribes aureum	Golden currant	berry	Summer/Fall
Ribes cereum	Squaw currant	berry	Summer/Fall
Ribes hudsonianum	Stinking currant	berry	Summer/Fall
Ribes lacustre	Prickly currant	berry	Summer/Fall
Ribes setosum	Redshoot gooseberry	berry	Summer/Fall
Rosa arkansana	Prairie rpse	hips	Summer/Winter
Rosa woodsil	Wood's rose	hips	Summer/Winter
Rubus idaeus	Red raspberry	berry	Summer
Sambucus racemosa	Black elderberry	berry	Summer/Fall
Shepherdia argentea	Silver buffaloberry	berry	Summer/Fall
Symphoricarpos occidentalis	Western snowberry	berry	Fall
Vaccinium globulare	Huckleberry	berry	Summer/Fall
Vaccinium scoparium	Grouse whortleberry	berry	Summer/Fall
TREES			
Larix occidental	Western larch	cambium	Spring
Pinus albicaulis	Whitebark pine	cambium	Spring
		nuts	Fall
Pinus contorta	Lodgepole pine	cambium	Spring
Pinus flexilis	Limber pine	-	-
Pinus ponderosa	Ponderosa pine	cambium	Spring
		nuts	Fall
Populus balsamifera	Black cottonwood	cambium	Spring
Populus termuloides	Quaking aspen	cambium	Spring
LICHENS AND FUNGII			
Alectoria fremontii	Black tree moss	-	-
Polyporus tuberaster	Tuckahoe/stone fungus	-	-
Lycoperdon spp.	Puffballs	-	-

focus on edible plant resources in this section, assuming that these would influence early man's occupation patterns, when viewed from a subsistence and survival standpoint. I am not denying the importance of other useable plants, I just do not feel that their presence alone would be a determining factor for group occupation. However, knowing that 212 useable plants were found in such a small area certainly adds to the potential importance of the location.

There is a difference in seasonal availability for the plants I have listed. In general, those plants producing roots, corms, stalks, bulbs, and cambial layers that were used as food were exploited in the late spring and early summer. The plants producing seeds, berries, and nuts were harvested in the late summer and early fall. Herbort (1987a) has noted that many plants grow in a restricted environment. Here again I emphasize that an individual could gather materials in each of these environments by traveling only a short distance. This underlying concept will be dealt with in a forthcoming chapter.

Summary

My goal in this chapter was to identify factors that indicate the area's potential importance to early hunters and gatherers. I have described the area as being one wherein it was relatively easy to move from one elevation

to another. The area was easily accessible both to and from surrounding regions, had a plentiful water supply, mild seasonal shifts and protection from severe storms. Numerous natural resources were available within a relatively small locale. I believe that the study area should be seen as part of the transitional zone between the plains and the mountains, offering in a small-scale area the best of both worlds.

CHAPTER III

ARCHAEOLOGICAL AND ETHNOGRAPHICAL INFORMATION FOR OCCUPATION OF THE STUDY AREA

In the previous chapter, I tried to define those attributes that would make this location desirable to prehistoric populations. In this chapter I discuss the evidences pertaining to when the area was occupied, who was there, and where archaeological sites were situated. By combining archaeological and ethnographic information, I hope to answer these questions so that we can address the questions of why and how the study area was used in Chapter IV.

First, in order to determine when the study area was occupied I reviewed the site forms for sites in the study area, and the survey reports for there and the surrounding regions. I examined the archaeological assemblages reported and used the diagnostics reported. Out of the 153 sites included in my analysis, 34 sites were found to contain diagnostic materials, i.e., projectile points, which have been dated in sites located elsewhere on the Northern Plains. My data, however, is limited because I was unable to view all of the materials that have been recovered by the various researchers. To some extent my identification of diagnostic artifacts depended on the verbal descriptions and the type identifications found on

the site forms or in reports, to line drawings and sketches included on some forms, and, rarely, to photographs included on site forms. Some investigators reported projectile points present in sites, but did not identify them by type or include drawings or photographs. I decided that I would have to use simple profile outlines of the artifacts reported. I then used these plus the verbal descriptions to determine the various types of projectile points represented. After the profiles were completed, I compared each individual example to type-specimens illustrated in the B.L.M. guidebook, and to other reports that contained photographic plates illustrating the range of variation in various point types from the Northern Plains (B.L.M. 1978; Davis and Helmick 1982; Greiser 1986; Reeves 1983; Wormington and Forbis 1957). I checked my types with faculty and colleagues to insure our agreement on categories. Once type identification was completed, I then adopted a chronological framework that has been developed and used by some workers in the northwestern plains (Reeves 1969). I adopted this chronology (see Figure 3.1) because there has not been enough research and excavation in the Helena Valley to provide a local chronology (Greiser 1986). Once I had adopted the chronological sequence and my data was organized within that framework, I then plotted the sites on a map according

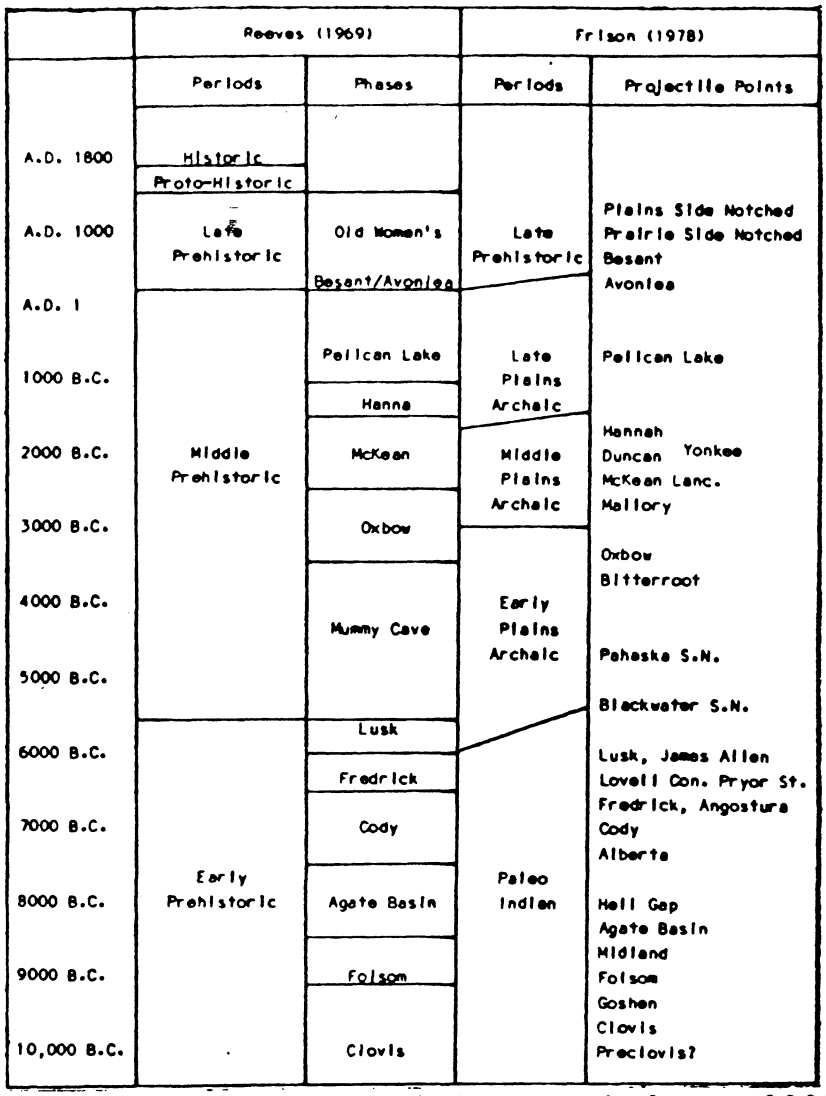


Figure 3.1 Chronology (after Ruebelmann 1983)

to their legal locations and verbal descriptions as recorded on the site forms. I made a separate distribution map for each major time period to determine whether or not the distribution of sites varied over time.

Secondly, I reviewed the written records about the traditional Late Prehistoric occupants in the area. In this section I present the available information that contains specific references to the occupation and activities in and around the area. This will demonstrate use of local resources and provide a historical example which may compare with exploitation during prehistoric times.

An analysis of an area's prehistory has traditionally involved the manipulation of archaeological evidence in terms of time, form, and space (Willey and Sabloff 1980). This will be addressed in the present chapter, as this analysis must precede my attempts to gain an understanding of the "processes" or "dynamics" of those prehistoric cultures with which I will deal in the following chapter (Binford 1968).

The Archaeological Record

As stated above, I organized my data according to a chronological sequence developed by Reeves that he based on data from sites in Alberta and Montana. This framework

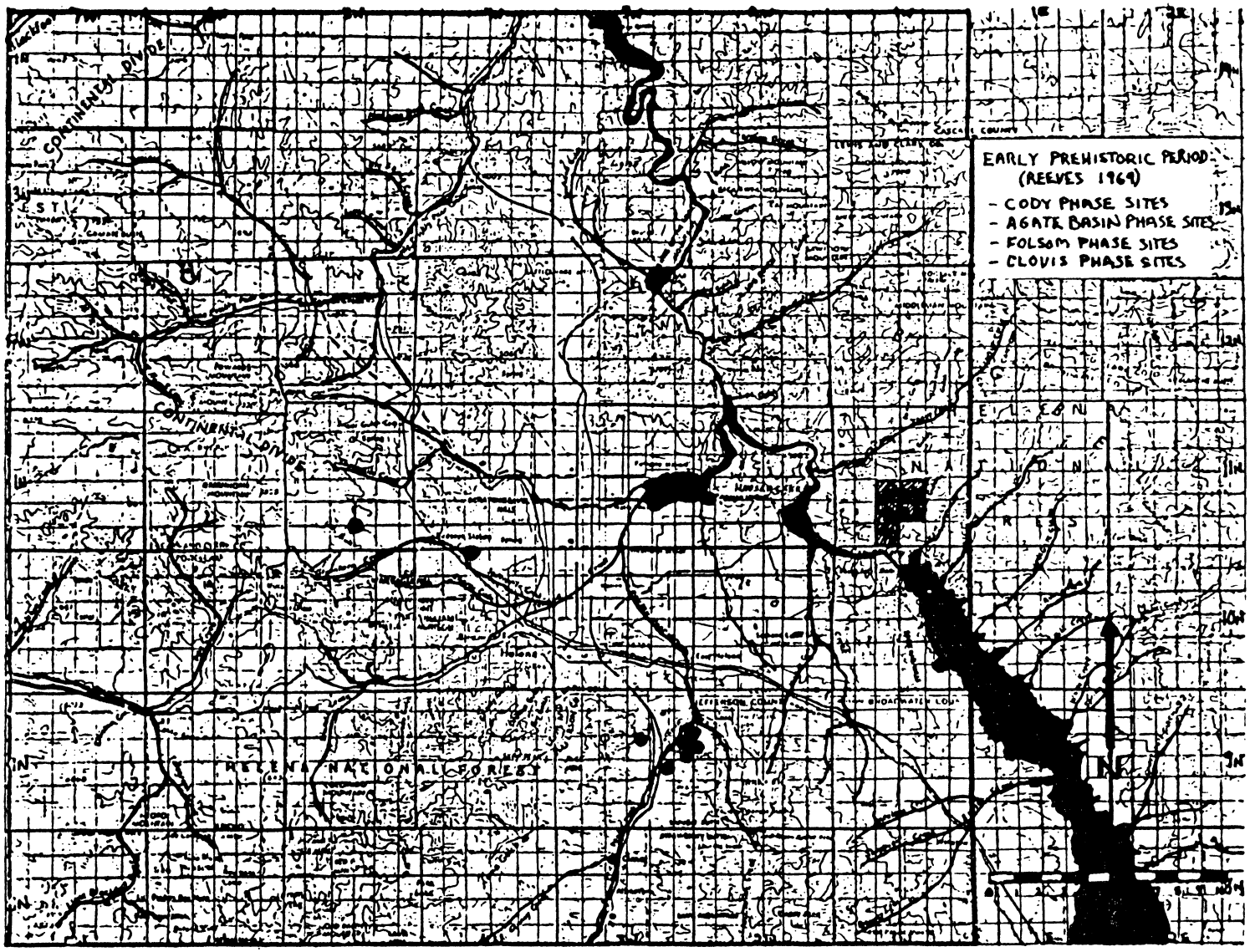
seems to be acceptable for use near the Helena Valley as all projectile point types identified are included in Reeves' scheme. I have left out Reeves' "traditions" category because, although it is suggested, my data is not complete enough to support the traditions. I have included another chronology developed by Frison (1978) for comparative purposes and as a convenience for other researchers (see Figure 3.1).

The earliest materials present in the sites are from the Early Prehistoric Period, and include artifacts from the Clovis, Folsom, Agate Basin, Cody, Frederick, and Lusk Phases. Diagnostic materials from each phase of this period are well represented in the archaeological record of the study area and surrounding regions.

The Clovis Phase lasted from before 10,000 B.C. to around 9,000 B.C. on the Northern Plains. The populations of this period are usually considered to have been big game hunters who concentrated on mammoth, but faunal remains from some Clovis sites include camel, deer, horse, elk, and various small animals (Reeves 1969). In addition to the faunal remains, Frison (1978) has reported a possible grinding stone at the Colby Site which he feels indicates more than a strict hunting economy for Clovis populations. Kill sites dating from this phase were usually located near springs or bogs, while campsites were situated on stream

terraces (Jennings 1984; Reeves 1969).

The Clovis Phase is represented by two surface finds in the Helena Valley (see Map 3.1). Mrs. George MacHaffie found a projectile point from 24JF4 in the stream bed just below the MacHaffie Site. Forbis (1955) first identified it as Clovis, but upon reconsideration decided it lay within the range of Folsom variations. There is a cast of this specimen in the University of Montana collection. Based on a discussion concerning flint knapping processes with Alan Stanfil (1987), I decided to consider it as a Clovis point in my analysis. My reasons for including this as a Clovis point are: 1) This point appears to be much larger than other Folsom points in the MacHaffie Site collection; 2) the fine edge flaking characteristic of Folsom is absent; 3) one side exhibits what appears to be the primary fluting scar, a characteristic of Clovis; 4) the reverse side exhibits an uncontrolled expanding fluting scar that passes over the surface, then through the point, removing the tip, and appears to represent the secondary fluting attempt; and, finally, 5) if this were a Folsom point in production, it most probably would have been salvaged, whereas a Clovis craftsmen, being unfamiliar with the Folsom form, probably would have discarded his mistake. These are my reasons for treating the specimen as a Clovis point that was rejected during production.



Map 3.1 Distribution of Paleo Phase Sites

A second Clovis point (see Figure 3.2) was also recovered off the surface by Carol Novotne (1983) during an inventory in the Scratchgravel Hills. Both Clovis Phase surface finds were located close to streams in foothill environments (see Map 3.1).

The Folsom-Midland Phase lasted from approximately 9,000 to 8,500 B.C., and is represented in three of our sites (See Figure 3.2). The MacHaffie Site is perhaps the most famous site in Montana reported to date; excavations there demonstrated that Folsom materials preceded Scottsbluff materials in time (Forbis 1955). Faunal remains from Folsom sites, including the MacHaffie Site, consist of several forms of bison, deer antelope, elk, wolf, fox, rabbit, muskrat, and turtle. Kill sites include pounds, traps, and the first evidence of use for a bison jump (Frison 1983). Folsom sites are usually located near a water supply (Reeves 1969). Two possible house structures 6 feet to 12 feet in diameter with postmolds are reported in the Midland component at the Hell Gap Site, and there is evidence from the Hanson Site that suggests a hunting and gathering economy (Frison 1978). The three Folsom sites recorded in the area are located near water; two on spring-fed streams and one on a creek which is now covered by Lake Helena (see Map 3.1).

From just outside of the research area, evidence for

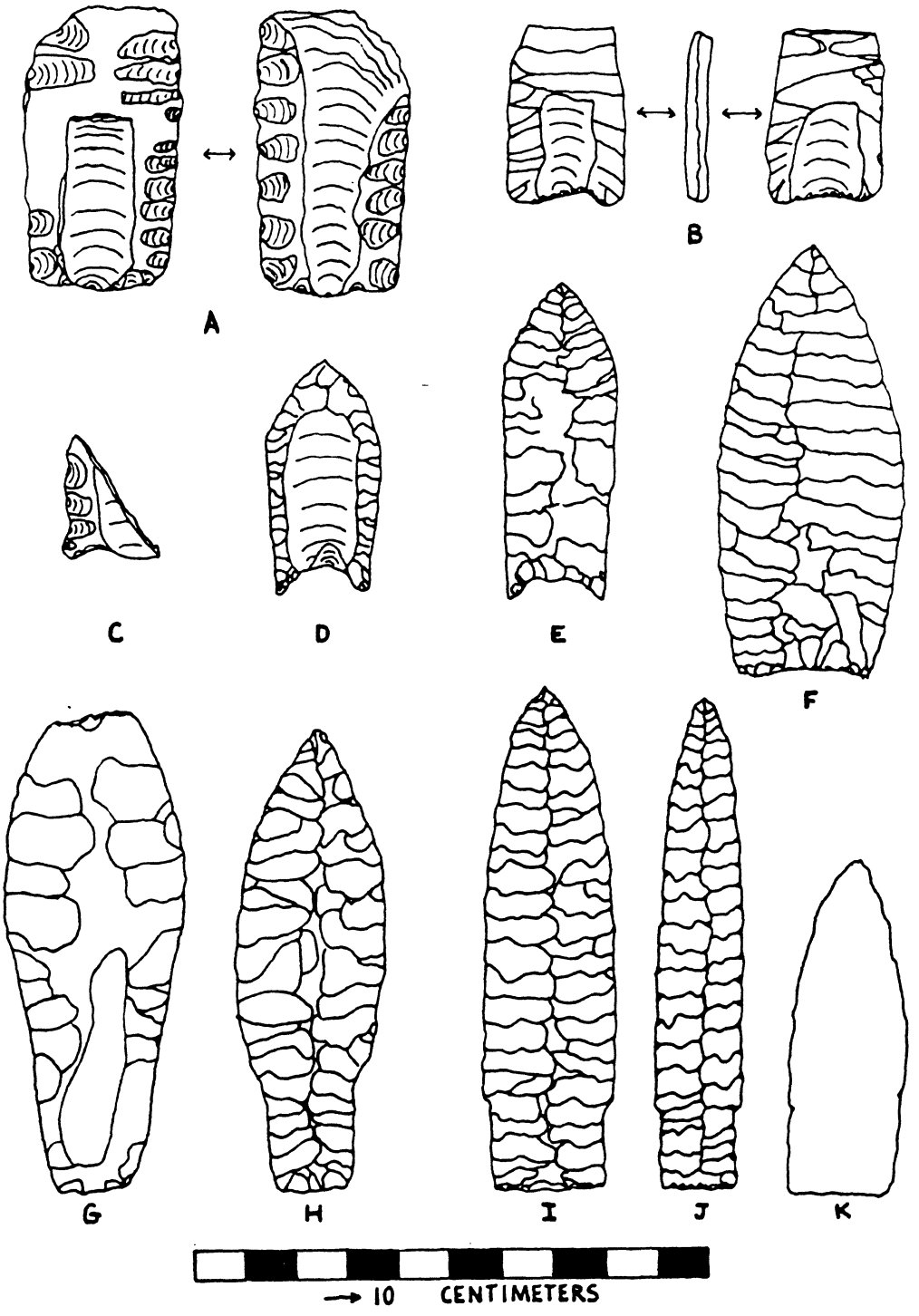


Figure 3.2 Projectile Point Styles

A=Clovis (MacHaffie Site-Cast); B= Clovis (Novotne 1983); C=Folsom (MacHaffie Site-Cast); D= Folsom (B.L.M. 1978); E= Midland, F= Brown's Valley (Wormington 1957); G= Hell Gap (Davis and Helmick 1982); H= Hell Gap (B.L.M. 1978); I,J= Scottsbluff/Alberta (Wormington 1957); K= Scottsbluff/Alberta (MacHaffie Site-Cast)..

occupation during this Phase was found at the Indian Creek Site, near the southern end of Canyon Ferry Reservoir on Indian Creek (Davis 1984). The site is currently still under investigation, but it is stratified with Folsom materials located just on top of Glacial Peak ash deposits. Preliminary analysis indicated a seasonal occupation or occupations, during the late winter, early spring months (Davis 1984). Lithic wear analysis indicated such activities as "lithic procurement and curation; lithic tool production and maintenance; food procurement, processing, and preparation; hide working, and/or bone, antler, or wood working" (Davis, Greiser, and Toth 1985). Surface finds of Folsom- and Midland-type points along the Missouri to the north have been reported by Maynard Shumate (1982).

The Agate Basin-Hell Gap Phase dates from approximately 8,500 to 7,500 B.C. and is represented in our locality by only one site (see Figure 3.2). This site was located by John Taylor, a B.L.M. Archaeologist, on a saddle between two high points overlooking the Prickly Pear Valley (see Map 3.1). Faunal remains from sites of this phase on the plains include bison, antelope, deer, and several types of rodents. Sites are usually located in or near springs or in sheltered valleys (Reeves 1969). Frison (1978) reports evidence of three structures for this period at the Hell Gap Site, and has noted that grinding tools are

documented at a site dating 7,500 B.C. Hell Gap and Agate Basin points are included in the Helmick Collection from the southern shores of Canyon Ferry Reservoir along former banks of the Missouri River at confluence points of feeder streams (Davis and Helmick 1982; Greiser 1986). Napton has reported Agate Basin points from sites in the Avon Valley which is over the Continental Divide and west of the study area (Melton 1983) but still relatively close. Shumate (1982) reported surface finds of both Agate Basin and Hell Gap types near Great Falls.

There are four sites in the Helena area with diagnostic artifacts representing the Alberta-Cody Phase, but the material was typed as Scottsbluff. The difference seems to be in preference for certain type names, not in time periods. I have not attempted to differentiate between Alberta and Scottsbluff points, because examination of artifact casts from the MacHaffie Site indicates that they fall into the range of variation for both (see Figure 3.3). The approximate time period represented by this phase runs from 7,500 to 6,500 B.C. A carbon date for the Scottsbluff level at MacHaffie falls within this range, being 8,100 B.P. or 6,150 $\pm$ 300 B.C. (Davis 1982b). Faunal remains associated with the Scottsbluff (Alberta-Cody) Phase sites include bison, deer, coyote, beaver, jackrabbits, cottontail rabbits, raccoon, various rodents,

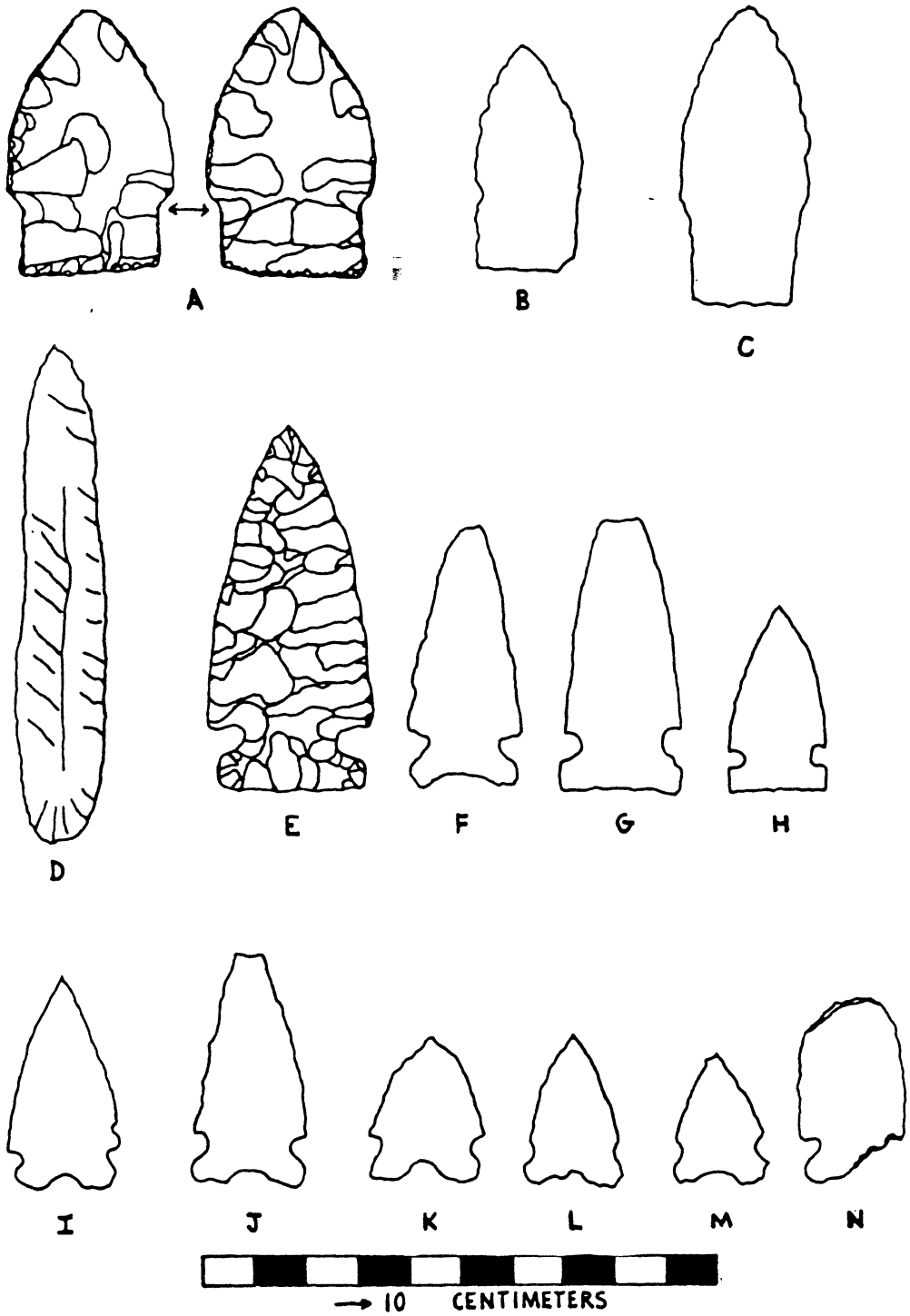


Figure 3.3 Projectile Point Styles

A-C= Scottsbluff/Alberta (MacHaffie Site-Cast); D= Possible Cascade (Novotne, 1983); E= Bitterroot/Mummy Cave (B.L.M. 1978); F,G,H= Bitterroot/Mummy cave (Davis and Helmick 1982); I,J,K = Oxbow (Davis and Helmick 1982); L,M,N= Oxbow (MacHaffie Collection).

turtles, and birds (Reeves 1969). Most excavated sites are bison traps, pounds, or surrounds (Frison 1978). Sites with material from this phase are located very close to water sources, one on the former banks of the Missouri River, one on the spring-fed stream, and two on benches overlooking a stream valley (see Map 3.1). Alberta-Cody Phase artifacts are reported to the north of the study area (Shumate 1982), to the south and east of the study area (Davis and Helmick 1982; Greiser 1986), and in the Boulder area to the south (Scarborough 1975).

Artifacts from the Lusk and Frederick Phase, dating approximately from 6,500 to 5,500 B.C., have not yet been reported to be represented in the Helena Valley. However, diagnostics of this period are present in the Avon Valley to the west (Melton 1983); from the Canyon Ferry area to the south and east, where Pryor-Stemmed varieties were noted (Greiser 1986); and to the north in the Great Falls area (Shumate 1982). It is likely that reanalysis and future research will demonstrate the presence of this material in the study area (Herbort 1987a). Reeves (1969) reported that, typically, sites from this period are communal bison kills, and that Lusk points mark the beginning of cave occupation in the Northern Plains as evidenced by Mummy Cave. Frison (1978) stated that sites in this period tend to be relatively small, found near

streams or springs, and in rockshelters or caves. The sites suggest an average band size of approximately 50 persons. Reeves (1969) added that stone circles were found in the Frederick component at the Hell Gap Site. The absence of this material from the area does indicate a problem for future research.

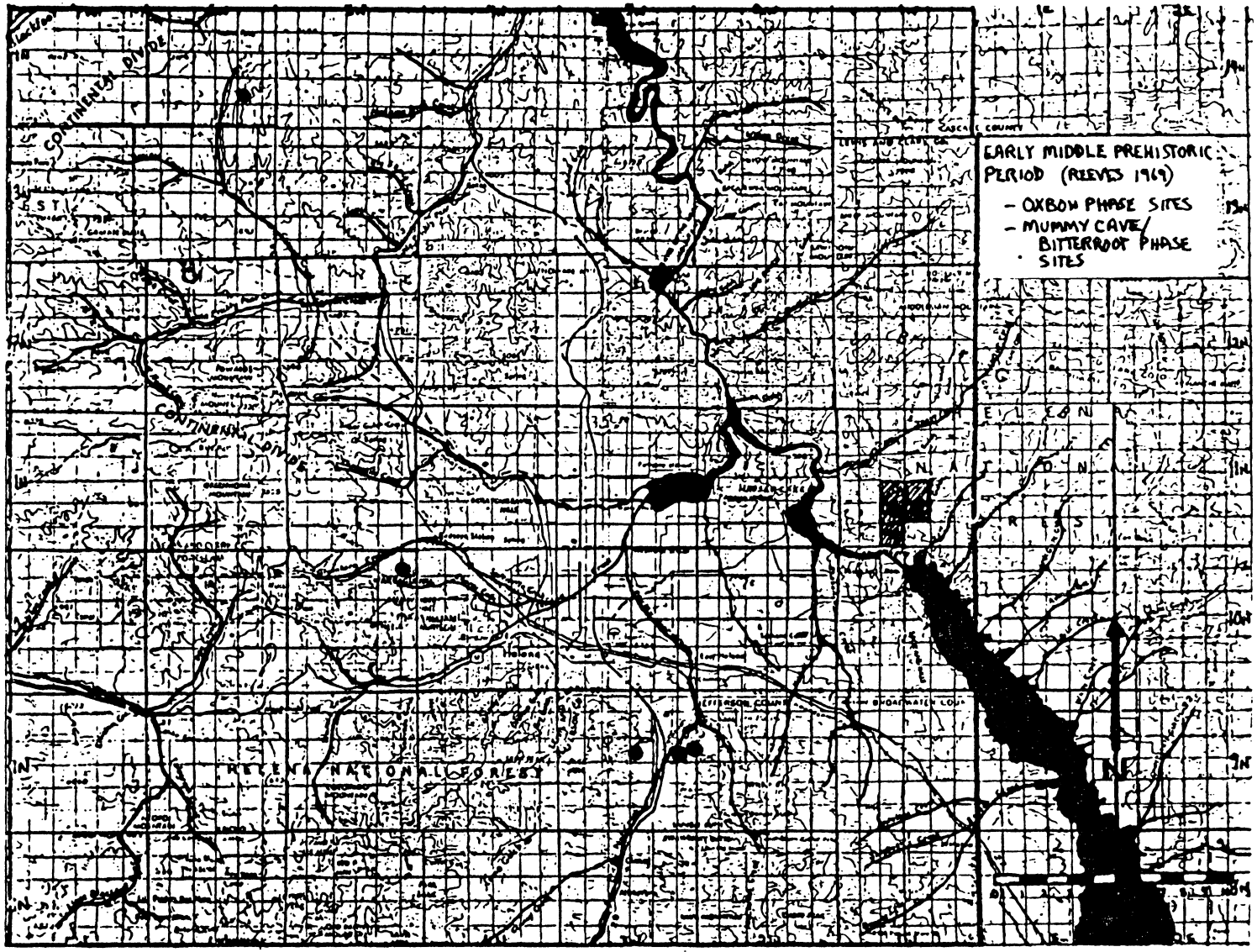
The Middle Prehistoric Period encompasses a time span lasting from approximately 5,500 B.C. until 200 A.D. Reeves has created five phases for this period which include the Mummy Cave, Oxbow, McKean, Hanna, and Pelican Lake Phases.

The oldest phase in this period is the Mummy Cave Phase. It is characterized by large side-notched projectile points identified as either Mummy Cave or Bitterroot types (Reeves 1969). This phase lasted from approximately 5,500 to 3,500 B.P., and is represented by two sites within the valley. Many researchers on the plains speak of cultural adaptations during this period as responses to the Altithermal, or a warming and drying trend for the environment (Reeves 1973). Others argued that the effect of the Altithermal had limited geographic distribution. I have not been able to resolve the issue on our locality because research has been limited. I mentioned earlier that a warming trend had been reported from bog studies south of the study area (Melton 1985).

However, this appears to have been a long-term trend represented by minor environmental changes. Perhaps two studies, as yet to be completed, will shed some light on climate and occupation during this period (Davis, Greiser, and Toth 1985; Herbort 1987b).

Elsewhere on the Northern Plains archaeological evidence comes from communal bison kills, cave occupations, and open-air sites. Usually these were located on stream terraces or in and around rock shelters (Reeves 1969). Mummy Cave, or Bitterroot type projectile points from stratified sites usually underlie Mazama ash deposits (Davis 1984; Frison 1978; Reeves 1969).

There is evidence for the hunting of bighorn sheep during this period at the Indian Creek site to the south and east of the project area. There seasonal analysis again suggests a late winter, early spring occupation (Davis 1984). The sites yielding material from this phase are located (see Map 3.2) in close proximity to a water source; one site is on a terrace, another is located on a bench overlooking a stream. Due to the absence of projectile points in the University of Montana Collection from the MacHaffie Site, I included the site because of the apparent presence of Bitterroot points in what Forbis called the Helena Component which stratigraphically overlay the Scottsbluff level. Though this period seems to be



Map 3.2 Distribution of Oxbow and Bitterroot Phase Sites

poorly represented in recorded archaeological sites in the Helena area, there are several examples found in the George MacHaffie Collection. These artifacts were collected over the years from sites within a fifty-mile radius of Helena (see Figure 3.3). Large side-notched points from this phase are reported in sites to the north (Shumate 1982), to the south and east (Davis 1984; Davis, Aaberg, and Fisher 1980; Davis and Helmick 1982; Greiser 1983; Hassler 1981; Malouf 1950), and west of the locale over the Continental Divide (Melton 1983).

Novotne has recorded one site in the project area (see Map 3.2) that yielded a point that she has identified as a Cascade type point (see Figure 3.3). No other points of this style have been reported from the immediate area, but they have been identified in areas to the south (Scarborough 1975) and to the east from around Canyon Ferry Reservoir (Davis and Helmick 1982; Greiser 1983, 1986). Cascade points usually occur in sites west of the mountains. I think the examples cited may be questionable, and might be classified as bifaces, preforms, or other artifact types since they fall within the range of variation for several types of projectile points. Future researchers should address this matter, as this problem may prove significant in demonstrating prehistoric contact.

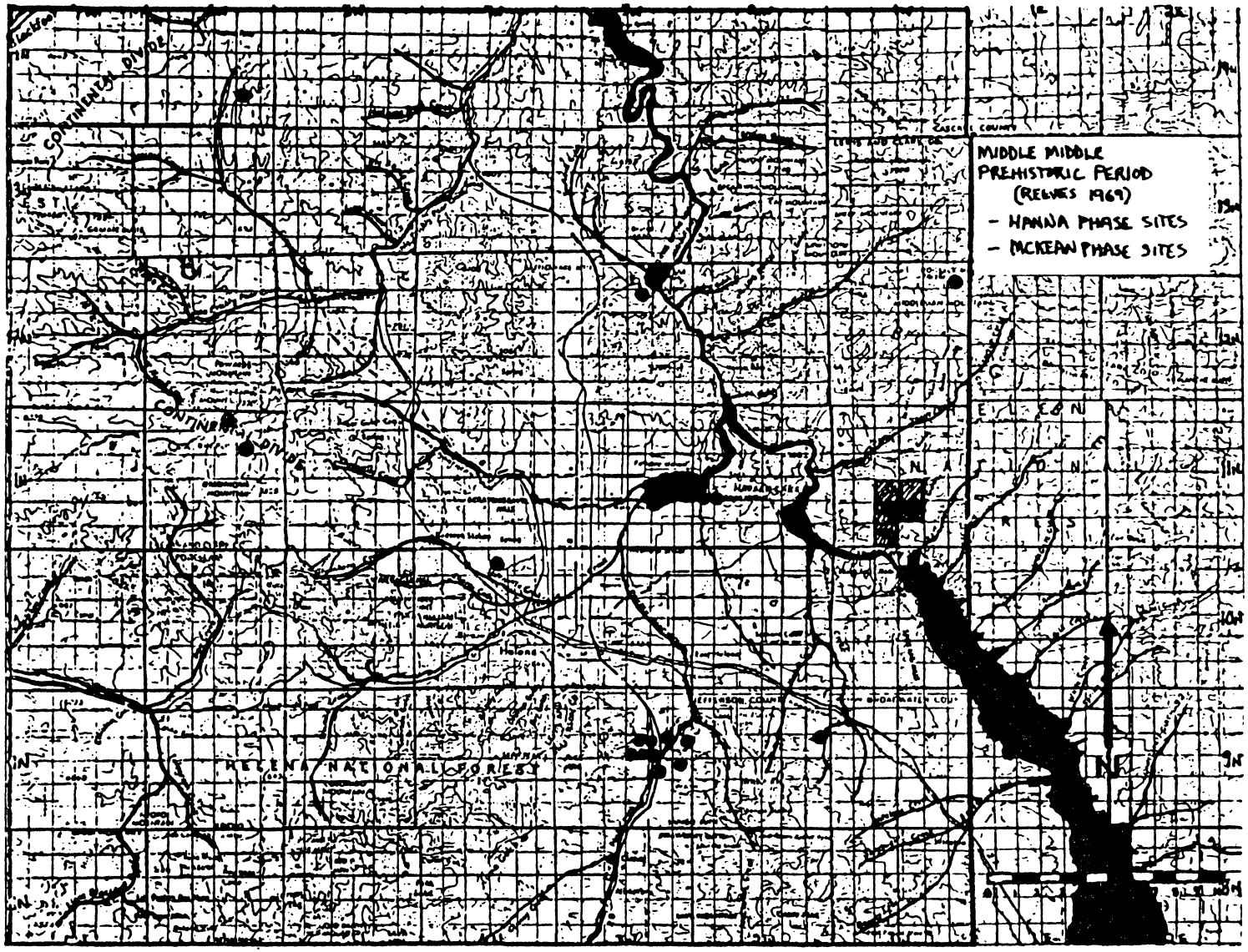
The Oxbow Phase began around 3,500 B.C. and lasted

until approximately 2,500 B.C. as outlined by Reeves (see Figure 3.3). Sites from this phase are also communal bison kills, traps, pounds, and jumps, with occupations usually located on stream terraces (Reeves 1969). Oxbow materials have been found in caves and rockshelters (Frison 1978). Two sites with evidence from this phase have been identified in the study area (see Map 3.2). One is on a stream terrace (Forbis 1955), and the other was found in a meadow near a mountain pass but close to a spring. This projectile point type is also present in the George MacHaffie Collection, which I examined at the University of Montana (see Figure 3.3). Oxbow Phase projectile point types have also been reported in the Avon Valley to the west (Melton 1983), from the Boulder area to the south (Scarborough 1975), from the Canyon Ferry area to the south and east (Davis, Aaberg, and Fisher 1980; Davis and Helmick 1982; Greiser 1983), and to the north along the Missouri River (Shumate 1982, 1984). Currently, research is being conducted by Doug Melton, a fellow graduate student, on whether or not Oxbow should be considered a separate complex or as a McKean variation or mix (Reeves 1978).

The McKean Phase covers a time period lasting from between 2,500 and 1,500 B.C., during which there appears to have been rapid cultural change and development. Many later artifact types are thought to have developed out of

this phase (Frison 1978). This phase and the representative artifact types seem to be poorly defined, and future research may indicate that Oxbow, McKean, Duncan, Hanna, and Powers-Yankee points should be considered as regional or functional variations of a single type and combined into a single phase or period (Frison 1978). There is evidence that use of plant foods increased at this time, and fire pits are noticed for the first time during this phase (Frison 1978). Plant cordage and hides are, as represented in the archaeological record, evidence for sophisticated clothing, and bone beads also appear as personal decorations (Frison 1978; Jennings 1974). Five sites from this phase are recorded in our locale (see Map 3.3). Two were located on benches overlooking streams, two were on stream terraces, and one was in a meadow near a spring at the mouth of a gulch in the mountains. Artifacts from the Mckean Phase (see Figure 3.4) are reported as being present to the north (Shumate 1982), to the south (Scarborough 1975), and to the south and east of the study area (Davis and Helmick 1982; Greiser 1983, 1986). In the areas to the south and east, from around Canyon Ferry Reservoir, the investigators included Powers-Yankee point styles in this phase.

The Hanna Phase, in which I have included both Duncan- and Hanna-type projectile points, lasted from approximately



Map 3.3 Distribution of McKean and Hanna Phase Sites

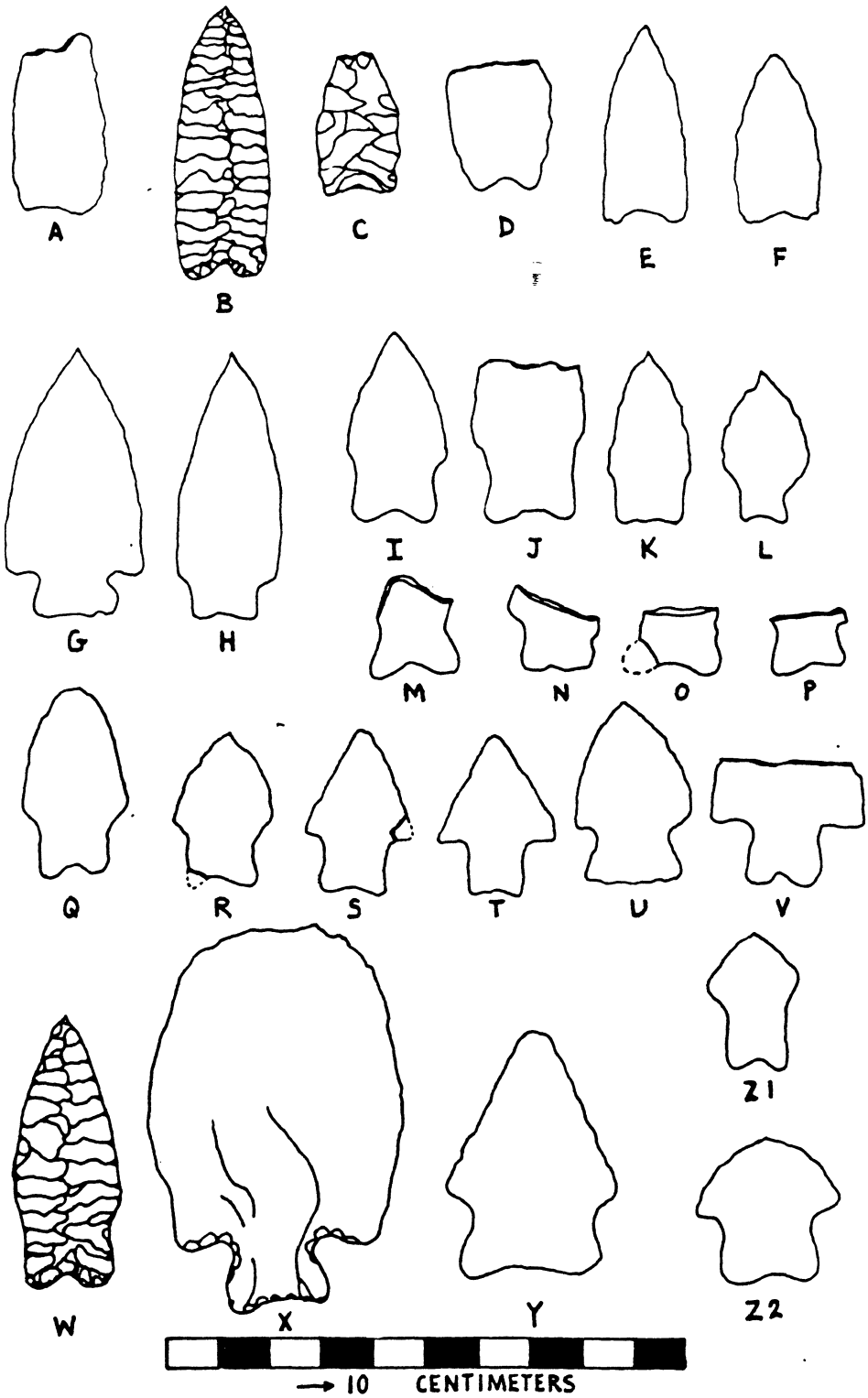


Figure 3.4 Projectile Point Styles

A- McKean (MacHaffie Collection); B- McKean (B.L.M. 1978); C-F- McKean (Davis and Helmick 1982); G- Duncan/Hanna (Malouf 1950); H- Duncan/Hanna (Forbis, 1950); I-L- Duncan/Hanna (MacHaffie Collection); M-P- Duncan/Hanna (Novotne 1983); Q-S- Hanna (MacHaffie Collection); T- Hanna (B.L.M. 1978); U- Hanna Knife (24JF1003); V-Z2- Duncan/Hanna (MacHaffie Collection).

1,500 to 1,000 B.C. This phase (see Map 3.3) was represented by 12 sites in the study area, and artifacts are numerous in surface collections from around the Helena area (see Figure 3.4). Three of the sites were located on benches overlooking streams, two were in gulches near streams or springs, one was on a hill overlooking a stream valley, and five sites were located on stream terraces. Artifacts from this phase are common both in and around the project area, and these may have resulted from an increased population or a more intensive use of the region's resources. During this phase, there seems to have been a significant increase in the use of obsidian and basalt for making projectile points, as Greiser (1986) noted in her analysis of the Helmick Collection. The increase in these materials may represent increased travel or trade, for there is no recorded obsidian source for some distance away (Flint and Sappington 1982; Greiser 1986).

Pelican Lake, the last phase in the Middle Prehistoric Period, is represented in seventeen sites where these large corner-notched points were found (see Figure 3.5). Ten of the sites were located on stream terraces, two were in gulches near springs, two were on benches overlooking streams, one was on a hill and one on a saddle, both of which overlooked stream valleys. Another was on Spokane Butte next to a spring (see Map 3.4). Elsewhere on the

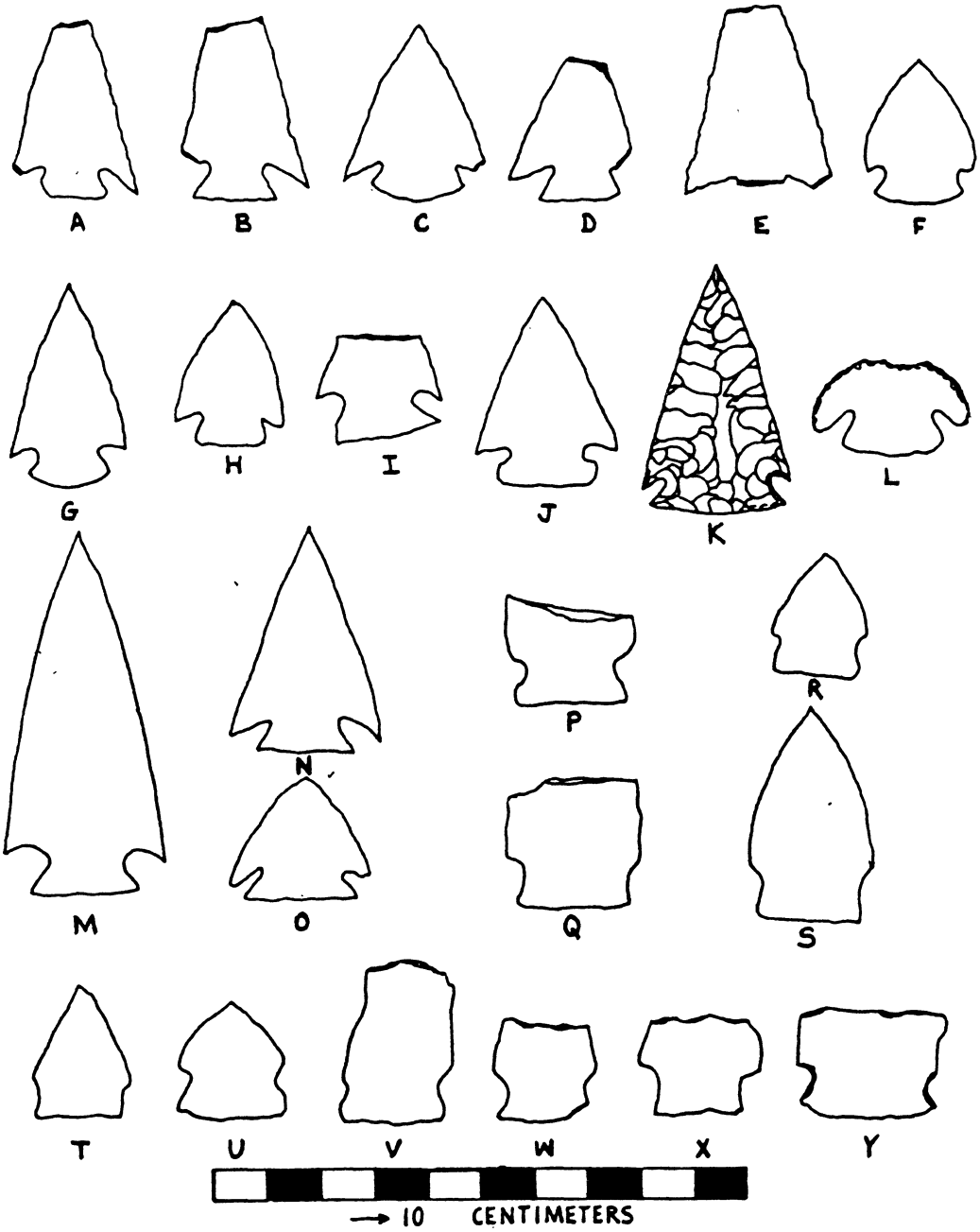
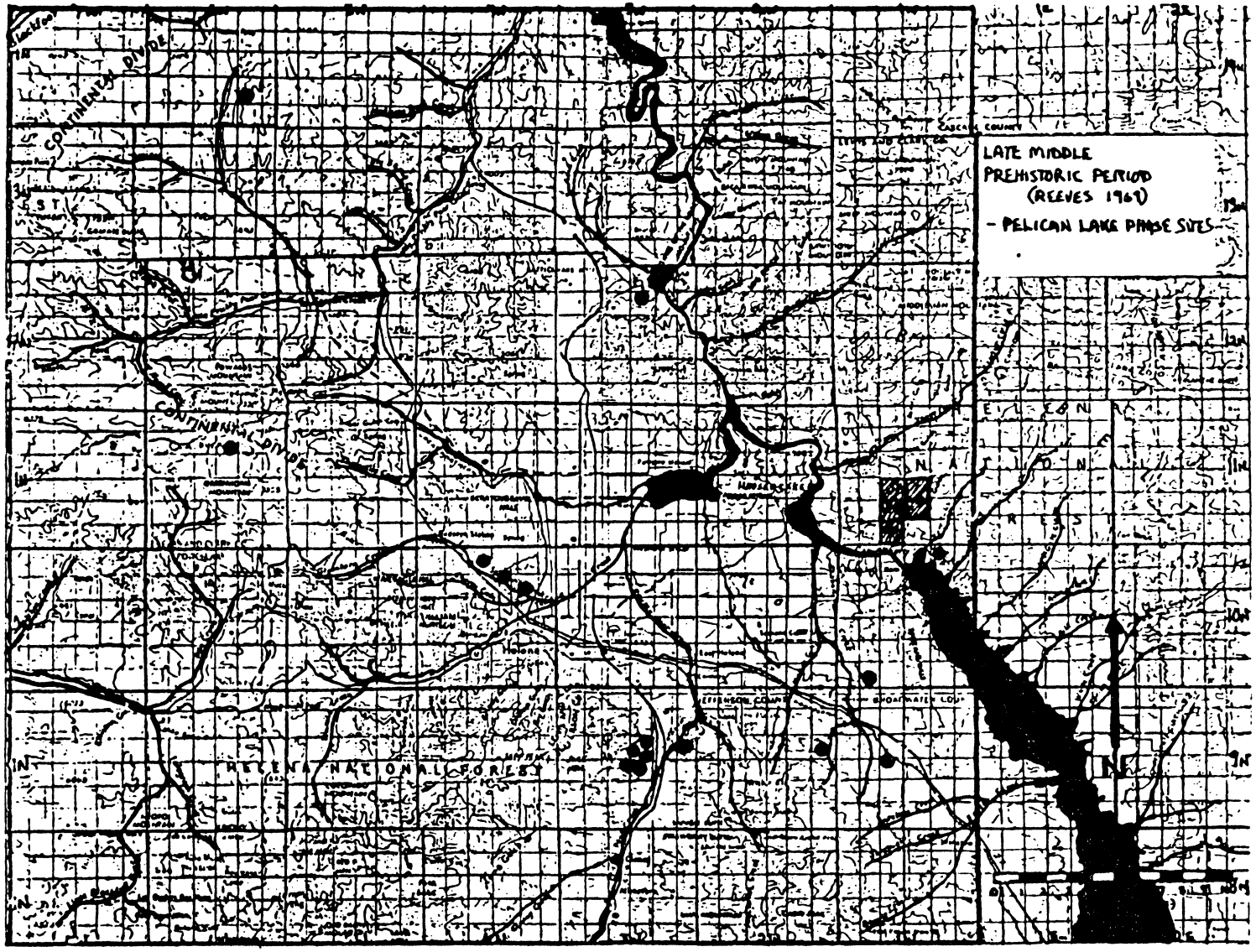


Figure 3.5 Projectile Point Styles

A-P= Pelican Lake (MacHaffie Collection); G= Pelican Lake (24JF1004); H= Pelican Lake (Forbis 1950); I= Pelican Lake (24LC668); J= Pelican Lake (24LC145); K= Pelican Lake (B.L.M. 1978); L= Pelican Lake (MacHaffie Collection); M-O= Pelican Lake (Davis and Helmick 1982); P,Q= Besant (Davis and Helmick 1982); R,S= Besant (MacHaffie Collection); T-X= Besant (MacHaffie Collection); Y= Besant (24JF1003).



Map 3.4 Distribution of Pelican Lake Phase Sites

plains, common sites of this period are bison kills (Reeves 1969), open-air occupation sites, and cave occupations. There is also evidence that some sites were used during particular times of the year. Sites show regional variations of environmental adaptations. People were hunting in the mountains and the plains during the summer and living in protected valley floors during the winter (Reeves 1983).

The first, and only, reported kill site with associated stone circles within the study area dates to this phase (Malouf 1950; Taylor 1987). The kill site appears to have been a pound or a snowdrift trap, in which bison were killed in number as evidenced by the bone deposit. The associated stone circles seem to have been used over several periods of occupation (Malouf 1950, 1987). Davis' crew, from Montana State University, excavated a stone circle site in the Limestone Hills. The results of this excavation demonstrated the association between Pelican Lake points and some of the stone circles there (Davis, Aaberg, Wilson, and Ottersburg 1982). In addition, a butchering site (24JF1004) has been recorded in the Montana City area, which yielded a stone grinding stone that may date from this phase. Excavation of the kill and occupation site (24BW36) would help us to understand and explain the archaeological record for the region.

The Pelican Lake Phase is well represented in the surrounding areas, and is perhaps the most common form found on the plains. Artifacts of this phase are found to the north (Shumate 1950, 1982), to the south and east (Davis, Aaberg, and Fisher 1980; Davis, Aaberg, Wilson, and Ottersburg 1982; Davis and Helmick 1982; Greiser 1983, 1986; Knight 1977; Malouf 1950), and to the south (Scarborough 1975).

The Late Prehistoric Period lasted from approximately 200 A.D. until historic contact. This period has been divided into two phases, the Besant-Avonlea Phase and the Old Women's Phase. Out of this phase came the modern Native-American Cultures familiar to us on the Northern Plains.

The Besant-Avonlea Phase lasted from around 200 A.D. until 700 A.D., and should be seen as a phase of significant technological development. During this period we see a shift from the use of atlatl and darts, associated with Besant-type projectile points, to the use of bows and arrows as reflected by Avonlea projectile points. This shift was not a rapid technological change, but one that probably occurred over a 300 or 400 year period (Reeves 1983). The analysis of sites with Besant materials has suggested that life was similar to the Pelican Lake Phase. Trade occurred more frequently and on a longer scale as

evidenced by the distribution of obsidian; copper; antler pins; olivella, conch and dentalium shells and ornaments; pottery; and possibly corn in some areas. In addition to the presence of pottery in some Besant and Avonlea sites, we see the appearance of burial mounds and various house forms (Reeves 1983). Three economic adaptations are indicated, which relate to the local environments in which the sites occur. They are: 1) communal bison hunters-gatherers, in areas that supported large bison populations; 2) generalized hunters-gatherers, in areas where generalized or mixed ungulate populations occurred; and 3) generalized hunter-gatherer-horticulturalists, where the environment was conducive to raising corn (Reeves 1983). Avonlea and Besant (see Figures 3.5 and 3.6) projectile points are thought to represent two interacting cultures that coexisted in the same environments. Reeves (1983:186-187) has characterized these as people who:

> . . . conformed to the "nomadic style"--groups which move around alot [sic], associate with geographical range, but do not operate as closed systems. The frequency of communication between groups results in a hunting society composed of a number of local bands, forming a larger breeding and linguistic community. The economic system is based on a homecamp and sexual diversion of labor (males hunting and females gathering), and a collective method of redistributing the food. The social system was generally equalitarian, with little personal property. Constraints existed to minimize wealth differences. The living groups varied throughout the year in size and composition. No one group had exclusive rights to resources, and this would prevent set patterns of group territoriality. Food storage would be at a minimum,

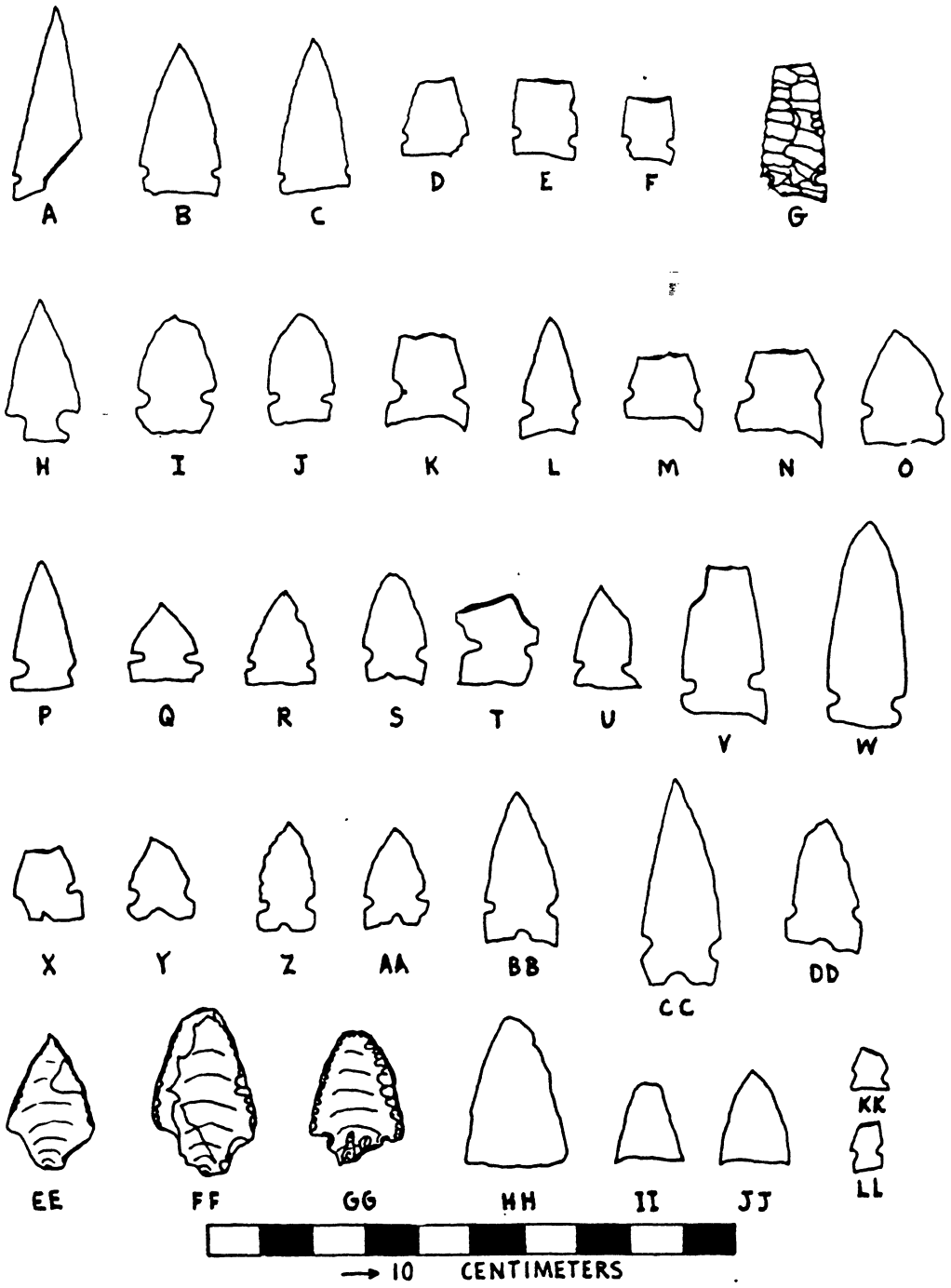


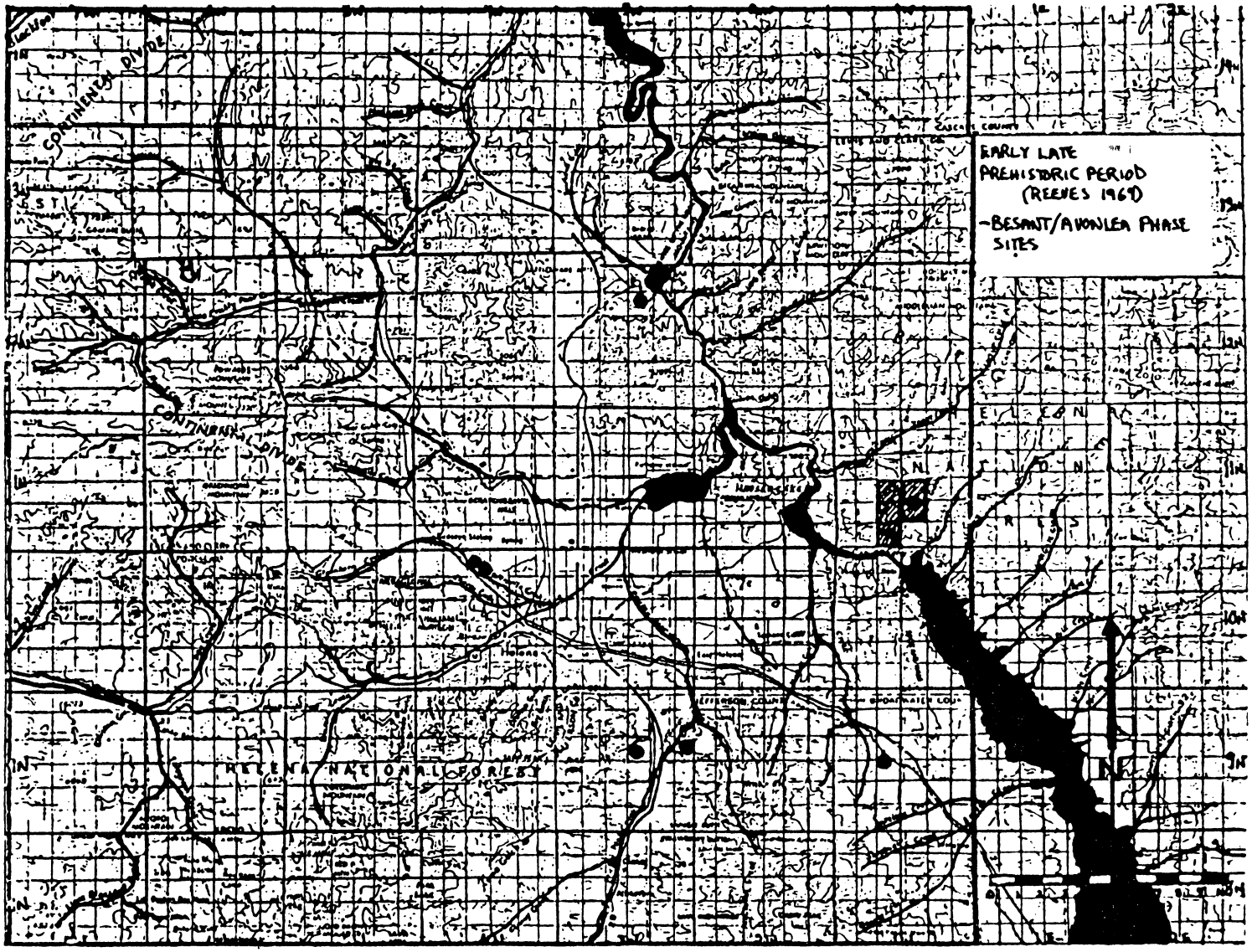
Figure 3.6 Projectile Point Styles

A,B,C= Avonlea (MacHaffie Collection); D= Avonlea (Novotne 1983); E,F,G= Avonlea (Davis and Helmick 1982); H-S= Old Women's Side-Notched (MacHaffie Collection); T= Old Women's Side-Notched (24LC705); U= Old Women's Side-Notched (24LC667); V,W= Old Women's Side-Notched (Davis and Helmick 1982); X,Y= Old Women's Tri-Notched (Hilger Collection); Z,AA= Old Women's Tri-Notched (MacHaffie Collection; BB,CC,DD= Old Women's Tri-Notched (Davis and Helmick 1982); EE= Old Women's Modified Flake Point (24LC667); FF= Old Women's Modified Flake Point (24JF719); GG= Old Women's Modified Flake Point (24JF759); HH,II,JJ= Old Women's Triangular (MacHaffie Collection); KK,LL= Old Women's Side-Notched (MacHaffie Collection).

since the environment was the storehouse.

There are seven sites from this phase in my area of study. Six sites contained Besant-type projectile points, while only one site has had Avonlea material. Avonlea is represented rather well in surface collections, such as the George MacHaffie Collection, from around the region. Two Besant Phase sites have yielded Besant points associated with stone circles; these were located on a stream terrace. Two sites lay on benches overlooking stream valleys, and one was situated on a hill overlooking a stream valley (see Map 3.5). As of now, no pottery has been reported from any site within the area, and I know of no evidence for mound burials, horticulture, or the various house forms reported by Reeves. Projectile points from this phase are reported from sites in the Avon Valley to the west (Melton 1985), in the Great Falls and Missouri River areas to the north (Shumate 1950, 1982), and to the south and east of the study area from around Canyon Ferry Reservoir (Davis, Aaberg, and Fisher 1980; Davis, Aaberg, Wilson, and Ottersburg 1982; Davis and Helmick 1982; Greiser 1983, 1986; Knight 1977; Malouf 1950).

The last phase, the Old Women's Phase of the Late Prehistoric Period, dates from approximately 700 A.D. until historical contact. This phase undoubtedly ended at different times depending on location and the availability



Map 3.5 Distribution of Besant/Avonlea Phase Sites

of trade goods. The lifeways that emerged and developed during the Pelican Lake, and the Besant and Avonlea Phases continued in much the same forms during this phase (Frison 1978; Reeves 1969, 1983). A seasonal round of activities, which was indicated in earlier phases, continued and was characterized by winter campsites in sheltered creek and river bottoms or protected valleys, with water and firewood close at hand. Communal bison hunts were conducted in those areas supporting bison herds during the spring and early summer, also a time for collecting plants for immediate and future use. Summer occupations occurred in the mountains and plains. The gathering of plant foods occupied much of the women's time, especially as summer came to an end. Generalized hunting and gathering was practiced then, and this lasted until the communal bison hunts began in the fall. After the bison hunts, the groups moved back to the sheltered areas for the winter.

I think the archaeological evidence indicates an intensification of cross-cultural contacts and perhaps the extension of previous trade networks during the Late Prehistoric. As for migrations or cultural movements discussed by some researchers, I suggest that there has been confusion between movement of peoples and the movement of materials and represented ideas. Some trade items can be observed in the archaeological record. The strong

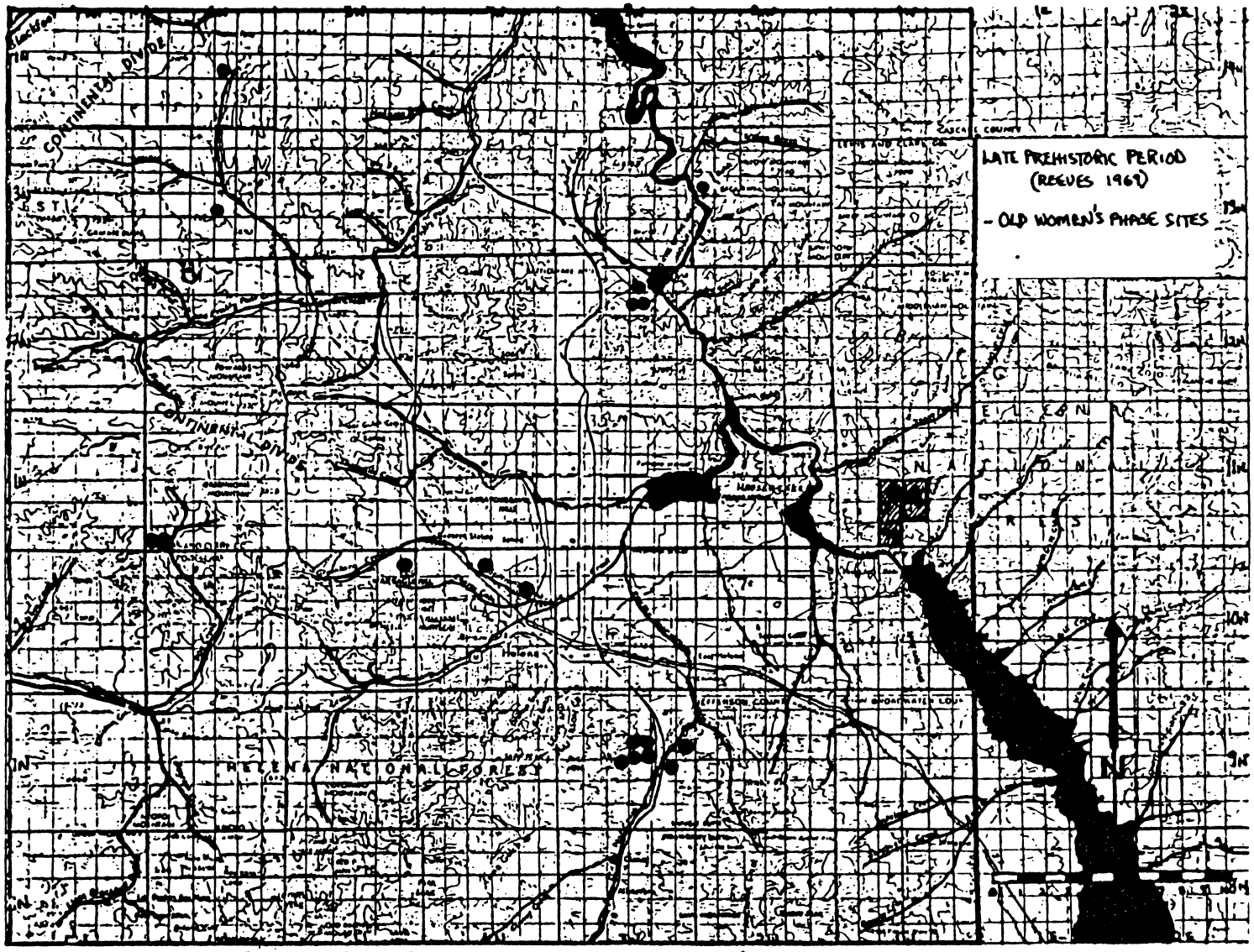
tribal identity that developed and was observed in historic times may not have been in place during earlier phases. The movement of ideas and materials may reflect the movement of individuals, families, or bands.

During this period, there was increased evidence for hunting, but that preference seemed to be for bison procurement. The bow and arrow had replaced the atlatl and dart, but the short thrusting spears were still used. Artifact assemblages remained much the same as those found in earlier phases, although there is more evidence for plant use in the grooved stone mauls, grinding stones, manos and matates, digging sticks, and, in some areas, hoes (Jennings 1984). Other evidence consists of features such as roasting pits and boiling pits (Frison 1978). Pottery, storage pits, and several house types, in addition to stone circles, have been found in other areas; none have been recorded in the immediate area. There are 17 sites with projectile points representative of this phase recorded in the study area. The characteristic (see Figure 3.6) projectile points include small side-notched, tri-notched, unnotched triangular, and modified flake varieties (Frison 1978; Reeves 1969, 1983). Two of the sites from this phase (24LC9 and 24LC297) had tubular stone pipes associated with them (Forbis 1950; Malouf 1950). Seven sites were found on stream terraces; five were found on benches; one on a hill;

and two on saddles; all of these were close to streams. One site was located near a spring, and one was in an open meadow near a mountain pass (see Map 3.6). To the north of the Helena Valley these point types and stone pipes are reported (Shumate 1950, 1982); towards the south and east, the points and stone pipes have been reported (Malouf 1950), although most researchers reported only points from there (Davis, Aaberg, and Fisher 1980; Davis and Helmick 1982; Greiser 1983; Malouf 1950). These point types have also been reported in sites and private collections to the south (Scarborough 1975).

The Ethnographic Record

The ethnographic evidence that is available on the prehistoric occupants within the Helena Valley is limited. Much of the information about the traditional occupants and their use of resources has been lost. By the time of the arrival of the whites in the early part of the twentieth century, much of the region had been abandoned by the traditional inhabitants. Much of the information that is available concerns the period after contact with white traders, and after dramatic changes in aboriginal lifeways because of epidemics, the acquisition of the horse and firearms, and after an intensification of tribal conflicts due to those changes. Cultural groups were displaced,



Map 3.6 Distribution of Old Women´s Phase Sites

absorbed, and modified. Evidence indicates a shift towards the "Nomadic Plains Indian" lifestyle, or rather an adoption by peripheral tribes of cultural traits, materials, ideologies, and social organizations that had been developed by traditional bison hunters on the Northern Plains. Little information has been preserved for the period which Ewers (1958) has called "dog days" that preceded these cultural changes. What has been preserved comes from oral accounts that had been handed down for generations. Some information about this period can be found in journals and records kept by trappers and fur traders who worked in the region during the 1700s. But much of our data comes from the early anthropologists who tried to salvage traditional lifeways before the elder tribal members passed away and information was lost forever.

I have focused on the information concerning the period before tribes acquired the horse, gun, and trade goods, or that period Reeves (1969) has called the "Proto-Historic Period". I have concentrated on the traditions dealing with prehistoric lifeways as practiced by the Kutenai, Flathead, and Blackfoot tribes, as they occupied the study area and similar environments along the eastern edge of the Rocky Mountains. It has been reported that the Snake Indians and Crow Mountain Indians were also in and

around the region (Brink 1986; Ewers 1958; Kidd 1986; Teit and Boas 1973). I have elected to leave information concerning these peoples out of my thesis, as the early accounts of lifeways and even the tribal identities are vague and do not contribute to my purpose. In this section, I have included the accounts referring to occupation of the immediate region, and the seasonal round of activities practiced by the traditional occupants. As pointed out in Chapter II the area has a lot of potential as a source of data for future research. I return again to that idea here.

Much has been written describing the probable prehistoric cultures that occupied the Northern Plains. These reports have resulted in a body of information, but there remain gaps in the data for large regions and areas where types of prehistoric occupations are debatable. In my thesis I do not propose to add to the confusion, rather to report what evidence I have acquired for my study area. I have found Teit's work to be very helpful where he reports the traditional accounts of the Flathead Indians. His informants told him that traditionally several bands of Flathead resided entirely on the eastern side of the Rocky Mountains. Their former boundaries were:

> . . . the Rocky Mountains on the west and south, and the Gallatin, Crazy Mountains, and Little Belt ranges on the east. Their approximate northern boundary seems to have cut across the Big Belt range near it's center,

> following some hilly country north of Helena, between the Rocky Mountains and Little Belt Mountains (Teit and Boas 1973:303-304).

Teit goes on to say that there were three distinct bands of the Flathead in this region, and that their main winter camps were in the western parts of this country. He says of the Flathead winter camps:

> Of these, it seems that one was on a river near Helena, one near Butte, another smaller one somewhere east of Butte, and one somewhere in the Big Hole Valley. The Big Hole and Helena Bands are said to have been large (Teit and Boas 1973:309).

Flathead informants told Teit that the Salish-Tunaxe lived to the north of this region, and that a vague line divided them from other Salish groups. The dividing line was located at a point between Marysville and Helena continued across the Big Belt Range and along a line north to Great Falls (Teit and Boas 1973). This information seems to have been accepted by other researchers on the Northern Plains (Brink 1986; Reeves 1983; Turney-High 1937). Teit's informants also described a "great trade route" that existed prehistorically and was said to have a main branch running from Missoula to:

> . . . Helena, and thence to the Salish-Tunaxe or Sun River People, continuing to Great Falls and the Teton River, and then north to the Kutenai-Tunaxe and the Blackfoot. However, the exact lines of the trade routes east of the Rockies are not quite clear. Some say there was a main line of travel following rather close to the mountains north and south from the Shoshone tribes south of the Flathead, through the territory of the later, and continuing through the Salish-Tunaxe and Kutenai-Tunaxe to the Blackfoot (Teit

and Boas 1973:357).

Evidence to support this trade or travel route consists of two travois trails recorded by the Forest Service; one leading up Alice Creek and over Clark's Pass to the north of my study area, and one on the south end of the Big Belt Mountains on the ridge leading up along Deep Creek to the south and east of the study area (Knight 1979; Rominger 1976). Also, the Lewis and Clark journals mentioned that Clark had traveled on an "Indian road" through the Helena Valley and along the Missouri to some point near Three Forks (Coues 1893). Teit reported that trade goods included pipes and pipestone, which may explain the presence of the tubular stone pipes (Malouf 1962) found in Late Prehistoric Period sites as mentioned previously in this chapter (Teit and Boas 1973). Though often it is nearly impossible to relate archaeological data with a particular cultural group, Teit made an important point that archaeologists might remember, this being that:

> On the whole, the ancient material culture of the area occupied by the Flathead groups appears to have formed a link between that of the Salish tribes to the west and northwest and that of the Shoshone of the mountains and plains to the east and southeast, although the difference between them was not great (Teit and Boas 1973:326).

Teit's informants told him, and he pointed out that there was a great deal of mixing and intermarriage between all of these groups (Teit and Boas 1973). A uniformity, or

similarity in material culture, is reflected in the archaeological record, as I have suggested earlier in this chapter. This similarity suggests to me that a similar lifeway was practiced by all of the prehistoric occupants of the study area, regardless of tribal identity. A part of this lifeway, an adaptation to the particular environment, involved a seasonal round of traditional activities that has been called the seasonal round. This seasonal round, or economic/exploitation strategy, allowed a group to divide their particular territory into resource zones, based on the seasonal availability of natural resources. By identifying a region's resource attributes, a group could plan their movements around resource availability, thus maximizing their exploitation efforts by being in a particular location when resources reached their peak, and this would help to insure that the group's needs were fulfilled. By examining the literature available for the Blackfeet (Ewers 1955; Kidd 1986), Kutenai (Hart 1976; Smith 1984), and Flathead (Teit and Boas 1973; Turney-High 1957), I have constructed a generalized outline of this seasonal pattern as practiced by tribes who lived in similar environments during prehistoric times.

In late spring or early summer as the weather warmed up, the bison herds moved out of their winter range and headed east towards the open plains. The various Indian

cultures along the eastern edge of the Rockies followed them into the plains in pursuit of meat. At this time, hunting seems to have been focused on the bison, although deer, elk, moose and bighorn sheep were killed whenever the opportunity presented itself. Groups were bands of several families who hunted and gathered as they moved, trying to replenish food supplies that had become depleted over the winter months. In June, when bison bulls became prime, many bands or family groups gathered together to hunt on the open plains. During mid-summer women became involved in berry collecting, as the various fruits became ripe. This probably meant that the groups collected around river bottoms and in moist areas where berry bushes tend to cluster. Men were involved in hunting the different ungulates, and this could be seen as a time of plenty. As food supplies were restored some family groups remained in the plains, while others returned to the mountains to collect berries, pine nuts, and lichens and to hunt bighorn sheep and mountain goats.

As fall approached the bison cows became prime and the various groups began to cluster in preparation for the big communal bison hunts. Communal hunts utilized the topography of the landscape as seen in the pounds, jumps, and traps that have been recorded archaeologically. These communal hunts, when successful, helped to insure that all

the members of the group were able to store up enough meat for the winter. During this time women continued to collect berries, process hides, process and dry meat, and make pemican in preparation for winter. After the big communal hunt the group began to break up to make the trip back to their winter camps. Some families returned to the mountain areas to hunt bighorn sheep, mountain goats, elk, and deer.

Winter camps were usually established in the late fall, well in advance of the periods of intense cold and deep snows. These camps were usually small in size, again being composed of family groups and friends or relatives. Winter camps were located in protected valleys where there was a good supply of firewood and a good water source. Bison herds tended to search out such protected areas in winter, too, although herd size was smaller. Men continued to hunt in the vicinity and women processed hides and stored up a winter's food supply. Just before the weather really turned cold camps may have moved out of open areas and into thick stands of trees and broken hills for added protection from the cold winds. The groups usually remained in the camp throughout the winter, unless depletion of local resources forced a move to an adjacent location. The distance moved was usually less than a mile. In winter months when the weather permitted men, alone or

in small groups, continued to hunt in the general vicinity.

To the people of the region, March was known as a hard time because bison began to head out into the plains after the rich spring grasses. During this time hunters pursued whatever game they could find.

Starting around mid-March, the weather began to warm up somewhat. Women began to collect the various root crops as they became available beginning in April and early May. When the ground was clear of deep snow and the river ice had broken up, groups began their move back towards the plains following the bison. The seasonal round started all over again.

After they had obtained horses and firearms, and after disease and warfare had decimated their people who lived east of the Divide, the remaining Flathead and Kutenai picked up and moved over the Rockies to the west, with the Shoshone groups soon following (Malouf 1987; Teit and Boas 1973; Turney-High 1937). The seasonal movements and resource exploitation in the area shifted. At this time many groups wintered on the western side of the Rockies and utilized my research area while passing to and from the bison hunting grounds on the plains in the spring and in the fall. Some family groups continued to break off from the main group to hunt elk, bighorn sheep, mountain goats, deer, and to collect berries in the region as they passed

through (Turney-High 1937). Turney-High (1937) does say that Flathead bison hunts were also organized in summer in "order to get hides, but ordinarily this did not go farther east than Helena".

Summary

In this presentation of the archaeological record and the ethnographic information available, I have indicated the study area's apparent importance to prehistoric peoples. The archaeological evidence demonstrates that the region was occupied continuously throughout the periods of man's presence in the New World. The ethnographical evidence gives life to the archaeological record, and allows us to infer cultural activities and how resources in the area were used through time.

From an examination of the distribution maps whereon I plotted sites for each period, it is evident that peoples who left evidence behind were occupying the same or similar locales within the valley region. It should be noted that the areas are located in the foothill regions, or transitional zones, between the mountains and the plains or valley floor. The sites are also located close to a water source, either a spring, stream, or river. These areas offer protection from the weather, and relatively easy access to the region's natural resources. I pointed out in

Chapter II that the environment and the natural resources available have changed little over time. In this chapter, I have indicated that the preference for site locations also changed little over time. By combining these two observations, I suggest that the periods, or seasons, of occupation, and the cultural activities and possible intentions of occupation have changed little over time. To support this interpretation I would point out that seasonal analysis from sites located in the adjacent regions indicate a late winter/early spring season of occupation. In addition, the ethnographic accounts indicate that this region was traditionally a winter camp locale for the Flathead Indians. Similar regions served as winter camp locations for the Blackfoot and Kutenai peoples.

In Chapter IV, I will examine the archaeological evidence, site distributions, natural resource proximity, and inferences drawn from the ethnographic evidence to determine the validity of my observations. By combining all the information available, I develop an acceptable picture of prehistoric activities and indicate the region's importance as a significant exploitation locale for prehistoric occupants of Montana.

CHAPTER IV

PATTERNS OF THE PAST

In this study, my goal has been to contribute to our understanding of the prehistoric use of the Helena Valley. In the previous chapters, I have presented the data base from which I made two assumptions that have preceded and influenced my analysis of the archaeological record. They are: 1) The environment has changed little over the last 12,000 years, and, in turn, the available natural resources have remained approximately the same with some degree of density variation; and 2) the distribution of cultural settlement and subsistence as reflected in the archaeological record changed little over time. These allowed groups to time their movements with the availability of resources and their seasonal demands. In short, I believe that although populations and cultures may have changed, the study area was seasonally occupied, and its resources exploited in much the same manner throughout all periods of occupations until native cultures were disrupted in historic times.

These assumptions serve as my justification for analyzing the distribution of archaeological sites without concern for time control (Thomas 1974, 1979). This allows me to include those 120 sites recorded in the region which lack diagnostic materials, and brings my total of

archaeological sites included to 153 sites. In the same way that Thomas (1979) did in his study of the Reese River Valley, I will be able to include information that has traditionally been ignored in my attempt to identify and interpret prehistoric settlement and subsistence patterns practiced in the locality.

In this chapter, I define the types of sites I have recognized as being present in the area of my study. I then proceed to analyze their distributions and locations in the environment. Finally, I examine the possible relationships between site locations and the natural resources present in the region.

Site Types

After I received a computer printout from the State Historical Preservation Office containing all of the sites recorded in the study area, I sorted out the prehistoric sites from the body of data. I then reviewed all site forms on record and ended up with 153 archaeological sites. Next I placed all sites into those site-type categories used by the State Historical Preservation Office, but found that the quality of the descriptions and legal locations recorded were very inadequate. Also the "type" categories used by the Historical Preservation Office were not clearly defined. I felt that because of the vague descriptions

found on many site forms, the category into which the site was placed reflected personal preferences and subjective judgments about the activities that were believed to be reflected in the archaeological sites. Thus I examined the forms closely, often revisited the sites, and then developed site-type categories that were general and descriptive. Nine categories were developed, and a description of each is presented below.

Lithic Procurement Sites. The sites included in this category are those in which a lithic source, whether free-floating nodules or a bedrock matrix, is present and there is some evidence of human activity associated. Procurement activities of that material may take the form of "pit" excavation or battered surface outcrops, but there is evidence of reduction and/or production as shown by lithic debitage. These sites are generally referred to as quarries, and 16 sites of this type were recorded in the study area. One other quarry has been recorded, but there are no legal locations available. Three of these sites had time-diagnostic materials present. These ranged from Scottsbluff type projectile points to Old Women's or Late Plains type points. In addition to the lithic debitage, tools common to these sites included hammerstones and retouched flakes that had been unifacially or bifacially worked. Excavation at the Palmer Chert Quarry (Herbort

1981) revealed the presence of antler and bone excavation tools, and possible evidence that fire was used to extract the material.

Stone Circle Sites. Sites in this type category included the presence of stone circles, or circular stone-outlined features. These features are generally believed to represent tipi locations, where stones were used to hold down the edge of the skin cover and/or the inside lining. The number of stone circles found in sites recorded in the study area ranged from one feature per site to thirty-three stone circle features per site (see Figure 4.1). In all, there are 32 sites included in this category. Two quarry sites had stone circle features, raising the number analyzed to 34. Two other sites have been recorded in the area, one of which has a possible lithic procurement pit, but they do not have legal locations. The general locations are known, and I will include them in my analysis. Six sites contained diagnostic projectile points. These ranged from McKean types to Old Women's or Late Plains types. Lithic Scatters and possible hearth features are also common in Stone Circle Sites. One site (24BW36) had an associated bison pound or snowdrift/trap kill area, but this has not been excavated and reported.

Lithic Scatter Sites. I included sites in this category because of the presence of lithic materials

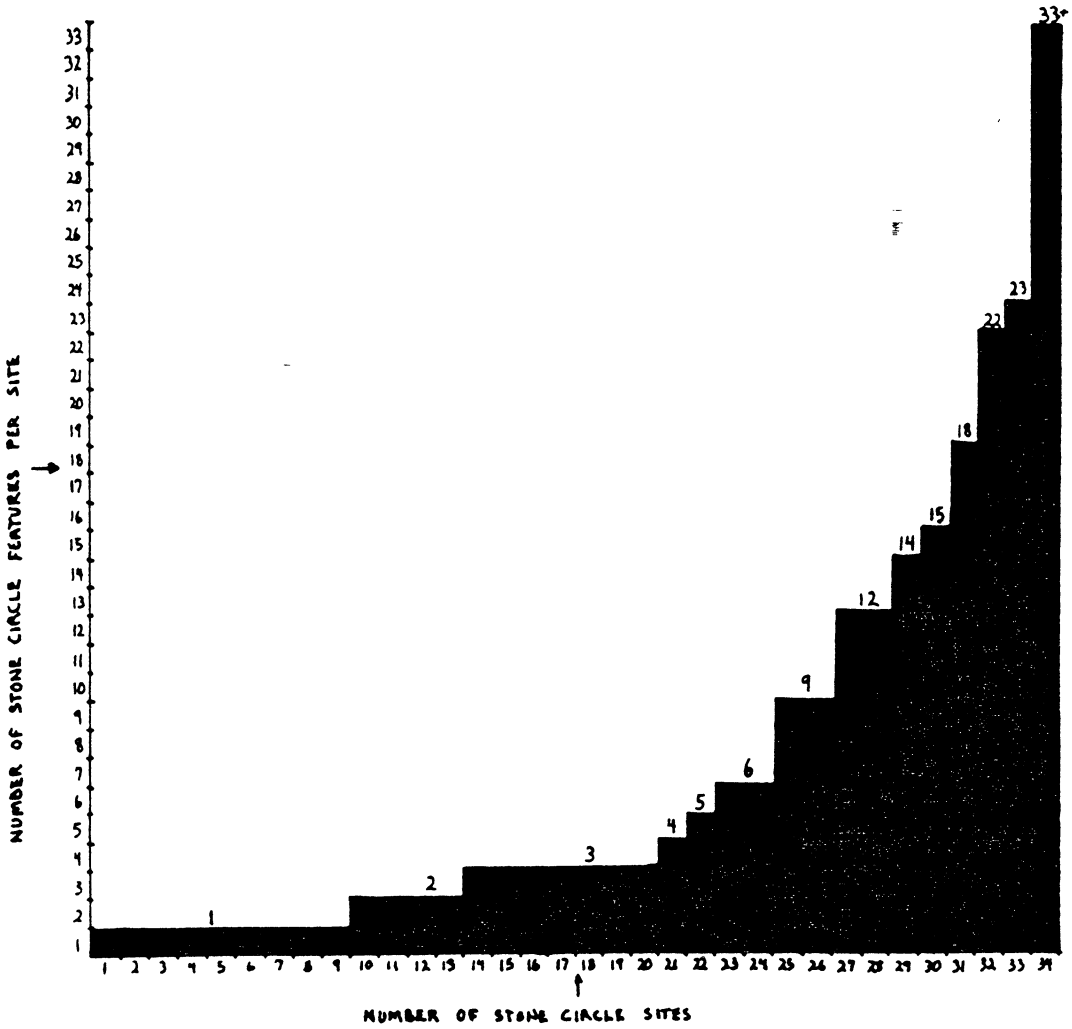


Figure 4.1 Graph of the Relationships between the Number of Stone Circle Sites and the Number of Features per Site

located away from Lithic Procurement and Stone Circle Sites. The surface areas, the amount of lithic debris, and the possible activities represented in these sites remain unknown at this time. A total of 83 sites have been included in this type category. Seventeen of these sites are known to have subsurface deposits, and three (24LC242, 24LC261, and 24LC272) are located in rockshelters or caves. One site (24LC706) apparently consisted of a single Clovis-type point fragment. At 54 of the Lithic Scatter Sites tools were reported as being present. These included retouched flakes, unifacial knives or scrapers, bifacial knives or scrapers, points and point fragments, hammerstones or mauls, choppers, tubular stone pipes (24LC9 and 24LC297), and one grinding stone (24JF1004).

Pictograph Panels. Sites reported and included in this category have evidence of shapes and figures painted on rock surfaces by prehistoric peoples. The designs tend to consist of anthropomorphic figures, zoomorphs, geometric designs, right and left hand prints, and vertical lines commonly called day counts (see Figure 4.2). As best as I can determine, all of the designs recorded in the study area's sites were drawn with a red pigment thought to have been derived from hematite. There are 13 sites in this category; three of these are in rockshelters, one is located in a cave, and nine are located on flat limestone

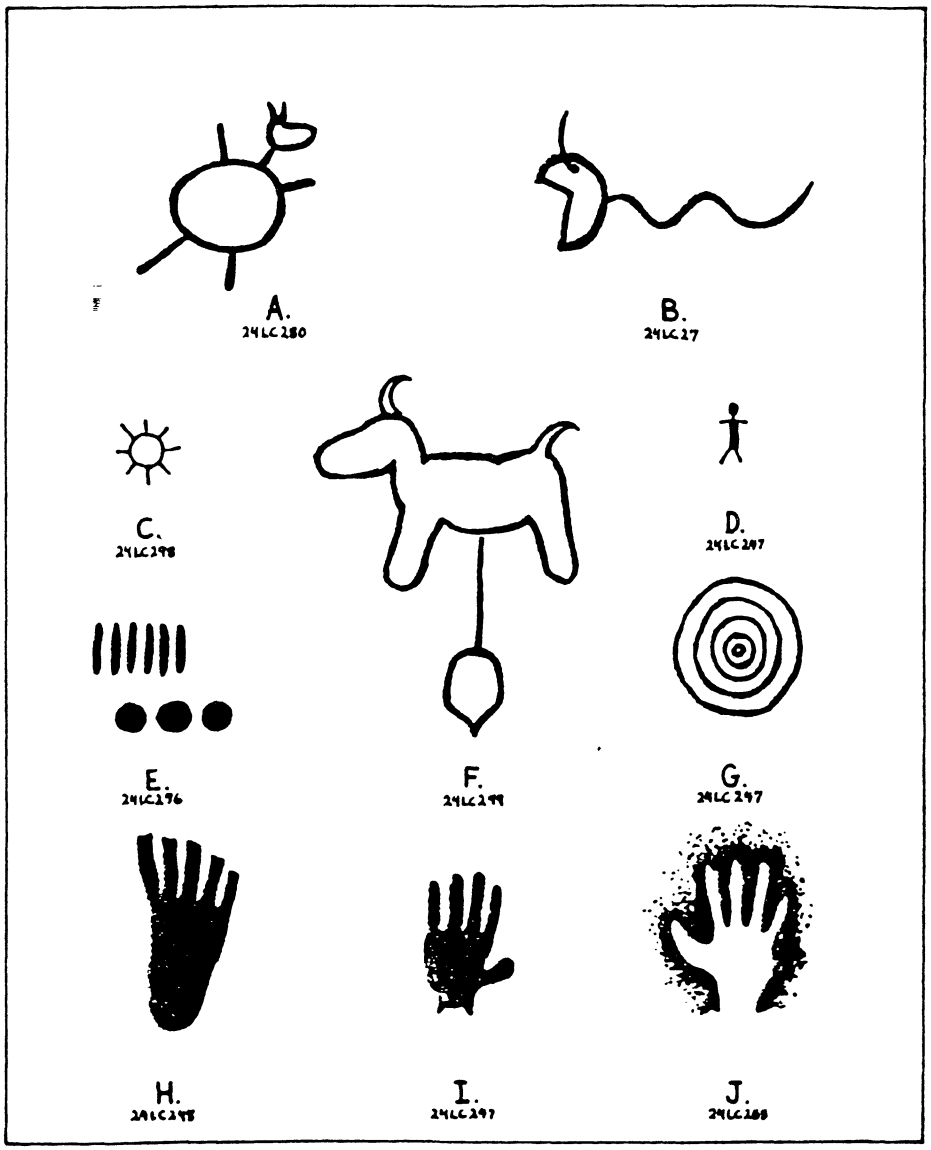


Figure 4.2 Types of Pictograph Designs Reported in the Study Area

faces. All of these sites occur in the limestone canyons or gulches located in the northern and northeastern regions of the area. A religious or ceremonial interpretation has been suggested for Pictograph Sites (Keyser 1978), but I question the validity of this interpretation because often, the supporting evidence is lacking.

Stone Cairns or Rockpiles. There are four of these sites recorded in the study area. These are rockpiles or cairns that are not associated with Lithic Scatters, Lithic Source Sites, or with Stone Circles. The number of cairns per site ranges from one to three. All of the investigators who reported these noted that the construction of these features may have occurred during historic times.

Stone Structures. I put two sites into this category, each consisted of semicircular, or half lunar-shaped stone alignments. One site (24LC277) was located in a rockshelter face, and consisted of a semicircular stone wall that measured five feet across. It had a circular stone hearth constructed against the wall on the inner side with fire-cracked rock and charcoal in evidence (see Figure 4.3). The site was located a quarter-mile up-slope from the Missouri River and provided an open view to the river. The second site (24LC282) consisted of a U-shaped stone wall, six-feet long and eight-feet across, located on the

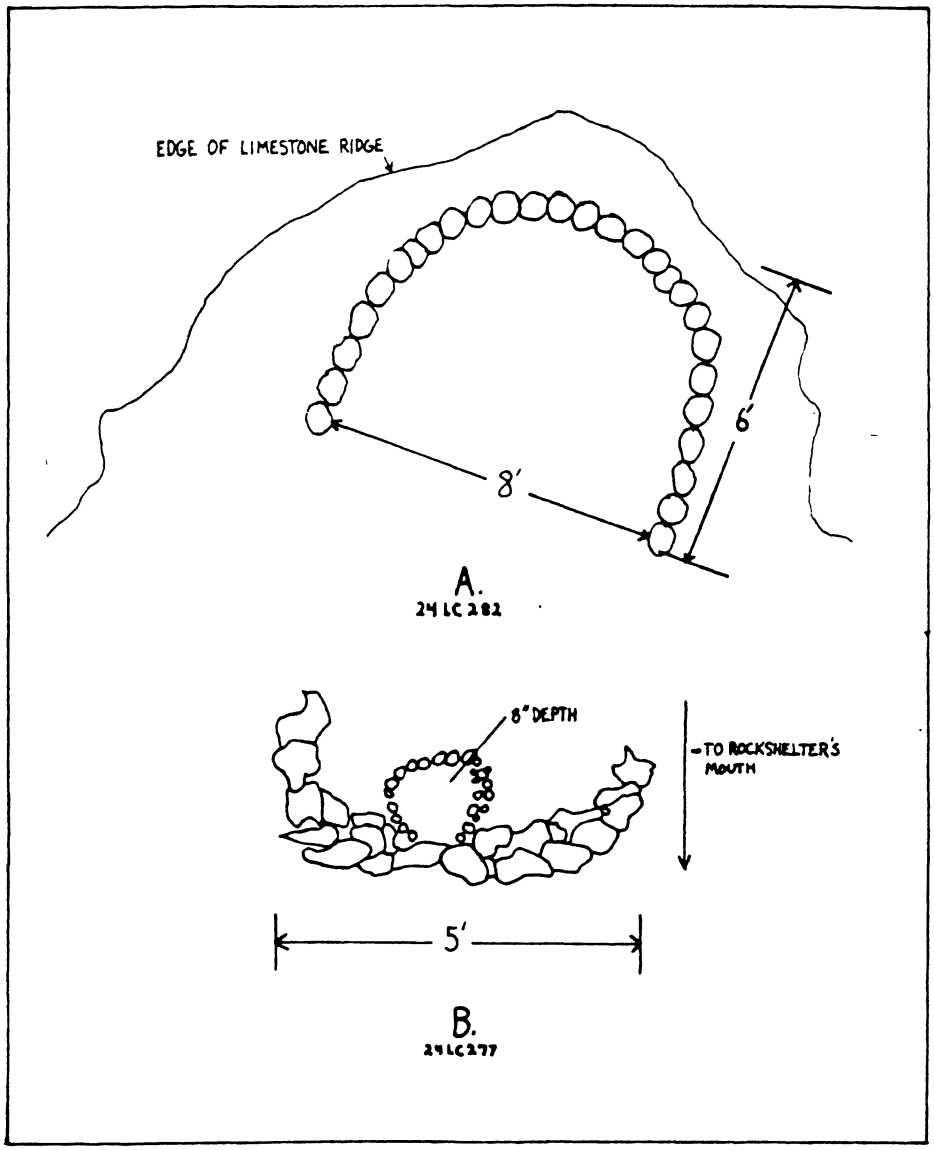


Figure 4.3 Stone Structure Features

end of limestone ridge overlooking the Missouri River (see Figure 4.3). Currently a game trail passes nearby, and the recorder noted the presence of many "goats" in the area. In the past, some investigators have referred to similar rock arrangements as "vision quest structures" (Knight 1977; Rominger 1976). Those in my area do not fit Conner's (1982) descriptions of such structures in his study of Crow Vision Quest Structures. One site has a hearth incorporated in the structure, and is located in a rockshelter overlooking a slope and the Missouri River. The other site is on the edge of a ridgeline overlooking a game trail and it also overlooks the Missouri River. Both structures are relatively large. These factors suggest to me that these structures functioned as hunting blinds similar to those reported by Binford (1978, 1983) in his ethnoarchaeological study of the Eskimo.

Prehistoric Human Burial. One prehistoric human burial has been recorded in the study area (24JF171). It was located at the base of a weathered stone outcrop near Montana City in the southern region of the area included. The individual, probably a female, was buried in a flexed position, accompanied by grave goods, and then covered by several layers of large rocks. The grave goods included a rejuvenated incised antler digging-stick handle; marine shell bead; 15 elk-tooth beads; part of a digging-stick

handle; an incised bone awl fragment; one flat, pointed bone with a hole drilled in it; 2 flat sections of curved bone; a thin, blunted section of bone; one broad, heavy section of bone with worn edges; one small antler section with a small hole in the distal end; one bison tooth; and one section of burned rib bone. Judging by the evidence reported, this burial would seen to be from a period preceding historic contact.

Subsurface Stone-Lined Feature. One site (24LC243) has been included in this category. It consisted of 30 to 40 rocks eroding out of a feature in a cut bank in the northern portion of the region. The site was recorded as a roasting pit and has since been destroyed. Confirmation through investigation is no longer possible, but subsurface testing might demonstrate the existence of intact features. Further examination would be beneficial for future analyses.

Hematite Source. I have placed one site in this category, even though the investigator reported no evidence of human activity. The site consisted of a hematite exposure in the Spokane Hills, in the eastern region of the Helena Valley. I included this site in the present study because Teit and Boas (1975) referred to a "paint" quarry near Helena that was used by the Flathead Indians. I have included it because it is representative of a prehistoric

resource exploitation activity, although this may not be the actual site of the quarry Teit and Boas reported.

Though not included in the categories described above, and not a site that I considered to utilize in my analysis, I mention the four sites (24LC684, 24LC685, 24LC686, and 24LC688) I shall refer to as the Byrd Complex. Each site represents a complex of unspecified activity areas including lithic scatters, quarries, kill sites, pictograph sites, and various occupation sites. As yet, no professional archaeologists have visited the complex. I have notified Gary Fairchild of the Helena National Forest and requested he examine and evaluate the area. The Byrd Complex was reported in an obscure source (Buell 1972). Diagnostics from the area include the complete range from Folsom-type projectile points to Old-Women's-type projectile points. I have included the area's location on my distribution maps for all time phases and for site locations and distributions. Though verification and adequate descriptions are lacking, I feel the reader should be aware of the possibility that this complex exists (see Appendix).

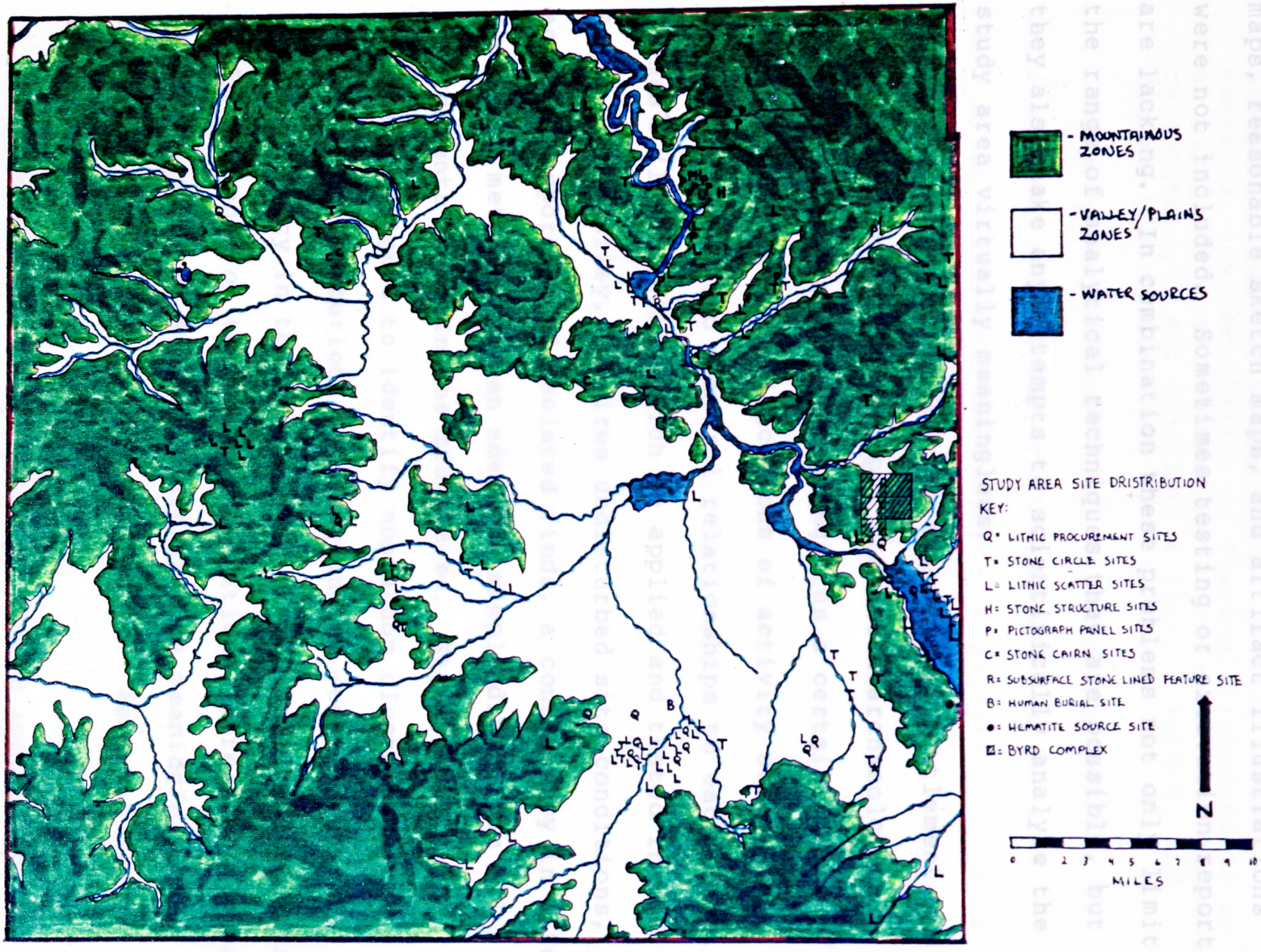
Analysis

Once the numbers and types of sites to be included in my analysis were established, I then plotted each site in

its approximate location on a map of the area (see Map 4.1). After this procedure was completed, I realized that there were serious problems with the data which restricted and limited the range of possible models and methods I could use in my analysis.

First of all, the majority of sites recorded in the area have been actively collected by the local residents in the region. Often this means that the sites could not be accurately ordered chronologically, and that the function or activity represented in each site cannot be accurately identified. In addition to the destruction of sites by "pothunter" activities, housing developments, ranching and farming have significantly impacted many known and unknown archaeological sites.

Secondly, there have been no major, comprehensive research surveys that covered the entire area. This has resulted in the existence of large areas that have not been examined by professionals. Possible cultural activities represented in archaeological sites will not be accounted for in an overview of the area. For most of the known sites, there has not been a standardized or consistent method of recording the data. Often the forms include vague to nonexistent descriptions of site boundaries, site types, legal locations, and other information as to whether the site represents single- or multiple-activity areas.



Map 4.1 Site Distribution in Study Area

With the exceptions of reports mentioned earlier, site maps, reasonable sketch maps, and artifact illustrations were not included. Sometimes testing or excavation reports are lacking. In combination these problems not only limit the range of analytical techniques that are possible, but they also make any attempts to scientifically analyze the study area virtually meaningless.

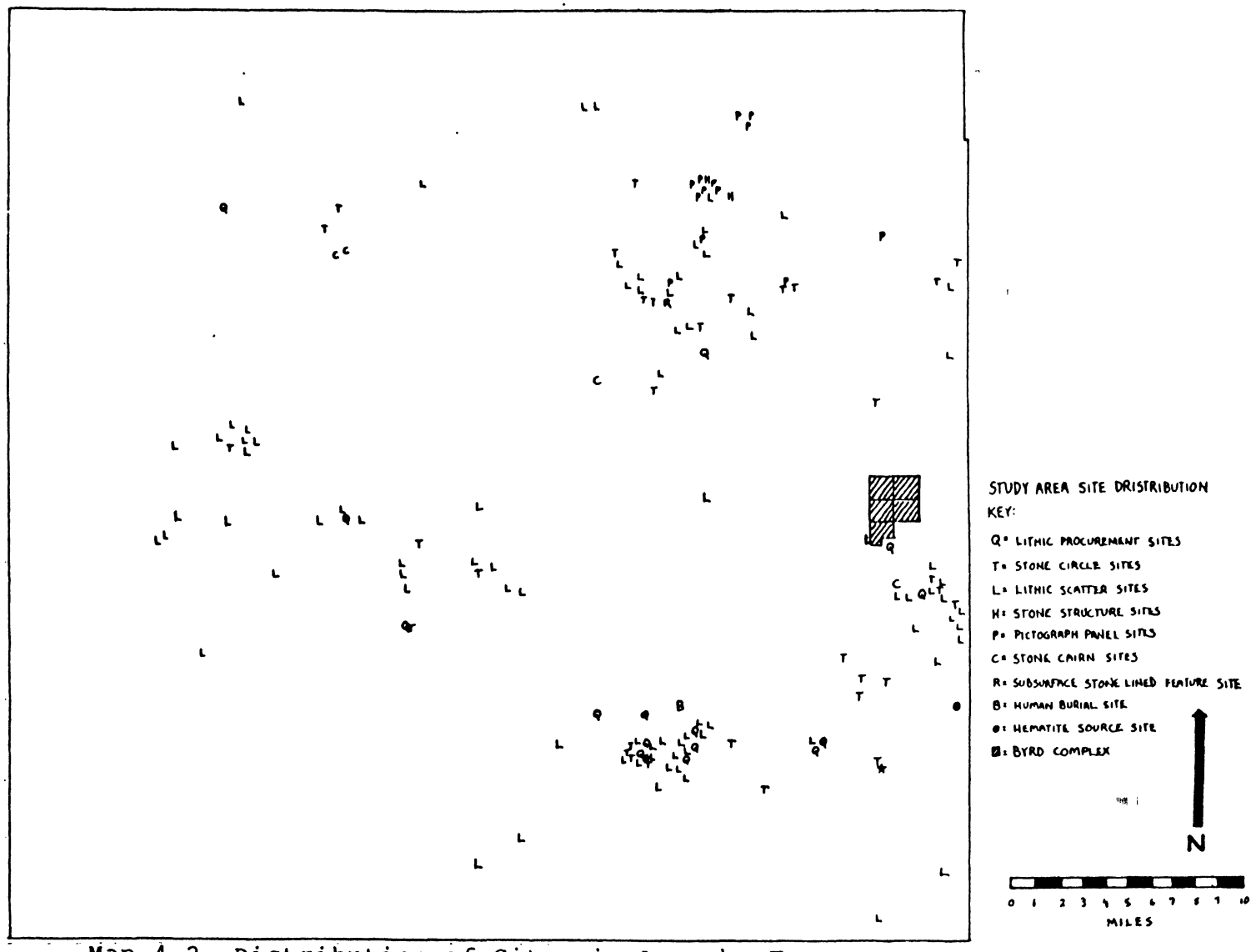
Binford's (1982) model for identifying settlement and subsistence patterns, developed from ethnoarchaeological observations and comparisons, requires a certain degree of confidence in the classifications of activity areas and their functional and temporal relationships to each other. Thomas's (1979) model, which he applied and tested in the Reese River Valley, requires undisturbed site conditions, accurate reporting of isolated finds, a consistency in site recording methods, and an adequate sample drawn from all environments found in the study area. Statistical analyses, designed to identify nonrandom clusters, site densities, distribution, and frequencies require accuracy and consistency in the development of the data base (Thomas 1976). Because of the present conditions, I felt that none of these models or methods could produce meaningful, nonbiased results if rigorously applied. As Davis has written:

> The Seasonal Transhumance Model can be applied to the archaeological record if two requirements are met: A)

> the cultural affiliation of each occupation must be identified, and B) the seasonality of each such occupation must be established. Lacking these controls, any postulation of seasonal transhumance as an explanation of archaeological remains . . . can only be conjectural and speculative (Davis, Aaberg, and Fisher 1980:104).

Since my data did not meet either of these requirements, I could not accomplish my intended goal of identifying settlement and subsistence patterns and changes in these over time. However, over the course of collecting and working with the available data, I feel that there is a recurring configuration and location of sites evident in the archaeological record. Even though I cannot do a rigorous scientific analysis at this time, I am compelled to make a "speculative" interpretation of the area's archaeological record. I hope to provide a tentative interpretive model which can be utilized as a guide in designing future research.

Once I had all sites plotted on a simplified map of the survey area (see Map 4.2), I recognized that the sites recorded within the area tended to cluster in the foothill region surrounding the main valley. Thomas (1979) observed a similar distribution of archaeological sites in the Reese River Valley. He called this the "edge effect", saying it "is a rather common form of ecological adaptation that allows exploitation of dual lifezones" (Thomas 1979). In Chapter II, I tried to identify the natural resources

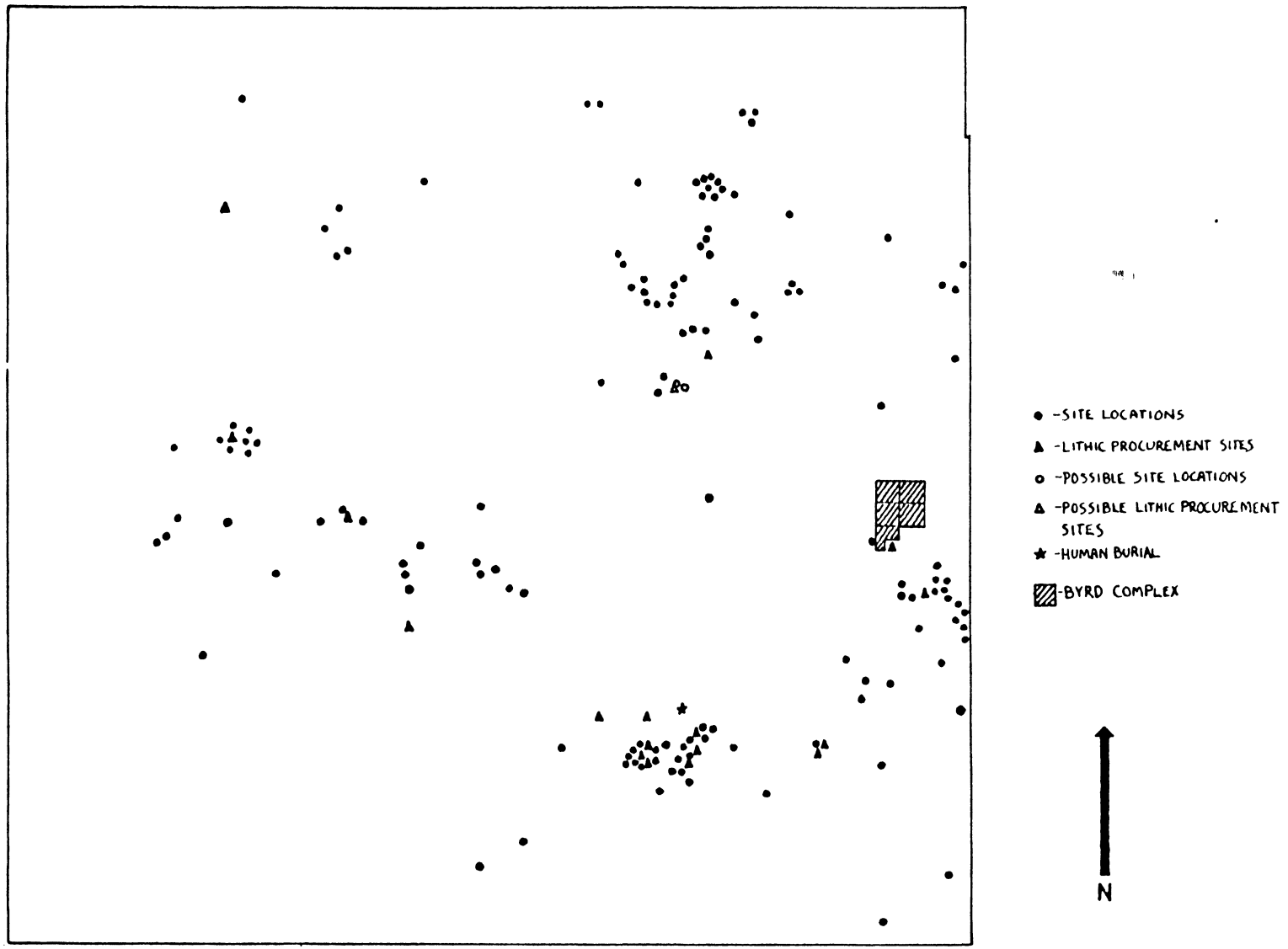


Map 4.2 Distribution of Sites in Area by Type

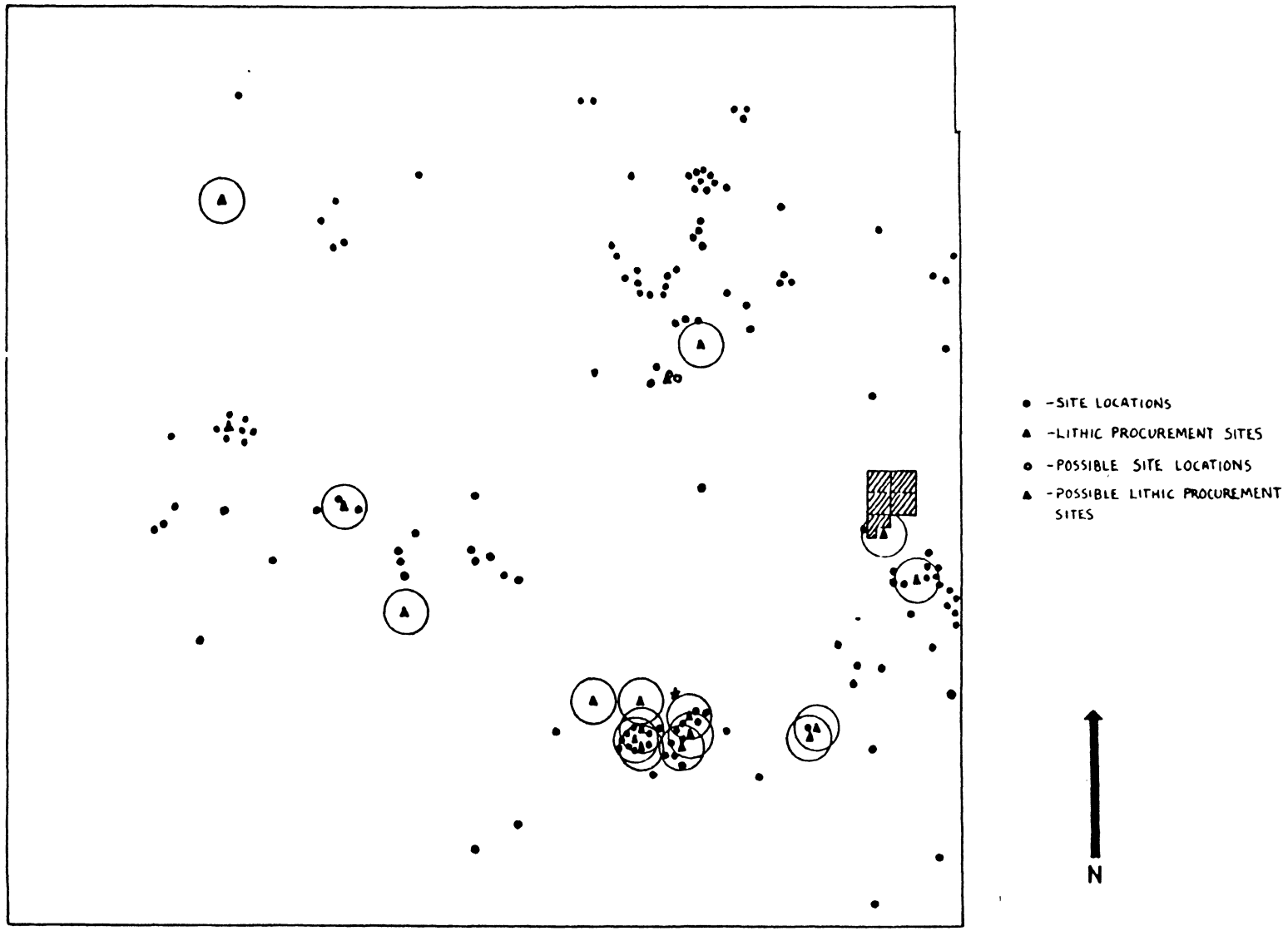
within the study area that would have been available to prehistoric populations throughout time. Of the resources identified, archaeological evidence for lithic resource procurement is the most visible, and most often the only direct evidence for use of the resource.

I then produced a simplified map illustrating site distribution in the study area, on which I distinguish lithic procurement sites from other site types (see Map 4.3). I produced a series of these maps illustrating the lithic procurement sites' spatial relationships to the other archaeological sites, in an attempt to determine whether or not lithic procurement was the focus of most prehistoric occupations. Using the lithic procurement site locations as the center, I used a compass to produce a radius of 1, 3, 5, 7, and 10 miles around each known lithic source (see, respectively, Maps 4.4, 4.5, 4.6, 4.7, and 4.8).

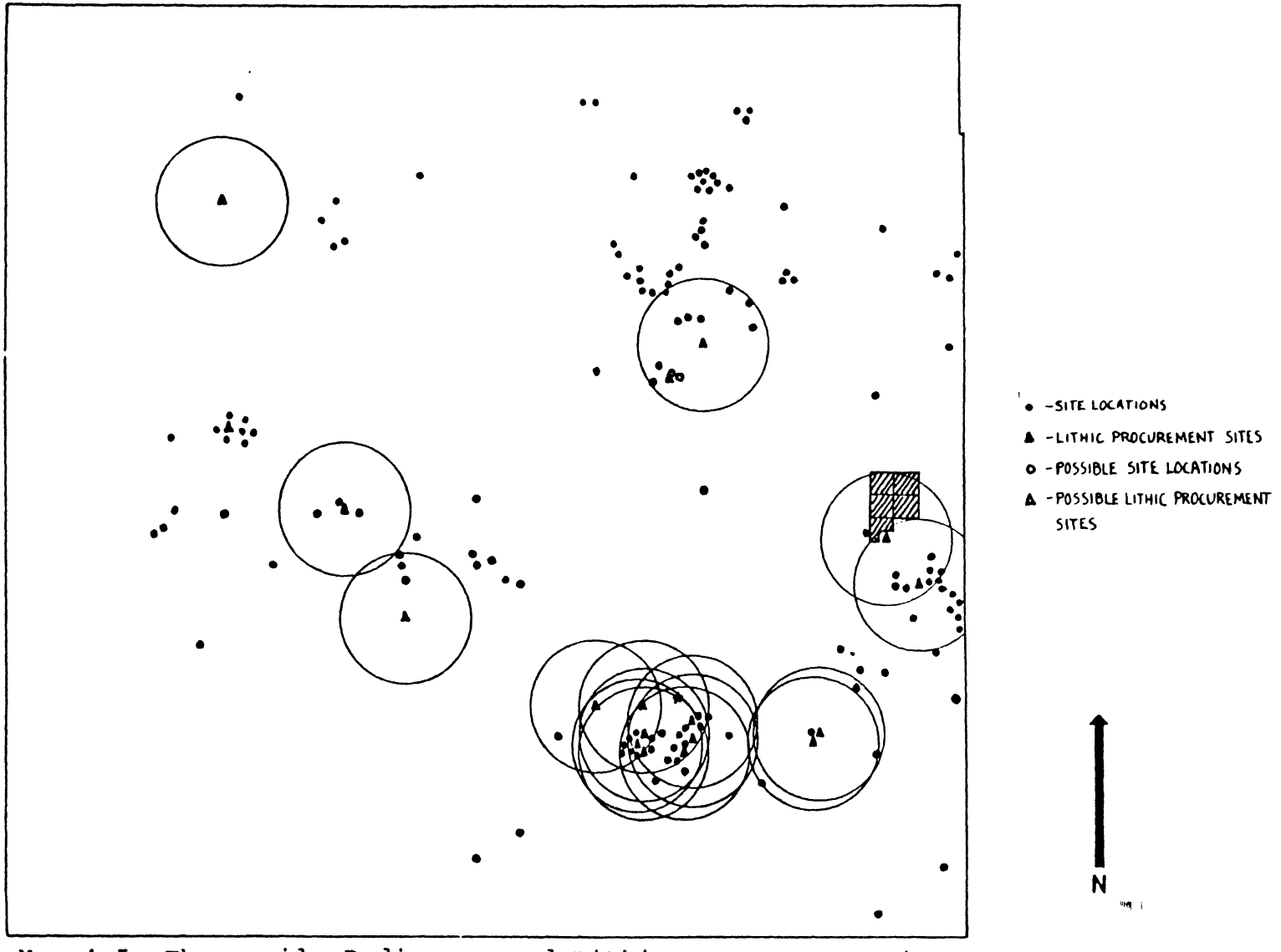
I then counted the number of sites located within the radii to determine what percentage of the total number of sites in the study area were included in each spatial relationship. Forty-eight sites, or 31% of the total sites, included in this study, lie within one mile of a lithic source. Seventy-six sites, or 50%, are located within three miles of a lithic source. At five miles, 102 sites, or 67%, are represented; one hundred twenty-seven,



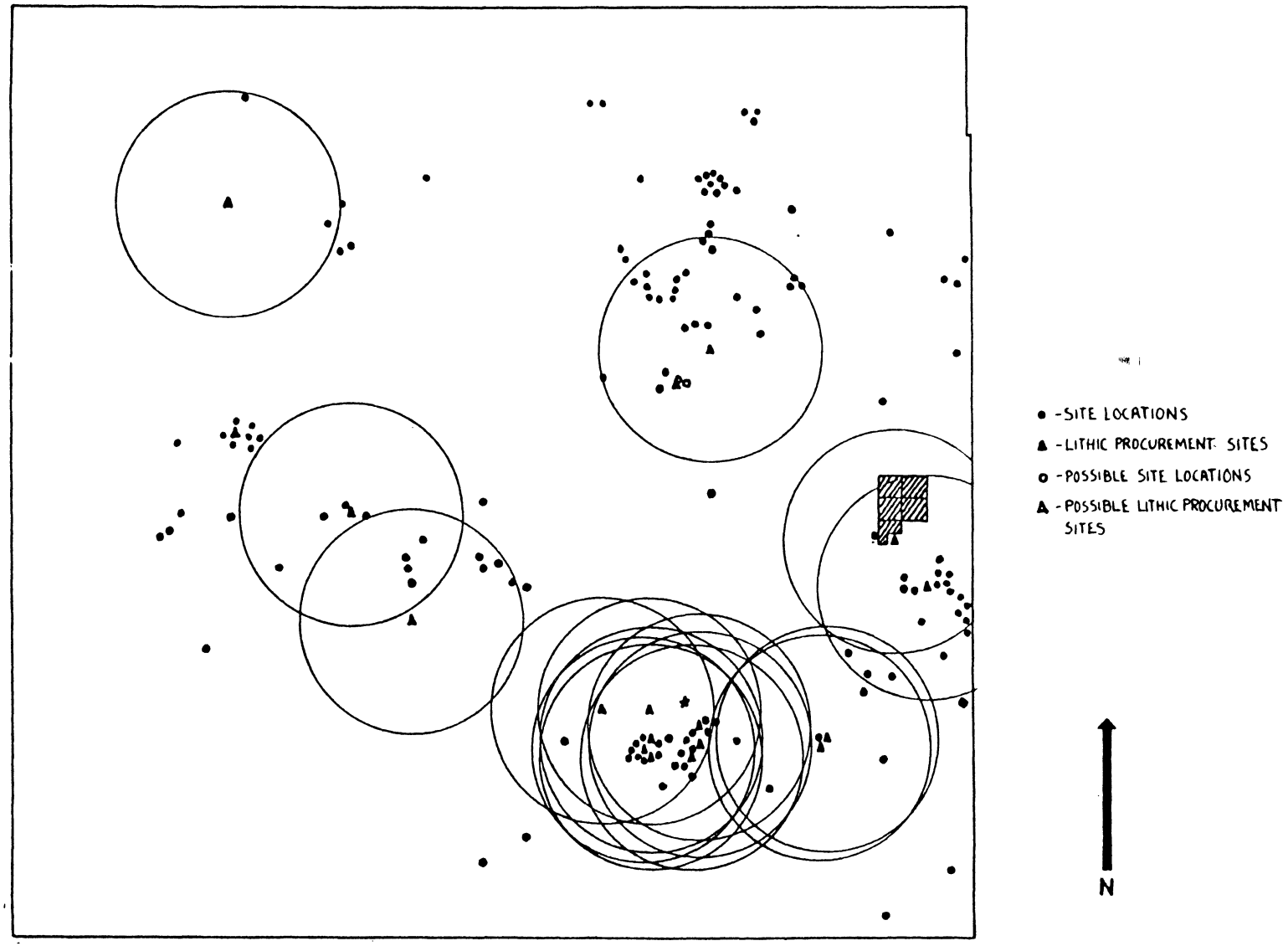
Map 4.3 Schematic Distribution of Sites



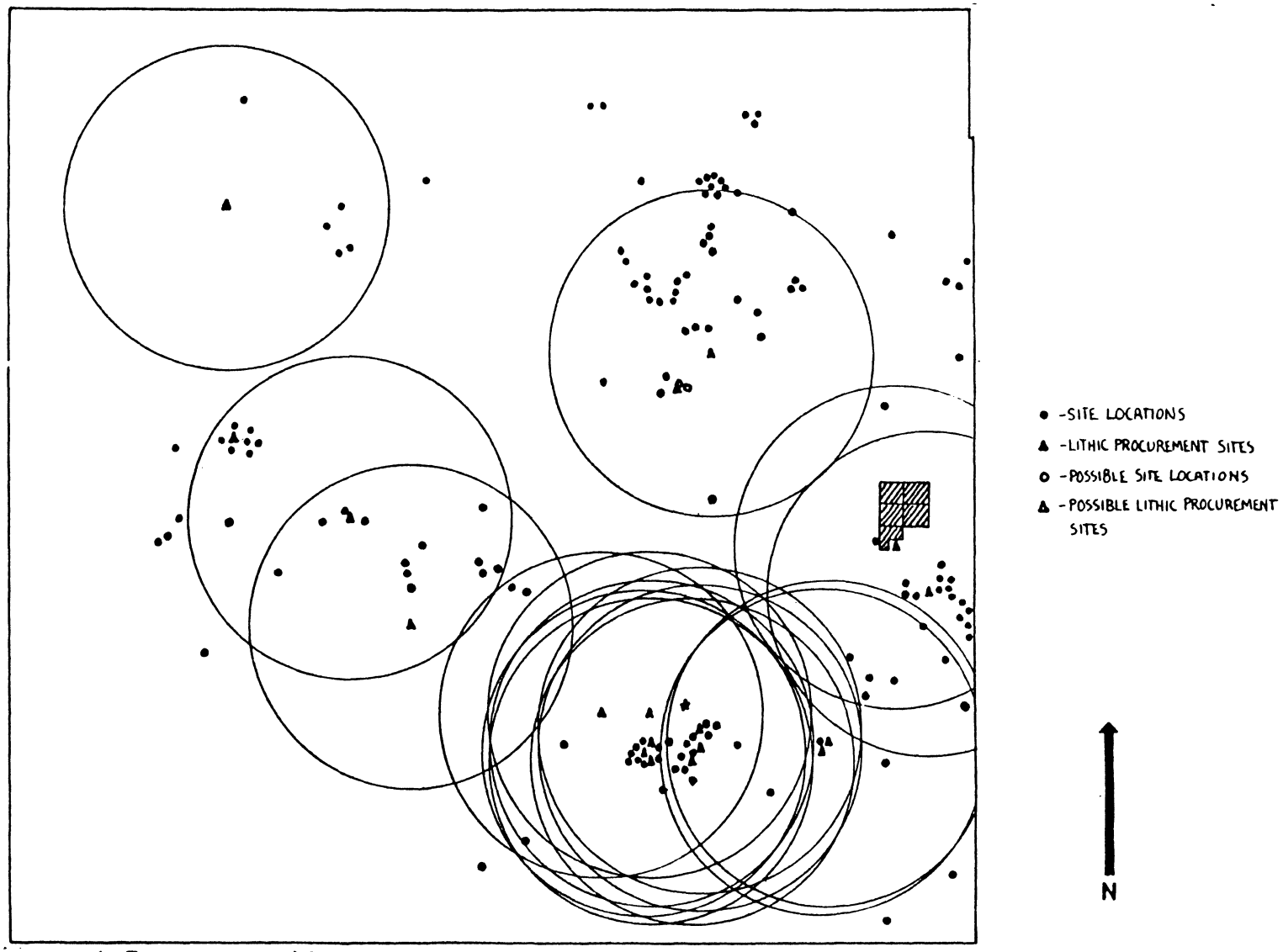
Map 4.4 One-mile Radius around Lithic Procurement Sites



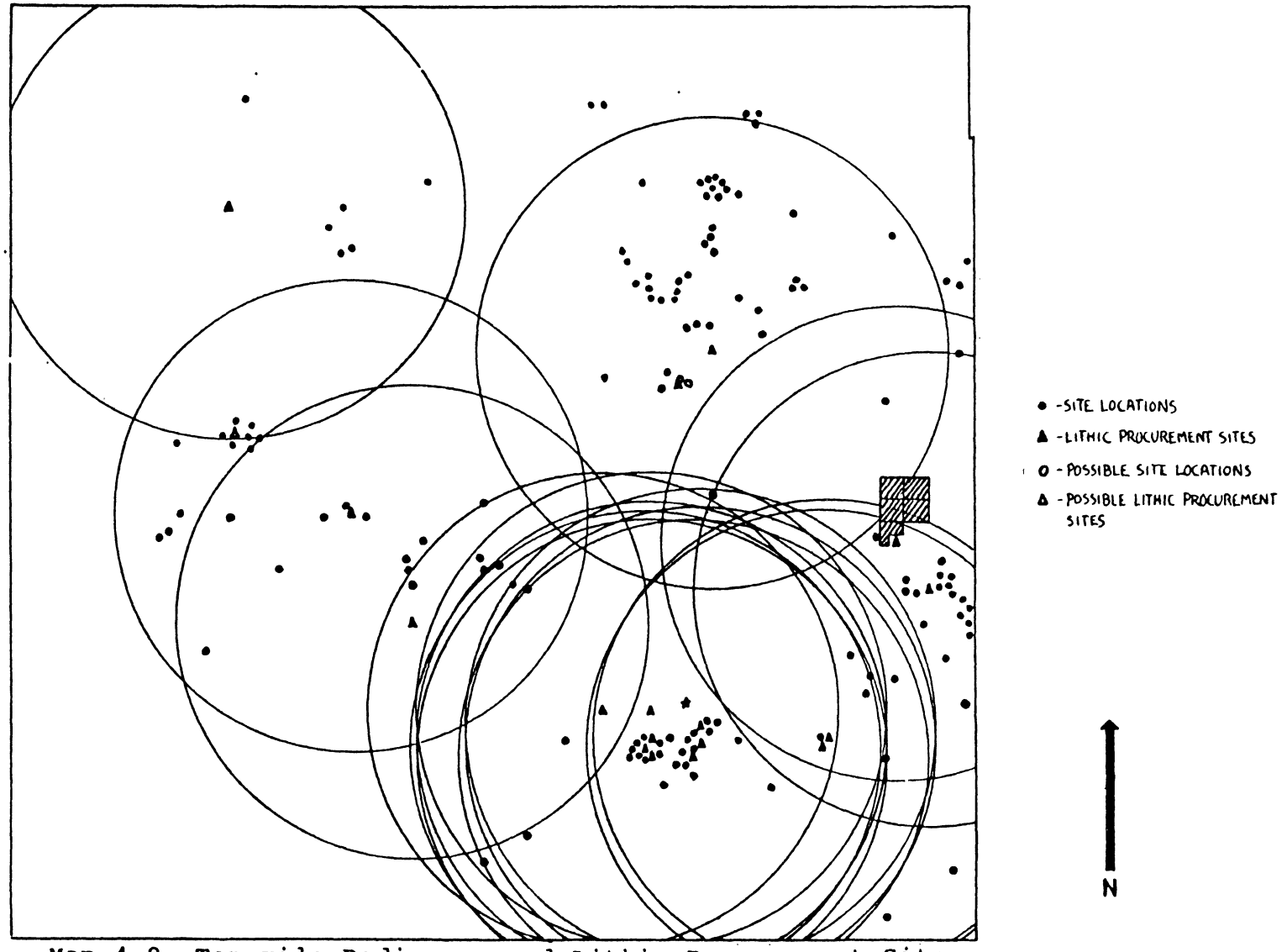
Map 4.5 Three-mile Radius around Lithic Procurement Sites



Map 4.6 Five-mile Radius around Lithic Procurement Sites



Map 4.7 Seven-mile Radius around Lithic Procurement Sites

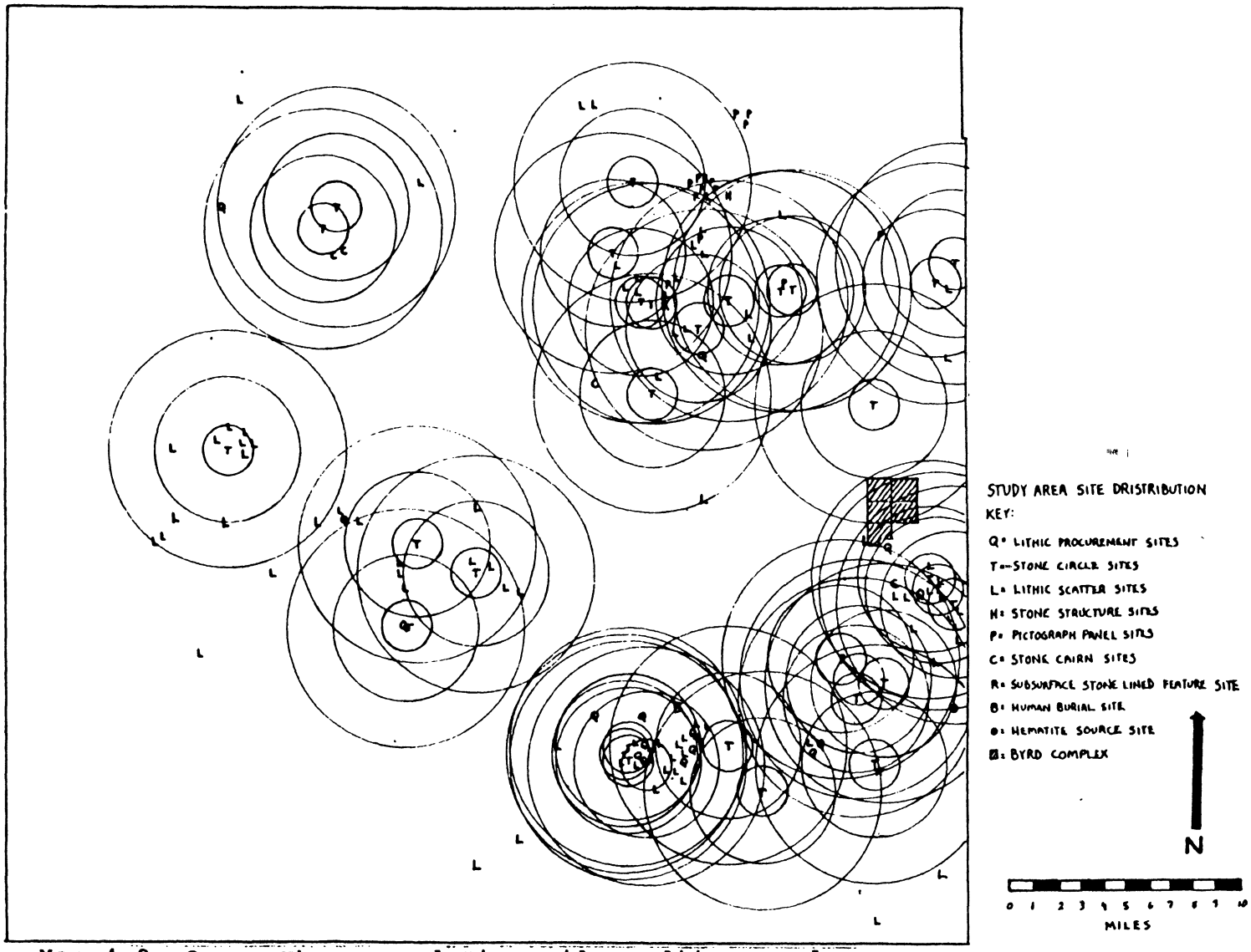


Map 4.8 Ten-mile Radius around Lithic Procurement Sites

or 83%, are located within seven miles; and one hundred forty-six, or 95%, are located within ten miles of a lithic source. This indicates to me that proximity to a lithic source influenced where people lived, hunted, or collected, but was not the central focus of resource exploitation.

I then produced a map on which I used the only identifiable base camps, represented by 34 Stone Circle sites, as the centers and drew 1-, 3-, and 5-mile radii around each to show base camp relationships to the other activity sites recorded in the area (see Map 4.9). A total of 72 sites, or 47% of the total, are located within one mile of the base camps; 118 sites, or 77%, lay within three miles of the base camps; and 141 sites, or 92%, were within five miles of the base camps. I should say that 151 sites, or 99%, are within seven miles; and 153, or 100%, are located within ten miles of the base camp areas. Of the 34 Stone Circle sites, 29 are located within five miles of a lithic source or Lithic Procurement Site. To me these results are significant, in that they indicate other influencing factors were operational.

This focus on base camps also indicated to me that although a location close to a lithic source was desirable, lithic procurement was not the main reason for occupation of this area. Of course, I am not treating the Stone Circle sites as having been base camps throughout time, for



Map 4.9 One-, Three- and Five-mile Radii around Stone Circle Sites

there is no evidence for the use of such structures until the Middle Prehistoric Period. I do think that when one combines the spatial relationships I have illustrated, and the distributions of the diagnostic projectile points I have illustrated in Chapter III, there is evidence suggesting that those areas which contained Stone Circle sites were used as base camp locales throughout time.

This further suggests to me that settlement and subsistence strategies remained the same through time. Also, the influencing factors such as proximity to natural resources, seasonal availability of natural resources, and preferences for similar environments appear to have changed little throughout time. From this I may infer the utilization of the same resources throughout time, reasoning that a change in the focus would result in a change in the settlement and subsistence patterns.

Although I decided that the data base was not complete enough at this time to allow the valid application of Binford's proposed model for site pattern analysis, I felt that in a general way a simplified application may be beneficial. In Binford's (1982) article, "The Archaeology of Place", he presented a model for site patterning analysis which he had developed from years of ethnoarchaeological observations and comparisons. In this article he presents a schematic model for economic activity

zones around a residential, or base camp, location (see Figure 4.4). Three general zones were identified, with the first zone being the campground, or "play radius"; the second zone being the "foraging radius"; and the third zone being the "logistical radius". The "play radius" represents the immediate area around the base camp. The "foraging radius" represents a zone that rarely exceeds six miles surrounding the "play radius", with this being the "area searched and exploited" by groups leaving and returning to camp in a single day (Binford 1982). The "logistical radius" is the area beyond the "foraging radius" in which exploitation occurs by groups that stay away from the base camp for at least one night. He says that from an

> . . .archaeological perspective we would expect "special use" areas in the play radius, primarily locations [including exploitation sites, hunting sites, and plant gathering areas] within the foraging radius and in the zones of the logistical radius field camps, stations, and caches may in fact be the dominant types of sites generated (Binford 1982).

By comparing "between-site" patterns, Binford has identified three patterns that may be observed (see Figure 4.5). The first pattern is the "half-radius continuous" pattern, which is a pattern of movement and exploitation that is exclusive to foragers, who move across the landscape in a directional manner exploiting resources as they are located. The second pattern is the "complete-

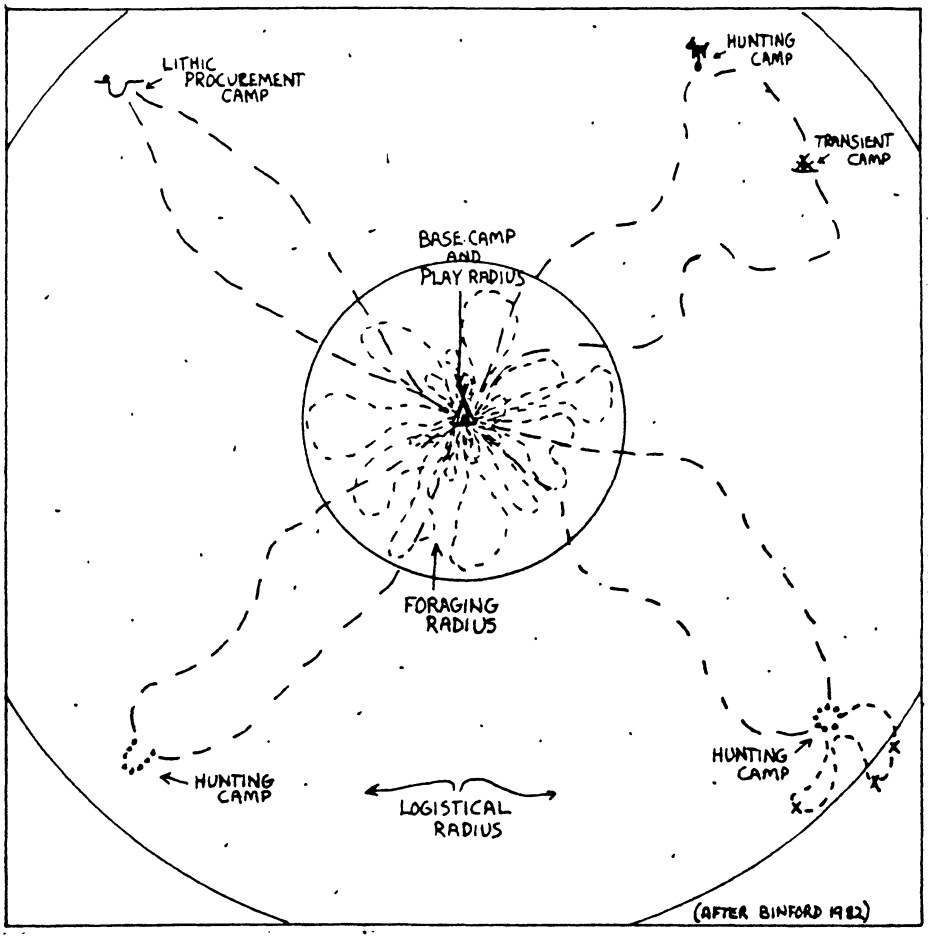


Figure 4.4 Simplified Illustration of Binford's Economic Activity Site Patterns around Residential Camps

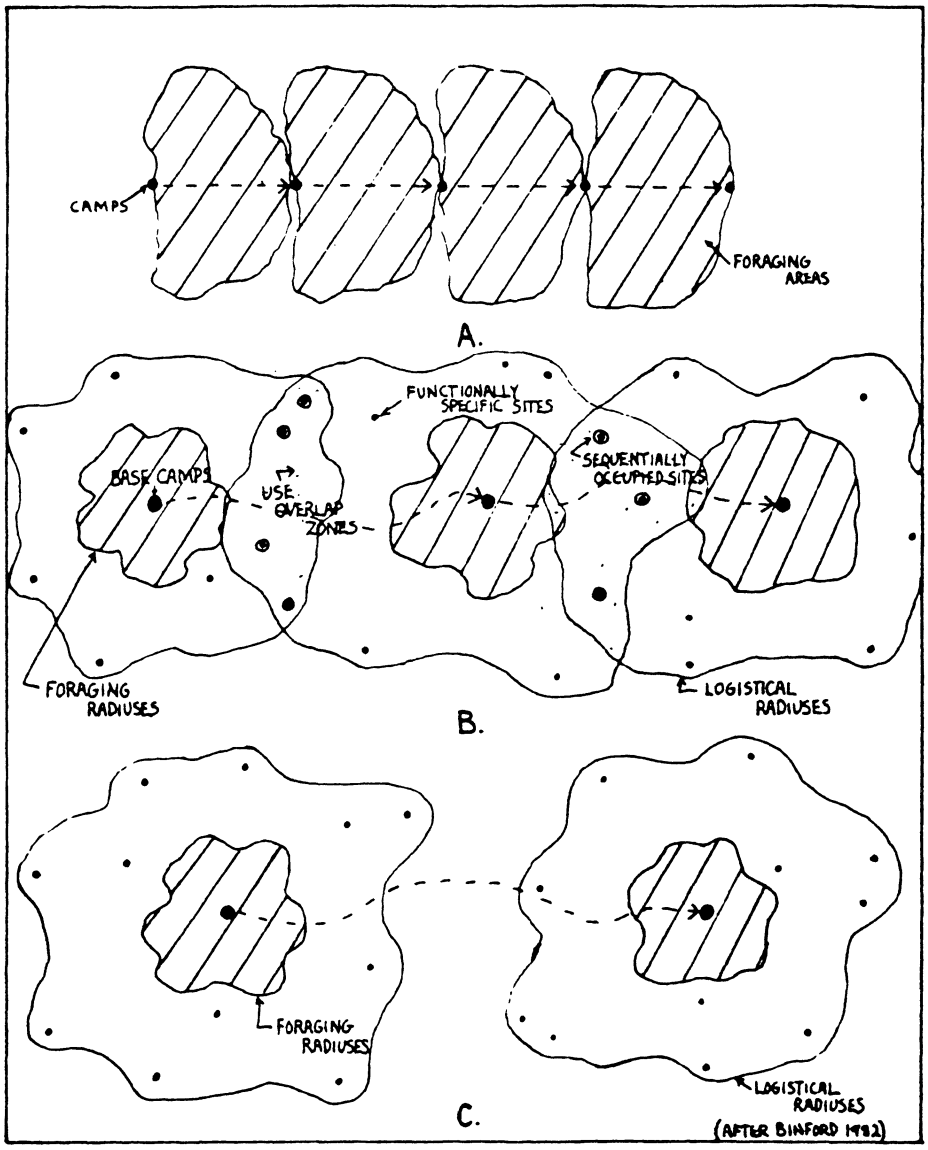


Figure 4.5 Simplified Illustration of Binford's Residential Camp Movement Patterns

radius leapfrog" pattern commonly seen in a high-biomass environment, and is utilized by foragers and logistically organized groups that have a familiarity with the environment and its available resources. The third pattern is the "point-to-point" pattern commonly seen in low-biomass environments and is more characteristically practiced by logistically organized groups. The "complete-radius leapfrog" and the "point-to-point" patterns are the results of planned movements around a group's habitat or "range". These are designed and utilized to place the group in a region when resources are available to insure maximization of exploitation return. Binford says:

> Residential placement in logistical systems is a compromise strategy relative to already known resource distributions, while forager strategies emphasize tactics aimed at learning about the distribution of resources in a region. Foragers employ coverage tactics, while collector site patterning derives from positioning tactics relative to a prior knowledge of resource distributions (Binford 1982:11).

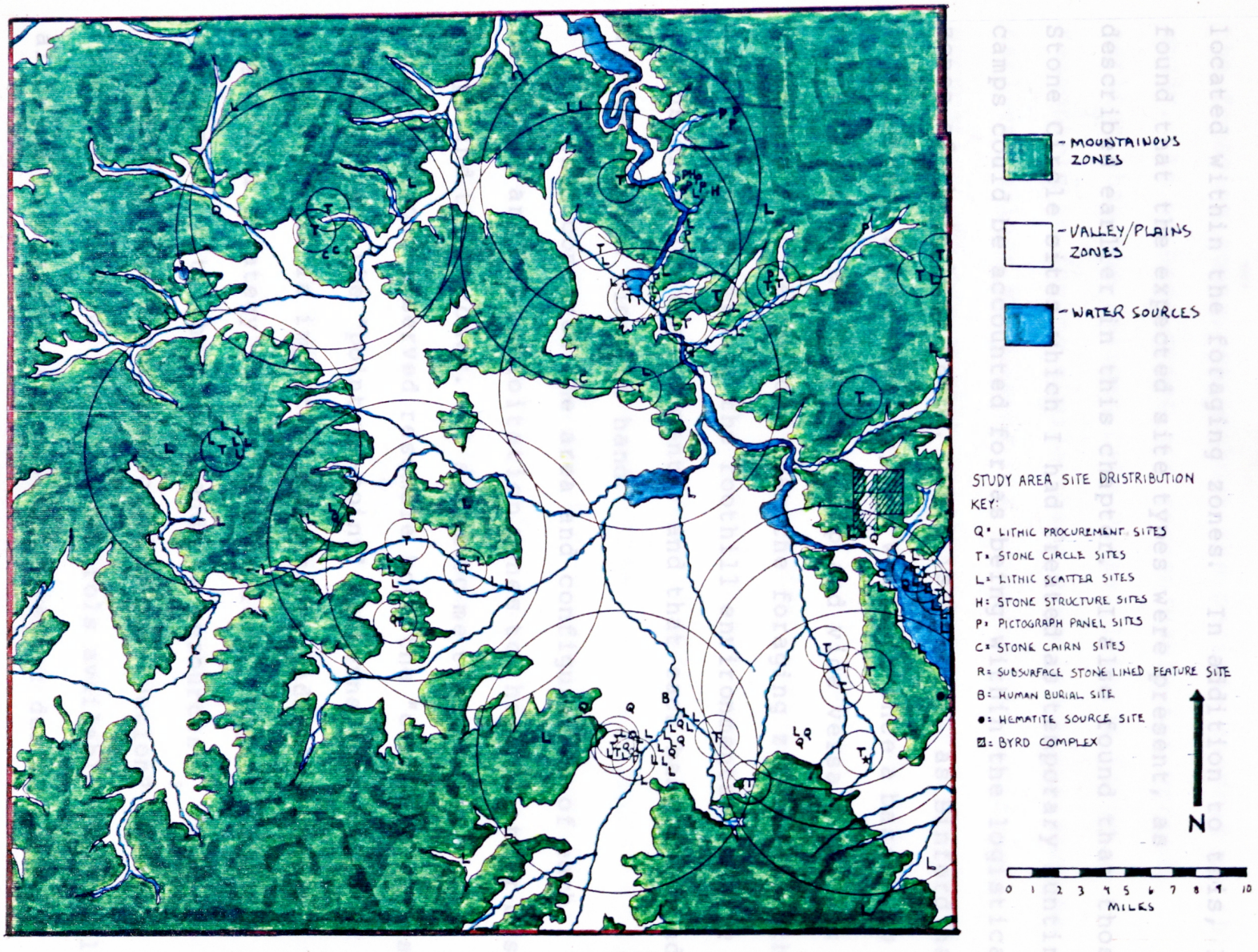
In addition, he points out that different groups may utilize different tactics during their seasonal movements around their exploitation range. He emphasizes this by saying:

> It can also be shown that many human groups may move through seasonal phases in which their coverage and positioning tactics change. For instance, in some systems people may be dispersed in summer, behaving like foragers by exploiting a mobility strategy designed for coverage, seeking to maximize the "encounter" with resources, yet during the winter they may be living from stores at a site which was positioned in terms of logistical concerns. Mobility

> patterns may be both geographically variable and regionally complicated (Binford 1982:11).

Finally, Binford (1982) observed that the more repetitive the seasonal movement of residential sites, the greater the chance for the presence of repetitive types of occupations around particular logistical sites. In other words, the more often a population repeatedly uses the same base camps during the same seasons, the more likely the repeat use of the same sites in the logistical zones.

In an attempt to develop some degree of an understanding of the archaeological record in the region, I decided to apply a modified and generalized version of Binford's model to the observed site distributions, ignoring the periods of occupation. First, all type sites and their locations were plotted on a generalized map (see Map 4.10) of the study area showing mountain regions (dark green), plains or valley floor (white), and the major water sources (blue). Not knowing how much area to include within the "play radius", I simply drew a radius of one mile around each Stone Circle site location to make its visual identification easier. Next, I identified the 12 Stone Circle sites in the area that were reported to have at least 4 stone circle features, which I decided would represent base camp locations. Around the Stone Circle sites I identified as base camps, I used a compass to draw a six-mile radius which represented Binford's "foraging



Map 4.10 Foraging Radii around Base Camps

radius" (see Map 4.10).

I found that 141 sites, or 92% of the total, were located within the foraging zones. In addition to this, I found that the expected site types were present, as described earlier in this chapter. I also found that those Stone Circle sites which I had treated as temporary hunting camps could be accounted for as being within the logistical zones of their base camps. This is because, as Binford has pointed out, zones overlap, and what was once a base camp may be used as a logistical camp and vice versa. I think it should also be noticed that the foraging zones cover the mountain environments, the foothill environments, and the plains or valley environments, and that each base camp had a water source close at hand.

I then compared the area and configuration of each base camp and its exploitation zones to those of other base camps and their zones. It seems to me that the configurations observed resemble both the "complete-radius leapfrog" and the "point-to-point" patterns identified by Binford. This is important because it indicates that a logistical strategy was being practiced, suggesting a familiarity with the region and its resources.

What is the importance of this observation? Even though I do not have the time controls available that would allow me to examine land use and movement during each

period in time, I feel the pattern reflects the continued use of the area, or at least the general areas included in the foraging zones, throughout the periods covered in this study. As no base camps are recognizable for periods earlier than the Pelican Lake Phase, I think it is reasonable to assume similar base camp locations for the earlier periods because of the evidence for continued occupation and use within the foraging zones (i.e., 24JF4 and 24LC9). From these observations I conclude that a similar seasonal occupation occurred throughout all the period. The sites reflect an ongoing settlement and subsistence strategy that focused on the same resources--although the focus and importance of particular floral resources may have varied over time. My conclusion is not completely demonstrable, but I do suggest the possibility of similar use through time. I am well aware of the many limitations that exist in this study.

Summary

To conclude this chapter, I believe that, even though the quality of the archaeological information available does not support rigorous scientific methods of analysis at this time, some insights into the past are possible. I feel that a recognizable settlement and subsistence pattern is present in the archaeological record and that it has

changed little, if any, over the periods of occupation under consideration. There seems to have been a preference for base camp locations in the foothill regions, or in areas where there was a high degree of topographic variation. Occupations in these areas were located within easy access to lithic procurement areas, although this was not the focus or only resource influencing locales of occupation. The foothill regions were transitional zones between the mountain environments and the valley environments; these allowed easy access for the exploitation of resources in both regions. This subsistence pattern, or ecological adaptation, has been called the "edge effect" by previous researchers (Thomas 1979), and similar patterns have been reported in the northern regions (Bonnichsen and Baldwin 1978; Brumley 1985; Ruebelmann 1983). It seems to me that the continued use of this locale and its resources indicates that the various prehistoric populations were using the same or similar strategies in exploiting resources during the same seasons over many centuries (Binford 1982). A change of focus should have produced a visible change in settlement and subsistence patterns during the time periods considered in this study, but this did not occur.

CHAPTER V

CONCLUSIONS AND INTERPRETATIONS

In Chapter I, I presented a hypothesis and five questions which I decided would require answering in order to test the validity of that hypothesis. The body of this thesis consists of my attempts at providing answers to those questions from the archaeological data available to me. In this chapter, I present the answers I have obtained, discuss a possible interpretation of the evidence, and outline problem areas that need to be addressed by future researchers before further analysis can proceed.

Conclusions

My hypothesis for the prehistoric occupations of the study area is that:

> The environment and the natural resources available in the study have changed little, if any, over time; thus the settlement and subsistence strategies practiced by the prehistoric populations have changed little over time. This resulted in a continued pattern of use that is visible in the archaeological record.

The five questions and the answers I obtained are presented here. Question number one asked: what natural resources, including mineral, floral, and faunal, were present in the study area that could have been utilized by prehistoric populations? In Chapter II, I reported the

results of my research that supported the basic premise of my hypothesis. The geological evidence suggests that the environment has changed little, and only in degree, over the past 12,000 years. The climate has remained stable, and those resources which are available today were present in the past. However, fluctuations in floral and faunal mass may have occurred throughout the period of man's occupation.

The mineral resources available include cherts, agate, quartzite, basalt, and, in lesser quantities, porcellanite, silicified ash, silicified limestone, tufts, and mudstones or platy-green chert. Also, hematite or iron oxide is plentiful.

The faunal resources include 28 prominent species of mammals, not including extinct forms of mammoth, muskox, brown bear, bison, and wolf. This is not an exhaustive list, as many other small game animals are present. In addition to this, there are 13 species of birds and 3 species of fish that native peoples exploited according to ethnographic records. There are 212 useable plants identified in the area, 119 of which are reported to be edible.

Question number two asked: based on recorded archaeological sites and the presence or absence of diagnostic projectile point types, during what periods or

phases was the area of consideration occupied? Based on the presence of diagnostic projectile points, I concluded in Chapter III that the valley had been occupied over the past 12,000 years from the Clovis Phase, throughout the Old Women's Phase and into historic times.

Question number three asked: ethnographically, what known peoples occupied the Helena Valley and how did they make use of the resources there? I presented ethnographic information that suggests a seasonal occupation wherein several bands of the Flathead occupied the region. One band used the study area as its winter camp location, one band wintered just to the north, and two bands wintered to the south. The Snake Indians are reported to have lived on the plains to the east. Due to trade contacts, intermarriage, and cooperative events, it seems likely that there was little difference evident between tribes as to their social organization and material cultures. The ethnographic evidence suggests the exploitation of a hematite source in the area, and confirms the use of faunal resources and the use of at least 67 of the floral resources that I presented in Chapter II. Unfortunately, I had no information about the exploitation of lithic resources.

Question number four asked: what evidence was there archaeologically and ethnographically that indicated the

utilization of those natural resources that were identified? Could a seasonal model be developed? Archaeologically, a lot of evidence suggests the utilization of the region's mineral resources. There are 16 recorded Lithic Procurement sites, 83 recorded Lithic Scatter sites, 32 Stone Circle sites; the majority of these had lithic scatters in association. One recorded hematite source was possibly exploited in prehistoric times. Ethnographically, this reference to the use of a hematite source is the only support for the idea that this mineral resource was exploited.

Archaeological information is scarce for the use of animals because there are so few excavations or subsurface test results. There is evidence for the hunting and procurement of bison, bighorn sheep, deer, elk, antelope, wolf, marmot, beaver, and other various small game animals found in the sites located in the area. Ethnographic evidence supports the utilization of all the faunal forms identified, except for the extinct mammoth and muskox species.

Archaeologically, the use of the floral resources can only be inferred. Support for claims of plant exploitation lie in tools which are believed to have been used in processing plants. Examples are grinding stones, mauls, manos, and the inclusion of what is believed to be a

digging stick handle in a human burial. In addition to this, there is one subsurface stone-lined feature recorded in the study area, that may represent a roasting pit used to cook vegetable foods, probably camas. The camp site locations in the transitional environments, or foothills, may suggest the exploitation of plant resources as they are readily available in the local areas. However, this cannot be directly demonstrated. Ethnographic data supports the idea that at least 67 plants present in the area could have been used.

Archaeological evidence from two sites located south and east of the study area suggests late winter/early spring as the period of prehistoric occupation. Further support for the idea of seasonal occupation can be inferred from the existence of 34 sites with stone circle features, with camp site locations in the protected foothill regions. In addition there are diversified faunal remains, and the presence of one recorded communal bison pound or snowdrift trap in association with a stone circle site. Ethnographic information offers support for winter occupation. A band of Flathead are reported to have used the study area as their traditional "winter camp" location. Other Native American groups used similar environments for their winter camp locations, where there was protection from winter storms, winds, and deep snowdrifts. There is also an

abundant supply of firewood, fresh water, and faunal resources in the area, with floral resources supplementing the diet in the spring and in the fall. By combining all of this information, I inferred a seasonal model, similar to the one outlined in Chapter II, but adequate proof or verification is not available at this time.

Finally, question number five asked: if the above questions can be adequately answered, can changes in the use and occupation over time be identified? If so, what types of settlement and subsistence pattern or patterns could be identified? First of all, I found that I could not adequately answer the question due to the condition and quality of existing archaeological information reported. The majority of the answers concerning prehistoric activities can only be inferred, because many site forms are deficient in recording and content descriptions, and lack data on site testing and excavations. In Chapter IV, I attempted to develop a means of analysis that would allow me to identify a settlement and subsistence pattern in the area. My results were inconclusive, although I feel there is no evidence to support the idea that prehistoric use or strategy changed over 12,000 years of occupation.

Several tendencies became apparent during my analysis. There appears to have been a definite preference for site locations in the foothill regions where a fresh water

source was close at hand, be it a stream, spring, or the Missouri River. Although evidence suggests that Lithic Procurement was not the focus of occupation, there seems to have been a preference for locating camp sites near a lithic source, with the optimum distance being approximately five or six miles.

Camp size appears to have been small, with the average number of lodges falling between three and six lodges. This inference is supported by ethnographic information which reports winter camps as composed of small family groups. Larger numbers of stone circle features in a site probably represent repeated occupation. This was demonstrated at the Pilgrim Site to the south and east of the area. Smaller-size camps probably represent small family groups who moved out to hunt during the warmer periods or during breaks in the cold weather during winter occupation. This is also supported by the ethnographic information, which reports that small dispersed groups hunted and collected food supplies as they moved in to winter camp areas. Hunting continued as the weather allowed during the winter season, and as spring approached and winter camp began to break up.

When I tried to apply Binford's model for the identification of settlement and subsistence patterns, I concluded that, even though adequate time control was

lacking, I could suggest a pattern. The evidence for repeated site occupation throughout time, the repeated evidence for the exploitation of the same or similar resources through time, the continuity of site types through time, and the archaeological and ethnographic information for similar seasonal occupations, combine to offer support for my hypothesis. The inverse of Binford's observation may be true. The presence of repetitive types of occupations around particular logistical sites, probably indicates a greater tendency for the repetitive seasonal movements of residential sites. More simply stated, the more repetitive the evidence for similar use of an area, the more likely the existence of a similar seasonal exploitation strategy. Although clues to the validity of my hypothesis are present, adequate testing is not possible at this time.

I think that the archaeological evidence can be used to formulate a pattern or a seasonal round strategy, which reflects familiarity with the environment and its resources. I suggest that the prehistoric population occupied the study area mostly during the winter season, because the area contained plentiful supplies of firewood, lithic materials, fresh water, and food. The area also offered protection from the elements, with relatively stable winter climate.

My tentative interpretation is that during the winter months, small family groups camped in the foothill regions around the area, exploiting the resources found locally. During warmer periods, family units ventured out to hunt in the mountainous regions, or to productive areas outside of the locally-used foraging zone. Occasionally, the opportunity to procure a small herd of bison by communal means presented itself, and fresh meat was acquired.

As spring approached, roots, corms, and tubers started to grow and attention was focused on plant procurement to replenish depleted supplies. In the spring, the bison began to return to the plains, and the populations prepared for their move to the plains to exploit the large herds as they gathered. Before leaving, the lithic sources were visited so that tool kits could be prepared and the blanks for spares produced. At times, the ground would be frozen and fire could have been used to extract the lithic material. After food and lithic supplies had been adequately procured, the winter camps broke up with some family groups possible going north and some going east or south to the bison hunting grounds to combine their efforts with those of other bands and to visit after the long period of isolation.

During the summer, a time of plenty for the traditional occupants of the plains, the bands camped along

river bottoms in the plains to visit, find wives, renew old friendships, and make new ones, and perhaps small trips were planned to hunt bighorn sheep, gather early berries, or procure more lithic material and replace broken or lost hunting tools, or to gather new lodgepoles. Trade probably intensified at this time, with hides, chert, obsidian, pipes, pipestones, hematite, turquoise, and sea shell items exchanging hands and being distributed over considerable distance. During this time it is possible that some groups moved into the study area as resources were plentiful. Later in the summer season, the attention again turned to the procurement of plant foods, as the berries began to ripen.

The fall season was a time of preparation, as hunting efforts and berry collecting intensified to store up the supplies needed to last through the coming winter. These activities continued until as late as November in some cases. As winter approached, various bands began to break up and plans were made as to who was going to camp together for the winter. The bands, or family units, headed for their "winter camp" areas, making final efforts at hunting and gathering as they traveled.

As the weather began to intensify, the groups set up their camps in the traditional wintering locales to repeat their cycle of seasonal movement. Perhaps, as has been

noticed among the Nunumuit Eskimo, certain areas were occupied for a time, then abandoned for a period of time because the resources had been exhausted (Binford 1978). At any rate, there is as of now no evidence to suggest a change in the subsistence and settlement pattern through time. For the time being, I think the study area should be seen as a winter camp locale that has been utilized as such throughout the period of man's occupation in Montana.

Summary

This thesis represents my attempt to interpret the archaeological record for a study area located in and around the Helena Valley. Research has been directed at the analysis of available information on the archaeological and ethnographic records pertaining to the region. My analysis was based on somewhat limited data, as the record is not complete enough at this time to permit rigorous, scientific examination. The results of this thesis are undoubtedly biased because of the kinds and amounts of data available and by my own personal beliefs. Thus, the interpretation presented here should be seen as tentative. I encourage other researchers to expand upon this work.

Currently, research is being conducted in the Montana City area in an attempt to reconstruct the paleoenvironment there, to revisit and rerecord known archaeological sites,

to review local amateur collections, and to develop a predictive model for site location in the area (Herbort 1986). It seems to me, that in addition to this, sampling surveys and excavations are needed before an adequate model for occupation can be developed.

Future research should be directed at relocation, updating and defining site boundaries. Site protection should be encouraged to prevent looting and the loss of data. Some attention should be given to excavation and testing of known sites to obtain C-14 dates, to identify the plants that were used, to identify animals that were exploited, and to seek evidence that would suggest a season or seasons of occupation. Until the questions are addressed, further analysis of this area and the surrounding region may remain largely speculative in nature. I hope the future professional researchers will accept the challenge.

APPENDIX

SITES INCLUDED IN ANALYSIS

SMITHSONIAN SITE NUMBER	TOWNSHIP	RANGE	QUARTER SECTION	SECTION
Lithic Procurement Sites				
24JF3	9N	3W	NW	11
24JF5	9N	3W	SW SE	13 &
			NW NE	24
24JF221	9N	2W	NE NE NE NE	13
24JF223	9N	2W	SW SW	7
24JF226	9N	2W	SW NW	18
24JF264	9N	3W	NE NE	8
24JF601	9N	2W		13
24JF697	9N	3W	NE	15 &
			NW	14
24JF758	9N	3W	SE NW SE	15
24JF760	9N	3W	NE SE SE	15 &
				14
24LC18				
24LC135	10N	1W		11
24LC265	12N	2W	SE NE	19
24LC687	11N	1W		33
24LC716	10N	5W	NW NW NE	24
24LC717	13N	6W	NE NE NE SW	22
24LC719	11N	5W	NW NW NW SE	28
Stone Circle Sites				
24BW32	9N	1W	N.CTR.	5
24BW36	9N	1W		16 & 21
24JF759	9N	3W	NE SW & NW SE	15
24JF760	9N	3W	NE SE SE	14 &
				15
24JF1001	9N	3W	CTR.	15
24JF1048	9N	2W	NW	27
24JF1049	9N	2W	NE	17
24JF1050	9N	3W	CTR.	15
24LC5	10N	1W		11
24LC17				
24LC18				
24LC84	12N	1W	NE SW	33
24LC86	13N	1W	SE NE	36
24LC87	12N	1W	SE NE	2
24LC124	13N	3W	NE NW	15

24LC136	10N	1W		11
24LC138	10N	1W		13
24LC145	10N	1W	CTR.	32
24LC146	12N	3W	NE NE	10
24LC150	13N	3W	SW NE	33
24LC257	12N	2W	NE SW	2
24LC259	12N	2W	NW SE	2
24LC271	12N	2W	SW NE	18
24LC274	12N	2W	NE NE	8
24LC660	10N	1W	NE NE SW	30
24LC663	12N	3W	NW	35
24LC664	11N	4W	N-1/2 SW	31
24LC707	10N	4W	SW SE	4
24LC716	10N	5W	NW NW NE	24
24LC744	13N	5W	NE SW NW	28
24LC745	13N	5W	SE NE SE	21
24LC760	10N	1W	SE NW SE	33
24LC1001	11N	6W	SE	10
24LC1030	12N	3W	NW NW	11

Pictograph Panel Sites

24LC27	13N	2W	NW NW	19
24LC216	14N	2W	SE NW	33
24LC247	14N	2W	SW NE	33
24LC248	14N	2W	CTR.NE	33
24LC249	13N	2W	NW NW	19
24LC258	12N	2W	NE SW	2
24LC264	13N	1W	SECT.LINE	21/28
24LC276	13N	2W	NE NE	18
24LC278	13N	2W	NE SE	30
24LC280	13N	2W	SE SE	18
24LC281	13N	2W	SE NE	18
24LC298	13N	2W	NE NW	18
24LC299	12N	3W	NE NE	2

Stone Cairns or Rockpiles

24LC2	10N	1W		3 & 10
24LC749	13N	5W	SE NW SW NW & NW SE SE NW	34-3
24LC750	12N	3W	NE SE SE SE	29-1
24LC753	13N	5W	NE NW SE SE	33-3

Stone Structures

24LC277	13N	2W	SE SE	19
24LC282	13N	2W	NE NE	18

Human Burial

24JF171	9N	3W	NW SE	1

Hematite Source

24BW37	9N	1W	SE	1

Byrd Complex

24LC684	11N	1W		33
24LC685	11N	1W		28, 33
24LC686	11N	1W		21
24LC688	11N	1W		22,27,28

Subsurface Stone-lined Feature

24LC243	12N	3W	SE NE	11

Lithic Scatter Sites

24BW48	8N	1W	SE	11 & 12
24BW115	8N	1W	NE SW	21
24BW816	8N	4W	SE NE SW NE	9
24BW817	8N	4W	NW SE NW	2
24JF4	9N	3W	NW SE	13
24JF6	9N	3W	NW	18
24JF222	9N	2W	SW SW SW SW	7 &
	9N	3W		12 &
				13
24JF224	9N	2W	SW SE	7
24JF225	9N	2W	SW SE	7
24JF602	9N	2W		13
24JF698	9N	3W	S-1/2 NE	14
24JF704	9N	3W	NE NW NE	26
24JF719	9N	3W	NE NE	23 &
			SW NW NW	24
24JF720	9N	3W	N-1/2 SW & NW	24
24JF722	9N	3W	SW SW SW	13
24JF756	9N	3W	SE SE NE	15
24JF761	9N	3W	SE SE NE SE	15
24JF824	9N	2W	NW NE SE	7
24JF1002	9N	3W	CTR.	14
24JF1003	9N	3W	SW	14
24JF1004	9N	3W	SW	15
24JF1018	9N	3W	SE NE	13
24JF1021	9N	3W	SW SE	24
24LC1	10N	1W		10
24LC3	10N	1W	SE	10
24LC4	10N	1W	SE	26

24LC6	10N	1W	SE	11
24LC7	10N	1W	SE	24
24LC9	11N	2W	SE	19
24LC10	10N	1W		11
24LC90	11N	6W	NW SW	8
24LC94	13N	2W	SE NW	23
24LC99	12N	1W	NW SW	1
24LC125	14N	3W	CTR. NW SW	20
24LC137	10N	1W		2
24LC143	10N	1W		13
24LC144	10N	1W	SW	13
24LC147	12N	3W	NW SW	3
24LC148	12N	3W	SW NE	3
24LC149	13N	3W	SE	33
24LC214	10N	6W	SW SE	1
24LC215	10N	6W	N-1/2	28
24LC237	12N	3W	NE SE	13
24LC238	12N	1W	NW SW	24
24LC239	11N	1W	NE SW	33
24LC240	13N	2W	NW SW & SW SW	30
24LC241	13N	2W	SE NW	30
24LC242	12N	3W	NW NW	1
24LC246	11N	6W	SW SE	27
24LC261	12N	2W	NW SE	9
24LC266	12N	3W	NE NE	11
24LC272	12N	2W	SE SE	16
24LC279	13N	2W	SE NE	31
24LC297	13N	2W	NE SE	18
24LC410	11N	6W	NE SW	29
24LC610	10N	1W	NE NE	22
24LC611	10N	1W	NE	11
24LC618	11N	6W	SE NE	31
24LC619	11N	6W	SE NE	31
24LC622	10N	5W	NW SW	1
24LC665	10N	1W	E-1/2 SW NE	24
24LC667	10N	4W	NW SW	3
24LC668	10N	4W	SW SE NE	10
24LC669	10N	4W	SW NW SE	11
24LC675	11N	6W	NE NW	11
24LC705	14N	6W	NW SW	23
24LC706	10N	4W	SE NW	4
24LC711	14N	3W	NE SW NE SE	20
24LC713	12N	3W	SW NW SE	13
24LC715	11N	5W	NE SW SE	29
24LC718	11N	5W	SE SE SW & SW SW SE SW	27
24LC720	11N	5W	SE NE SE	28
24LC725	11N	6W	S-1/2 NE SE	3
24LC726	11N	6W	NW SE SW NE	11
24LC732	12N	3W		26

24LC735	10N	5W	SE SW SW	1
24LC741	13N	4W	NW NW NW	18
24LC742	10N	5W	NW NE SE NW	12
24LC843	11N	4W	SW NE NW NE	28
24LC1008	11N	6W	SW SW	11
24LC1009	11N	6W	SE SW	2
24LC1010	11N	6W	NW NW	10
24LC1031	12N	3W	SW SE	3

REFERENCES CITED

Alt, David D., and Donald W. Hyndman
1972 Roadside Geology of the Northern Rockies. Missoula, MT: Mountain Press Publishing Company.

Binford, Lewis R.
1978 Nunamiut Ethnoarchaeology. New York: Academic Press.

1982 The Archaeology of Place. Journal of Anthropological Archaeology 1(1):5-31.

1983 In Pursuit of the Past: Decoding the Archaeological Record. New York: Thames and Hudson.

Binford, Sally R., and Lewis R. Binford
1968 New Perspectives in Archaeology. Chicago: Aldine.

Bliss, Wesley L.
1948 Supplementary Appraisal of the Archaeological and Paleontological Resources of Canyon Ferry Reservoir, Lewis and Clark and Broadwater Counties, Montana. Missouri Valley Project, River Basin Surveys, Smithsonian Institution for the Missouri River Basin Recreation Survey, Region 2, National Park Service.

Bonnichsen, Robson, and Stuart J. Baldwin
1978 Cypress Hills Ethnohistory and Ecology. Archaeological Survey of Alberta, Occasional Paper No. 10, Alberta Culture, Historical Resources Division.

Brink, Jack
1986 Dog Days in Southern Alberta. Archaeological Survey of Alberta, Occasional Papers No. 28, Alberta Culture, Historical Resource Division.

Brink, Miltwright, Bob Dawe, and Doug Glaum
1982 Final Report of the 1983 Season at Head-Smashed-In Buffalo Jump, Alberta. Archaeological Survey of Alberta, Manuscript Series No. 1, Alberta Culture, Historical Resources Division.

Brumley, John, and Barry Dao
1985 Proposed Historical Resource Development Zones on the Suffield Military Reserve, Alberta. Prepared by Ethos Consultants, Ltd. for the Alberta Energy Corporation.

Buell, Richard
1972 Canyon Ferry's Treasures of Archaeology. Montana Historian 3(1):20-25. Published by the Montana High School Historian.

Bureau of Land Management
1978 Cultural Resources Automatic Data Processing System Guidebook. B.L.M., Montana State Office.

Conners, Stuart W.
1982 Archaeology of the Crow Indian Vision Quest. Archaeology in Montana 23(3):85-127.

Coues, Elliott, ed.
1893 The History of the Lewis and Clark Expedition. Volume II. New York: Dover Publications, Inc.

Davis, Karen E.
1987 Boulder Batholith. The Independent Record, Helena, Montana, March 1, pp. 1C-2C.

Davis, Leslie B.
1982a Archaeology and Geology of the Schmitt Chert Mine. Missouri Headwaters Fieldtrip Guidebook for the Rocky Mountain Section. Geologic Society of America.

1982b Montana Archaeology and Radiocarbon Chronology: 1962-1981. Archaeology in Montana, Special Issue (3):v-31.

1984 Late Pleistocene to Mid-Holocene Adaptations at Indian Creek, West Central Montana Rockies. Current Research 1:9-10. A Peopling of the Americas Publication, Center for the Study of Early Man, University of Maine at Orono.

Davis, Leslie B., Stephen A. Aaberg, and John W. Fisher
1980 Cultural Resources in the Limestone Hills Army National Guard Training Site, Broadwater County, Montana. Department of Sociology/Anthropology, Montana State University, Bozeman.

Davis, Leslie B., Stephen A. Aaberg, Mike Wilson, and R. Ottersburg
1982 Stone Circles in the Montana Rockies: Systematic Recovery and Cultural-Ecological Inference. Department of Sociology, Montana State University, Bozeman.

Davis, Leslie B., Sally T. Greiser, and Nicholas Toth
1985 Use Wear Analysis of Paleoindian Unifaces from the Initial Late-Glacial Occupation of the Indian Creek Site. Current Research in the Pleistocene 2:45-46. A Peopling of the Americas Publication, Center for the Study of Early Man, University of Maine at Orono.

Davis, Leslie B., and Troy Helmick
1982 Inundated Prehistoric Sites along Canyon Ferry Lake. Archaeology in Montana 23(3):41-84.

Denny, Evan, Steven A. Carlson, and John M. Crowley
1973 Land Use Capability Study. For the Diehl Development Corporation, S.E. Helena Project, Helena, Montana.

Ewers, John C.
1955 The Horse in Blackfoot Culture. Washington, DC: Smithsonian Institution Press. (1980 reprint.)

1958 The Blackfeet: Raiders on the Northwestern Plains. Norman: University of Oklahoma Press.

Flannery, Kent V.
1968 Archaeological Systems Theory and Early Mesoamerica. In Anthropological Archaeology in the Americas. B. J. Meggers, ed. Pp. 67-87. Washington, DC.

Flint, Patricia R., and Robert Lee Sappington
1982 Geological Sources of Archaeological Obsidian in the Flint Creek Valley Area, Northern Rocky Mountain Region. Archaeology in Montana 23(1):21-26.

Foor, Thomas
1987 Personal communication, Winter Quarter.

Forbis, Richard G.
1950 Archaeological Data from the Gates of the Mountains. Anthropology and Sociology Papers, No. 1, Department of Sociology and Anthropology, Montana State University, Missoula.

1955 The MacHaffie Site. PhD. dissertation, Political Science Department, Columbia University, New York.

Forbis, Richard G., and John D. Sperry
1952 An Early Man Site in Montana. American Antiquity No. 2:127-133.

Fredlund, Lynn B.
1980 Assessment of Palmer Quarry Site (24JF226) and Surroundings. Prepared by Cultural Resources Division, Mineral Research Center, for Maronick Construction Company, East Helena, Montana.

Frison, George
1978 Prehistoric Hunters of the High Plains. San Francisco: Academic Press.

1983 The Western Plains and Mountain Region. In Early Man in the New World. Richard Shutler, Jr., ed. Pp. 109-124. Beverly Hills, CA: Sage Publications.

Gardner, William M.
1980 Settlement-Subsistence Strategies in the Middle and South Atlantic Portions of the Eastern United States during the Late Pleistocene and Early Holocene. Paper presented to the annual meetings of the Anthropological Association, Washington, DC.

Greiser, Sally T.
1983 Class III Cultural and Paleontological Inventory at Canyon Ferry Reservoir, near Helena, Montana. Prepared by Historical Research Associates for U.S. Department of Interior, Bureau of Reclamation.

1986 Artifact Collections from Ten Sites at Canyon Ferry Reservoir. Archaeology in Montana 27(1-2):1-90.

Hart, Jeff
1976 Montana--Native Plants and Early Peoples. The Montana Historical Society and the Montana Bicentennial Administration, Helena, Montana.

Hassler, Robert C.
1981 Cultural Resources in the Indian Creek Placer Mine Area, Broadwater County, Montana: A Final Report. Prepared by Peter Kiewit Sons' Company, Mining Division, for the Bureau of Land Management, U.S. Department of Interior, Montana Department of State Lands, Montana State Historical Preservation Office, and S. & G. Mining Company.

Herbort, Dale P.
1981 Palmer Chert Quarry: An Examination of the Chert's Characteristics, Mechanics and Prehistoric Procurement. Prepared by Cultural Resource Division, Mineral Research Center, Montana Tech Foundation, for Maronick Construction Company, East Helena, Montana.

1986 Cultural Resource Investigation on the Broadwater Dam Project. Prepared by G.C.M. Services, Inc., for the Montana Department of Natural Resources and Conservation, Helena.

1987a Personal communication concerning State Historical Preservation Office Contract Report for the Montana City Area. January 14.

1987b Montana City Archaeological Study: Environmental Analysis and Model. Project No. SP-30-86-10013A-5. Prepared by G.C.M. Services, Inc., for National Park Service and Montana State Historical Preservation Office. (In press.)

Hughes, Jack T., and Wesley L. Bliss
1947 Preliminary Appraisal of the Archaeological and Paleontological Resources of Canyon Ferry Reservoir, Montana. Missouri Valley Project, River Basin Surveys, Smithsonian Institution for Missouri River Basin Recreation Survey, Region 2, National Park Service.

Jennings, Jesse D.
1974 Prehistory of North America. 2nd Edition. New York: McGraw-Hill Book Company.

Johnston, A.
1969 Man's Utilization of the Flora of the Northwest Plains. In Post-Pleistocene Man and His Environment. Pp. 109-177. Proceedings of the Annual Chacmool Conference, Archaeological Association of the University of Calgary, Alberta.

Keyser, James D.
1978 The Central Montana Abstract Rock Art Styles. British Columbia Provincial Museum, Heritage Record No. 8:153-177.

Kidd, Kenneth E.
1986 Blackfoot Ethnography. Archaeological Survey of Alberta, Manuscript Series No. 8, Alberta Culture, Historical Resources Division.

Knight, George
1977 Archaeological Resources in the Elkhorn Wilderness Study Area: A Predictive Assessment. Prepared for the U.S.D.A. Forest Service, Helena National Forest, Helena, Montana.

1979 Cultural Resource Overview: Helena National Forest. Prepared for the U.S.D.A. Forest Service, Helena, Montana.

Lee, Richard B.
1979 The !Kung San: Men, Women and Working in a Foraging Society. Cambridge: Cambridge University Press.

Lee Rue, Leonard, III
1971 Sportsmans Guide to Game Animals: A Fieldbook of North American Species. New York: Harper and Row, Outdoor Life Books.

Light, Timothy
1985 Cultural Resource Inventory: Green Meadow Drive, Lewis and Clark County, Montana. Prepared by Heritage Research, Missoula, Montana, for the Department of Highways, Helena, Montana.

Loendorf, Lawrence L.
1973 Prehistoric Settlement Patterns in the Pryor Mountains, Montana. Columbia: University of Missouri.

Loscheider, Mavis, and John W. Greer
1979 An Intensive Cultural Resource Survey of the Oxbow Ranch Exchange, Holter Lake Portion (B.L.M.), West Central Montana. Prepared by Archaeological Services, Inc., for the Bureau of Land Management, Butte District, Butte, Montana.

Malouf, Carling
1950 The Archaeology of the Canyon Ferry Region, Montana. Anthropology and Sociology Papers, No. 11, Department of Sociology and Anthropology, Montana State University, Missoula.

1962 Pipes. Archaeology in Montana 5(1):4-10. Montana Archaeological Society, Inc., Montana State University, Missoula.

1987 Personal communications. Winter and Spring Quarters.

McClintock, Walter
1968 The Old North Trail: Life, Legends and Religion of the Blackfeet Indians. Lincoln: University of Nebraska, Bison Books.

McCullough, E. J., and M. C. Wilson
1982 A Prehistoric Settlement--Subsistence Model for Northeastern Alberta, Canstar Oil Stands, Ltd., Bituminous Sands Lease 33, 92, and 95: A Preliminary Statement. Prepared by Fedirchuk, McCullough and Associates, Ltd., for Canstar Oil Sands, Ltd., Calgary, Alberta.

Melton, Douglas A.
1983 Report Review: Archaeological Investigations in the Avon Valley, by Lewis K. Napton. Archaeology in Montana 24(2):153-155.

1985 Archaeological Investigations in the Montana City Vicinity II: Cultural Resources Inventory of the Proposed Jefferson Tracts Subdivision. Prepared by Department of Anthropology, University of Montana for Mr. Dave Rasmussen, Helena, Montana.

1987 Personal communications. Winter Quarter.

Mohler, Edwin A., and William T. Spencer
1984 A Cultural Resource Survey of the McClellan Creek Quarry. Prepared by Econ, Inc., for Maronick Construction, Helena, Montana.

Munday, F. C.
1978a Archaeological Investigations near Montana City, Montana. Prepared by the University of Montana for Kaiser Cement Corporation.

1978b Preliminary Report on Archaeological Investigations North of Clark Gulch near Montana City, Montana. Prepared by the University of Montana for Kaiser Cement Corporation.

Novotne, Carrol
1983 A Preliminary Survey of the Scratchgravel Hills. Carroll College, Helena, Montana.

Reeves, Brian O. K.
1969 The Southern Alberta Paleo-Environmental Sequence. In Post-Pleistocene Man and His Environment on the Northern Plains. Pp. 6-46. Proceedings of the Annual Chacmool Conference, Archaeological Association of the University of Calgary, Alberta.

1973 The Concept of an Altithermal Cultural Hiatus in Northern Plains Prehistory. American Anthropologist 75:1221-1253.

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

Riches, David
1982 Northern Nomadic Hunter-Gatherers: A Humanistic Approach. Academic Press, Studies in Anthropology.

Rominger, Dale H.
1976 An Archaeological Survey of the Helena National Forest. Department of Anthropology, University of Montana, Missoula.

Ruebelmann, George N.
1983 An Overview of the Archaeology and Prehistory of the Lewistown B.L.M. District, Montana. Archaeology in Montana 24(3):1-165.

Scarborough, Vern
1975 Archaeological Survey in the Jefferson Planning Unit of Jefferson County, Southwestern Montana. A Western Interstate Commission for Higher Education (W.I.C.H.E.) Project sponsored by the Dillon District Office, Bureau of Land Management, Montana.

Schultz, James W.
1974 Why Gone Those Times?: Blackfoot Tails as Told by James Willard Schultz. Eugene L. Silliman, ed. Normon: University of Oklahoma Press.

Schwab, David
1984 Field Report on an Archaeological Survey of the Proposed McClellan Creek Quarry Extension. Prepared for Maronick Construction, Helena, Montana.

Service, Elman
1966 The Hunters. Englewood Cliffs, NJ: Prentice-Halls, Inc., Foundations of Modern Anthropology Series.

Shumate, Maynard
1950 The Archaeology of the Vicinity of Great Falls, Montana. Anthropology and Sociology Papers, No. 2, Department of Sociology and Anthropology, Montana State University, Missoula.

1982 The Archaeology of Post-Glacial Lake Great Falls. Archaeology in Montana 23(3):1-40.

1984 Surface Finds from Missouri River Blowouts between Tunis and Loma, Montana. Archaeology in Montana 25(1):17-24.

Smith, Allan H.
1984 Kutenai Indian Subsistence and Settlement Patterns, Northwest Montana. Technical Report No. 2 Vol. 2, U.S. Army Corps of Engineers, Seattle District, Northern Pacific Division, Washington.

Stanfil, Alan
1987 Personal communications. January 20 and March 14.

Taylor, Dee C.
1987 Personal communications. Winter and Spring Quarters.

Teit, James A., and Franz Boas
1975 (Reprint.) The Flathead Indians. An Extract from the Salish Tribes of the Western Plateaus 45th B.A.E. Annual Report, 1927-28. Seattle, WA: Facsimile Reproductions, The Shorey Book Store.

Thomas, David Hurst
1974 Predicting the Past: An Introduction to Anthropological Anthropology. New York: Holt, Rinehart and Winston, Basic Anthropology Units.

1976 Figuring Anthropology: First Principles of Probability and Statistics. New York: Holt, Rinehart and Winston, Basic Anthropology Units.

1979 Archaeology. New York: Holt, Rinehart and Winston.

Turney-High, Harry Holbert
1937 The Flathead Indians of Montana. Memoirs of the American Anthropological Association, Menasha, Wisconsin. Contribution from Montana State University, Missoula.

Willey, Gordon R., and Jeremy A. Sabloff
1980 A History of American Archaeology. 2nd edition. San Francisco: W. H. Freeman and Company.

Wormington, H. M.
1957 Ancient Man in North America. 4th edition. Denver Museum of Natural History, Popular Series No. 4, Colorado.