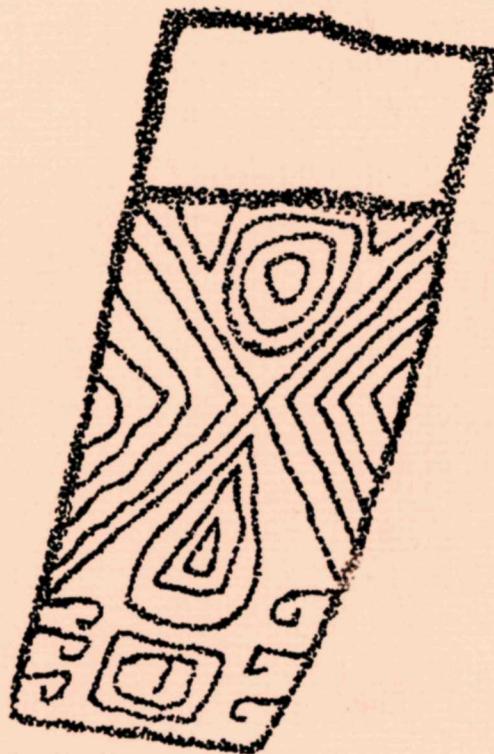


# PETRIFIED FOREST NATIONAL PARK BOUNDARY SURVEY, 1988: THE FINAL SEASON

by  
SUSAN J. WELLS

With a contribution by  
DON D. CHRISTENSEN



Western Archeological and Conservation Center  
National Park Service  
U.S. Department of the Interior

Publications in Anthropology 51  
1989

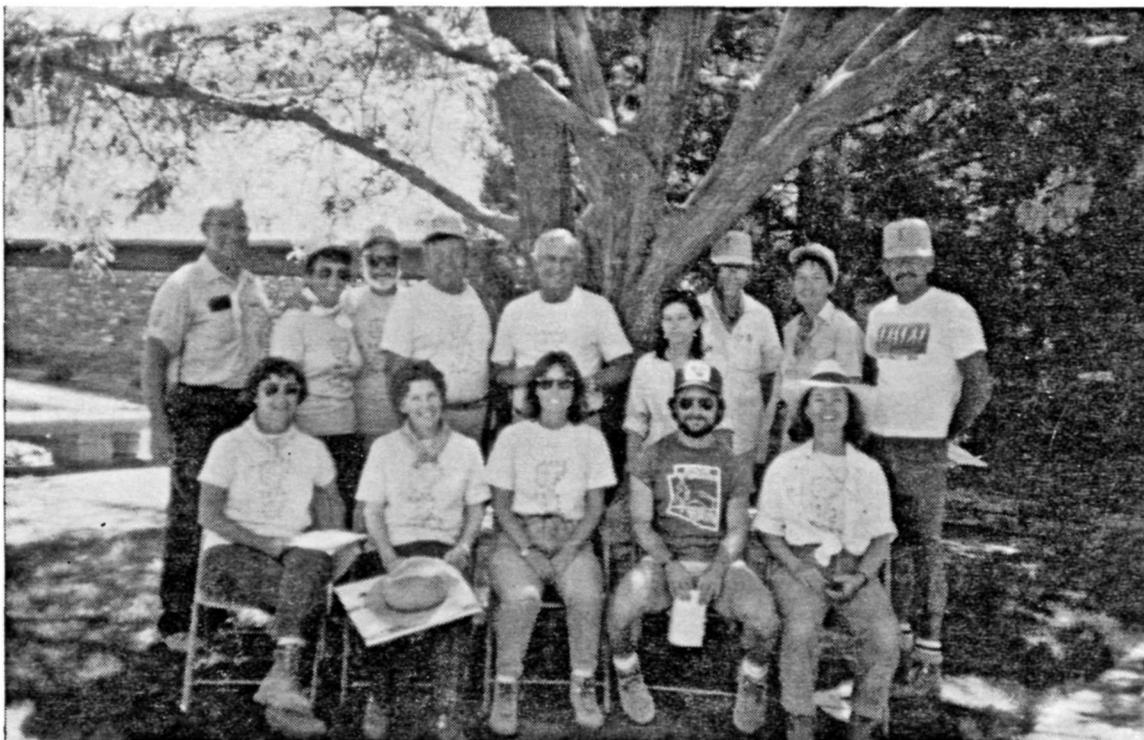
**PETRIFIED FOREST NATIONAL PARK  
BOUNDARY SURVEY, 1988:  
THE FINAL SEASON**

by  
**SUSAN J. WELLS**

With a contribution by  
**DON D. CHRISTENSEN**

**Western Archeological and Conservation Center  
Tucson, Arizona  
April 1989**

**Publications in Anthropology 51**



PEFO 1988 A: Volunteers and WACC Archeologists. Top Row: Ferral Knight, A.J. Bock, Frank Bock, Jim Stoddart, Jack McCreery, Lynne D'Ascenzo, Bob Cooper, Susan Wells and Don Christensen. Bottom Row: Kitty Stoddart, Pat McCreery, Sandy McCreery, Marty Tagg and Trinkle Jones.

Cover Illustration: Rock art design from PEFO 88A-16.

## TABLE OF CONTENTS

	PAGE
LIST OF FIGURES . . . . .	v
LIST OF TABLES . . . . .	vii
ABSTRACT . . . . .	viii
PROJECT SUMMARY . . . . .	ix
ACKNOWLEDGEMENTS . . . . .	xi
Chapter 1. INTRODUCTION . . . . .	1
Field Methods . . . . .	2
Environment . . . . .	4
Organization of this Report . . . . .	5
Chapter 2. SURVEY RESULTS . . . . .	7
Survey Data . . . . .	7
Sites in the Boundary Survey Area . . . . .	9
Sites on Pilot Rock . . . . .	11
Mountain Lion Mesa Sites . . . . .	11
Sites Southeast of Agate House . . . . .	20
Other Sites Recorded by PEFO 1988 A . . . . .	20
Site Types . . . . .	22
Rock Art Sites . . . . .	22
Single-Room Masonry Sites . . . . .	24
Multiple-Room Masonry Sites . . . . .	24
Pit House Site . . . . .	25
Slab Feature Sites . . . . .	25
Lithic Scatters . . . . .	26
Site Dates . . . . .	26
Site Condition . . . . .	27
Sites Outside the Park Boundary . . . . .	27
Isolated Finds . . . . .	28
Chapter 3. ARTIFACTS . . . . .	31
Ceramics . . . . .	31
Chipped Stone Artifacts . . . . .	33
Ground Stone Artifacts . . . . .	35

CONTENTS (continued)

	PAGE
Chapter 4. THE ROCK ART OF MOUNTAIN LION MESA by Don D. Christensen . . . . .	37
Petroglyph Design Element Analysis . . . . .	38
Anthropomorphs . . . . .	38
Zoomorphs . . . . .	49
Hands and Tracks . . . . .	52
Geometric Designs . . . . .	54
Abstract Designs . . . . .	57
Indeterminate and Indistinct Designs . . . . .	57
Historical Designs . . . . .	58
Discussion . . . . .	58
Temporal Affiliation . . . . .	59
Design Style . . . . .	60
Function of Rock Art . . . . .	61
Conclusions . . . . .	62
Chapter 5. SETTLEMENT PATTERN STUDY . . . . .	63
The Data . . . . .	63
Landform . . . . .	66
Site Dates . . . . .	68
Paleo-Indian and Archaic . . . . .	70
Basketmaker . . . . .	70
Pueblo I . . . . .	73
Pueblo II and Pueblo III . . . . .	75
Pueblo IV . . . . .	77
Comparison with the Hopi Buttes and Homol'ovi	
Survey Data . . . . .	79
Archaic . . . . .	79
Basketmaker . . . . .	81
Pueblo I . . . . .	82
Pueblo II/III . . . . .	82
Pueblo IV . . . . .	83
Discussion . . . . .	83
REFERENCES . . . . .	87

## LIST OF FIGURES

		PAGE
Figure 1.1	PEFO 1988 A crew recording rock art at Mountain Lion Mesa . . . . .	4
Figure 2.1	Location of sites recorded by PEFO 1988 A boundary survey . . . . .	10
Figure 2.2	PEFO 88A-10, a multiple-room masonry site located on top of Mountain Lion Mesa . . . . .	12
Figure 2.3	PEFO 88A-11, a rock art site at Mountain Lion Mesa with 288 petroglyphs . . . . .	14
Figure 2.4	PEFO 88A-12, a rock art site at Mountain Lion Mesa with 38 petroglyphs . . . . .	15
Figure 2.5	PEFO 88A-13, a rock art site at Mountain Lion Mesa with 101 petroglyphs . . . . .	16
Figure 2.6	PEFO 88A-14, a rock art site at Mountain Lion Mesa with 137 petroglyphs . . . . .	17
Figure 2.7	PEFO 88A-15, a rock art site at Mountain Lion Mesa with 27 petroglyphs . . . . .	18
Figure 2.8	PEFO 88A-16, a rock art site at Mountain Lion Mesa with 537 petroglyphs . . . . .	19
Figure 2.9	PEFO 88A-17, a pueblo southeast of Agate House . . . . .	21
Figure 2.10	PEFO 88A-6, a rock art site with a possible masonry room . . . . .	23
Figure 2.11	Location of PEFO 1988 A isolated finds . . . . .	29
Figure 3.1	Chipped stone artifacts . . . . .	34
Figure 4.1	Variety of petroglyph designs . . . . .	40
Figure 4.2	Anthropomorphic petroglyph designs . . . . .	41
Figure 4.3	Petroglyph panel at PEFO 88A-16 . . . . .	42
Figure 4.4	Anthropomorphic petroglyph designs at PEFO 88A-11 . . . . .	44
Figure 4.5	Mask and figure petroglyphs . . . . .	45
Figure 4.6	Kachina mask petroglyphs . . . . .	46
Figure 4.7	Full Kachina figure at PEFO 88A-11 . . . . .	47

LIST OF FIGURES (continued)

	PAGE
Figure 4.8 Petroglyph panel at PEFO 88A-11 . . . . .	48
Figure 4.9 Petroglyph panel with variety of motifs at PEFO 88A-16 . . . . .	50
Figure 4.10 Zoomorphic petroglyph designs . . . . .	51
Figure 4.11 Zoomorphic petroglyphs at PEFO 88A-16 . . . . .	53
Figure 4.12 Ceramic/textile designs at PEFO 88A-16 . . . . .	55
Figure 4.13 Ceramic/textile petroglyphs . . . . .	56
Figure 5.1 Territory surveyed at Petrified Forest National Park as of July, 1988 . . . . .	64
Figure 5.2 Distribution of sites at Petrified Forest in relation to landform . . . . .	67
Figure 5.3 Archaic period sites at Petrified Forest National Park . . . . .	71
Figure 5.4 Basketmaker sites at Petrified Forest National Park . . . . .	72
Figure 5.5 Pueblo I sites at Petrified Forest National Park . . . . .	74
Figure 5.6 Pueblo II and Pueblo III period sites at Petrified Forest National Park . . . . .	76
Figure 5.7 Pueblo IV period sites at Petrified Forest National Park . . . . .	78
Figure 5.8 Map of middle Little Colorado Region . . . . .	80
Figure 5.9 Bar graph comparing percentages of sites from each time period at Petrified Forest, Homol'ovi Ruins State Park and the Southwest Hopi Buttes . . . . .	81

LIST OF TABLES

	PAGE
Table 2.1 PEFO 1988 A Site Data . . . . .	8
Table 2.2 Isolated Finds . . . . .	30
Table 3.1 Ceramic Wares Identified on PEFO 1988 A Sites . . . . .	32
Table 3.2 Collected Ceramics . . . . .	32
Table 3.3 Collected Chipped Stone Artifacts . . . . .	34
Table 4.1 Summary of Petroglyph Design Element Analysis . . . . .	39
Table 5.1 Number of Sites by Type . . . . .	65
Table 5.2 Site Type by Landform . . . . .	66
Table 5.3 Temporal Components . . . . .	69
Table 5.4 Site Type by Time Period . . . . .	69

## ABSTRACT

The fourth and final season of the Petrified Forest National Park Boundary Survey was conducted from June 27 to July 15, 1988. Twenty-one miles of quarter-mile-wide corridor were surveyed along the northern and western edges of the Painted Desert. Additional survey was conducted in various localities throughout the park including Pilot Rock, Mountain Lion Mesa and a ridge system southeast of Agate House. Intensive rock art recording at Mountain Lion Mesa was undertaken upon completion of the survey. Nineteen sites and twelve isolated artifacts were recorded.

Also included in this report is a rock art analysis by Don D. Christensen (Chapter 4). He summarizes the rock art sites recorded this summer and compares Petrified Forest rock art with other rock art from the Rio Grande and Little Colorado River regions.

In addition to summarizing this season's discoveries, this report includes a settlement pattern study using all survey data collected since 1978. Broad patterns of settlement are compared with the Homol'ovi State Park and Southwest Hopi Buttes survey data.

## PROJECT SUMMARY

Project Name: Archeological Boundary Survey, Petrified Forest National Park: the Final Season.

Project Number: PEFO 1988 A.

Package Number: None.

Type of Project: Archeological Survey and Rock Art Recording.

Project Archeologists: Susan J. Wells, Diane Hamann, Lynne D'Ascenzo and Don Christensen.  
Volunteers provided additional labor.

Fieldwork Dates: June 27 to July 15, 1988.

Person-Days: 205 person-days.

Project Location and Size: Boundary survey covered 21-mile-long, quarter-mile-wide corridor along the northern boundary and adjacent western boundary (3360 acres). Reconnaissance survey of Pilot Rock, Mountain Lion Mesa and the ridge system southeast of Agate House covered an additional 120 acres.

Project Scope: 19 sites and 12 isolated finds were recorded. The project included intensive rock art recording at Mountain Lion Mesa.

Summary Management Recommendations: Preservation recommended for all sites. Summary of site condition included in Chapter 2.



## ACKNOWLEDGEMENTS

The completion of the boundary survey at Petrified Forest National Park required the efforts of many people. Of course the project would not have been possible without financial support from the Petrified Forest Museum Association (PFMA) and private donors. Park superintendent L. Edward Gastellum supported the project wholeheartedly and made sure the park staff was available to provide logistical support, moral support and volunteer labor.

WACC Archeologist A. Trinkle Jones was the project director. Having initiated the project in 1985 as field director, she continued her involvement by coordinating funding and volunteer matters. Trinkle also instructed the volunteers in ceramic identification and spent several days with us in the field.

Diane Hamann, Lynne D'Ascenzo and Don Christensen were the crew leaders from WACC. Their archeological expertise and interest in rock art were an invaluable asset. Don's rock art analysis (Chapter 4) is an important contribution to our study. Lynne's help cataloguing photographs and organizing the survey and rock art data was invaluable.

The volunteers from the American Rock Art Research Association (ARARA) were, once again, the core of our labor pool and the moving force behind the project. Pat and Jack McCreery, Kitty and Jim Stoddart and Bob Cooper were there for the fourth season in a row. A.J. and Frank Bock and Sandy McCreery were putting in their second season with us. The ARARA volunteers surveyed the rugged terrain and recorded rock art under less than ideal conditions (in other words it was hot). Frank Bock and Ferral Knight gave an evening slide presentation that was enjoyable and informative.

We had a number of volunteers who worked with us for one to four days. The park staff who volunteered are: Nancy Ackerman, Faith Caffey, Mike Croll, Anne Doherty, Beth and Greg Henry, Mary Kline, Mary Knight, Glenda Mitchell, Gretchen Sherwood (from Mesa Verde N.P.), Larry Titus, Dan Ward, John Williams and Pamela Zimmerman. Park residents Jason Dupee, Robby Dupee, Jimmy Gentless and Jeremy Sutton volunteered along with Sue Farley, Dorothy Harrison and Barbara Mandivil. YCC supervisors Ferral Knight, Molly Hysell and Darell Husard worked with us. The YCC crew, Tammy Alford, Jay

Bitsoe, Randy Gardner, Melissa John, Marty Lewis and Weston Whittaker were involved in one of our ten-mile hikes. Archeologists John Madsen and Marty Tagg donated several days of their professional expertise.

One of the biggest obstacles this year was the problem of access to remote areas along the park boundary. Ranger Bill Wagers led a scouting expedition in the spring to show us access roads. When early rains blocked one of the planned routes, Bill Jeffers kindly provided access through his land which is adjacent to the park. Bill and his wife Lois gave us a tour of a rock art site on their property. Their videotape of the site tour and of Frank and Ferral's lecture is a wonderful memento of the summer of 1988.

The completion of the boundary survey was the cause for much celebrating. Superintendent Gastellum and PFMA director Wayne Cassidy arranged a ceremony to honor the volunteers. Associate Regional Director Lew Albert presented an Honorary Park Ranger award to Pat and Jack McCreery, VIP plaques to Kitty and Jim Stoddart and Bob Cooper, and certificates of appreciation to A.J. and Frank Bock, Sandy McCreery, Don Christensen and Marty Tagg. A plaque was also presented to the Petrified Forest Museum Association for its support of the survey. The volunteers were honored guests at a parkwide pit barbecue and at a farewell dinner at the Painted Desert Inn. The efforts of Carolyn Gastellun, Buddy Dupee, Carl Bowman, Marion Clark and other members of the staff who helped with these festivities are much appreciated.

Division secretary Sandra Elliot provided logistical support for personnel, travel and budget matters. The WACC administrative staff was also very helpful.

The chipped stone artifacts were examined by George Teague (WACC), and by Ken Rozen and John Madsen (Arizona State Museum, University of Arizona).

A number of people were involved in the report production. Drafted illustrations and the artifact photograph were ably done by Ron Beckwith. Don Christensen's chapter on rock art is illustrated with his own drawings. The computer generated maps in Chapter 5 were produced by Jim Holmlund of Geo-Map Inc. We appreciate the efforts of Carol Heathington, who edited the manuscript, and Tina Bays, who formatted, corrected and printed the manuscript.

## Chapter 1

### INTRODUCTION

The final season of the four-year archeological survey of the 91-mile park boundary at Petrified Forest National Park was conducted from June 27 to July 15, 1988. Twenty-one miles along the boundary fence were surveyed. Nineteen sites were recorded this summer but only five sites were within the boundary survey area. In the four seasons, 163 sites have been recorded within the 91-mile-long, quarter-mile-wide survey corridor. Since 1978, 296 sites in the park have been recorded to modern standards (Hammack 1979; Jones 1983; Jones 1987; Tagg 1987; Wells 1988).

The boundary survey was begun in 1985 under the direction of Western Archeological and Conservation Center (WACC) archeologist A. Trinkle Jones. The findings of the first two seasons of field work are summarized in her 1987 report (Jones 1987). The third and fourth seasons were conducted by this author; see Wells (1988) for the results of the third year of survey.

Recording all sites within a quarter-mile-wide corridor along the park boundary should help park management protect these sites from vandalism. In addition, the data can be used for park planning and to enhance interpretation of the cultural resources. The site data collected will help archeologists address the research issues of culture history, economic orientation, technological change, regional interaction and trade (Jones 1987).

The WACC project number, PEFO 1988 A, indicates that this is the first archeological project conducted in the park in 1988. Site field numbers are preceded by PEFO 88A and isolated find numbers are preceded by PEFO 88A-IF. Nineteen sites and 12 isolated finds were recorded. Corresponding Arizona State Museum (ASM) site numbers are listed in Chapter 2.

WACC Archeologists Susan Wells, Lynne D'Ascenzo, Diane Hamann, Don Christensen and Trinkle Jones worked with volunteers from the American Rock Art Research Association (ARARA), the Petrified Forest National Park staff, park residents and visitors, as well as archeologists on holiday. Volunteers provided 75% of the labor for the survey this year. The WACC staff provided 56 person-days, the ARARA volunteers provided 103 and other volunteers and park personnel provided 46 person-days. Funding was provided by the Petrified Forest Museum Association (PFMA) and private donors.

Survey began on Tuesday, June 28, and was completed on Thursday, July 7. All grassland areas were intensively inspected for archeological remains; however, most of the 3360 acres along the fenceline were in badland areas requiring reconnaissance, rather than intensive surveying techniques. After the boundary corridor was completed, additional acreage in the vicinity of Pilot Rock and Mountain Lion Mesa was surveyed by the PEFO 1988 A crew. More than a week was spent recording the rock art and archeological sites at Mountain Lion Mesa. Six rock art sites and a multiple-room masonry site were recorded at the mesa. Almost 200 panels with more than 900 design elements were drawn, photographed, mapped and described at the petroglyph sites. Prior to the beginning of the PEFO 1988 A field season, three sites were recorded on a ridge system southeast of Agate House by Wells.

#### Field Methods

Twenty one miles of the 91-mile-long boundary fence were surveyed this summer. Most of this was in the Painted Desert proper, an area of rugged terrain and heavily eroded surfaces. It quickly became apparent that intensive 100 percent survey coverage of the Painted Desert would be unnecessary. The steep clay hills were virtually impossible to cover in well-ordered, evenly-spaced transects. Only the upland grasslands north and west of Pilot Rock were surveyed at 100 percent intensity with surveyors spaced 20 m apart following the procedures used in previous seasons (Wells 1988:41). In the lowlands and badlands of the Painted Desert reconnaissance survey of approximately 85 percent of the terrain, with the surveyors spaced at 40-m intervals whenever it was possible to walk a straight line, was sufficient. The 3360 acres were surveyed in 93 person-days (36 acres per person-day).

Access to the remote areas along the northern and northwestern boundary was difficult. On several days the drive to the starting point took up to two hours. Coverage of the survey corridor on either side of Chinde Mesa required more than ten miles of hiking from the nearest access points.

By our definition, a site must have a variety of artifact types or a moderate to high surface artifact density; a minimum of approximately 75 artifacts was required unless features were present. In a few cases site status was given to scatters with fewer than 75 artifacts that had a variety

of ceramic types and the possibility of features. Artifact scatters of fewer than 75 artifacts were usually recorded as isolated finds (IFs), as were single projectile points and isolated petrified wood logs that had been quarried. Features on the sites usually consisted of concentrations of sandstone slabs and artifacts indicating the possibility of buried or eroded structures such as pit houses, masonry rooms, hearths or storage cists. Site type definitions follow those used by Jones, Tagg (Jones 1987) and Wells (1988).

All sites and IFs within the 400-meter-wide corridor were recorded. Site forms prompted the archeologist to describe the site's location, environment, artifacts, features and condition as well as to describe the site. Each site was also assessed for National Register potential. To characterize a site's surface artifact assemblage, two one-meter-square density units were chosen on most sites. The units were judgementally placed in areas with the greatest artifact density and diversity. The artifacts within these density units were counted and recorded. Estimates of the total numbers and types of ceramics and chipped stone on the entire site were made. Numbers of tools and ground stone artifacts reflect actual counts. Diagnostic and unusual artifacts were collected for analysis. A map of the site showing the location of features, collected artifacts, density units and other pertinent information was made for each site. Sites and isolated finds were plotted on 1:24,000 (7.5') USGS topographic maps: Agate House 1982, Adamana 1982, Chinde Mesa 1972, Little Lithodendron Tank 1972 and North Mill Well 1972. Both black-and-white and color photographs were taken of each site and its features. Isolated finds were plotted and briefly described on a log sheet.

Systematic recording of the rock art sites at Mountain Lion Mesa required 108 person-days. Sites were mapped and all petroglyph panels were drawn and photographed (Fig. 1.1). Additional features at the rock art sites and a habitation site on the mesa top were also recorded. We were fortunate to have the expertise of the ARARA volunteers for this project. The scorching temperatures and the large number of rock art elements pushed both the archeologists and rock art enthusiasts to their limits. The documentation of these sites is an important contribution to Petrified Forest archeology. All artifacts, survey records and photographs are housed at the Western Archeological and Conservation Center in Tucson, Arizona.



Figure 1.1. PEFO 1988 A crew recording rock art at Mountain Lion Mesa.

### Environment

The reader is referred to Stewart (1980) and Jones (1987) for a comprehensive review of the environment of Petrified Forest National Park. The information pertinent to this report is briefly summarized below. This summary is taken almost verbatim from Wells (1988:43-44).

The park lies within the archeological province known as the middle Little Colorado River Basin. Located within the Colorado Plateau system, the mean elevation of the park is 5,440 feet and average precipitation is 8.64 inches annually (Stewart 1980). Most of the park's drainages flow into the Puerco River, which in turn flows into the Little Colorado River. Although springs are mentioned in historical records there is presently no permanent surface water supply in the park. Cycles of wet and dry climate have been proposed for the prehistoric past and have been used to explain, in part, changes in prehistoric settlement patterns.

The unusual scenery of Petrified Forest National Park is the result of differential erosion of the Triassic Chinle Formation. North of the Puerco

River, the Painted Desert Headquarters and Mainline Road are on a plateau overlooking the Painted Desert to the north and west and Dead Wash to the east. South of the river the road crosses over mesas and through badlands where extensive exposures of petrified wood have attracted man for centuries.

Although there are many microenvironments, there are three major plant communities in the park. These are the Great Basin desertscrub, with sage, salt bush and mixed grasses; the plains grassland community, with grama grass, Sacaton grass and ricegrass as the dominant species; and the pinyon-juniper woodland, which is restricted to Chinde Mesa and Pilot Rock (Stewart 1980). There are also barren areas that lack soil and are therefore unable to support plant life.

Soils in the park are a combination of alluvial and eolian deposits with areas of sheet wash, dunes and barren badlands making up the three most common surfaces in the park. Most of this season's survey was conducted in barren badlands of the Painted Desert.

#### Organization of This Report

This is primarily a descriptive report. The 1988 survey data will be discussed in Chapter 2; this chapter includes a section on site condition. Chapter 3 is a brief summary of the artifacts encountered and collected on survey. Chapter 4 is an analysis of the rock art recorded this season and a synthesis of Petrified Forest rock art by Don D. Christensen. In Chapter 5 the new site data are incorporated into a settlement pattern study initiated after the 1987 field season.



## Chapter 2

### SURVEY RESULTS

Nineteen sites were recorded during this field season, including seven single-room masonry sites, five multiple-room masonry sites, three sites with pit houses or slab-lined features and three lithic scatters. Of the eight sites with rock art present, only one is exclusively a rock art site; the other seven have masonry or slab feature components. The site data are summarized in Table 2.1.

Only 5 of the 19 sites recorded were within the quarter-mile-wide boundary survey area; these will be described first, followed by descriptions of the sites recorded elsewhere in the park this season. A discussion of the site data by site type, with comparisons to the types of sites found in previous seasons, follows. Time periods represented by the PEFO 1988 A sites and a short summary of site condition will also be discussed. Three sites recorded on property adjacent to the park will be briefly described; these sites are not included in the tables, maps or overall discussion sections. (We recorded these sites for the rancher who graciously gave us access through his property to remote areas along the boundary fence.) Isolated find data will then be presented.

#### Survey Data

With the exception of one site found on a deflated desert pavement surface, the heavily eroded surfaces of the Chinle formation within the survey area lacked archeological sites (Fig. 2.1). Four sites in the survey corridor were found in the grasslands north and west of Pilot Rock. One site was found enroute to the northern boundary in a sand dune along Lithodendron Wash, two sites were found on top of Pilot Rock and seven sites were recorded at Mountain Lion Mesa. A prehistoric artifact scatter with rock art was recorded in the vicinity of the old Civilian Conservation Corps (CCC) camp southeast of Puerco Ruin. Three sites southeast of Agate House were also recorded.

Table 2.1  
PEFO 1988 A SITE DATA

Field No. ASM No.	Site Period	Site Area (m <sup>2</sup> )	Features	Estimated Number:			Maximum Artifact Density (per m <sup>2</sup> )	Site Type
				Ceramics	Chipped Stone	Ground Stone		
PEFO 88A-1 AZ K:13:83	PII/PIII	1400	SLAB CONCENTRATION	80	44	-	7	MASONRY ROOM
PEFO 88A-2 AZ K:13:84	PIV	144	CONCENTRATION OF SANDSTONE SLABS	7	4	-	2	MASONRY ROOM
PEFO 88A-3 AZ K:13:85	PII/PIII	1050	CONCENTRATION OF SANDSTONE SLABS	5	1	-	1	MASONRY ROOM
PEFO 88A-4 AZ K:13:86	PII/PIII	1050	CONCENTRATION OF SANDSTONE SLABS	66	31	-	17	MASONRY ROOM
PEFO 88A-5 AZ K:13:87	ARCHAIC	700	NONE NOTED	-	130	-	5	LITHIC SCATTER
PEFO 88A-6 AZ Q:1:200	BMII; PII/PIII	1200	CONCENTRATION OF SANDSTONE SLABS; 5 ROCK ART PANELS	47	430	-	25	ROCK ART/ MASONRY ROOM
PEFO 88A-7 AZ K:13:88	PREHISTORIC	400	HISTORIC CAIRN, USGS BENCHMARKS	-	-	4	2	LITHIC SCATTER (GROUND STONE)
PEFO 88A-8 AZ K:13:89	PUEBLO	600	C-SHAPED STRUCTURE, 6 ROCK ART PANELS	-	-	-	-	ROCK ART/ MASONRY ROOM
PEFO 88A-9 AZ K:13:90	PREHISTORIC	600	NONE NOTED	-	300	-	10	LITHIC SCATTER
PEFO 88A-10 AZ Q:1:201	BMII PII/PIII	40,700	8 STRUCTURES AND 2 SLAB FEATURES	1550	2540	6	47	MASONRY ROOMS
PEFO 88A-11 AZ Q:1:202	PII/PIII; PIV	16,000	19 PANELS OF ROCK ART, SLAB CONCENTRATION	17	5	-	1	ROCK ART / SLAB FEATURE
PEFO 88A-12 AZ Q:1:203	PII/PIII; PIV	16,000	9 ROCK ART PANELS, 2 ERODED SLAB FEATURES	5	7	-	1	ROCK ART/ SLAB FEATURES
PEFO 88A-13 AZ Q:1:204	PII/PIII	7,125	18 ROCK ART PANELS, SANDSTONE BLOCKS	40	31	1	3	ROCK ART/ MASONRY ROOM
PEFO 88A-14 AZ Q:1:205	PII/PIII	6,000	43 ROCK ART PANELS, ROOMBLOCK, 2 FEATURES	48	20	-	3	ROCK ART/ MASONRY ROOMS
PEFO 88A-15 AZ Q:1:206	PII/PIII	1,880	10 ROCK ART PANELS	-	-	-	-	ROCK ART
PEFO 88A-16 AZ Q:1:207	PII/PIII	10,250	97 ROCK ART PANELS, MASONRY ROOMS, MOQUI STEPS	260	250	1	10	ROCK ART/ MASONRY ROOMS
PEFO 88A-17 AZ Q:1:208	BMII/III; PIII	1,000	5 ROOM PUEBLO, 4 SLAB/ARTIFACT CONCENTRATIONS	P	P	P	U	MASONRY ROOMS

Table 2.1 (Continued)

Field No. ASM No.	Site Period	Site Area (m <sup>2</sup> )	Features	Estimated Number:			Maximum Artifact Density (per m <sup>2</sup> )	Site Type
				Ceramics	Chipped Stone	Ground Stone		
PEFO 88A-18 AZ Q:1:209	BMII/IIII	500	5 SLAB/ARTIFACT CONCENTRATIONS	P	P	P	U	PIT HOUSE/SLAB FEATURES
PEFO 88A-19 AZ Q:1:210	P111	2,200	2 SLAB/ARTIFACT CONCENTRATIONS	P	P	P	U	MASONRY ROOMS

--NONE NOTED  
P=PRESENT  
U=UNKNOWN

#### Sites in the Boundary Survey Area

The grasslands area north and west of Pilot Rock was the only terrain in the 1988 boundary survey area that appears to have been inhabited prehistorically. The sites are small artifact scatters; three of the four sites have sandstone slab concentrations that may represent masonry rooms or other features. Two of these sites, PEFO 88A-1 and 3, date to the Pueblo II/III period. The third site, PEFO 88A-2, has only Jeddito Yellow Ware ceramics on the surface suggesting Pueblo IV occupation. The fourth site in the grassland is a lithic scatter (PEFO 88A-9) with more than 300 pieces of chipped stone debitage, most of it the result of secondary reduction. No diagnostic artifacts were noted on this site.

The only other site recorded in the 1988 boundary survey area is a lithic scatter in the Painted Desert between Pilot Rock and Chinde Mesa. The site, PEFO 88A-5, is located on a desert pavement surface and has heavily patinated chopping and scraping tools as well as chipped stone debitage with the same degree of patination. The assemblage resembles the Tolchaco complex identified by Bartlett (1943). An Archaic age is suggested for this site.

**Figure removed in an effort to  
protect sensitive cultural resources.**

Figure 2.1. Location of sites recorded by PEFO 1988 A boundary survey.

### Sites on Pilot Rock

A reconnaissance survey of Pilot Rock led to the recording of two sites. The first site (PEFO 88A-7) is highly unusual. It is a scatter of ground stone artifacts with three metates and a single mano. Located at the summit of Pilot Rock, the area has been disturbed by the construction of two historic cairns, one over a meter high, and the installation of two USGS benchmarks. The vesicular basalt used to manufacture the ground stone artifacts outcrops on the site. This site may have been a ground stone manufacturing location or a milling site.

The site on the spur of land northeast of Pilot Rock is plotted as "RUINS" on the 15 minute USGS map of Petrified Forest National Park dated 1955. A C-shaped masonry structure and six rock art panels were noted at the site, PEFO 88A-8. No artifacts were observed on the site but a few, including Jeddito Yellow Ware sherds, were noted on the steep slope below and north of the site. Erosion and vandalism have taken their toll on this site. One of the rock art elements may have been made with a metal tool suggesting it is vandalism rather than prehistoric rock art.

### Mountain Lion Mesa Sites

Mountain Lion Mesa is a rock art locality south of Jasper Forest. The sites at Mountain Lion Mesa were brought to our attention by the ARARA volunteers in 1987. Tumbled boulders along the slopes of the mesa have heavily patinated surfaces perfect for rock art. Almost 200 panels with more than 900 elements were recorded. The rock art localities along the base of the mesa were recorded as six separate sites. In addition to the rock art, eroding slab features and masonry structures were recorded at five of these sites. A large multiple-room masonry site on top of the mesa was also recorded.

PEFO 88A-10 is the multiple-room masonry site on top of Mountain Lion Mesa. The site was recorded as three separate loci (Fig. 2.2). At least eight possible structures and two slab features were noted, and outlines of both habitation and storage rooms were identified. Burned daub fragments and the lack of rubble suggest that some of the structures may have had jacal superstructures; however, the daub may also be from a burned roof.

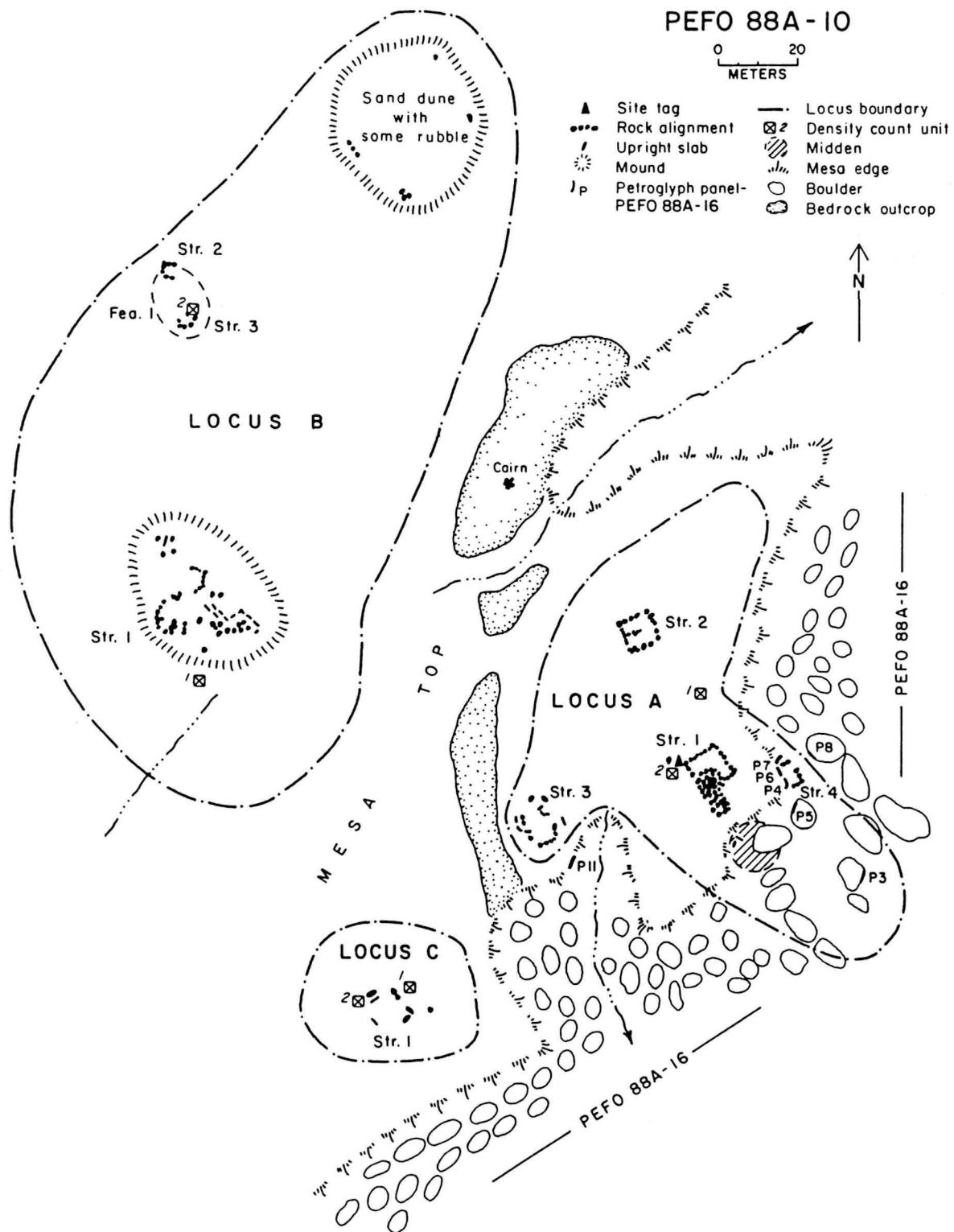


Figure 2.2. PEFO 88A-10, a multiple-room masonry site located on top of Mountain Lion Mesa.

The remains of a granary built against the cliff face on the eastern edge of the site include masonry walls several courses high. The midden deposit exposed near this granary is over a meter deep. Most of the ceramics indicate a Pueblo II/III date, but a Basketmaker II point and a few Lino sherds were also noted.

The rock art at the Mountain Lion Mesa sites will be discussed at length by Christensen in Chapter 4. A short description of each of the sites is included here. PEFO 88A-11 is located at the north end of the mesa. A total of 288 elements was recorded at five loci (Fig. 2.3). An eroding slab feature was noted at Locus 3. The rock art elements are mostly Pueblo II and III styles but the Kachina mask petroglyphs may date to the Pueblo IV period (see Chapter 5).

PEFO 88A-12 is on the northwest-facing slope of the mesa. Thirty-eight elements at three loci were recorded (Fig. 2.4). There are two eroding slab features at this site. One of these may be a structure. The ceramics and most of the rock art at Site 12 are Pueblo II/III, but some Kachina mask petroglyphs were also noted at this site.

An eroded masonry structure and an artifact scatter were recorded at PEFO 88A-13 (Fig. 2.5). The rock art panels include 101 rock art elements. The site is located south of Site 12 in a west-facing alcove along the mesa slope. A Pueblo II/III date is suggested for this site.

PEFO 88A-14, located south of Site 13, has a masonry room block and rock art panels with 137 petroglyph elements (Fig. 2.6). The room block is on the edge of the mesa top overlooking the rock art. Two eroded features were also noted, one just east of the room block and the other on the heavily eroded land below the mesa slope. The artifacts and petroglyphs are consistent with the rest of the sites at the mesa and date to the Pueblo II/III period.

PEFO 88A-15 is the smallest of the Mountain Lion Mesa petroglyph sites (Fig. 2.7). Ten panels with 27 rock art elements were recorded. The site is located on the southwest corner of the mesa. The land below the site is heavily eroded. No additional features were noted. The rock art is Pueblo II/III style.

The largest rock art site recorded at the mesa is PEFO 88A-16 (Fig. 2.8). Located on the southeast edge of the mesa, the site is immediately adjacent to the multiple-room masonry site on top of the mesa. Almost

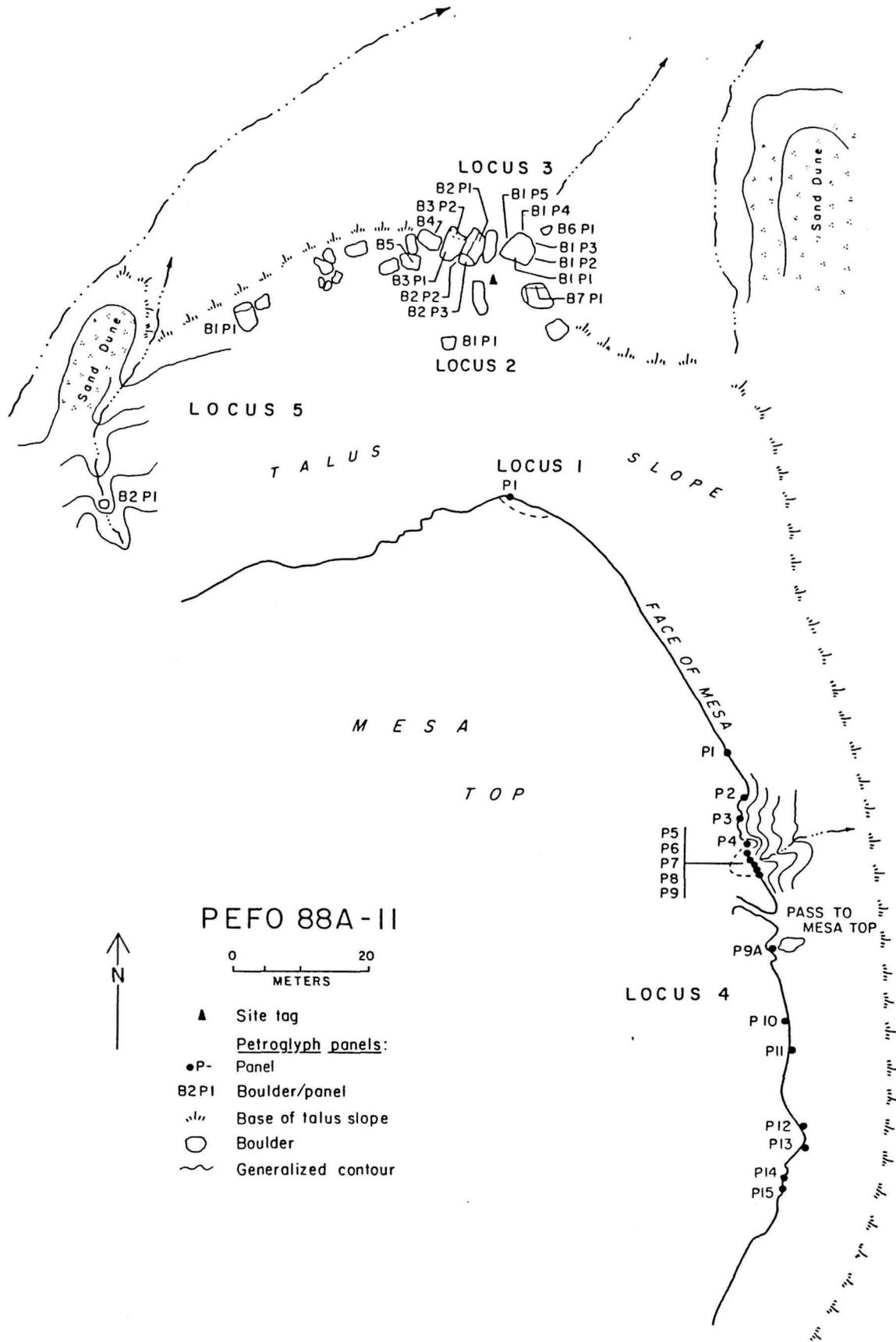


Figure 2.3. PEFO 88A-11, a rock art site at Mountain Lion Mesa with 288 petroglyphs.

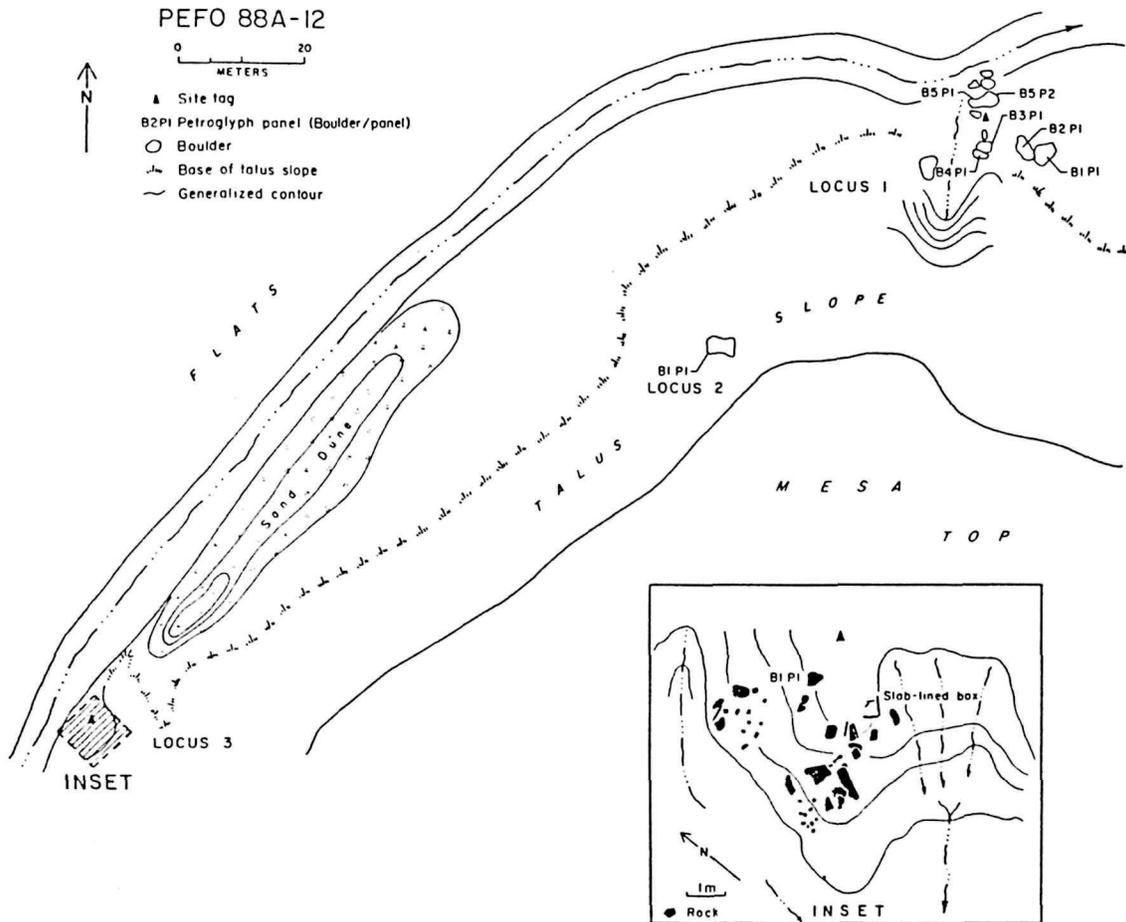


Figure 2.4. PEFO 88A-12, a rock art site at Mountain Lion Mesa with 38 petroglyphs.

PEFO 88A-13

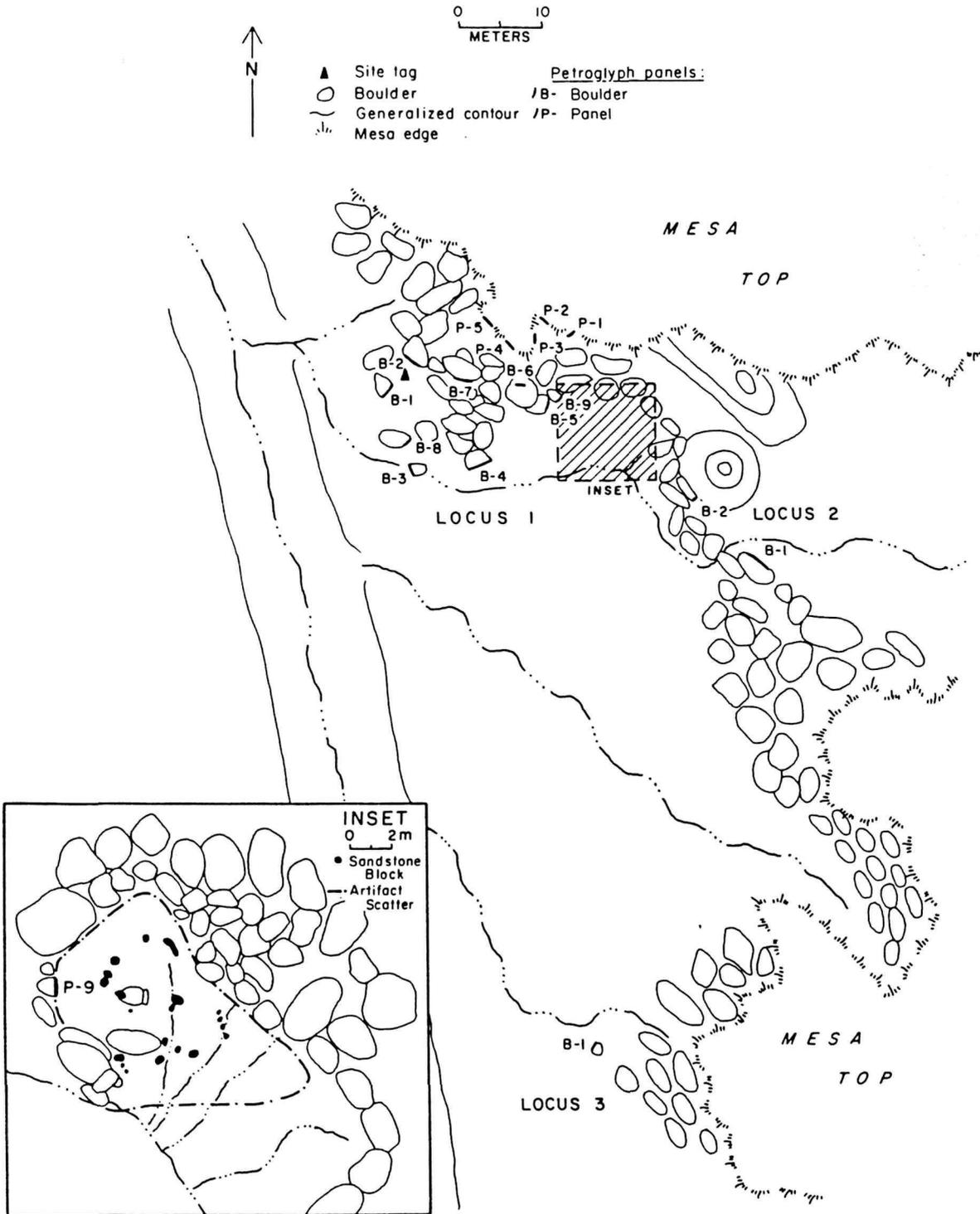


Figure 2.5. PEF0 88A-13, a rock art site at Mountain Lion Mesa with 101 petroglyphs.

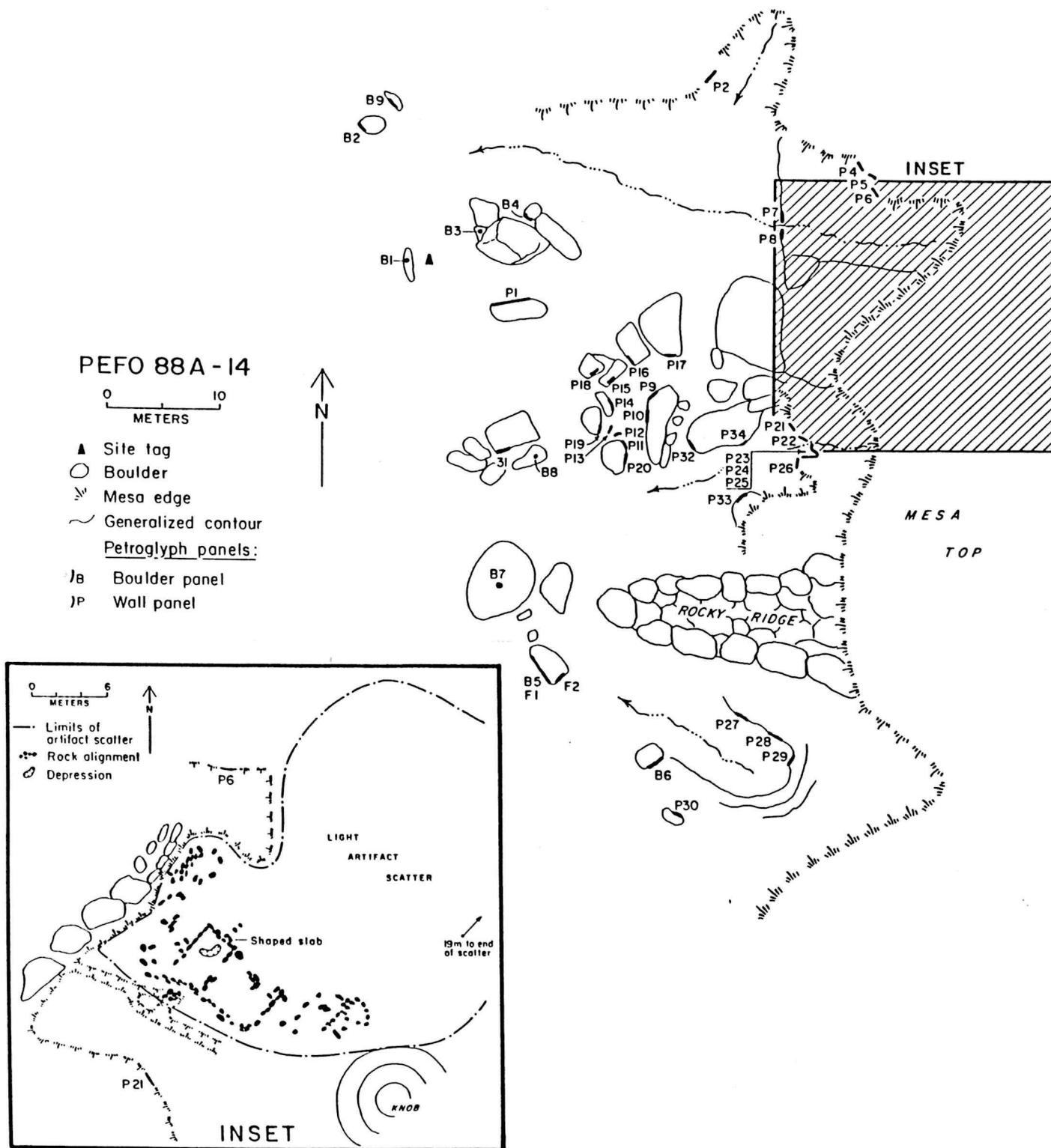


Figure 2.6. PEFO 88A-14, a rock art site at Mountain Lion Mesa with 137 petroglyphs.

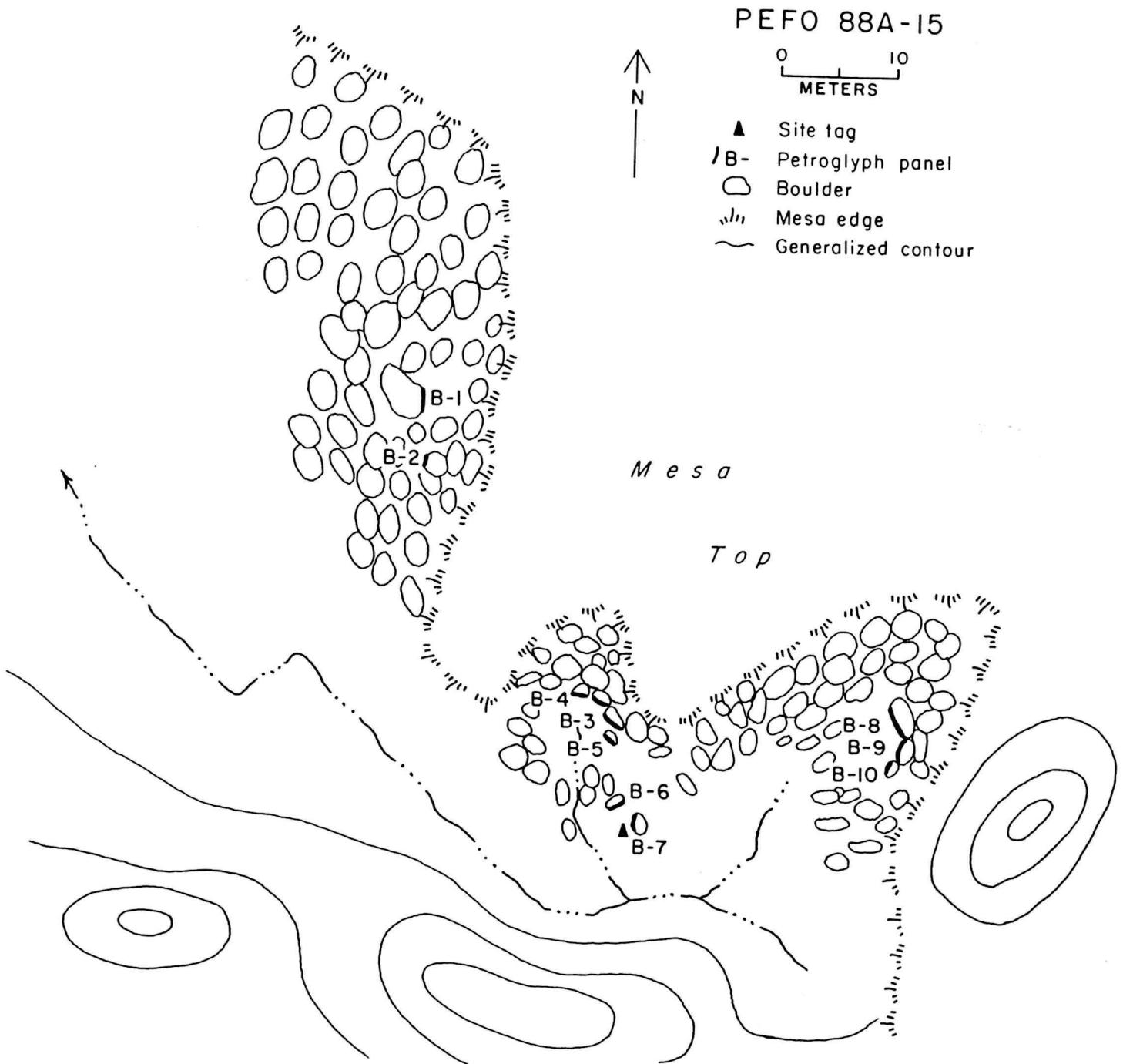


Figure 2.7. PEFO 88A-15, a rock art site at Mountain Lion Mesa with 27 petroglyphs.

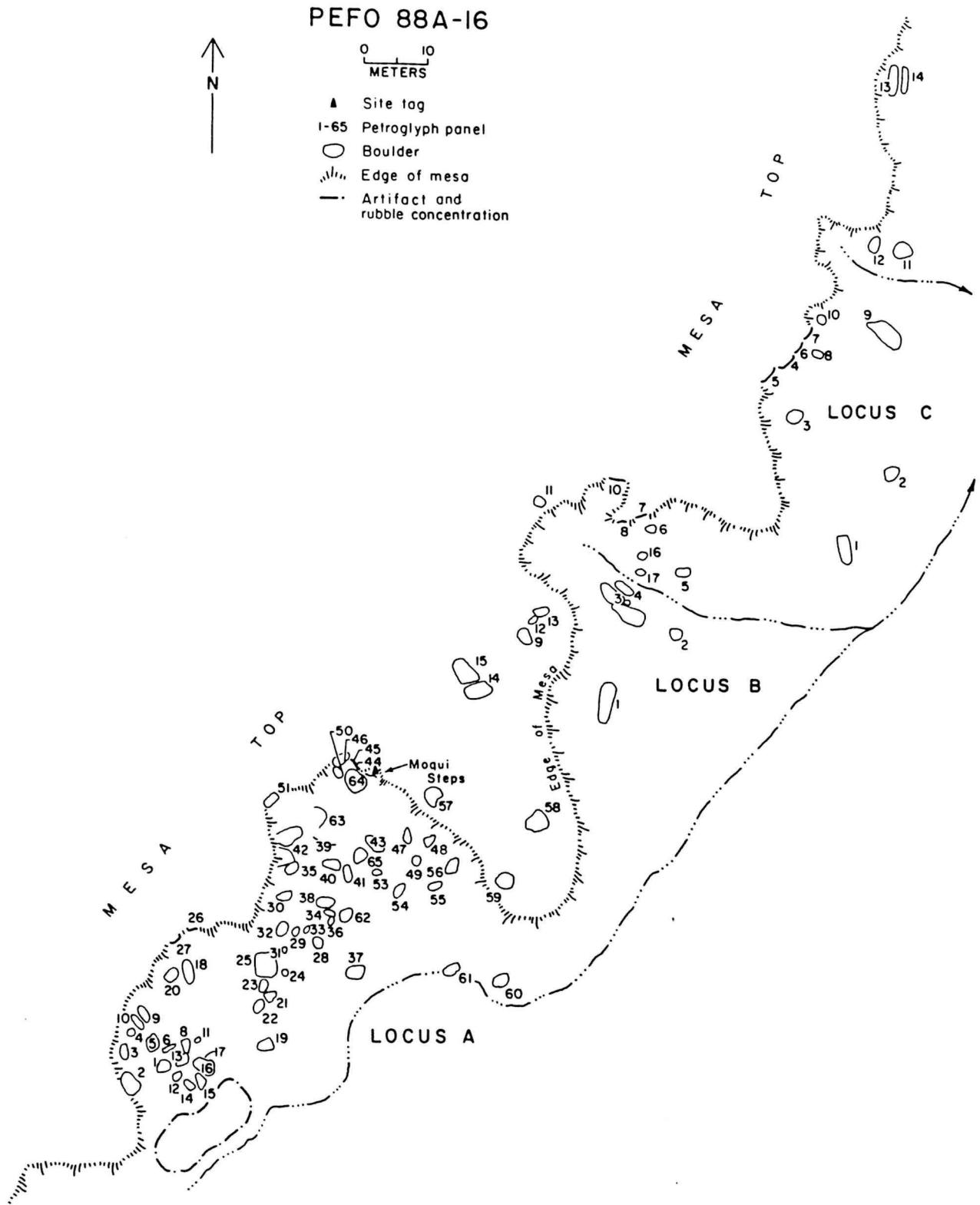


Figure 2.8. PEFO 88A-16, a rock art site at Mountain Lion Mesa with 537 petroglyphs.

half of the rock art elements recorded at Mountain Lion Mesa, 537 of 1128 elements, occur at Site 16. Additional features at the site include a slab and artifact concentration that may represent eroding masonry rooms. A set of three moqui steps (foot or hand holds carved into a vertical rock face) leading down to a cave formed by tumbled boulders was also recorded.

#### Sites Southeast of Agate House

The three sites southeast of Agate House were recorded on a scouting trip in the spring of 1988. PEFO 88A-17, also known as PEFO Site 21 and LA 1380, was recorded previously by Mera (1934) and Jepson (1941). Reed (1980) dated the ceramics from this site to the Pueblo III period and noted the presence of Adamana Brown pottery, suggesting a minor Basketmaker component. Teague visited the site in 1983 to assess pothunting damage on the site. A map of the five-room pueblo was prepared in 1988 (Fig. 2.9). Five rock and artifact concentrations were also noted; at least one of these may be a masonry room.

Two additional sites were recorded in the vicinity of PEFO 88A-17. PEFO 88A-18 is a pit house/slab feature site with Adamana Brown ceramics. The five features consist of slab and artifact concentrations with dark soil that range in size from 1 to 9 square meters. These features are located on the spine of a narrow ridge and are extensively eroded. PEFO 88A-19 has two features visible. The first is a one- or two-room masonry structure that measures 5 m by 10 m. The second feature is a dark soil stain, 5 m by 7 m in size, with sandstone slabs and artifacts. The pottery on this site includes White Mountain Red Ware indicating a Pueblo III date.

#### Other Sites Recorded by PEFO 1988 A

On the way back from the northern boundary fence east of Chinde Mesa, a small site was discovered in a sand dune along Lithodendron Wash. PEFO 88A-2 is a small artifact scatter with a few sandstone slabs suggesting the presence of a buried masonry feature. Jeddito Black-on-yellow sherds and a few pieces of petrified wood debitage were the only artifacts noted, suggesting the site dates to the Pueblo IV period.

PEFO 88A-17



- ▲ Site tag
- ▬▬▬ Rock alignment
- ▨ Artifact and rubble concentration
- ▬ Sandstone slab
- ⊕ Disturbance / pothole
- ~ Generalized contour

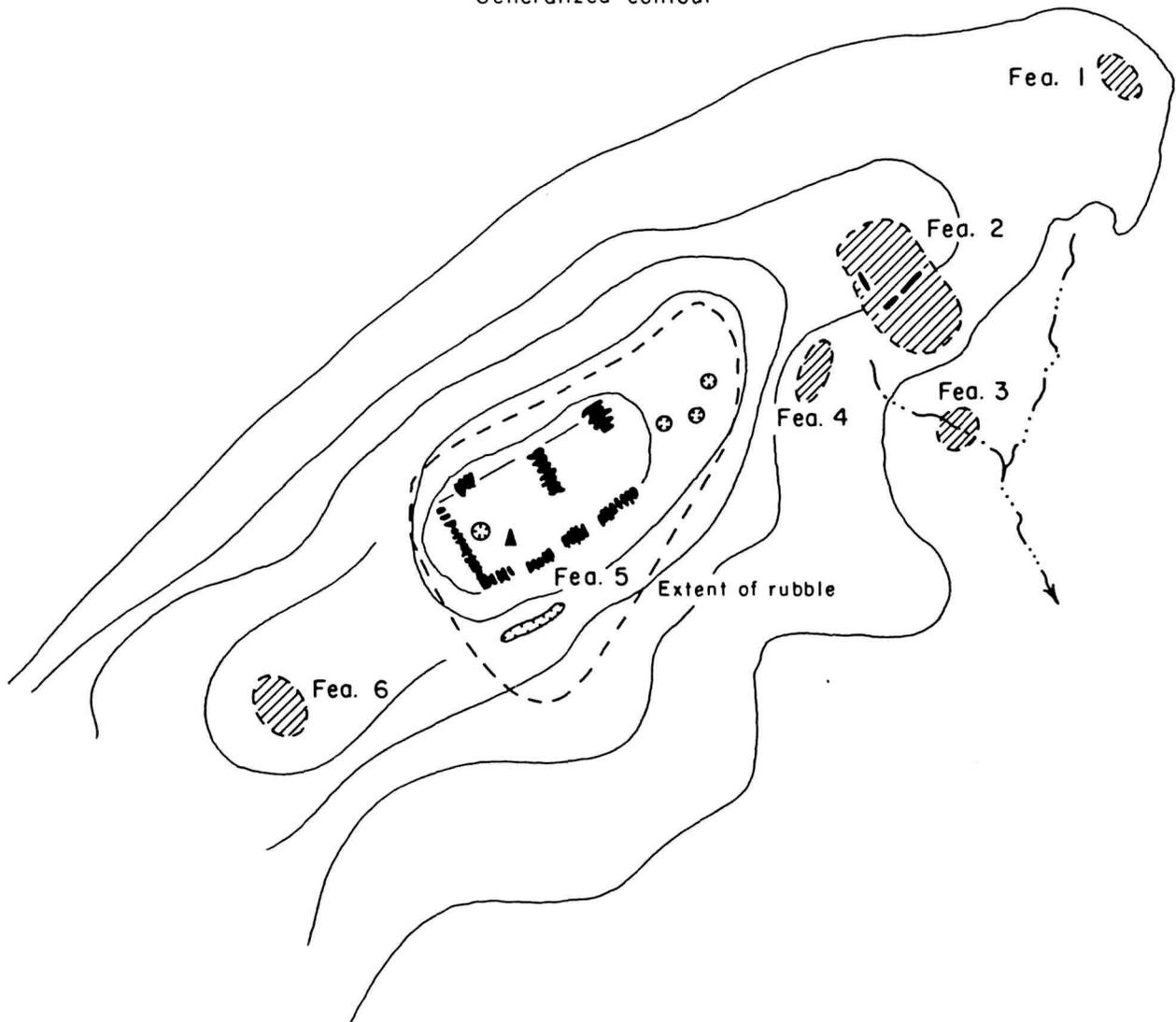


Figure 2.9. PEFO 88A-17, a pueblo southeast of Agate House.

A site with a possible masonry room is located near the historic Civilian Conservation Corps (CCC) work area (Fig. 2.10). The site, PEFO 88A-6, came to our attention because of the six rock art panels. Three projectile points were collected from this site. Two are Basketmaker II points; the third is a small modified flake that served as an arrow point during the Pueblo II/III occupation at the site. Most of the ceramics are also from this transitional Pueblo period, but a few Lino Gray and Adamana Brown ceramics were noted, providing additional evidence of a Basketmaker component. It appears that the site was heavily disturbed by the CCC but intact deposits are probably present on the east-facing slope.

### Site Types

The definitions of the types of sites recorded in Petrified Forest National Park can be found in Jones (1987) and Wells (1988). In order of their frequency of occurrence among the 296 sites recorded since 1978 these types are artifact scatters, multiple-room masonry sites, single-room masonry sites, rock art sites, pit house/slab feature sites, historical sites, lithic scatters, rockshelters and agricultural sites. Not all of these types were recorded by PEFO 1988 A; no artifact scatters, historical sites, rockshelters or agricultural sites were identified this season. Rock art sites are the most common type of site, followed by single- and multiple-room masonry sites, pit house/slab feature sites and lithic scatters. Rock art sites are over-represented because we chose to record seven previously known sites.

### Rock Art Sites

Eight rock art sites were recorded this season. Six of these sites, PEFO 88A-11, 12, 13, 14, 15 and 16, are at Mountain Lion Mesa. PEFO 88A-8 is located on Pilot Rock and PEFO 88A-6 is near the old CCC work area. In addition to rock art, other features are present at seven of these sites. A discussion of the rock art sites can be found in Chapter 4.

PEFO 88A-6



- ▲ Site tag
- Limits of artifact scatter
- /5 Petroglyph panel
- 2☒ Density count unit
- Boulder
- ~ Generalized contour

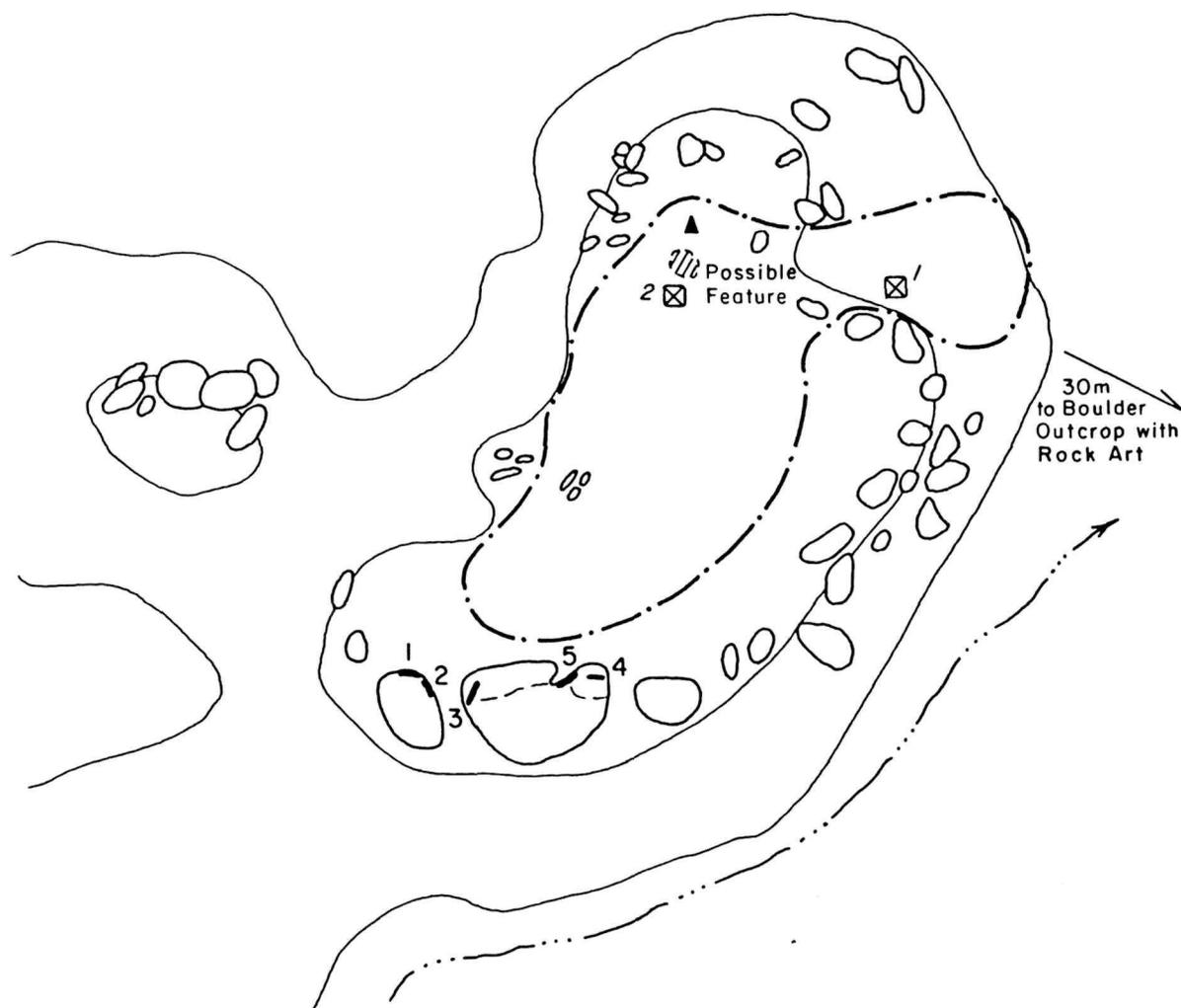


Figure 2.10. PEF0 88A-6, a rock art site with a possible masonry room.

### Single-Room Masonry Sites

The single-room masonry sites are PEFO 88A-1, 2, 3, 4, 6, 8 and 13. Rock art is present at PEFO 88A-13. The seven sites in this category have small rubble mounds or slab concentrations ranging in size from 2.25 to 12 square meters. The average size of these features is 6.8 square meters and the median size is 6 square meters. The one-room features on the PEFO 1988 A sites are within the size range of the features recorded by the 1987 boundary survey but are at the low end of that range (Wells 1988:58). These features probably had either full-height masonry walls or stone foundations with jacal superstructures.

The size of the associated artifact scatters is fairly consistent with that reported for the PEFO 1987 B sites, ranging from 144 square meters to 7,125 square meters with a mean of 1,700 square meters and a median of 1,050 square meters. Ceramics and chipped stone were found on all but one site, PEFO 88A-8. Ground stone was found only at PEFO 88A-13. The number of artifacts noted on the surface varied from no artifacts to almost 500 with a mean of 112 artifacts and median of 97 artifacts.

These sites all have pueblo period components. PEFO 88A-1, 3, 4, 6 and 13 have Pueblo II/III period ceramics. There is also a Basketmaker component at PEFO 88A-6. Pueblo IV sherds were noted at Site 2. No diagnostic artifacts were found at PEFO 88A-8.

### Multiple-Room Masonry Sites

Three of the five multiple-room masonry sites are located at Mountain Lion Mesa (PEFO 88A-10, 14 and 16); the other two sites are southeast of Agate House (PEFO 88A-17 and 19). All but one of the sites fall within the size range of the sites recorded by PEFO 1987 B (Wells 1988:60). The exception is PEFO 88A-10 which is more than 40,000 square meters in size. The other sites range from 1,000 to 10,250 square meters with an average size of 4,800 square meters and a median size of 4,100 square meters. Ceramics and chipped stone were present at all five sites and ground stone was noted at all but PEFO 88A-14.

All of the sites have at least one multiroom structure but the types of structures present on each site vary considerably, and include pueblos,

small room blocks and structures with jacal superstructures. Rock art is present at both PEFO 88A-14 and 16.

PEFO 88A-10 is the largest and most complex site with at least eight structures and several other features present. Structures have from one to three habitation rooms; storage rooms were also noted. There is a round structure with a cist visible in one corner. A granary, with several courses of masonry still in place, was built against the cliff face.

A five-room pueblo and one or more additional features are present at PEFO 88A-17. The room block at PEFO 88A-14 has two to three rooms and one of the two structures at PEFO 88A-19 may have two rooms; the other feature at Site 19 is a one-room structure. At PEFO 88A-16 the number of rooms present is unclear, but the amount of rubble present in a 17 m by 6 m area represents more than one room.

The sites at Mountain Lion Mesa (PEFO 88A-10, 14 and 16) date to the Pueblo II/III period. A minor Basketmaker II component may also be present at PEFO 88A-10. Reed (1980) dated PEFO 88A-17 to Pueblo III but noted a minor Basketmaker component. PEFO 88A-19 dates to the Pueblo III period.

#### Pit House Site

One site, PEFO 88A-18, appears to have been a Basketmaker pit house village. The site's size, artifact assemblage and location on a high ridge are consistent with the description of pit house sites recorded in 1987 (Wells 1988:65-66). The five features are small slab and artifact concentrations with dark soil. The features are from 1 square meter to 9 square meters in size. The presence of Adamana Brown ceramics indicates a Basketmaker II/III date.

#### Slab Feature Sites

The features at PEFO 88A-11 and 12 may represent hearths, storage cists or small storage structures. Located at the base of Mountain Lion Mesa on a hard "pan" surface, these features are badly eroded; other features may have been destroyed over time. Both sites are also major rock art locations. The ceramics and rock art at the sites are primarily from the Pueblo II/III period. The presence of a Jeddito sherd at PEFO 88A-11 and

of Kachina mask glyphs at both 11 and 12 may indicate Pueblo IV occupation as well.

### Lithic Scatters

Three lithic scatters were recorded this season. Two of these sites, PEFO 88A-5 and 9, are chipped stone scatters; the third, PEFO 88A-7, is a ground stone scatter. Small petrified wood quarry areas were recorded as isolated finds.

The heavy patination and the form of the tools at PEFO 88A-5 suggest an Archaic date. The artifacts at this site resemble the artifacts of Bartlett's (1943) Tolchaco complex found between Cameron and Holbrook, Arizona. PEFO 88A-9 appears to be a secondary reduction locus (Rozen 1981) with a large quantity of small waste flakes of fine-grained material; no diagnostic artifacts were noted on this site. Three metates and a mano were noted at PEFO 88A-7. The presence of vesicular basalt outcrops on the site suggests this site may have been a ground stone manufacturing locus.

### Site Dates

Most of the PEFO 1988 A sites were assigned to one or more prehistoric time periods. Two sites, PEFO 88A-7 and 9, were simply designated as prehistoric. No Paleo-Indian remains were found, but the heavily patinated chipped stone assemblage at PEFO 88A-5 is probably from the Archaic period. Basketmaker II points and a biface that probably dates to the Basketmaker period were found at PEFO 88A-6 and 10, and at Isolated Finds 3 and 8. Traces of Lino Gray and Adamana Brown pottery which may represent transitional Basketmaker II/III occupations (Wells 1988:46) were found at PEFO 88A-6, 17 and 18. The single Lino Gray sherd noted at PEFO 88A-11 is not sufficient to define an early component. Pueblo period components were recorded at three of the sites with Basketmaker artifacts, PEFO 88A-6, 10 and 17.

No Pueblo I period sites were reported this season. One site, PEFO 88A-8, was assigned to the pueblo period based on the presence of a masonry structure but had no diagnostic ceramics. Most sites were assigned to the transitional Pueblo II/III period. Pueblo II/III ceramics or rock art

styles were found at ten sites: PEFO 88A-1, 3, 6, 10, 11, 12, 13, 14, 15 and 16. Reed's (1980) analysis of the ceramics from PEFO 88A-17 and the occurrence of White Mountain Red Ware sherds at PEFO 88A-19 indicate a Pueblo III occupation at these two sites. Based on the presence of Jeddito Yellow Ware pottery or Kachina mask petroglyphs three sites, PEFO 88A-2, 11 and 12, were assigned a Pueblo IV designation.

#### Site Condition

Most of the 19 sites recorded are in good condition. Although subject to erosion and deposition since their abandonment hundreds of years ago, most are fairly stable. The remote location of most of the sites will protect them from vandalism. A few sites have been disturbed in the past; these are described below. Specific management recommendations for these sites will be transmitted to the park at a later date.

PEFO 88A-6 appears to have been disturbed by CCC activities. An area on the north end of the sites may have been bladed flat.

PEFO 88A-7 was disturbed by the construction of cairns and the installation of USGS benchmarks. The site is also visited by hikers who will probably not recognize its value as a site but may inadvertently do damage.

PEFO 88A-8 has at least one petroglyph that was recently made using a metal tool. The appearance of this site as "RUINS" on the 15' topographic map may continue to attract unwanted attention. The masonry structure may have been altered or rearranged.

PEFO 88A-17 has had recent occurrences of pothunting; the locations of the potholes are shown in Figure 2.9. The site is now monitored by the Petrified Forest National Park staff, which should lead to its protection.

#### Sites Outside the Park Boundary

Three sites on the property adjacent to the park were visited by the survey crew. These sites will be briefly described but their locations will not be plotted on the maps in this report to provide maximum protection of these resources.

Jeffers Number 1 is a small L-shaped pueblo with from four to eight rooms. It is located on a high ridge overlooking the Painted Desert. Artifacts on the site indicate a Pueblo II/III occupation.

Jeffers Number 2 is a rock art location with 2 loci and a variety of elements. Two eroding slab features with Pueblo II/III period pottery were noted at the north end of the site.

Jeffers Number 3 is a major rock art location, similar in many ways to the rock art sites at Mountain Lion Mesa. There is a great deal of consistency in the elements at the site. Most notable are the textile designs, anthropomorphs with ear bobs and a panel with various depictions of footprints.

#### Isolated Finds

The sparseness of the archeological remains along the boundary this season is reflected in the small number of isolated finds recorded. Their locations are shown in Figure 2.11. Of the twelve isolated finds, three are ceramic, four are single chipped stone artifacts and five are small petrified wood quarries. Table 2.2 is a list of the isolated finds recorded by the PEFO 1988 A survey crew.

Jeddito Polychrome (PEFO 88A-IF-4), Tuwica Black-on-orange (IF-2) and Jeddito Yellow Ware sherds (IF-6) were found at three locations in the grasslands north and west of Pilot Rock. The first two types date to the Pueblo III period; the latter dates to the Pueblo IV period. The dates of these isolated finds are consistent with the dates of the sites recorded in this area.

The isolated chipped stone artifacts include a dart point found on Mountain Lion Mesa (IF-1) and a large biface found north of Pilot Rock which probably dates to the Basketmaker II period (IF-3). A worked petrified wood flake that may be a point preform (IF-7) and a white quartzite core (IF-9) were found along the western boundary, southwest of Pilot Rock.

In previous seasons, the abundance of petrified wood deposits made it impossible to record all quarries in the study area; however, the infrequent occurrence of petrified wood deposits in the Painted Desert made it easy to define the limits of small quarry sites. Five small petrified wood quarries

**Figure removed in an effort to  
protect sensitive cultural resources.**

Figure 2.11. Location of PEFO 1988 A isolated finds.

Table 2.2  
ISOLATED FINDS

<u>PEFO 88A-</u>	<u>Description</u>	<u>Collection</u>
IF-1	Dart point, petrified wood	
IF-2	2 sherds Tuwica Black-on-orange	Bag 7
IF-3	Basketmaker II point, petrified wood debitage	Bag 8
IF-4	3 sherds Jeddito Polychrome	Bag 9
IF-5	Small scatter of black petrified wood; core reduction locus	
IF-6	8 Jeddito Black-on-yellow sherds	
IF-7	Petrified wood flake, possible point preform	
IF-8	Large biface, probably Basketmaker II	Bag 18
IF-9	White quartzite core	
IF-10	Quarried outcrop of petrified wood	
IF-11	Small petrified wood quarry with flake and scraper nearby	
IF-12	Light scatter of petrified wood debitage	

were recorded (IF-3, 5, 10, 11 and 12). A Basketmaker II projectile point was noted at one of these quarries (IF-3) and a scraper was noted at another (IF-11).

## Chapter 3

### ARTIFACTS

Surface artifact assemblages were assessed during site recording. In addition to recording artifacts in one-meter-square counting units, an estimate was made of the total number of artifacts on the site. Some ceramics were identified in the field and a few diagnostic sherds were collected for laboratory identification. Several chipped stone artifacts were also collected.

#### Ceramics

Ceramics were often used to provide site dates. The ceramic time line created for the sites recorded by PEFO 1987 B (Wells 1988:45) was useful for dating the 1988 sites. See Wells (1988:99-121) for a detailed discussion of ceramics at Petrified Forest National Park. Table 3.1 indicates the ceramic types noted on the surface of the 14 sites with ceramics present.

The most common utility ware for Pueblo period sites is gray/brown corrugated pottery; it occurs on 9 of the 14 sites. It is followed in frequency of occurrence by plain gray/brown ware, Adamana Brown, Woodruff Brown, Little Colorado Corrugated and Lino Gray. The presence of Lino Gray with Basketmaker points and the lack of Woodruff Brown suggest a Basketmaker rather than Pueblo I occupation. One of the local gray/brown corrugated sherds at PEFO 88A-6 is tooled. One of the sherds from PEFO 88A-3 classified under "other" (Table 3.1) was identified as Moenkopi Corrugated.

Little Colorado and Cibola black-on-white types occur on at least six sites; Tusayan black-on-white types were found on only 3 sites. White Mountain Red Ware was noted on five sites, Showlow Black-on-red on two sites and Jeddito Yellow Ware on two sites.

The "other" category also includes unidentified black-on-white sherds at PEFO 88A-3, 12 and 13 and an unidentified red ware sherd at PEFO 88A-13. Collected ceramics are listed in Table 3.2.

Table 3.1  
 CERAMIC WARES IDENTIFIED ON PEFO 1988 A SITES

Types	PEFO 88A-1	2	3	4	6	10	11	12	13	14	16	17	18	19
Lino Gray					X	T	T							
Adamana Brown					X							*	X	
Woodruff Brown	X											*		
Gray/Brown Ware	X					X			X					
Gray/Brown Corrugated	X		X		X	X	X	X	X	X	X			
Little Colorado Corrugated				X	X									
Tusayan black-on-white	X				X	X	X							
Little Colorado black-on-white	X				X	X				X	X	*		
Cibola black-on-white				X	X	X				X	X	*		
Showlow Black-on-red	X					X								
White Mountain Red Ware				X		X					X	*		X
Jeddito Yellow Ware		X					X							
Other			X					X	X					

X=Present

T=Trace

\*=Types from Reed (1980)

Table 3.2  
 COLLECTED CERAMICS

PEFO 88A-	Bag Number	Description
1	6	Holbrook Black-on-white
2	10	Jeddito Black-on-yellow
3	11	Moenkopi Corrugated
	12	Unidentified black-on-white
4	13	Little Colorado Corrugated
	14	St. Johns Black-on-red
	15	Tularosa Black-on-white
	16	Tularosa Black-on-white
	17	Dogoszhi Black-on-white
6	1	Brown/Gray Corrugated with Tooling
	4	Red Mesa Black-on-white
	5	Red Mesa Black-on-white
	31	Little Colorado Corrugated, Gray/Brown Ware

Table 3.2 (Continued)

PEFO 88A-	Bag Number	Description
10-A	22	Red Mesa Black-on-white
	23	Puerco Black-on-white
	24	Tularosa Black-on-white
	25	Black Mesa Black-on-white, Flagstaff Black-on-white
	26	Walnut Black-on-white
	27	Red Mesa Black-on-white
	10-B	20
21		Puerco Black-on-white
10-C	28	Unidentified black-on-white
	30	Unidentified black-on-white, Gray/Brown Ware
14	19	Puerco Black-on-white
IF-2	7	Tuwica Black-on-orange
IF-4	9	Jeddito Polychrome

#### Chipped Stone Artifacts

Chipped stone artifacts were noted on 16 of the 19 sites recorded. Petrified wood was the most common material used for chipped stone tools. Small amounts of cobble chert were noted at five sites. The only exception is the assemblage at PEFO 88A-5; the material used here was a naturally occurring igneous rock, probably rhyolite or basalt. A quartzite hammerstone was recorded at this site.

The collected chipped stone artifacts are all made of petrified wood. The artifacts were examined by Ken Rozen and John Madsen (Arizona State Museum, University of Arizona) and by George Teague (WACC). These artifacts are identified in Table 3.3 and pictured in Figure 3.1. The four large points are Basketmaker II points (Fig. 3.1C-F). A biface collected at PEFO 88A-IF-8 is also probably Basketmaker II (Fig. 3.1A). A single Pueblo period point was collected at PEFO 88A-6 (Fig. 3.1B).

Table 3.3  
COLLECTED CHIPPED STONE ARTIFACTS

PEFO 88A-	Bag Number	Description
6	2	Basketmaker II point
	3	Basketmaker II point
	32	Pueblo II/III point
10-C	29	Basketmaker II point
IF-3	8	Basketmaker II point
IF-8	18	Biface (probably Basketmaker)

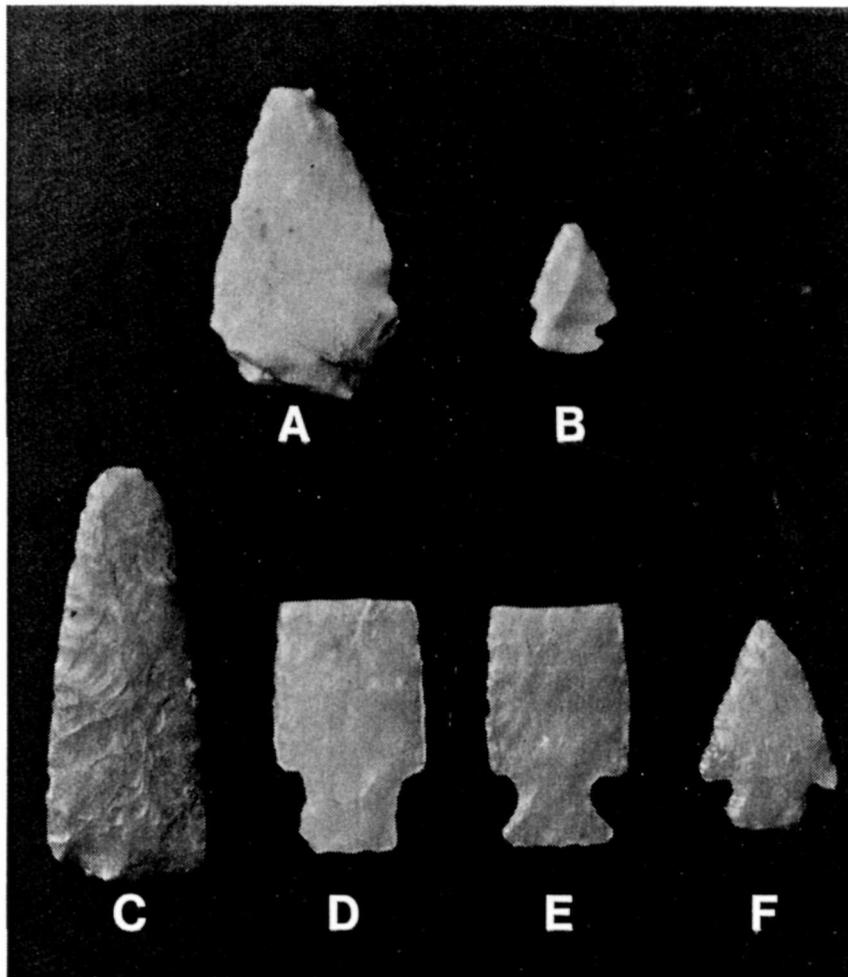


Figure 3.1. Chipped stone artifacts. A) PEFO 88A-IF-8, biface; B) PEFO 88A-6, Pueblo II/III point; C) PEFO 88A-IF-3, Basketmaker II point; D-E) PEFO 88A-6, Basketmaker II points; F) PEFO 88A-10, Basketmaker II point.

### Ground Stone Artifacts

Ground stone artifacts were noted on only 7 sites. One site, PEFO 88A-7, was entirely a ground stone scatter. The other sites with ground stone were PEFO 88A-10, 13, 16, 17, 18 and 19. One of these is a pit house site, one is a single-room masonry site and the others are multiple-room masonry sites. Sandstone and basalt were the two materials used to make these artifacts.



Chapter 4  
THE ROCK ART OF MOUNTAIN LION MESA  
by  
Don D. Christensen

The concluding season of the Petrified Forest boundary survey found no rock art sites within the quarter-mile corridor investigated adjacent to the park perimeter. Because the Painted Desert badlands contained so few cultural remains, the survey crew was able to devote a significant amount of time to recording rock art in a previously unstudied portion of the park. The area chosen was dubbed Mountain Lion Mesa and consisted of six sites (PEFO 88A-11, 12, 13, 14, 15 and 16) located around the periphery of a small mesa (Fig. 2.1). Besides the concentration of petroglyph panels, the sites also had in association either architectural features, artifact scatters, or both. This provides some valuable chronometric correlation for the rock art. Two other small rock art sites (PEFO 88A-6 and 8) with related cultural materials were recorded in the process of auxiliary reconnaissance. The focus of this chapter will be the Mountain Lion Mesa data.

More than half the field season, 108 person-days, was spent recording rock art. This produced a very accurate and complete body of rock art data. Almost every panel was photographed in black and white using PX-125 print film and in color with KR-64 slide film. A data board, showing provenience, metric scale and north arrow, was used whenever possible. Magnetic orientation of each panel was measured and the azimuth was recorded on the photo log. A field sketch was made of every element of every panel on all the sites. The drawings were essential; several panels could not be photographed either due to extensive weathering or because of their location on boulders that had been dislodged from their original position and fallen down the talus to a new position that defied photography. As time allowed, additional information on environmental orientation, manufacturing techniques and physical condition with respect to cultural and natural destructive forces was recorded for 34 panels. All archeological features including rock art panels were mapped (Figs. 2.2 through 2.8 and 2.10) and the standard PEFO archeological site form was completed for each site.

## Petroglyph Design Element Analysis

Each of the 1163 rock art design elements was assigned to one of seven categories: anthropomorphs, zoomorphs, hands/tracks, geometric, abstract, indeterminate/indistinct and historic. The design element analysis for Mountain Lion Mesa and for sites PEFO 88A-6 and 8 is summarized in Table 4.1. Each category is discussed below.

### **Anthropomorphs**

An examination of anthropomorphic elements at Mountain Lion Mesa indicates that there was no commonly held concept of how the human form should be depicted. Sixteen percent of the glyphs are anthropomorphs, running the gamut from stick figures to full-bodied individuals done in outline or with completely pecked torsos. There are also figures with pecked bodies and sticklike extremities. Both arms are usually raised. Digits are more frequently shown on hands than on feet with from three to five fingers displayed. Feet often appear as rectangular "blocks." Projections from the head include possible horns, feathers and ears. The ears are exaggerated and sometimes droop. Only one element (Fig. 4.1B) exhibits ear ornamentation. The possible headdresses range from one to six short straight lines radiating from the top of the head. On one figure at PEFO 88A-14 a single line projecting from the head was 65 cm long. There are less than a dozen anthropomorphs which are phallic. Only one of the anthropomorphic elements is female and her fingers and genitalia are incised. Incising is not a common rock art technique within the park.

Objects held in the hands of anthropomorphic figures were quite rare at the Mountain Lion Mesa sites. One figure at PEFO 88A-13 holds an upright "spear" that is almost as long as the body. The projectile tipping the shaft is triangular and exaggerated in size. Figure 4.2D, from PEFO 88A-15, depicts paired figures either exchanging or joined by linear objects. At PEFO 88A-16 one panel shows several stick figures holding circles and orbs. The same site has another panel (Fig. 4.3) with a bowman and an anthropomorph holding a "staff." This was the only staffman recorded which is unusual since they are common within the Petrified Forest and the encompassing region.

TABLE 4.1  
PEFO 1988 A SURVEY  
SUMMARY OF PETROGLYPH DESIGN ELEMENT ANALYSIS

Site	# Panels	Representational			Nonepresentational				Total Glyphs	Dates
		Anthro- pomorphs # (%)	Zoomorphs # (%)	Hands/ Tracks # (%)	Geometric # (%)	Abstract # (%)	Indeterminate/ Indistinct # (%)	Historic # (%)		
<u>Mountain Lion Mesa:</u>										
PEFO 88A-11	33	50 (17)	32 (11)	64 (22)	37 (13)	83 (29)	21 (7)	1 -	288	PIII/IV
PEFO 88A-12	9	11 (29)	6 (16)	1 (3)	8 (21)	8 (21)	3 (8)	1 (3)	38	PIII/IV
PEFO 88A-13	20	14 (14)	18 (18)	7 (7)	15 (15)	35 (35)	12 (12)	0 -	101	PII/III
PEFO 88A-14	44	19 (14)	32 (23)	12 (9)	20 (15)	38 (28)	16 (12)	0 -	137	PII/III
PEFO 88A-15	10	4 (15)	5 (18)	1 (4)	9 (33)	7 (26)	1 (4)	0 -	27	PII/III
PEFO 88A-16	118	81 (15)	100 (19)	44 (8)	73 (14)	147 (27)	92 (17)	0 -	537	PII/III
TOTAL for Mountain Lion Mesa	234	179 (16)	193 (17)	129 (11)	162 (14)	318 (28)	145 (13)	2 -	1128	
<u>Other Rock Art Sites:</u>										
PEFO 88A-6	6	0 -	0 -	9 (39)	2 (9)	6 (26)	5 (22)	1 (4)	23	PII/III
PEFO 88A-8	6	2 (17)	3 (25)	1 (8)	1 (8)	4 (33)	0 -	1 (8)	12	Pueblo
Overall Total	246	181 (16)	196 (17)	139 (12)	165 (14)	328 (28)	150 (13)	4 (-)	1163	

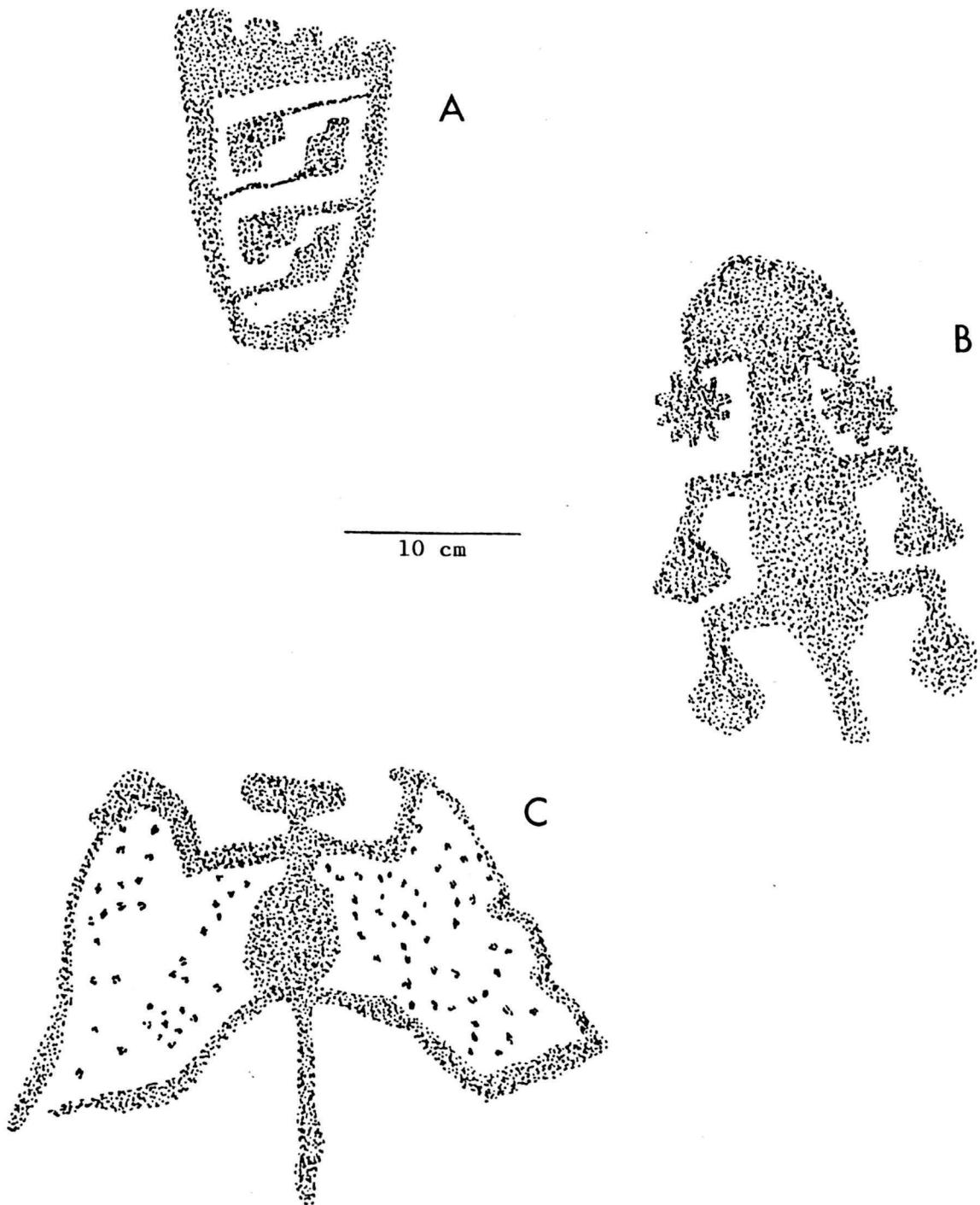


Figure 4.1. Variety of petroglyph designs. A) PEFO 88A-16, human foot with geometric design--may represent a sandal; B) PEFO 88A-16, anthropomorph with ear ornaments; C) PEFO 88A-11, bat glyph.



A

10 cm



B



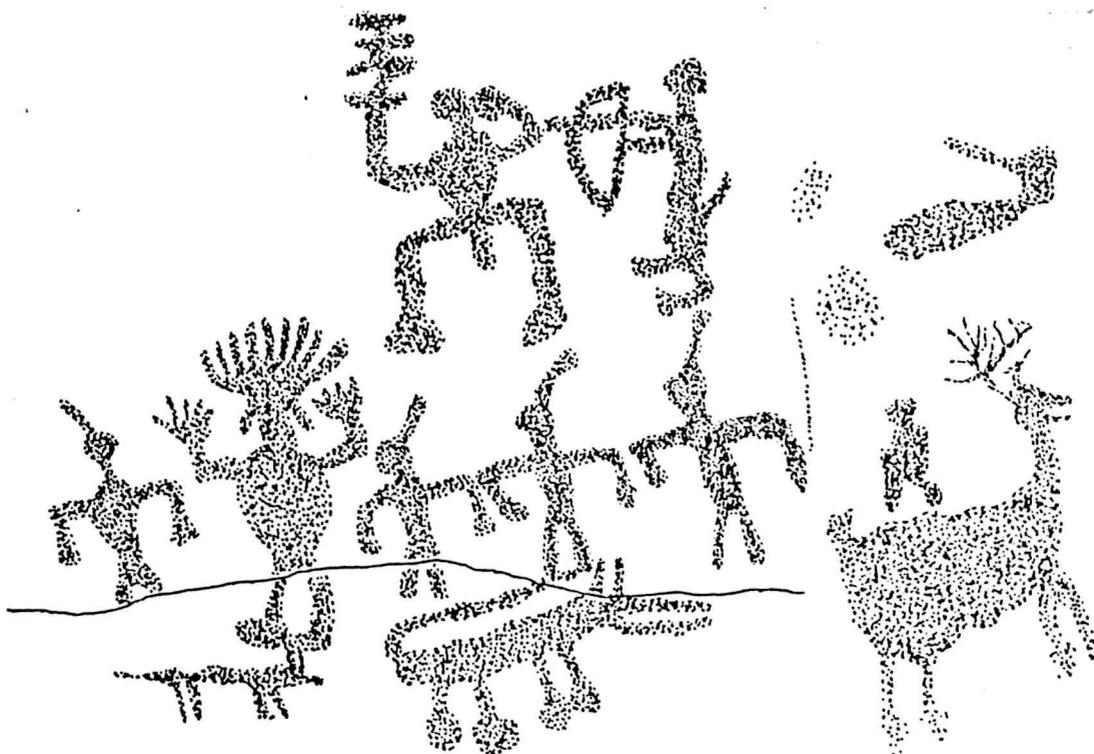
C

10 cm



D

Figure 4.2. Anthropomorphic petroglyph designs. A) PEFO 88A-11, supine flute player with rabbit ears; B) PEFO 88A-16, upright flute player with flute higher than 45 degrees; C) PEFO 88A-15, supine flute player; D) PEFO 88A-15, paired anthropomorphs exchanging or joined by linear objects.



10 cm

Figure 4.3. Petroglyph panel at PEFO 88A-16. Panel with arrangement of figures including figure with headdress and raised arms, four figures with single line out of head and downturned arms, bowman and anthropomorph holding a "staff". Cougar and deer are also present.

Probably the most interesting anthropomorphic figures recorded this year are those that present possible ethnographic inferences. Twelve flute players were observed, six at PEFO 88A-11 and four at PEFO 88A-16. They were pictured in one of three postures: standing straight up with the flute at a 45° angle or higher (Fig. 4.2B), bent over with the flute pointed downward (Fig. 4.4C), or supine with the legs bent upward and the flute raised at a 45° angle (Figs. 4.2A,C). Only two of these figures show a Kokopelli with the characteristic hunchback (Fig. 4.4B). Two of the flute players are quite whimsical since they appear to have ears like rabbits (Figs. 4.2A, 4.4A).

Fourteen Kachina masks were recorded at PEFO 88A-11 and three at PEFO 88A-12. All of these masks were front views, circular or elliptical in shape and had either circular or slit eyes. One element at PEFO 88A-11 was extremely large (Fig. 4.5A). Some had circular mouths and others had what appear to be teeth or perhaps snouts with teeth (Fig. 4.6A-B). Projections from the head included a single curved horn (Fig. 4.6D), large ears, a "mushroom-shaped" object, a short single line or a long meandering line (Fig. 4.6C).

There were three exceptional full-bodied Kachina figures. At PEFO 88A-11 there is an extremely large figure reclining on its side, with upraised arms, two pointed curved horns protruding from the side of its head, large circular eyes, a snout with teeth, knee caps, limbs with digits, apparent exposed ribs and a curvilinear spiral in midtorso suggesting a digestive tract (Fig. 4.7). Nearby a similar head with dual horns, snout and large eyes was recorded at another panel (Fig. 4.8B). In this case, however, the head was attached to a stylized rectangular body decorated with rectilinear geometric designs and no limbs were indicated. An adjacent rectilinear geometric design parallels the figure but lacks any anthropomorphic features (Fig. 4.8A). At PEFO 88A-12, Locus 2, a boulder that has tumbled from the upper reaches of the mesa edge has a single element on it that now rests in an inverted position. This is a stylized shield figure with a circular body divided in two by a straight line (Fig. 4.5B). The upper division has a pair of small circles within it and the bottom half is ornamented with four perpendicular lines. The outside circle has legs with feet and a head. Several members of the survey crew were struck by its similarity to the "All-American Man" figure in the Salt Creek drainage of Canyonlands National

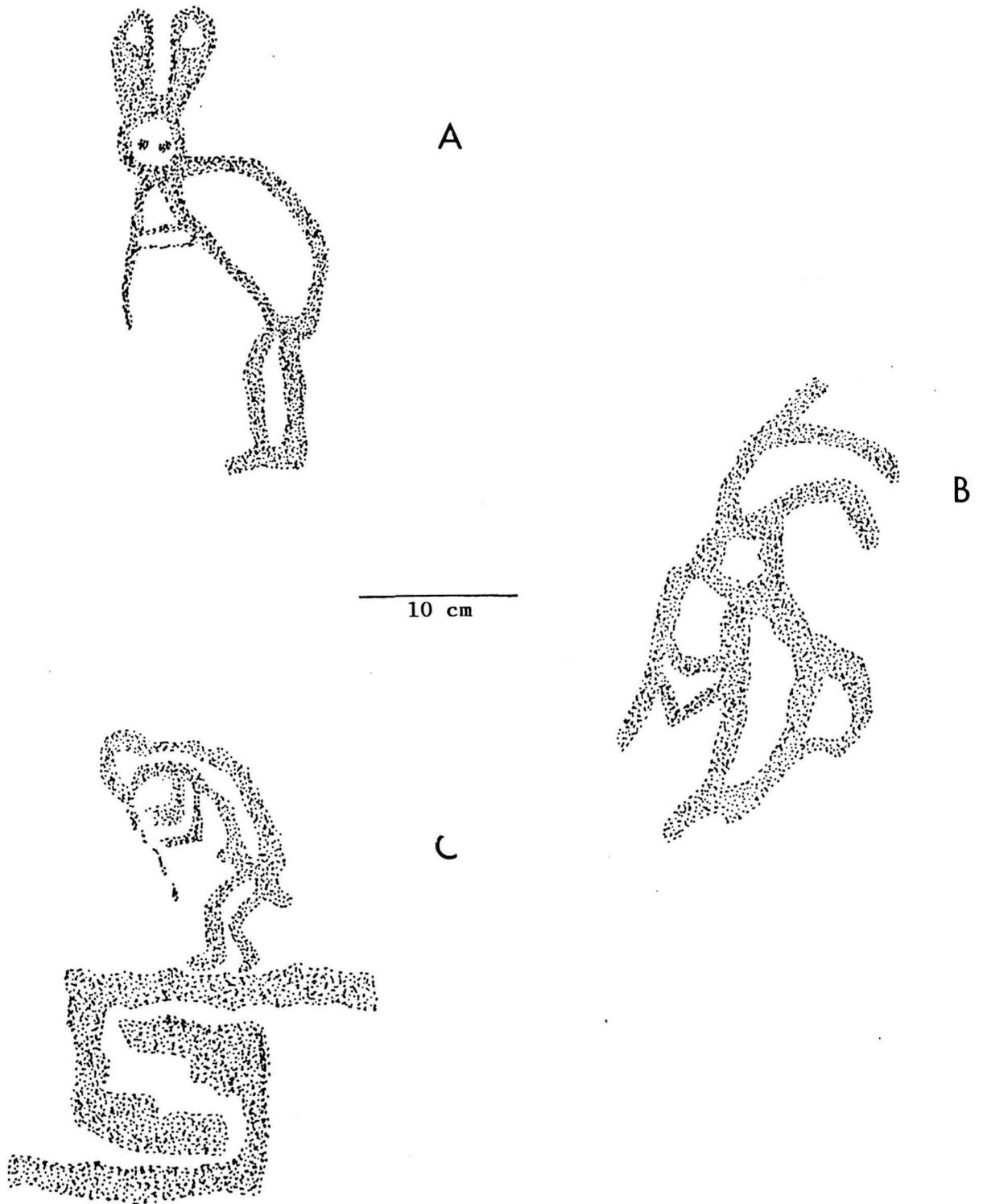
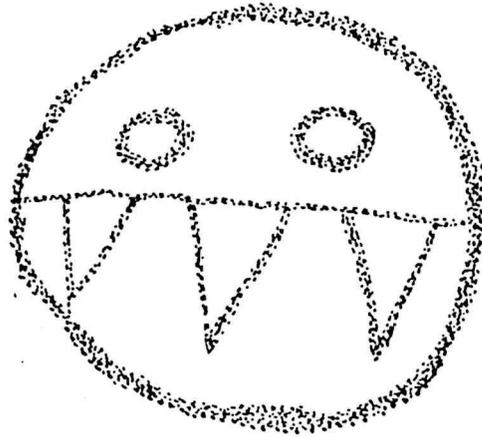
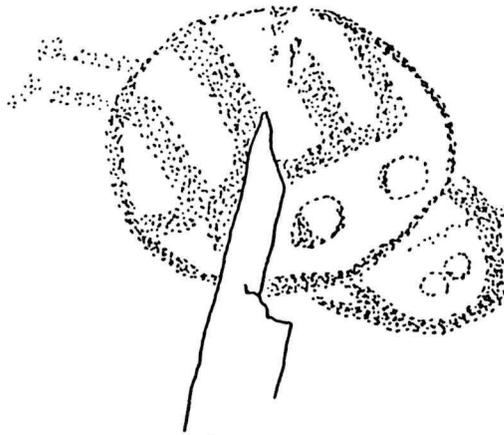


Figure 4.4. Anthropomorphic petroglyph designs at PEFO 88A-11. A) flute player with rabbit ears; B) hunchback fluteplayer or Kokopelli; C) bent-over flute player with flute pointed down.



A

10 cm



B

Figure 4.5. Mask and figure petroglyphs. A) PEFO 88A-11, large Kachina mask glyph; B) PEFO 88A-12, stylized shield figure with circular body reminiscent of the "All-American Man" figure found at Canyonlands National Park.

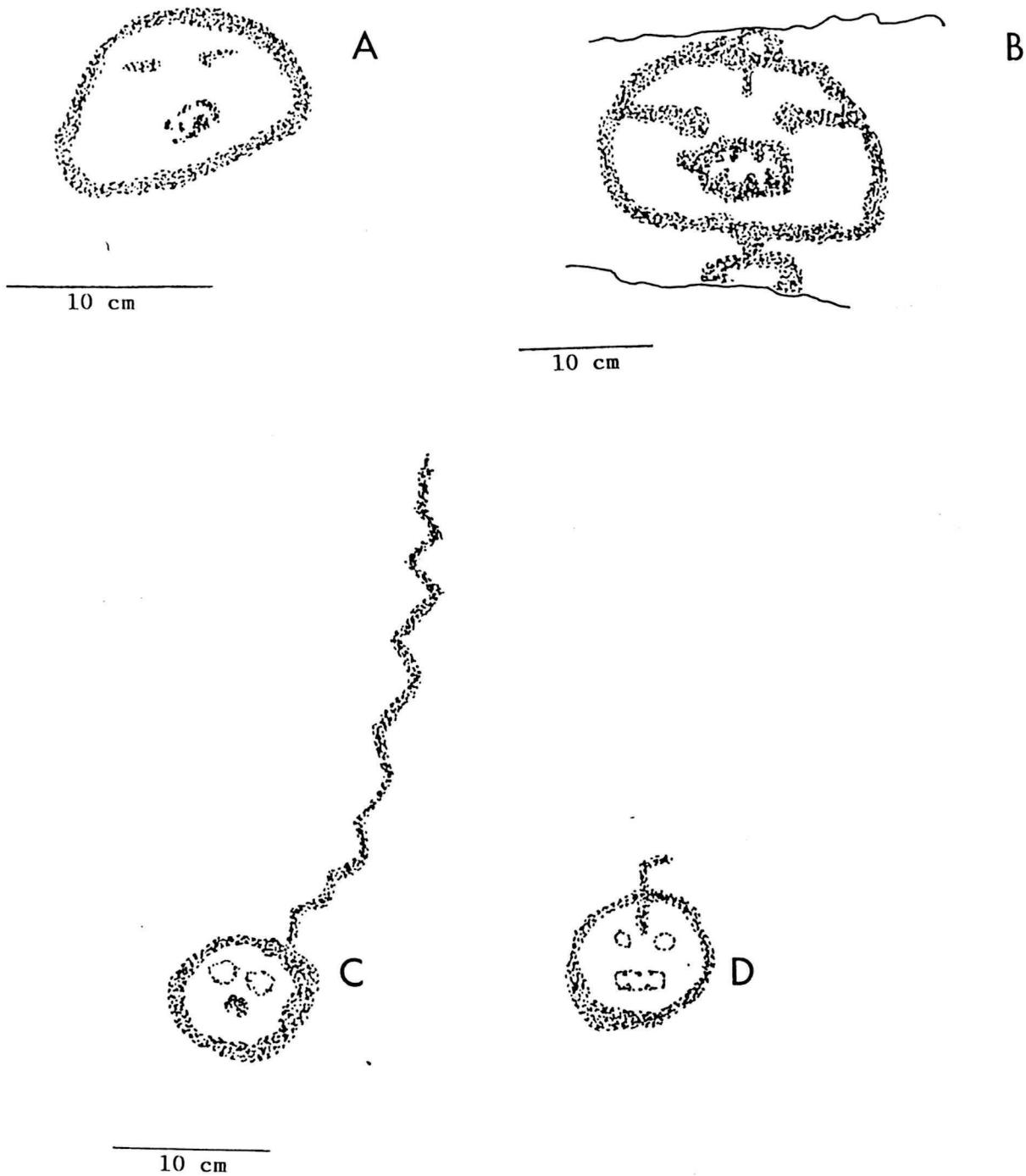
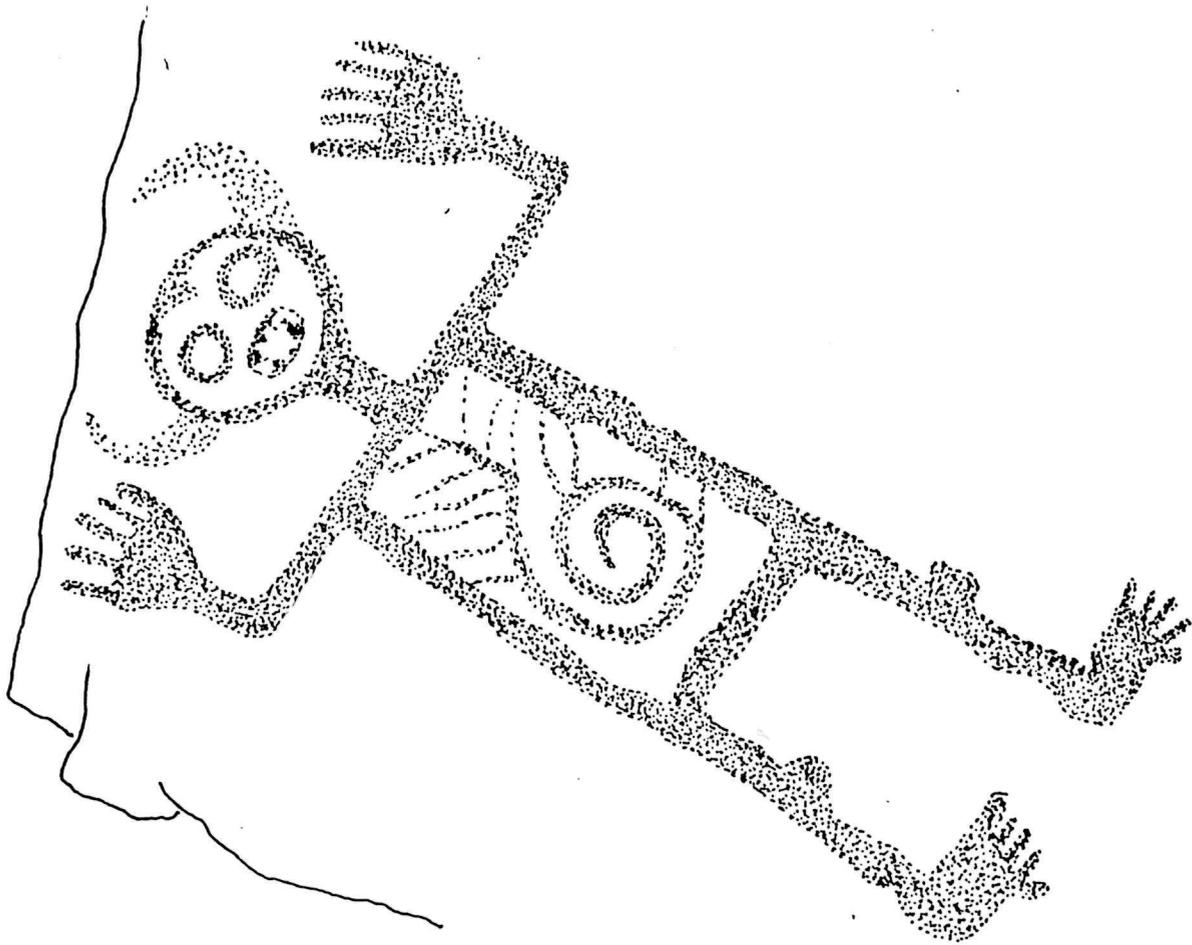


Figure 4.6. Kachina mask petroglyphs. A) PEFO 88A-12, Kachina mask glyph with snout or teeth; B) PEFO 88A-12, Kachina mask glyph with snout or teeth; C) PEFO 88A-11, Kachina mask glyph with long meandering line projecting from the head; D) PEFO 88A-11, Kachina mask glyph with single curved horn.



10 cm

Figure 4.7. Full Kachina figure at PEFO 88A-11. Figure has large round eyes, horns, snout, knee caps, digitated limbs, ribs and possible digestive tract.

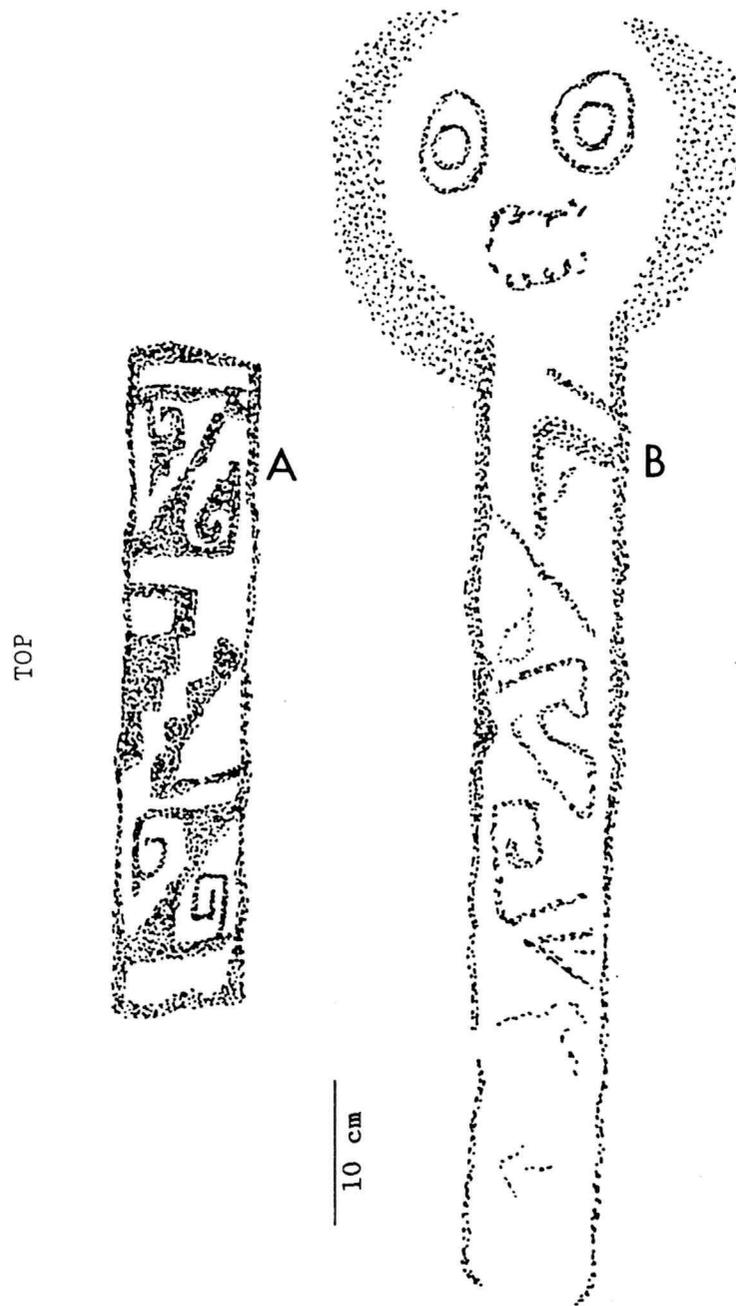


Figure 4.8. Petroglyph panel at PEFO 88A-11. A) rectilinear geometric design; B) Kachina mask glyph attached to stylized body. Top of panel to left.

Park in Utah (Pike 1974:109; Castleton 1979:278). No cultural affinity is suggested, but it is an interesting coincidence.

Site 88A-16 had four different panels with deliberately arranged anthropomorphic elements (Figs. 4.3 and 4.9). These groups are all characterized by a large central figure with upraised hands and a headdress. This dominant element is surrounded by 2, 4 or 5 supportive figures all with arms down and a single curved or diagonal line coming from the head. The ceremonial context of the arrangement seems to be implicit.

### Zoomorphs

Among representational design elements, zoomorphic motifs represent the most common element, 17 percent of all glyphs recorded by PEFO 1988 A. The most frequently occurring zoomorphs are quadrupeds which make up 55 percent of all the animal-like forms. Quadrupeds, without exception, are portrayed in profile, have four legs in a ventral position and 53 percent exhibit horns. The horned versions all appear to be ungulates, most likely antelope. There was one big horn sheep, distinguished by his full curled horns and an elongate muzzle (Fig. 4.10C). Four deer were also recorded, all on panels at PEFO 88A-16 (Figs. 4.3 and 4.10G). Deer glyphs are not common in the park; however, a few panels do exist along the Puerco River. Deer do not inhabit the Petrified Forest at the present, although according to Superintendent Gastellum, some did appear recently to graze on grains planted to hold roadbed soils in place during highway resurfacing. The number of depicted ungulates could be higher because 29 percent of the quadrupeds have what may be either very short horns or ears. Some of these could be antelope (Fig. 4.10B); others are undoubtedly meant to be carnivores, either coyotes, dogs or cougars. There are six definite depictions of cougars, all at PEFO 88A-16 (Fig. 4.3). They have long bodies, big feet, short square ears and long tails that curve back over the body. In two cases the cougars were also phallic (Fig. 4.10D) and one animal was pecked with exaggerated lips. Twelve percent of the quadrupeds lack identifying characteristics other than their four legs.

Approximately 40 percent of the zoomorphs are reptiles, about equally divided between snakes and lizards. Snakes were pecked as rectilinear zig-zags or curvilinear lines with a definable head. Some of the bodies were



Figure 4.9. Petroglyph panel with variety of motifs at PEFO 88A-16. Petroglyph panel with anthropomorph wearing headdress with upraised arms, surrounded by five figures with single line coming from head and arms held down. Geometric glyph. Top of panel to right.

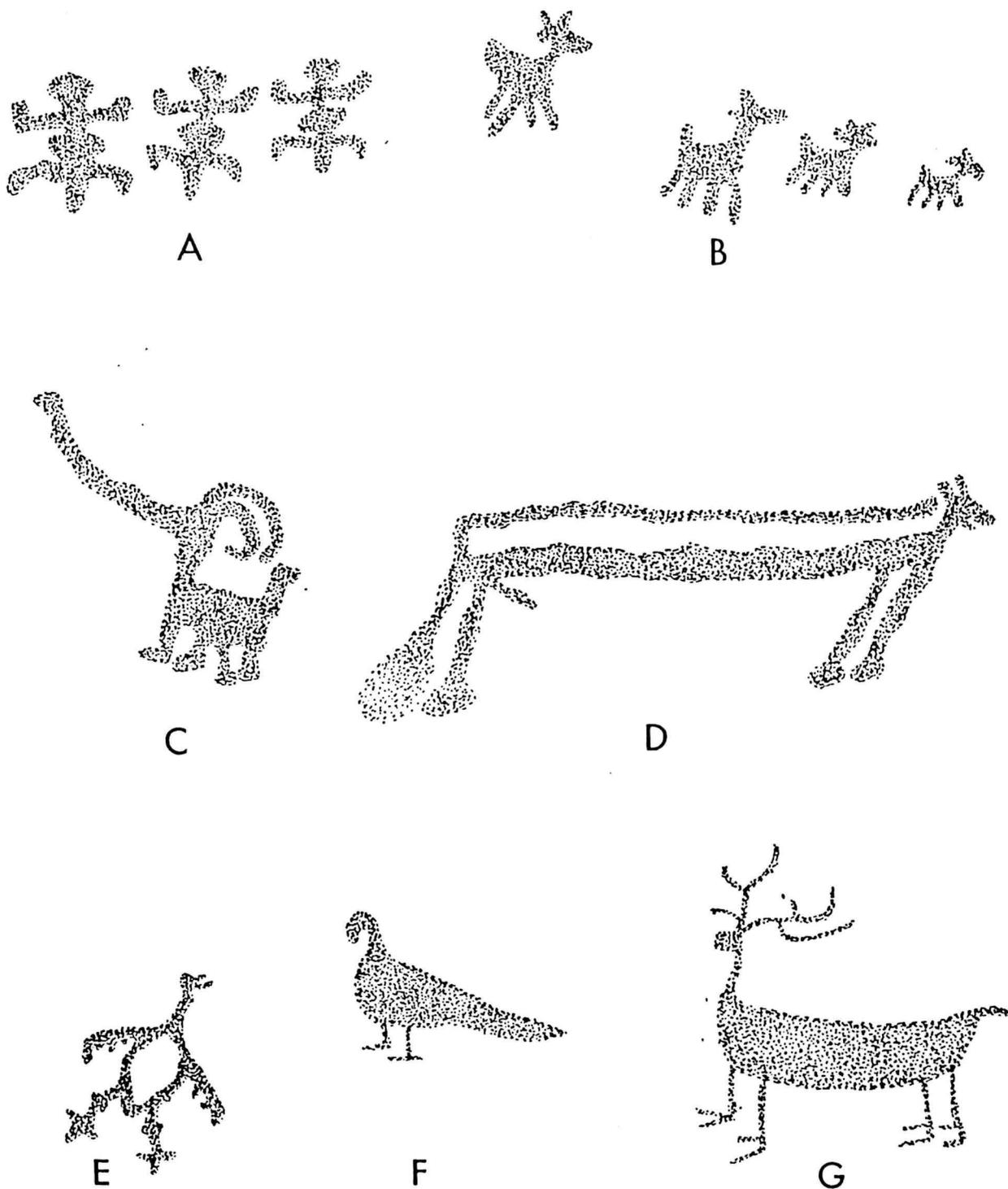


Figure 4.10. Zoomorphic petroglyph designs. A) PEFO 88A-16, "lizard-men" with circular body, splayed legs and tails; B) PEFO 88A-16, quadrupeds with short horns or ears, probably antelope; C) PEFO 88A-11, big horn sheep with full curled horns and elongated muzzle; D) PEFO 88A-16, phallic cougar with long body, big feet, long tail curved back over body; E) PEFO 88A-12, front view of bird with extended wings, seemingly in flight; F) PEFO 88A-12, macaw with long tail feathers and distinctive curved beak; G) PEFO 88A-16, deer with characteristic antlers.

exceptionally long, up to 230 cm. Snake heads were usually elliptical; however, a diamond-shaped head, a head with four curved lines, a head with two horns and a mouth, and a head with three short perpendicular lines with orbs at the ends were also observed (Fig. 4.11B). These might be interpreted as the plumed or horned snakes of Mexican origin or the water serpents of historic Pueblo society. The lizards, sometimes dubbed "lizard-men," are fairly uniform (Fig. 4.10A). A dorsal view is shown with a characteristically elliptical or circular body with stick legs splayed at the joints above and below the body. They have round heads with no protrusions and long thin tails. Most have three digits on the ends of their extremities.

Birds are the next largest category of zoomorphic forms. Most show a frontal view, seemingly in flight with extended wings and a flared tail (Fig. 4.10E). They appear to be raptors, most likely eagles. Only one flying bird was depicted in profile. A single element is a walking bird; from its long tail feathers and distinctly curved beak, it appears to be a macaw (Fig. 4.10F).

Insect forms include beetles, spiders, centipedes and scorpions (Fig. 4.11A). The most unique zoomorph is a single glyph of a bat which was found at PEFO 88A-11 (Fig. 4.1C).

#### Hands and Tracks

Twelve percent of the glyphs at Mountain Lion Mesa represented hands or tracks. As is the case elsewhere in the Petrified Forest, bear paw prints make up the vast majority of glyphs in this category. At Mountain Lion Mesa 45 panels had one or more hand or track motifs; 37 (82%) of those panels had bear paw elements. Twenty-four percent of the panels in this category are bird tracks. Whereas bear prints will appear one at a time or in groups, bird tracks usually will appear in multiples, sometimes seven or eight at a time on a panel.

There were five examples of human hands. All appeared as a single hand print on different panels and all were depictions of the left hand. The most unique glyph was a human foot with a geometric design on the sole which might represent a sandal (Fig. 4.1A).

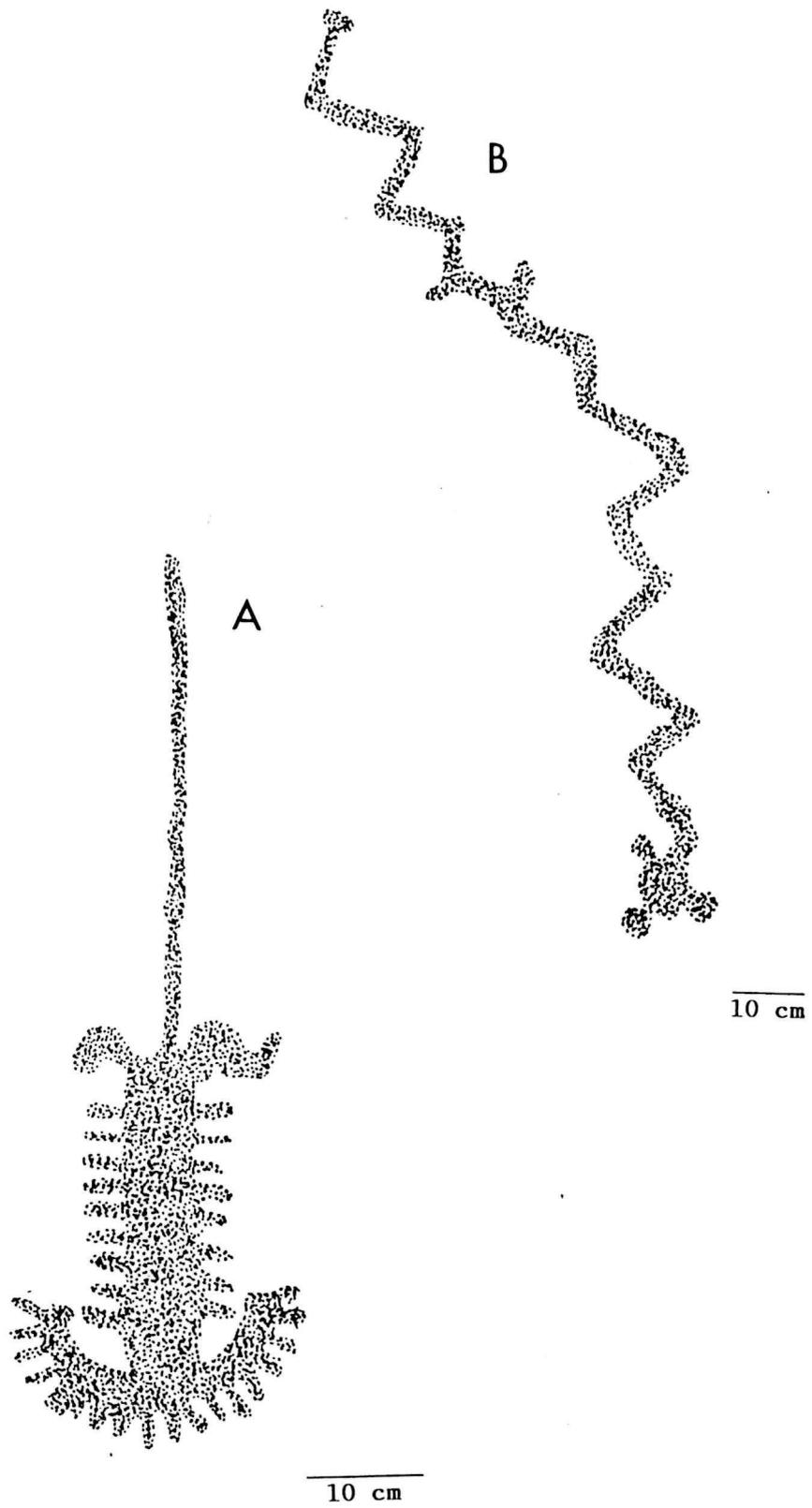


Figure 4.11. Zoomorphic petroglyphs at PEFO 88A-16: A) insect glyph; B) snake glyph with three short perpendicular lines capped by orbs.

Conspicuously absent from this year's sample were ungulate and cougar tracks which amble across numerous rock art panels in the Petrified Forest.

### Geometric Designs

Geometric designs make up 14 percent of the glyphs recorded. Spirals, both rectilinear and curvilinear, are the most common geometric design elements at Mountain Lion Mesa. Sometimes the peripheral end of the spiral is reversed to create a double, connecting spiral. Many of the spirals are interlocking, creating frets or scrolls.

Various elements based on a circle are prevalent. This includes "sun" symbols (circles with radiating tick marks), concentric circles and bisected circles. Other elements catalogued were triangle chains, diamonds, concentric diamonds and stepped designs, some of which interlock.

Probably the most interesting geometric design element is the enclosed grid. They have a concrete appearance and the largest linear dimensions. These have been called "textile/ceramic" designs in the literature because they include motifs common in weaving and on pottery. The most common enclosed grid form is based on repeated designs in four triangles created by intersecting diagonal lines within the rectangle. At the Mountain Lion Mesa sites there are several grids that differ from this norm. These designs are divided by a straight line into two unequal rectangles. The upper, smaller rectangle is left undecorated or is lightly pecked with asymmetrical lines. The lower and larger rectangle is more formally laid out around a design of concentric diamonds, concentric triangles or interlocking rectilinear frets (Figs. 4.12A, 4.13A, 4.13B). One grid includes a lizard form surrounded by asymmetrical frets (Fig. 4.12B). These textile/ceramic designs can also appear outside the enclosing grid (Fig. 4.9). The major importance of these types of designs is that they use some of the elements that occur in ceramics. Schaafsma (1987) has correlated rock art designs at Wupatki National Monument with Tusayan White Ware ceramics. The same possibilities await further analysis at Petrified Forest.

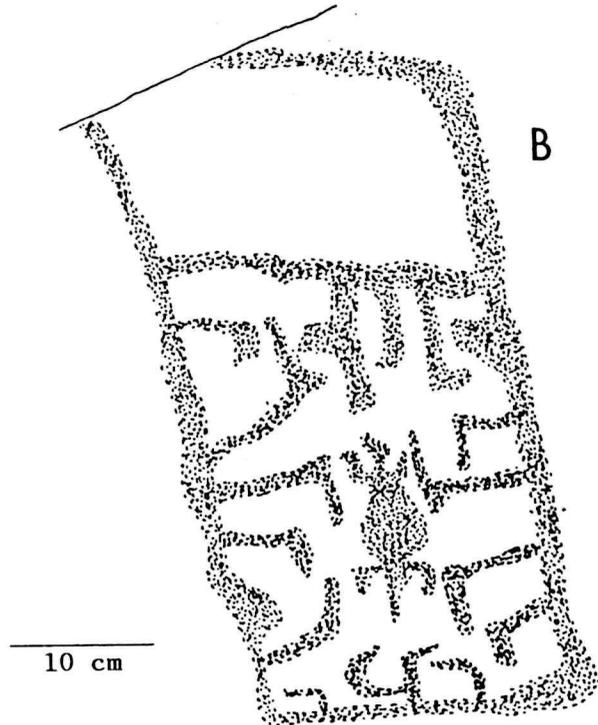
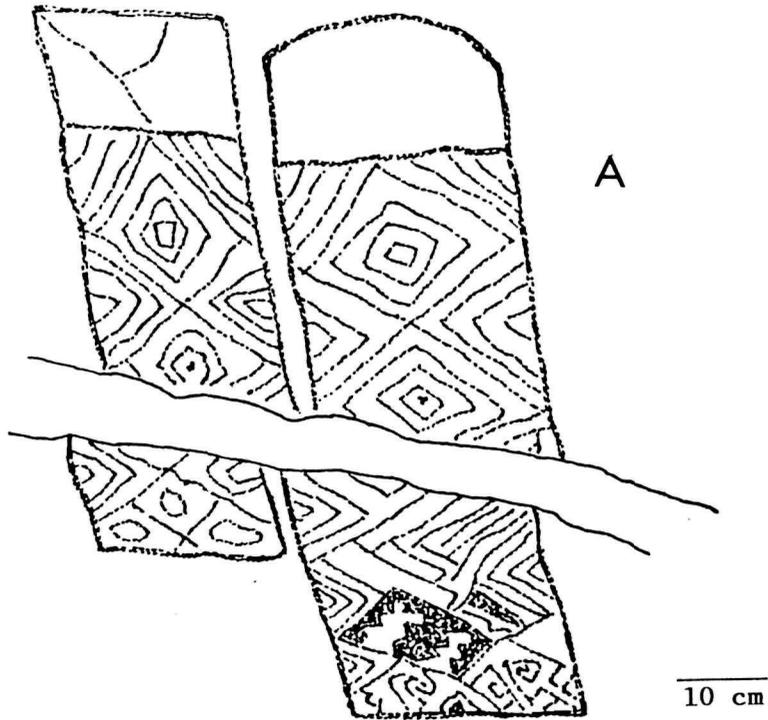


Figure 4.12. Ceramic/textile designs at PEFO 88A-16. A) enclosed grid is divided into two rectangles with concentric diamond design in larger rectangle; B) enclosed grid divided into two rectangles with a lizard surrounded by asymmetrical frets in larger rectangle.

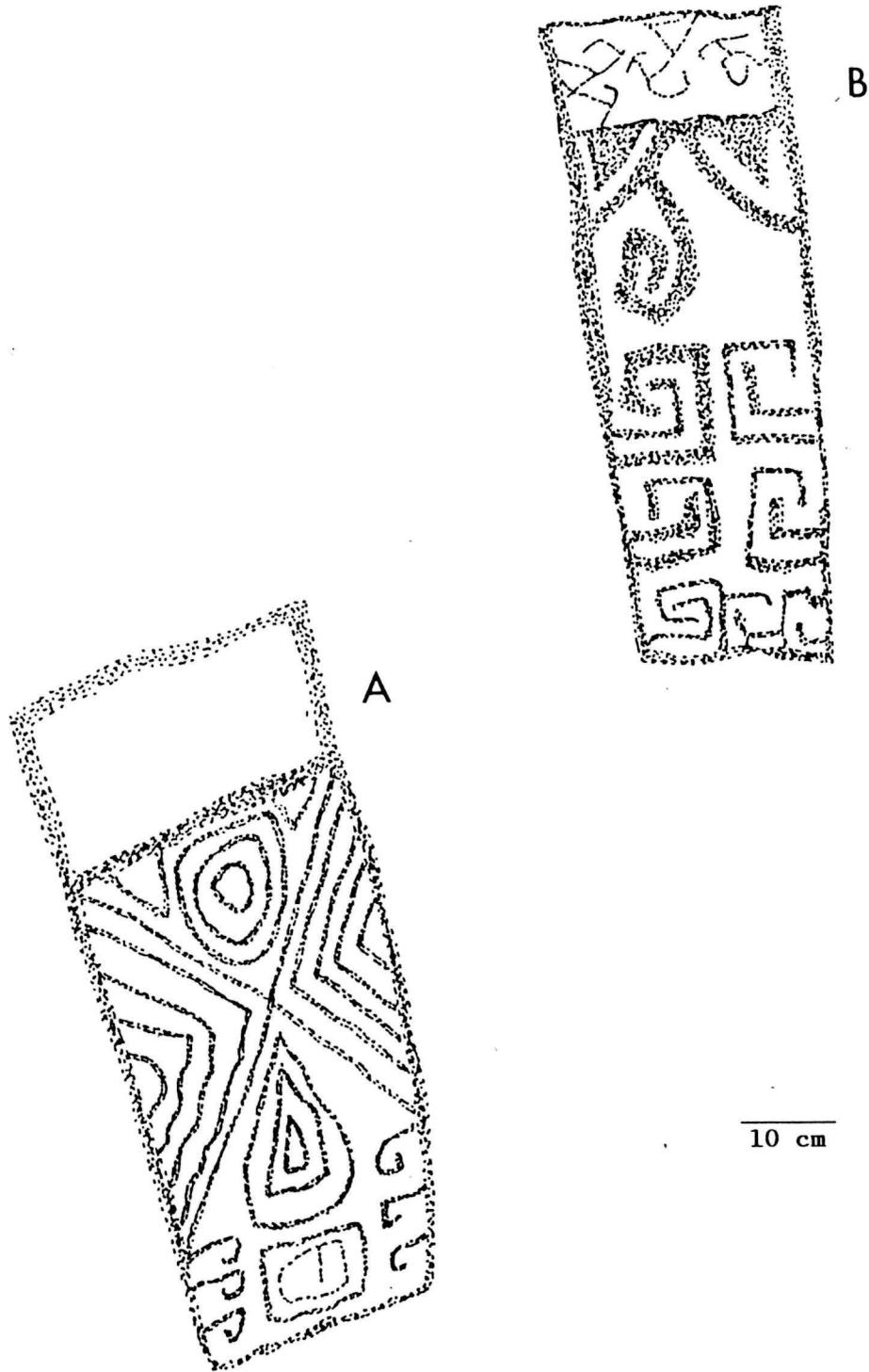


Figure 4.13. Ceramic/textile petroglyphs. A) PEFO 88A-16, enclosed grid is divided into two rectangles with concentric triangle design in larger rectangle; B) PEFO 88A-13, enclosed grid is divided into two rectangles with interlocking rectilinear frets in larger rectangle.

## Abstract Designs

One pattern that has remained consistent through two seasons of detailed rock art recording at Petrified Forest is that 32 to 33 percent of the elements that can be categorized (that is, are not indeterminate or indistinct) are abstract. On Mountain Lion Mesa only 10 percent of the panels (24 out of 234) were devoted entirely to abstract elements. On each of these panels there were five or fewer total elements. Abstract designs appear most frequently on panels with representational or geometric designs. The physical dimensions of the abstract elements are usually smaller than other classes of elements. This could lead to the conclusion that abstract designs are of secondary importance, but there are no ethnographic or prehistoric data to support this.

A varied inventory of abstract elements exists at project sites. The most common are zigzag, wavy and meandering lines, asymmetrical bisecting lines, crosses, long parallel lines, short parallel lines or tick marks, dots, large dots or orbs and dots connected by straight lines. Found in lesser numbers were chevrons, stacked chevrons, semicircles and "U"s, barbells, rakes and ladders. Absent from the panels at Mountain Lion Mesa is the enclosed or boxed cross which is common throughout the park.

## Indeterminate and Indistinct Designs

There is a large disparity between the percentages of indeterminate and indistinct elements recorded along the Petrified Forest western fenceline in 1987 (Christensen 1988) and Mountain Lion Mesa. Indistinct elements comprised 42 percent of the total elements recorded in 1987 compared to 13 percent in 1988. There are primarily two factors that contribute to this: rock conditions and the directional orientation of the rock art panel.

The sandstone at Mountain Lion Mesa does not seem as friable as that at other locations in the park; therefore, the worked edges of the petroglyphs do not weather as badly. It also lacks the consistent degree of dark patination seen at sites such as PEFO 87A-28. Whether there is a relationship between heavy patination and exfoliation and erosion has not been determined.

Orientation seems to be of major importance. Panels that are on a horizontal plane or are facing the north or west seem to have the greatest degree of erosion. For example, PEFO 88A-11 is positioned on the north point of the mesa and PEFO 88A-15 is on the southwest base. The panels within these sites that face north and west are the most weathered on the entire mesa. In PEFO 88A-14 some of the panels are on horizontal surfaces and they have become almost unintelligible due to the loss of patination on the parent rock. The same can be said for panels that are low on rock faces in areas devoid of vegetation and oriented to the prevailing winds. These panels exhibit little contrast between pecked surface and the parent rock due to the scouring affect of eolian erosion.

The majority of elements classified as indistinct are random peck marks. These could be either designs that were started and then abandoned early in the manufacturing process or a testing of a rock surface to determine its properties prior to a more ambitious effort. It is impossible to ascertain the validity of either explanation.

#### Historical Designs

The great advantage of recording rock art in an area like Mountain Lion Mesa is the fact that the sites are pristine. Prehistoric rock art seems to inspire graffiti and vandalism. There are only two elements on the whole mesa that indicate any modern origin. One element at PEFO 88A-11 is an indeterminate design that shows no repatination and has been produced by abrading, possibly with a metal object. The only other historical element is at PEFO 88A-12 and appears to be the letter "R." The semicircular portion of the design is prehistoric and the linear parts appear to have been added later. A Petrified Forest park waterline and maintenance road pass about 500 m north of these two sites so it is fortunate that there is no additional evidence of modern intrusions.

#### Discussion

There are three main topics to be discussed in this section: temporal affiliation, design style and function of the Mountain Lion Mesa rock art.

## Temporal Affiliation

In dating the rock art of the Petrified Forest, the results of other researchers have been consulted. The most extensive regional work has been done by Pilles (1975) and Martynec (1982). Pilles studied 18 petroglyph sites between Winslow and Holbrook along the Little Colorado River drainage, west of Petrified Forest. Martynec recorded over 2,000 elements at 11 sites within Petrified Forest. Attributes used in chronometric studies include superpositioning of elements, differential erosion within a panel, the vertical location of elements on a panel, associated artifacts and diagnostic motifs such as ceramic designs. Our analysis of 20 sites and slightly less than 2,500 petroglyph elements in the last two years follows that of Pilles and Martynec.

Superpositioning was not common in many of the panels or sites at Mountain Lion Mesa. The superimposing of one element over another seems to be more frequent on large panels with numerous elements. None of the panels recorded on the PEFO 1988 A survey contained more than 50 elements and only three panels had more than 40. These larger panels did present some examples of superpositioning. For most of our analysis we relied upon differential weathering within the site and the association of diagnostic artifact scatters or architectural features.

One of the attractions of recording at Mountain Lion Mesa was the great variety and number of petroglyphs. It was hoped that this would yield a wide temporal span as well; however, this was not the case. No Basketmaker rock art elements were recorded. AZ Q:1:67 remains the only Basketmaker petroglyph site recorded during the four-year-long boundary survey at Petrified Forest.

The bulk of the elements at Mountain Lion Mesa are early and middle Pueblo III. This includes in particular such elements as the ceramic/textile designs (Figs. 4.12 and 4.13) and the anthropomorphic figures with headdresses (Figs. 4.3 and 4.9). A wide variety of other outlined bodied anthropomorphic and solid pecked zoomorphic elements were produced during this period.

The most interesting images are the Kachina masks and Kachina figures most prevalent at PEFO 88A-11 and PEFO 88A-12. Martynec (1985) places these chronologically in the early Pueblo period (A.D. 650 - 1000). Dozier (1970)

favors a date around A.D. 1000. Pilles (1975) disagrees and places the Kachina elements in Pueblo IV (A.D. 1300-1450). Other researchers also advocate the Pueblo IV appearance of the Kachina cult (Schaafsma and Schaafsma 1974; Anderson 1955). On the basis of superpositioning and relative weathering at PEFO 88A-11, these later dates seem more likely. This coincides with the frequent occurrence of Kachina motifs at Puerco Ruin (AZ Q:1:22), the only large Pueblo IV site within the Petrified Forest.

### Design Style

The question of design style may have implications regarding cultural affiliation. Based on the rock art recorded at Mountain Lion Mesa, contact with the Rio Grande River valley seems plausible but connections with the Jornada Mogollon are very tentative. Elements similar to the Petrified Forest Kachina masks can be found in New Mexico in the Galisteo Basin (Schaafsma 1972:142-43) and at Pottery Mound near Los Lunas (Schaafsma 1980:276). Sixteen painted kivas with numerous Kachina figures portrayed were reported at Pottery Mound. Hopi-style ceramics at the site, which dates A.D. 1300-1450, indicates contact with the Little Colorado Basin (Hibben 1975).

This does not imply a migration of Rio Grande inhabitants into the park region, any more than the presence of Mogollon ceramics indicates a Mogollon occupation of Petrified Forest; it does indicate cultural contact between the Little Colorado area and the Rio Grande valley. There obviously exists a danger in trying to take a few rock art elements and infer cultural affiliation. For example, the enclosed cross motif found in Petrified Forest also occurs in New Mexico, southern Utah, southern Nevada and across California to the western edge of the Mohave Desert, and the presence of a single common element does not suggest a common origin. But there are enough Rio Grande-style glyphs in Petrified Forest to indicate some type of cultural contact and interaction.

Another design style is represented by the multitude of diagnostic rock art elements that indicate an affinity with the lower Little Colorado River area, particularly the Wupatki region. Schaafsma (1987) has attributed the rock art of this area to the Sinagua culture. Evidence of contact with the Sinagua is rare in the central and eastern Little Colorado basin (Gumerman

and Skinner 1968), yet significant quantities of Little Colorado White ware have been found in the Flagstaff area (Colton 1946). The Sinagua rock art examples cited by Schaafsma at such sites as Crack-in-the-Rock and Horseshoe Mesa are probably more closely associated with Kayenta Anasazi sites than with Sinagua sites (Schroeder 1977). The presence of Tusayan White Ware ceramics within the park indicates some Kayenta Anasazi influence. This is further reflected in the similarity of rock art motifs at Wupatki and Petrified Forest.

### Function of Rock Art

The ultimate goal of archeology is interpretation, but attempting to decipher the symbolic content of an extinct religious system is fraught with uncertainties as Burton (1988) aptly points out. In the Great Basin, for example, no living descendants of the indigenous creators of the rock art now occupy the area (Irwin 1980; Bettinger and Baumhoff 1982). That is not the case at Petrified Forest; the descendants of those who inhabited sites within the park now reside on the mesas at Hopi or along the banks of the Zuni River, and some elements of their prehistoric rituals remain intact (Fewkes 1919; Cordell 1984). From Southwestern researchers who have used ethnography (McCreery and McCreery 1986) and informants (Ellis and Hammack 1968), religious ceremonialism offers the principle explanation of the function of rock art.

The presence of Kachina masks and figures, the anthropomorphic figure with headdress surrounded by subordinate attendants, Kokopellis and flute players, anthropomorphs with staffs and plumed and horned serpents all point to traditional ceremonial practices and themes in contemporary Pueblo ritual (Parsons 1939; Titiev 1944; Courlander 1971; Nequatewa 1973).

Closely allied to this is the function of archaeoastronomy. Preston and Preston (1985) have recorded ten solar correlations within Petrified Forest. Ferral Knight has recorded a summer solstice interaction with a spiral petroglyph at Martha's Butte, a short distance south of Mountain Lion Mesa, and a correlation between the vernal equinox and a spiral glyph on Panel 49, Locus A at PEFO 88A-16. A number of east-facing spiral elements would certainly indicate the possibility of additional phenomena at the Mountain Lion Mesa sites.

Some rock art elements may represent clan symbols. Present at Petrified Forest and identified as possible clan symbols are the bear, badger, coyote, rabbit, eagle, parrot, lizard, snake, antelope, crow, deer, corn, star, sun, Kachina, flute, and one- and two-horned symbols (Lowie 1929; Colton 1960; Nequatewa 1973; Michaelis 1981). The occurrence of such symbols has been tied to migrations, pilgrimages, ceremonies and clan boundaries.

Another long-standing explanation of rock art has been that it represents sympathetic hunting magic (Heizer and Baumhoff 1962; Von Werlhof 1965; Grant and others 1968). Many quadrupeds are depicted at the Mountain Lion Mesa sites, most of them ungulates. There are no hunting scenes portrayed at the mesa, but such scenes do exist both in the park (AZ Q:1:68 and AZ K:13:52) and east of the park along the Puerco River at Pinta. Because so little excavation has been done in Petrified Forest, it is difficult to assess the importance of hunting in the area prehistorically. Several of the earlier excavation reports mention mammal bones, but only at the Twin Buttes excavation is there specific evidence of antelope bone (Wendorf 1953). More recent work has benefitted from higher standards of control but the role of hunting in prehistoric subsistence is still unclear (Jones 1986, 1987; Tagg 1987; Wells 1988).

### Conclusions

These observations underscore the importance of recording and analyzing rock art in the Petrified Forest and the surrounding region. As the data base expands, chronological sequence, cultural affiliation and interpretation become more credible. Understanding the rock art of the Petrified Forest is an important part of evaluating regional cultural processes and dynamics.

## Chapter 5

### SETTLEMENT PATTERN STUDY

A settlement pattern study was initiated following the third season of the Petrified Forest National Park boundary survey for a Society of American Archeology symposium on research in the middle Little Colorado region. This analysis is mainly descriptive, looking for patterns in the locations of sites on the landscape. The land forms present in the park will be examined and the locations of sites through time will be discussed. A comparison of the Petrified Forest site data with survey data from other areas in the middle Little Colorado province, the southwest Hopi Buttes and the Homol'ovi areas, will also be made.

#### The Data

The site data from the fourth season has been added to the site data from (1) the first three seasons of the boundary survey (Jones 1987, Wells 1988), (2) systematic survey data collected from the Mainline Road survey conducted by Hammack (1979) in the late 1970s, (3) data from compliance-related survey work done by Jones, Tagg and Wells and (4) previously investigated sites such as Puerco Ruin, Agate House and the Flattop Site. The compliance projects include the 1986 waterline survey (Tagg and others 1987) as well as testing projects along the Mainline Road (Jones 1983, 1986), at an Archaic campsite (Tagg 1987) and at the lithic workshop/quarry adjacent to Puerco Ruin (Wells 1988).

These surveys provide data for three north-south transects running through the park joined by east-west transects at the north and south ends of the park (Fig. 5.1). All environmental zones are represented in the surveyed areas. More than 19,500 acres, a 21 percent sample of the park, have been systematically surveyed. To date 296 sites have been recorded to modern standards. These data have done much to change the picture of prehistory at Petrified Forest. Much of our present interpretation differs from Stewart's (1980) overview prepared less than 10 years ago, when the only data available were systematic survey data from a 3.8 percent sample of the park (Hammack 1979) and data from the early reconnaissance surveys done by Mera (1934) and Jepson (1941; Reed 1980).

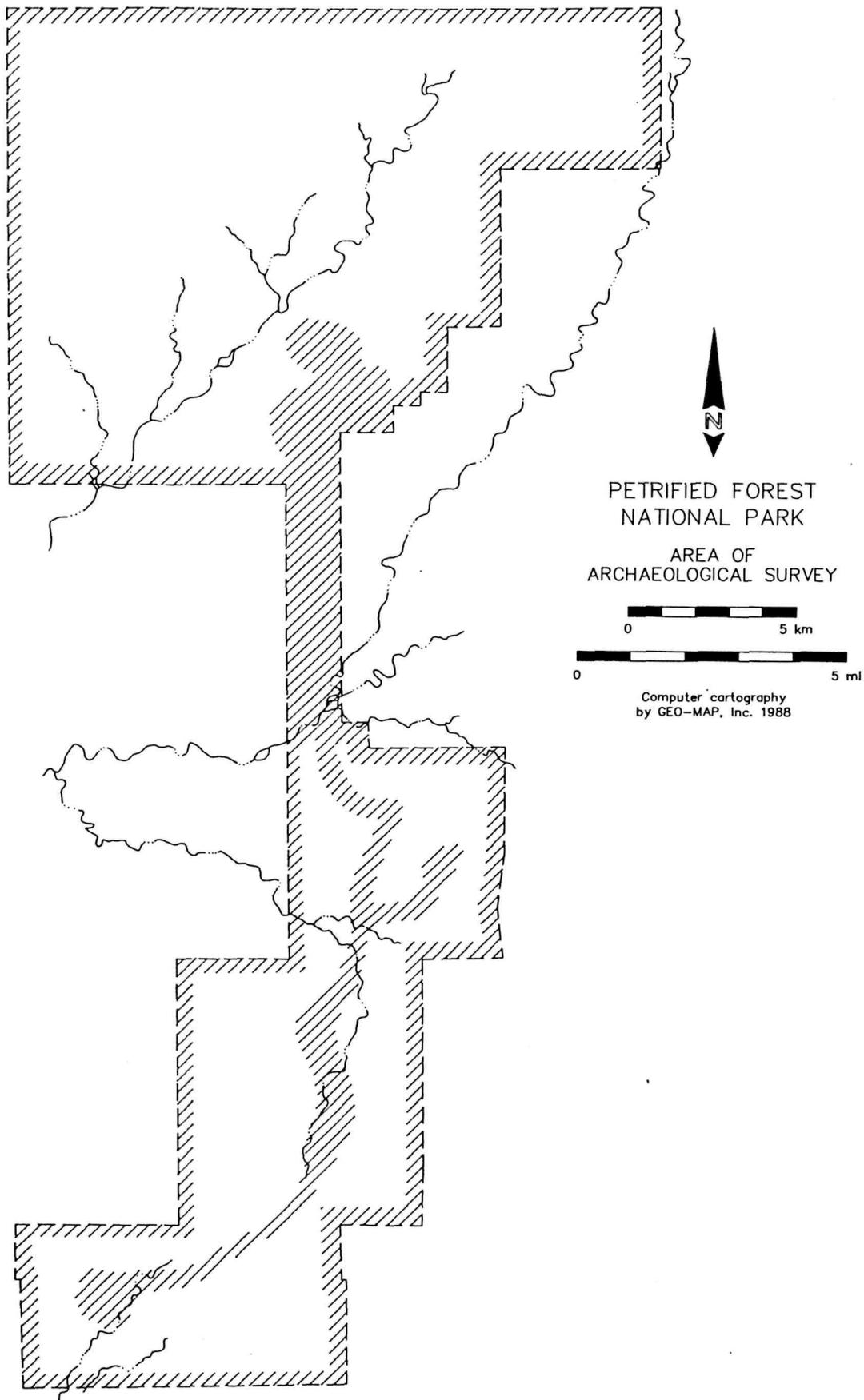


Figure 5.1. Territory surveyed at Petrified Forest National Park as of July, 1988.

Although not a statistically derived sample, the available data represent a good cross-section of site variability from a variety of environmental zones. For the 30 square miles surveyed, overall site density averages 10 sites per square mile with an actual density of up to 25 sites per square mile and projected densities of 0 to 32 sites per square mile.

Sites range from Basketmaker pit house villages to large pueblos, from farmsteads to rock art sites and from petrified wood quarries to a great kiva site. Site types were defined based on the number and variety of surface artifacts and surface features. Eight prehistoric site types have been recognized: artifact scatters, multiple-room masonry sites, single-room masonry sites, rock art sites, pit house/slab feature sites, lithic scatters, rockshelters and agricultural sites. Historical components were recognized at 12 sites but are not included in this discussion. Table 5.1 lists the number of sites per site type. Although this analysis deals with 296 sites, 22 of these sites may be assigned to two type categories, making the total number of site components in this table 318 (296 + 22 = 318).

Table 5.1  
NUMBER OF SITES BY TYPE

<u>Site Types</u>	<u>Number of Sites</u>	<u>Sites with Other Components</u>
Artifact Scatters	81	
Multiple Masonry Rooms	72	(2)
Single Masonry Room	68	(2)
Rock Art	38	(16)
Pit House/Slab Feature	36	
Historical	12	(2)
Lithic Scatter	8	
Rockshelter	2	
Agricultural	<u>1</u>	<u>          </u>
Total	318	(22)

## Landform

Today the park is an arid environment, with grassland communities in the sand dunes and active alluvial areas. For this analysis six broad categories of landform were defined, including upland, lowland and badland areas on either side of the Puerco River. Badlands include barren hard pan areas, isolated rock outcrops, isolated mesas and steep, boulder-covered escarpments. The site counts are summarized in Table 5.2. Site distribution by landform is illustrated in Figure 5.2.

Table 5.2  
SITE TYPE BY LANDFORM

SITE TYPE	North of Puerco:			South of Puerco:			TOTAL
	UPLANDS	LOWLANDS	BADLANDS	UPLANDS	LOWLANDS	BADLANDS	
Artifact Scatters	40	1	-	26	14	-	81
Multiple Masonry Rooms	20	4	-	19	24	5	72
Single Masonry Room	26	2	-	12	28	-	68
Rock Art	1	2	3	8	7	17	38
Pit house/Slab Feature	9	1	-	7	17	2	36
Historical	5	-	-	4	3	-	12
Lithic Scatter	2	3	-	1	2	-	8
Rockshelter	-	-	-	1	-	1	2
Agricultural	-	-	-	-	1	-	1
Total	103	13	3	78	96	25	318
Percentage	32%	4%	1%	25%	30%	8%	

Sixty-three percent of the sites recorded are located south of the Puerco River. This is due in part to the lack of sites in the Painted Desert but can also be attributed to the fact that a smaller fraction of the northern part of the park has been surveyed (approximately 14% in the north versus 25% in the south). Fifty-seven percent of all sites are found in one of the two upland zones, 34 percent in the lowlands and the remaining 9 percent in the badlands.

Sites are most often located in three of these environmental zones. Thirty-two percent of all sites lie within the upland zone north of the Puerco River where wind is the primary force affecting the sand dunes; here building stone is in short supply. In the upland mesa tops south of the

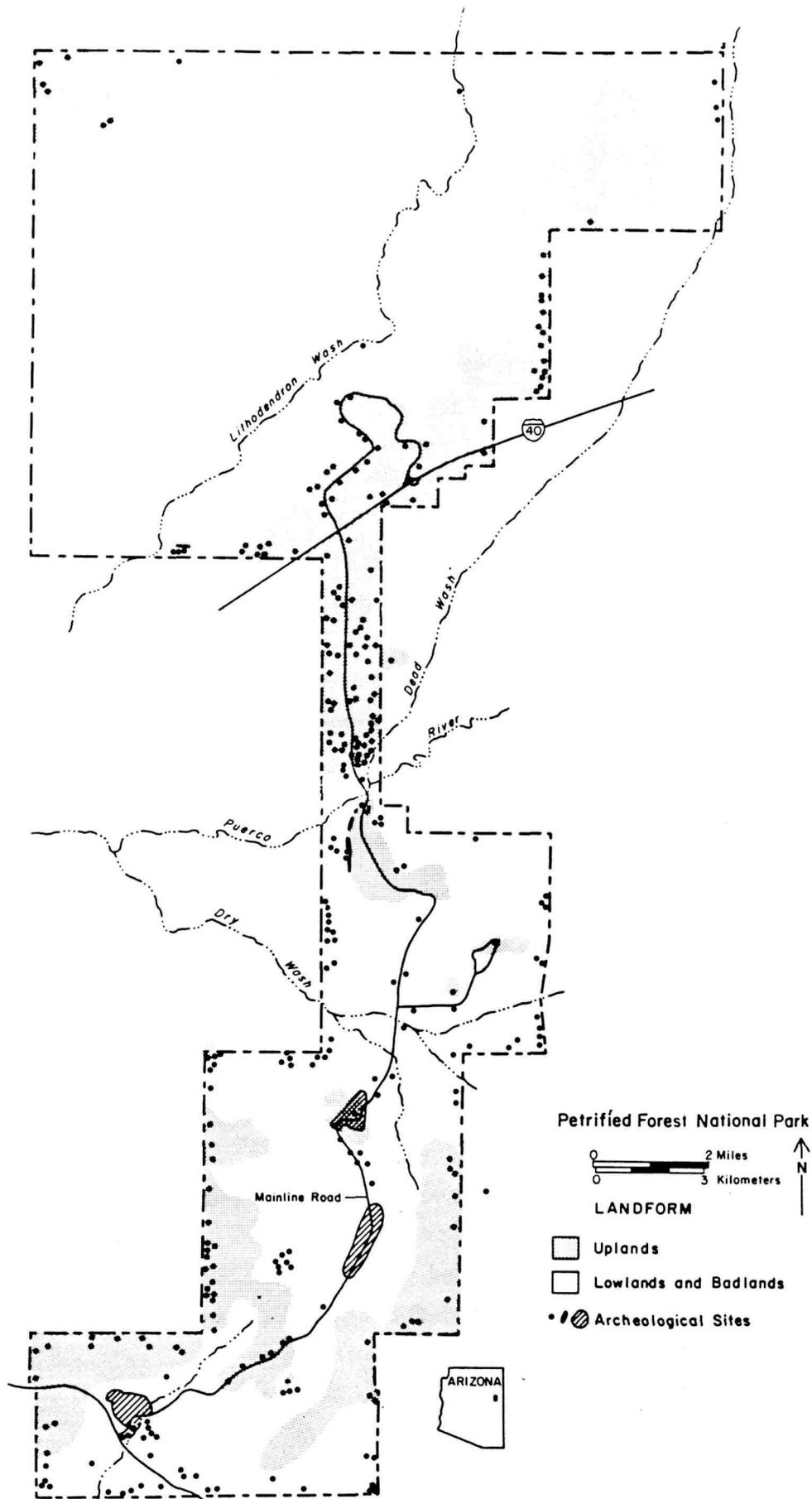


Figure 5.2. Distribution of sites at Petrified Forest in relation to landform.

Puerco River, where 30 percent of the sites are located, both eolian and alluvial forces are at work; building stone is plentiful here. Twenty-five percent of the sites are in the lowland zone south of the Puerco River which has very active sheetwash areas with some sand dunes.

Only four percent of the sites occur in the lowlands north of the Puerco River; most of these sites are close to major drainages. Most of the rock art sites, one rockshelter and a few multiple-room masonry sites and pit house/slab feature sites are found in the badlands. In the badlands, sites with structures occur south of the Puerco River and are usually also rock art locations.

Certain types of terrain were favored for particular types of sites. The uplands were preferred for artifact scatters (81%), multiple-room masonry sites (54%), single-room masonry sites (56%) and historical sites (75%). Lowlands were favored for lithic scatters (62%); half of all pit house sites, 39 percent of the multiple-room sites and 44 percent of the single-room sites are in lowland areas. Badlands are the preferred locations for rock art sites (52%).

The three most heavily occupied areas throughout prehistory are the bluff overlooking the confluence of the Puerco River and Dead Wash (an upland area), the Dry Wash drainage basin (a lowland area) and the uplands along the southern quarter of the western boundary. Access to arable land and to a variety of other resources such as plant foods, water and building stone seems to be an important factor when choosing a site location.

#### Site Dates

The dates for the Anasazi occupation at Petrified Forest National Park differ slightly from the original Pecos classification. The dating scheme pictured in Wells (1988:45) is based on ceramic dates. Although the Park is located within the area defined for the Winslow branch (Gumerman and Skinner 1968), ceramics in surface assemblages show the influence of the Kayenta and Chaco branches of the Anasazi as well as the Mogollon. Table 5.3 is a summary of sites by time period. The large number of multiple-component sites brings the total number of datable components present on the Petrified Forest sites to 397. Table 5.4 is a cross listing of site type and time period.

Table 5.3  
TEMPORAL COMPONENTS

Archaic	9
Basketmaker II	8
Basketmaker II/III	12
Basketmaker III	42
Pueblo I	44
Pueblo II	18
Pueblo II/III	188
Pueblo III	28
Pueblo IV	16
Prehistoric	18
Historic	13
Unknown	<u>1</u>
Total Number of Components	397

Table 5.4  
SITE TYPE BY TIME PERIOD

Site Type	Time Period										
	Archaic	Basketmaker II	Basketmaker II/III	Basketmaker III	Pueblo I	Pueblo II	Pueblo II/III	Pueblo III	Pueblo IV	Prehistoric	Historic
Artifact Scatters	8	1	3	9	9	7	43	12	2	8	-
Multiple Masonry Rooms	-	1	4	8	10	3	58	7	4	-	-
Single Masonry Rooms	-	1	-	6	10	3	59	3	2	1	-
Rock Art	-	2	2	4	5	1	26	5	7	4	2
Pit House/Slab Feature	-	4	3	19	15	4	15	2	3	2	2
Historical	-	-	-	-	-	-	1	-	-	-	11
Lithic Scatter	1	-	-	1	-	-	2	1	-	4	-
Rockshelter	-	-	-	1	1	-	2	-	-	-	-
Agricultural	-	-	-	-	-	-	1	-	-	-	-
Subtotal	9	9	12	48	50	18	207	30	18	19	15
Less sites w/ 2 types	-	-1	-	-6	-6	-	19	-2	-2	-1	-2
Total sites per period	9	8	12	42	44	18	188	28	16	18	13

## Paleo-Indian and Archaic

The prehistory of Petrified Forest National Park appears to extend back into Paleo-Indian times (15,000 B.C. to 8,000 B.C.) based on the discovery of a handful of Paleo-Indian points. To date, however, no Paleo-Indian sites have been located.

The Archaic period (6,000 B.C. to A.D. 300) is represented at nine sites including AZ K:13:60 (ASM) which was tested by Tagg in 1986 (Tagg 1987). Dateable fragments of corn and juniper place the site between 1010 and 150 B.C. Tagg interprets AZ K:13:60 as a seasonal campsite from the transitional Archaic/Basketmaker II period.

Most of the Archaic sites in the park occur on mesa tops overlooking lowland or badland areas (Fig 5.3); however, one site is on a deflated ridge in the Painted Desert. Six sites are north of the Puerco River and three are to the south. All but one of the Archaic sites is an artifact scatter; the exception is PEFO 88A-5, a lithic scatter in the Painted Desert.

## Basketmaker

Twenty-one percent of all sites (62 sites) have Basketmaker components. Their locations diverge slightly from the overall pattern, with 48 percent upland and 39 percent lowland (compared to the overall pattern of 57% upland and 34% lowland; Fig. 5.4). Thirteen percent of the sites are in badland areas.

Although most sites are pit house villages or artifact scatters, eight Basketmaker rock art sites were also recorded. The largest cluster of Basketmaker sites is found on the bluff overlooking the confluence of the Puerco River and Dead Wash. A cluster of Basketmaker rock art sites was found on the Newspaper Sandstone outcrop across the river to the south. Two Basketmaker rock art sites are also found associated with the Flattop Site. Upland sites are found along most of the park boundary. At least four Basketmaker pit house villages are located on isolated buttes. Most of the lowland Basketmaker sites are found on dunes or low ridges surrounded by the alluvially active drainage basin of Dry Wash.

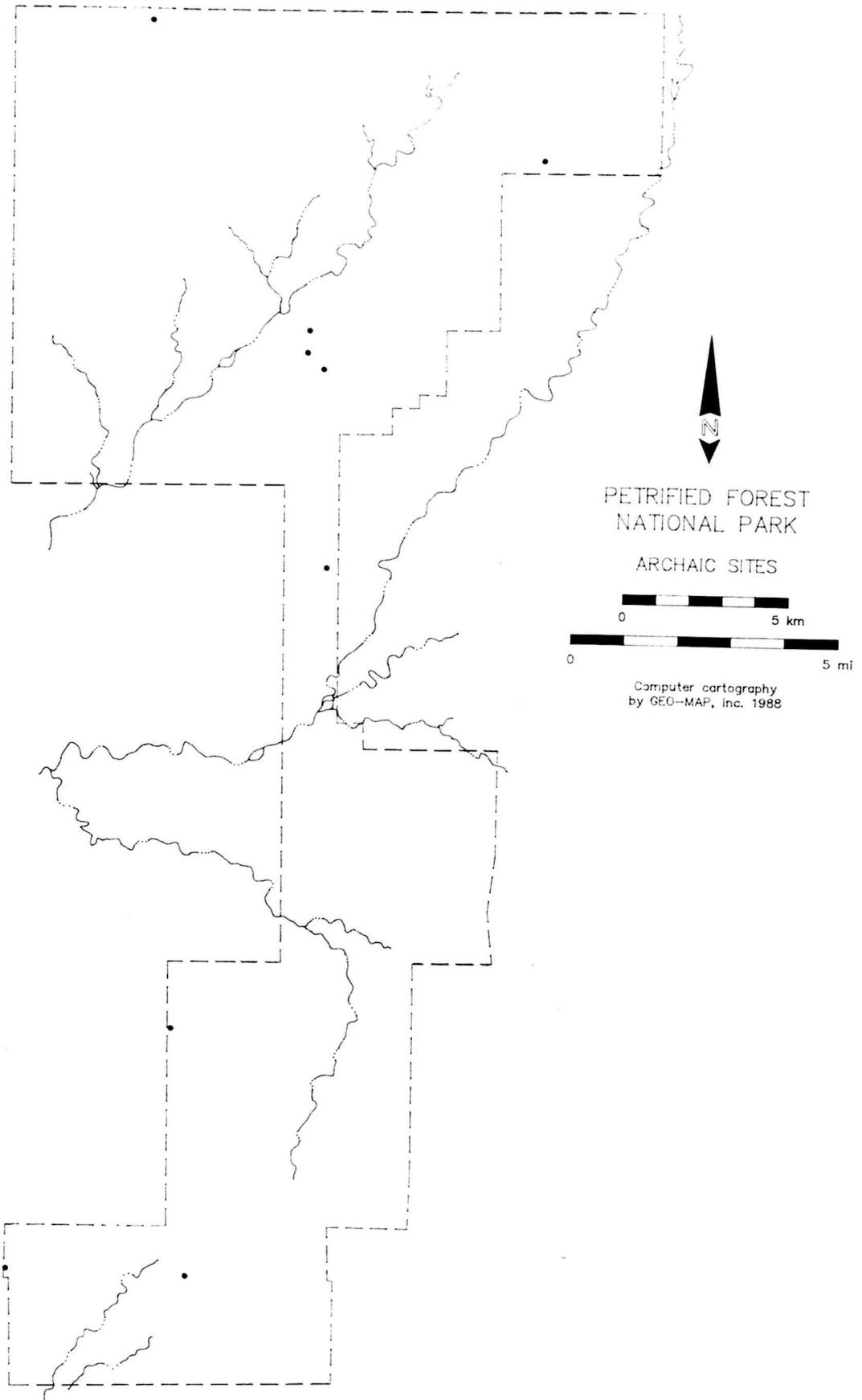


Figure 5.3. Archaic period sites at Petrified Forest National Park.

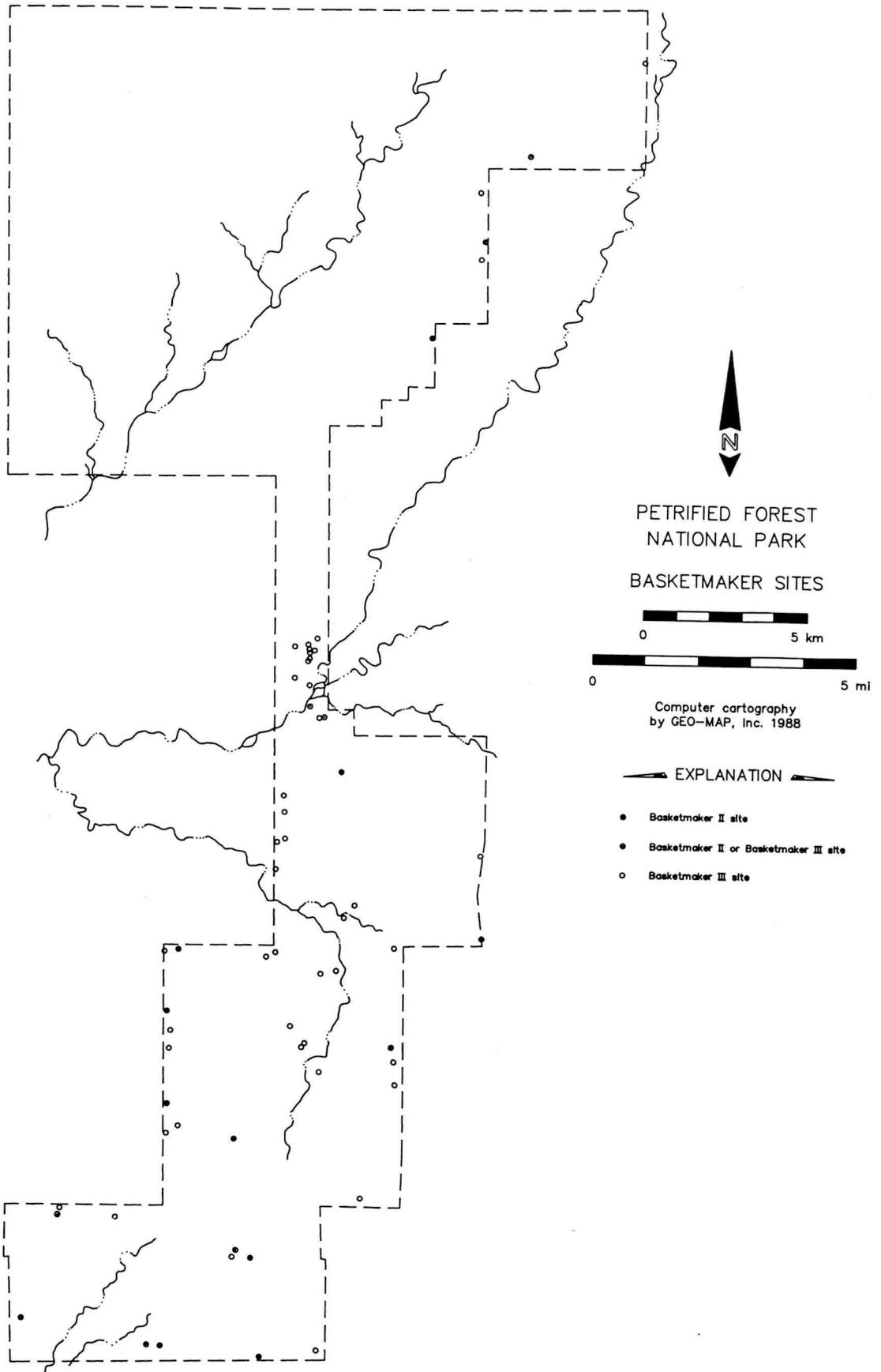


Figure 5.4. Basketmaker sites at Petrified Forest National Park.

In addition to pit house/slab feature sites, Basketmaker components are found at artifact scatters, rock art sites, lithic scatters and at a rockshelter. Twenty pueblo period sites with single- or multiple-room structures also have Basketmaker components.

Most of the Petrified Forest sites are classified as transitional Basketmaker II/III. The Basketmaker II assemblage identified by Wendorf (1953) at the Flattop Site, which is characterized by Adamana Brown ceramics, is not found anywhere else in the middle Little Colorado River area. According to Stewart (1980:84), Wendorf eventually reassigned the site to early Basketmaker III because of the presence of pottery but still believed the site to predate A.D. 500. In this study, sites with Adamana Brown ceramics are classified as transitional Basketmaker II/III because of the lack of chronometric dates (Wells 1988:46).

Sand-tempered brown ware ceramics have been found at sites predating A.D. 500 in the Zuni area 80 km (40 miles) east of the Petrified Forest (Varien 1986, Fowler 1988). These sherds are similar, but not identical, to Adamana Brown or Woodruff Brown (Varien 1986). The presence of brown ware ceramics and the early dates confirmed for these sites is interesting, as it implies the possibility of similarly early dates for the Petrified Forest sites.

### Pueblo I

Until very recently, the Pueblo I period was poorly known at Petrified Forest. Two-thirds of the 44 sites (15% of all sites) with Pueblo I components have been identified since 1985. Although no single-component Pueblo I sites have been identified, we can finally see a pattern in their location. There are fewer Pueblo I sites than Basketmaker sites but the locations are only slightly more restricted (Fig. 5.5). The sites are almost equally divided between upland and lowland zones with the largest cluster of sites on the bluff above the Puerco/Dead Wash confluence. Lowland sites still occur in the Dry Wash basin and Pueblo I sites are found in the uplands along the southern quarter of the park boundary. No Pueblo I sites have been identified in the Painted Desert.

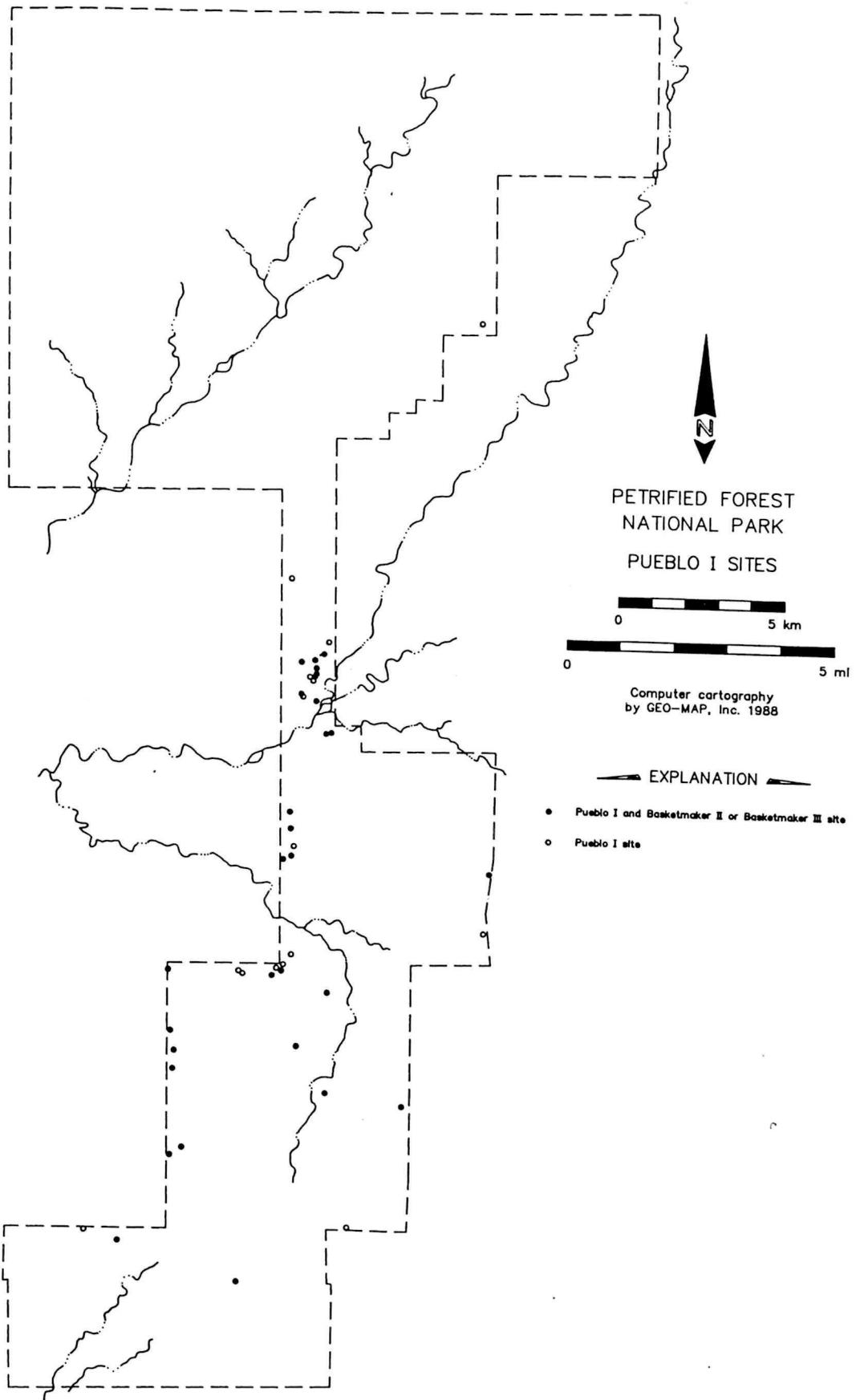


Figure 5.5. Pueblo I sites at Petrified Forest National Park.

Because the sites with Pueblo I occupation have more than one component it is difficult to identify and assess the features dating to the Pueblo I period. Pueblo I components are found at six different site types. Test excavation of multicomponent sites threatened by erosion may help expand our knowledge of Pueblo I occupation at Petrified Forest National Park. Tusayan White Ware is found on 48 percent of these sites, whereas Cibola White Wares occur on 68 percent of the Pueblo I sites, suggesting stronger ties to the Chaco branch at this time.

### Pueblo II and Pueblo III

Based on the number of Pueblo II and Pueblo III sites recorded, the population of Petrified Forest National Park reached its highest levels during these periods. Pueblo II is a period of great expansion, with the number of sites increasing from 44 sites in the Pueblo I period to 206 sites (79% of all sites). Only 18 sites are single-component Pueblo II sites. Of the 216 sites (73%) with Pueblo III components, only 28 lack a Pueblo II component.

Uplands continue to be favored over lowlands (60% and 32% respectively). The three main areas, the bluff overlooking the confluence of the Puerco River and Dead Wash, the Dry Wash drainage basin and the uplands in the southern quarter of the western boundary, continue to be heavily occupied but there are also sites along the southern and southeastern boundary in this period (Fig. 5.6). There is expansion into the northern uplands that overlook the Painted Desert. Three sites in the vicinity of Pilot Rock are occupied during this period.

In addition to artifact scatters, rock art sites, pit house/slab feature sites, lithic scatters, rockshelters and the only agricultural site recorded, 133 sites have either single- or multiple-room masonry features. Burned daub fragments were found at two sites in the upland area overlooking the Painted Desert, at PEFO Site 236 and at the pueblo site on Mountain Lion Mesa (PEFO 88A-10). This suggests the presence of jacal structures during this period. Structures with clay walls were also reported for this period in the Hopi Buttes area (Gumerman 1969:34).

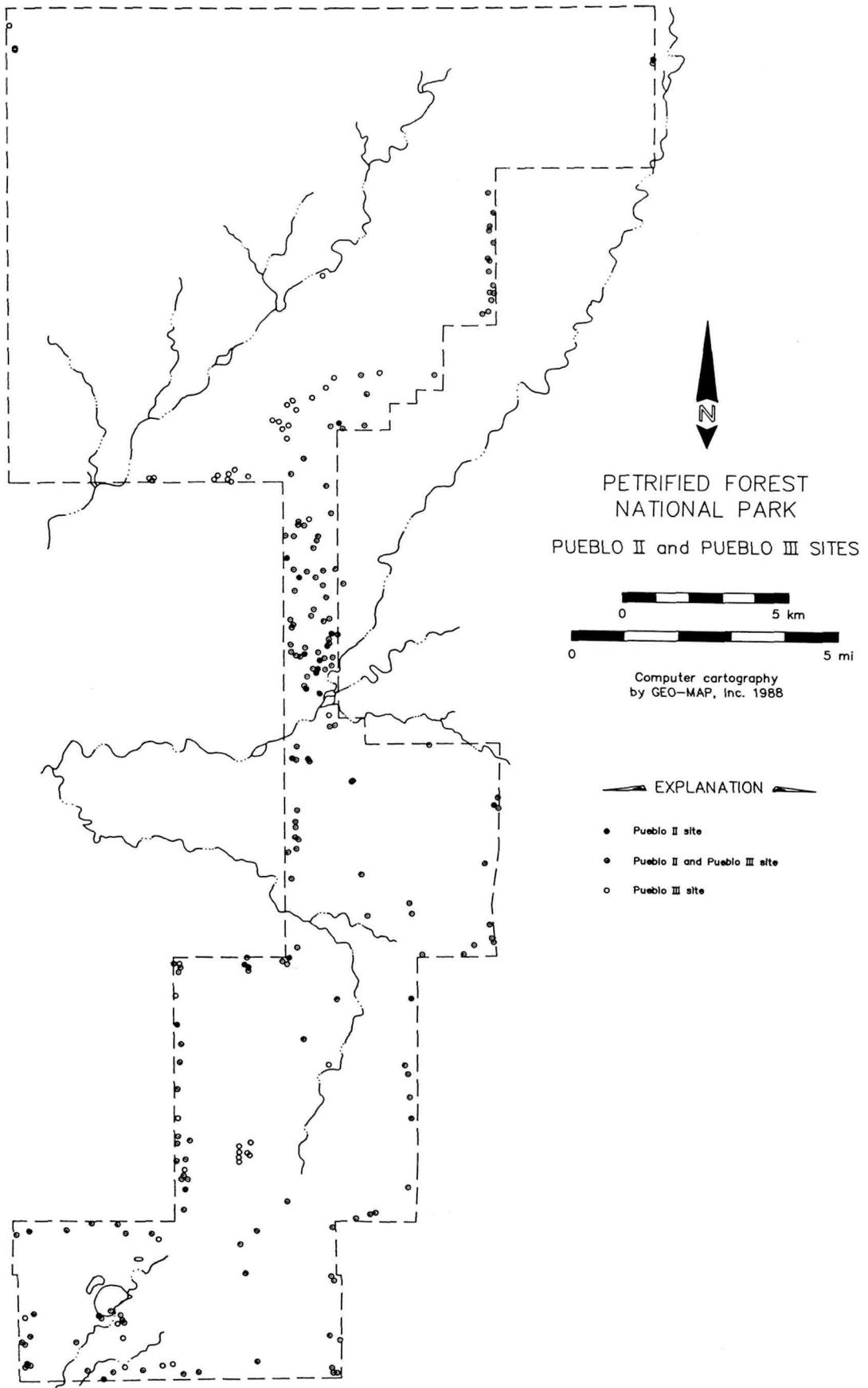


Figure 5.6. Pueblo II and Pueblo III period sites at Petrified Forest National Park.

Ceramic assemblages became complex during this period. During the Pueblo II period, plain brown utility ware is replaced by a locally produced gray/brown corrugated ware (not a corrugated Mogollon brown ware). During the transitional Pueblo II/III period, Cibola White Ware is again the most common decorated ware; it occurs on 70 percent of the sites. Little Colorado White Ware occurs on 56 percent and Tusayan White Ware on 30 percent of the sites. Showlow Black-on-red, which has a paste similar to the locally produced brown ware, is found on 32 percent of the sites and Mogollon brown ware on only 4 percent. White Mountain Red Ware was found on at least 23 percent of the Pueblo II/Pueblo III sites. The red wares indicate Mogollon contact.

Evidence for local pottery production had been noted previously by Mera (1934) and Jennings (1980). Collections from the boundary survey include Walnut and Gallup-style black-on-white sherds with selenite temper. An appliquéd gray/brown corrugated sherd was also collected.

It is obvious that there were more people in the area at this time and that they were bringing more land under cultivation. There is some regularity in the spacing of sites and for the first time we find multiple-room masonry sites surrounded by smaller masonry sites or artifact scatters suggesting a satellite field house arrangement or at least groups of interacting sites. Most of the multiple-room masonry sites, representing either granaries or unit pueblos, are only 2 to 5 room sites, not large pueblos.

#### Pueblo IV

By A.D. 1250, much of the middle Little Colorado region is abandoned. The prevailing settlement pattern changes to large pueblos located along major drainages. Climatic change and changes in social organization both take place.

The number of sites occupied in this time period at Petrified Forest National Park decreases dramatically. Yellow ware, Homol'ovi ceramic types and rock art diagnostic of the Pueblo IV period are found on only 16 sites (Fig. 5.7). Thirteen of the Pueblo IV sites also have Pueblo III components.

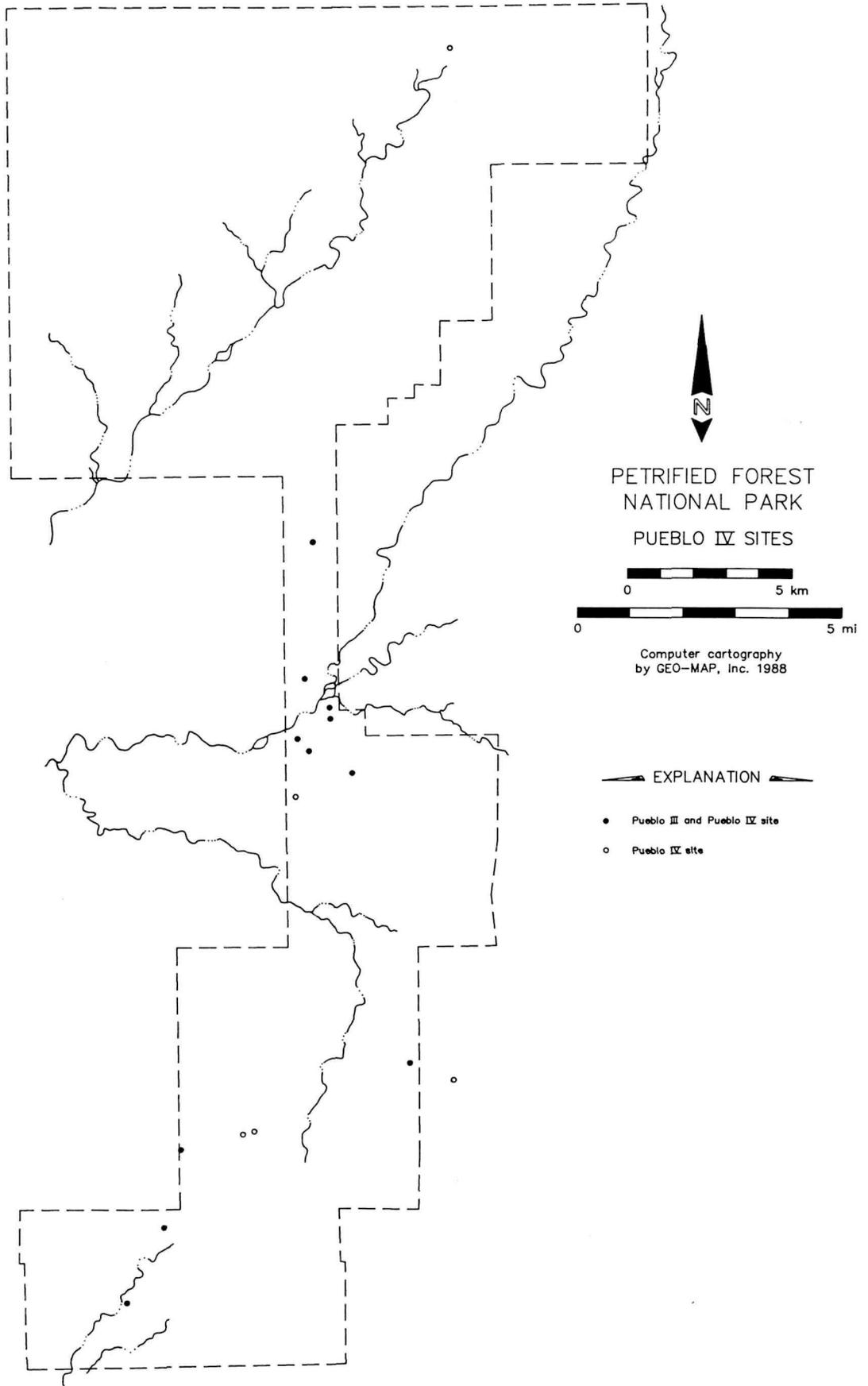


Figure 5.7. Pueblo IV period sites at Petrified Forest National Park.

Puerco Ruin is the only large site in the park occupied at this time. It is a 75- to 125-room pueblo that was occupied in both late Pueblo III and late Pueblo IV (Homol'ovi) periods (Wells 1988). Other sites in the park include seven multicomponent rock art sites with Pueblo IV elements such as Kachina masks. The Pueblo IV dating of the Kachina mask glyphs has been proposed by Pilles (1975), Schaafsma (1980) and by Sally Cole of the Homol'ovi Archaeological Research project. One small single-room masonry site has only Jeddito ceramics. The remaining sites are multicomponent artifact scatters, surface masonry or pit house sites with only a few Pueblo IV sherds.

Of the 16 Pueblo IV sites, 6 are within a one-mile radius of Puerco Ruin. One site is less than a mile from Stone Axe or Wallace Tank Ruin, which is a large Pueblo IV pueblo with more than 200 rooms, located just east of the park boundary. The other sites are scattered throughout the park.

#### Comparison with the Hopi Buttes and Homol'ovi Survey Data

Large-scale archeological surveys of other localities within the middle Little Colorado province have been conducted at the Hopi Buttes area 30 miles northeast of Petrified Forest (Gumerman 1969, Gumerman and Skinner 1968) and at Homol'ovi Ruins State Park 50 miles to the west (Lange and others 1986, 1987; Fig. 5.8). A comparison of population trends through time follows.

Figure 5.9 is a bar graph showing the differences in percentages of sites for the three survey areas during each prehistoric time period. Percentages are calculated for 296 sites at Petrified Forest, 200 sites at Homol'ovi and 202 sites at the Hopi Buttes.

#### **Archaic**

Although there are Archaic sites at Petrified Forest, no Archaic remains have been identified at Homol'ovi or at the Hopi Buttes.

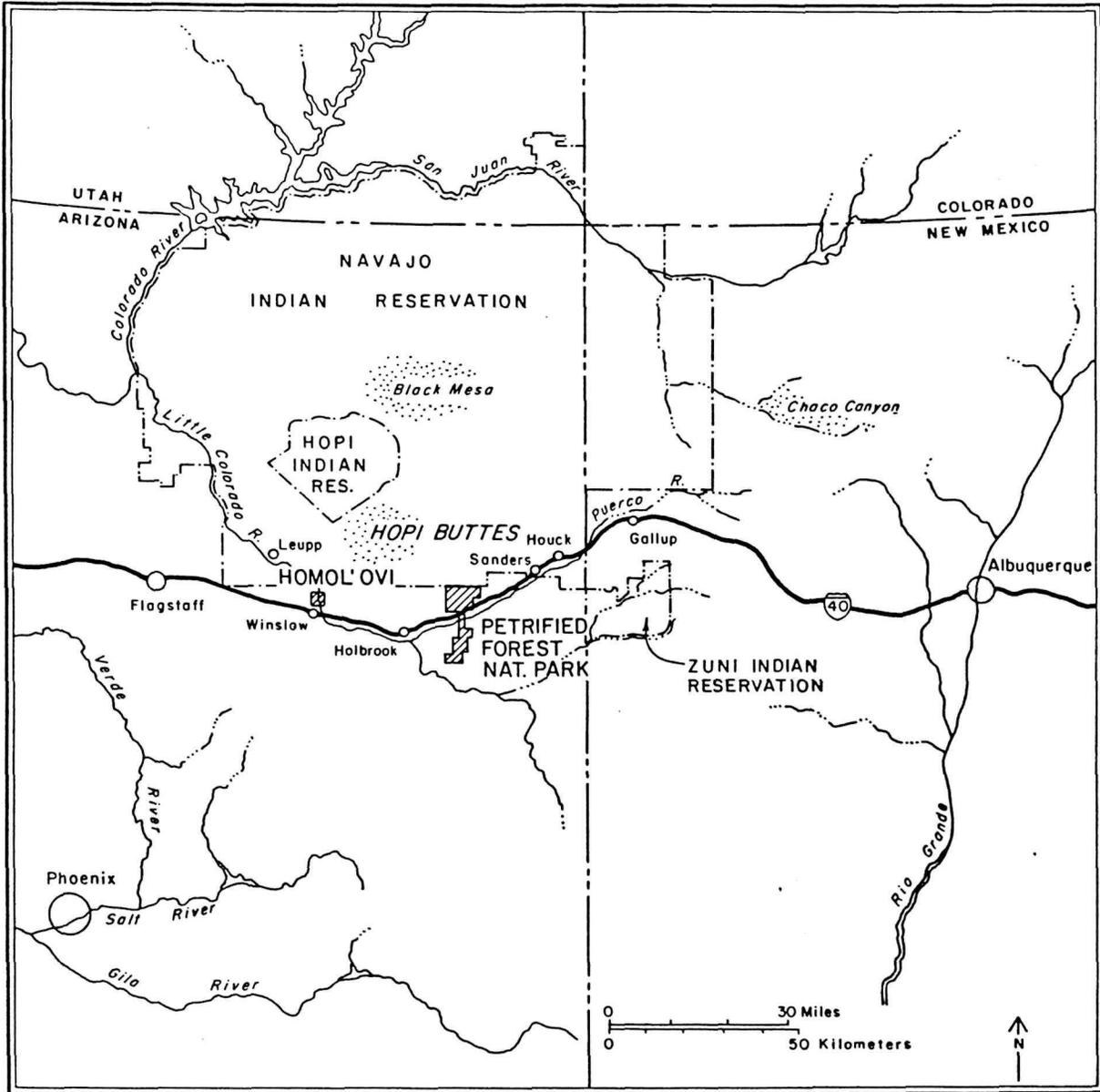


Figure 5.8. Map of the middle Little Colorado Region.

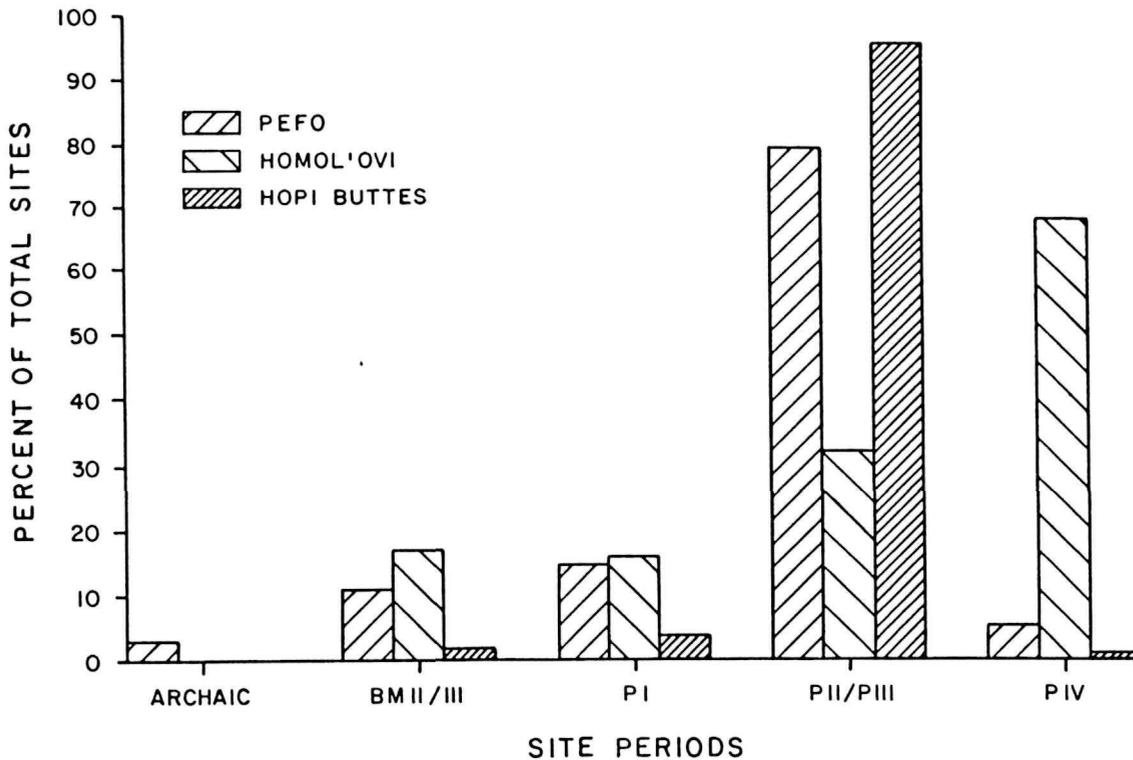


Figure 5.9. Bar graph comparing percentages of sites from each time period at Petrified Forest, Homol'ovi Ruins State Park and the Southwest Hopi Buttes.

#### Basketmaker

The proportions of Basketmaker sites at Petrified Forest and Homol'ovi are similar, with 11 percent at the former and 17 percent at the latter. Only two percent of the sites at the Hopi Buttes have Basketmaker components.

The location of Basketmaker sites at Homol'ovi is similar to that seen at Petrified Forest. Two-thirds of the 34 Homol'ovi sites are on the terraces overlooking the Little Colorado River. One site was found on an isolated mesa top. The concentration of population along river terraces is a logical choice for early farmers.

Only four Basketmaker sites were recorded at the Hopi Buttes. There appear to be ties with the Puerco area during this period, indicated by the presence of Cibola White Ware sherds, but even at this early period Gumerman and Skinner (1968) see a boundary between the Hopi Buttes and Petrified Forest based on differences in ceramic assemblages.

## Pueblo I

The percentages of Pueblo I sites at Petrified Forest and Homol'ovi are again very close at 14 percent and 16 percent respectively. Sites at Homol'ovi again cluster on the Little Colorado River terrace, which is similar to the clustering seen north of the confluence of the Puerco River and Dead Wash at Petrified Forest. The eight Pueblo I sites with pit house architecture and Kayenta Anasazi ceramics recorded at the Hopi Buttes make up only four percent of the site total.

## Pueblo II/III

In the Pueblo II/III period the settlement patterns at Petrified Forest become more similar to those at the Hopi Buttes than to those at Homol'ovi. Pueblo II/III components are present at 79 percent of the Petrified Forest sites and 95 percent of the Hopi Buttes sites. Although this is also a period of population growth at Homol'ovi, only 32 percent of the sites have Pueblo II/III components. Three of the large Homol'ovi pueblos are established at the end of the Pueblo III period.

At Petrified Forest, the sites in this period are dispersed throughout the Park. This is similar to Hopi Buttes where Gumerman and Skinner (1968) suggest that the fragile environment would not support aggregation of populations into large pueblos. Diversification of farming techniques would allow this expansion into new microenvironments. At Homol'ovi there is also expansion into new microenvironments, including Hoe Valley. Lange (1988) believes that ak-chin farming at the mouths of washes is first used to supplement dry farming at this time. This dispersion contrasts with what is seen in higher, wetter environments as near to the park as the Houck-Sanders sites (Gumerman and Olsen 1968) located 30 miles east of Petrified Forest which have from 20 to 25 room pueblos occupied during this period.

The Great Kiva site at Petrified Forest, PEFO Site 236 or McCreery Pueblo, dates to the transitional Pueblo II/Pueblo III period (A.D. 1075-1125). The small number of rooms at the site suggests that it is similar to sites found at Hopi Buttes and Holbrook, the Plaza and Sundown sites,

respectively. Gumerman and Skinner (1968:194) have suggested that these sites, each with a great kiva, two smaller kivas and five or six dwellings, were centers of "intersettlement ceremonial participation". Based on the population aggregation seen elsewhere at this time and the evidence for interaction between the people of the middle Little Colorado region and their neighbors, participation in social or ceremonial activities on an intersettlement level seems likely.

#### Pueblo IV

With only one large site in the park during this period, the situation parallels the Hopi Buttes where only one large Pueblo IV site, Chimney Butte, was recorded in 26 square miles. Homol'ovi, on the other hand, has six large pueblos of from 35 to more than 700 rooms at this time. Figure 5.9 is based on numbers of sites, not numbers of rooms, and does not adequately represent the huge population increase that accompanies the large Pueblo IV sites at Homol'ovi.

#### Discussion

The early period similarities between Homol'ovi and the Petrified Forest diverge by the Pueblo II/II period. At that point in time there is an overwhelming similarity between the settlement patterns at Petrified Forest and those described by Gumerman and Skinner (1968) for the Hopi Buttes area; both the types of sites found and the general population trends appear to be very close for the Pueblo II/III period and Pueblo IV occupations of these areas.

Gumerman and Skinner (1968) see a boundary between the two areas based on surface ceramic assemblages. These differences can be attributed to interaction with each group's nearest neighbors, that is the Chaco Branch Anasazi and Mogollon to the east and south of Petrified Forest and the Kayenta Anasazi north of the Hopi Buttes.

The most obvious explanation for the difference in settlement between Petrified Forest and Homol'ovi during Pueblo IV is environmental. The portion of the Homol'ovi survey area bordering on or accessible to the Little Colorado River floodplain, which is from one to two miles wide, far

outweighs the one-mile stretch of the Puerco River that passes through the Petrified Forest. The Little Colorado River is still a dependable stream and the water table is high due to the sandstone substrate. In comparison, the surveyed portion of Petrified Forest stretches away from the river and samples a wide range of lowland and badland areas up to 15 miles from the river. Further, the boundaries of Petrified Forest were drawn around the Rainbow Forest and Painted Desert and, as such, are a real boundary between unusual desert formations and grasslands. A survey that followed along the Puerco River for twenty or thirty miles would present an entirely different body of site data.

The lack of a major stream in the Hopi Buttes area makes it more similar to Petrified Forest than to Homol'ovi. The overall similarity in settlement data between the two areas is remarkable; however, one big difference between Hopi Buttes and the Petrified Forest is the latter's location outside the core area of Little Colorado White Ware manufacture (Gumerman and Skinner 1968; Douglass 1987). Another difference is the dominance of Cibola White Ware over Little Colorado types in Petrified Forest survey collections. Despite these discrepancies, and Wendorf's (1953) inclusion of the park in the Chaco Branch, the Petrified Forest sites best fit the Winslow Branch Anasazi, defying the "pottery equals people" rule. Further investigation of architecture, subsistence strategies and the like will be needed to test the strength of this proposed affiliation.

Douglass (1987) has proposed that Little Colorado White Ware production may have helped maintain a balance between groups controlling different resources. The large quantity of Little Colorado White Ware traded into the Flagstaff area, and the lack of Flagstaff ceramics in the Little Colorado White Ware core area suggest that Little Colorado White Ware was traded for perishables.

The dispersed settlement pattern and the local production of pottery suggest a fairly high level of self sufficiency for the residents of Petrified Forest; however, the artifacts also suggest a great deal of interaction with neighboring groups. To build on this idea of exchange as one part of adapting to a fragile environment, I would like to suggest that the occupants of the Petrified Forest may have used petrified wood as a commodity of exchange with their neighbors. There is no reason to believe that man's fascination with trees turned to stone is solely the province of

modern tourism. Petrified wood is available elsewhere in small quantities, but it may be possible to design a study, based on source analysis of petrified wood, to determine if indeed there was trade of petrified wood from this area.

The four-year-long boundary survey has provided new data regarding the location of Pueblo I sites, the presence of jacal structures and evidence of locally made decorated pottery. Although the analysis of Petrified Forest settlement data presented here is preliminary, the opportunity to compare the site data with that collected elsewhere in the middle Little Colorado has helped place the prehistory of the park in a regional perspective. Although living on a dramatic landscape, the prehistoric occupants of Petrified Forest were living in a manner consistent with others in the same geographic province.



## REFERENCES

- Anderson, Frank  
1955 The Pueblo Katchina Cult: A Historical Reconstruction  
Southwestern Journal of Anthropology 11:404-419.
- Bartlett, Katherine  
1943 A Primitive Stone Industry of the Little Colorado Valley,  
Arizona. American Antiquity 8:3(266-268).
- Bettinger, Robert L. and Martin A. Baumhoff  
1982 The Numic Spread: Great Basin Cultures in Competition.  
American Antiquity 47:485-503.
- Burton, Jeffery F.  
1988 Hunters and the Hunted: The Prehistoric Art of Tom Ketchum  
Cave. The Kiva 53(4):335-356.
- Castleton, Kenneth B.  
1979 Petroglyphs and Pictographs of Utah: Volume Two: The South,  
Central, West and Northwest. Salt Lake City: Utah Museum  
of Natural History.
- Christensen, Don D.  
1988 Rock Art Sites. In "Archeological Survey and Testing at  
Petrified Forest National Park, 1987," by Susan J. Wells,  
Western Archeological and Conservation Center Publications  
in Anthropology, 48:80-91. Tucson: National Park Service.
- Colton, Harold S.  
1946 The Sinagua: A Summary of the Archaeology of the Region of  
Flagstaff, Arizona. Museum of Northern Arizona Bulletin 22.  
Flagstaff: Northern Arizona Society of Science and Art.
- 1960 Drawings On Rock. In Black Sand: Prehistory in Northern  
Arizona. Albuquerque: University of New Mexico Press.
- Cordell, Linda S.  
1984 Prehistory of the Southwest. Orlando, Florida: Academic  
Press.
- Courlander, Harold  
1971 The Fourth World of the Hopis. New York: Crown.
- Douglass, Amy  
1987 Prehistoric Exchange and Sociopolitical Development: The  
Little Colorado White Ware Production-Distribution System.  
MS, doctoral dissertation, Arizona State University, Tempe.
- Dozier, Edward P.  
1970 Pueblo Indians of North America. New York: Holt, Rinehart  
and Winston.

- Ellis, Florence Hawley and Laurens Hammack  
 1968 The Inner Sanctum of Feather Cave: A Mogollon Sun and Earth Shrine Linking Mexico and the Southwest. American Antiquity 33:25-44.
- Fewkes, J. Walter  
 1919 Designs on Prehistoric Hopi Pottery. 33rd Annual Report, Bureau of American Ethnology. Washington.
- Fowler, Andrew P.  
 1988 Archaeological Testing of Site NM:12:K3:263 at Blackrock, Zuni Indian Reservation, McKinley County, New Mexico. Zuni Archaeology Program Report 250. Zuni Pueblo: Zuni Archaeology Program.
- Grant, Campbell, James W. Baird and J. Kenneth Pringle  
 1968 Rock Drawings of the Coso Range, Inyo County, California. Maturango Museum Publication 4. China Lake, California: Maturango Museum.
- Gumerman, George J.  
 1969 The Archeology of the Hopi Buttes District, Arizona. MS, doctoral dissertation, University of Arizona, Tucson.
- Gumerman, George J. and Alan P. Olsen  
 1968 Prehistory in the Puerco Valley, Eastern Arizona. Plateau 40(4):113-127.
- Gumerman, George J. and Alan S. Skinner  
 1968 A Synthesis of the Prehistory of the Central Little Colorado Valley, Arizona. American Antiquity 33:185-199.
- Hammack, Nancy S.  
 1979 Archeological Road Corridor Survey, Petrified Forest National Park, 1978 and 1979. MS, Western Archeological and Conservation Center, National Park Service, Tucson.
- Heizer, Robert F. and Martin A. Baumhoff  
 1962 Prehistoric Rock Art of Nevada and Eastern California. Berkeley: University of California Press.
- Hibben, Frank C.  
 1975 Kiva Art of the Anasazi at Pottery Mound. Las Vegas: KC Publication.
- Irwin, Charles N. (Ed.)  
 1980 The Shoshone Indians of Inyo County, California: The Kerr Manuscript. Independence, California: Ballena Press and Eastern California Museum.

- Jennings, Calvin H.  
 1980 Further Investigations at the Puerco Site, Petrified Forest National Park, Arizona. MS, Western Archeological and Conservation Center, National Park Service, Tucson.
- Jepson, Carl E.  
 1941 Dwelling Places of the Prehistoric Indians in the Petrified Forest National Monument. MS, Western Archeological and Conservation Center, National Park Service, Tucson.
- Jones, Anne Trinkle  
 1983 Patterns of Lithic Use at AZ Q:1:42, Petrified Forest National Park, Arizona. Western Archeological and Conservation Center Publications in Anthropology 25. Tucson: National Park Service.  
 1986 Pueblo Period Archeology at Four Sites, Petrified Forest National Park. Western Archeological and Conservation Center Publications in Anthropology 38. Tucson: National Park Service.  
 1987 Contributions to the Archeology of Petrified Forest National Park, 1985-1986. Western Archeological and Conservation Center Publications in Anthropology 45. Tucson: National Park Service.
- Lange, Richard C.  
 1988 Prehistory of the Homol'ovi Ruins State Park, Winslow, Arizona. Paper presented at the 53rd Annual Meeting of the Society for American Archeology, Phoenix, Arizona.
- Lange, Richard C., Lisa C. Young and Lee Fratt  
 1986 The First Season's Survey by the Arizona State Museum in the Vicinity of the Homolovi Ruins. MS, Arizona State Museum, University of Arizona, Tucson.
- Lange, Richard C., Miriam T. Stark, Lee Fratt, Lisa C. Young, Sara L. Seibert  
 1987 The Second Season's Survey of the Homol'ovi Ruins State Park, Northeastern Arizona. MS, Arizona State Museum, University of Arizona, Tucson.
- Lowie, Robert H.  
 1929 Notes on Hopi Clans. American Museum of Natural History Anthropological Papers 30. New York: American Museum of Natural History.
- Martyneec, Richard J.  
 1982 The Archaeology of Petrified Forest National Park: A Rock Art Perspective. MS, Western Archeological and Conservation Center, National Park Service, Tucson.

- 1985 An Analysis of Rock Art at Petrified Forest National Park. In "Rock Art Papers, Volume 2," edited by Ken Hedges. San Diego Museum Papers 18:73-82. San Diego: San Diego Museum of Man.
- McCreery, Pat and Jack McCreery  
1986 A Petroglyph Site with Possible Hopi Ceremonial Associations. In American Indian Rock Art, Volume 11, edited by William D. Hyder, Helen Crotty, Kay Sanger and Frank Bock. El Toro, California: American Rock Art Research Association.
- Mera, Harry Percival  
1934 Observations on the Archaeology of the Petrified Forest National Monument. Laboratory of Anthropology Technical Series Bulletin 7. Santa Fe: Laboratory of Anthropology.
- Michaelis, Helen  
1981 Willowsprings: A Hopi Petroglyph Site. Journal of New World Archaeology 4:3-23.
- Nequatewa, Edmund  
1974 Truth of a Hopi. Flagstaff: Northland Press (Reprint of 1936 Museum of Northern Arizona Bulletin 8).
- Parsons, Elsie C.  
1939 Pueblo Indian Religion. Chicago: University of Chicago Press.
- Pike, Donald G.  
1974 Anasazi: Ancient People of the Rock. Palo Alto, California: American West Publishing Company.
- Pilles, Peter J., Jr.,  
1975 Petroglyphs of the Little Colorado River Valley, Arizona. In American Indian Rock Art: Papers presented at the 1975 Rock Art Symposium, edited by Shari T. Grove. Bloomfield: San Juan County Museum Association.
- Preston, Ann L. and Robert A. Preston  
1985 The Discovery of 19 Prehistory Calendric Petroglyph Sites in Arizona. In "Earth and Sky: Papers from the Northridge Conference on Archaeoastronomy," edited by Arlene Benson and Tom Hoskinson. Thousand Oaks, California: Slo'w Press.
- Reed, Erik K.  
1980 Special Report on Review of Archeological Survey Potsherd Collections (1947). In "An Archeological Overview of Petrified Forest National Park," by Yvonne G. Stewart. Western Archeological and Conservation Center Publications in Anthropology 10:191-221. Tucson: National Park Service.

- Rozen, Kenneth C.  
 1981      Patterned Associations Among Lithic Technology, Site Content and Time: Results of the TEP St. Johns Lithic Analysis. In "Prehistory of the St. Johns Area, East-Central Arizona: The TEP St. Johns Project," edited by Deborah Westfall. Arizona State Museum Archaeological Series 153:157-232. Tucson: University of Arizona.
- Schaafsma, Polly  
 1972      Rock Art of New Mexico. Santa Fe: State Planning Office.  
 1980      Indian Rock Art of the Southwest. Santa Fe: School of American Research and Albuquerque: University of New Mexico.  
 1987      Rock Art at Wupatki: Pots, Textiles, Glyphs. In "Wupatki and Walnut Canyon: New Perspectives on History, Prehistory, Rock Art," edited by David Grant Noble. Exploration: Annual Bulletin of the School of American Research. Santa Fe: School of American Research.
- Schaafsma, Polly and Curtis F. Schaafsma  
 1974      Evidence for the Origins of the Pueblo Katchina Cult as Suggested by Southwestern Rock Art. American Antiquity 39:535-545.
- Schroeder, Albert H.  
 1977      Of Men and Volcanoes: The Sinagua of Northern Arizona. Globe, Arizona: Southwest Parks and Monuments Association.
- Stewart, Yvonne  
 1980      An Archeological Overview of Petrified Forest National Park. Western Archeological and Conservation Center Publications in Anthropology 10. Tucson: National Park Service.
- Tagg, Martyn D.  
 1987      Excavations at AZ K:13:60: Utilization of Corn at a Late Archaic Site in Petrified Forest National Park. In "Contributions to the Archeology of Petrified Forest National Park, 1985-1986," by Anne Trinkle Jones. Western Archeological and Conservation Center Publications in Anthropology 45:161-196. Tucson: National Park Service.
- Tagg, Martyn D., Susan J. Wells and Krista Deal  
 1987      Results of the Water System Survey. In "Contributions to the Archeology of Petrified Forest National Park, 1985-1986," by Anne Trinkle Jones. Western Archeological and Conservation Center Publications in Anthropology 45:101-123. Tucson: National Park Service.
- Titiev, Mischa  
 1944      Old Oraibi: A Study of the Hopi Indians of Third Mesa. Papers of the Peabody Museum of American Archaeology and Ethnology 22(1). Cambridge: Harvard University.

- Varien, Mark  
1986 Excavations at Three Prehistoric Sites Along Pia Mesa Road, Zuni Indian Reservation, McKinley County, New Mexico. Zuni Archaeology Program Report 233. Zuni Pueblo: Zuni Archaeology Program.
- Von Werlhof, Jay C.  
1965 Rock Art of the Owens Valley, California. Reports of the University of California Archaeological Survey 65. Berkeley: University of California Archaeological Research Facility.
- Wells, Susan J.  
1988 Archeological Survey and Testing at Petrified Forest National Park, 1987. Western Archeological and Conservation Center Publications in Anthropology 48. Tucson: National Park Service.
- Wendorf, Fred  
1953 Archaeological Studies in the Petrified Forest National Monument. Museum of Northern Arizona Bulletin 27. Flagstaff: Northern Arizona Society of Science and Art.

