THESIS

ARCHAEOLOGICAL INVESTIGATIONS OF HIGH ALTITUDE SITES NEAR MONARCH PASS, COLORADO

Submitted by

Lewis A. Hutchinson

Department of Anthropology

In partial fulfillment of the requirements

for the Degree of Master of Arts

Colorado State University

Fort Collins, Colorado

Summer 1990

COLORADO STATE UNIVERSITY

April 25, 1990

WE HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER OUR SUPERVISION BY LEWIS A. HUTCHINSON ENTITLED ARCHAEOLOGICAL INVESTIGATIONS OF HIGH ALTITUDE SITES NEAR MONARCH PASS, COLORADO BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS.

Committee on Graduate Work

James B. Benedict

Adviser

Department Head

COLORADO STATE UNIVERSITY LIBRARIES

ABSTRACT OF THESIS

ARCHAEOLOGICAL INVESTIGATIONS OF HIGH ALTITUDE SITES NEAR MONARCH PASS, COLORADO

The tundra and upper forest border north of Monarch Pass, in the central Colorado Rocky Mountains, contains a cluster of twelve sites. One of the sites, Water Dog Divide Game Drive, is an extensive system of rock alignments and associated hunting blinds. This site and other smaller systems in the Monarch site area are at present the southernmost documented examples of prehistoric timberline game drives along the Continental Divide. Cultural materials include projectile points, other flaked tools, groundstone and a broken ceramic vessel. Temporal periods indicated are 3000 B.C. to the historic. Two hunting blinds were excavated and three radiocarbon dates were obtained with corrected dates ranging from 900 A.D. - 1640 A.D. Four of the rock walls in the largest drive site contain a number of remnant wooden posts or sewels apparently used to help delineate the rock walls. It is hypothesized that the area was utilized on a seasonal basis to camp and communally hunt large game animals (bison, mule deer, elk, and mountain sheep). The sites may have been visited by peoples from the Plains, Great Basin, and Southwestern culture areas.

Lewis A. Hutchinson
Anthropology Department
Colorado State University
Fort Collins, Colorado 80523
Summer 1990

ACKNOWLEDGEMENTS

The archaeological investigations at Monarch Pass have required the time and energy of a number of people over the past years. I would like to first thank the members of my graduate committee, Dr. Jeffrey Eighmy, head of committee, Dr. Elizabeth Ann Morris, Anthropology Department, Dr. James B. Benedict, Faculty Affiliate in the Anthropology Department, and Dr. Liston Leyendecker, Department of History. An extra and sincere thanks goes to Dr. Morris for her guidance and close friendship during my undergraduate and graduate career. It is in large part due to her inspiration that I decided to return to the University after a ten-year absence.

I would also like to thank a number of people who took the time and energy to visit, advise, and in many instances spend days working in less than ideal conditions. Even though compensation was not possible, I hope that the beauty of the mountains and timberline in particular will suffice. These include Elizabeth Morris, Calvin Jennings, James Benedict, Ramona Hutchinson, David Schaeffer, Maria Martin, David Blackburn, and Russell Coberly.

The staff at Monarch Ski Area, and in particular manager Ned Stock, have been extremely helpful in allowing access to the ski area roads and in providing information on present game animal patterns. It would have been difficult to conduct the study without their cooperation. The Tree-Ring Laboratory at the University of Tucson is also owed thanks for

the help in identifying and attempting to date wood samples from the sites. Helpful advice on the ceramics was also obtained from Dr. Ann Johnson with the National Park Service, Dr. William C. Buckles of the University of Southern Colorado, and Priscilla Ellwood with the University of Colorado Museum. Barney Lyons, Alan Kane and others with the United States Forest Service also are thanked for their help and assistance.

Funding is an important portion of any research. Assistance from the Karen S. Greiner Endowment for Colorado Archaeology and the Colorado Mountain Club is greatly appreciated.

Finally, I would also like to offer thanks to my wife Ramona and our two daughters, Erin and Abbigail, for all of their assistance and patience in this endeavor.

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

> "There the land itself ascends into the sky. These mountains lie at the top of the continent, and they cast a long rain shadow on the sea of grasses to the east."
>
> N. Scott Momaday (1969)

Mountains - often places of pristine beauty and tranquility - are viewed by many with admiration and awe. Historically they have been considered by some cultures as the homes of wild beasts, nymphs and centaurs. Homer's Iliad makes reference to the mountains' wildness, isolation, and forceful storms. "As south wind and the southeast wind, contending in mountain groves, make all the forest thrash" (Iliad, Book 16). Mountains figure prominently in Greek mythology, Roman poems, and Medieval superstitions. Hannibal's crossing of the Alps in 218 B.C. is well known because of its difficulty and perhaps the boldness of the effort. The Romans of that era apparently dreaded the mountain travel and made offerings to deities as they passed summits of the Alpine passes.

It is largely unknown how prehistoric peoples in the Western Hemisphere viewed mountains. Ethnographic evidence from both North and South America indicates highland areas have long been considered as homes to various spirits and deities. Mountaintop shrines are common and range from the large and well known Medicine Wheel in the Big Horn Mountains of Wyoming to small shrine sites in the Colorado mountains (Benedict 1985b:3).

In addition to mountains' spiritual values, there is increasing evidence of extensive resource exploitation by native peoples. A wide variety of projectile points, other tools, and lithic scatters have been reported from many high country locations. Plant utilization is also indicated by finds of grinding slabs, handstones, and ceramics. Adding depth to the evidence for extensive utilization of the mountain ecosystems are the numerous discoveries of stone walls in the tundra regions of the Colorado Rocky Mountains.

The research on which this study is based focused on one such concentration of sites on Monarch Pass in central Colorado. The sites include areas of rock walls, lithic scatters, and camp sites, representing over 3000 years of various uses by prehistoric and historic peoples. The extent of the rock walls suggests a great investment of labor and offers some clues about early hunting strategy.

Mountain passes are natural routes for animal migrations through the ordinarily steep and difficult alpine terrain of Colorado. The passes also possess other important features, such as ample water sources and a wide variety of flora and fauna. Earlier human populations must have noted these advantages. This has been suggested in the recent work by Bender and Wright (1988) in the Teton area of Wyoming. They propose a "Broad Spectrum Model" and state that ". . . the effects of elevational differences on local climate are such that high-country resources generally become available just as their low elevation counterparts pass out of season" (Bender and Wright 1988:626).

Location of Study Area

The Monarch site group is located north of the U.S. Highway 50 crossing of Monarch Pass and approximately 32 km (20 mi) west of Salida,

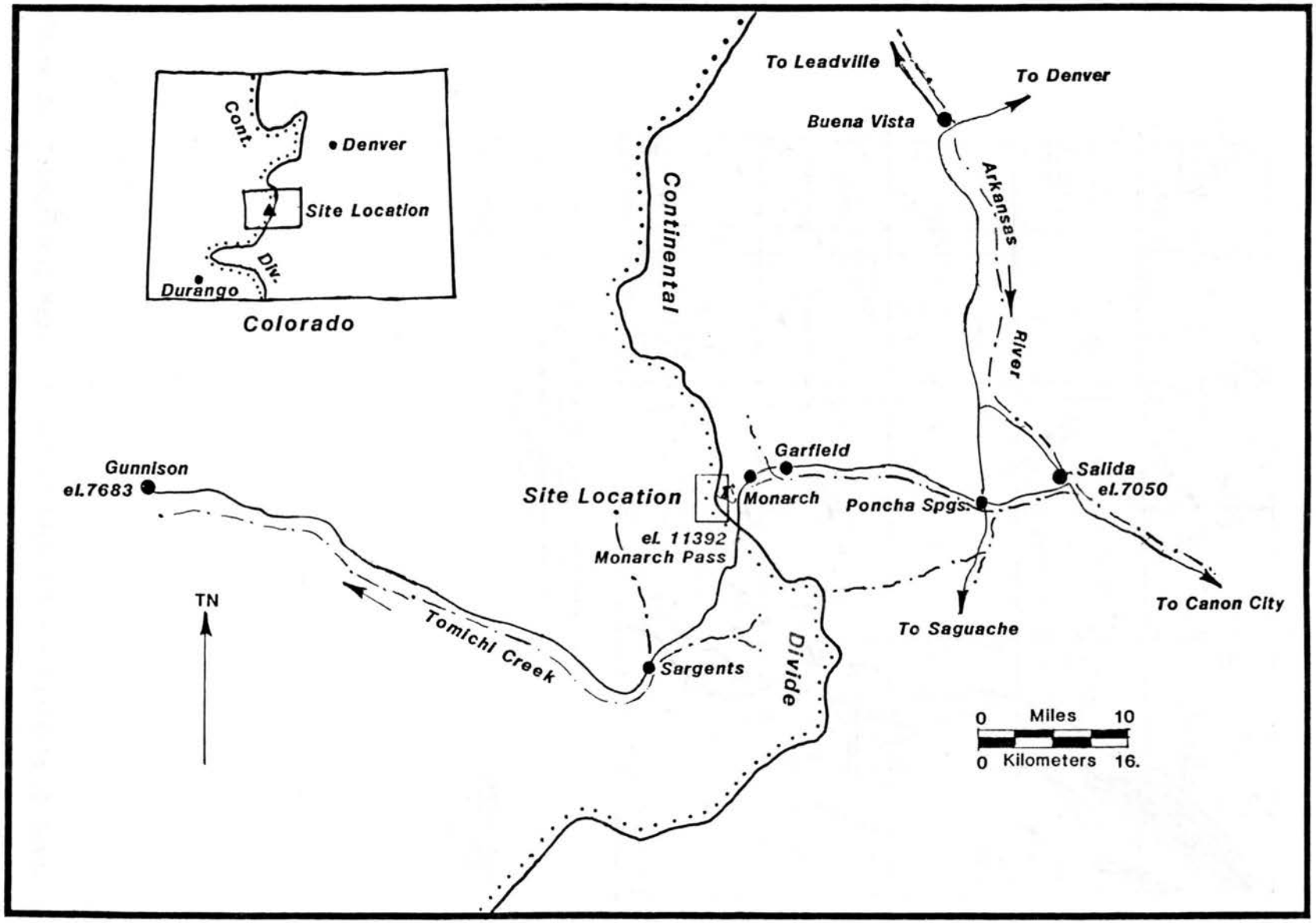
Colorado (Figures 1 and 2). The Continental Divide was surveyed for approximately 10 km (6 mi) north of the old highway crossing of Monarch Pass. Because time constraints limited the survey to the area along the Divide ridge, just 12 sites were identified, many of which cross the crest of the Divide. In these instances, additional site numbers (Chaffee County-CF and Gunnison County-GN) were given at the request of the State Archaeologist's Office. These sites are considered individual use areas based on differences in the topography and the relative concentrations of cultural materials.

The Divide is relatively uniform in elevation within the study area; less than 152 m (500 ft) of elevation change exists between the twelve site areas. Altitude ranges from 3511 m (11,520 ft) to 3663 m (12,020 ft). Slopes are moderate, typically less than 20-30%, allowing numerous game trails and various historic trails to crisscross the Divide. Permanent water, although not available year-round on the sites, is located in nearby springs and lakes. Deep snowbanks offer additional water on or near many of the sites during much of the early summer.

Game animals are found in abundance. The researchers saw both deer and elk in the site area on numerous occasions. In one instance, two deer followed one of the drive lines while keeping their distance from a present-day hunter. The hunter was not aware of the function or existence of the system or of the presence of the animals, who casually passed by the old drive pits and escaped into the nearby forest. Employees of the nearby Monarch Ski Area have also seen mountain sheep in the area during the summer.

Cold weather and snow return to the high mountains during the latter part of October, usually giving animals about four months of optimal

Figure 1. Map of Monarch Area


Cont.
Div.
Denver
Site Location
Durango
Colorado
To Leadville
To Denver
Buena Vista
Continental
Arkansas
River
Garfield
Gunnison
el.7683
Site Location
Monarch
Poncha Spgs.
Salida
el.7050
el. 11392
Monarch Pass
TN
Tomichi Creek
Sargents
Divide
To Saguache
To Canon City
0 Miles 10
0 Kilometers 16.

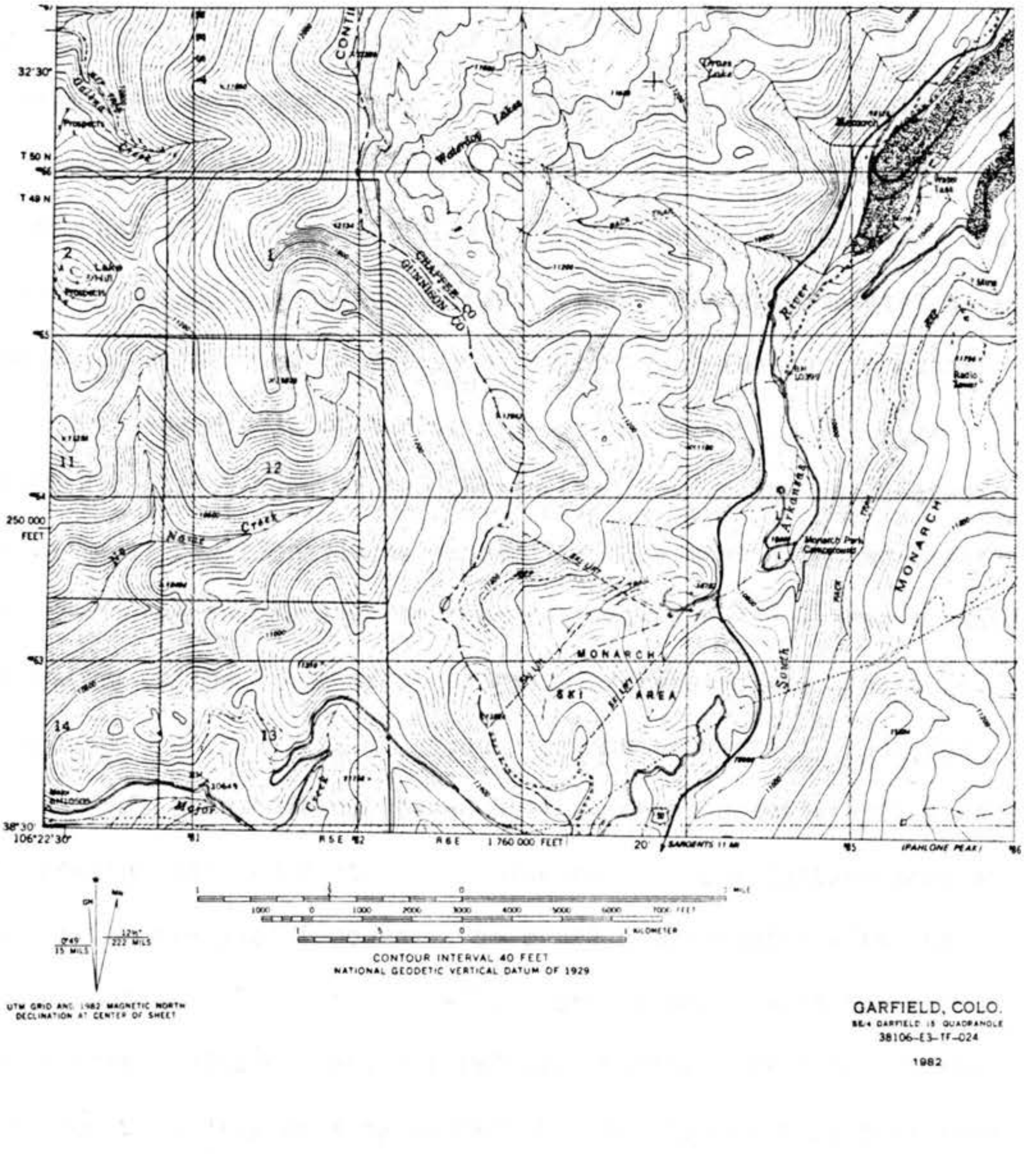


Figure 2. Topographic Map. Portion of 1982 7.5 min Garfield CO Quad.

foraging conditions. Seasonal use by game animals, however, depends on many factors. Because weather patterns and winter snowpack accumulations vary, the potential for animal and human use of the area differs from year to year. It is, of course, possible human activity in historic times increased the pressure on animals to return early to the high country and stay later in the fall. It is unlikely, however, that the higher alpine valleys and passes would ever have accommodated a large number of animals until after the majority of the spring runoff was over, about the middle of June.

Prehistoric utilization of the Continental Divide and associated mountain valleys traditionally have been lumped either with the Great Plains culture area to the east or the Great Basin culture area to the west, depending on the focus of the particular researcher. There is continuing debate on how best to categorize the prehistoric cultural resources in this area. The Colorado State Archaeologist's Office notes that "the mountain/alpine portion of Colorado is not a culture area as such, but is an area used frequently by peoples associated with the other culture areas" (Tate et al. 1978). Others argue well for a mountain-oriented culture (Benedict 1979b). Further complicating the picture is the proximity of Monarch Pass to the Southwest culture area and the inability to assign the prehistoric cultural resources in the central Colorado mountains to any one neighboring area.

History of Research at Monarch Pass

The expansion of Monarch Ski Area in 1978 by Monarch Recreation Corporation permitted the author and Ramona Hutchinson to undertake a cultural resource survey of the chairlift-serviced area. Investigations at that time revealed a historic and prehistoric camp site, 5CF208

(Hutchinson and Hutchinson 1978), and a small rock alignment thought to have been reported in 1975 as site 5CF128. Site 5CF128 was originally reported to the Forest Service by a local resident and was investigated by forestry technician Janice Peaker (Peaker 1975). Attempts to locate Peaker and the reported lithic materials have been unsuccessful. Later research indicated this site was actually part of site 5CF373, a much larger drive system recorded in 1981 by a Colorado State University (CSU) Anthropology student (Hutchinson 1981). Dr. James Benedict was contacted in 1982 about the discovery of the system and indicated any research on this system would be invaluable. This favorable response helped confirm the significance of the sites and, in 1985, the Hutchinsons enlisted the help of Dr. E. A. Morris of CSU in verifying the extent of the sites in this vicinity. The 1985 survey located many new rock alignments, rectangular pits, lithic materials, and broken prehistoric pottery. Dr. Benedict joined the party later that summer and helped to gather more data on the walls, including an experimental lichenometric date on one of the stone alignments. Work since that time has been conducted with the help of CSU's Anthropology Department.

Methodology - Monarch Pass Camp Drive Systems

The sites on Monarch Pass are similar in many respects to their more northern counterparts in the Colorado Front Range. Monarch's relatively southern location makes these sites unique, a fact that may change as more archaeology is completed in the mountains.

Collections were made on sites 5CF128 and 5CF208 prior to the formal research on the game drive sites in 1987. Artifacts recovered during the Peaker (1975) survey of 5CF128 have not been located. The artifacts

from 5CF208 were curated by Colorado State University and form part of the data base of this project.

The United States Forest Service granted permission to collect and map artifacts during the summer of 1987. The technique of re-surveying site locations on successive visits was utilized in order to increase the size of the collection and the potential for analysis and interpretation. Each visit yielded more materials despite previous attempts to collect everything. Different weather conditions, ground visibility, and erosional activity yielded material in sites that were heavily collected on the previous effort.

Limited test excavations were performed during the course of the 1987 field season. It was felt that there were possibilities of recovering cultural materials from the pit structures, as had proven to be the case at other sites (Benedict 1969, 1975b). Excavations were kept on a small scale to meet the limitations of the research time schedule and available funds. All materials were returned to the archaeology laboratory at CSU for labeling, identification, and further analysis.

Airplane and ground photographs were utilized during the research to aid ground mapping and verification of all sites. These photos proved very useful in the identification of the extensive stone walls and nearby site structures.

Site Number Allocation

To minimize confusion and needless repetition of Colorado site numbers, I refer to the sites in this report only by their Chaffee County (CF) numbers. The following is a list of joint site numbers, where applicable, for reference.

5CF373 - 5GN1936
5CF499 - 5GN1934
5CF208 - 5GN1929
5CF426 - 5GN1931
5CF427 - 5GN1932
5CF430 - Only in Chaffee County
5CF495 - 5GN1930
5CF428 - 5GN1933
5CF429 - Only in Chaffee County
5CF496 - 5GN1935
5CF497 - 5GN1937
5CF431 - 5GN1938

The artifacts collected during this project will be curated by the United States Forest Service, Pueblo, Colorado. A portion of the diagnostic artifacts will be placed in an interpretive exhibit at a Visitor's Center on the summit of Monarch Pass.

CHAPTER II

NATURAL ENVIRONMENT

Physiography

Monarch Pass is a main travel route for contemporary human populations in the central Rocky Mountains, linking the Arkansas River Valley of the Eastern Slope with the expansive valleys and basins containing tributaries of the Colorado River to the west. In addition, a branch of the south flowing Rio Grande River has its headwaters at the top of nearby Poncha Pass. The Continental Divide barrier modifies the local climate, producing great differences in precipitation and wind, depending on altitude, location, and topography. This fact was no doubt of importance to the prehistoric peoples, affecting their seasonal use of the local ecosystems.

The topography in this area of Colorado varies as widely as the weather. Chaffee County has a total of 15 peaks over 4267 m (14,000 ft). Despite these high peaks and average elevations, there are a few routes through the mountains with relatively moderate grades and gentle passes. Monarch Pass is one of those routes. Thus, it remains a significant pass in Colorado, and it appears from the archaeological record to have fulfilled a similar role in the past.

Area History

The earliest documented expeditions in the general area were those of Spanish explorer Don Juan Bautista de Anza in 1779. Zebulon Pike

spent Christmas day of 1806 in the Arkansas River Valley 20 miles to the east. Fur trappers and other "mountain men" were in the area in the 1820s and 1830s. No documentation, however, has been located concerning any utilization of Monarch Pass by these early explorers.

The gold rush of 1859 brought the first waves of Americans into what would in 1876 become the state of Colorado. This mass migration gradually penetrated most regions of the state, especially the mineralized areas of the high mountains. The Monarch Pass area was no exception, and a town, Arborville, was established on the pass in 1879. Junction City (present-day Garfield) followed suit one year later, just one mile to the west (Emerson 1881).

It is unknown who built the first roadway over Monarch Pass. Leadville-area miners may have constructed one (more likely, they widened an existing trail) in 1874 when they traveled to plat the town of Gunnison. We do know from documentation that the pioneer Boone family of the Upper Arkansas Valley constructed a toll road in 1878 (Emerson 1881). Some of the historic artifacts from site 5CF208 are possible discards originating during this period.

Monarch Pass likely hosted its first notable travelers when Ulysses S. Grant, along with former first Colorado Governor John L. Routt, traveled over it in 1880. These men reportedly were traveling by spring wagon through this area after taking a loop from Salida to the Crested Butte mining camps (Sanford 1926:81-86; Sprague 1964).

Mining has figured prominently in the history of the Monarch area. The area occupies a portion of the famed Colorado Mineral Belt, a zone occupying a 50-mile-wide path from the San Juan Mountains to the mines west of Boulder (Chronic 1980). The Boone family made the first legal

filing of a mining claim in the Monarch area in 1878. The early Monarch District mines were predominantly worked for silver and, according to the assay reports, ran as high as 200 ounces per ton (Crawford 1901). The mining map of 1890 indicates a pack trail along the Continental Divide and three prospect pits in the vicinity of the Monarch sites. These prospects remain visible and have been useful reference points during this study.

A longtime resident of Garfield, George MacKeen, confirmed to the author in 1987 that the pass referred to as "Old-Old Monarch" by Marshall Sprague in his book, The Great Gates, was indeed the first "auto pass" over the divide in this area. He noted that in 1920 he drove a Model T Ford to the summit. "It was a real rough trip, but we made it to the top" (George MacKeen, personal communication 1987). This road was replaced during the same year by what is now known as Old Monarch Pass. This new roadway became publicized as the Forest Service's famous "Rainbow Route" linking Salida and Gunnison (Sprague 1964). The present asphalt highway over Monarch Pass moved the crossing of the divide one-half mile to the south in 1939.

There are indications of two different electric and/or telegraph line routes through the study area. One crossed the Divide at the crest of Old-Old Monarch Pass (5CF208), and the other was constructed in the pass two miles to the north through site 5CF373. These lines are believed to have been constructed around 1900 to provide utility service to the Western-Slope mining camp of White Pine. An existing electric line follows a more direct route just north of the study area.

The most obvious contemporary feature in the region is the Monarch Ski Area, which began as a single rope tow in 1939, operated initially

by the community of Salida. Monarch Ski Area has since grown to include four chairlifts and over 100,000 annual skier visits. The expansion of the ski area in 1979 focused attention on the cultural resources in this area and was the impetus for this study. Fortunately, these game drive structures are located in areas that have not been greatly affected by skiing activities and construction. The present management of the area is very cooperative and indicates it will be cognizant of these sites in any future expansion or maintenance activities.

Geology

The predominant rock type in the area is a Precambrian granite, part of the large batholithic structures that form the nearby large peaks of Mounts Taylor, Etna, Shavano, and Tabeguache. According to John Buchanan (in Hutchinson 1981), a former doctoral candidate at CSU, the granite dates from 1.4 to 1.7 billon years and is composed primarily of quartz, plagioclase feldspar, and biotite. The granite weathers easily by the hydration of the mica and clay minerals, which releases granule-size feldspar and quartz grains. These weathered deposits are known as grus, a predominant surface material in the rock saddles of the divide area. The grus is well-drained and, therefore, freeze-thaw and other periglacial processes do not operate at optimum levels [such as those reported by Benedict at the Mount Albion sites] (Benedict and Olson 1978; Hutchinson 1981). Geologic testing of the Monarch tundra soils would yield more information about the soils than reported in Hutchinson's 1981 paper.

This area in central Colorado was uplifted during the Laramide Orogeny of the Tertiary period (65-54 million years [MY]). A few remaining sedimentary limestone and shale deposits from the earlier

Mississippian and Pennsylvanian epochs (370-280 MY) are seen as graben outcrops in the areas immediately east and west of the Divide (Chronic 1980). A few residual volcanic cap rocks from the Oligiocene and Miocene epochs (26-12 MY) remain in the area (Kent and Porter 1980). This material was utilized for a handstone collected on site 5CF208 in 1979 (See Figure 17f).

Present Climatic Conditions

The climate of the alpine regions is a modified version of the Colorado highland climate in this characteristic mid-continental location. The extreme physiographic influences of the mountains create great differences in seasonal precipitation, temperatures, and winds. As a general rule, as the terrain rises, the temperature decreases and precipitation increases (Barry 1973). The mountain regions have short, cool summers with frequent middle- to late-summer thunderstorms. Autumn is cold, dry, and breezy. Winter varies in length but is generally long with frequent high winds and cold temperatures. At these timberline locations, much of the snow that falls is blown by the prevailing westerly winds into the protected areas on the leeward side of the divide. Monarch Ski Area receives one of the most reliable snow packs in the state due to its protected position on the eastern slope.

No year-round precipitation or other detailed weather information is available for the area along the Divide around Monarch Pass. Monarch Ski Area does maintain a snow monitoring station in a basin south of the drive systems, and the Soil Conservation Service reports snow depths and water content during the last half of the winter at an additional site further away. The snow pack measured at Monarch Ski Area's midway

location (3323 m) is generally about 2.5 m (100 in) at its greatest depth. The snowpack usually reaches this depth in March or early April and is recorded as unpacked but settled snow accumulation.

The winds at timberline greatly influence the abilities of plants, animals, and even researchers to adapt to this ecosystem. Winter winds at speeds of well over 45 meters per second (100 miles per hour) have been reported at the weather station above the Monarch Ski Area. Wind gusts in the Colorado mountains are known to have reached 89.8 mps (201 mph) during one recording period on Long's Peak (Glidden 1982). The resultant pattern of tree islands, cornices, snow banks, and other effects of the winds likely have influenced how prehistoric people used this ecosystem and, in particular, located campsites and modified hunting strategy.

Ecology

The area of Monarch Pass lies in two ecological zones, the alpine tundra and the subalpine forest. The majority of sites in this study are located either in the alpine zone or at the extreme high end of the forest. Timberline in the study area averages 3510 m (11,400 ft), depending on slope orientation. The conditions for plant growth in this zone are affected by the length of the growing season, prevailing wind, topography, and other geologic conditions including soil movement, snow distribution, slope exposure, substrata, and distribution of meltwater (Zwinger and Willard 1986:3-80).

Flora

Alpine ecosystems, despite a harsh and long winter, have a surprising variety of alpine-tundra plant communities. Climatic factors

such as altitude, winds, moisture, duration of winter snows, temperature, and soil types largely determine the localized floral distributions.

A number of studies have focused on these resources and can be consulted for reference. These include the Plant Information Network (PIN) (Dittberner and Olson 1983); Harrington (1967); Wardle (1968); Weber (1976); Zwinger and Willard (1986). John Gooding consulted the PIN data base for the Vail Pass area and lists 65 possible edible species of plants for that area (Gooding 1981:2). This indicates that at least on a seasonable basis there are a number of useful floral resources available to prehistoric peoples. A more useful approach would be a complete floral inventory of the specific site area.

Fauna

The alpine tundra is a rich zone for mammals and other animals despite the short temperate season and long severe winters. Armstrong (1972:322-324) lists 17 species of mammals as frequenting the alpine tundra zone of Colorado. Including the subalpine forest zone in this group increases the number of species by 20. A few of these animals are mule deer, elk, and Rocky Mountain bighorn sheep.

It would be risky to assume that all of these animals coexisted with prehistoric peoples. Some species known to have been present in the past have been eradicated or forced to more restricted ranges.

Bison and pronghorn antelope are two examples of animal species that may have utilized this area in the prehistoric past. For example, "great herds of bison and pronghorn" were reported to be present in the nearby high altitude expanse of South Park by early white explorers.

Fryxell (1926:130) quotes a report from J.D. Figgins that "I am confident you may assume that bison once ranged practically all the areas above timberline in Colorado." A second to this opinion comes from Abner E. Sprague, and Fryxell (1926:132) quotes "that [he] has no doubt that buffalo crossed back and forth over the continental divide. . . . He believes that the game trails were worn as much by buffalo as by elk and deer." Additional information comes from the journals of Zebulon Pike, the leader of the first American military expedition in this area, whose party killed buffalo for their 1806 Christmas dinner in the Arkansas Valley just east of this site area. While these accounts do not prove that bison and pronghorns were present on Monarch Pass they should at minimum be considered in the realm of possibles.

Historically, man has influenced prehistoric migration routes and population balances in remote alpine areas. It would be extremely difficult to even attempt to hypothesize what migration patterns and summer grazing habits were like prior to mining activity, road construction, ranching operations and ski area developments. Recent work by Colorado State Division of Wildlife researchers have added a great deal of information about these changes as well as on more contemporary issues relating to large animals in Alpine habitats.

> Journals of early explorers and travelers indicate great numbers of bighorn sheep (Ovis canadensis canadensis) in the 1800's in the mountainous areas of the then Colorado Territory. . . . Although bighorn populations have undergone periodic fluctuations, the general trend is downward in Colorado as well as other western states. There were an estimated 7,230 bighorns in Colorado in 1915 and . . . 2,200 in 1970. . . . Distribution of bighorn sheep is also decreasing. Historically, bighorns were widespread. Herds, as we view them today, are remnants that persisted in the most productive or isolated portions of the range. Historically,

> the bighorn herd in Rocky Mountain National Park was very large, utilizing areas eastward to the edge of the plains (Hibbs et al. 1973:1).

Reconstructing and developing a model involving the prehistoric dynamics of ungulate populations, ecological segregation of species and migration patterns is beyond the scope of this project. I refer the interested reader to recent research on contemporary populations (e.g., Harrington 1978; Hibbs et al. 1973; Johnson 1980).

CHAPTER III

LITERATURE REVIEW

The mountains and western valleys of Colorado are now only beginning to receive the archaeological attention they deserve. Current archaeology is taking a new direction reflected in a willingness to explore all types of prehistoric sites including "unspectacular" campsites, lithic chipping scatters, and isolated hunting sites. Such sites generally lack the defined architecture and preserved material culture that attracted early archaeological attention in the American Southwest.

The result of such inattention has led to an obvious gap in the published reports and regional syntheses. Unfortunately these mountainous areas are pigeonholed as merely transition zones between the nearby "recognized" culture areas (i.e., Southwest, Plains, or Great Basin). It is noteworthy that the western half of Colorado received only marginal attention in the recently released Great Basin volume of the Handbook of North American Indians (Aikens and Madsen 1986:149-160). Two contemporary archaeologists, Susan Bender and Gary Wright, emphasized the lack of early archaeological research in mountainous areas.

> In many regions, mountains form an integral part of the landscape. For a few areas, archaeologists have demonstrated that reconstruction of regional prehistory cannot be successfully achieved without consideration of the processes by which local populations adapted to mountainous ecosystems. Archaeologists working on the western margins of the North

> American Great Plains, however, have been much slower in recognizing this essential fact. While much of this oversight probably derives from our own culturally embedded notions of mountains as inaccessible and marginal, it has also been fostered by early interpretive syntheses proclaiming "It is certainly true that the prehistoric sites are largely concentrated in the Plains about the flanks of the mountains rather than in the mountains themselves" (Mulloy 1958:18). (Bender and Wright 1988:619).

Fortunately, a few amateur and professional archaeologists have had some interest in these remote areas. Notable examples of early regional studies include reports by Clarence T. Hurst of Western State College (e.g., 1939) and Etienne B. Renaud of the University of Denver (e.g., 1942). These reports point out the potential for further archaeological investigations.

Such potential is now becoming very evident. Recent surveys, many in response to the passage of cultural resource protection legislation, have located a number of significant prehistoric sites. A surprising number are found at high elevation locales in the Great Basin and Intermountain West.

Colorado reports indicate the mountains have numerous sites with considerable antiquity. A few representive samples include published research by Benedict (1975a, 1975b, 1975c, 1979a, 1981, 1985a), Benedict and Olson (1978), Black (1983, 1988), and Gooding (1981). Work at moderately high altitude Utah sites also suggest at least seasonal use of mountains for the last 7000-8000 years. A few of these projects include reports by Rose and Snedeker (1982), Simms (1979), and Janetski (1985). At sites near Jackson Hole, Wyoming, Gary Wright (1980) and his students (Bender and Wright 1988) have found evidence for nearly 10,000 years of potential occupations. Finally, David H. Thomas (1982) has

reported on multicomponent sites above 10,000 feet including important house structures dating from the late prehistoric period.

Despite thse efforts a great deal of additional research is needed before we begin to truly understand the lifeways of the prehistoric peoples who inhabit these high altitude ecosystems. The Colorado Historical Society's recent summary of mountain archaeological research emphasizes this point and notes a number of unanswered and pressing research problems (Guthrie et al. 1984:37-53).

Comparative Examples of Game Drive Sites

Ethnographic accounts of game drive sites from high mountain locations are lacking in the literature not only from Colorado but from the other intermountain states as well. The closest game drive sites with such documentation are located in the Alaskan arctic. These sites share with Monarch Pass a tundra environment and similar style of construction and possible hunting strategy.

The earliest historical accounts of such sites include reports by George M. Stoney (1883), Vilhjalmur Stefansson (1914), and Knud Rasmussen (1927). George M. Stoney's description of such a system near Kotzebue Sound, Alaska is very informative.

> Running for miles in two converging lines they [caribou hunters] make piles of stones four feet high and having the general resemblance of a man. Beginning at the outer ends of these lines, which are miles apart, the piles are built every thirty yards; the distance gradually lessening as the lines converge, until at their inner ends, where the width is about forty yards, the piles occur every ten feet.
>
> In the narrow mountain passes frequented by deer [reindeer] similar arrangements are made. One native caught ninety deer during the season. In the big lake near the limit of the mountains large herds of deer gather in the fall. It is shut in by the mountains, with the ends open and accessible, but the sides so very steep that only in places

> can the deer climb; at such points some natives conceal themselves while others drive the deer in the ends (Stoney 1899:838).

Arthur E. Speiss noted a similar example from the Russian arctic.

> In summer, hunters would plant a V-shaped arrangement of sewels [slender posts with a fluttering attachment or flag at its tip] on the tundra, downwind from a herd of wild reindeer. The most exerienced hunter . . . would circle behind the wild herd and drive it to waiting archers (Speiss, 1979:128).

Recent work in the area by archaeologists working in conjunction with the Alaskan Native Claims Settlement Act has also added considerable archaelogical information about these early ethnographic observances (Lynch et al. 1984; Kent 1986). Excellent research is also being accomplished on similar sites in Greenland by Swedish scientists (Gronnow et al. 1983). These studies are indicative of the wide interest in such sites.

After investigating a number of reported sites, it appears that the most useful of the Alaska sites for comparative purposes are found in the Brooks Range of Alaska. In the late 1960's, Dr. Lewis Binford researched the subsistence activities of a group of Nunamuit Eskimo (Inuit) in the vicinity of Anaktuvuk Pass. Binford and his fellow researchers lived with and observed Nunamuit hunters in order to investigate the settlement and land use patterns, or in Binford's words "to understand the dynamics of living systems and study their static consequences" (Binford 1983:100). They recorded a number of game drive sites on the "dynamic landscape" (Binford 1983:138). These sites are surprisingly analogous to those drives found in the Colorado mountains.

The following example emphasizes the similarities.

> The complexity of archaeological remains resulting from the exploitation of caribou in the vicinity of Tulugak Lake is

> tremendous. Caribou were driven between linear barriers which take advantage of natural features in the landscape..., but also incorporate man-made features, which would have been very difficult to detect without ethnographic information.
>
> Along one caribou drive, which goes up the mountain adjacent to the lake, we located seventy small hunting blinds from which two Nunamuit men could ambush game. Each of the blinds consists of a permanent structure made by excavating a hollow in the rock talus slope or by building a low wall. They have a dual function: not only can the hunters hide there, but the shelters also provide a measure of protection from the wind while the men wait for the game to appear - as long as eight or even twelve hours if necessary" (Binford 1983:128).

Binford's work with hunter-gatherer groups such as the Nunamuit have since led to considerable theorizing about site utilization and the seasonal rounds of such groups. For example, Bender and Wright (1988: 625) noted that "We believe that an understanding of mountainous occupations must derive from models that account for the local dynamics of subsistence and settlement."

Non-mountainous Game-drive Sites

Game-drive systems also occur in many other ecosystems outside of the arctic tundra. Such systems have been recorded as far away as the Outback of the Australian desert and as close as the Great Plains in eastern Colorado. A few, such as some in the Great Basin, have limited ethnographic detail available for reference (e.g., Steward, 1938). The research was limited to areas with a lack of tree cover as it is felt such areas better approximate the conditions found above tree line on Monarch Pass.

In the Australian Outback, Richard A. Gould describes a system he refers to as a game trap in the vicinity of Lake Moore. Serpentine rock alignments less than two feet high apparently had been constructed by

the Gibson Desert Aborigines to facilitate the hunting of emus and other animals. The aborigines reportedly call the place where these alignments were found -Kunturu, which is loosely translated as "all bunched up" (Gould 1969:139).

Much closer to home, in the western Great Plains in North America, there are a quantity of "spectacular" game drives. A number of these cliff-edge jumps are well documented and include the Roberts Buffalo Jump (Witkind 1971), Glenrock Buffalo Jump (Frison 1970); Big Goose Creek (Frison 1967a); Piney Creek (Frison 1967b); Vore Buffalo Jump (Frison 1978); Hudson Meng (Agenbroad 1973). Additional methods of communal bison hunting on the Great Plains are natural feature traps that utilize narrow stream arroyos and sand dunes. Representative sites include the Wardell Site (Frison 1973b), Hawken (Frison et al 1976), Agate Basin (Agogino 1972); Olsen Chubbuck (Wheat 1972), Jones-Miller (Stanford 1974), Casper (Frison 1974b), and Gull Lake (Kehoe 1973). These drive sites lack the artificially constructed rock walls found at the arctic and mountain sites. Instead, the hunters were apparently relying on the natural topography and carefully positioned support staff that facilitated the hunt.

Archaeologists working in the Great Basin are also recording an increasing number of drive sites. Their reports indicate these drives were primarily designed for the communal hunting of pronghorn antelope and desert bighorn sheep. There are a number of historic eye witness accounts of these systems in use (Eagan 1917:238; Regan 1934:54). Julian Steward reported that the method was so effective for hunting pronghorn antelope that the area was hunted out for many seasons to come (1938:33). Recent site reports from the eastern Great Basin include

reports by Murphy and Frampton (1986), Pendleton and Thomas (1983), Thomas and McKee (1974), Wilke (1986), and Windmiller and Huckel (1973). George Frison has also reported a similar antelope trap near Ft. Bridger in southeastern Wyoming. He estimated the age of this particular system at over 100 years (Frison 1987:254).

Game-drive sites are interestingly scarce in the Southwest. Only one site, Hall Ranch, has been investigated. Hall Ranch is located near Springerville, Arizona on the upper portions of the Little Colorado river, and is believed to be an antelope drive with puzzling masonry-lined vertical shafts in the drive walls. The drive was reportedly used between A.D. 600 and 900 (Diggs 1982:26-38). The author notes that there are suggestions that this type of hunting may have "great antiquity" (Diggs 1981:26-38).

Mountain Game-drive Sites

Examples from other areas are useful, but it is necessary to focus on sites with the closest similarities to the Monarch sites in order to attempt site interpretation. Unfortunately such systems from the high alpine tundra are rare in the archaeological literature. In the mountains of northwestern Wyoming, a number of structures thought to be bighorn sheep traps have been investigated by researchers from the University of Wyoming (Darlington 1984; Frison 1978). Frison notes that these facilities contain a considerable quantity of dead timber and stone walls, and he feels they are "at least 100 years old and probably of Shoshonean origin" (Frison 1978:267).

In the Colorado mountains, the majority of the sites have been researched by Dr. James Benedict. These game drives are primarily

located in the Indian Peaks section of the Colorado Front Range. Sites include: Rollins Pass (Benedict 1969), Murray Site (Benedict 1975b), Scratching Deer (Benedict 1975c), Arapaho Pass (Benedict 1985a), and a site near Milner Pass in Rocky Mountain National Park (Benedict 1987).

Benedict describes common characteristics of these game drives as follows:

> They range in altitude from 3350 m to 3950 m: all are above timberline, and most are above tree limit. All are in locations chosen to take maximum advantage of natural topographic barriers and preferred game-animal movement routes. Drive systems can be recognized by their dry-laid stone walls, lines of cairns, and circular or semi-circular blinds, generally occurring in combination (Benedict 1985:84).

It should be emphasized that the sites on Monarch Pass are over 160 km south of the next closest known game-drive site in the Indian Peaks. There are no reported game drives to the south of Monarch Pass in either the San Juan or Sangre de Cristo mountains. It is very likely that other drive sites exist and it is hoped that this report will stimulate more investigations, just as the work of Dr. Benedict provided the interest in this project.

Research Strategy

Archaeological research relies heavily on past investigations conducted at similar sites. Ethnographic observations, when available, are an invaluable addition to any attempts to understand what is seen in the archaeological record. One approach that was effectively used by Pendleton and Thomas at the Fort Sage site in Nevada was to "marshall relevant mid-range theory" (Pendleton and Thomas 1983:25) in order to examine the probable strategy behind the construction and use of these systems. This is a direct reference to Lewis Binford's theoretical approach at understanding hunter-gatherer lifeways. Binford notes that:

> We must seek a deeper understanding. We must seek to understand the relationships between the dynamics of a living system in the past and the material by-products that contribute to the formation of the archaeological record remaining today" (Binford 1980:5).

Unfortunately, very little is presently understood about the annual round of subsistence activities used during the prehistoric past. Traditionally, sites have been recorded as they were found and very few regional surveys or excavations been attempted. The Monarch Pass project is no exception; these sites admittedly represent only a synchronic or a single portion of the entire landscape that would have been utilized during an annual cycle.

Hunter-gatherers are typically characterized as peoples who live in groups or bands of no more than 50 people. This depends on the time of year, environmental conditions, and type of activity. Seasonal and cyclical variation in the availability of resources determines the environment's capacity to produce foods. These and other factors allow for annual differences in human concentrations in a given area as well as the overall size of each group or band of hunter-gatherers. Arthur Speiss emphasizes and expands on this point:

> Subarctic and artic band societies consist of small residence units (microbands) that gather annually, or whenever food is plentiful, into larger groupings (macrobands). Groups of macrobands may be related linguistically and culturally into "tribes," whether the members recognize that relationship or not (Speiss 1979:7).

Speiss also notes that the archaeological record is confused by the changes in micro and macroband dynamics and in a larger framework the general tribal or cultural entity.

> During one year there will be an average deposition of material determined by place activity, and season, which is repeated year after year with some chance variation until the environment, adaptation or macroband boundaries change (Speiss 1979:11-12).

Lewis Binford feels that differences in the archaeological record are confused by a number of variables and that:

> We must be able to detect variation through time between different groups of hunters and gatherers in the organization of behavior at the regional level, the residential core level, the site complex level, and the activity level (Binford 1983: 142).

Binford's work with various groups of hunterer-gatherers has led him to consider two distinct hunting strategies. He catgorizes these techniques as **encounter strategy hunting** and **intercept strategy hunting**, each of which describes a fundamentally different organization to the hunting effort (Binford 1978:169).

Encounter strategy can be characterized as a hunting strategy in areas where game animals either are in limited supply or have unknown or unpredictable behavior. The opportunity for a successful hunt is typically limited by the overall skill and/or luck on that day by an individual hunter. Binford should include in his strategy the situation in which hunters can predict, through previous experience, overall game patterns in a specific area, while continuing to maintain a basic strategy of encounter hunting. Judging from personal experience, encounter strategy is the typical method utilized by many of today's big game hunters in Colorado.

Encounter strategy is countered by the intercept hunting strategy, whereby a hunting group plans, constructs traps, and utilizes topography to increase the potential hunting yield. Intercept strategy tends to maximize the potential for group hunting success. This would be important in ecosystems where game animals have predictable patterns or there are sufficient quantity of animals to warrant the investment of time and energy. Hunters today occasionally attempt to use this type of

hunting when they can successfully organize themselves into groups. Its popularity may be tempered by disorganization, unfamiliarity of the terrain, and the hunting regulations that prevent each of the waiting hunters from shooting more than one animal (e.g., "party hunting").

The greater investment of time and energy into permanent structures is an important development in hunting strategy. This may have been the outgrowth of a succcessful (or possibly failed) encounter strategy where an individual or group felt the investment in permanent structures would aid future hunting efforts and success. Pendleton and Thomas add that:

> There is, in fact, a clear-cut and relatively constant relationship between the cost of a given facility and the long-term benefits of its usage: high-cost facilities will be constructed only where game is at least seasonally (1) abundant, (2) predictable, and (3) relatively easy to ambush. The acceptable construction costs of an ambush facility drop off in proportion to (1) lower game densities, (2) lessened game predictability, and (3) increased difficulty of ambush. This pattern is pervasive among aboriginal inhabitants of the northern two-thirds of North America (Pendleton and Thomas 1983:25).

The decision to build walls indicates a confidence of success and perhaps an intention to reuse the area in the future. Additionally, a site that failed to attract animals for a successful hunt would likely be abandoned, others would hear of its futility and the result would be little archaeological evidence for its original existence.

Stefansson (1914) reported the use of three different game drive hunting strategies in the Alaskan arctic. These strategies include large-band hunting groups, small (one or two) extended family units-partnerships, and individual hunters. The large-scale systems were extensive systems ranging from less than one to more than 10 miles in length. These big systems were staffed by groups of people, many with 40 to 50 individuals. Large-scale drives reportedly were used

seasonally and only when various microband groups gathered together for communal hunting, typically during the annual migrations of the large herds.

Smaller scale, partnership type, hunting activity was limited to trapping animals during the course of daily foraging, when migrations were not in progress. Stefansson (1914:383) describes spur-of-the-moment constructions of drive-fences requiring less than an hour of construction time. He recorded a party of four male hunters and six women and children drivers who killed 11 caribou during one such hunt.

Individual efforts are noted as well and Stefansson records (1914: 386) that a good single hunter utilizing chance-encounter hunting could, on a good day, kill up to three caribou. Because many nonproductive days were expected, Stefansson feels this type of strategy was considered too undependable and the least preferred hunting strategy.

The first two observed patterns follow the intercept hunting strategy as defined by Binford. Pendleton and Thomas add that this hunting style

> exploits specific areas of biogeographic circumscription, ambushing relatively large numbers of individuals agglomerated in a predictable pattern of seasonal density (Pendleton and Thomas 1983:25).

Following this line of reasoning, the extensive sites of Monarch represent a very labor-intensive facility. They offer a unique opportunity to learn more about systematic hunting techniques in one particular ecosystem in this area of Colorado. Perhaps the investigations will be able to detect some of the variations that Binford feels are necessary in order to begin to understand hunter-gatherer lifeways.

Possible Cultural Affiliations

Benedict's previous research indicates there are possibilities of finding evidence of a variety of cultural and temporal occupations perhaps as early as the Paleo-Indian period. By the same token there are possibilities that the Utes, the last known indigenous occupants of the Colorado mountains, may have built or utilized existing drive areas. For example, Benedict notes that "Several generations of drive structures are present" at site 5BL114 on Arapaho Pass (Benedict 1985:87). The arrow point styles found in the vicinity of some of the game drives also indicates at least that later peoples hunted those ecosystems.

It is surprising that there are no historic observations of Utes using these rock walls to drive game into the mountains. Benedict notes that one explanation this may be the possibility that "hunting from horseback had supplanted such [game drives] traditional techiques" (Benedict 1985:84). However, historic accounts indicate the adoption of the horse was relatively slow and not uniform among different groups. This would indicate that traditional hunting techniques may have been slower to change than we might assume. For example, there is at least one historic account (apparently without horses) of Ute game drives from lower altitudes of the Eastern Slope of the Colorado Rockies.

> The Utes were very successful hunters. The white settlers knew the presence of the Utes late in the fall, before seeing deer [that they were] coming down from the high altitudes to winter in the valley [Arkansas valley near Canon City]. The writer, in his trips through the stock country, often ran onto the Indian Drives, as we call places where they put up winnows of brush to turn the direction of deer to the reception-places where Indians lay concealed, waiting the arrival of their game, which was being driven toward them by scouts, who seldom fired a shot (Rockafellow 1881:641).

This account indicates that the Utes utilized game drives on at least a seasonal basis. It seems possible the Utes also built or reutilized older game drives in the mountain passes. These instances may be simply unreported by the early historians.

Unfortunately, dating the actual uses of such sites is difficult due to poor preservation conditions at high altitudes. Additionally, there are possibilities that these systems were modified at various times in the past in order to overcome these limitations. Benedict has utilized careful excavation techniques as well as geological and botanical clues to help determine the age of these sites (e.g., Benedict and Olson 1978:19-28; Benedict 1985:43). More reseach, especially on sites with excellent stratigraphy, needs to be done to help determine the actual use patterns of such sites.

Research Model

The research at Monarch relies on previous research on game drive sites in the Intermountain West and ethnoarchaeological approaches used in Alaska. The literature analysis indicates that the sites with the most usefulness for this research are the observations from Nunamuit sites in Alaskan Brooks Range and the excavations of similar sites in the Colorado Front Range.

This project is necessarily limited by available money, staff and time and stipulations of the Special Use Permit issued by the Salida Ranger District. With these considerations in mind, the research design will consider the following general research domains.

A. Chronology/Culture History

1. What are the dates, in general terms, of the occupation of the site?
2. Which cultural groups, i.e., Paleo-Indian, Archaic, Prehistoric utilized the sites?
3. Is it possible to determine differences in the origin of the peoples who utilized the sites, e.g., Plains, Southwest, Great Basin?
4. How do the sites at Monarch compare with other high altitude sites in the Colorado Rocky Mountains?

B. Subsistence

1. What activities are represented at the sites (e.g., hunting, butchering, tool making, camping, etc.)?
2. What animals or other resources were being exploited?
3. In what season of the year were the sites utilized?
4. Do differences in the constructions of the various walls indicate the hunting strategy?
5. How does the topography and vegetation influence where the alignments are built?

CHAPTER IV

SITE DESCRIPTION

The 12 individual sites at the Monarch study area have been separated into three functional types based on location as well as the artifact assemblage, size and diversification in order to simplify the research and analysis. This is an admittedly subjective classification as there are many possibilities for overlapping and variance of uses, very difficult to determine from the limited archaeological record present at the Monarch sites. At the Alaskan Nunamuit sites Binford noted:

> . . . the archaeology [of these Nunamuit sites] also becomes very complicated. . . . The pattern of re-use at these sites has to a large degree determined their size, in terms of the distribution of artifacts and features; consequently, locations occupied repeatedly are considerably larger than those used on a few times. This means that variability in the amount of space occupied by a site, . . . would not be due to differences in the size of social organization of the group who resided there, but would merely reflect the degree of repetitiveness in the way the landscape was used by the same mobile band" (Binford 1983:113).

It should be emphasized that some mountain passes, Monarch in particular, are very centrally located vis-à-vis major river valleys. These passes would have provided corridors for human and animal migrations between different areas of the mountain valleys and parks. Due to the constricted topography in these alpine saddles there is an apparent concentration of sites in one area. This pattern would not be found in a less restricted landscape.

Further complicating the picture is the distinct possibility that different bands from the surrounding culture areas could easily have left refuse on the same sites in an overlapping pattern. ". . . We can no longer make simple equations between variability in site size and nature of the group which resided there, until we know more about all the other factors which contribute to the spread of debris at a site" (Binford 1983:114). Binford's analysis of the Nunamuit's sites is much easier than at sites with the potential for having different cultural groups utilizing the same environment.

Unfortunately, it appears there is little potential for the discovery of extensive buried sites along this Continental Divide ridge which might solve this problem. The soils are shallow and the majority of the artifacts are likely to be found on top of the tundra and in a mixed context. Buried, unmixed and ideally multicomponent sites are needed before we can sort out these obvious issues.

Monarch Pass Site Types (Table 1 and Figure 3)

The three Monarch archaeological site types are:

1) Game-drive features
2) Camps
3) Specialized activity locations

Site Type 1 - Game-Drive Features: The sites designated game drives follow the Benedict's mountain game-drive characteristics (1985a:85). His criteria include:

1) collection area -- locations "where animals are found with sufficient predictability to justify the labor involved in the building of the drive structures,"

Table 1. Site Description

Site No.	Site Type	Elevation	Closest Water	Slope	Aspect (deg)	Apparent Size	Vegetation
5CF208 GN1929	Campsite	3511 m	Perm-Spring/500 m Seasonal-100m	0-3%	80-90	5.0 A	Alpine Tundra, Bristlecone Pine, Engleman Spruce
5CF373 GN1936	Game Drive	3640 m/max 3566 m/min	Perm-Spring/500 m Seasonal-On site	0-35% Av-10%	Av 50	133 A.	Alpine Tundra grasses Bristlecone Pine
5CF426 GN1931	Campsite	3544 m	Perm-Spring/250 m Seasonal-On site	0-10%	90	3.2A	Alpine Tundra, Bristlecone Pine, Sub-alpine fir
5CF427 GN1932	Campsite	3547 m	Perm-Spring/210 m Seasonal-On site	0-10%	300	.13 A	Alpine Tundra, Bristlecone Pine
5CF428 GN1933	Specialized Activity Area	3553 m	Perm-Spring/300 m Seasonal-On site	5-40%	90 and 270	.12A	Alpine Tundra Bristlecone Pine
5CF429 GN1935	Specialized Activity Area	3560 m	Perm-Spring/700 m Seasonal-On site	2-10%	180	4.34 A	Alpine Tundra Bristlecone Pine
5CF430 -no GN#	Campsite	3550 m	Perm-Spring/210 m Seasonal-On site	2-10%	310	.17 A	Alpine Tundra, Bristlecone Pine, Engleman Spruce
5CF431 GN1938	Specialized Activity Area	3627 m	Perm-Lake 1000 m Seasonal - 20 m	0-2%	210	1.7A	Alpine Tundra
5CF495 GN1930	Specialized Activity Area	3541 m	Perm-Spring/350 m Seasonal-On site	0-8%	90 and 280	.44 A	Alpine Tundra
5CF496 -no GN#	Specialized Activity Area	3593 m	Perm-Spring/1000 m Seasonal - 60 m	0-10%	Top of ridge (360 Degrees)	.02 A	Alpine Tundra
5CF497 GN1933	Specialized Activity Area	3547 m	Perm-Spring/210 m Seasonal-On site	0-10%	300	.13 A	Alpine Tundra, Bristlecone Pine
5CF499 GN1934	Game Drive	3563 m	Perm-Spring/400 m Seasonal-On site	0-8%	90 and 270	.22A	Alpine Tundra grasses Bristlecone Pine

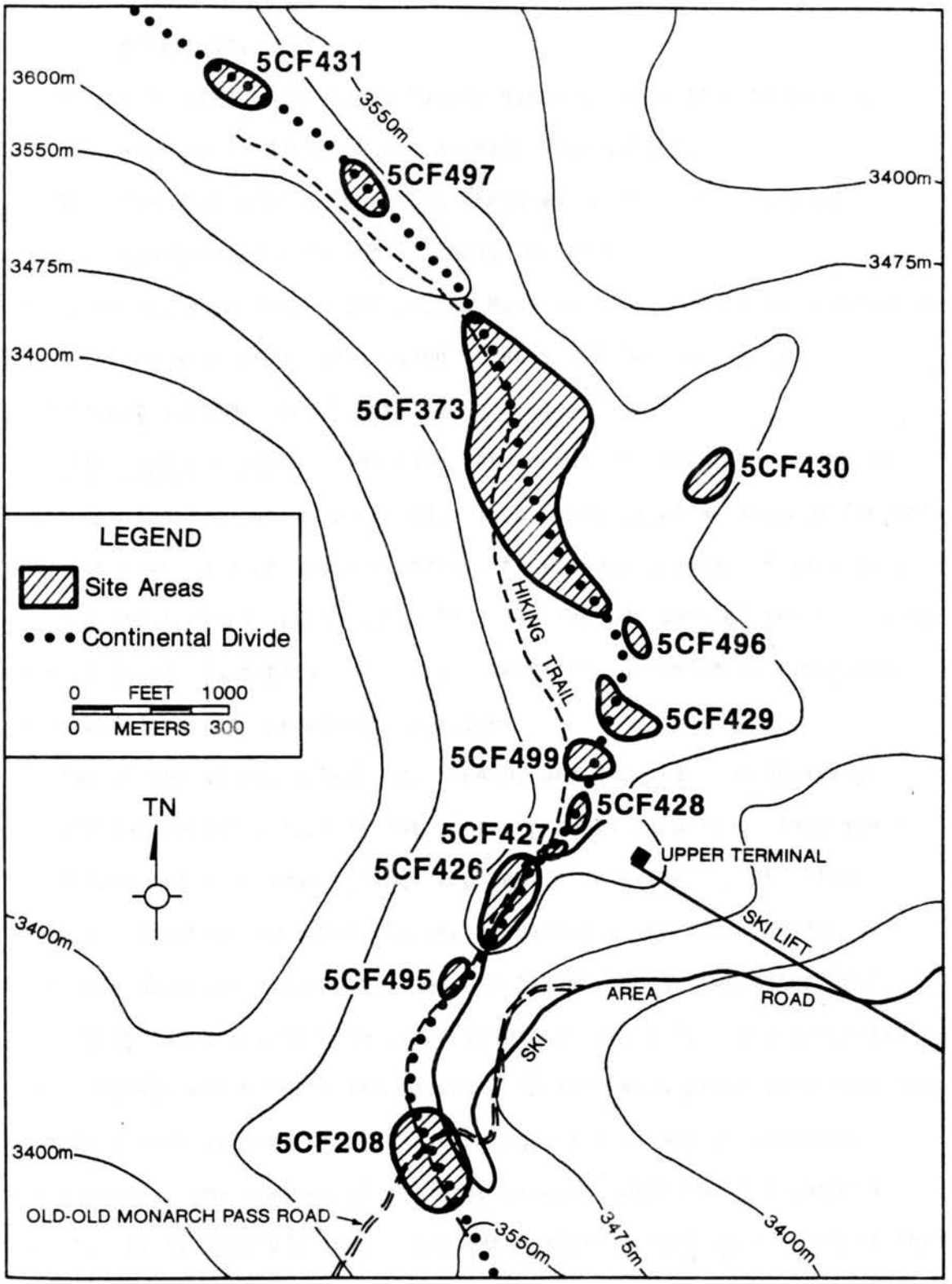


Figure 3. Map of Site Area

2) concentration area - locations "where natural obstacles and man-made barriers were used to funnel the animals in a desired direction,"

3) kill area - locations "where hunters lay hidden in blinds, waiting to dispatch the animals from ambush,"

4) overlook area - locations "from which the hunt could be coordinated with hand signals or calls."

The above criteria enable the entire Monarch site area to be considered as one drive site or a combination of at least two smaller yet significant systems (see Figure 4).

Site Type 2 - Camps: The camp site areas are locations where at least limited habitation occurred. To be considered a campsite for this study it must have at least evidence of extended occupation such as a diverse artifactual assemblage. This may include some of the following: lithics (tool and debitage variety); ceramics; groundstone materials; protected location; proximity to water.

Two of the sites, 5CF208 and 5CF430, are located in moderately protected forested locations out of the prevailing winds. They are a reasonable distance from springs and have a wide variety of lithic remains. Groundstone materials are prevalent at 5CF208. Using Binford's observations of the Nunamuit Eskimo, these two sites could be considered temporary hunting camps (Binford 1983:118). The other two camps, 5CF426 and 5CF427, are situated in more wind-prone locations but exhibit a wide variety of lithic debitage, tools, and groundstone. Additionally, the remains of a single ceramic vessel were located at 5CF426. It is possible that these later sites served as very short term and temporary camps or kill processing locations during periods of

favorable weather (Binford 1983:120-124). I hesitate to call any of the camps true "base camps" (Binford 1983:131) at this time without actual testing. It is more likely that the larger and more diverse base camps would be found at lower altitudes, where there are more options for protection. For example, the nearby Water Dog Lakes, or even what is called Monarch Park, would have provided ample running water, more firewood, and a more diverse ecosystem.

Site Type 3 - Special Purpose/Limited Activity Areas: This site type at Monarch is small in size and contains little diversity in tool stone material. Such sites are often referred to in the literature as lithic scatters. This category is a catch-all for a wide variety of diverse activity areas that do not readily fall into the first two categories.

These sites tend to be situated in more exposed locations on locations near the top of the Continental Divide crest. Winds have been observed to be very strong at some of these spots and would not be conducive to much more than short term occupation. In four of these locations (5CF431, 495, 496, 497) less than five lithic flakes per site were recovered. One site, 5CF497, produced a projectile point (see Figure 14) which had been utilized as a knife prior to discard. In these instances the site was likely used for either limited tool manufacture or solitary kill site. Other sites such as 5CF428 and 5CF429 have a few game-drive features such as hunting blinds and short rock walls.

Binford (1983:133-134) noted that special-purpose sites in the Nunamuit areas could be very large and have archaeological diversity. Activities observed at such sites were where final butchering took

place, meat was cached, and hides were prepared. It is possible to infer from this description that the four sites referred to in this report as camps may have also served as special activity areas at one time or another. Despite the obvious problems with a subjective classification of sites at Monarch it is felt that it is useful in comparing the observed archaeology to other sites in the Colorado mountains.

CHAPTER V

ROCK ALIGNMENTS AND ENCLOSURES

One hundred and eight years ago a Kansas traveler reported what are believed to be the same rock walls and structures that are the focus of this research. It is interesting that they appeared extensively weathered even at that time. The following is an excerpt from a report of his discovery in an 1882 volume of Scientific American:

> During the past summer I had the occasion to travel over and along the continental divide which separates the waters of two oceans, as well as the counties of Gunnison and Chaffee, Colorado, and at a point about four miles west from the town of Monarch, near the head of the South Arkansas, I noticed the debris of a very ancient works of stone, which, considering their location, were very curious and interesting. They comprised a series of low stone walls, and extending along the smooth summit or backbone of the mountain and connecting two elevated rocky points about a quarter of a mile apart. On top of these points were circular inclosures of stone ten or fifteen feet in diameter, and two feet in height; the walls were made by placing upon edge and leaning together slabs of granite rock, and were originally about two feet or more high, and are so ancient that in many places the granite rock of which they were composed had disintegrated and crumbled into sand. . . . The design [function] of it was difficult to comprehend. . . . I have implements of stone picked up in that locality (J. R. Mead, 1882:3).

The article indicates these walls were an obvious and curious feature on the landscape over one hundred years ago. The stone walls described by Mead are believed to be those of site 5CF373, which are the most extensive and obvious in the site area (see Figure 10). It is hoped that this traveler left a more complete record of these walls but at the time of this writing, no further information on this visit could be located.

Water Dog Divide Site 5CF373 (Figures 4, 9, 10)

This large site encompasses all of a large broad saddle on the Continental Divide. Wind sculpted krummholz tree islands and tundra grasses provide the majority of the vegetative cover. Strong westerly winds continually scour the western side of the Divide, resulting in deep snowbanks on the lee side. These snow fields melt slowly in the spring, providing additional sources of water for animals as well as possibly contributing to the overall hunting strategy of prehistoric peoples.

The mountain slopes on both sides of the divide are tree-covered to within 100 m of the crest of the Divide. The trees provide animals with cover and perhaps a sense of protection until they are ready to commit themselves to the open tundra on the top of the saddle. Elk and deer were observed on numerous occasions, during the research, grazing at the tundra-forest contact area.

The pass itself is extensively crisscrossed in various and confusing patterns of stone walls. The walls are constructed of locally available stones, dry-laid in long sinuous lines (see Figure 11). Typically they bend and change direction rather than simply using the shortest distance across the tundra, apparently to connect various large tundra-rock outcrops and boulders. In many instances, far fewer stones could have been used if constructed in a straight line.

Four of the drive walls contain a number of wooden posts or sewels at 2-3 m intervals. The wood has been eroded by exposure to the alpine weather and, unfortunately, does not give many clues as to original heights. They were probably tall enough to be visible from a distance.

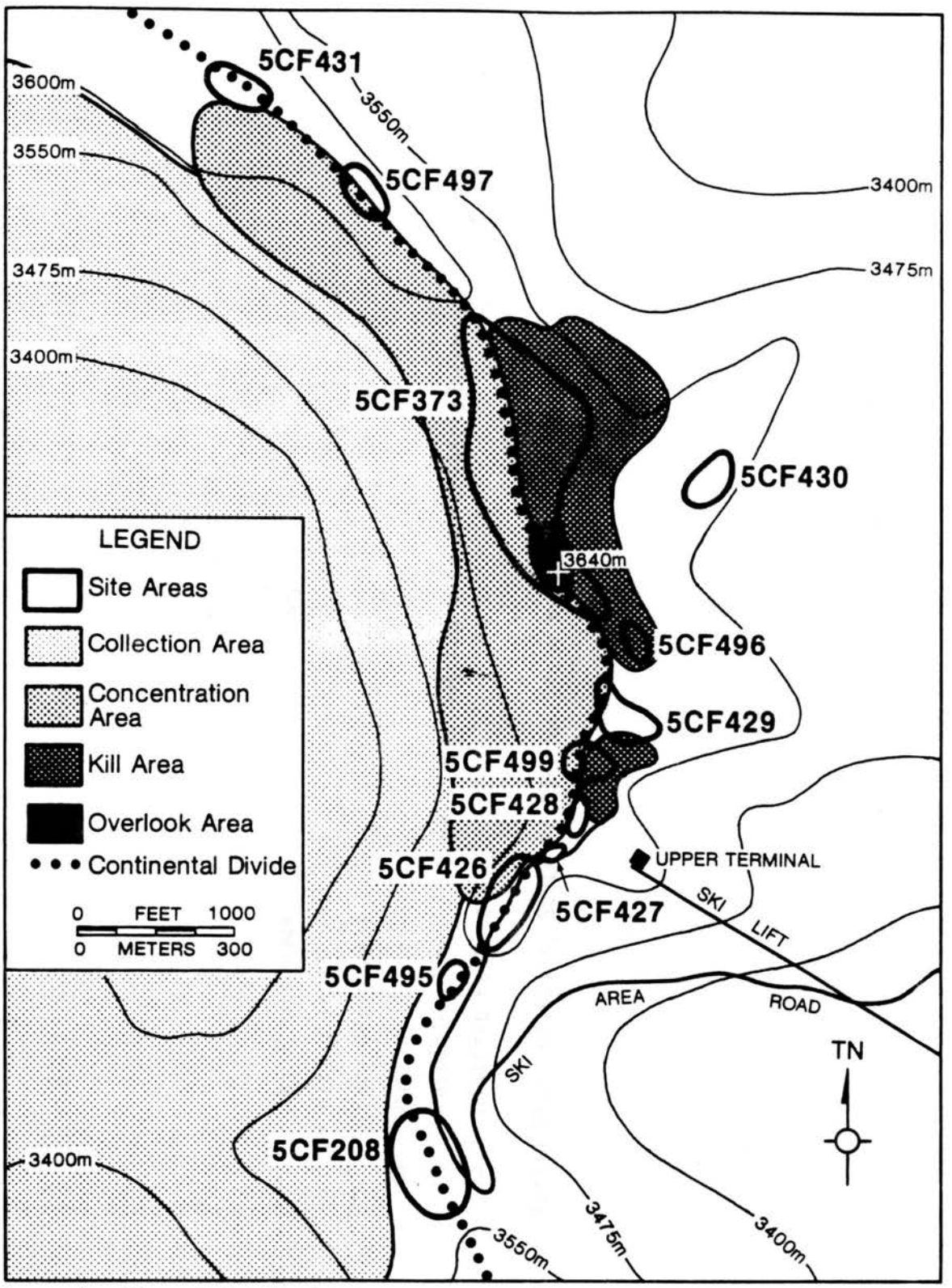


Figure 4. Map of Entire Study Area - Game Drive Strategy Classification emphasized.

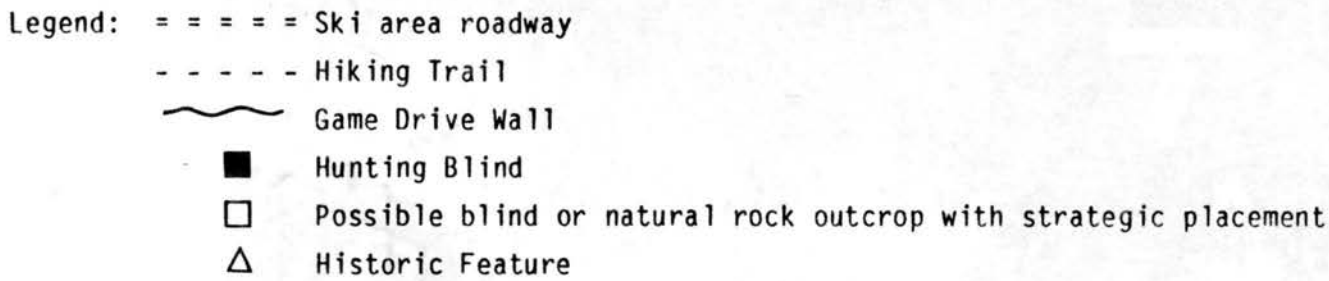
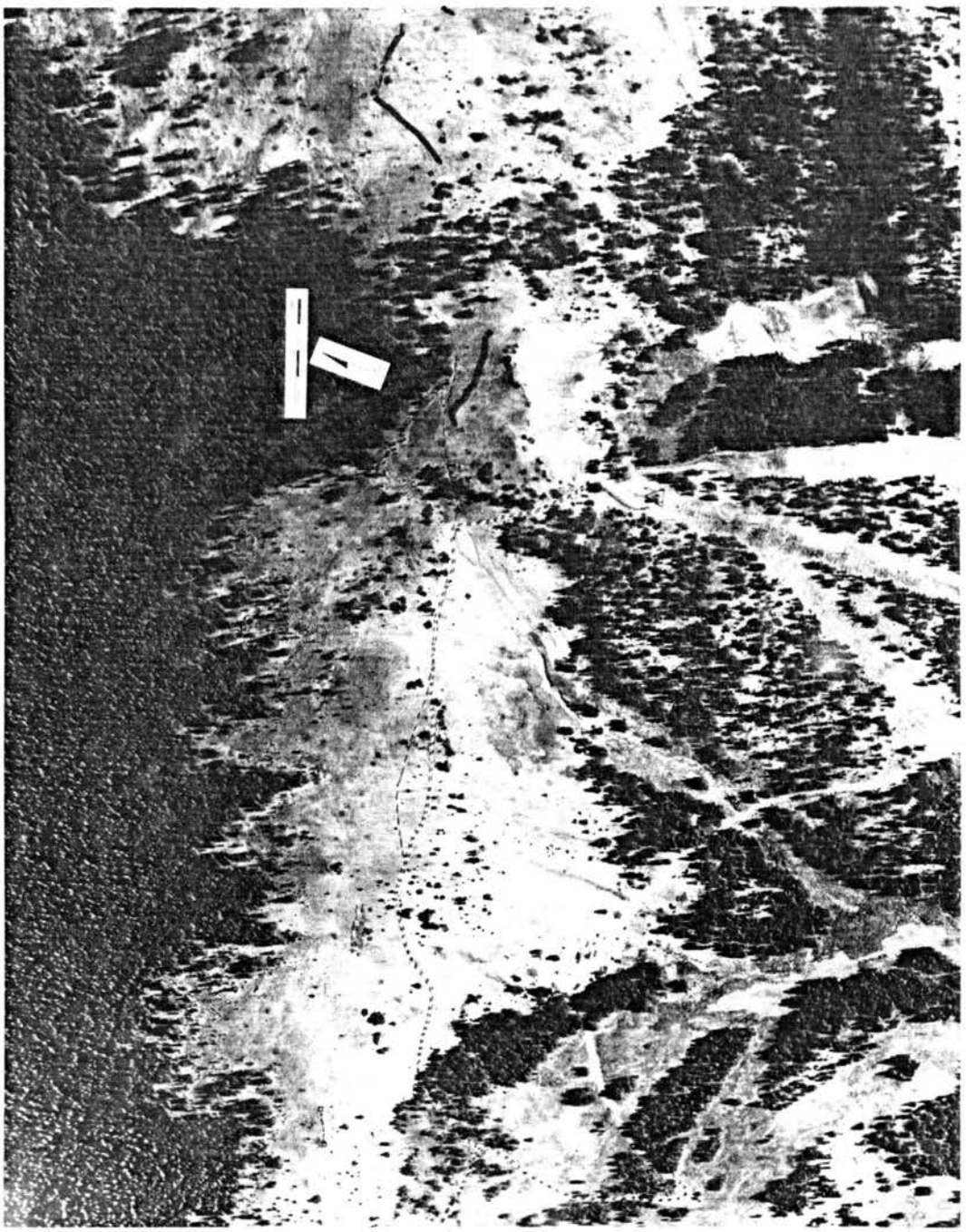


Figure 5. Aerial Photo of Walls, South Portion of Study Area.



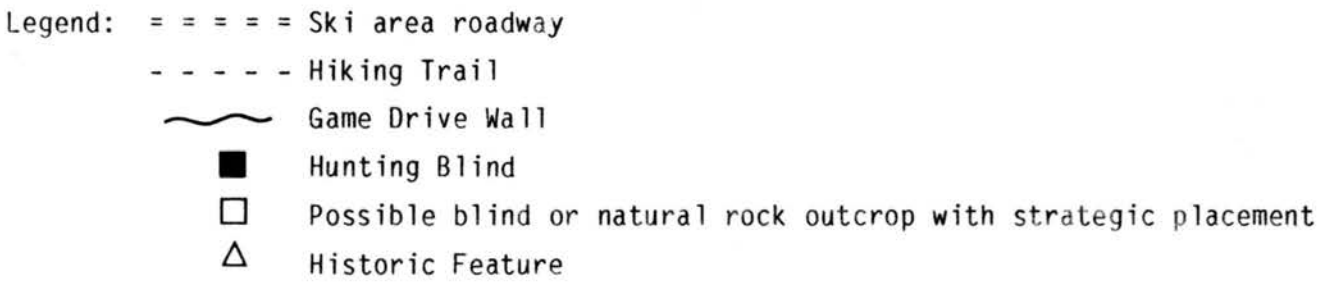


Figure 6. Aerial Photo of Walls, North Portion of Study Area (Water Dog Divide Game Drive 5CF373).

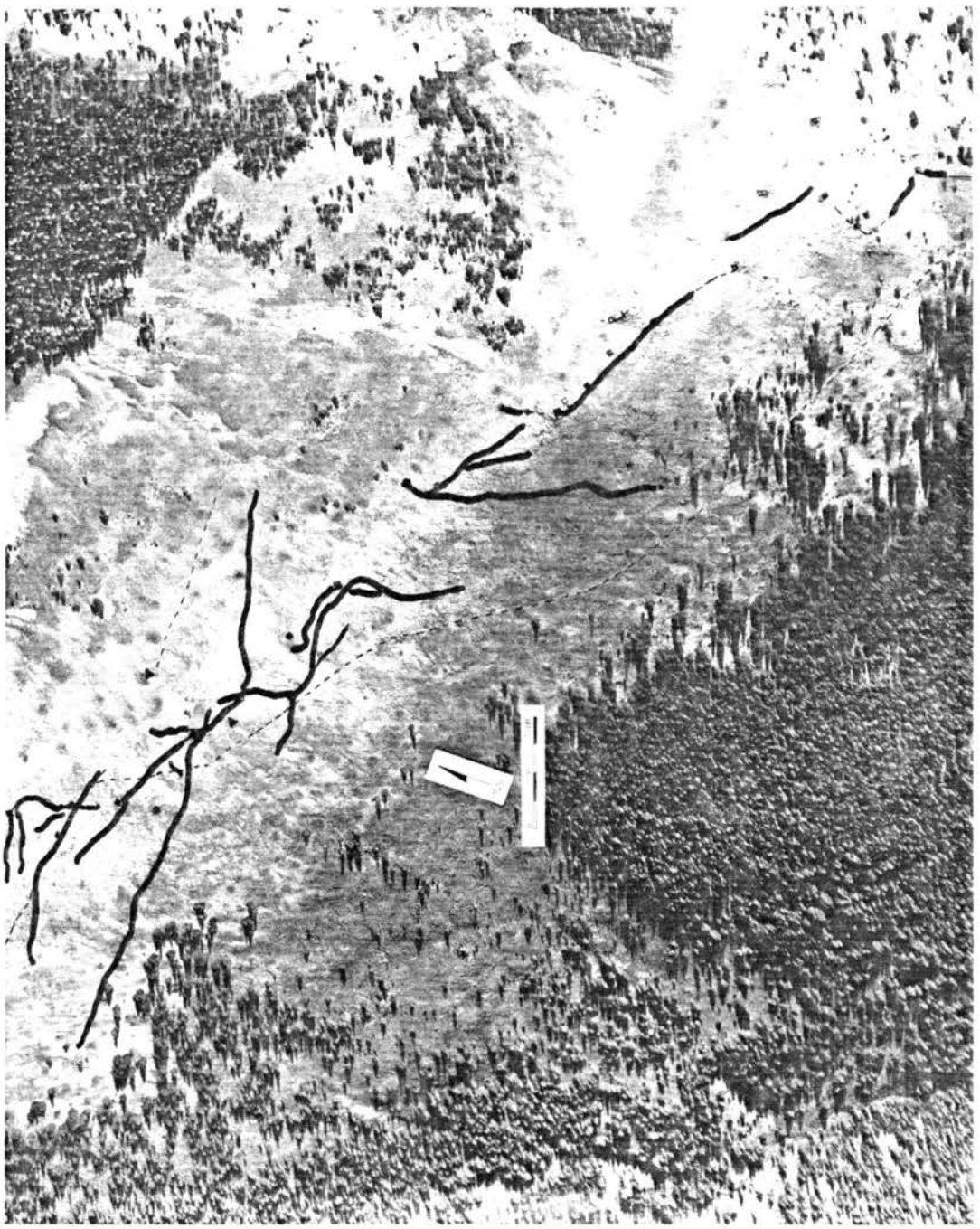


Figure 7. Map of South End of Study Area (5CF208, 5CF495, 5CF426)

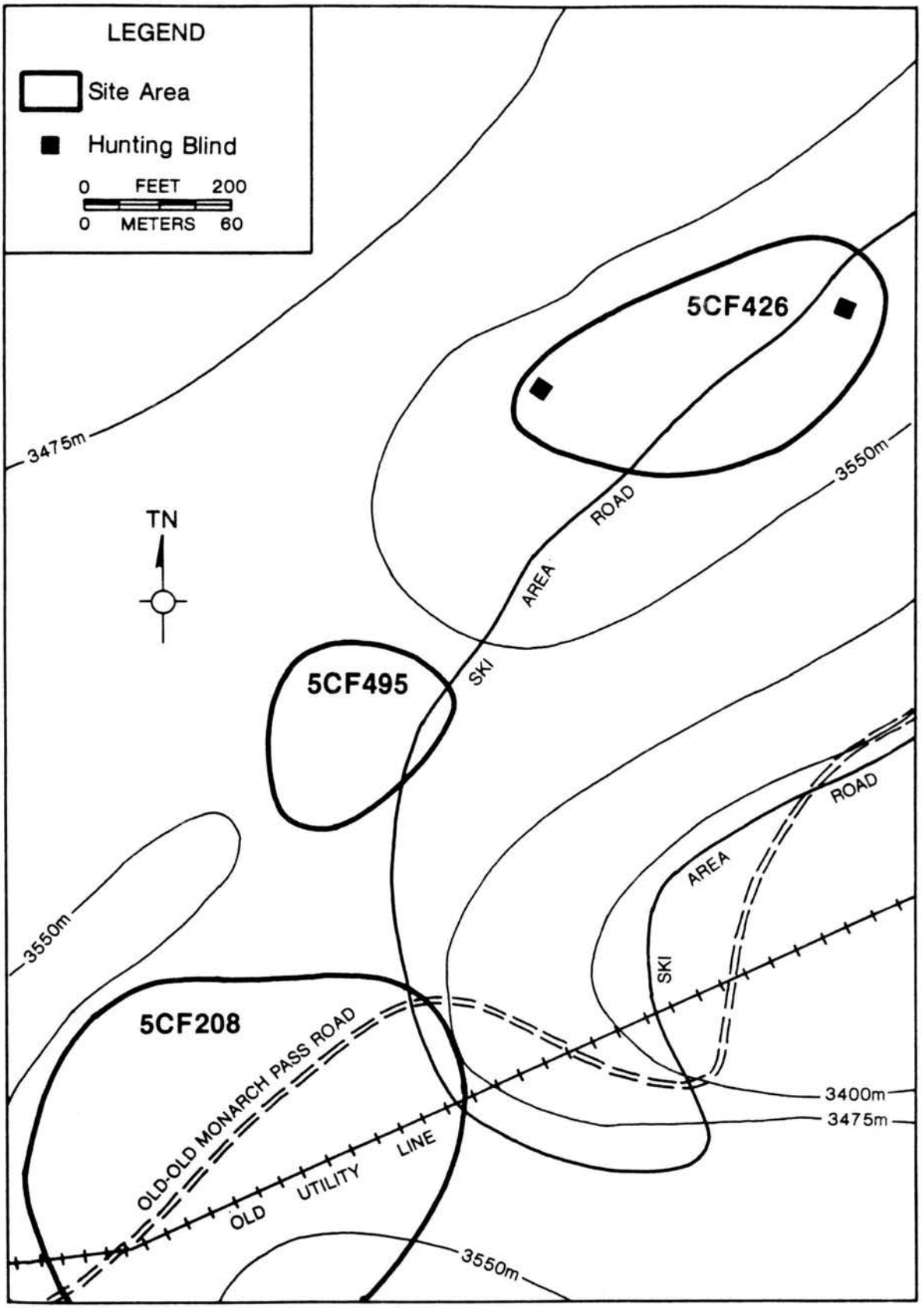

LEGEND
Site Area
Hunting Blind
0 FEET 200
0 METERS 60
5CF426
5CF495
5CF208
3475m
3550m
3400m
TN
SKI AREA ROAD
OLD-OLD MONARCH PASS ROAD
OLD UTILITY LINE

Figure 8. Map of Middle Section of Study Area (5CF427, 5CF428, 5CF499, 5CF429, 5CF496)

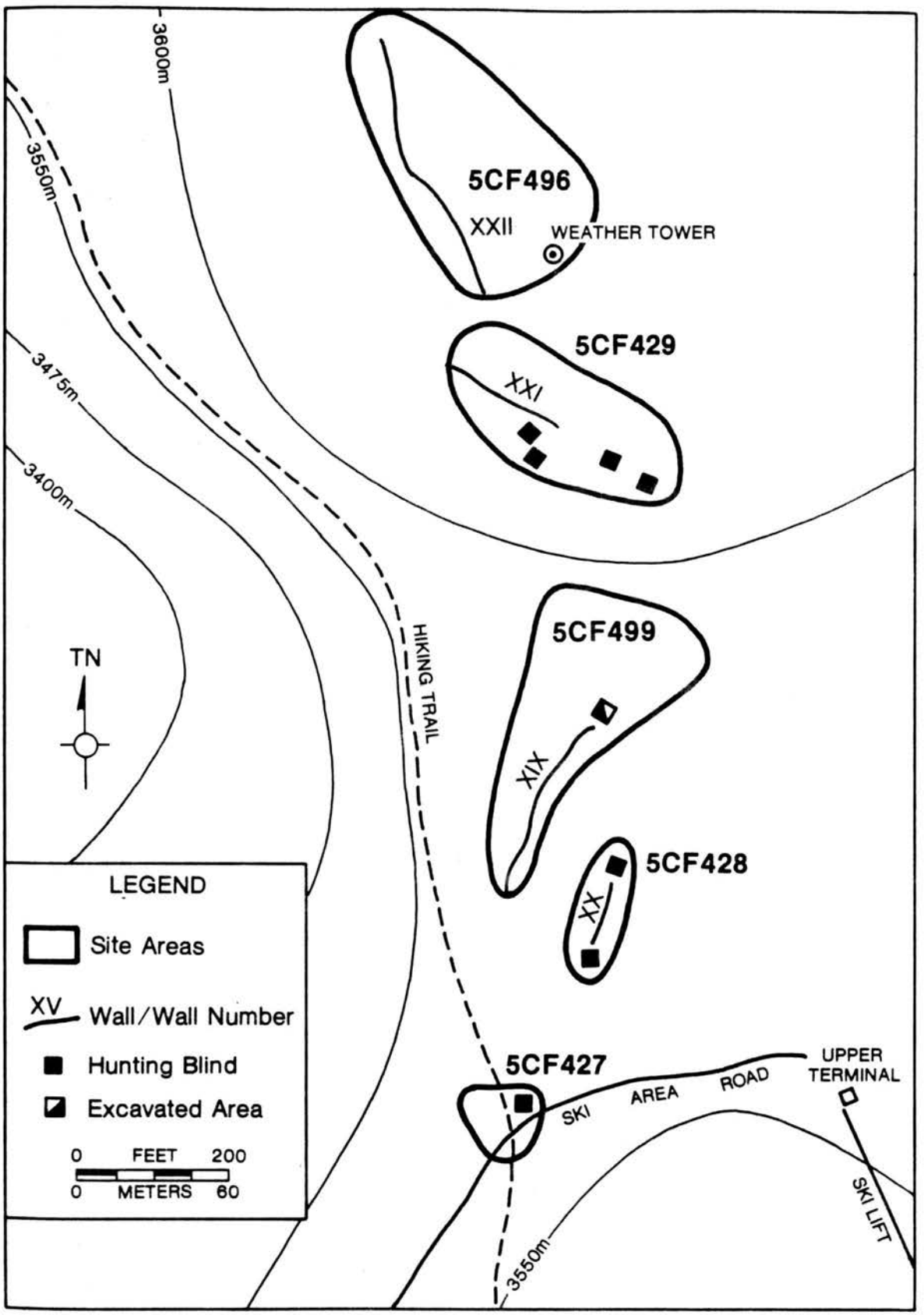
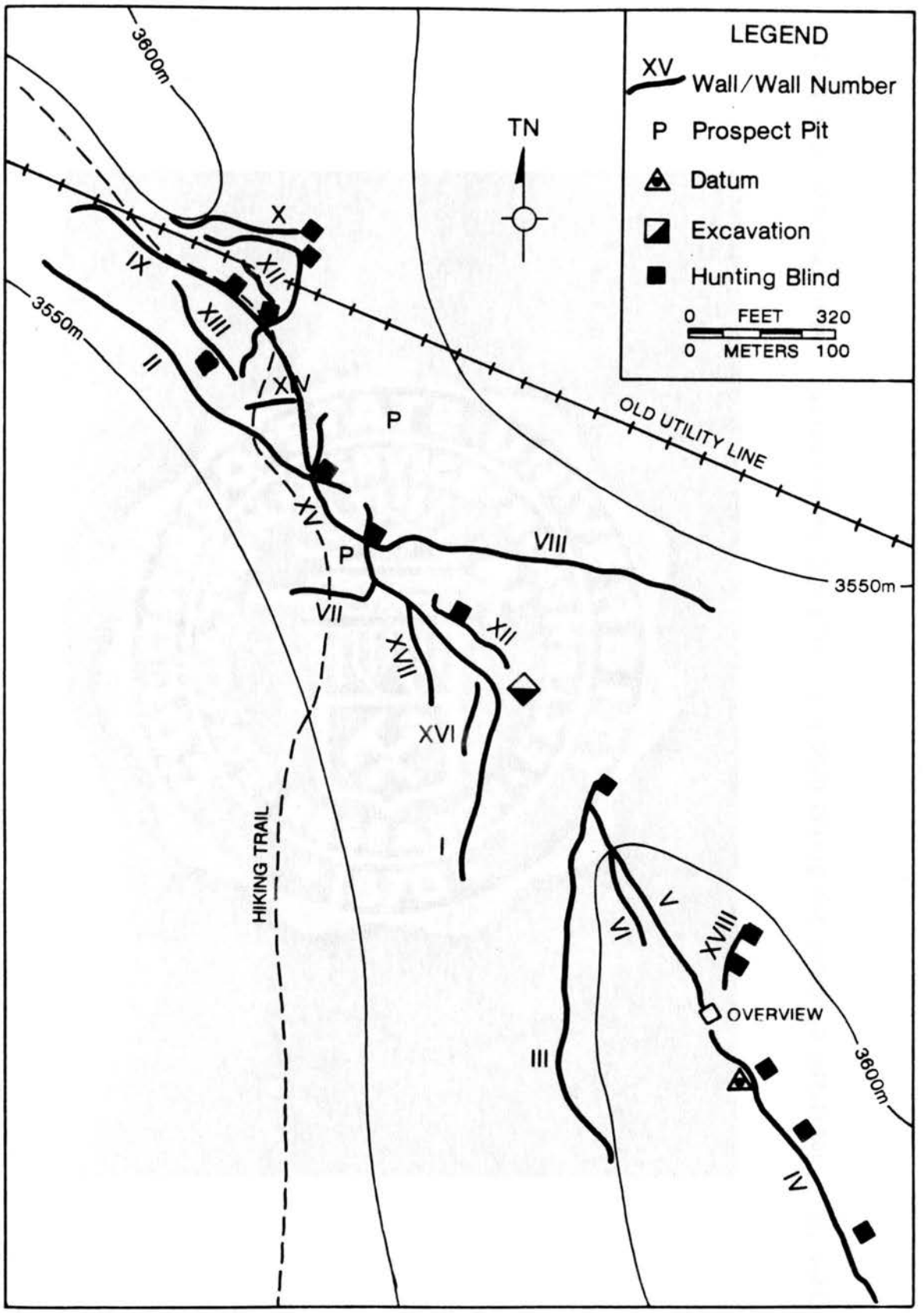

3600m
3550m
3475m
3400m
5CF496
XXII
WEATHER TOWER
5CF429
XXI
5CF499
XIX
5CF428
XX
5CF427
HIKING TRAIL
TN
LEGEND
Site Areas
XV Wall/Wall Number
Hunting Blind
Excavated Area
0 FEET 200
0 METERS 60
SKI AREA ROAD
UPPER TERMINAL
SKI LIFT
3550m

Figure 9. Map of Water Dog Divide (5CF373)


LEGEND
XV Wall/Wall Number
P Prospect Pit
Datum
Excavation
Hunting Blind
0 FEET 320
0 METERS 100
TN
3600m
3550m
OLD UTILITY LINE
HIKING TRAIL
OVERVIEW
X
IX
XII
XIII
II
XIV
P
XV
VIII
VII
XVII
XVI
I
III
VI
V
XVIII
IV

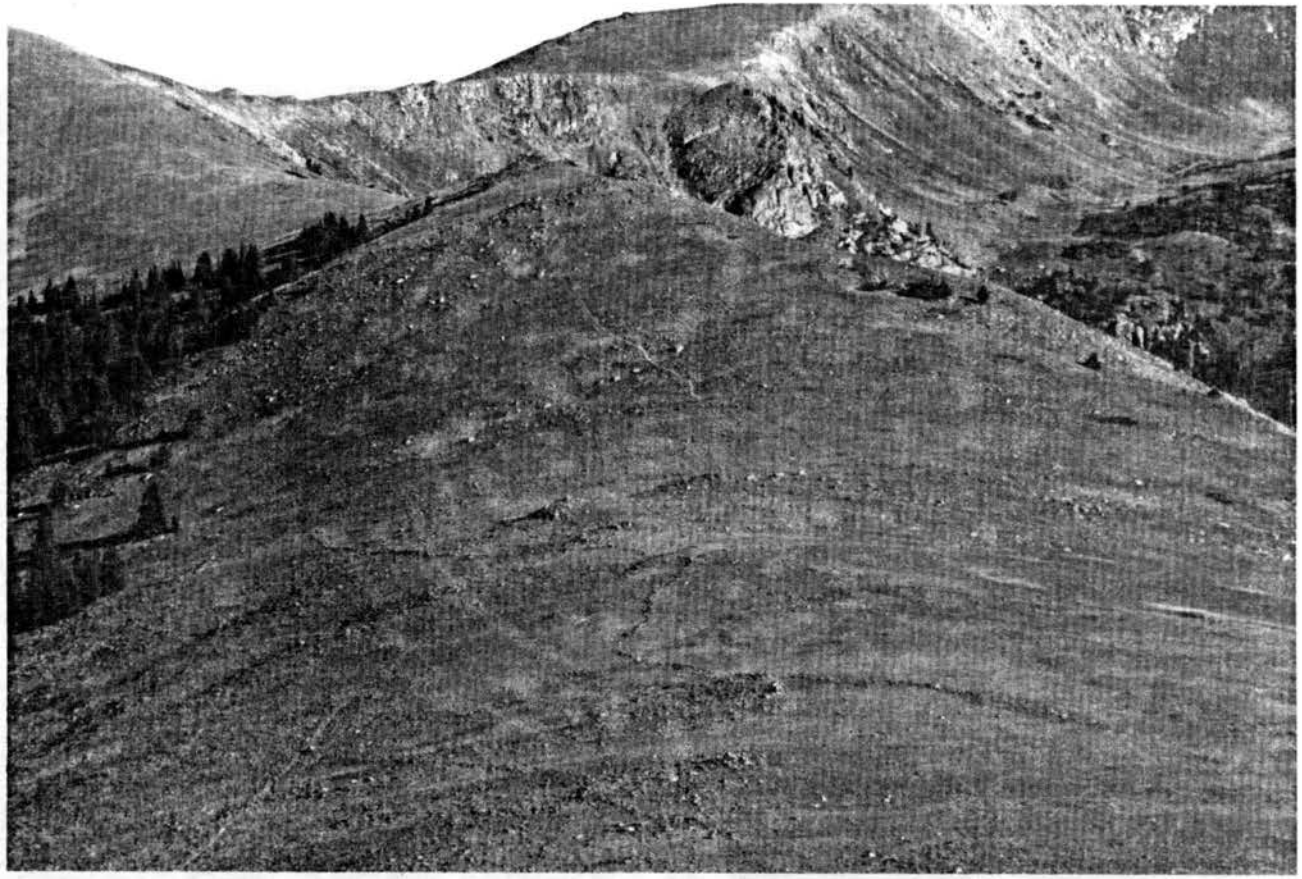


Figure 10. Photograph of Water Dog Divide Game Drive (5CF373) Facing North. Taken from Overview Area.

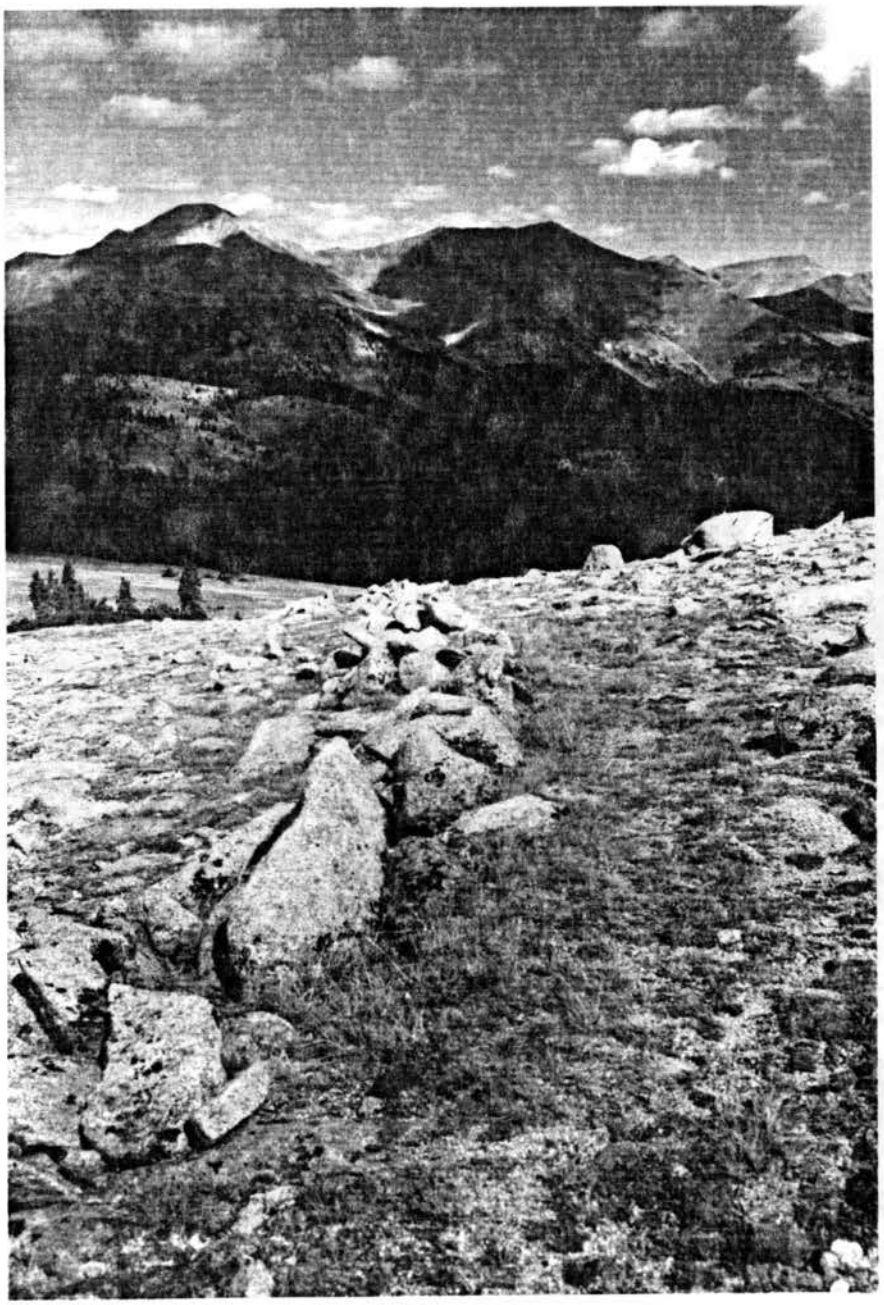


Figure 11. Close-up of Rock Wall III, Water Dog Divide Game Drive Site 5CF373, facing north.

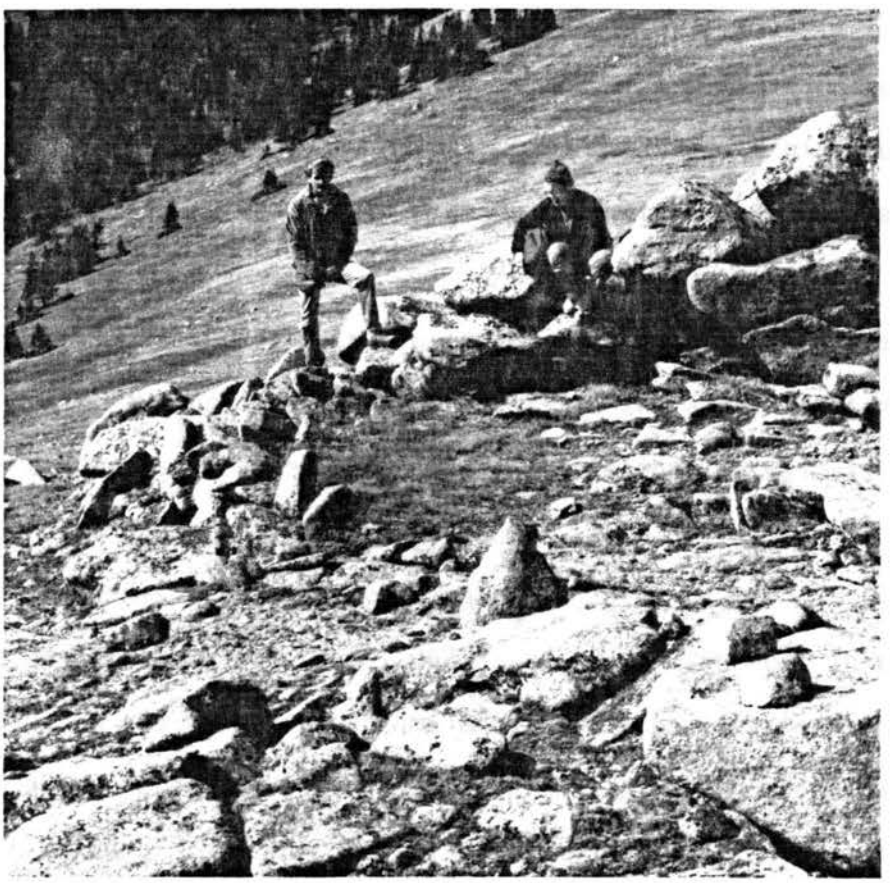


Figure 12. Photograph of Hunting Blind Facing North. Overview Area of Water Dog Divide Site 5CF373 (left, Art Hutchinson; right, E.A. Morris).

Upright rocks resembling weathered cairns along the drive walls are found in certain areas, but in smaller amounts than anticipated. This was not the case in other game-drive sites in the state (Benedict, personal communication 1987). It is possible that the Monarch sites were disturbed in the past century by vandals who removed or knocked down many of these structures. Soil and weather conditions in this area also may have contributed to the collapse of the cairn walls.

A number of stone enclosures, believed to be hunting blinds, are located in strategic locations near the walls. The limited excavations indicate they were partially excavated into the shallow tundra soils. It also appears the removed rocks and those on the nearby surface were stacked on the perimeter to increase the height of the walls. The subsurface depth and wall height may have been designed to hide hunters from the game animals as well as to provide protection from wind and weather.

Many of the walls and pit structures are not obvious to the casual visitor and only "appeared" after many visits to the area. Differences in the time of day, snow cover, and tundra vegetation, as well as aerial photography, contributed to their discovery.

Natural processes such as weathering contributed to the "disintegrated and crumbled" (Mead 1882:3) nature of the rock in the walls. Colluvium and grus have accumulated on the upslope sides of the walls, gradually decreasing their visual heights. Random checking indicates 10-20 cm of these deposits along many of the stone walls. Tundra vegetation has also encroached, further decreasing the present height of the walls.

The most prominent walls remain obvious and easily identifiable. Others almost have vanished into the tundra soils. Relative antiquity, and/or subsequent maintenance activities, are likely contributors to some of the obvious differences in their appearances.

Unfortunately, few artifacts are recovered from areas near these walls. Similar patterns have been reported from other sites (Benedict, personal communication 1987). Perhaps this is partly due to collections made during the past century by various parties. It is also equally possible that frosts and loose soils in this area have cycled many of the tools under the present surface, leaving few clues to the past activities. Artifacts recovered are typically found downwind of the convergence of wall systems. This pattern was anticipated, assuming the animals were driven from the windward direction. This strategy is used today by some big game hunters.

Interestingly, one area of minor lithic concentration is near some residual snow banks. These snow fields may be a functional part of at least some drive systems (Binford 1983:120). Lack of artifact concentrations on the drives may be explained by off-site butchering. Campsite 5CF430 is downslope and in close proximity to this site. The snow banks may also have aided the removal of the animals for processing. For example, today hunters use slick snow-covered ground to help drag animals back to camp. Future research should include investigation of the areas of lithic concentrations at 5CF430. The possibilities for locating subsurface materials appear excellent in this area.

5CF499 (see Figures 6, 8): This site consists of one rock wall and a stone blind in a very small pass south of the large Water Dog Divide site. This is a very narrow mountain pass with rocky slopes that

probably helped restrict and funnel the game animals. There is ample evidence of game animals still using this specific area for crossing the Divide. As with 5CF373, the forest boundary lies very close to the actual pass. The single rock alignment consists of a short linear wall and a rectangular stone-ringed pit at the downwind end. The nearby forest could easily have provided cover for additional hunters.

This site, as contrasted to the Water Dog Divide site, contains a large quantity of projectile points. These points are uniform in size and construction, closely resembling the Hogback style point associated with the foothills area of the Eastern Slope of the Colorado Rocky Mountains (Nelson 1971:81-14). Additional tools such as a scraper, a biface, cores, and flakes may indicate on-site butchering activities. Microscopic analysis of these tools indicates the majority, including most projectile points, apparently were used in processing-type activity before they were lost or discarded.

5CF428 (see Figures 6, 8). This site sits on the crest of a hill just south of and above 5CF499 and consists of one short rock wall joining two small hunting blinds. These blinds were constructed using the natural rocky outcrops as the majority of the structure. Possibly this wall functioned in conjunction with the activities at site 5CF499. The tools found on the site also indicate heavy use in some type of processing function. In addition, one groundstone fragment was found on this site.

5CF429 (see Figures 5, 6, 8). This site is north of 5CF499 and may have functioned to further restrict animal travel in that area of the pass. It consists of four blind structures and a rock alignment following the slope contour, which makes a right-angle turn and extends

toward the Divide. There are a number of wooden fragments near the wall alignment that may have served as a fence. Similar structures have been reported by George Frison from northwest Wyoming (Frison 1978:261). Unfortunately, no diagnostic artifacts were recovered from site 5CF429.

Other Structures. Small circular and rectangular pits lie in many other areas in the vicinity of the sites. Occasional stone structures and short rock alignments are on the crest of the Divide in most areas between 5CF208 and 5CF373. Unfortunately, very few artifacts were found in association with these structures. It is possible they were an important part of an overall game-drive strategy.

Function of the Rock Walls

Several strategies are possible in the use of these rock alignments. The strategy likely would have changed depending on the number of people available, the types of animals involved, and the season of the year. One may interpret the Indian groups utilizing these systems as following at least a seasonal if not full-time hunting and gathering life-style. It is possible that the mountains were used seasonally by certain horticultural groups to supplement or add variety to their diet. Some of the side- and corner-notched projectile points cannot be ruled out as possibly originating with horticultural groups. Ethnographic accounts indicate the typical size of a hunting and gathering band level society ranged from 10 to 50 individuals. Some anthropologists have suggested two or more bands may have occasionally joined forces for communal hunting activities (Eighmy 1984; Wheat 1972).

Rough estimates to determine the staffing requirements for the entire site area have been attempted based on the number of hunting blinds located on the sites. One estimate made during this study

suggests 30 workers, including one person in each of 20 blinds, five in secondary positions, and five drivers - all well within the described arctic large-scale drives. This estimate is based on a slow-drive or drift scenario where the skilled hunters waited in the rock enclosures while various members of the group slowly drove the subject animals into the constricted areas.

The rock cairns, wooden sewels, and observation blinds may have been utilized to suggest to the animals that they should stay inside the ever-narrowing rock alignments. These structures evidently required a great expenditure of time and energy by these early peoples. The potential for greater success in hunting must have warranted the initial investment, later maintenance, and modification.

Stone Blind Construction (see Figure 12).

The blinds are built of locally obtained rocks piled in regular and occasionally circular patterns. They vary in size from enclosures barely capable of holding one person to larger structures nearly three meters in diameter. The largest size is approximately two square meters and easily could have provided enough room for two people, lying down. Excavation of two of these blinds indicate some were likely over 50 cm in depth and, if all of the rocks were in place along the border, they might have been tall enough for hunters to sit or kneel while keeping a watchful eye out for game. They would also have offered protection from the strong winds.

Some pits are not easily explained within a game drive context. Several hypotheses have been suggested for potential uses of the pits other than hunting blinds, including eagle or hawk traps. This

hypothesis suggests a hidden hunter could entice a raptor to the pit using a tethered rodent for bait, then courageously reach out and capture the raptor or at least remove a few desired feathers. These structures have been rarely reported in the state, but recent surveys in the Glenwood Canyon area may indicate the rarity results from a lack of previous identification of these features (Larry Wood, personal communication 1988).

Certain pits may have functioned as meat caches. Excess meat from a kill could have been stored in pits and covered with rocks as a cold safe storage until it was needed at a later time (Binford 1984:124).

Other pits not directly related to hunting may be related to the vision quest. Vision quest sites were used for attaining supernatural powers or adult identity prior to initiation ceremonies; they tend to be found in areas with excellent visibility. Mountain crest sites such as those on Monarch do offer excellent vistas for such activities (Benedict 1987; Driver 1969; Steward 1941, 1943).

Shrine sites are similar but may contain a wide variety of deposited artifacts, such as pottery, river cobbles, unusal rock types, and specialized projectile points (Benedict 1985b). The sites on Monarch Pass contain some of these items, but not in the quantities reported at Old Man Mountain. It is possible that previous collectors have found these specialized materials and they are no longer available for study. Despite the lack of evidence, vision quest and/or shrine locale hypotheses should not be ruled out.

Finally, some of the stone-rimmed pits in more protected locations could have functioned as small shelters or temporary house pits. These pits as previously described are probably large enough to hold two

persons. Shelter at these high altitude sites is appreciated even on the warmest of summer nights.

Stone Wall Construction

Rock wall construction varies according to terrain and possible use strategy. Five wall types are recognized, based on map patterns and distribution. The types were named during this study to help emphasize their location or most important characteristics.

Type 1 - Contour Walls. These structures are constructed with the wing walls beginning on the flanks on either side of the pass area and converging toward the lower portions of the saddle. Associated blinds or other natural blind locations lie downwind of the walls. Surviving length of these types of walls varies, with the longest being Wall #II on site 5CF373 and at nearly 300 m in length.

Type 2 - Crest Walls. These walls appear designed to prevent animals from attempting to cross the Continental Divide at any but predetermined drive areas. They typically appear in a slightly sinuous pattern, connecting larger, natural tundra rock outcrops in tundra on the windward side of the Divide ridge. One of the most prominent walls of this type is found on the south side of 5CF373. Numerous hunting-blind pit structures are found along and just downwind of these walls. In addition, there are a number of larger natural rock outcrops along the ridge referred to by geologists as "tors." These tors could have functioned easily as hunting blinds and observation areas. These crest walls are the longest of the rock alignment structures found at the sites; Wall #III, at 5CF373, for instance, is more than 600 m in length.

Type 3 - Direct Drive Walls. These are very short lineal walls that end directly at a constructed hunting blind, natural depression, or rock outcrop. The best example of this wall type is the single lineal wall at the Game Drive site, 5CF499.

Type 4 - Connecting Walls. This category describes very short connecting walls in the convergence zone of the contour walls (Type 1). Their location is generally in the lowest portion of the saddle or pass in question. These walls often are built in a confusing array of U shapes that may be indicative of an attempt to slow the oncoming animals. It is possible this pattern is similar to the corral set-up at the confluence of Great Basin Game Drives (Murphy and Frampton 1986). It is also possible, if the Great Basin analogy is correct, that some type of netting could have been utilized in this area to help detain or slow the desired animals.

Natural features such as tree islands, and especially the long-lasting snowbanks on the lee edge of the Divide, could have functioned easily in the overall makeup of the drive pattern, especially in the area where the rock walls converge. Deep snow is difficult for animals to run through and would have served the same purpose as nets.

Type 5 - Sewel Walls. This wall construction is a modification of contour and crest wall types. In these walls, wooden sewels (Speiss 1979) were placed at regular intervals in the piled rocks. These wooden posts apparently were used to act as flagging or in place of a person to help delineate the walls - a simple method of suggesting to game animals that they not cross out of the predetermined drive area. In the instance of Wall #III at 5F373, the wooden post interval is usually about 3 m, and the overall wall contains at least 32 posts. In

addition, as with the previous wall type, the wooden posts could have functioned to help hold nets up off the ground. This may help explain the regular pattern of sewel placements in Wall III at 5CF373. Overall, 54 wooden fragments have been discovered in direct contact with these wall alignments. These wooden fragments range in size from a 2 cm thick wooden splinter to larger knotty pieces 30 cm in length and 15 cm thick.

Construction of the Hunting Blinds

The various styles of stone enclosures have been grouped into the category of hunting blinds. It is possible these stone enclosures had specific and/or overlapping functions, such as serving as vision-quest areas, raptor traps, meat caches, as well as actual hunting blinds. Constructed with locally available tundra stones and rocks in circular to rectangular patterns, these walls share much of their construction styles with the rock walls. They average 2 m on a side, enough room for two adults to sit or lie inside the structure.

The original height of the hunting-blind walls undoubtedly was greater than it is today. Excavation of two of these structures indicates these two pits were originally excavated into the tundra soils; fill material was probably utilized to help form the outside walls.

The stone enclosures have been grouped into three types based on location:

Type 1 - Convergence. These typically sit at the end of long drive walls. They are found in the lower portion of the saddles in the Continental Divide sites of 5CF373 and 5CF499. They are of either circular or rectangular construction and are interpreted as blinds

strategically placed to take advantage of the converging rock walls. A possible secondary function is as a meat cache.

Type 2 - Ridgetop. These structures generally sit along the top or western side of the Continental Divide ridge. They are rectangular to rounded in construction. The majority have excellent views of much of the surrounding terrain. Possible functions include vision quests, eagle traps, hunting lookouts, hunting blinds, and game drive control.

Type 3 - Eastern Focus. These structures are similar to Type 2 except they are on the eastern slope of the divide ridge. Their positions suggest they may have been constructed to take advantage of the morning sun for spiritual functions. Other possibilities include use as eagle traps and hunting lookouts.

Dating of the Rock Walls - Lichenometric Methods

Alpine tundra soils are shallow and acidic; constant exposure to adverse weather conditions does not allow for good preservation of bone. Charcoal, however, is generally well preserved; C-14 dating has been used successfully in a number of alpine sites (Benedict and Olson 1978). One other procedure that holds promise is lichenometric dating. This technique utilizes the known growth rates of certain species of lichen on exposed rock surfaces to help determine when the rock was last disturbed or an overlying material such as glacial ice receded off that surface.

Dr. James Benedict has been attempting recently to use the regular growth rate of Rhizocarpon subgenus rhizocarpon, a group of related green and yellow lichen species, to aid his efforts in determining the recession dates of various glacial advances in the Colorado mountains.

He also has used a variation of this technique, involving size-frequency analysis of large populations, to date game-drive structures on Arapaho Pass (Benedict 1985a:90). The size-frequency procedure is admittedly new and faces tests of its accuracy.

Dr. Benedict, Dr. E. A. Morris, and the author attempted size-frequency analysis on the most prominent wall (III) in the Water Dog Divide system (Benedict 1985c). This wall was selected due to its excellent preservation and because it was long enough and high enough to provide the 1000 lichen thalli believed to be the minimum sample size. The granitic rocks at Monarch, according to Benedict, appear to be particularly susceptible to weathering, and therefore may not allow Rhizocarpon to grow as long as it does on more stable rock surfaces. Benedict feels a growth curve must be established for this particular area before the dating can be considered reliable (Benedict, personal communication 1988). It is noteworthy that Benedict's estimated age (540 radiocarbon years) for the rock wall compares favorably with a C-14 date obtained from a charcoal sample (see Chapter VI, Table 2) obtained from a hunting blind near this wall.

The walls vary in height and overall appearance. In instances where two walls parallel each other (Figure 9, Walls I and III), one looks more complete and distinct than the other. This is true especially where two rock walls cross each other (Figure 9, Walls I and VIII). One is always more complete and therefore higher than the other. Perhaps this indicates more recent construction; however, stones from the former wall could have been removed and utilized in the new wall. Future lichenometric-dating work could help evaluate this hypothesis.

The lichenometric-dating procedure has many potential advantages for tundra archaeology. Lichenometry is nondestructive to the walls, does not require elaborate laboratory equipment, and can be performed by researchers with relatively little training. It does require patience, an unbiased eye, and the ability to withstand changeable conditions on exposed alpine ridges. Lichenometry is a much-needed technique for obtaining at least relative dates in an environment at present lacking few alternatives.

Dating of the Rock Walls - Sewels

One of the most interesting and unique aspects of the research at the Water Dog Divide game drive was the discovery of numerous wooden sewels embedded in the rock walls. This is the first report of wooden posts in any of the Colorado drive systems. It is of course a distinct possibility that they were not preserved in the other sites due to other variables such as different wood types (Benedict, personal communication 1988). The use of these types of materials is common in the literature on arctic systems (Speiss 1979).

These wooden fragments were found in the shelter of the piled stones composing the rock walls. Constant exposure to the winds at this exposed location had weathered them almost beyond recognition. We collected 19 of the larger specimens for tree-ring dating and species-identification, after first mapping and photographing them in place. Markers were placed in the former locations to ensure they could be relocated. These samples were labeled and sealed before removal to the laboratory at CSU. There they were unwrapped, cleaned of dirt and other foreign materials, then allowed to dry before being resealed. The 19

specimens were sent to the Tree Ring Laboratory at the University of Arizona.

The laboratory was unable to cross-date the material with any known sample from the area. Species identification was made and 17 of the samples were identified as limber pine (Pinus flexilis). The other two were identifed as fir and spruce. These samples have been retained for possible further attempts at dating. The determination of limber pine is surprising, as the closest trees to the site are bristlecone pine.[1] Future work on the site may help solve this potential discrepancy.

---

[1]Dr. Craig Shuller (Colorado State Wood Science Laboratory, Colorado State University) reported it is extremely difficult, if not impossible, to differentiate between Pinus flexilis and Pinus aristata in their state of preservation.

CHAPTER VI

EXCAVATIONS

Limited test excavations were performed during the 1987 field season. Previous research by Benedict (1975b) indicated that in the Front Range about 20% of the hunting blinds yielded cultural materials and a large percentage contained charcoal deposits (Benedict, personal communication 1987). Limited excavations were intended to test for similar characteristics at the Monarch sites.

The test excavations focused on the two main game drive locations. One apparent blind that met certain characteristics was chosen from each area (5CF499 and 5CF373). Selection criteria included an area of at least four square meters and an obvious perimeter structure. Both were located strategically near the end of one of the prominent rock walls.

Each pit was excavated following customary archaeological procedures. Trowels were utilized during all but surface vegetation removal. All dirt was screened through 1/4" mesh screening and back dirt was checked continually for smaller materials. The pits were excavated in 5 cm levels below the tundra grass cover, each layer documented with photographs and maps. The excavations continued until investigators encountered sterile soil. The pits were then back-filled and the tundra grasses replaced on the surface. In both instances, a portion of the pit was left undisturbed, allowing for future research.

5CF499

The first blind excavated was at the small drive site 5CF499. The visible outline of rocks initially measured 2.1 x 2.8 m. The walls averaged 20 cm in height on the western edge and gradually diminished to ground level on the east. The center of the pit contained tundra grasses intermixed with small granules of wind-blown or downslope-washed grus deposits. The perimeter rock contained numerous colonies of various species of lichen on the exterior surfaces that, in many instances, were growing across rock boundaries. In addition, no lichens were found on the lower and hidden surfaces. This indicates the walls have been undisturbed for a number of years (Benedict 1985a, 1987).

The western half of the pit was selected for testing. This side was chosen because of its distinct perimeter walls as well as its location on the windward side of the blind. It was felt a hunter would have faced this direction and possibly placed artifacts along or in that area of the structure.

The initial 0.5 m x 0.5 m grid was established with the datum stake at the west corner of the rectangular structure. Tundra grasses were cut into small squares and removed with a small spade. The root mat was checked thoroughly for cultural materials and the grasses protected for later replacement. The depth of this initial layer of turf was approximately 5 cm. Arbitrary 5 cm levels were maintained throughout the remainder of the excavations.

Level I was characterized by a high grus content and tightly bound roots originating from the overlying grass tussocks, the color a dusky yellowish-brown (10YR 2/2) (Munsell Soil Chart 1954). A few charcoal flakes were noted in the western corner of the pit, and a small bone

fragment was located in the screening process. It was decided to enlarge the walls of the excavation at this point to allow the unit to include the visible rock walls. This enlargement produced an excavation unit of 1 m x 0.5 m.

Layers II, III, and IV contained a lighter brown soil (7.4YR 4/3) characteristic of the grus from the surface. Root penetration was less intensive, and the earth was less compact. Small charcoal flakes were abundant in both layers. A filled rodent hole was encountered at 25 cm depth in the northeast quadrant and appeared to extend to the center of the pit. At this point, the excavation was enlarged to the northeast; extending the overall size to one square meter allowed better control over the excavation and stratigraphy.

Layers V and VI yielded larger and more numerous charcoal flakes. Rocks of the same general dimension and shape as the surface wall rocks were present, decreasing in density toward the center of the pit. This pattern persisted in lower levels but the overall quantity of rocks increased, probably the result of rocks falling into the pit from wall collapse.

The seventh through tenth layers contained the greatest quantity and largest sizes of charcoal materials. The biggest specimen was a partially charred wood fragment, approximately 18.5 cm x 5.5 cm in overall size. It was found at 51-cm depth, where it lay horizontally immediately under some small rocks. These apparently fell from the side wall soon after the wood was charred, as no soil was found on top of the wood specimen. This fragment was collected and a portion was sent for C-14 dating (see below).

The rocks below this layer were mapped and removed to determine if there were charcoal deposits below this apparent level. Sterile soil and bedrock were encountered. This soil was moderate, yellowish brown in color (10YR 5/4) and contained no evidence of charcoal or other materials. The rocks at this level were at least double the size of those noted in the upper levels of the test pit. It appears that the pit was excavated originally to a depth of approximately 68 cm below the ground surface. This would have been a more than adequate structure for extended periods of waiting.

The possibility that this structure was not of cultural origin was considered. For example, a tree could have burned during a forest fire, leaving this charcoal deposit. The observations indicating cultural use are:

1. The rock walls of the pit are rectangular in overall shape.
2. The pit is located at the end of a drive wall.
3. The pit follows the general pattern of the more circular of pits at Indian Peaks excavations.

These observations indicate the pit is cultural. Secondary evidence was obtained from digging random test pits in the vicinity. Four 20 cm X 20 cm pits were dug in each of the cardinal directions, each about 10 m from the main excavation unit. These test pits produced a profile of 5 cm of tundra grasses; 5-10 cm of compact, root-bound, brown, A-horizon soils; and the remainder of yellow gruss deposits. None of the four pits produced any flakes of charcoal nor stratigraphies with any similarities to those of the excavated unit. This additional testing indicated the excavated pit has cultural origins.

Water Dog Divide - 5CF373

Excavations at 5CF373 followed the same pattern established at 5CF499, except the original area opened was 1 m square. This was determined to be a more efficient size. It was felt the stratigraphy of this blind would be similar to that found in the initial testing and would therefore contribute to proving the cultural origins of the structures.

The turf horizons were removed in the same manner as at 5CF499, except that they were broken up more thoroughly to test for cultural materials. The depth of this layer of turf horizon again was approximately 5 cm. A complete projectile point (see Chapter VII, Figure 14f) was recovered from the layer of soil immediately below the tussocks. This point is of apparent late Middle Ceramic origin. No other lithic materials were found in the pit, leaving the possibility this point was dropped in relatively recent times after the pit had partially filled up naturally.

The lower levels produced soil horizons much like those at 5CF499. The same tightly bound roots and light brown hard soil persisted for about 20 cm; this soil, however, was harder and much more difficult to excavate than the 5CF499 soil had been at the same depth. In addition, it contained less grus, possibly allowing for denser compaction. Charcoal and rock size followed the pattern of the first excavation, increase in density and size as depth increased.

The pit contained two distinct and large quantities of charcoal. The first was 25 cm below the north datum stake, immediately adjacent to rocks that showed evidence of burning. The sides of the rocks facing the charcoal were oxidized, but the opposite sides were not.

The second charcoal concentration was at 52 cm depth. It was 11 cm thick and consisted of an ash and charcoal lens of lenticular cross section, together with a mat of charred evergreen needles and small twigs. We expanded the excavation northward 0.5 m to allow a more complete look at this layer. As expected, the charcoal and charred needle layer at 52 cm depth extended into the enlarged section. The lenticular shape of this lens was confirmed and found to be 4 cm thicker in the northwest half of the pit. Its maximum thickness was 11 cm, consisting of 8 cm of grey ash above about 3 cm of slightly charred needles and twigs. It appears the needles were not burned, as they were only lightly affected by heat. The majority are stained black through contact with the charcoal. This was a very compact layer and portions of it remained intact after removal and transportation to the laboratory. Collections were made of this material for use in species analysis and C-14 dating. The needles and twigs were identified as bristlecone pine by the Colorado State Wood Science Laboratory.

Disturbance in this portion of the pit was limited to occasional rootlets extending into the lower layers and to one rodent burrow, an obvious but isolated intrusion into a portion of the charcoal/needle layer. Fortunately, this rodent activity was isolated to one circular burrow. The collected charcoal and needles were not affected by any rodent-intrusive activity. Sterile soil was encountered below this level.

Carbon-14 Dates

Three samples were submitted to Beta Analytic, Incorporated, for analysis. The first sample was the large wood fragment from 51-cm depth

from the excavated hunting blind at 5CF499. The other two were from the two charcoal concentrations in the blind at Water Dog Divide (5CF373), one from the 25 cm level and the other from the evergreen needle layer at 52-63 cm. All samples appeared undisturbed by rodents and were chosen from locations directly under rocks. It was felt that the cap rocks had offered some protection and therefore made dating more accurate (Table 2).

These dates suggest utilization of the sites during the late Early Ceramic and early Middle Ceramic periods. These results do not help to determine the ages of specific surface cultural materials; but the earliest C-14 date from 5CF373 is consistent with the Early Ceramic projectile points found at the site. The date for site 5CF499 is later than expected from the surface Hogback style points and much later than the dates Benedict obtained for Hogback materials at the Scratching Deer site (Benedict 1975c).

An obvious discrepancy also exists at Water Dog Divide (5CF373), where charcoal from the 25 cm level gave an older date than charcoal and charred needles from the 50 cm level. It is entirely possible that older or standing dead wood was used in one instance and green or recently dead wood was used in the other. Both types of wood are available in the local tree-line environment today.

Overall the radiocarbon dates indicate use of these structures during at least the Early to Mid-Ceramic periods. It is possible that the structures have greater antiquity and that modification or cleaning of the pits by Ceramic-period peoples removed evidence of earlier use. Further site-wide excavations could enable us to better assess this possibility.

Table 2. C-14 Results (Beta Analytic, Inc.)

Sample Number	Depth (cm)	Lab No.	C-14 Age Years B.P. ±	Corrected Dates[1]
1-5CF499	a-51 cm depth	Beta - 24183	350 ±60 BP	1454-1639 A.D.
2-5CF373	a-25 cm depth	Beta - 24185	1060 ±60 BP	897-1018 A.D.
3-5CF373	b-52 cm depth	Beta - 24184	720 ±60 BP	1259-1288 A.D.

[1]Corrected using Stuiver and Pearson 1986.

CHAPTER VII

MATERIAL CULTURE

Flaked Stone Artifacts

A wide variety of cryptocrystaline, quartzite, and obsidian toolstone materials were located on the Monarch sites in the following percentages:

Cryptocrystaline	84.8%
Quartzite	12.6%
Obsidian	2.6%
Total	100.0%

(See Table 3 for further information on site and toolstone materials.)

These materials are not native to the sites and therefore indicate transportation to the specific area from various possible sources. A few potential quarry sites have been reported for the area, but little quantitative research has been conducted to identify definite source areas. An accurate data base from central Colorado would be extremely useful in determining previous travel patterns. The following is a partial list of some potential quarry areas:

Jaspers - Trout Creek Jasper - Trout Creek Pass Quarry

Dendritic cherts - Possibly Agate Creek - on Western Slope of Monarch Pass

Petrified wood - South Park

Yellow cherts - Marshall Pass

Various cherts - Ute Trail and Badger Creek

Table 3. Flaked Stone Artifacts and Debitage by Site

	G/W Q*	Y Q*	R Q*	O Q*	G/W C*	Y C*	R C*	O C*	O B*	Total N
5CF208	20	0	1	0	40	82	101	15	3	262
5CF373	6	1	1	0	14	9	10	4	3	48
5CF426	6	0	7	1	21	28	44	8	4	119
5CF427	3	1	0	0	12	2	3	5	5	31
5CF428	1	0	3	0	7	11	12	3	0	37
5CF429	0	0	0	0	0	2	0	0	0	2
5CF430	7	1	0	9	18	6	3	0	0	44
5CF431	0	0	0	0	0	3	0	0	0	3
5CF495	2	0	0	0	0	1	4	0	0	7
5CF496	1	0	0	0	1	0	0	0	0	2
5CF497	0	0	0	0	1	1	0	0	0	2
5CF499	2	0	0	0	6	6	5	2	0	21
Total	48	3	12	10	120	151	182	37	15	578

Legend: G/W Q = Grey to White Quartzite; Y Q = Yellow Quartzite; R Q = Red Quartzite; O Q = Other Quartzite; G/W C = Grey to White Cryptocrystalline; Y C = Yellow Cryptocrystalline; R C = Red Cryptocrystalline; O C = Other Cryptocrystalline; O B = Obsidian

White chert - Leadville Formation, east of Salida and Leadville area.

Obsidian - Cochetopa Dome near Saguache, Antonito area in San Luis Valley, Leadville area

Quartzites - Arkansas River Canyon and Blue Mesa Reservoir area

Little Snake banded chert - northwestern Colorado

Methodology

The artifacts from the Monarch sites are separated on a macro-scale into flaked stone, nonflaked stone, ceramics and vegetal items. Individual flaked stone materials were further classified according to attributes of size, shape, material, and indicators of use or lack of use. The basic class of communality in the archaeological taxonomic system is the type, a designation based on specific characteristics of the artifact, which may or may not indicate past cultural significance. Willey and Phillips (1958) consider the designation of type as either the actual delivery of significant cultural templates or simply a convenient design of the researcher.

Flaked Stone: The 12 sites at Monarch Pass yielded 578 pieces of flaked stone artifacts and were classified into eight tool types for this site area (Tables 4 and 5). These types include:

projectile points and similar hafted tools
bifaces
scrapers
drills, gravers and burins
choppers
utilized flakes
non-utilized flakes

Table 4. Artifactual Material

Figure	Site Number	Projectile Point	Rock Type Group	Length	Dimensions (mm)* Width	Thickness	Hafting/Neck) Width)
			Projectile Points				
Group 1: Small-Unnotched, Concave Base - Possibly Preforms of Group 2							
Fig 13	5CF426	g	yellow/chert	ND	12.8	2.8	ND
Fig 13	5CF430	h	clear/brown chalcedony	ND	13.8	2.5	ND
Remarks: Blade lanceolate to triangular, widest at base and fully bifacially flaked. Base slightly to moderately concave, with bifacial thinned, unground. Transverse and longitudinal sections are slightly biconvex. The points are estimated to have been 20-22 mm in length. Edge wear limited to random flake scars. Edge angles range from 22-30 degrees. Age: Mid-Late Ceramic.							
Group 2: Small-Concave Base, Side Notch							
Fig 13	5CF499	j	light green banded chert	ND	14.1	3.5	9.6
Fig 13	5CF499	i	grey chert/quartzite	ND	18.5 est	3.2	9.6
Remarks: Blade triangular to lanceolate, widest at base. Moderately to strongly concave base. Biconvex in cross section and fully flaked. Shoulders abrupt and unground. Notches are bifacially thinned. This group of points is estimated to have ranged from 35-45 mm in length. Edge angles are 25-30 degrees. Blade edges exhibit moderate wear intensity and light polishing. Age: Mid-Late Ceramic.							
Group 2a: Small-Side Notch (Probable Concave Base)							
Fig 14	5CF428	d	white chalcedony	40 est.	15.0	3.5	7.7
Remarks: Lanceolate shaped blade, fully bifacially flaked on a slightly asymmetrical flake. Serrations are poorly flaked averaging about 5 per cm. Several serrations have been broken either with use or during post-depositional activity. Base was likely convex in shape, bifacially thinned. Shoulders are abruptly sloping with slightly ground notches. Stem is greatly expanding, apparently widest portion of point at base. Point is bi-convex in longitudinal and transverse section. Estimated length is 40-45 mm. Edge angle 20-30 degrees. Edge damage on distal portions of point is indicated by moderate crushing and blunting of serrations. Age: Mid to Late Ceramic.							
Group 3: Small-Side Notched, Straight Base							
Fig 14	5CF499	i	milky white chert	25 est.	12.6	3.5	10.7
Fig 13	5CF499	o	yellow dendr. chert	ND	12 est.	2.5	8.2
Fig 13	5CF427	p	yellow dendr. chalcedony	22 est.	11.9	1.4	8.0
Fig 14	5CF373	f	white chalcedony	25 est.	12.6	3.3	9.4
Remarks: Blade lanceolate to triangular, widest at base; flaking, bifacial and complete. Shoulders are abrupt to abruptly sloping. Stems greatly expanding, rectangular and approximately equal to widest part of blade. Notches are unground. Basal area straight, bifacially thinned and unground. The points are bi-convex in transverse and longitudinal section. Original length estimated 20-30 mm. Unifacial wear indicated with moderate crushing and step factures. Edge angle 20-35 degrees. Age: Mid-Late Ceramic.							
Group 4: Small-Unnotched, Convex Base - Probable Preforms for Group 5 Points							
Fig 13	5CF208	l	white/waxy chert	ND	14.4	2.8	ND
Fig 13	5CF428	k	reddish chert	ND	17.2	4.9	ND
Remarks: Blade lanceolate to triangular, widest at mid-section; fully bifacially flaked. Base slightly to moderately convex and bifacially thinned. Specimens moderately to strongly biconvex in transverse cross section. Edge wear is slight. Edge angle variable and ranges from 20-40 degrees and exhibits moderate crushing with irregular step and hinge fractures. Age: Mid-Ceramic.							
Group 5: Small-Corner Notch, Convex Base							
Fig 13	5CF499	m	red dendritic chert	28.3	15.5	3.5	6.3
Fig 13	5CF208	n	yellow dendr. chalcedony	24.2	14.5	3.0	4.5
Fig 13	5CF208	b	red dendr. chalcedony	ND	14.5 est	1.7	5.7
Fig 13	5CF499	d	milky white chert	20.5	15.3	2.8	8.2
Fig 13	5CF499	e	red chert	25 est.	15.9	2.8	5.8
Remarks: Triangular points; specimens bifacially and unifacially flaked. All specimens exhibit bifacial basal thinning. Shoulders oblique to strongly oblique. Base slightly convex and unground. Notches show crushing, are plano-convex in transverse section and biconvex in longitudinal section. Edge wear is extensive with pronounced bifacial hinge and step fractures. Age: Early Ceramic.							
Group 6: Small-Corner Notch, Straight Base							
Fig 14	5CF499	m	dark yellow/green chert	28 est.	15.8	3.0	7.7
Remarks: Triangular blade, bifacially flaked with smooth edges. Biconvex in longitudinal and transverse cross section. Shoulders abrupt to oblique. Notches indicate light grinding and some crushing. Wear on blade edges is indicated by bifacial heavy crushing and step flaking. Stem is expanding with slightly concave, bifacially thinned. Age: Early Ceramic.							

Table 4. (continued)

Figure	Site Number	Projectile Point	Rock Type Group	Dimensions (mm)* Length	Width	Thickness	Hafting/Neck Width
Group 7: Small-Corner notch, Extended Stem							
Fig 13	5CF373	c	red chert	12	10.5	3.2	4.5
Fig 13	5CF499	a	orange chalcedony	20 est.	11.0	2.5	4.0
Fig 14	5CF428	c	milky white chalcedony	ND	11.5	2.2	3.9
Remarks: Very small triangular points, fully bifacially flaked. Oblique shoulders with slightly expanding and elongated stems. Notches are unground but exhibit light crushing. Blade edges exhibit moderate bifacial crushing, step flaking, and in one instance light rounding. This type of edge wear is consistent with sawing or other hard material processing. Age: Early to Late Ceramic.							
Group 8: Small-Basal Notch							
Fig 13	5CF428	f	yellow/red chalcedony	25 est.	11.5	2.5	4.8
Remarks: Blade triangular, manufactured on a plano-convex flake exhibiting unifacial flaking. Shoulders are strongly oblique and assymmetrically shaped. Stem is slightly expanding and set at oblique angle to longitudinal axis of point. Notches are deep, exhibit crushing and one side exhibits slight grinding. Transverse and longitudinal sections are concavo-convex. Estimated length of point 25-35 mm. Small, irregular unifacial step fractures are present on the specimen. Age: Early to Mid Ceramic.							
Group 9: Medium Concave Base Points							
Fig 15	5CF208	m	brown chalcedony	ND	19 est.	5.5	17.0
Fig 14	5CF373	j	white quartzite	30.0	23 est.	5.4	11.5
Fig 14	5CF499	k	grey/white quartzite	ND	24	5.2	ND
Remarks: Broad triangular points. Points are bifacially flaked with rough flake scars. Lateral hafting area is well ground. Basal area is unground. Edge angle 25-35 degrees. Light rounding and polishing is evident on the prominent edges. Age: Late Archaic.							
Group 10: Medium-Side Notch, Convex Base							
Fig 15	5CF208	l	red quartzite	30 est.	16.4	7.5	12.0
Fig 14	5CF208	n	grey chert	30 est.	16.1	5.2	11.8
Remarks: Blade lanceolate with irregular edges, widest in center of point. Rough bifacial flaking with thick biconvex cross section. Bases are bifacially thinned and convex. Specimen-13-cc exhibits heat spalling. Edge angle 30-40 degrees. Edges are moderately crushed, rounded and slightly polished. Distal portions of both specimens are fractured. Age: Late Archaic.							
Group 11: Medium-Other							
Fig 15	5CF426	n	yellow petrified wood	21.6	20.5	6.0	15.5
Fig 15	5CF373	i	obsidian	15.0	15.0 est.	4.0	11.2
Fig 15	5CF430	k	red chalcedony	45 est.	28.0	4.9	13.0
Fig 14	5CF373	e	white chalcedony	ND	23.0	3.5	11.5
Remarks: This category is composed of a variety of medium corner notched points with differing amounts of use. Unfortunately most are broken too severely to allow definitive grouping. The most complete points exhibit biconvex section and full bifacial flaking. Surviving blade edges are smooth to irregular. Shoulders where present are strongly abrupt to oblique with pronounced notches; notches are ground. Bases range from slightly concave to straight and are lightly to moderately ground. Flaking and resharpening evident on all points. Edge angle varies widely and averages 20-40 degrees. Age: Late Archaic.							
Group 12: Medium-Extended and Parallel Stemmed							
Fig 14	5CF497	o	clear chalcedony	24.6	16.7	5.5	10.2
Fig 14	5CF373	l	white chert	30 est.	16.1	5.2	11.8
Remarks: Blade parallel sided and smooth. 16-kk is bifacially flaked on a bi-convex flake. 16-ll is flaked unifacially on a plano-convex flake. Shoulders rounded to abrupt with parallel-sided stem. Stem is slightly expanding. Grinding is evident on sides of stem and on basal area in specimen 16-ll. 16-kk has only light grinding on lateral portions of stem. Both specimens show extensive use and resharping. Extensive crushing and hinge fractures and light rounding are evident on all working surfaces. Edge angle 20-45 degrees. Age: Mid Archaic.							
Group 13: Medium-Deep Concave Base							
Fig 14	5CF428	h	white chalcedony	ND	20.0	5.5	120 est.
Remarks: Deep concave based point. Thicker and wider point than Group 2 styles. The flaking is bifacial; biconvex in cross section. Specimen fractured at hafting area and does not show secondary use on that surface. Age: Early Archaic to Early Ceramic.							

Table 4. (continued)

Figure	Site Number	Projectile Point	Rock Type Group	Length	Dimensions (mm)* Width	Thickness	Hafting/Neck Width
Group 14: Medium-Concave Base, Straight Sides							
Fig 15	5CF373	g	red quartzite	ND	15.3	5.5	14.0
Fig 15	5CF426	h	blue/grey banded chert	ND	19.5	4.6	16.5
Remarks: Lanceolate shaped blades, finely bifacially flaked; biconvex in transverse section. Bases are bifacially thinned, fully ground. Both specimens are fractured just above hafting area and do not show secondary use on the fracture surface. 17-nn shows two serrations at fracture possibly indicating a serrated point. Unfortunately both points are fractured; determining the patterns and use of former blade edges is indeterminant. Specimens have many similarities to Paleo-Indian style points. Age: Mid Archaic to Late Paleo-Indian.							
Group 15: Large-Concave Base, Side Notch							
Fig 15	5CF208	j	red quartzite	60 est.	40 est.	11.1	30 est.
Remarks: Broad thick point; biconvex in transverse cross section, crudely and randomly bifacially flaked. Blade edge rough and irregular. Notch is deep, large and bifacially thinned. Remaining shoulder is broken but estimated to have been sloping to oblique in form. Base is concave and may have been intended to be a deep notch, unifacially flaked during thinning process. This point is very fractured and intended shape or use is difficult. Edge wear is evident but due to quartzite rock type any use pattern is undetermined. Age: Archaic?							
Group 16: Undiagnostic Points							
Fig 14		a	Quaetzite Tip				
		b	Preform				
		g	Preform				
Fig 15		a, d, e	Midsections				
		c	Well utilized obsidian point				
		f	Brown Quartzite - tip - Note parallel flaking.				
Other Tool Stone Material							
BIFACES							
Group 1: Leaf shaped,sharp tipped							
Fig 16.	5CF373	h	White Quartzite	ND	39.5	11.3	
Fig 16.	5CF208	q	Red Quartzite	53.1	34.4	9.2	
Fig 16.	5CF373	l	Red Chert	ND	36.2	9.2	
Leaf shaped sharp tipped, and biconvex in section. Tips where present are sharp or at least were sharp prior to use. Tips are blunted, rounded, and polished. Both faces are fully percussion flaked with very little additional fine pressure flaking. Basal areas are convex and are unground. Numerous regular step fractures along distal portions of specimens. Edge angle is variable and ranges from 20 to 55 degrees. 21-c has apparent heat spalling. Proximal end may have been hafted. Age and Cultural Affilation - Similar to type MM80 of Magic Mountain (Irwin-Williams and Irwin 1966:125-6).							
Group 2: Elongated asymmetrical shaped biface							
Fig 16.	5CF208	m	White Chert	78.3	35.2	10.4	
Biconvex and bifacially flaked. Tip well rounded with numerous polished step fractures. Edges of specimen also exhibit extensive step fractures, indicating heavy use. Edge angles are variable and range from 30-50 degrees. Age and Cultural Affiliation: Unknown.							
Group 3: Parallel sided, ovoid base							
Fig 16.	5CF208	a	Yellow/Green Chert	ND	23.9	8.2	
Biconvex and fully bifacially flaked. Step fracture along the proximal surface. Distal portion is fractured. Edge angle is variable and ranges from 25-45 degrees. Age and Cultural Affiliation: Unknown.							
SCRAPERS							
Group 1: Large-hafted end scrapers							
Fig 16.	5CF208	n	Yellow dendritic chert	62.3	46.8	11.0	
Fig 16.	5CF208	o	Grey/White Chert	60.2	34.6	9.0	
Ovoid general shape with extension on proximal ends or possible hafting surfaces. Plano convex in transverse section and concavo convex in longitudinal section. Distal working edge exhibits only unifacial use, well rounded and polished. Edge angle is 60-80 degrees. Age and Cultural Affiliation: Similar to type MM45 at Magic Mountain (Irwin-Williams and Irwin 1966:100-101).							

Table 4. (continued)

Figure	Site Number	Projectile Point	Rock Type Group	Length	Dimensions (mm)* Width	Thickness	Hafting/Neck Width)
Group 2: Small nonhafted end scrapers							
Fig 16.	5CF208	i	Red Dendritic chert	35.4	24.0	9.0	
Fig 16.	5CF208	k	White Chert	24.0	21.0	8.1	
Fig 16.	5CF208	j	Yellow-white chalcedony	28.0	31.8	8.2	
Small ovoid shaped scrapers made on expanding flakes. Distal transverse working edes are evenly convex, steep and range from 70-85 degrees. Use wear is limited on these specimens to small step flaking on dorsal surface. Some polishing is exhibited over the fractures. The proximal constricted portions of the specimens only exhibit slight abrasion and smoothing. Age and Cultural Affiliation: Unknown.							
Group 3: Plano-Convex scrapers							
Fig 16.	5CF208	r	White Quartzite	59.2	36.3	10.1	
Fig 16.	5CF208	d	White Chalcedony	34.2	21.2	6.2	
Fig 16.	5CF208	f	White Chalcedony	22.2	14.2	4.2	
Specimens are medium to large in overall size, ovoid in outline and plano-convex in cross section. Edge angle variable and ranges from 40-60 degrees. Quartzite is coarse and makes edge wear analysis difficult. Use is apparently limited to one side and along the convex lateral edge of the specimen. Age and Cultural Affiliation: Undetermined; however 33-h has many similarities to the Uncompahgre style scraper of the Colorado western slope (Wormington and Lister 1956:19).							
Group 4: Biconvex scraper							
Fig 16.	5CF208	b	White Chalcedony	25.2	27.2	7.3	
Medium sized, biconvex in section. Manufactured on a primary flake. Little use is indicated on the working surfaces. Age and Cultural Affiliation: Unknown.							
DRILLS, GRAVERS AND BURINS							
Group 1: Drill							
Fig 16.	5CF426	c	White Chalcedony	21.5	12.0	5.0	
Biconvex in cross section. Base is expanding and roughly triangular. Finely pressure flaked on both surfaces. Shaft is broken and has a diamond-shaped section. Age and Cultural Affiliation : Unknown.							
Group 2: Gravers							
Fig 16.	5CF428	p	Yellow Chalcedony	53.0	29.8	5.2	
Fig 16.	5CF208	e	Grey Chert	29.8	20.0	7.0	
Plano-convex in cross-section. Sharp protruding points exhibit small step fractures, light crushing and rounding. Sharp tips were apparently made by removal of flakes on either side of the working surface. Age and Cultural Affiliation: Unknown.							
Group 3: Burin							
Fig 16.	5CF208	g	Red Chalcedony	30.0	19.2	1.0	
Burin is made on an irregular secondary flake. Burin curing spall scar is 9 mm long with a well defined chisel edge. The actual working surface is a hard crystalline deposit that appears to be much harder than the majority of the flake. This harder surface may account for a lack of use patterning along that surface area. Age and Cultural Affiliation: Unknown.							
CHOPPERS							
Fig 17.	5CF426	a	Waxy Red Chert	71.3	52.6	24.0	
Fig 17.	5CF208	b	Blue/White Chalcedony	63.0	41.0	19.0	
Large, thick, and biconvex in section. Flake scars cover all surfaces. 51-b exhibits heavy use with extensive crushing and battering. 51-c was used in a different fashion as the working edges are sharp, exhibiting step fractures and little rounding. Age and Cultural Affiliation: Unknown - 51-a similar to MM67 (Irwin-Williams and Irwin 1966:116-7).							
UTILIZED FLAKES							
No attempt was made to divide this category into groups. These tools were primarily made on secondary and tertiary flakes. Sizes are variable with the largest 35 mm in length, 20 mm in width and 6 mm thick. It is significant that approximately 50% of the total flake category is utilized. This likely indicates how valuable any lithic fragment was at locations well removed from tool stone sources.							
NON-UTILIZED FLAKES							
Again no attempt was made to subdivide this category into groups. All types of flakes and cores are in this category. Very few core fragments were found on the Monarch sites. This indicates that the majority of the tools were manufactured prior to arriving at these sites.							

Table 4. (continued)

Figure	Site Number	Projectile Point	Rock Type Group	Length	Dimensions (mm)* Width	Thickness	Hafting/Neck Width)
			Non-Flaked Material				
POLISHED COBBLES							
Fig 17.	5CF208	c	Black Basalt	57.8	46.3	23.3	
Fig 17.	CF373	d	Black Basalt	94.2	39.1	25.5	
These two stones are well polished, smooth on all surfaces. One is ovoid and the other is elongated in overall outline. Edges are not battered or otherwise altered. This type of stone is not found on the site area and had to have been imported. Age and Cultural Affiliation: Similar examples are found at the George W. Lindsay Site (Nelson 1971:9) and from the Ute Shelter in Saguache County (Hurst 1939:60) and from the Woodland Zone at Magic Mountain (Irwin-Williams and Irwin 1966:156-157). Lindsay considers these types of stones to be gaming pieces or charm stones.							
GRINDING SLABS AND SANDSTONE							
Twelve fragments of probable grinding stones were located on three sites. There is a possibility of 4-6 original slabs. The surface of these fragments do not give any indication as to the pattern if any of their use. The thickest specimen is 45 mm and the thinnest is 14 mm. The surfaces are flat and all edges are irregular. The closest known source of native sandstone is east of Salida, about 30 miles from the site area.							
MANOS							
Fig 17.	5CF208	e	Grey Sandstone	135.0	95	52	
Convex grinding surface, oval in outline. Edges are not battered although they are weathered and difficult to determine.							
Fig 17.	5CF208	f	Grey Tuff	85.0	77.0	42.0	
Small ovoid shape with flat dorsal and ventral grinding surfaces. Specimen was found fractured but was restored. This tuff has been called Waugh Mountain tuff and could have originated in the Ute Trail area, north of Salida.							
Fig 17.	5CF373	g	Granite	115.0	90.0	58.0	
Convex grinding surface, oval in outline. Edges are rough and may indicate some battering.							

*ND = Not Determined; Est= Estimated; Hafting indicates (neck) width

Table 5. Artifact Provenience (Flaked Stone)

Category	Site Number 5CF208	5CF373	5CF426	5CF427	5CF428	5CF429	5CF430	5CF431	5CF495	5CF496	5CF497	5CF499	Total
Core Fragments													
*	0	0	15	7	7	0	4	2	1	1	0	0	37
Reduction Flakes													
*	15	3	6	1	3	0	2	0	0	0	0	1	31
Utilized Flakes													
*	97	15	37	10	7	0	12	0	4	1	1	3	187
Non-Utilized Flakes													
	114	2	35	7	5	1	19	1	1	0	0	1	186
Plano-convex Scrapers													
*	3	2	3	1	1	0	1	0	1	0	0	0	12
Bi-convex Scrapers													
*	6	1	1	0	0	0	0	0	0	0	0	0	11
Gravers													
*	10	5	4	0	3	1	1	0	0	0	0	0	24
Drills													
*	0	0	1	0	0	0	0	0	0	0	0	0	1
Burins													
*	1	2	1	0	0	0	0	0	0	0	0	0	4
Bifaces													
*	5	4	6	1	2	0	0	0	0	0	0	0	16
Diagnostic Projectile Points													
*	8	8	3	1	6	0	2	0	0	0	1	10	39
Non-diagnostic Projectile Points - Fragments													
*	2	5	5	3	3	0	3	0	0	0	0	6	26
Total	261	47	117	31	37	2	44	3	7	2	2	21	574
Total Tools (*)													
*	129	43	63	16	22	1	19	0	5	1	2	19	320
% Tools of Total													
*	49%	91%	54%	52%	59%	50%	43%	0%	71%	50%	100%	90%	56%
						Groundstone and Ceramic Provenience							
Hand Stones (Mano)													
	2	1	0	0	0	0	0	0	0	0	0	0	3
Sandstone / Grinding Slab Fragments (Original number possibly 4-6 specimens)													
	2	0	8	1	1	0	0	0	0	0	0	0	12
Ceramics - Sherds (One original pot)													
	0	0	71	0	0	0	0	0	0	0	0	0	71
Polishing stone/smooth cobble													
*	1	0	1	0	0	0	0	0	0	0	0	0	2
Choppers													
*	0	1	1	0	0	0	0	0	0	0	0	0	2

The differences and similarities in each of these tool types are based on morphology and do not imply function. For example, projectile points have been utilized for many secondary functions including cutting and scraping. Descriptions will note these functions but will not attempt to further subdivide the type based on this usage.

Edgewear Analysis

All lithic materials were analyzed using a binocular microscope at a magnification of 37.5X and 75X. Illumination was aided by a 35 watt spotlamp of condensed light. This technique helped identify edge wear patterns as described in a number of recent publications on lithic edge wear analysis (Ahler 1979; Greiser and Sheets 1979; Tringham et al. 1974). The most common types of edge wear observed were crushing, step flaking, rounding and some polishing. Striations resulting from use in a single direction were difficult to observe. Exposure to the elements at these high altitude locations may contribute to the lack of preservation of such microscopic detail.

The careful microscopic analysis of all lithic materials is extremely time-consuming and tedious. It is also extremely valuable in determining the usages of lithic materials. For example, on first observation only 12% of the debitage flakes were classified as being utilized. Further analysis procedures indicate 25% utilization. This suggests much valuable information is lost when edge wear analysis is not accomplished.

Projectile Points (Figures 13, 14 and 15): Projectile points are typically a well recognized tool type as well as the most described category in many lithic analyses. Attributes observed during this study

Figure 13. Projectile Points. Top row (left to right): a, b, c, d. Middle row (left to right): e, f, g, h, i, j. Bottom row (left to right): k, l, m, n, o, p.

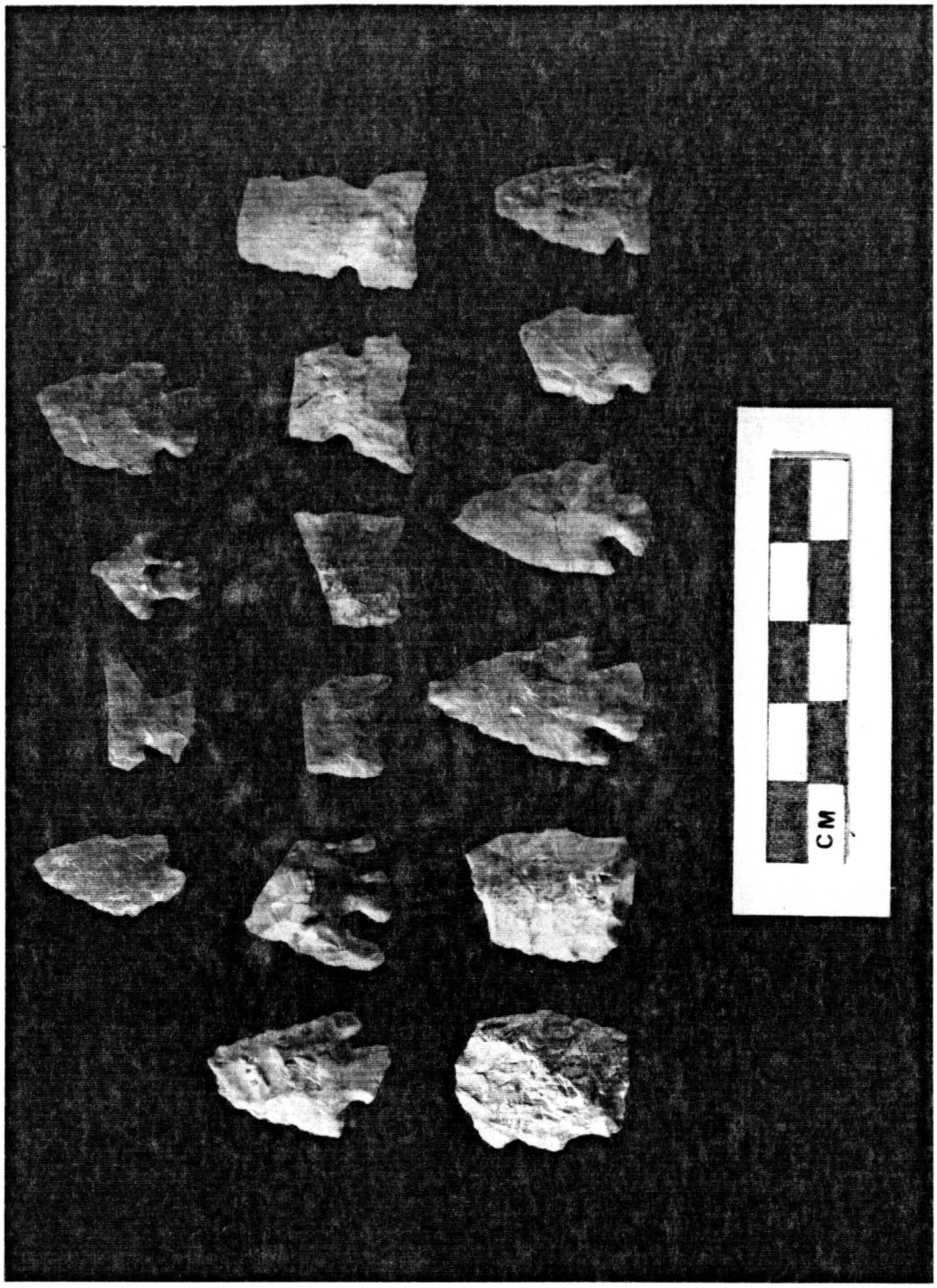

CM

Figure 14. Projectile Points. Top row (left to right): a, b, c. Middle row (left to right): d, e, f, g, h, i. Bottom row (left to right): j, k, l, m, n, o.

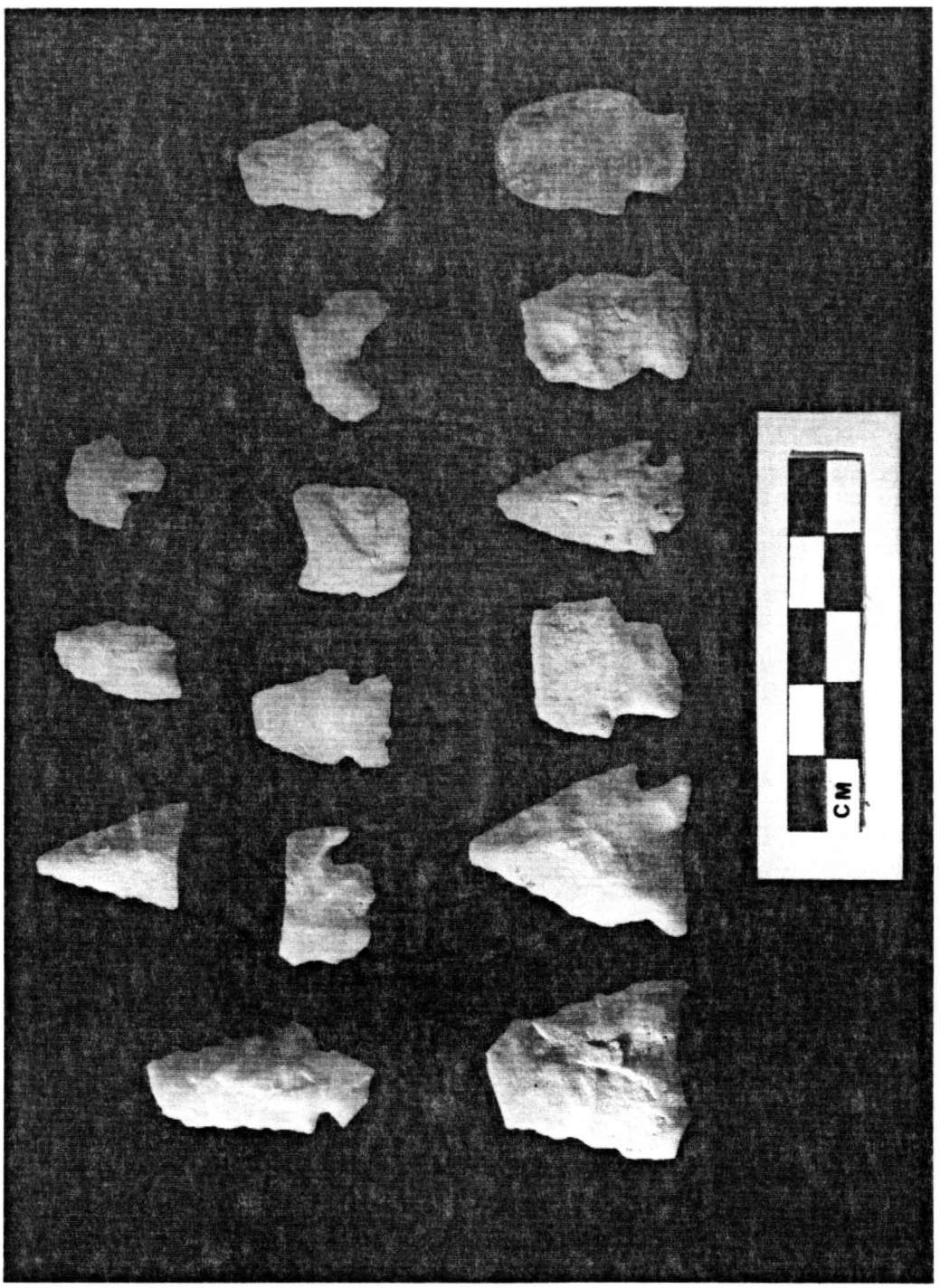
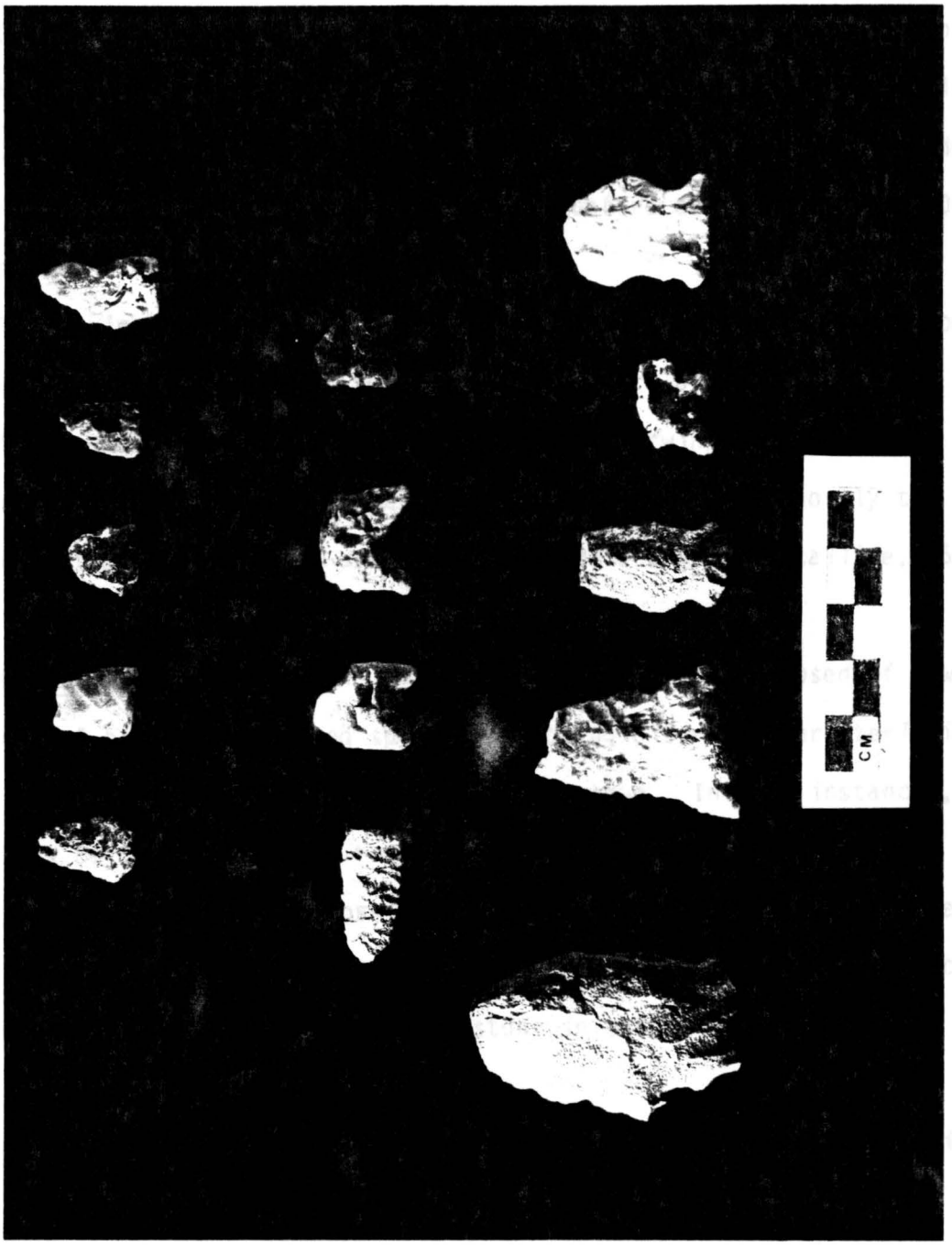

CM

Figure 15. Projectile Points. Top row (left to right): a, b, c, d, e. Middle row (left to right): f, g, h, i. Bottom row (left to right): j, k, l, m, n.


CM

include size, blade form, notching, basal form, cross section, grinding, flaking, and use characteristics as well as quantity, material type, and provenience.

Sixty-five whole and fragmentary projectile points were located on the Monarch sites. These represent 9.6% of the total lithic materials and 17.2% of the entire tool assemblage. This figure does not include an unknown number of points removed by collectors during the past 100 years (for example, Mead, 1882).

The projectile point category was divided into ten groups based on a number of common diagnostic features such as form of stem, notch location, and overall size (Irwin-Williams and Irwin 1966:65). The materials that projectile points were made from followed closely the material type of the whole assemblage; 81% were cryptocrystalline, 16.5% quartzite, and 1.5% obsidian.

Bifaces (Figure 16): The biface tool category is composed of a wide variety of bifacially flaked specimens lacking discrete characteristics that would place them into a more specific group. In some instances, they may be mid-sections of fractured projectile points, pieces of scrapers, knives, or even possibly a variety of preforms. Due to their fractured nature, descriptions of these artifacts are sketchy. Bifaces represent 2.7% of the total chipped-stone inventory and 4.9% of the total tools found on the site.

Scrapers - End and Side (Figure 16): Scrapers are tools indicating scraping action on at least one of their edges. Basic described attributes include shape, cross section, flaking, characteristics of working edges, size, materials, and provenience.

Figure 16. Bifaces, Scrapers, Drills, Burins, and Gravers. Top row (left to right): a, b, c, d, e, f, g. Middle row (left to right): h, i, j, k, l. Bottom row (left to right): m, n, o, p, q, r.

CM

Drills, Gravers, and Burins (Figure 16): These tool types are discussed together because they tend to have similar functions. Basic attributes such as shape, size, and materials are discussed.

* Burins are characterized as tools with a unique perpendicular flake removed from a flake edge. This results in a sharp chisel edge that has many potential uses, especially on bone and wood.
* Gravers have short projections on one or more edges of a flake. Gravers are used for perforating and incising a variety of materials.
* Drills are usually bifacially flaked tools with a grasping surface and long, thin distal ends and a biconvex cross-section.

Utilized Flakes: This is a tool category with indications of various uses. Typically, these tools are primary, secondary, or even tertiary flakes exhibiting regular patterns of use scars on any of the working edges. Many of these tools were identified only after microscopic examination. It is interesting to note that half of the flakes on the site indicate utilization. This is a good indicator of how valuable tool material was at these remote sites far from material sources.

Non-Utilized Flakes: This is a non-tool category. These flakes may be primary, secondary, or tertiary flakes. The edges do not exhibit a pattern of edge wear or use. In many instances, flake scars are present that may indicate limited use; however, they were rejected if sufficient evidence for intentional use was not present. For example, years of exposure on the surface of the sites could have produced some of the observed flake scars. (See Tringham et al. 1974 for discussion.)

Non-flaked Material Culture: A small but wide variety of non-flaked tools and other artifacts were found on various portions of the Monarch sites. These items include: Choppers, Polished Cobbles, Ceramics, and Vegetal Items.

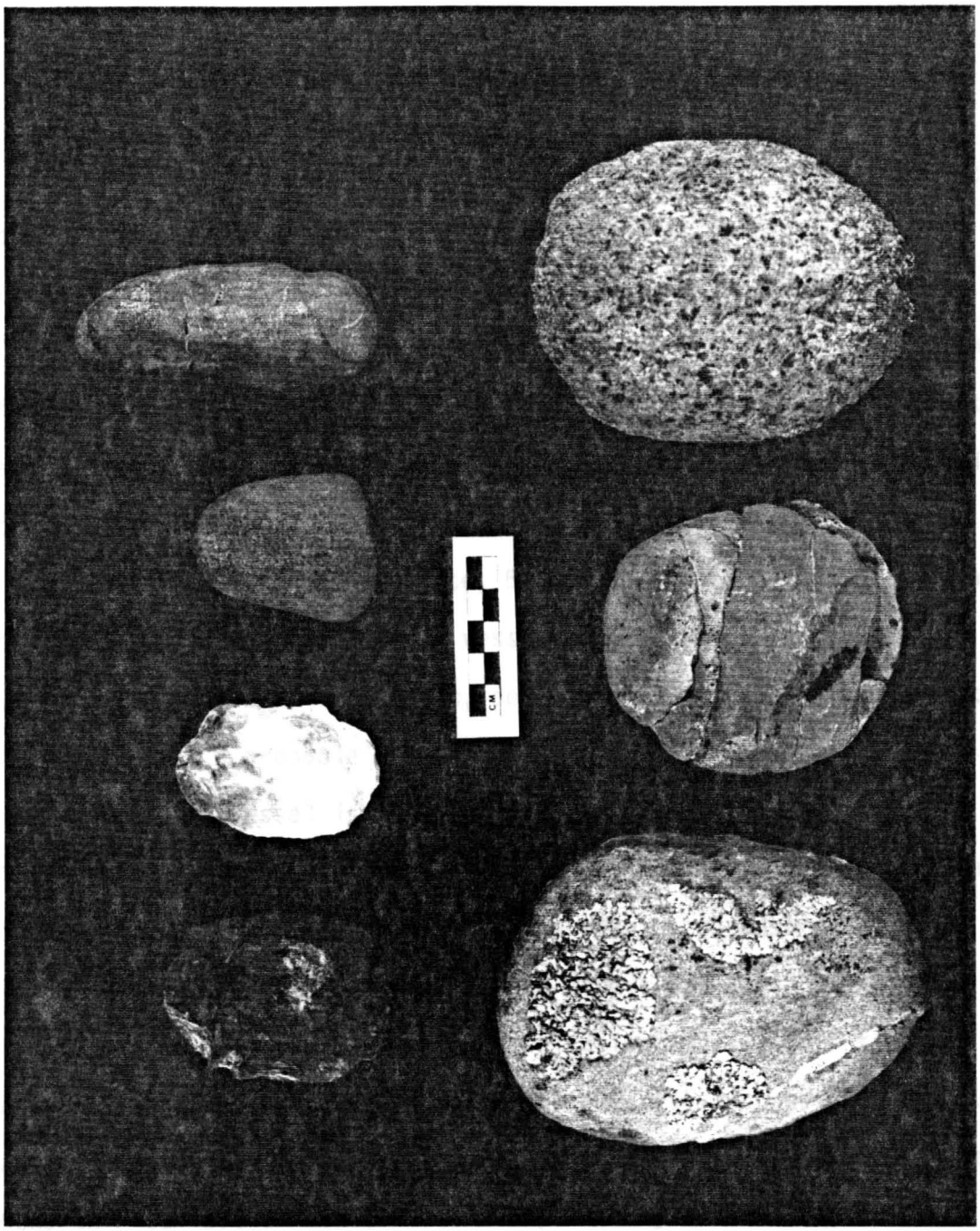
Choppers (Figure 17): These are generally large and coarsely flaked tools with irregular working edges. Edge wear may indicate a variety of uses, including crushing and battering. Attributes such as size, material, shape, and edge characteristics are listed in the table for these tools.

Polished Cobbles (Figure 17): These are smooth, hard stones used in various functions, such as tool manufacturing and polishing activities. Attributes are size, shape, wear patterns (if any), and material type.

Ceramics: Seventy-one sherds resulting from the breakage of one pottery vessel were located on the short-term campsite, 5CF426. A complete discussion of these sherds is located in a separate chapter of this report.

Vegetal Items: The perishable cultural materials from the Monarch sites include: the wooden post fragments (sewels) located along four of the drive walls, charred evergreen needles and other pieces of wood from the exavation test units and one bone splinter recovered from the excavation at 5CF499.

Figure 17. Choppers, Cobbles, Ground Stone, and Manos. Top row (left to right): a, b, c, d. Bottom row (left to right): e, f, g.


CM

CHAPTER VIII

CERAMICS

Ceramic remains are rarely found at high mountain sites. Important exceptions are the Old Man Mountain site near Estes Park, Colorado (Benedict 1985b), Caribou Lake site (Benedict 1985a), and Vail Pass (Gooding 1981). The usual lack of ceramics may be due to the distance from clay sources, site type, relative lack of need for pottery vessels at high altitude locations, or simply a lack of research and attention toward these materials.

Surprisingly one Monarch site, 5CF426, produced 71 sherds of what is believed to be a single ceramic vessel (Figure 18). This site also yielded a number of lithic tools, debitage flakes, and broken sandstone fragments from a probable grinding slab.

The pottery vessel is of plainware style, possibly of coil construction with a paddle and anvil finish (Ann M. Johnson, personal communication 1987); alternately it may have been constructed using a large clay coil or mold and patch with paddle and anvil finish (Priscilla B. Ellwood, personal communication 1988). This type of construction is found in some Great Basin wares, such as Salt Lake Grey and Promontory Grey, which have some similarities to the sherds from Monarch Pass (Butler 1986). Microscopic analysis of a fresh break indicates the finishing was applied extensively, as numerous small layers are built up in the surface paste. The vessel, despite its

Figure 18. Picture of Ceramic Vessel Sherds


CM

relative plain and crude appearance, is well-fired. Typical wares associated with the Ute and Apache cultures are much thicker and lack the firing characteristics evident in this vessel (W. G. Buckles, personal communication 1989).

The vessel is unique in that it exhibits a number of incised curvilinear lines with occasional pendent triangles (Figure 18). The lines are crisply delineated; the overall design or pattern is uncertain. It is possible that these lines are only on the neck or upper regions of the pot; they apparently do not extend over the entire surface, as only 17 of the 71 sherds exhibit the markings. To test this theory, 30 thickness measurements each were taken on incised and nonincised sherds. The nonincised sherds were slightly, but not statistically significantly (t-test, level .05), thicker than their incised counterparts.

A portion of the rim has been reconstructed and indicates an outcurving shape with a lip that varies from rounded to slightly flattened (see Figure 19). The exterior of the rim exhibits an uneven texure and, in one instance, almost appears that a nodule or small pellet of clay was attached (Figure 19). It is, however, possible that this is just a result of a casual finish of the rim. The estimated diameter of the original vessel based on curvature measurements of the small section of reconstructed sherds is from 21 cm to 22 cm. The temper is of very fine grain size and appears to be quartz sand. The majority of the temper is obscured by the paste; percent temper is difficult to determine, but is estimated to be 30-40%. Color of the vessel varies from very dark grey/black (10YR2/1) to yellowish red (5YR5/6). This difference may be attributable to fire clouding, a

Figure 19. Profile of Rim. Note nodule on exterior side of rim (actual size).

variable reducing/oxidizing atmosphere, and/or possibly differential exposure to recent weathering on the exposed tundra ridge. The average thickness of the sherds is 5.4 m; the range of thickness is 4.1 m to 7.1 m. No base fragments have been identified from the sherd collection. It is likely more fragments will appear at the site as frost sorting and erosion continue.

Pottery exhibiting this style of decoration is very rare in the archaeological record on either side of the Continental Divide. The overall construction most closely resembles vessels from the Great Basin. Butler describes Great Salt Lake Grey wares with a slightly similar wavy and incised pattern (Butler 1986:41). Color, thickness, and the hardness of these sherds are also similar to the Great Basin examples (Madsen 1977). The distance to this potential source area presents problems in determining any definite cultural relationships. In a similar situation incised lines on ceramics are reported from the Anza-Borrego Desert area of southwest California (Wallace and Taylor 1960).

Unfortunately, the ceramics from site 5CF426 cannot at this time be definitely associated with any specific culture area or temporal period. Closest resemblances appear to be with pottery from the Western Slope of the Rocky Mountains.

CHAPTER IX

CULTURAL RELATIONSHIPS

Taxonomic Systems

Various taxonomies have been used in the past to help archaeologists define the various cultural components of sites throughout the Plains, Great Basin, and Southwestern culture areas. For example, in the Plains area alone no less than six different temporal chronologies have been used since the 1950s. These include: Withers (1954); Mulloy (1958), Irwin-Williams and Irwin (1966), Wood (1967), and Gunnerson (1987). Most recently, Butler (1988) has proposed a slight modification in the Colorado Woodland taxonomy.

Monarch Pass is unique in that its location and artifact inventory indicate that peoples from three different culture areas may have used this area at various times. It would be, at the very least, confusing to attempt to describe each in regard to all of the typologies described for each area. In order to simplify the chronology, this paper uses Gunnerson's (1987) sequence of High Plains archaeology.

Paleo-Indian	Earlier than 6000 B.C.
Archaic	
Early	6000 B.C. - 3000 B.C.
Middle	3000 B.C. - 1000 B.C.
Late	1000 B.C. - A.D. 500

Ceramic

Early	A.D. 1 - A.D. 1000
Middle	A.D. 1000 - A.D. 1500
Late	Post A.D. 1500

The transition dates for the periods are approximate and vary from area to area. Some groups did not adopt maize agriculture or engage in the manufacture of ceramics. For example, it is still a matter of debate whether the Utes manfactured pottery or traded with nearby tribes such as the Apache for the product (Buckles, personal communication 1989).

Projectile point typology is a common means of establishing approximate temporal time periods where more specific dating methods are only rarely available. This is especially true in areas where well-stratified sites are rare. Frison (1978:19) states "projectile point typology offers the best temporal indicator for many situations where stratigraphic, faunal, or absolute dating evidence is lacking." A few studies, such as those at the Hungry Whistler (Benedict and Olson 1978), Ptarmigan (Benedict 1981), and Curecanti sites (Jones 1984a, 1984b, 1986) have helped begin to establish a mountain cultural chronology. However, additional research is necessary before more accurate and useful chronologies can be established.

Archaeological investigations in Colorado have tended to focus on the culture area most closely associated with the site in question. This orientation must be considered carefully in high mountain sites because mountain passes and nearby rich resource areas appear to be natural corridors for travel from all directions. For example, Gooding's (1981) investigations on Vail Pass indicate many potential

source areas for the cultural material recovered on the project. Like Vail Pass, Monarch Pass occupies a strategic location in the central Rockies, but it does not appear to possess the large variety and quantity of material in evidence at Vail.

The archaeological record in Colorado is extensive and the data base is growing rapidly each year. The state contains a variety of rich ecosystems that have been used by prehistoric and historic peoples for at least 10,000 years. There are at present no known sites of this great antiquity in this central alpine region of the state, although the potential remains for future discovery.

The Regional Chronology as Applied to the Monarch Sites

Paleo-Indian Period: 11,500 B.C. - 6000 B.C. The oldest undisputed period recognized in North American archaeology is the Paleo-Indian Period. Frison (1978) recognizes 12 complexes including Clovis, Goshen, Folsom, Midland, Agate Basin, Hell Gap, Alberta, Firstview, Plainview, Cody, Frederick, and Lusk. The sites which characterize these Complexes are generally killing and butchering locations associated with extinct fauna and well-flaked lanceolate projectile points. Many isolated points have been found in mountain locations, but definite occupation or stratified sites of this type are very rare. No definite Paleo-Indian artifacts were found on the Monarch sites during this study.

Early Archaic Period: 6000 B.C. - 3000 B.C. The Archaic Period is generally characterized as one of climatic and cultural change. The largely unexplained extinction of the Pleistocene megafauna and warming of the climate coincides with a change in settlement patterns and site inventories as well as a change in projectile point styles.

Many researchers (e.g., Antevs 1955) feel this period corresponds to a warm, dry episode referred to as the Altithermal. Benedict and Olson (1978) hypothesized that Plains and other lowland-orientated Early Archaic peoples took refuge in the Foothills and mountain locations. Olson and Benedict's thesis remains controversial, but it helps explain the apparent lack of contemporary sites on the High Plains.

Materials associated with this time period were not identified at the Monarch sites, although Early Archaic materials have been found in nearby areas, such as the Curecanti area of the Gunnison Valley (Stiger 1980). Early Archaic use cannot be ruled out in the Monarch area and should be considered in future research projects.

Middle Archaic Period: 3000 B.C.- 1000 B.C. Site density throughout the eastern Plains, Foothills, and western slope valleys increases during this period. Frison (1978) feels there is increased emphasis on plant procurement as well as the use of communal hunting techniques. Projectile points are generally of the McKean complex common on the northwestern Plains, and include the following variants: Duncan, Hanna, McKean and some suggest Mallory (for example, Kornfeld and Todd 1985). Very similar points such as Pinto Basin are described from the Great Basin. In the northern part of the Southwest the San Jose phase of the Oshara tradition produced a projectile point with many of the same characteristics (Irwin-Williams 1979:40).

The Monarch sites contained three probable specimens representative of this type. Generally, two points are fractured at the hafting area (Figure 15g-h). One intact McKean point (Figure 14o) indicates extensive use and resharpening. All specimens were found on the surface of the sites.

Late Archaic Period: 1000 B.C. - A.D. 500 The Late Archaic period is characterized on the northwestern Plains as a period when the McKean-style in the complex gradually was replaced by projectile points with side and corner notches, often with expanding stems. Eighmy (1984) feels there was an increased use of smaller mammals relative to larger species in this period. Bison kill sites are present on the High Plains, indicating at least some large game procurement. Grinding tools continue to be present. Great Basin sites of this period are characterized by projectile points referred to as the Elko Series (Holmer 1986).

Early Ceramic: A.D. 1 - A.D. 1000. This period is commonly referred to as the Woodland or Plains Woodland on the eastern High Plains (Gunnerson 1987). Cord-roughened pottery similar in style to pottery further east is relatively common during this period. Other changes include adoption of the bow and arrow, a less nomadic lifestyle in some areas and semi-permanent dwelling structures. The temporal overlap between the Late Archaic and this period indicates the transition was gradual and variable. It is also possible that in some areas ceramics were never adopted. In this instance, Archaic lifeways apparently lasted until historic contact. Research at mountain sites has indicated there are similarities with the changes going on further east, but whether this represents a similar culture or some type of diffusion and trade is still being debated (see Butler 1988).

Activity to the west and southwest of the Rocky Mountains is extensive. Like the eastern Plains, maize horticulture is found and becomes extensive in locations such as the Basketmaker, Pueblo, and certain Fremont sites. Nomadic hunting and gathering activity continues

in the Great Basin. Projectile points from the Great Basin include the Rose Spring and Eastgate styles (Holmer 1986). In the Southwest, points are associated with the Basketmaker III and Pueblo I period (Hayes 1964: 39; Morris & Burgh 1954:135).

Small corner- to basally-notched arrowpoints of the Early Ceramic period are well represented at the Monarch sites. As with the previous artifacts, these materials in many instances indicate extensive use and resharpening. Unlike earlier styles, many have retained their tips and midsections. These materials were all located on the surface of the site areas.

Mid-Ceramic: A.D. 1000 - A.D. 1500. This period differs on the eastern plains from the previous period due to an overall increase in evidence for maize horticulture, and more permanent dwellings and villages. The use of the mountains by these people is sketchy, although small triangular side notched projectile point styles indicate at least periodic visits by, or possibly trade with, eastern peoples.

The Upper Republican aspect is the most distinctive cultural material located along the eastern plains of North Eastern Colorado. In particular, Buick Focus (Withers 1954) overlaps into the Arkansas River Valley east of the mountains. No known Upper Republican sites are known in the Upper Arkansas Valley.

In the Southwest, the Anasazi culture reached its peak and gradually abandoned the Four Corners area during this time. Distinctive Anasazi pottery occasionally is found in the mountains, especially in the southwestern part of the state. Isolated sherds are found further north but in very small quantities. The Anasazi triangular points are very similar to other triangular points common in this period. Some

researchers feel later Anasazi groups exploited the mountain environments near their core areas. More research at mountain sites is needed to determine the extent of this utilization.

Late Ceramic: - post A.D. 1500. The Late Ceramic corresponds with the approximate arrival of the European explorers and horses on the eastern plains and southwestern deserts. Athabaskan groups are believed to have also entered the area just before this time.

Dismal River Aspect cultural materials (Gunnerson 1987), attributed to Athabaskan peoples, are found in various sites on the high plains of Colorado. It is also possible that part of this migration followed the eastern basin and ranges as well. In addition, Shoshonean groups are also believed to have entered the area east of the Rockies, further mixing the archaeological record.

The Utes are the aboriginal group associated with the historic occupation of the mountains and western Colorado valleys. It is uncertain how long they occupied this vast area of the state, but may have considerable antiquity. Conservative estimates place their arrival around A.D. 1500.

Very little is known about the early Ute culture. Archaeological sites of definitive origin are rare. There is considerable spatial and temporal variability in the recorded sites, much of it resulting from contacts with nearby cultural groups (Buckles 1978:61; Stewart 1962:31).

Few diagnostic materials characterize this period. The main projectile point from the eastern plains is a small triangular point. A similar but slightly larger variety is referred to as Cottonwood Triangular (Holmer 1986) in the Great Basin. In the Colorado highlands,

small, thin, side-notched and unnotched triangular points are attributed to the Utes, recent Shoshonean speakers from the Great Basin.

Use of the Monarch sites between A.D. 1500 and the beginning of historic mining activity is unknown. Three small unnotched specimens were found as well as some smaller points with undiagnostic basal characteristics. These points could be associated with earlier parts of the Ceramic period. It is possible that use of the drive systems at Monarch had stopped by this period. However, as noted earlier, there is at least one reference to Ute game drives at lower elevations in the Colorado foothills (Rockafellow 1881:640).

Possible Cultural Relationships Based on Projectile Point Style Comparisons

Group 1 and Group 2 Points (Table 4, Figure 13g-h,i-j): These two groups are very similar in overall style. They tend to occur together at a number of sites on both sides of the Continental Divide. Benedict has reported similar points from site 5GA45 in the Caribou Lake Valley (Benedict 1985:62, Fig. 59a-c). Additionally, the points occur together at the Caribou Lake site, 5GA22, in the headwaters of Arapaho Creek (Benedict 1985:145, Fig. 113d-e,h-j). These points were also found at the Vail Pass site (Gooding 1981:Fig. 15).

East of the mountains the points are also reported from a number of sites including: Lo DaisKa (Irwin and Irwin 1959:Fig. 19); Avery Ranch (Watts 1975:Fig. 5); Chamber Cave (C. Nelson 1970:Figs. 2-3); The Robert Buffalo Jump (Wilkins 1971).

In Wyoming the points occur at a number of Buffalo Jump sites including: Glenrock Buffalo Jump (Frison 1970); Big Goose Creek (Frison et al. 1978); Vore sites (Reher and Frison 1980). West of the Divide,

the unnotched points are referred to as Cottonwood Triangular (Heizer & Hester 1978). The notched points are commonly referred to as Desert Side-notched (Baumhoff and Byrne 1959). In the Anasazi areas, a slightly concave based point is also common during the Pueblo II and III periods (Hayes 1964).

Unfortunately, these points do not have a large number of radiocarbon dates available for use. In Wyoming at the Big Goose Creek, dates ranged from 530 ± 10 Yrs BP to 210 ± 100 BP. Many of the sites reported having cord impressed and fingernail-impressed pottery. Kingsbury and Gobel (1980) found these points with Puebloan trace pottery estimated to have been manufactured between A.D. 1490 and A.D. 1575.

These points may have been brought to the mountain sites in the Indian Peaks by the Utes. The Utes were the tribes with the extensive occupation of the mountains during the historic period. The few available radiocarbon dates and pottery styles support this correlation. However, similar points are found in virtually all surrounding cultural areas.

Group 3 Points (Table 4, Figure 13o-p; Figure 14f-i): This style of point is found in various locations in the mountains. A very similar point is reported by Benedict from a game-drive blind on the east side of Mount Albion (Benedict 1975a:Fig. 8). Specimen #5CF373 - Figure 14 - (f) was recovered in situ 8 cm below the turf in the excavation at site 5CF373. The point was found above the areas where charcoal for radiocarbon dating was recovered, so the dates of 1060 ± 60 Yrs and 720 ± 60 do not necessarily relate to the age of this point. The Rollins Pass site, 5BL147, also yielded similar points (Benedict and

Olson 1970: Fig. 5). The authors feel these points may correspond with a late (1150-950 Yrs BP) modification of the drive walls. The Vail Pass campsite (Gooding 1981:Fig. 15, A-B) reported two side-notched arrow points and felt they resembled Upper Republican styles. Curiously, these points are not common in the eastern Rocky Mountain Foothills. They, however, are common in sites in Northeastern Colorado from sites associated with pottery of the Upper Republican Phase of the Central Plains Tradition (Wood 1971:78-80).

The small side-notched style point is very common in Late Fremont sites. Holmer and Weder (1980) note these points throughout the Colorado Plateau and Great Basin and consider the dating of 1150-750 yr BP accurate for a point style called the Uinta Side-notch. In the Western Colorado valleys a few of these points are noted and include the Colorado Park and Little Park sites (Wormington and Lister 1956:93, Fig. 62). In the Southwest during Pueblo II and III a side-notch with many similarities is also noted (Hayes 1964:129).

This small side notch is again not culturally diagnostic. It is possible that an Upper Republican group from the Northeastern Plains of Colorado, a Fremont group out of the Colorado or a Southwestern Anasazi party could have left these points on the site. Benedict (1985a:148) feels the lack of Upper Republican pottery west of "the mountain front and the scarcity" of these points in the eastern Foothills indicates more of a western direction for the origin of these points.

Group 5, 6, 7, and 8 Points (Table 4, Figure 13a-e,j; Figure 4c, m): These points are discussed together because of their overall size and form. The notch placement varies but flaking style is very similar. This association is common in a number of game-drive sites and camp

sites in the high Colorado mountains, out on the Plains of eastern Colorado, and in the Great Basin.

Mountain sites include: Murray Site - 970 ± 100 Yr BP (Benedict 1975b); Scratching Deer - 1260 ± 95 Yr BP (Benedict 1975c); Rocky Mountain National Park (Husted 1962).

In the eastern foothills of the Colorado Rocky Mountains these styles of points are called "Hog Backs" (Nelson 1967). The Hog Back phase is believed by some to be a Foothills variant of the Plains Woodland. Hog Back points are found in a large number of Foothills sites. These specimens are often serrated which may be a functional difference noted at these sites. Sites include: Magic Mountain (Irwin-Williams and Williams 1966:Fig. 30), Lo DaisKa Rockshelter (Irwin and Irwin 1959:Figs. 26, 27); Willowbrook (Leach 1966:Fig. 3,D-H); Hall-Woodland Cave (Nelson 1967:Fig. 3 and 4); Van Bibber Creek (Nelson 1969: Fig. 9); and Wilbur Thomas Shelter (Breternitz 1971:Fig. 11).

In the Great Basin a point with many similarities is the Rose Spring point (Lanning 1963). Kevin Black (personal communication 1989) feels the Rose Spring point is very rare in western Colorado and can be identified as a longer bladed point than the Hog Back.

The asymmetric basal notch point (Figure 13f) does appear to have more of a Western Slope affinity. These points are not common in the eastern Foothills sites although some were reported at Magic Mountain, Zone A (Irwin-Williams and Irwin 1966:Fig. 29, MM 37). These authors feel this point is the result of Fremont influence on Woodland culture. In the eastern Great Basin these points are referred to as Parowan basal-notch (Jennings 1978:216,Fig. 213-h).

The unnotched points in Group 4 are likely preforms of a corner-notched point. The overall size and flaking of the specimens lends itself to this specification.

It is felt that the Group 4-8 points would correspond to dates obtained from other sites. The dates from the Scratching Deer Site and Murray place these points in Mountain settings in the Early to Mid-Ceramic period.

Groups 9, 10 and 11 Points (Table 4, Figures 14e,j,k,n; 15k,l,m,n): These groups are combined because they can be treated together. In both overall size and style, the points in these groups are similar to points associated with sites dating from the Late Archiac. This period is characterized by the dominance of corner-notched medium-size points often with contrasting stems. Few if any cultural affiliations can be made with these points. In the Southwest, the Basketmaker II (Morris & Burgh 1954) point is distinctive, but is not part of the Monarch Pass collection. This group of varied points has a number of close matches in the Late Archaic sequence from both Buckles (1971) Uncompahgre sequence and from the Taylor Rockshelter sequence (Wormington and Listen 1956).

Group 12 Points (Table 4, Figure 14l,o): These medium-sized stemmed points are both extremely worn from use and retouching. It is likely they were utilized as knifes before they were discarded. The closest similarities to these points are the McKean style points common at sites in the northwestern Great Plains. Group 12 specimens are shouldered with pronounced stems and slightly concave bases. Few McKean points have been recovered from mountain sites. Points resembling these points

have been found at Magic Mountain (Irwin-Williams and Irwin 1966:78, MM17). Similar points were recovered from level 4 at the Willowbrook site (Leach 1966:Fig. 3,s). Unfortunately it appears they were out of sequence and are considered the result of curation of artifacts by later groups of people utilizing the site.

Draper Cave, in the foothills of Custer County, has a number of Middle Archiac points from the McKean Complex. Radiocarbon dates from the site range from 3520 ± 70 C-14 Yrs B.P. (UGa 736) to 3480 ± 65 Yrs B.P. (UGa 737) (Hagar 1976: 8-11). Other sites with dated collections are Wilbur Thomas (Breternitz 1971:70), Dipper Gap (Metcalf 1974:69) and Spring Gulch (Kainer 1976: 74). Projectile points resembling the McKean are referred to as the Pinto Shouldered and generally date from the period of pre-4000 B.C. (Holmer 1986:97-98). San Jose Complex artifacts from the northern part of the region are slightly similar and range in age from 3000 B.C. to about 1800 B.C.

Group 13 Points (Figure 14h): This projectile point base is discussed separately because of its possibilities to have considerable antiquity. At first glance it appears to follow the concave based form as seen in Group 2 points. It is, however, thicker and slightly larger. Unfortunately the point is fractured and the shape of the blade is undetermined. Interestingly, a point base nearly identical to this one was recovered from the Albion Boardinghouse site (Benedict 1975a: Figure 5j). Benedict reports that one is also found in the Rocky Mountains National Park collections (1975a:11). The radiocarbon dates range from 2420 ± 220 C-14 Yrs BP (I 4582) to 5730 ± 145 Yrs BP (I 5020). Benedict feels the older date of 5730 Yrs BP is the most accurate for this site (Benedict personal communication 1989). It is of course possible those

points are examples of curation by later peoples and do not necessarily indicate this antiquity. On the western side of the Divide similar points of the Pinto and Elko series cover a wide time span from ca 5000 to 3000 Yrs BP (Jennings 1978:59). In the Southwest the San Jose Complex share slight similarities with other concave point styles.

Group 14 Points (Table 4, Figure 15g,h). Again, these points are discussed by themselves because of the possibility of considerable antiquity. The size of these two points would indicate placement with the McKean Complex as discussed with Group 12. However, these two points are extremely well flaked and seem to resemble points from the Late Paleo-Indian period. Benedict feels there is a continuation of point style that originated during the Late Paleo-Indian and lasted through the Middle Archaic in certain areas (Benedict personal communication 1989). Until these points are recovered from datable contexts all that can be said is they resemble points from both the Paleo-Indian, Early and Mid Archaic periods. These point styles are found throughout the Intermountain West, Southwest and Great Plains.

Group 15 Points (Table 4, Figure 15j): This specimen is included mainly for future reference. The artifact was apparently broken during its manufacture. Overall it appears to be a side notch concave base point or knife. The indented base would seem to place it with either a Pinto Basin or McKean.

Other Artifacts: Unfortunately the remainder of the lithic artifacts recovered from the Monarch sites are very undiagnostic. The scrapers, bifaces, handstones, and other tools are very generic. There is one interesting exception, and the exception is the presence of two smooth cobbles (Figure 16c-d). In particular an elongated stone found

at the George W. Lindsay Ranch site, 5JF11 (Nelson 1971:9 Fig. 7e) is nearly identical to the one found on Monarch Pass (Figure 17d). At the "Ute" Shelter (Hurst 1939:60, Plate 11) shows a small smooth cobble very similar to the ovid cobble (Figure 17c) from Monarch. Both sites have evidence of occupations of groups during at least the Early Ceramic and in particular there are occurrences of serrated "Hog Back" style points at both locations.

CHAPTER X

DISCUSSION AND INTERPRETATION

Interpretation of the exact function of the game-drive structures and any attempt to infer social organization from these sites is plagued by a number of difficulties. First, the vast majority of the recovered artifacts were found on the surface of the shallow tundra soils. The excavations produced datable charcoal, but were not accompanied by other cultural material. Secondly, many of the rock walls are found in a confusing and overlapping pattern. This complexity indicates an unknown number of uses and/or modifications of the site. Further complicating the interpretation of the sites is the lack of historic accounts of such systems in use at such mountain locations. Conclusions are based on the best information available; the observed archaeology and ethnoarchaeological accounts from similar but very distant locations.

As with most archaeological sites the observed remains represent only an imperfect represention of the past activities on any particular site. For example, only a fraction of the available cultural material are ever left on a site, even less is preserved, and only a portion of those are recovered. Because the majority of the artifactual materials were found on the surface, it must be noted that curation of artifacts, both by prehistoric and historic collectors, complicates the interpretation. Finally, these sites represent only a small fraction of the many areas that any one group of people would have used in the

course of normal annual foraging or collecting activities. Binford stresses that an emphasis on one site is only a "stationary" view and is therefore a biased "picture of the whole range of activities, depending upon its unique position within a regional system of behavior" (Binford 1983:109).

Despite the many limitations (not unique to this project), a number of contributions have been made to limited mountain game-drive data base. Admittedly, this research has followed a basic inductive research design, a direct result of the general lack of extensive research on similar sites. As more information becomes available from other projects there can be more efforts made toward deductive approaches.

Research Conclusions

Location-Topography and Vegetation: The increasing numbers of known and researched high mountain game drive sites are demonstrating the importance of this hunting technology. Wildlife researchers have long noted that bold topography in mountainous regions orients animal migration routes, separates herd groups, affects "human land use patterns and [provides] a strong influence on vegetion cover type interspersion" (Young 1982:116). Prehistoric peoples obviously noted similar situations in their efforts to exploit the tundra resources.

Literature reviews from other treeless environments indicate that drive systems were widely used and very effective means of hunting game animals. In all the researched instances, the hunters took advantage of the local topography in order to concentrate herd animals into a restricted portion of the landscape. This type of hunting shows a

sophisticated knowledge of animal behavior, a practiced hunting strategy and a high degree of group cooperation.

The sites on Monarch Pass are no exception. This major pass is one of the few favorable routes over the Continental Divide in this portion of the state and is a direct passage between two major river valleys. The low broad saddle, containing the most extensive set of game-drive walls (5CF373), actually sits in a more favorable hunting location than does the present highway crossing of Monarch Pass.

The landscape in the immediate area of the game drives also provided the hunters with a number of natural features that aided the construction of these facilities. This includes a large area for collecting animals, a concentration zone where the animals are restricted by natural features and an observation point where the hunt can be viewed and coordinated. The rock wall constructions simply added further artificial constructions that forced the animals into a favorable hunting situation.

Game Drive Constructions: The drive walls are located in two major areas of the sites. The majority of the river walls are found in the lower portions of the two major saddles along the Divide. The walls tend to angle toward the lower portions of the Pass. These were presumably constructed to funnel the animals to the kill locations. These walls are arranged in a confusing and overlapping pattern. It is felt that the overlapping walls represent separate construction events and attempts to refine the system (see Figures 9, 10). This observation is based on their overall appearance and spatial relationship to other walls. For example, some walls are in relatively good condition (see Figure 11). They also show the most clarity on aerial photographs.

Other walls are barely visible and in some instances cross under the more obvious walls. It is possible that later hunters may have removed stones from the earlier walls in order to improve the design of the overall system. This modification may also indicate use by a different band of people, a different animal focus or simply the passage of time.

The other major set of walls follows the crest of the Continental Divide Ridge. Their use is unknown but they may help define the boundaries of the drive area and help steer flanking animals toward secondary kill locations. The wooden posts found along one length of these walls may have been used as visual barriers. These sewels could have provided an artificial human "Presence" to the outer perimeter.

One natural feature of the Monarch Pass sites that differs from those in the Indian Peaks is the proximity of the forest boundary to the crest of the Divide. The cover of trees could have provided animals with a sense of protection until they were forced to cross the open alpine tundra. How this affected the hunting strategy is unknown. It may have allowed the hunters, especially those in the observation areas, less warning that the animals were approaching. However, such animals could have been less nervous after leaving protection of the trees due to the short distances they had to cover. Perhaps future research will be able to tell differences in overall site layout and construction based on this observation.

The well defined hunting blinds are typically found either on the downwind side of the drive walls or along the Continental Divide ridge. Additionally, there are a number of less obvious rock structures and natural outcrops that served as hunting blinds and concealment for

waiting hunters or other support personnel. The largest of these blinds is built as the promontory above the Water Dog Divide site (5CF373). This is apparently the most strategic location. From there most of the entire 12-site area can be seen. It is likely that this was the location from where the entire drive was coordinated.

Camp Areas and Lithic Scatters: The camp areas are located in moderately protected areas on the leeward side of the often windy Divide crest. The camp locations did yield a wide variety of debitage, tools, groundstone and even a sherd from a ceramic vessel. Without further testing and more complete excavations, it is difficult to estimate the extent of subsurface materials. The soils appear shallow and may not yield significant buried deposits. It is likely that more extensive base camps lie in the more protected valleys immediately below these sites. This was the case with the Fourth of July Valley below the Arapaho Pass game-drive site area (Benedict 1985a:7-10). Future research should attempt to locate such sites.

A few of the sites such as 5CF495, 5CF496, and CF497 are considered to be lithic scatters. Only a few pieces of toolstone materials were located on these sites. They are located in the immediate vicinity of the game drive and camp locations. It is impossible to tell from this research if they were deposited as a result of the use of the game drives.

Temporal and Cultural Summary

The archaeological evidence, based on the projectile point collection, the radiocarbon dates, and comparisons with previous work by Benedict, indicates the different walls represent many periods of use

and reuse. This is especially the case at the Water Dog Divide site, 5CF373. This site seems to have been most heavily used during the Archaic (3000 B.C.) to the Early ceramic (A.D. 1000) period even though earlier and later use is still quite possible.

The Garfield game drive site, 5CF499, exhibits the least confusing wall construction and produces the most uniform projectile point styles. Based on the C-14 date of 350 + B.P. and the prevalence of small corner- and side- notched points it is felt this site was in use during the Early to Mid Ceramic. Unfortunately without more extensive excavations and locations of buried and datable deposits it is impossible to provide a crisp chronology of the construction and use of these sites.

Excavated game-drive sites in northern Colorado indicate their use was not limited to one temporal period. Scratching Deer (Benedict 1975c) and the Murray site (Benedict 1975b) are of the Early Ceramic period. Hungry Whistler (Benedict and Olson 1978) on the other hand is much older and dates to the early Archaic. Four artifacts recovered from the Monarch sites may indicate such antiquity. Unfortunately, these materials were found on the site surface and no further determination of age is possible in this context.

Ethnographic Clues from the Arctic: Arctic game-drives, while not a perfect analogy, provide some useful information of the interpretation of the sites on Monarch Pass. Jim Benedict noted in his Arapaho Pass report that "Only in the far North, beyond the influence of the horse, did drive systems similar to those in the Front Range continue to be employed" (Benedict 1985a:84). The high arctic and the alpine tundra do

have a number of similarities to help interpret the archaeology at Monarch.

Using Stefansson's early ethnographic writings for comparisons (see Chapter III), it is possible that all three of his group size observations - large band, extended family, and individual hunter - are represented in various parts of the entire Monarch site area. First, the large scale sites described on the arctic would correspond to an extensive basin-wide hunting strategy. This would involve the use of the entire No Name Creek drainage including the Water Dog Divide site on the north to the immediate area near "Old-Old Monarch Pass" (5CF298) south. Staffing requirements for this type of large scale, site-wide game-drive is estimated to be between 25-40 individuals. This range is based on the number of observed hunting pits, other likely concealment locations, and estimated number of drivers to push the animals out of the No Name Creek Basin.

If fewer hunters were available, then the option may have been to concentrate the efforts on the Water Dog Divide site, 5CF373. Staff required for the operation of this site alone is estimated to be one fourth of the estimate of the first drive scenario. The main problem with staffing only the Water Dog Divide site would be the opportunity for some animals to escape through the unprotected southern perimeter of the basin. It is also likely that this smaller scale drive was more appropriate when animals were naturally concentrated in the upper reaches of that basin and only minimal driving would be necessary.

The small game-drive site 5CF499 is situated such that a very small group or even a single hunter could simply lie in wait for animals to be

driven from the forest boundary through the small pass area. One to perhaps four hunters could easily have staffed that single site area.

The above analysis relies on the overall size of each particular system to interpret how it was used. Unfortunately, no other clues were uncovered that would further the analysis. Arthur Speiss (1979:105) noted in his description of Alaskan drives that it would be difficult to use the archaeological record to distinguish accumulation of numerous small-scale kills from one large drive event.

Available Animals in the Monarch Site Area

The obvious question is what animals were the focus of efforts on the drive sites. This question can be answered only with a large degree of uncertainty. It is known that mule deer (Odocoileus hemionus), elk (Cervus canadensis), and bighorn sheep (Ovis canadensis) were present in the Colorado mountains in recent times. It is also possible that bison (Bison bison) and even pronghorn antelope (Antilocapra americana) may have crossed the mountain passes in the past as well. Extrapolating this back into prehistoric times is difficult with the present archaeological record. The confusing pattern of the various rock walls may also indicate that prehistoric hunters took advantage of one or more species' individual characteristics during specific times of the year. For example, recent studies of bighorn sheep in the Sangre de Cristo Mountains in northern New Mexico note that, at various times of the year, the male sheep occupy moderately steep terrain similar to that found near the sites of Monarch Pass (Johnson 1980:19).

Rocky Mountain Bighorn Sheep: Today these animals are considered mountain dwellers and tend to be restricted to habitats with ample

escape cover. There are questions that at least some of this behavior may be the result of historic hunting pressures and the encroachment of humans on their traditional habitats (e.g., Hibbs et al. 1973:1). It is noteworthy that bighorns split into bachelor and nursery herds during the summer months and return to a single herd pattern during the fall and winter. If this congregation pattern existed in the past then it is possible that communal hunting of bighorn sheep may have taken place in the fall before the first snows forced the herds out of the high country.

Deer: The mountain pastures near Monarch Pass are ideally suited for deer. Numerous deer were seen grazing and browsing during this research. Early historic accounts indicate that deer were present in the high country, but actual numbers are unknown. Deer are relatively easy to hunt although they generally exhibit solitary behavior (Frison 1978:271). The exception to this solitary pattern is found during the spring and fall when they travel to and from the high mountain valleys. Due to abundant residual snows at timberline and the reluctance of deer to leave the lower altitudes, the spring and summer would therefore appear to be a poor time for effective deer hunting drives at this altitude. The fall appears the best time for obtaining deer with these drive systems.

Elk: These animals are prevalent in the high country during the summer, fall, and early winter. Historic accounts indicate elk were abundant in the Colorado mountains when the first European explorers arrived (Murie 1951:20-22). Like deer, elk tend to migrate to the high country in the early summer, but apparently leave after the fall rut, well after the first winter snows. Elk also tend to migrate in very

regular patterns with indications that the same herds return each season to their former pastures (Murie 1951:64-64; Young 1982:6). Unlike deer, elk tend to form bands in the summer and remain in groups of 20-30 and herds occasionally reach 300-400 in number by late summer. The fall rut temporarily breaks up the large herds, but only until the start of the winter migration to lower altitudes. Murie (1951:21) notes that elk have herding instincts similar to caribou. If observed elk herding characteristics represent prehistoric patterns, then it appears elk would have been natural targets for the high altitude game drives for the majority of the summer and fall seasons.

Bison and Antelope: These two animals must be considered because of the possibility they utilized the mountain passes during the prehistoric times. Early historic accounts note they were present in various parts of the high country, especially the nearby South Park area (Fryxell 1926:130). Like elk, bison and antelope tend to form herds and follow regular patterns. Julian Steward (1938:33) feels that antelope and bison could be profitably hunted on a communal basis. Without more evidence that these animals frequent the mountain passes, it is difficult to state with any degree of confidence that bison or pronghorns were the target animals.

The research did not provide any definite conclusions as to what types of animals were being hunted. The information learned from arctic sites indicates that animals that form herds are most effectively hunted with intercept hunting strategy. All of the local species could fit this description depending on the time of year in question. It appears that elk have the longest period of herd congregation. Deer and mountain sheep would most likely be targets only during the fall

migration out of the high country. Bison and antelope are only a remote possibility. However, their herding characteristics would favor a game drive hunting strategy.

Regardless of the target species, the extent of the rock walls intimates a considerable investment in time and energy. Such expenditures indicate the site area was sufficiently predictable for logistically organized hunters. Pendleton and Thomas (1983:29) note that "the effort required to construct such facilities is in direct proportion to the probability of long-term success from that locale." Binford (1978:169) adds that if there were excellent faunal preservation we would expect to find high utility parts at such sites. Unfortunately, no preserved faunal materials were found during the course of this research that would help prove this observation.

Lacking such preservation or contextual buried deposits of cultural materials, the temporal interpretation of the Monarch sites relies on projectile point typology. As mentioned earlier, these associations have distinct problems with various regional interpretation and imprecise dating techniques. Additionally, with one exception, all points from the sites were recovered from the surface of the alpine tundra.

Conservatively, it appears that the use of the Monarch area began by at least the Middle Archaic period (3000-5000 B.C.)[2] and continued until sometime in the Mid Ceramic (A.D. 1000-A.D. 1500). By far the greatest

---

[2]It should be noted there are four projectile points from these sites that exhibit some late Paleo-Indian to mid Archaic similarities. Paleo-Indian sites are found on both sides of the Continental Divide in central Colorado. It is very likely that some of the early use of this area was made by these peoples.

numbers of projectile points are represented in the Early Ceramic and Mid-Ceramic periods. This is especially true at Sites 5CF499 and 5CF428. Additionally, the radiocarbon dates obtained from analyses of charcoal in the excavations indicate use of the drive walls during those periods. Cultural affiliation during this period may have originated in the Great Basin, Southwest, or Plains cultural areas. It is tempting to state that the small corner-notched points resulted from the closest possible source area, the eastern foothills, but only a few serrated points were found at the Monarch sites. This is not the pattern observed in most foothills locations. Serriation may likely imply function of the site rather than cultural significance.

This use of recovered projectile point typology indicates that the use of this area diminished after the Mid-Ceramic period. Interestingly this follows the pattern observed in the Great Basin where such "high-cost hunting facilities tend to be associated with relatively early point types" (Pendleton and Thomas 1983:31). Benedict's research notes some decrease in the number of later materials on sites in the Front Range (Benedict, personal communication). Late Ceramic and even historic contact materials have been located in excavations near the drive sites. Unfortunately it is unknown if these later peoples used the drives in a communal fashion or if the observed materials represent an isolated visit (vision quest?) to such mountaintop locations.

Future Research

A number of research possibilities remain to be investigated. For example, areas in the vicinity of campsites 5CF208 and 5CF430 have

excellent possibilities for stratified materials. Excavations in these areas may help determine the cultural sequence in this area.

Secondly, considerable work needs to be done to determine the overall patterns of game migrations in the Monarch area. An interesting experiment would be to stage a mock game drive and record the behavior of animals as they were pushed through the site area. This might produce data helpful in determining the overall potential and efficiency of such a system.

Other research goals might be establishment of a local tree ring chronology to date the wooden sewels, more work on the available fauna in this area, and further excavation of the known hunting blinds.

Finally this site area should be preserved. It is rare to find structural remains of prehistoric cultures in this part of Colorado or anywhere in the southern Rocky Mountains. These sites, fortunately, have not been in areas where extensive construction or mining activities have occurred. It is hoped that they will remain in this condition.

LIST OF REFERENCES CITED

Ahler, Stanley A.
1979 Functional Analysis of Nonobsidian Chipped Stone Artifacts: Terms, Variables, and Quantifications. In Lithic Use-wear Analysis, edited by B. Hayden, pp. 301-328. Academic Press, New York.

Aikens, C. Melvin
1970 Hogup Cave. Anthropological Papers No. 93. University of Utah, Provo.

Aikens, C. Melvin, & David B. Madsen
1986 Prehistory of the Eastern Area. In Great Basin, edited by Warren L. D'Azenrod, pp. 149-160. Handbook of North American Indians, Vol. 11, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Antevs, Ernst
1955 Geologic-Climatic Dating in the West. American Antiquity 20 (4, pt. 1):168-191.

Armstrong, David M.
1972 Distribution of Mammals in Colorado. Monograph of the Museum of Natural History No. 3. University of Kansas, Manhattan.

Barry, R. G.
1973 A Climatological Transect Along the East Slope of the Colorado Front Range. Arctic and Alpine Research 5(2):89-110.

Baumhoff, M.A. and J.S. Byrine
1959 Desert Side-notch Points as a Time Marker in California. University of California Archaeological Survey Report No. 48: 32-65.

Bender, Susan J. and Gary A. Wright
1988 High Altitude Occupations, Cultural Process, and High Plains Prehistory: Retrospect and Prospect. American Anthropologist 90(3):619-639.

Benedict, James B.
1969 Aerial Photography and Mapping of the Rollins Pass Site, Colorado. Year Book of the American Philosophical Society 1969, pp. 504-506.

1974 Early Occupation of the Caribou Lake Site, Colorado Front Range. Plains Anthropologist 19(63):1-4.

1975a The Albion Boardinghouse Site: Archaic Occupation of a High Mountain Valley. Southwestern Lore 41(3):1-12.

1975b The Murray Site: A Late Prehistoric Game Drive System in the Colorado Front Range. Plains Anthropologist 20(69):161-174.

1975c Scratching Deer: A Late Prehistoric Campsite in the Green Lakes Valley, Colorado. Plains Anthropologist 20(70):7-17.

1979a Excavations at the Blue Lake Valley Site, Front Range, Colorado. Southwestern Lore 45(4):7-17.

1979b Getting Away from it All: A Study of Man, Mountains, and the Two-Drought Altithermal. Southwestern Lore 45(3):1-12.

1981 The Fourth of July Valley. Glacial Geology and Archeology of the Timberline Ecotone. Research Report No. 2. Center for Mountain Archeology, Ward, Colorado.

1985a Arapaho Pass: Glacial Geology and Archeology at the Crest of the Colorado Front Range. Research Report No. 3. Center for Mountain Archeology, Ward, Colorado.

1985b Old Man Mountain, A Vision Quest Locality in the Colorado High Country. Research Report No. 4. Center for Mountain Archeology, Ward, Colorado.

1985c Size-Frequency Analysis of the Rhizocarpon geographicum, Population on a Game Drive Wall at Site 5CF373. MS in possession of author.

1987 A Fasting Bed and Game Drive Site on the Continental Divide in the Colorado Front Range. Southwestern Lore 53(3):1-27.

Benedict, James B. and Byron L. Olson
1978 The Mount Albion Complex. A Study of Prehistoric Man and the Altithermal. Research Report No. 1. Center for Mountain Archeology, Ward, Colorado.

Binford, Lewis R.
1978 Nunamuit Ethnoarchaeology. Academic Press, New York.

1980 Willowsmoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. American Antiquity 45(1):4-20.

1983 In Pursuit of the Past. Thames and Hudson, New York.

Black, Kevin D.
1983 Shelter and Subsistence at 5GN344, A High Altitude Short-Term Camp Near Almont, Colorado. Southwestern Lore 49(3):1-27.

1988 Archaic Origin's Chronology in the Colorado Rockies: The Mountain Tradition. Paper presented at the 1986 Plains Anthropological Conference, Denver.

Breternitz, David A. (editor)
1971 Archaeological Investigations at the Wilbur Thomas Shelter, Carr, Colorado. Southwestern Lore 36(4):53-104.

Buckles, William G.
1968 Archaeology in Colorado: Historical Tribes. Southwestern Lore 34(3):53-67.

1971 The Uncompahgre Complex: Historic Ute Archaeology and Prehistoric Archaeology on the Uncompahgre Plateau in West Central Colorado. Unpublished Ph.D. dissertation, Anthropology Department, University of Colorado, Boulder.

Butler, Robert B.
1986 The Pottery of Eastern Idaho. In The Pottery of the Great Basin and Adjacent Areas, edited by Suzanne Griset, pp. 37-57. Anthropological Papers, No. 111. University of Utah, Provo.

Butler, William B.
1988 The Woodland Period in Northeastern Colorado. Plains Anthropologist 33(122):449-465.

Chronic, Halka
1980 Roadside Geology of Colorado. Mountain Press, Missoula, MT.

Crawford, R.D.
1901 A Preliminary Report on the Geology of the Monarch Mining District, Chaffee County, Colorado. Colorado Geological Survey, Bulletin 1.

Darlington, David
1984 The Dendrochronological Dating of Three Bighorn Sheep Traps in Fremont County, Wyoming. Unpublished M.A. thesis, Department of Anthropology, University of Wyoming, Laramie.

Diggs, Robert D.
1982 Stone Walls and Shafts: Evidence of a Communal Game Drive System on the Colorado Plateau. Southwestern Lore, 48(3):26-38.

Dittberner, Philip L. and M. R. Olson
1983 The Plant Information Network (PIN) Data Base: Colorado, Montana, North Dakota, Utah, Wyoming. U.S. Fish and Wildlife Service Publication. FWS/OBS 83/36. Fort Collins, CO.

Driver, Harold
1969 Indians of North America. University of Chicago Press, Chicago.

Eighmy, Jeffrey L.
1984 Colorado Plains Prehistoric Context. Office of Archaeology and Historic Preservation, Colorado Historical Society, Denver.

Emerson, E. R.
1881 History of Chaffee County. History of the Arkansas Valley, Colorado. O. L. Baskin, Chicago.

Frison, George C.
1970 The Glenrock Buffalo Jump, 48CO304. Plains Anthropologist, 15(50), pt. 2.

1978 Prehistoric Hunters of the High Plains. Academic Press, New York.

Frison, George C., M. Wilson, and D. N. Walker
1978 The Big Goose Creek Site: Bison Procurement and Faunal Analysis. Occasional Papers on Wyoming Archaeology, No. 1. University of Wyoming, Laramie.

Fry, Gary F. and Gardiner F. Dalley
1979 The Levee Site and the Knoll Site. Anthropological Papers, No. 100. University of Utah, Provo.

Fryxell, F. M.
1928 The Former Range of the Bison in the Rocky Mountains. Journal of Mammalogy 9(2):129-133.

Glidden, D. E.
1982 Winter Wind Studies in Rocky Mountain National Park. Rocky Mountain Nature Association, Estes Park, CO.

Gooding, John D.
1981 The Archaeology of Vail Pass Camp. Highway Salvage Report No. 35. Colorado Department of Highways, Denver.

Gould, Richard A.
1969 Yiwara: Foragers of the Australian Desert. Charles Scribner's and Sons, New York.

Greiser, Sally T. and Payson D. Sheets
1979 Raw Materials as a Functional Variable in Use-Wear Studies. In Lithic Use-wear Analysis, edited by B. Hayden, pp. 289-296. Academic Press, New York.

Grønnow, Bjarne, Morten Meldgaard, and Jørn Berglund Nielsen
1983 Aasivissuit-the Great Summer Camp: Archaeological, Ethnographical and Zoo-archaeological studies of a Caribou-Hunting Site in West Greenland. Man and Society (Meddelelser om Grønland) 5 Copenhagen.

Gunnerson, James H.
1987 Archaeology of the High Plains. Colorado Cultural Resource Series, No. 19. Burea of Land Management, Denver.

Guthrie, Mark R., Renee Johnson, Powys Gadd, and Joseph J. Lishka
1984 Colorado Mountains Prehistoric Context. Office of Archaeology and Historic Preservation. Colorado Historical Society, Denver.

Hagar, Ivol K.
1976 5CR1 - Draper Cave: Excavation and Research Report. Southwestern Lore 42(3):1-13.

Harrington, Fred A. Jr.
1978 Ecological Segregation of Ungulates in Alpine and Subalpine Communities. Unpublished Ph.D. Dissertation, Department of Fishery and Wildlife Biology, Colorado State University, Fort Collins.

Harrington, H.D.
1967 Edible Native Plants of the Rocky Mountains. University of New Mexico Press, Albuquerque.

Hayes, Alden C.
1964 The Archaeological Survey of Wetherill Mesa: Mesa Verde National Park, Colorado. National Park Service Archaeological Research Series 7-A:129.

Heizer, Robert F. and M. A. Baumhoff
1961 The Archaeology of Wagon Jack Shelter. In The Archaeology of Two Sites at Eastgate, Churchill County, Nevada, pp. 119-149. Anthropological Records, No. 20. University of California, Berkeley.

Heizer, Robert F. and T.R. Hester
1978 Great Basin Projectile Points: Form and Chronology. Bellena Press Publications in Archaeology, Ethnology and History, No. 10. Socorro, New Mexico.

Hibbs, L., T. Woodard, W. Rutherford, and G. Bear
1973 History and Distribution of Bighorn Sheep in Colorado. Colorado Division of Wildlife, Denver, CO.

Holmer, Richard N.
1986 Common Projectile Points of the Intermountain West. In Anthropology of the Desert West, Essays in Honor of Jesse D. Jennings, edited by C. J. Condie and D. D. Fowler, pp. 89-110. Anthropological Papers, No. 110. University of Utha, Salt Lake City.

Holmer, Richard N. and Dennis G. Weder
1980 Common Post Archaic Projectile Points of the Fremont Area. In Fremont Perspectives, edited by Dennis B. Madsen, pp. 55-68. Antiquities Section Selected Papers, No. 16. Utah State Hitorical Society, Salt Lake City.

Hurst, Clarence T.
1939 A Ute Shelter in Saguache County, Colorado. Southwestern Lore 5(3):59.

Husted, Wilfred M.
1962 A Proposed Archaeological Chronology for Rocky Mountain National Park Based on Projectile Points and Pottery. Unpublished M.A. thesis, Department of Anthropology, University of Colorado, Boulder.

Hutchinson, Lisa B.
1981 Prehistoric Game-Drive Systems in the Alpine Regions of the Colorado Front Range and Monarch Pass, Colorado. Unpublished Report to Anthropology Department, Colorado State University, Fort Collins. Ms. in possession of author.

Hutchinson, L. Art and Ramona G. Hutchinson
1978 Archaeological Survey of the Proposed Lift #3 and Proposed Ski Run Area, Monarch Ski Area, Chaffee County, Colorado. Unpublished report to Salida Ranger District, Pike-San Isabel National Forest and Monarch Recreation Corporation. Ms. in possession of authors.

Irwin, Henry J. and Cynthia C. Irwin
1959 Excavations at the Lo DaisKa Site. Proceedings, No. 8. Denver Museum of Natural History, Denver.

Irwin-Williams, Cynthia
1979 Post-Pleistocene Archaeology 7000-2000 B.C. In Southwest, edited by Alfonso Ortiz, pp. 31-60. Handbook of North American Indians, vol. 9, William G. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Irwin-Williams, Cynthia and Henry J. Irwin
1966 Excavations at Magic Mountain. Proceedings, No. 12. Denver Museum of Natural History, Denver.

Janetski, Joel C.
1985 Archaeological Investigations at Sparrow Hawk (42TO261). A High Altitude Prehistoric Hunting Camp in the Southern Oquirrh Mountains, Tooele County, Utah. Technical Series, No. 85-37. Brigham Young University, Museum of People and Cultures, Provo.

Jennings, Jesse D.
1928 Prehistory of Utah and the Eastern Great Basin. Anthropological Papers, No. 98. University of Utah, Provo.

Johnson, Bruce K.
1980 Bighorn Sheep Habits, Forage Preferences, and Habitat Selection in Alpine and Subalpine Communities. Unpublished Ph.D. Dissertation, Department of Fishery and Wildlife Biology, Colorado State University, Fort Collins.

Jones, Bruce A.
1984a The Curecanti Archaeological Project: 1980 Investigation in Curecanti National Recreation Area, Colorado. Midwest Archeological Center Occasional Studies in Anthropology, No. 8. Ms. on file with Midwest Archeological Center, National Park Service, Lincoln, Nebraska.

1984b Radiocarbon Dates from the Gunnison Basin, Curecanti National Recreation Area, Colorado. Midwest Archeological Center Occasional Studies in Anthropology, No. 14. Ms. on file with Midwest Archeological Center, National Park Service, Lincoln, Nebraska.

1986 The Curecanti Archeological Project: 1981 Investigations in Curecanti National Recreation Area, Colorado. Midwest Archeological Center Occasional Studies in Anthropology, No. 14. Ms. on file with Midwest Archeological Center, National Park Service, Lincoln, Nebraska.

Kainer, Ronald E.
1976 Archaeological Investigations at the Spring Gulch Site 5LR252). Unpublished M.A. Thesis, Department of Anthropology, Colorado State University, Fort Collins, 227 pp.

Kehoe, Thomas F.
1973 The Gull Lake Site: A Prehistoric Bison Drive Site in Northwestern Saskatchewan. Publications in Anthropology and History, No. 1. Milwaukee Public Museum, Milwaukee.

Kent, H. C. and K. W. Porter (editors)
1980 Colorado Geology. Rocky Mountain Association of Geologists, Denver.

Kent, Ron
1986 1983-1984 BIA ANSCA 14(H)(1) Doyon Region Caribou Fence Investigations. Paper presented at 13th Annual Conference, Alaska Anthropological Association, Fairbanks.

Kidder, Alfred V.
1932 The Artifacts of Pecos. Yale University Press, New Haven.

Killim, Edward
1987 Report on Rifle Casings from Monarch Pass. Ms. in possession of this author.

Kingsbury, L. A. and L. H. Gabel
1980 Eastern Apache Campsites in Southeastern Colorado. Publications in Archaeology, No. 3. Colorado College, Colorado Springs.

Kornfeld, Marcel and Lawrence Todd
1985 McKean-Middle Archaic: Current Research. Occasional Papers in Wyoming Archaeology, No. 4. University of Wyoming, Laramie.

Lanning, E. P.
1963 Archaeology of the Rose Spring Site INY-372. University of California Publications in American Archaeology and Ethnology 49(3):237-336.

Leach, Larry L.
1966 Excavations at Willowbrook: A Stratified Site near Morrison. Southwestern Lore 32(2):25-46.

Lynch, A. J. and Michael Elder
1984 Gwich'In Caribou Fences: New Light on an Old Subject. Paper presented at 11th Annual Conference of Alaska and Anthropological Association, Fairbanks.

Madsen, R. E.
1977 Prehistoric Ceramics of the Fremont. Museum of Northern Arizona Ceramic Series 6:1-40.

McGuire, Kelly R. and Brian Hatoff
1987 A Prehistoric Large Game Drift Fence in the Clan Alpine Range, West-Central Nevada. Unpublished report for Far Western Archaeological Research Group and Bureau of Land Management, Reno, Nevada.

Mead, J. R.
1882 Ancient Stone Remains on Summit of Rocky Mountains. Scientific American 46(1):3.

Metcalf, Michael D.
1974 Archaeological Excavations at Dipper Gap: A Stratified Butte Top Site in Northeast Colorado. Unpublished M.A. Thesis, Department of Anthropology, Colorado State University, Fort Collins.

Morris, Earl H. and Robert F. Burgh
1954 Basketmaker II Sites Near Durango, Colorado. Publication No. 604. Carnegie Institute, Washington, D.C.

Mulloy, William
1958 A Preliminary Historical Outline for the Northwestern Plains. Publications in Science, No. 22(1). University of Wyoming, Laramie.

Murie, Olaus J.
1951 The Elk of North America. The Stackpole Company, Harrisburg, Pennsylvania.

Munsell Color Company, Inc.
1954 Munsell Soil Color Charts. Munsell Color Company, Inc., Baltimore.

Murphy, Timothy and Fred P. Frampton
1986 Aboriginal Antelope Traps on BLM Lands in the Elko Area, Northern Nevada. Paper presented at 20th Biennial Great Basin Anthropological Conference, Las Vegas.

Nelson, C. E.
1967 The Archaeology of Hall-Woodland Cave. Southwestern Lore 33(1):1-13.

1970 Chamber Cave. Southwestern Lore 36(1):1-11.

1971 The George W. Lindsay Ranch Site, 5JF11. Southwestern Lore 37 (1)1-14.

Peaker, Jan
1975 Cultural Resource Inventory Report North of Monarch Ski Area. Unpublished report for Salida Ranger District, Pike San Isabel National Forest. Ms. on file at Salida District Office, Salida, Colorado.

Pendleton, Lorann, S. A. and David H. Thomas
1983 The Fort Sage Drift Fence-Washoe County, Nevada. Anthropological Papers No. 58, part 2. American Museum of Natural History, New York, New York.

Rasmussen, Knud
1927 Across Arctic America. Putnam and Sons, New York.

Reeves, Brian O. K.
1983 Cultural Change in the Northern Plains: 1000 B.C.-A.D. 1000. Occasional Paper No. 20. Archaeological Survey of Alberta, Alberta, Edmonton.

Reher, Charles A. and George C. Frison
1971 The Vore Site, 48CK302, A Stratified Buffalo Jump in the Wyoming Black Hills. Plains Anthropologist Memoir 18, part 2.

Renaud, Etienne B.
1942 Reconnaissance Work in the Upper Rio Grande Valley, Colorado and New Mexico. Archaeological Series No. 3. Department of Anthropology, University of Denver, Denver, CO.

Rockafellow, Capt B.F.
1881 History of Fremont County, History of the Arkansas Valley - Colorado. O.L. Baskin & Co., Chicago:640-641.

Rose, Judy, and Randy Snedeker
1982 High Altitude Archaeology: The Markagunt Plateau. Paper presented at the 18th Great Basin Anthropogical Conference, Reno.

Rossilon, Mary P.
1984 The Curecanti Archaeological Project: The Archaeology of Marion, An Historic Railroad Camp in Curecanti National Recreation Area, Colorado. Occasional Studies in Anthropology, No. 9. Midwest Archaeological Center, National Park Service, Lincoln, Nebraska.

Sanford, S.
1926 John L. Routt, First State Governor of Colorado. Colorado Magazine, 3(3):128.

Simms, Steven R.
1979 High Altitude Archaeology in Utah. Archaeological Center Reports of Investigation, No. 79-36. University of Utah, Salt Lake City.

Speiss, Arthur E.
1979 Reindeer and Caribou Hunters: An Archaeological Study. Academic Press, New York.

Sprague, Marshall
1964 The Great Gates: The Story of the Rocky Mountain Passes. Little Brown and Company, Boston.

Stefansson, Vilhjalmur
1914 The Stefansson-Anderson Arctic Expedition of the Amercian Museum: Preliminary Ethnological Report. Anthropological Papers, No. 14. American Museum of Natural History, New York.

Steward, Julian H.
1938 Basin-Plateau Sociopolitical Groups. Bulletin, No. 120. Bureau of American Ethnology, Washington, D.C.

1941 Culture Element Distributions: XIII. Nevada Shoshone. University of California Anthropological Records 4(2). University of California, Berkeley.

1943 Culture Elements Distribution: XXIII. Gosiute Shoshone. University of California Anthropological Records 8(3). University of California, Berkeley.

Stewart, Omar C.
1962 Ute Bands: Early Historical References. Southwestern Lore 28(2):31-33.

Stiger, Mark A.
1980 Archaeological Inventory and Evaluation of Curecanti Recreation Area. Occasional Studies in Anthropology, No. 7. Midwest Archaeological Center, Natiomal Park Service, Lincoln, Nebraska.

Stoney, George M.
1899 Explorations in Alaska. US Naval Proceedings, US Naval Institute, Annapolis.

Stuiver, Minze and Gordon W. Pearson
1986 High Precision Calibration of the Radiocarbon Time Scale, A.D. 1950-500 B.C. Radiocarbon 28(2B):805-838.

Tate, Marcia J., Bruce E. Rippeteau, and David R. Stuart
1978 The Colorado State Parks Archaeology Training Manual. Technical Publication Series, No. 13. Office of State Archaeologist, Denver, CO.

Thomas David H.
1982 The 1981 Alta Toquima Village Project: A Preliminary Report. Technical Report Series. No. 27. Desert Research Institute, Social Sciences Center, Reno, Nevada.

Thomas, David H. and E. H. McKee
1974 An Aboriginal Rock Alignment in the Toiyabe Range, Central Nevada. American Museum Novitiates, 2534:1-18.

Tringham, Ruth, Glen Cooper, George Odell, Barbara Voytek, and Anne Whitman
1974 Experimentation in the Formation of Edge Damage: A New Approach to Lithic Analysis. Journal of Field Archaeology 1:171-196.

Wallace, William J. and Edith S. Taylor
1960 The Surface Archaeology of Indian Hill Anza-Borrego Desert State Park, California. The Masterkey 34(10):14.

Wardle, Peter
1968 Engelmann Spruce (Picea engelmannii Engel.) at its upper limits on the Front Range, Colorado. Ecology 49(3):483-495.

Watts, Howard
1975 The Avery Ranch Site. Southwestern Lore 41(1):15-27.

Weber, W. A.
1976 Rocky Mountain Flora. Colorado Associated University Press, Boulder.

Wedel, Waldo R.
1961 Prehistoric Man on the Great Plains. University of Oklahoma Press, Norman.

Wendorf, Fred and John P. Miller
1959 Artifacts from High Mountain Sites in the Sangre de Cristo Range, New Mexico. El Palacio 66(2):37-52.

Wheat, Joe Ben
1972 The Olsen-Chubbuck Site. A Paleo-Indian Bison Kill. American Antiquity 37(1), pt. 2:1-180.

Wilke, Phillip J.
1986 Aboriginal Game Drive Complexes At and Near Whiskey Flat, Mineral County, Nevada. Paper presented at the 1986 Great Basin Anthropological Conference, Las Vegas.

Willey, Gordon R. and Philip R. Phillips
1958 Method and Theory in American Archaeology. University of Chicago Press, Chicago.

Windmiller, Ric and Bruce B. Huckell
1973 Desert Culture Sites Near Mormon Lake, Northern Arizona. The Kiva 39(2):199-211.

Withers, A. M.
1954 Reports of Archaeological Fieldwork in Colorado, Wyoming, New Mexico, Arizona and Utah in 1952 and 1953: University of Denver Archaeological Fieldwork. Southwestern Lore 19(4):1-3.

Witkind, W. Max
1971 An Archaeological Interpretation of the Roberts Buffalo Jump Site, Larimer County, Colorado. Unpublished M.A. thesis, Department of Anthropology, Colorado State University, Fort Collins.

Wood, John J.
1967 Archaeological Investigations in Northeastern Colorado. Unpublished Ph.D. dissertation, Department of Anthropology, University of Colorado, Boulder.

Wood, W. Raymond.
1971 Excavations at Two Woodland Sites in Arapahoe County, Colorado. Plains Anthropologist 16(54).

Woodward, B. L. and William G. Buckles
1978 Prehistoric Material Culture. In Anthropological Investigation Near the Crest of the Continent 1975-1978, edited by W. G. Buckles. Submitted to Bureau of Reclamation, Denver.

Wormington, H. Marie
1956 The Moore, Casebier, and Taylor sites. In Archaeological Investigations on the Uncompahgre Plateau in West Central Colorado, edited by H. M. Wormington and Robert H. Lister, pp. 3-64. Proceedings No. 2, Denver Museum of Natural History, Denver.

Wright, Gary W.
1980 High Country Adaptation. Plains Anthropoligst 25:181-197.

Young, Sewall
1982 Migration Patterns of the Upper Gunnison River Elk Herd. Unpublished M.A. Thesis, Department of Fishery and Wildlife Biology, Colorado State University, Fort Collins.

Zwinger, A. H. and B. E. Willard
1986 Land Above the Trees: A Guide to American Alpine Tundra. Harper and Row, New York.

APPENDIX

HISTORIC ARTIFACTS

The historic artifacts deposited on the Monarch Pass sites indicate the continuing strategic importance of this pass in spite of the passage of time and cultural change. The focus of this project is not historical artifacts, but the quantity of historic materials found on and near the sites emphasize the continuing strategic importance of this site area.

The following discussion should be interpreted as a summary of various types of historical remains available on the sites and not a complete listing. For example, ski area use has resulted in recent and unique additions to the sites in the southern half of the site group. Such items as single skis, zipper pulls, broken sunglasses, and pocket change tell interesting stories, but not ones relevant to this project. Other items indicate historical activities not unlike those in prehistoric times.

Hunting of animals continues along the Continental Divide as evidenced by the quantity of spent rifle cartridges. A small selection of brass casings was collected from the sites and analyzed by a forensic specialist who is a graduate student at CSU (Killim 1987). His analysis indicates a broad spectrum of rifle types was used, ranging from a brass cased 40.82, an early 1880s black powder-type rifle, to the ever-popular 30.30 saddle gun. Recent rifle varieties, such as the 257 Roberts, are also represented in the sample.

The vast majority of historic materials were apparently associated with early mining and mountain travel activities. A majority of the travel-related material was located in the area referred to as Old-Old Monarch Pass (5CF208). The original survey of this area (Hutchinson and Hutchinson 1978) indicated this was a historic camping spot and roadway over the pass. Objects found included colored glass bottles, crockery fragments, leather shoe soles, condensed milk cans, cut nails, stove parts, a broken steel ax, and a rusted, three-rivet, wooden-handled knife (see Figure 20). One interesting item recovered was identified as a lead bullet fragment, which had penetrated a steel can and mushroomed out of shape. In addition, there is evidence of an abandoned utility line through the pass, indicated by pieces of broken insulators, utility pole fragments, utility pole stumps, and support wires.

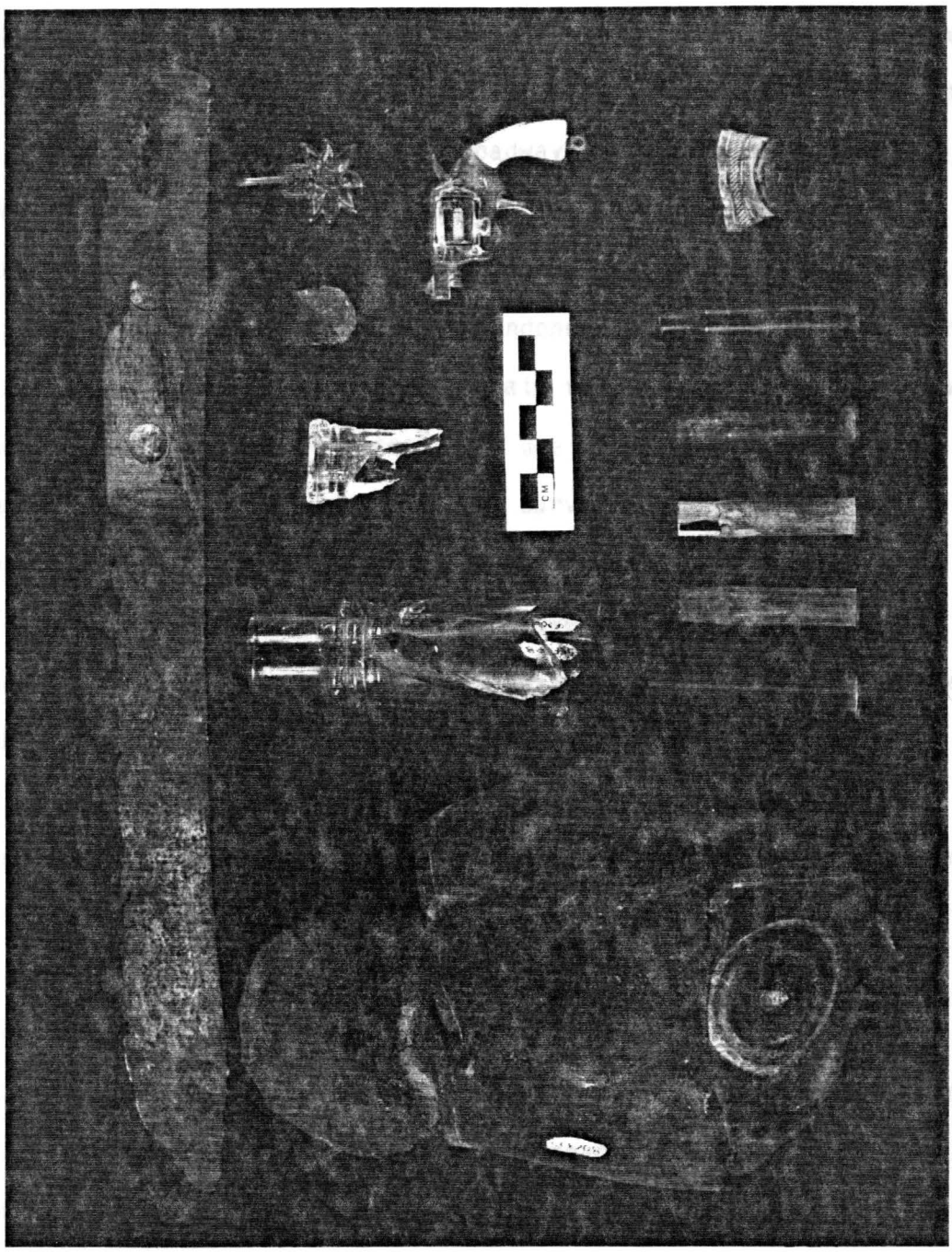
Historic items were also located in abundance on the Water Dog Divide Game Drive site (5CF373), as well as in the nearby campsite of 5CF430. These remains reflect the presence of a utility line, hunting activities, and possibly a temporary camp for the construction of the utility line. Artifacts included numerous electric insulators, support wires, power pole stumps, colored glass, steel cans, and spent rifle cartridges.

Historic Roadways and Other Construction Activities

The ski area, with its obvious amenities such as chairlifts, associated buildings, and ski runs, is the main architectural feature directly associated with the area of the archaeological sites. Other evidence for historic activities is evident but minimally apparent on and near the prehistoric sites. Examples include a two-lane roadway

Top: Wooden handled knife. Middle: a) soldered, hole-in-top can; b) neck and collar of brandy style bottle; c) neck and collar of double ring style extract bottle; d) lead slug embedded in tin can fragment; e) zipper pull from ski jacket; f) small cap gun; g) brass casings from rifles; h) shotgun shell base.

Figure 20. Historic Materials Photograph



leading up through the ski area lease and cresting the pass at site 5CF208. It continues north and south until reaching the top terminals of the two chairlifts. This roadway is maintained for ski area access and maintenance during the summer season. It appears to have followed and, in most areas, erased evidence of the original wagon road over the pass. A second and long-abandoned roadway leads northward from the broad saddle of 5CF373 and continues up the Continental Divide ridge toward site 5CF497. This is believed to be an old wagon road built during the construction of the now-abandoned utility line. In addition, a historic mining, pack, and hiking trail follows the Divide and shows occasional use by humans and continual use by deer, elk, and other animals. This trail has recently been surveyed for re-establishment as a non-motorized hiking trail by the Gunnison National Forest.

A recently installed metal weather tower sits on the Continental Divide north of 5CF499 and near site 5CF496. It is owned and operated by the Monarch Ski Area for weather forecasting and avalanche prediction. A slightly buried power supply cable runs to the metal tower from the top of the Breezeway chair lift. It crosses a portion of the Garfield Game Drive site (5CF499) as well as the lithic scatter site, 5CF429. No cultural materials appeared to have been uncovered during its construction.

The final historical remains on the sites are three prospect pits dating from the turn of the century, one near 5CF495 and two on the Water Dog Divide Game Drive site (5CF373). These pits are indicated on a 1901 map of the Monarch Mining District and likely were constructed between 1878 and 1900 (Crawford 1901). They apparently were of little economic importance, as they are shallow and did not produce large

quantities of waste rock or tailings. Also, there is little evidence of timbering or other permanent structures typical of deep shafts. Claim corner markers and cairns are found in various portions of the site. No claim numbers or recording pins were observed on any of the markers. They have no apparent specific historical interest with respect to National Register of Historic Places criteria, even though their age qualifies them.

The prevalence of historical materials and sites indicates at least occasional use of this area throughout the last century. Such finds stress the continuing importance of this mountain crest location. Apparently at least some of the important features of this ecosystem have proven valuable to peoples from vastly different cultural backgrounds.