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Days in the Painted Desert and the Petrified Forests of Northern Arizona

Contributions to the Archeology of Petrified Forest National Park
1988–1992

by
Jeffery F. Burton

with
Mary M. Farrell
Laura C. Fulginiti
Christine E. Goetze
Tzipi Kahana



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

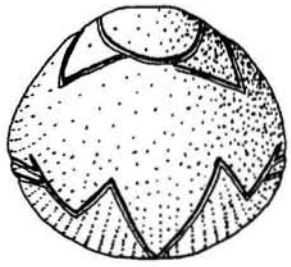
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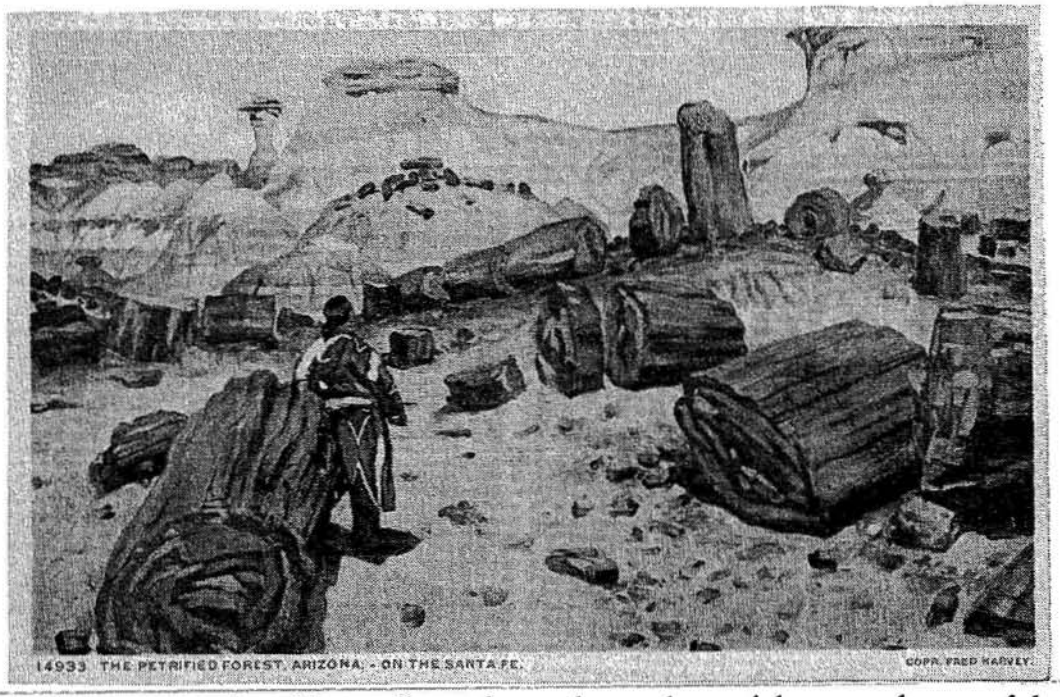
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Days in the Painted Desert and the Petrified Forests of Northern Arizona



"In that moment the Old Traveller understood something of the magic beauty of the Painted Desert, which is a beauty of things at once near and far, real and unreal, definite and hazy with distance: it is a beauty of an earth close at hand and the beauty of a far off land that never was a 'land made out of distance and desire.'"

Harold S. Colton and Frank C. Baxter,
Days in the Painted Desert and the San Francisco Mountains, 1932.

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PROJECT SUMMARIES

Project Name: General Management Plan Survey.
WACC Project Number: PEFO 1988 E.
Type of Project: Inventory Survey.
Field Director: Jeff Burton.
Project Archeologist(s): Chris Hardaker, Dana Robinson, Bill Scholz, Jim Vint, Margaret Wood.
Volunteer(s): None.
Fieldwork Date(s): November 7-December 1, 1988.
Person Days in Field: 75.
Project Location: Parkwide.
Project Scope: Survey of 1,510 acres; 43 sites & 34 isolates recorded.
National Register Status: None.
Collections Accession Information: PEFO Acc. No. 484, WACC Acc. No. 664, WACC Photograph Acc. No. 88:19 and 88:20.

Project Name: Excavation of Eroding Burial.
WACC Project Number: PEFO 1988 H.
Type of Project: Salvage.
Field Director: Jeff Burton.
Project Archeologist(s): Jim Vint.
Volunteer(s): Jim Burton.
Fieldwork Date(s): December 21, 1988.
Person Days in Field: 3.
Project Location: AZ Q:1:226 (Rainbow Forest).
Project Scope: Excavation of eroding burial.
National Register Status: None.
Collections Accession Information: PEFO Acc. No. 485, WACC Acc. No. 665, WACC Photograph Acc. No. 88:22.

Project Name: Contel Fiber Optics Line Survey.
WACC Project Number: PEFO 1989 C.
Type of Project: Clearance Survey.
Field Director: Jim Vint.
Project Archeologist(s): Jeff Burton.
Volunteer(s): None.
Fieldwork Date(s): June 19-21, 1989.
Person Days in Field: 6.
Project Location: Rainbow Forest.
Project Scope: Survey of 240 acres; 2 sites & 5 isolates recorded.
National Register Status: None.
Collections Accession Information: PEFO Acc. No. 487, WACC Acc. No. 667, WACC Photograph Acc. No. 89:11.

Project Name: Site Monitoring.
WACC Project Number: PEFO 1990 B.
Type of Project: Monitoring & Surface Collection.
Field Director: Jeff Burton.
Project Archeologist(s): Ron Beckwith, Don Christensen, Pam Thorne.
Volunteer(s): Mike Bergum, Bob Cooper, Mary and Ferrell Knight, Raquel Lopez, Dick and Florence Lord, Jack, Pat, and Sandy McCreery, Donna Medina, Leslie Pettit, Doug Scher, Jim and Kitty Stoddart.
Fieldwork Date(s): July 2-20, 1990.
Person Days in Field: 150.
Project Location: Parkwide.
Project Scope: 95 sites were inspected and surface collected.
National Register Status: None.
Collections Accession Information: PEFO Acc. No. 504, WACC Acc. No. 726, WACC Photograph Acc. No. 90:12.

Project Name: Excavation of Eroding Burial.
WACC Project Number: PEFO 1990 D.
Type of Project: Salvage.
Field Director: Jeff Burton.
Project Archeologist(s): Ron Beckwith, Don Christensen.
Volunteer(s): None.
Fieldwork Date(s): July 11, 1990.
Person Days in Field: 4.
Project Location: AZ K:13:51.
Project Scope: Excavate and reinter eroding burial.
National Register Status: None.
Collections Accession Information: PEFO Acc. No. 510, WACC Acc. No. 705, WACC Photograph Acc. No. none.

Project Name: Basket Removal.
WACC Project Number: PEFO 1990 E.
Type of Project: Surface Collection.
Field Director: Trinkle Jones.
Project Archeologist(s): Ron Beckwith.
Volunteer(s): Jack and Pat McCreery, Jim and Kitty Stoddart.
Fieldwork Date(s): July 5, 1990.
Person Days in Field: 2.
Project Location: AZ Q:1:201 (Mountain Lion Mesa).
Project Scope: Collection of artifacts, feature mapping.
National Register Status: None.
Collections Accession Information: PEFO Acc. No. 503, WACC Acc. No. 704, WACC Photograph Acc. No. 90:12, Conservation Lab. Report No. C902082.

Project Name: Volunteer Survey.
WACC Project Number: PEFO 1991 C.
Type of Project: Inventory Survey.
Field Director: Jeff Burton.
Project Archeologist(s): Ron Beckwith, Don Christensen, Pam Thorne.
Volunteer(s): Bob Cooper, Mary Farrell, Ferrell Knight, Dick and Florence Lord, Jack and Pat McCreery, Vince Santucci, Jim and Kitty Stoddart.
Fieldwork Date(s): July 29-August 16, 1991.
Person Days in Field: 156.
Project Location: Parkwide.
Project Scope: Survey of 2,956 acres; 83 sites & 48 isolates recorded.
National Register Status: Seven of the recorded sites are within the Twin Butte Archeological District; listed 7/12/76.
Collections Accession Information: PEFO Acc. No. 512, WACC Acc. No. 774, WACC Photograph Acc. No. 91:5.

Project Name: Waterline Survey.
WACC Project Number: PEFO 1992 A.
Type of Project: Clearance Survey.
Field Director: Steve Baumann.
Project Archeologist(s): Ron Beckwith.
Volunteer(s): None.
Fieldwork Date(s): March 23-27, 1992.
Person Days in Field: 8.
Project Location: Old Route 66.
Project Scope: Survey of 140 acres; 3 sites & 4 isolates recorded.
National Register Status: None.
Collections Accession Information: PEFO Acc. No. 527, WACC Acc. No. 784, WACC Photograph Acc. No. 92:1.

Front cover: Lithodendron Wash (from Whipple 1855).
Frontispiece: Petrified Forest on the Santa Fe (Fred Harvey Corp. postcard *ca.* 1915-1930).

This report is Number 62 in a continuing series, Publications in Anthropology, published by the Western Archeological and Conservation Center, Post Office Box 41058, Tucson, Arizona 85717.

Abstract

This report presents the results of several archeological projects conducted at Petrified Forest National Park between the fall of 1988 and the spring of 1992. Projects include survey of large areas of the park, salvage of two eroding burials, collection of a basket, and initiation of a program of archeological site monitoring. Although preliminary information about these projects is on file at the Western Archeological and Conservation Center in Tucson, this report compiles the results and synthesizes the data, where possible, to make the information more accessible to a wider audience.

The surveys covered in this report include survey for the General Management Plan (GMP) (WACC project number PEFO 1988E), survey for a proposed fiber optics line (PEFO 1989C), volunteer survey in 1991 (PEFO 1991C), and survey for a proposed water line (PEFO 1992A). These surveys covered a total of 4,187 acres throughout the Park, and resulted in the recording of 131 sites and 91 isolates. The 131 sites recorded include 99 prehistoric, 18 historic, and 14 dual component sites.

Two eroding burials were discovered and salvaged at two different sites, during 1988 and 1990 (PEFO 1988H and 1990D). Differences in associated grave goods suggest distinctions that may be temporal or social. A basket and other artifacts discovered in a small rockshelter by park staff were collected (PEFO 1990E). The fortuitous discovery of these items provides more information on early Navajo use of the area.

In 1990 site monitoring was begun to provide data on the nature and extent of site deterioration problems (PEFO 1990B). Using standardized categories developed for the Archeological Resources Inventory (ARI) to collect site condition data, the monitoring has established methods to measure change and deterioration. To date, monitoring information has been collected from 139 sites.

Artifacts recovered during the surveys are dealt with in some detail. A key is developed for projectile points collected since 1979 in the Park. A sample of ceramics collected during the surveys is analyzed, focussing on standard identification of types to provide chronological information. Shell and small stone artifacts recovered are also described. Finally, this report provides a brief summary of how the projects contribute to Petrified Forest archeology, followed by recommendations for future management and research.

Acknowledgments

Funding for the projects reported here came from a variety of sources. The 1988 fieldwork was sponsored by the National Park Service, Western Regional Office and the 1989 survey by CONTEL. The 1990 and 1991 fieldwork was funded by the Petrified Forest Museum Association and a private donor and the 1992 survey by the National Park Service, Denver Service Center.

The 1988 crew consisted of Chris Hardaker, Dana Robinson, Bill Scholz, Jim Vint, and Margaret Wood. Jim Burton helped excavate a burial. The 1990 and 1991 crews consisted of Ron Beckwith, Don Christensen, and Pam Thorne, aided by volunteers Mike Bergum, Bob Cooper, Mary Farrell, Mary and Ferrell Knight, Raquel Lopez, Dick and Florence Lord, Ekkehart Malotki, Donna Medina, Jack, Pat, and Sandy McCreery, Leslie Pettit, Vince Santucci, Doug Scher, and Jim and Kitty Stoddart. Beyond amazing, Bob Cooper, Jack and Pat McCreery, and Jim and Kitty Stoddart returned for their six and seventh summers of fieldwork. No one could ask for a better core of professional volunteers.

For the 1988, 1990, and 1991 fieldwork, Ron Beckwith, Don Christensen, and Jim Vint led crews in the field. Ron Beckwith, Pam Thorne, and Jim Vint completed site records and organized field records back at WACC. Jim Vint supervised the 1989 CONTEL survey and completed the site records and wrote the trip report. Steve Baumann and Ron Beckwith completed the 1992 survey. Pictographs in the Cave of Hands were recorded in 1988 by American Rock Art Research Association volunteers Frank and A.J. Bock, Jack and Ester Swartz, and Susan Hammersmith. Photographs during 1988 were taken by Dana Robinson, Margaret Wood, and myself. Starting in 1990 Dick and Florence Lord took responsibility for all field photography. They also took on the additional task of relocating and reshooting views in historic photographs on their own.

Elbridge and Genevieve Morrill, Frank Dobell, Robert Perry, and Paul LeVasseur shared their memories, photographs, and other memorabilia of their stays with the Civilian Conservation Corps at Petrified Forest. Former Park Resource Manager Johnny Johnson reported the location of Navajo hogans in the Painted Desert. Park Ranger Bill Wagers reported a basket found by him and his son, and rock art researcher Ekkehart Malotki pointed out the locations of a CCC spike camp and two rock art sites with 1897 inscriptions. Nearly all of the rock art sites recorded in 1991 below Lacey Point had been previously located by Jack and Pat McCreery. Working with Hopi observers Dalton and Wayne Taylor during salvage of a burial in 1990 was both informative and inspirational. Laura Fulginiti and Tzipi Kahana made the long drive from Tucson at short notice to analyze the remains.

As always the Park staff made each trip enjoyable, with former Park Superintendent, Ed Gastellum, and the present Park Superintendent, Gary Cummins, providing support. Trinkle Jones was responsible for all planning and budgeting for the projects, and recruited and hired many of the archeologists who worked on them. Besides providing advice and support throughout the Petrified Forest work, Trinkle collected the basket and other associated artifacts reported by Bill Wagers.

During the course of these projects, WACC Librarian Johanna Alexander hunted down innumerable obscure references. Ron Beckwith drafted the artifact drawings (excluding ceramics) and the AutoCAD™ map used in Chapter 2. The ceramic illustrations and other maps are my own. Dick and Florence Lord took the artifact plates and produced all of the photographs used in this report. Angela Nava formatted and reformatted numerous tables. Hank Baron, as always, provided behind the scenes administrative support instrumental to the completion of this report. Chris Goetze analyzed the ceramics. Mary Farrell provided extensive comments and suggestions that helped shaped this report. She also took responsibility for completing Chapter 8 as the deadline for the report turned my attention to other unfinished sections. George Teague, Terry Maze, Gary Cummins, and Trinkle Jones provided comments on the draft final report. Lastly, the report was edited by Marci Donaldson and proofread by Lynne D'Ascenzo.

To these and others, and especially my wife Mary and son Daniel, many thanks.

Jeff Burton
Tucson, Arizona

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Chapter 1
Introduction

Since the completion of the Boundary Survey in 1988 (Jones 1987; Wells 1988, 1989), the pace of archeological research at Petrified Forest National Park has continued unabated. In addition to reported excavations at Puerco Ruin (Burton 1990) and Sivu'ovi (Burton 1991), large areas of the Park have been surveyed, two eroding burials have been salvaged, a basket was collected, and in 1990 a program of archeological site monitoring was begun. In addition, members of the American Rock Art Research Association (ARARA) have recorded several rock art sites and are in the process of recording the abundant rock art at Newspaper Rock. This report presents the results of eight of these projects conducted between fall 1988 and spring 1992. In many respects this volume should be considered an interim report. Detailed analysis of rock art, an overview of the Civilian Conservation Corps (CCC), and in-depth analysis of data collected during site monitoring are currently in progress or being planned.

The surveys covered in this report include survey for the General Management Plan (GMP) in 1988 (WACC project number PEFO 1988E), survey for a proposed fiber optics line (PEFO 1989C), volunteer survey in 1991 (PEFO 1991C), and survey for a proposed water line (PEFO 1992A). The first and third projects were directed by the author, the second was directed by Jim Vint, and the fourth was directed by Steve Baumann. In all, these surveys covered a total of 4,187 acres and included the recording of over 130 sites. Several other surveys have been conducted within the Park (*e.g.*, Burton 1988; Jones 1990), but because these generally were of limited extent with no sites encountered, they are adequately described by their trip reports and are not included here.

Each project is briefly discussed below. In Chapters 2 and 3 the environmental and cultural background is addressed. Results of the surveys, monitoring, and salvage are discussed in Chapters 4 through 7. These are followed by discussions of projectile points, ceramics, shell, and small stone artifacts recovered during the surveys and monitoring (Chapters 8 through 10), a summary chapter (Chapter 11), and a final chapter that includes both research and management recommendations (Chapter 12).

Project Descriptions

Field methods for each of the surveys were basically the same and are discussed fully in Chapter 4. Methods for the other projects are discussed in the appropriate chapters.

GMP Surveys (PEFO 1988E)

These surveys, conducted from November 7 to December 1, 1988, were funded by the Western Regional Office, National Park Service. The main purpose of the work was to provide Park staff with information useful for the Park's General Management Plan. This included four tasks: (1) survey to re-

cord ruins and petroglyphs plotted on current and old USGS maps; (2) survey of areas considered for development in the proposed General Management Plan; (3) survey of Puerco Ruin Mesa and assessment of the Newspaper Rock Petroglyphs; and (4) recording of Stone Axe (Wallace Tank) Ruin. In all, 1,510 acres were surveyed with 43 sites and 33 isolated finds located and recorded. WACC archeologists spent 75 person–days on this project.

The goal of the first task was to record ruins and petroglyphs within the Park that were plotted by the USGS on either old or current maps. Since locations of these sites were published and made available to the public, they were recorded to current archeological standards to provide baseline data for monitoring site condition. Four general areas were involved. Three were in the Painted Desert portion of the Park and one was near the Flattops. A total of 314 acres was surveyed, and nine sites and two isolates were recorded in 18 person–days.

For the proposed GMP, 562 acres were surveyed in the Rainbow Forest section of the Park. Sixteen sites and 20 isolates were recorded. In addition, six sites and an isolate that had been noted previously (Jones 1988) were recorded near the Painted Desert Headquarters. The GMP survey required 38 person–days; most of this time was spent recording one site, AZ Q:1:230, a large petroglyph site near Rainbow Forest that is plotted on early USGS maps.

On Puerco Ruin Mesa, approximately 600 acres were surveyed. The main purpose of this work was to provide survey data that could be used in interpreting the excavations and rock art recording at Puerco Ruin (see Burton 1990) and to plot the full extent of Newspaper Rock (a National Register district) in detail sufficient to assess the level of effort needed to fully record the site. Eleven sites and ten isolates were recorded. WACC archeologists spent 15 person–days on this task.

The final task involved recording Stone Axe Ruin, a large Pueblo IV site on private land just outside the Park boundary. The Park is considering acquisition of the site through a land exchange.

Burial Salvage (PEFO 1988H)

An eroding burial was discovered on November 8, 1988, at a large Pueblo III site (AZ Q:1:226) near Rainbow Forest within an area surveyed for the GMP. Portions of three ceramic vessels and a skull were visible, and three shell beads and numerous fragments of bone were noted on the surface. Consultations were conducted with staff from the Park, WACC, the Western Regional Office, the Hopi Tribe, and the State Historic Preservation Office. The burial was then excavated on December 21, 1988. Three person–days (2 WACC, 1 volunteer) were spent on this project.

Fiber Optics Line Survey (PEFO 1989C)

From June 19 to 21, 1989, a survey of approximately 240 acres in the southern portion of the Park (Rainbow Forest) was conducted for a proposed fiber optics line. This work was funded by CONTEL, the project proponent. The survey area consisted of a 400–meter–wide corridor centered on old State Highway 180 from where it enters the west end of the Park east to the Mainline Road (1.6 miles), and from the Mainline Road south to the Park boundary

(1.4 miles). Three sites, all previously recorded, and five isolates were encountered. Only one of the sites, previously excavated (NA 10,808; Harrill 1971), was located within the impact area. WACC archeologists spent six person–days in the field on this project (Vint 1989).

Site Monitoring (PEFO 1990B)

Previously recorded sites were revisited between July 2 and 20, 1990. The purpose of this project was to assess the sites' current condition (for both Park management and Archeological Resources Inventory [ARI] data input) and to obtain controlled surface collections from the sites. Five tasks were completed at each site: (1) collection of baseline data for future monitoring; (2) ARI data collection of current site condition and susceptibility to future impacts; (3) photographic documentation; (4) tabulation of artifacts along transects with a sample collection of ceramics; and (5) detailed on–site lithic analysis.

Ninety–five sites were relocated. During work at the sites, 20 temporally diagnostic projectile points, numerous beads, pendants, bracelet fragments and other items were collected (see Chapters 8 and 9). Analysis of the lithic and ceramic data is being completed as part of a dissertation project. A total of 150 person–days was spent on this project, 51 by WACC archeologists, 92 by volunteers, and seven by Park staff. The work was funded by the Petrified Forest Museum Association and a private donor.

Burial Salvage (PEFO 1990D)

On July 11, 1990, an eroding burial was discovered during monitoring work at a small pueblo site (AZ K:13:51) located east of the Mainline Road in the central portion of the Park. After consultation with Park staff, Regional Office staff, the Hopi Tribe, and the State Historic Preservation Office, a decision was made to excavate and rebury the remains (including any associated grave goods). On July 18 the burial was excavated with representatives of the Hopi Tribe present. Physical anthropologists from the Arizona State Museum conducted *in situ* analysis of the skeleton after it was exposed by excavation. WACC and Park archeologists spent four person–days on this project.

Removal of Basket (PEFO 1990E)

Also during the 1990 field season, a basket discovered in an isolated rockshelter by a Park employee was collected. On July 5, 1990, WACC archeologists spent two person–days mapping the shelter, documenting the basket location, and collecting the basket and two associated artifacts for curation.

Volunteer Survey (PEFO 1991C)

Survey at Petrified Forest from July 29 to August 16, 1991, was funded by the Petrified Forest Museum Association and a private donor, with volunteer crews contributing the bulk of the labor. The main purpose of this survey was to investigate previously unsurveyed microenvironmental niches and areas of current high use or with a high potential for site vandalism. A total of 82 sites and 50 isolated finds were recorded. Over 150 person–days were spent on this project, 57 by WACC and Park archeologists, 96 by volunteers, and three

by Park staff. In all, 2,295 acres in ten parcels were surveyed. Each parcel is briefly discussed below (from north to south).

Sandhill
In the northeast portion of the Park, 257 acres were surveyed to determine if prehistoric sites occurred near clay deposits of the lower Bidahochee Formation. Only one isolate was encountered.

Hogans
Approximately 10 acres in the Painted Desert section of the Park were surveyed while recording a historic Navajo site. The site was reported by Johnny Johnson, retired Park Resource Management Specialist. This site was recorded to provide more information on the little-known Navajo occupation of the Petrified Forest area. Nine rock hogans were recorded and the site designated AZ K:13:101. A cursory survey approximately 1 mile to the west was conducted to look for reported corrals, but no corrals or corral ruins were discovered.

Desert Park Northeast
While trying to relocate a pothunted site reported by the Park Superintendent, 30 acres northeast of the microwave tower were surveyed. Only one isolate was encountered. The site could not be relocated based on the information available.

Lacey Point
The Lacey Point survey area comprises one of the major portions of the 1991 season's work. The area includes a microenvironmental niche (the terrace below the Painted Desert rim) that had not been previously studied. In addition, the area contains extensive outcrops of Bidahochee clay, which may have influenced prehistoric settlement patterns. In all, 900 acres were surveyed and 32 sites and 21 isolates were recorded.

Puerco Mesa West
This area was surveyed to provide contextual data for the ongoing ARARA recording of rock art at Puerco Ruin and Newspaper Rock. In addition, the survey filled a gap left between the boundary survey (Wells 1988) and the 1988 survey of Puerco Ruin Mesa, described in this report. Two prehistoric sites, the remains of a CCC camp, and seven isolates were recorded in the 258 acres surveyed.

Puerco Mesa East
This area was chosen for survey to fill in a gap in survey coverage, and to document CCC-era sites known to be in the area. We surveyed 450 acres in the Puerco Mesa East area and recorded 19 sites and six isolates. A CCC camp, a CCC residential area, and ten other CCC-era sites were located and recorded. Also completed was the recording of rock art in the vicinity of the Cave of Hands (AZ Q:1:70). Elements within the cave itself had already been recorded by the American Rock Art Research Association (Bock 1988).

Crystal Ridge
Crystal Ridge, located in an isolated portion of the Park, exhibited one of the highest site densities recorded by Jepson in 1941. The 1991 survey covered 340 acres where 21 sites and seven isolates were recorded. Most notable were four large multi-room pueblos. All of the sites identified by Jepson within the survey area were relocated. Additional sites recorded consisted of artifact scatters, rock art, and small one-room structures.

Box Canyon
Fifteen acres in Box Canyon were surveyed to provide additional data on CCC activities in the Park. The area includes a CCC spike camp and inscriptions, as well as a prehistoric rock art site. Ekkehart Malotki, who reported the camp's location, also noted some inscriptions dated 1897.

Flattops Vicinity
A multi-room pueblo in the Flattops area was reported by Park staff. The site, which contains one of the greatest concentrations of painted ceramics at the Park, is in a high use area (wilderness camping is allowed just east of the site) and is impacted by severe erosion. Recording the site was considered a priority to provide baseline data for monitoring.

Cottonwood Wash
Three sites were noted in this area during the 1990 site monitoring while enroute to other previously recorded sites. More recently, Park staff expressed concern that the high visibility of the sites and their location near the Park boundary would make them susceptible to illegal collection and vandalism. In addition to recording the sites, 25 acres were surveyed and a large historic dump noted.

Waterline Survey (PEFO 1992A)

This survey of 140 acres in the northern portion of the Park, conducted from March 23 to 27, 1992, was funded by the Denver Service Center, National Park Service. A 100-meter-wide corridor on the south side of old U.S. Highway 66, north of the Painted Desert Headquarters, was surveyed for a proposed waterline. Three sites and four isolates were recorded. While not within the waterline survey project area, a small pictograph site reported by a Park employee near the Cave of Hands was recorded as well. WACC archeologists spent eight person-days on this project (Baumann 1992).

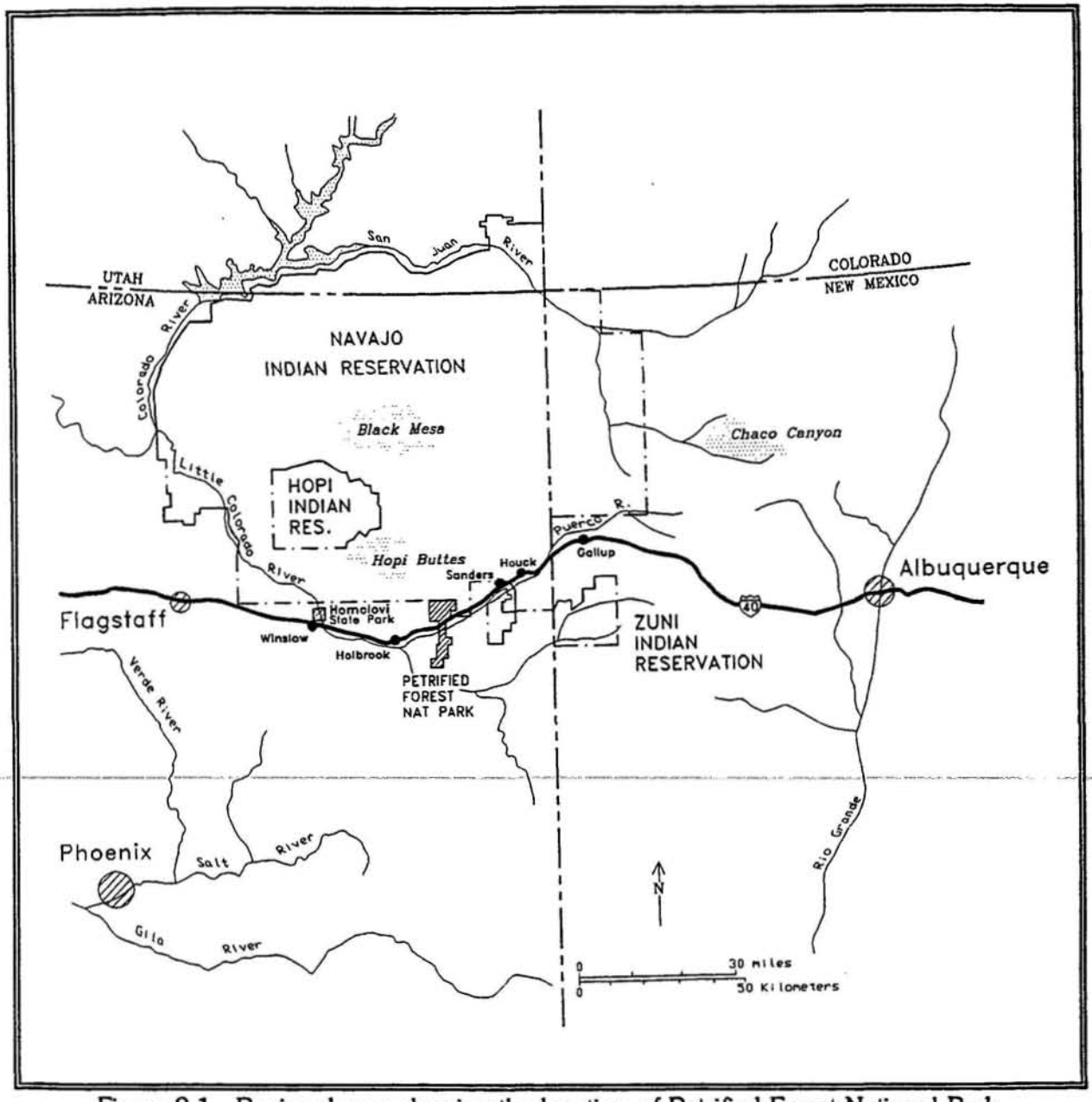


Figure 2.1. Regional map showing the location of Petrified Forest National Park.

Chapter 2
Environmental Setting

Petrified Forest National Park is located in the Painted Desert region of the Little Colorado River Valley (Figure 2.1). The Park, 32 km (20 miles) northeast of the town of Holbrook, Arizona, lies within the Colorado Plateau physiographic province. The Park is characterized by a variety of landforms, from rolling grasslands and mesas in the southern portion to eroded badlands in the northern section (Figure 2.2). Extensive exposures of petrified wood are concentrated mainly in the southern portion of the Park but occur throughout the region as well. Elevations range from 1615 meters (5300 feet) along the Puerco River to 1900 meters (6235 feet) at Pilot Rock in the northwest portion of the Park. The average elevation is roughly 1680 meters (5500 feet).

The bedrock geology of the Park area consists of irregular sandstone beds separated by siltstones and mudstones. There are several major sandstone units within the Park. Newspaper Sandstone is overlain by Rainbow Sandstone, which contains colorful petrified logs, and Sonsela Sandstone, which contains chert cobbles and red logs. Flattops and Painted Desert Sandstone overlie the Sonsela Sandstone (Billingsley 1985). The names of the sandstone beds reflect the area of the Park in which they are found, with Rainbow and Flattops sandstone in the southern portion, Newspaper Sandstone in the central portion, and Painted Desert Sandstone in the northern portion. Sonsela Sandstone occurs throughout the Park. All of these beds are part of the Petrified Forest Member of the Triassic Chinle Formation. The overlying Bidahochee Formation (Tertiary lake deposits) is present in isolated areas of the Park. Basalt outcrops occur on Pintado Point, in the vicinity of the Painted Desert Inn. More recent sediments consist of alluvial clays and gravels overlain in places by eolian sands stabilized by vegetation.

The vast majority of the Park is within the Puerco River drainage, a major tributary of the Little Colorado River. The main tributaries of the Puerco within the Park are Lithodendron, Dead, Ninemile, and Dry washes (Figure 2.3). The Park's southern portion drains directly into the Little Colorado River via Cottonwood and Jim Camp washes. The Petrified Forest region currently has little surface water; the Puerco River and other washes are ephemeral. Generally water is present just below the surface of the Puerco riverbed year–round; just north of Puerco Ruin there is a small pool of water in the riverbed kept full by water seeping out of the adjacent sandstone. A fairly large tinaja, or natural tank, is located 2.3 km (1.5 miles) southeast of Puerco Ruin and Jones (1987:88) notes a possible seep in the vicinity. Currently there are no active springs in the Park. However, springs may have been present prehistorically; springs at Zuni Well, Agate Bridge, and other areas flowed until the 1940s (Stewart 1980), and a spring just outside the Park at Stone Axe Ruin has been converted into a cattle tank (Wallace Tank).

Presently the climate at the Park is windy and semi–arid with an average annual precipitation of 22 cm (8.69 inches;

Sellars and Hill 1979). The precipitation pattern is biseasonal, with winter storms from the north and west and summer thunderstorms generated by the flow of moisture from the south. The average frost free period at the Park is 180 days (Smith 1945), a timespan suitable for maize cultivation. Arable land appears to be plentiful on the floodplain sediments. However, Wendorf (1953:13) suggests that only eolian soils are suitable for agriculture, since the alluvial soils are too alkaline. If Wendorf's thesis is correct, floodplain areas may have been of limited usefulness for farming (Stewart 1980:14). Agriculture may have been effectively limited to the base of the mesas where dune sand could accumulate.

Vegetation

The Park lies within the Great Basin Grassland biotic community (Brown 1982:115-121). Predominant vegetation consists of shadscale (*Atriplex confertifolia*), saltbush (*A. canescens*), blackbush (*Coleogyne ramosissima*), sagebrush (*Artemisia tridentata*), greasewood (*Sarcobatus vermiculatus*), and mixed grasses such as dropseed (*Sporobolus* spp.), grama (*Bouteloua* spp.), and galleta (*Hilaria jamesii*). Other major plants include rabbitbrush (*Chrysothamnus nauseosus*), snakeweed (*Gutierrezia sarothrae*), winterfat (*Ceratoides lanata*), Mormon tea (*Ephedra viridis*), narrow-leaf yucca (*Yucca angustissima*), cliffrose (*Cowania mexicana*), prickly pear (*Opuntia* sp.), cholla (*O. whipplei*), juniper (*Juniperus monosperma*), and pincushion cactus (*Mammillaria* sp.).

Vegetation mapping within the Park has identified four sub-communities (see Stewart 1980). The desertscrub community, adapted to salty soils and cold temperatures, is indicated by shadescale, mormon tea, sagebrush, blackbush, and greasewood. The grassland community, generally restricted to fine-grained alluvial and eolian de-



Figure 2.2. Small eroded butte in the Painted Desert section of the Park.

posits, includes grama, dropseed, galleta, and other grasses. Pinyon–juniper woodland, restricted to Chinde Mesa, Pilot Rock, and other higher elevations, is usually composed solely of juniper within the Park; pinyon occurs only on Chinde Mesa. Roughly one–quarter of the Park is considered barren, meaning it has less than 5 percent vegetative cover.

Riparian zones along the Puerco River and larger washes consist mainly of cottonwood (*Populus* spp.), willow (*Salix* spp.), and tamarisk (*Tamarix pentandra*), an exotic plant that has become densely established along the Puerco River (Johnson 1985:75).

Fauna

During fieldwork a wide variety of fauna was observed, including pronghorn (*Antilocapra americana*), coyote (*Canis latrans*), bobcat (*Felis rufus*), mule deer (*Odocoileus hemionus*), jackrabbit (*Lepus californicus*), cottontail (*Sylvilagus audubonii*), prairie dog (*Cynomys gunnisoni*), rattlesnake (*Crotalus viridis*), toads (*Bufo* spp.), quail (*Callipepla gambelii*), raven (*Corvus corax*), golden eagle (*Aquila chrysaëtos*), hawks (*Buteo* spp.), and migratory waterfowl. Porcupines (*Erethizon dorsatum*) are common along the Puerco River. Other common wildlife in the Park includes: gopher (*Thomomys bottae*), ground squirrel (*Spermophilus spilosoma*), antelope squirrel (*Ammospermophilus leucurus*), badger (*Taxidea taxus*), striped skunk (*Mephitis mephitis*), and spotted skunk (*Spilogale putorius*). Rare sightings of bear (*Ursus americanus*), mountain lion (*Felis concolor*) and gray fox (*Urocyon cinereoargenteus*) have been made. In prehistoric times elk (*Cervus canadensis*), white–tailed deer (*Odocoileus virginianus*), bighorn sheep (*Ovis canadensis*), and bison (*Bison bison*) may have been present in the region. In addition, beaver (*Castor canadensis*), otter (*Lutra canadensis*), and various fish may have been supported by a flowing Puerco River (Davis 1982).

Paleoenvironment

Any change in the amount or predictability of rainfall would have had profound impacts on the prehistoric occupation of the region. Euler and others (1979) and more recently Gumerman (1988a) have compiled paleoclimatic data from a number of sources to reconstruct past climatic change on the Colorado Plateau. Generally, by about 4000 B.P. climatic conditions were similar to those of today, with alternating periods of increased moisture and drought. The period between A.D. 950 to 1150 is the best documented period of increased effective moisture on the plateau (Euler *et al.* 1979:1096). Three periods of low effective moisture, low water tables, down–cutting, and high temporal variability in rainfall have been identified: A.D. 250 to 400, 800 to 950, and 1350 to 1500 (Gumerman 1988a). There is some evidence for short–term droughts around A.D. 1000 and A.D. 1150. A fourth major dry period started around A.D. 1875. Combined with overgrazing and groundwater pumping, it may have brought about the demise of springs within the Park and the invasion of juniper into former grasslands (Stewart 1980).

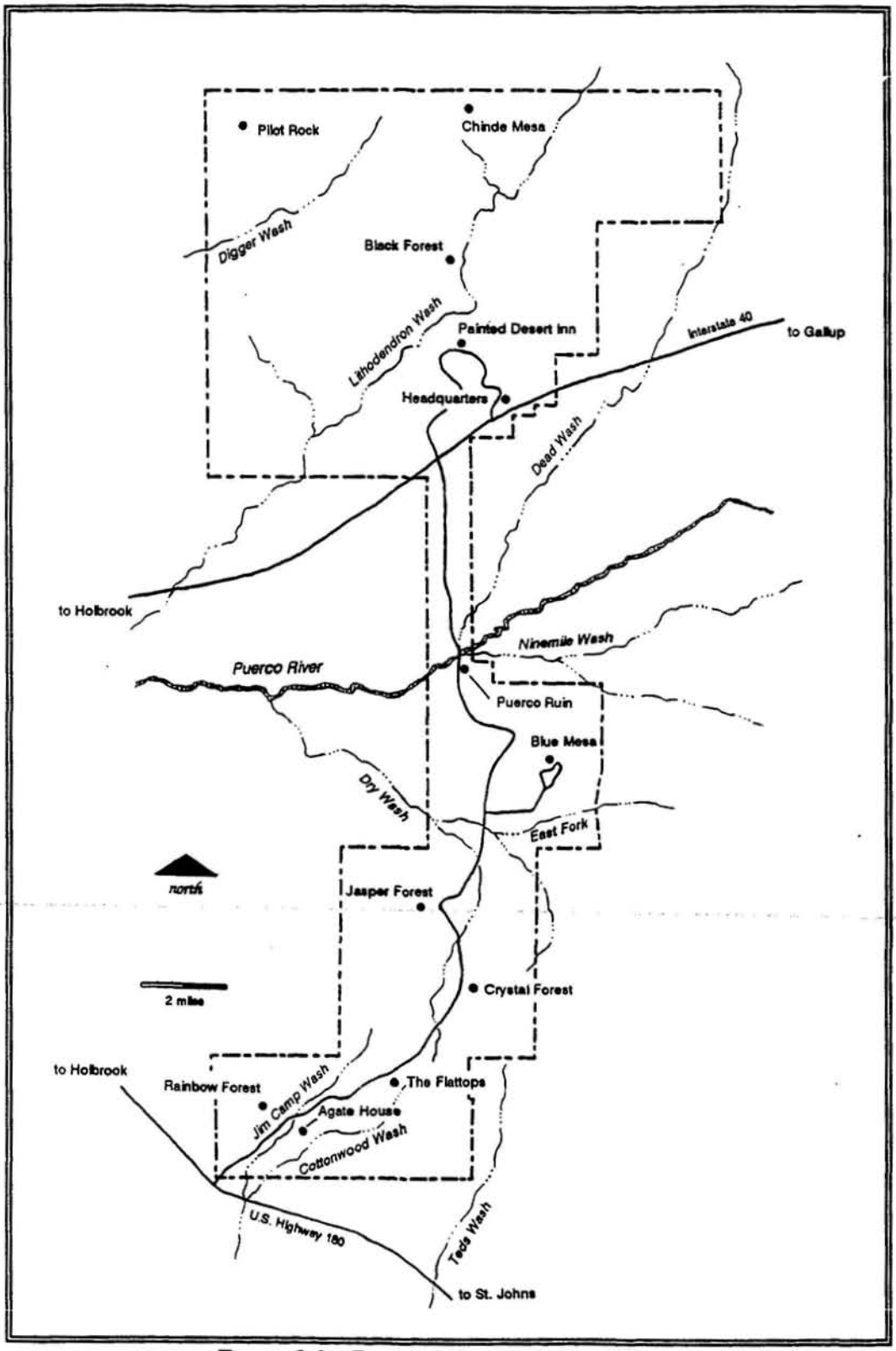


Figure 2.3. Petrified Forest National Park.

Chapter 3
Cultural Background

In order to provide a contextual framework for the projects described in this report, the prehistory, ethnography, and history of the region are briefly discussed below and archeological work at Petrified Forest is summarized. A more complete synopsis of archeological work in the region is available in Burton (n.d.), Plog (1981), and Stewart (1980).

Previous Research

Archeological work at Petrified Forest reflects the general trends in the development of archeological method and theory. The first anthropological investigations in the region centered around ethnographic studies. Archeological work was designed primarily to acquire specimens for museum collections and secondarily to provide evidence about prehistoric societies. Completion of the railroad through the region in 1883 not only eased access to many sites, but also provided a means of shipping specimens back to Eastern museums. Public interest in the prehistory of the region was fueled by the visibility of many sites with standing architecture. Increased curiosity about the nearby Hopi and Zuni pueblos also provided impetus to study the past. Other sites, difficult to see and without obvious cultural continuity, generally were overlooked.

Jesse Walter Fewkes (1898, 1904) conducted surveys and excavations in the Little Colorado River Valley for the Smithsonian Institution and the Bureau of American Ethnology. Part of Fewkes' study focused on tracing Hopi migrations through the analysis of pottery and architecture. Concentrating his excavation efforts on burials at in order to obtain whole vessels, Fewkes collected over 2,824 artifacts (mostly pots) and other specimens from numerous ruins, mostly dating to the Pueblo IV period.

Walter Hough continued the tradition of collecting for museums. In charge of the Gates–Museum Expedition, Hough collected 2,500 specimens through purchase and excavations (Hough 1902, 1903). He visited 55 sites in the White Mountain, Hopi, and Petrified Forest regions. He remarked on the wide extent of pothunting, noting that Holbrook served as a "collection center" for various museum purchases (Hough 1903:326-327; 357-358), probably because of its location along the railroad.

Hough conducted excavations at 18 sites, including Stone Axe Ruin, Metate Ruin, Milky Hollow Ruin, and others in the Petrified Forest area. At Stone Axe Ruin (also called Wallace Tank Ruin), a Pueblo IV site near Petrified Forest, Hough concentrated on excavating over 30 burials, many of which contained no objects. He noted a greater variety of pottery types (including red, orange, and Zuni wares) than in the Hopi area, suggesting to him that Stone Axe Ruin was occupied by a different clan, most likely from the south. Hough recovered fragments of mats, baskets, and pahos from some of the burials and noted obsidian at the site. Fifteen whole vessels and numerous other artifacts from Stone Axe Ruin are pictured in the report (Hough 1903).

Metate Ruin is apparently within the

present Park boundaries east of Agate Bridge. The exact location is unknown, but it may be what is now known as the Twin Butte site, later excavated by Wendorf (1953). Milky Hollow Ruin is located nine miles east of Petrified Forest. Both sites appear to be Adamana phase pit house villages. Hough collected surface artifacts and conducted limited excavation at both sites, although the exact nature of his work is unclear. The pottery at the two sites was described as a coarse gray–brown plain ware; the only decoration noted was scratched lines in the paste of a few sherds. Slab–lined houses and numerous metates were noted at Metate Ruin. Over 70 houses were observed eroding out at Milky Hollow Ruin (Hough 1903:Plate 53) and were described as "small and rudely built" (Hough 1903:319). Numerous stone artifacts including stone balls, pipes, and a hoe were noted at the site. Shell ornaments and perforated slabs were also present. Hough (1902:318) considered both sites an "archaeological enigma in light of present knowledge." In a later elaboration on the sites, Hough (1903:898) stated, "[the] people who once lived here were not related in any way to the others of this region." He went on to say "that [they are of a] different people, and perhaps a different time."

Naturalist John Muir conducted excavations at Puerco Ruin during the winter of 1905-1906. Muir, in Arizona for his daughter's health, had located at Adamana primarily to study the fossil forests (Limbaugh and Lewis 1986). His work is known from two sources, a hand–written note on Petrified Forest Hotel stationery by Alice Cotton Fletcher in 1906, and a memoir by Fletcher written years later (Limbaugh and Lewis 1986; Wild 1987). Fletcher met Muir while visiting Petrified Forest with her parents. Muir gave the family a tour, the highlight of which was Indian ruins. Fletcher noted Muir had done a great deal of excavating at a site that fits the description of Puerco Ruin. Specifically, she mentions a kiva and the "weird checkerboard effect" of excavated rooms. Muir decided that the ruin was not a burial place because no human bones were encountered. He took the utmost care to not damage relics, but had only dug to a depth of four to five feet since he was working alone (Muir was 70 years old at the time). Fletcher noted an abundance of maize cobs on the surface. She mentioned that Muir was doing his study for a series of magazine articles, but none is known to exist (Kimes and Kimes 1986; Wild 1987). Wild (1987) suggests the lack of published material from Muir's Petrified Forest work can be explained by the recent death of Muir's wife and his subsequent preoccupation with the political battle to save Hetch Hetchy Valley in California. Fletcher also noted that Muir was working on a pottery chronology for the area and rock art interpretation. The earliest pottery in Muir's sequence was characterized by basket impressions, followed by plain wares, then red–and–black, and finally polychromes and well–polished wares. Muir suggested that the rock art at Puerco Ruin may tell stories of events by their groupings.

Federally–funded research during the Depression greatly accelerated archeological research in the area. Under contract with the Works Progress Administration (WPA), H.P. Mera (1934) of the Laboratory of Anthropology, Santa Fe, conducted the first systematic study of pottery in the region at Petrified Forest, recognizing and describing several new types. He recorded 109 sites, including a few outside the monument. Workshop and stone industries were noted,

although no chronometric information was available to tie them to particular time periods. Mera noted the remains of daub structures and defined early pottery types (Adamana Brown, Woodruff Brown, and Woodruff Smudged) at slab–lined pit house sites. Relative frequencies of Zuni glaze wares suggested to Mera that Wallace Tank Ruin (previously known as Stone Axe Ruin) was slightly later than Puerco Ruin. Mera speculated that the lack of Jeddito Black–on–orange in his survey area was due to disrupted trade. Mera's pottery chronology, although further refined, is the same one in use today.

As part of the same WPA project, C.B. Cosgrove (1934) conducted excavations at Agate House, Puerco Ruin, and the Flattop site. Information from the excavations is available in Cosgrove's preliminary report. His untimely death, caused by choking on pinyon nuts less than a year after the fieldwork (Smith 1992), prevented the completion of a final report. Agate House, with seven rooms, was completely excavated; firepits were found in two of the rooms. Over 2,200 sherds, four small crushed vessels, manos, metates, ornaments, food bones, and two human jaws were discovered. Pottery types collected included corrugated, Walnut Black–on–white, Showlow Black–on–red, Chaco Black–on–white, Wingate Black–on–red, and brown ware distinguished by polished black interiors. Most of the material collected was from the surface, the site having shallow cultural deposits. At Puerco Ruin, Cosgrove excavated three rooms and a series of trenches both inside and outside the pueblo walls. Cosgrove spent one day at the Flattop site, excavating two pit houses. The fill in one was only a foot deep, with a few flecks of charcoal and ash. No artifacts or floor features were present in either pit house, although there was an abundance of sherds and lithics on the surface (Cosgrove 1934).

Carl Jepson (1941) continued Mera's work, surveying a 51–square–mile area and recording 230 sites. Using pottery cross–dating. He placed 34 sites in the Basketmaker period, 28 in Pueblo II, 41 in Pueblo III, and four sites in Pueblo IV. He suggested that the apparent lack of Pueblo I sites might be due to the lack of trade wares, since the period is defined by intrusive pottery. Jepson also classified sites by size: 100 of the sites consisted of only one room, 72 had two to seven rooms, eight had seven to 12 rooms, four had 13 to 20 rooms, and three contained over 20 rooms. Jepson noted problems of both erosion and burial of sites by blowing sand. He inferred that site location was determined by proximity to suitable building stone, and that availability of water and farmlands was not a factor. However innovative Jepson's settlement analysis was for the time, it is partially biased by his consideration of only stone architecture sites, which are more visible than jacal structures or pit houses.

A rockshelter that Jepson had recorded appeared to be in danger of destruction through ongoing erosion. Salvage excavation at the site (PEFO Site 171) was conducted by Bennet Gale (1941). On the surface Gale found a few sherds and bits of charcoal; petroglyphs were located above the rockshelter entrance. Inside the shelter 18 inches of fill lay above the shale bedrock; artifacts were limited to the upper three inches. During complete excavation Gale recovered 24 plain gray sherds, one black–on–gray sherd, one moccasin, two wood drills, one fire stick, charcoal, unworked petrified wood, sandstone, gypsum fragments, possible rodent bones, corn

kernels and cobs (one on a stick, possibly recent), pitch concentrations, and a burned newspaper fragment. Most of the material was considered to be the result of either historic or natural intrusions. For analysis of sherds see Reed (1947), who inferred it to be a Pueblo IV site.

Erik Reed (1947), expanding on Mera's and Jepson's work, defined pottery horizons for the Park region through ceramic cross dating and placed all but 40 of 280 recorded sites into temporal groups. Six percent of the sites belonged to his Adamana horizon, 21 percent to the Lino–Woodruff period, 42 percent to the Holbrook period, 20 percent to the Walnut horizon, 10 percent to the Tularosa–St. Johns, and two percent to the initial Pueblo IV (Homolovi) focus.

Fred Wendorf (1948) reanalyzed the portion of Reed's (1947) ceramic collection curated at the Museum of Northern Arizona. Due to time limitations, Wendorf focused on 100 sites, most of them pre–Pueblo III sites. Using seriation he defined seven ceramic groups. Group 0 (Adamana Brown), present at 19 sites, dated to before A.D. 500. Group 1, with 23 sites, dated to A.D. 500 to 700. Characteristic pottery types were Lino Gray and Woodruff Brown. Group 2 was present at 21 sites and the pottery, including White Mound Black–on–white, Lino Black–on–gray, and Woodruff Brown, was dated to A.D. 700-800. Group 3, dating to A.D. 800 to 900, included four sites, and was characterized by Kana-a Black–on–white and Kiatuthlanna Black–on–white. Group 4 (Black Mesa Black–on–white and Holbrook Black–on–white) dated to A.D. 900 to 1100, and was present at 12 sites. Group 5 (Sosi Black–on–white and Walnut "A" Black–on–white), dated to A.D. 1050 to 1120, was present at over 44 sites. Group 6 (Chaco Black–on–white and Walnut "B"), present at over 46 sites, was dated to A.D. 1120 to 1200.

To clarify and test his pottery groupings, Wendorf excavated two sites located in the Petrified Forest National Monument. In 1949 Wendorf excavated eight pit houses at the Flattop Site. These were small houses that had been constructed by excavation into bedrock. All were slab–lined and only one contained a well–defined hearth, suggesting seasonal occupation. Ceramics were predominantly Adamana Brown, of paddle–and–anvil construction, which may have been imported. Interestingly, some small amounts of coil–and–scrape brown ware were recovered from the floors of six of the houses. The site contained an extensive and varied Basketmaker II lithic assemblage, including 32 corner–notched projectile points. Maize cobs were also recovered. Because pH tests indicated the soil was not acidic, Wendorf inferred that the lack of bone was not due to poor preservation, but that it indicated animals were not important in the diet. Therefore, the large number of projectile points combined with the site's location atop a bluff were taken to indicate warfare. Because intrusive Adamana sherds at the Bluff site (Haury 1940) were dated to pre–A.D. 600 (perhaps *ca.* A.D. 300), the Flattop Site was considered to date to the same time.

In 1949-50, Wendorf excavated two trenches at the Twin Butte Site and discovered numerous features, such as three turkey burials, eight human burials, two pit houses, storage rooms, a deep adobe–walled granary, agricultural features, and storage pits. Pottery included Lino plain wares, Lino Black–on–gray, and White Mound Black–on–white. Wendorf (1953) posed and tested several hypotheses to account for the presence of two distinct

pottery types (Mogollon Brown and Anasazi Gray) at the site, and discounted theories of simultaneous occupation by Mogollon and Anasazi groups and of temporally distinct occupations. Three lines of evidence suggested to Wendorf that the Mogollon artifacts had been imported: architecture was similar to Anasazi types; the most numerous ceramics were Anasazi; and the Mogollon ceramics were present in burials as though associated with status. The site was considered a Basketmaker III site of the White Mound phase. Artifacts were both more diverse and more numerous than at the Flattop Site, and abundant faunal remains were recovered. Wendorf noted a change in projectile points from the Flattop Site. New traits present included axes, ornaments, mauls, and bone and shell artifacts. The presence of brown wares was inferred to indicate extensive trade.

The next excavation within the Park was again at Puerco Ruin. Al Schroeder (1960, 1961) reported on excavations conducted to help stabilize walls and expose more of the pueblo for visitors. In 1957, Schroeder excavated three rooms and tested a kiva and areas of the plaza adjacent to the rooms. The next year, Gordon Vivian excavated three rooms, the rest of the kiva, and portions of the plaza. Artifact distribution and sediments were inferred to indicate a leisurely abandonment of the rooms as the occupants moved to other parts of the pueblo or elsewhere; few artifacts were found on the floors of "domestic" rooms (with hearths), and the floors and firepits were covered by wind-blown sand. Roof-fall over the sterile deposits suggested a later roof collapse (Schroeder 1960:2). Schroeder (1960:5-6) also defined possible family units on the basis of interior doorways. Data from the kiva were interpreted to indicate a leisurely abandonment of that structure; not only were floor artifacts lacking but masonry was scarce (possibly scavenged) and early artifacts were present in the fill (possibly secondary deposition from excavation of a newer structure in the pueblo). Although several rooms showed evidence of burning just prior to abandonment, this was considered to have been accidental. Schroeder interpreted the pottery as indicating the pueblo was occupied between A.D. 1250 and 1350, and that there was an earlier occupation, indicated by walls found under the exterior pueblo wall.

Once again at Puerco Ruin, Calvin Jennings (1967, 1980), working for the Museum of Northern Arizona, excavated 15 surface rooms and two subsurface rooms. Most of the excavated rooms were located in the southwest corner, but some were also exposed along the east wall to determine if masonry techniques were similar to those in the southwest part of the site. Basically, the purpose of the excavation was "to expand the viewable area [for visitors] and the extent of the site's interpretation" (Jennings 1980:14). Particular attention was paid to wall junctures to determine the sequence of construction of the excavated rooms. This analysis suggested that the south and west walls and most of the rooms along the south and west sides were constructed in a single coordinated effort, with between 18 and 22 rooms built at once (Jennings 1980:38). Rooms along the east wing of the pueblo included secondary walls (not integrated with the exterior wall) and may have been constructed later. Jennings suggested that there was a hiatus in site occupation between A.D. 1200 and 1300. No dates for the construction of the surface pueblo rooms were offered, but most of them apparently would have been built during the second

period of occupation (Jennings 1980:95). Jennings inferred that the one excavated subsurface room and the walls Schroeder found below the pueblo walls were associated with the early (pre–A.D. 1200) pottery at the site. However, it is more likely that the subsurface room is a kiva.

For a road construction project, Bruce Harrill (1971) excavated fourteen 15–meter–long trenches at NA 10,808, a small site (40 m by 20 m) located on a low ridge south of Rainbow Forest. Three hearths visible on the surface and a possible pit house and possible firepit were excavated. Cultural material generally extended no deeper than 20 cm. The 1,000–plus sherds recovered included no restorable vessels; the 28 types identified included Mogollon Brown ware (63 percent), Snowflake Black–on–white (11 percent, most apparently from the same jar), St. Johns Black–on–red, Gila Polychrome, and Showlow Black–on–red. Lithics included two manos, one metate, an incised slab, nine chipped stone artifacts, and 285 whole and broken flakes (predominantly petrified wood, n=225, and chert with cortex, n=58). Seven hammerstones and eight cores also attest to the importance of lithic reduction at the site. The site, with both Mogollon and Anasazi traits, was interpreted as a small Mogollon campsite or field house, or possibly a seasonal camp for hunting and gathering, with intermittent occupation between A.D. 1150 and 1300.

The next year, Harrill (1973) excavated the Dobell Site, a small pit house village, for a road realignment project just outside the southern boundary of the Park. Surface indications at the Dobell Site, located on a west–facing slope, consisted of sheet trash; no features were apparent. Harrill excavated a 600–square–meter area (maximum depth of fill 25 cm), including four pit houses (each with a central hearth), one platform kiva, numerous extramural hearths and pits, and nine burials. Artifacts recovered from the pit house and kiva areas included bone awls, shell pendants, ground stone, limonite, gypsum, worked sherds, a 3/4 groove axe, six projectile points (three small fragments), three drills, two choppers, 21 petrified wood hammerstones, seven chert hammerstones, seven quartzite hammerstones, 11 scrapers, 17 utilized flakes, 13 retouched flakes, 10 bone awls, other worked bone and shell, and stone ornaments. Several of the burials included grave goods, such as stone and shell jewelry, ceramic vessels, and awls. Faunal remains recovered were dominated by cottontail and jackrabbit, with lesser amounts of prairie dog, grasshopper mice, antelope, mule deer, ground squirrel, gopher, coyote, turkey, and sandhill crane. In total, 26 whole or restorable vessels, plus some 10,000 sherds, were recovered. Ceramics, including Snowflake Black–on–white, brown indented corrugated, Snowflake Black–on–red, Puerco and St. Johns black–on–red, St. Johns, Springerville, and Wingate polychromes, are nearly identical to those at the Carter Ranch and Broken K sites, 20 miles south, which have been dated to A.D. 1100 to 1300. The close spatial and temporal proximity of the Dobell pit house village site to these pueblo sites suggested the possibility of two distinctly different contemporaneous settlement patterns and architectural styles, possibly due to environmental or functional differences. Chipped stone artifacts and faunal remains indicated hunting, while agriculture was inferred from the presence of grinding implements. The abundance of chipping debris and proximity to lithic sources suggested manufacture of tools for trade.

Nancy Hammack (1979) surveyed 31

linear-miles within the Park along the Mainline and Blue Mesa roads, recording 74 sites ranging from Archaic to late Pueblo III and Historic. This survey was the first to record the widespread petrified wood quarries in the Park. Temper analysis of collected sherds suggested that culinary wares were locally made, and decorated wares imported (Rinehart 1979). Hammack concluded that settlement patterns and population growth patterns were similar to the Hopi Buttes area; in Pueblo I, local brown wares disappear, and population drastically declines. In Pueblo II, there is a population increase, and extension of trade; in late Pueblo III trade was exclusively with the Cibola and White Mountain areas. In Pueblo IV populations were aggregated into a few large sites such as Puerco Ruin and Stone Axe Pueblo. A short appendix to the survey report by Mary Bernard (1979) discusses the surface collection of a lithic site (PEFO 1978A-3). A total of 287 flakes, all of petrified wood, were collected from along the road. Also collected were two battered chert cobbles and a possible petrified wood tool. A petrified log on site lends support to Bernard's inference that quarrying activities occurred there.

Trinkle Jones (1983), of the Western Archeological and Conservation Center, conducted investigations prior to road reconstruction at AZ Q:1:42. At the site, a two component artifact scatter, one 1 m by 2 m unit was excavated and several 4 m by 4 m units were surface collected. Cultural material in the excavation unit occurred in the top 20 cm depth. Four sherds, nine lithics, one ground stone fragment, two shaped sandstone slabs, and a worked sherd were recovered from the excavation unit. The surface collection yielded 657 sherds, 1,724 lithics, a shell bracelet fragment, and a spindle whorl fragment. Jones defined four loci within the site based on artifact density and datable ceramics. Based on four White Mountain Black-on-white, two Lino Black-on-gray, and 473 Lino White sherds, Locus B was dated to A.D. 700 to 775. Loci A, C, and D (with 18, 13, and 8 sherds, respectively) included a few corrugated and two Holbrook Black-on-white sherds. These areas and a possible masonry structure were dated to the early Pueblo III period, A.D. 950 to 1150.

Jones (1986) later conducted investigations at three other sites along the Mainline Road (AZ K:13:13, AZ K:13:19, AZ Q:1:58) and at a great kiva site (PEFO Site 236, AZ K:13:41). At AZ K:13:13 surface collection and one 1 m by 2 m excavation unit yielded 51 artifacts, including one worked sherd and 16 lithics. From the fill of a firepit, six black-and-white sherds, six miscellaneous sherds, two flakes, and a polishing stone were recovered. AZ K:13:13 contained mostly plain and corrugated wares with a few Holbrook Black-on-white "B" and Snowflake Black-on-white sherds. The site was dated to *ca.* A.D. 1100 based on ceramics.

At AZ K:13:19, Jones collected 434 artifacts, including three worked sherds and 218 lithics from both surface collection and excavation of 12 square meters. Ninety percent of the lithics were of petrified wood. A flotation sample recovered one burned maize kernel. The site was dated to A.D. 1175 to 1250, based on ceramics present, which were predominantly plain and corrugated wares, with Tularosa Black-on-white, Wingate Black-on-red, and St. Johns Polychrome.

Site AZ Q:1:58, a small farming site, included a midden deposit bisected by the road; 33 square meters were excavated,

with most artifacts in the upper 40 cm. Excavation of a female burial, 15 to 18 years in age, yielded nine fragments of a highly polished Woodruff Smudged bowl found under the head. Artifacts recovered from the site included eleven worked sherds and 1,570 lithics (85% petrified wood). Pottery included predominantly plain wares (61%), as well as lesser amounts of corrugated wares, Mogollon Brown ware, Sosi Black-on-white, Holbrook Black-on-white, Snowflake and Red Mesa Black-on-white, Puerco Black-on-red, and Showlow Black-on-red. The site was dated to *ca.* A.D. 1100. Jones suggested that there may have been a small masonry structure at the site destroyed by road construction.

The fourth site investigated by Jones, McCreery Pueblo (AZ K:13:41), included a large circular depression 18 m in diameter, interpreted as a great kiva; a small U-shaped room block with a possible kiva; and ten other features such as midden and possible jacal rooms. The site is similar to the Plaza and Sundown Sites (Gumerman and Skinner 1968). Investigations at the site consisted of surface collection of a 70 by 80 m area, mapping, and analysis of 20 percent of the collected ceramics. Based on ceramics, which included 50 percent plain wares as well as Sosi Black-on-white, Holbrook Black-on-white, Puerco Black-on-white, Dogoszhi Black-on-white, Puerco Black-on-red, and Mogollon Brown Ware, the site was dated to A.D. 1075 to 1125. Also collected were six mano fragments, a grinding slab fragment, nine worked sherds, and a turquoise bead. No diagnostic flaked tools were recovered, and collected debitage has not yet been analyzed.

Jones (1987) reported on the first two years of the Petrified Forest National Park boundary survey and three other surveys (one at Rainbow Forest, one along a proposed water line, and one of the McCreery Pueblo environs). A total of 8,491 acres was surveyed with 124 sites recorded. Jones provided a management plan for the Park and a brief synthesis and status report on the archeology of Petrified Forest.

Martyn Tagg (1987) conducted test excavations at AZ K:13:60. The site is located on a small knoll on a north-south trending ridge. Surface indications included flaked stone, a handstone, one sherd, rock concentrations, and fire-cracked rock. A Clovis projectile point, broken during manufacture, was also found on the surface of the site. Excavations revealed three possible structures, one with a hearth, and two rock clusters. In all, 540 lithics (76% petrified wood) were recovered, including 512 pieces of debitage, 18 retouched pieces, one hammerstone, nine cores, four tested cobbles, three projectile points, five bifaces, four preforms, three unifacial fragments, two scrapers, and a perforator. The projectile points consisted of the Clovis point, a corner-notched Basketmaker II point, and a unidentifiable fragment. Also recovered from the site were a polishing stone, one sherd of Adamana Brown, and two bone fragments. Radiocarbon dates from charcoal within the pit features were 2960±90, 2900±95 B.P., juniper in the hearth was radiocarbon dated to 2420±110 B.P., and maize was radiocarbon dated to 2100±60 B.P. The dates and maize indicate the site was not Paleoindian as originally hoped. On the basis of wild plant remains and maize, Tagg suggested a midsummer to early fall occupation of the site. The low frequency of complete flakes and retouched flakes, the high number of small thin flakes with little cortex, and the high frequency of lipped and faceted platforms, indicated that

secondary reduction predominated at the site. The one sherd recovered may or may not be associated with the occupation.

Susan Wells (1988) conducted excavations prior to road reconstruction at AZ Q:1:101, a lithic scatter adjacent to Puerco Ruin. Forty 10 m by 10 m units were surface collected (about 50% of the site), and 47 1 m by 1 m units were excavated. Of the over 3,800 artifacts collected, none was recovered from below 20 cm in depth. Few tools or ceramics were recovered, and over 92 percent of the assemblage was core shatter or chunks, indicating that primary reduction was the predominant activity at the site. The highest surface lithic density was approximately four per square meter. The presence of battered petrified logs on the site indicated it was a quarry. Wells suggested that AZ Q:1:101 was used throughout the occupation of the Petrified Forest area, but most heavily during the occupation of Puerco Ruin (Wells 1988:35).

Wells (1988, 1989) describes the final two seasons of the boundary survey. In 1987, 4,520 acres were surveyed with 82 sites and 62 isolates recorded. Seventy-eight percent of the sites dated to the Pueblo II or Pueblo III periods; the few Basketmaker sites were found only in uneroded upland areas. The Archaic period was represented by a few projectile points, the Basketmaker period by four sites, and the Basketmaker III/Pueblo I period by nine sites. No single component Pueblo I sites were encountered. Two Pueblo II sites, 55 Pueblo II/III sites, and seven Pueblo III sites were recorded. The Pueblo IV period was represented by only three sherds and a few rock art panels. During the 1988 season, 3,360 acres were surveyed with 19 sites and 12 isolates recorded. The survey area consisted primarily of badlands. Two sites were unidentified as to time period; one was a possible Archaic site, five were Basketmaker, one Pueblo, and ten dated to the Pueblo II/III time span. Once again, the Pueblo IV period was represented by a few sherds and rock art. Also recorded were three sites outside of the Park on private land.

Wells (1989) summarizes the 340 sites at Petrified Forest recorded to current standards, which she considered as 397 components: 9 Archaic, 8 Basketmaker II, 12 Basketmaker II/III, 42 Basketmaker III, 44 Pueblo I, 18 Pueblo II, 188 Pueblo II/III, 28 Pueblo III, 16 Pueblo IV, 18 unknown prehistoric, 13 historic, and one unknown. The site types include: artifact scatters (n=81), multi-room pueblos (n=74), single-room pueblos (n=70), rock art sites (n=54), pit house or slab features (n=36), historic (n=13), lithic scatters (n=8), rockshelters (n=2), and agricultural features (n=1). Of the surveyed areas, the most heavily occupied areas within the Park appears to be a bluff north of the Puerco River, the Dead Wash area, and upland areas in the southern portion of the Park. Access to a variety of resources as well as arable land appears to have been important in site location. The Petrified Forest settlement data were then compared to that from Homol'ovi and the Hopi Buttes. While aware of the differences in the survey methods, Wells notes parallels between Petrified Forest and Homol'ovi for the early periods and between Petrified Forest and the Hopi Buttes for the later periods. She attributes these to environmental differences between the areas surveyed, suggesting that if large areas along the Puerco River were surveyed, the later period Petrified Forest data would be more similar to the Homol'ovi data.

During 1988 and 1989, archaeologists

from the Western Archeological and Conservation Center conducted data recovery excavations at Puerco Ruin (Burton 1990). The data recovery, conducted to mitigate the effects of proposed visitor facilities at the site, included surface collection of sixteen 10 m by 10 m units north of the pueblo and excavation of ninety–two 1 m by 1 m excavation units, four surface rooms, and portions of a kiva. In addition, over 1,000 rock art elements on the cliffs surrounding the pueblo were recorded. Over 4,000 sherds (including 16 partially reconstructible vessels) and 26,000 flaked stone artifacts, as well as ground stone and other artifacts and abundant floral and faunal remains, were recovered. Analyses included obsidian sourcing and hydration, ceramic refiring and temper identification, and radiocarbon dating. In contrast to earlier work (Schroeder 1961; Jennings 1980), chronometric data indicate a short occupation of the site, from around A.D. 1250 to 1380.

During 1989 and 1990, small scale salvage excavations were conducted at Sivu'ovi, a large Basketmaker II site in the southern portion of the Park (Burton 1991). Two eroding pit structures, two extramural units, and five shovel tests were excavated and artifacts in a 180 square meter area were systematically surface collected. Over 3,600 artifacts, ecofacts, and other samples were recovered, including five complete or partially restorable Adamana Brown vessels. Radiocarbon analysis indicated a pre–A.D. 300 date for the occupation, starting perhaps as early as 300 B.C. Sivu'ovi appears to be transitional between the Archaic and Basketmaker periods. The ubiquity of maize in floral and pollen samples and the limited spectrum of faunal remains suggested a heavy dependance on maize agriculture. Lithic analysis indicated a strong affinity with the Archaic tradition, while ground stone artifacts most resemble Pueblo period types. Architecture, artifact caches, and other data indicate that the site served as a warm–season residential site.

Prehistory

Based on archeological work conducted in the region since the late 1800s, numerous chronologies have been proposed, refined, and debated (Figure 3.1). Early chronologies for the Petrified Forest vicinity varied little from the original Pecos classification (Stewart 1980). The earliest detailed chronology was developed by Colton (1939, 1943), on the basis of his informal surveys and on excavations by Fewkes and others at Pueblo IV sites in the region (Gumerman 1988b:175). Gumerman and Skinner (1968) provided a framework for the Holbrook area to the west, which combined Colton's phase system with the Pecos classification. Gumerman and Olson (1968) provided a similar chronology for the upper Puerco River Valley, to the northeast. Based on extensive work in the Hay Hollow Valley, 30 miles south of Petrified Forest, Longacre (1964) developed a chronology that focuses on the development of agriculture and large villages: Stage I, Incipient Agriculturalist; Stage II, Initial Sedentary Agriculturalist; Stage III, Established Village Farming; Stage IV, Beginning of Planned Towns; Stage V, Established Towns; and Stage VI, Large Towns.

The earliest chronology specifically developed for the Petrified Forest area was proposed by Mera (1934), who assigned various pottery types to the culture periods of the Pecos Classification. Reed (1947) used the concept of ceramic horizons to

form a sequence of pottery types based on ceramic cross dating. Reed's phases differ slightly from the original Pecos Classification. Using Breternitz's (1966) reevaluation of tree-ring dated pottery, Wells (1988, 1989) found that most sites recorded during recent surveys at Petrified Forest fall into transitional categories, such as Pueblo II to III. Wells developed a chronology that augmented the ceramic horizons originally defined by Reed (1947) with data on changes in architecture, projectile point types, and rock art styles. This chronology is necessarily less precise than those developed for surrounding regions because of the lack of directly-dated sites at Petrified Forest. Wells' chronology parallels that of Plog's (1983, 1984) political and economic alliances, outlined below.

Based primarily on distinctive groupings of ceramic types, Plog (1983, 1984) suggested that between A.D. 400 and 1450, ten broad cultural patterns are evident. Three of these, the Adamana (characterized by Adamana Brown pottery), the Little Colorado (Little Colorado White Ware), and the Jeddito (yellow and orange wares), were centered along the Little Colorado River. The White Mountain pattern (White Mountain Red Ware) was centered on the Upper Little Colorado River Valley. The White Mound pattern (Kana-a-style ceramics) was widespread throughout the Colorado Plateau; others such as the Zuni or Kayenta patterns are of more limited extent. These "political and economic alliances," as Plog has termed them, have a homogeneous distribution of one or more ceramic types, a homogeneous architectural style, and at least some large central sites. It has been postulated that the alliances may have linked smaller villages into larger social groupings during times of increased environmental risk (Plog 1984).

Pilles (1975), as part of an environmental assessment for the Cholla Power Plant, recorded 18 rock art sites along the Little Colorado River between Winslow and Holbrook. In a seminal work in the region for rock art chronology, Pilles provided a preliminary definition of seven petroglyph styles, characterized primarily by distinctive manufacturing techniques, superpositioning, vertical position, and pottery comparisons. His chronology is comparable to Turner's work at Glen Canyon (1963). Styles identified for the Little Colorado River Valley were Basketmaker, a possible Pueblo II, an early to middle Pueblo III, a late Pueblo III to early Pueblo IV, a Pueblo IV, a scratched, and a modern style. A Pueblo I rock art style could not be defined, since Pilles's sample did not include any Pueblo I sites.

The following culture history is based primarily on Wells (1988), but also includes elements from more recent work in the region.

Paleoindian and Archaic

Paleoindian occupation in the Southwest, characterized by the hunting of now-extinct megafauna, has been dated to 9500 to 6000 B.C. To date, the only evidence of Paleoindian occupation of the Petrified Forest area is from surface finds of fluted points (Huckell 1982), including two within Petrified Forest National Park (Tagg 1987; Wendorf 1953). No Paleoindian sites in datable strata or contexts have yet been found.

The Archaic period (6000 B.C. to *ca.* A.D. 1) is well represented at Petrified Forest and in the vicinity (Tagg 1987; Sims and Daniel 1962; Wendorf and Thomas 1951). Nine Archaic sites have been recorded

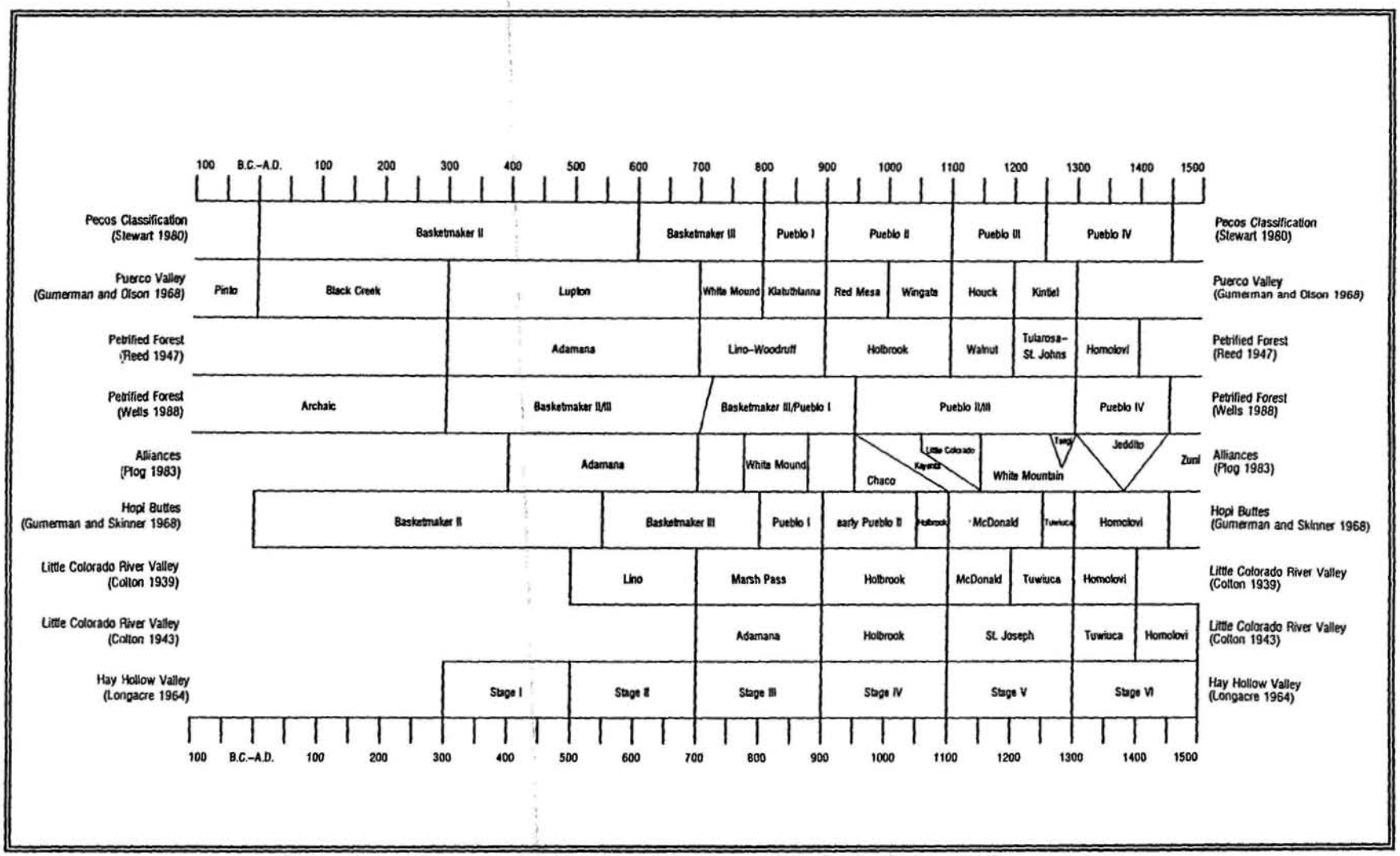


Figure 3.1. Chronologies developed for the middle Little Colorado River region.

within the Park (Wells 1989) and one, AZ K:13:60, has been excavated (Tagg 1987). The Archaic Period marks a shift from the big game hunting of the Paleo-indian Period to a broader subsistence base of hunting and gathering. Basin metates, bifacial tools, and the lack of pottery are considered diagnostic of Archaic Period sites. Projectile points at these aceramic sites include Bajada (Pinto–like) and Jay style types (Irwin–Williams 1973). Utilization of maize is indicated during the late Archaic Period (Tagg 1987).

Basketmaker II–III Period

Based on recent work at Sivu'ovi and other early Basketmaker sites in the region (Burton 1991, 1992), this period can be divided into early (Basketmaker II) and late (Basketmaker II–III) sites. Basketmaker II sites (*ca.* A.D. 1 to A.D. 300) are indicated by the presence of a single pottery type, Adamana Brown, while Basketmaker II–III (A.D. 300 to 700) sites are indicated by the presence of Lino Gray, Lino Black–on–gray, White Mound Black–on–white, Woodruff Brown, and Adamana Brown pottery. Large side–notched projectile points are common throughout this time span.

This period is marked by increasing sedentism, which is reflected in the change from production and use of formal bifacial tools (common during the earlier Archaic Period) to use of an expedient flake technology (Parry and Kelly 1987). Eleven percent of the recorded sites at Petrified Forest, including the excavated sites of Sivu'ovi (Burton 1991) and Flattop (Cosgrove 1934; Wendorf 1953), fall into this period (Wells 1989). Hough (1903) excavated two sites dating to this period.

Basketmaker settlements consisted of shallow to deep pit houses and associated slab lined cists located on isolated buttes and dune ridges. Subsistence was characterized by a heavy dependance on maize, indicated not only by vegetal remains but also by two–hand manos, trough metates, and ceramics for storage.

Sites with Adamana Brown pottery are larger and more numerous than sites in any preceding period; this has been equated with initial settlement of the region (Mera 1934) or interpreted as indicating a sudden influx of people, perhaps from the south where paddle–and–anvil constructed pottery is a more common technique. Schroeder (1979) has postulated the presence of Yuman–speaking "Hakataya" in the area at this time. According to Plog (1983), Adamana phase sites are distinctive in terms of their location, architecture, and ceramics. This "strong normative pattern" has been argued as reflecting an alliance characterized by specialized production, trade and exchange, and possibly social ranking. However, some of the data that Plog uses to support the presence of an alliance need further substantiation. For example, at least some of the sites appear large due to recurrent seasonal occupation rather than simultaneous habitation by large numbers of people (Burton 1991).

Basketmaker style rock art consists mostly of lightly pecked designs. Common motifs include oval–bodied bighorn sheep, human figures, stick figures, and snakes. An x–ray motif (vertical and horizontal lined torsos) in sheep and anthropomorphs and a horn–like headdress are also common. Basketmaker rock art is rare in the region, with only 3 of 18 sites recorded by Pilles and only one site at Petrified Forest National Park (AZ Q:1:67) have Basketmaker

elements. Some researchers suggest the style may actually be older, dating to the Archaic period (Cole 1992; Christensen 1992).

Basketmaker III–Pueblo I Period

This period (A.D. 700 to 950) is recognized by the presence of Kana-a Black-on-white, Kiatuthlanna Black-on-white, Woodruff Brown, and Lino Black-on-gray ceramics. Lesser amounts of Red Mesa Black-on-white may also be present. Trough metates and corner-notched projectile points are indicative of this and later periods. Around A.D. 700 the first year-round villages are established and the development of one-level decision-making hierarchies occurs between A.D. 700 to 1100 (Lightfoot 1981). Settlements are located in diverse topographic settings and include from five to fifteen pit houses. In general, the pit houses are deep and have associated features such as wall niches, floor pits, and entry ramps. Surface and subsurface storerooms are also common. Fourteen percent of the recorded sites at Petrified Forest, including the excavated Twin Butte Site (Wendorf 1953) and one locus of AZ Q:1:42 (Jones 1983), date to this time period.

Pueblo II–III Period

This period, dating from A.D. 950 to 1300, is characterized by the introduction of corrugated pottery, above-ground habitation rooms, slab metates, and side-notched projectile points. Sites can be divided into early (A.D. 950 to 1100) and late (A.D. 1100 to 1300) based on ceramics and, to some extent, architecture. Some pottery types such as Holbrook Black-on-white, Puerco Black-on-white, Black Mesa Black-on-white, and Showlow Black-on-red are common throughout the Pueblo II and Pueblo III periods. Other pottery types are found only at later sites: Walnut Black-on-white, Padre Black-on-white, Tularosa Black-on-white, Snowflake Black-on-white, and St. Johns Polychrome. Early sites consisting of 8 to 15 rooms and a kiva, appear to be clustered around great kiva sites, such as McCreery Pueblo (Jones 1986), the Plaza Site (Gumerman 1969, 1988b), the Sundown Site (Gumerman and Skinner 1968), and the Navajo Springs Great House (Warburton and Graves 1992), or possibly around other larger villages (Wells 1988:150). Site clusters appear to be regularly spaced across the landscape, with habitation expanding into new, previously unexploited microenvironments.

Lightfoot (1981) suggests that two-level decision-making hierarchies began to emerge between A.D. 1100 and 1250 in response to population and environmental pressures. In the Little Colorado River region, sites become larger (up to 50 rooms) but fewer in number after A.D. 1000. It has been suggested that this aggregation did not occur in areas such as Hopi Buttes and Petrified Forest because of their fragile and marginal environments (Gumerman and Skinner 1968; Jones 1987). Continued dispersal rather than aggregation seems to be the case at Petrified Forest, where 79 percent of the recorded sites have Pueblo III components (Wells 1989). Evidence of aggregation could, however, be obscured by the lack of fine temporal resolution in the ceramic chronologies.

Excavated Pueblo II and III sites within the Park include Agate House (Cosgrove 1934), NA 10,808 (Harrill 1971), and four small sites along the Park Mainline Road

(Jones 1983, 1986). The excavated Dobell Site, just outside the southern Park boundary (Harrill 1973), also dates to this period. Within the Park, extensive surface collection (Jones 1985) and some excavation (Burton 1993) were conducted at McCreery Pueblo.

In Pueblo II rock art, zoomorphic and geomorphic designs, such as outlined forms, horned toads, quadrupeds, snakes, and sheep are most common. Few Pueblo II rock art sites were identified in Pilles's, sample, and currently this style is hard to differentiate from later Pueblo styles. Early and middle Pueblo III period rock art consists predominately of pottery/textile designs, bird tracks, sheep, ticked lines, and footprints. Human figures with portions of anatomy are common, as are subrectangular bodies and headdresses, and large hands and feet.

Late Pueblo III to early Pueblo IV rock art is reportedly the most prevalent style in the Little Colorado River region. Common motifs include stick figures, full-bodied human figures, flute players, snakes, bird tracks, foot and hand prints, birds, deer, antelope, and sheep. Stick figures are highly stylized and often lack hands, feet, and heads. Wide-bodied snakes appear unique to this time period. Hallmarks of the style include anthropomorphs with staffs and quadrupeds with cloven hoofs, balls for feet, open mouths, knee joints, long legs, or bird-shaped bodies. Dogs, antelope, parrots, and other birds are common while snakes and sheep are the only identifiable animals in earlier rock art.

Pueblo IV Period

Pueblo IV sites (A.D. 1300 to 1450) contain small triangular projectile points and a variety of ceramics including Homolovi Corrugated, Black-on-red and Polychrome, Awatovi and Jeddito Black-on-yellow, Pinedale and Fourmile Polychrome, and Zuni Glaze wares. Piki stones and kachinas in rock art and kiva murals mark the introduction of the Kachina Cult during this time span, with evidence pointing to its introduction between A.D. 1350 and 1400 (Adams 1981, 1991).

The Pueblo IV period has been traditionally divided into an early (Tuwiuca) and late (Homolovi) phase (Colton 1939). Typically the late phase is marked by the introduction of Zuni Glaze ware and Jeddito Black-on-yellow pottery. Few sites (4%) in Petrified Forest have been attributed to Pueblo IV and previous archeological work (mostly surveys) has not generated the data needed to test this refinement. In general, Pueblo IV occupation sites are large with over 100 rooms, several kivas, and frequently a plaza, and are located along major drainages or at springs. Only two large sites are known in the Petrified Forest region: Puerco Ruin, within the Park along the Puerco River, and Stone Axe Pueblo, at a spring 7 km (4.3 miles) southeast of Puerco Ruin. Only a handful of smaller Pueblo IV sites, such as artifact scatters and rock art, has been recorded within the Park. The entire Petrified Forest region was seemingly abandoned by the end of Pueblo IV times, although pueblo groups may have continued to use the area for resource procurement or as a travel corridor.

Four separate excavations have been conducted by the National Park Service at Puerco Ruin (Cosgrove 1934; Burton 1990; Jennings 1980; Schroeder 1961). Other excavated Pueblo IV sites in the vicinity include a small rockshelter south of Puerco Ruin (PEFO Site 171; Gale 1941) and Stone Axe Pueblo (Hough 1903). Excava-

tions indicate Puerco Ruin was occupied from about A.D. 1250 to 1380. Apparently founded during a period of drought conditions. A wide variety of non-traditional food resources may indicate environmental stress. Pottery and other artifacts suggest ties with the Hopi, Homolovi, Flagstaff, Gallup, and Zuni areas, with some evidence of the increasing importance of Zuni/Gallup trade. Widespread burning of rooms and stored food suggest a rapid abandonment.

Common motifs in Pueblo IV rock art are outlined faces, kachina masks, geometric designs, rectilinear footprints, dogs, parrots, rabbits, and composite animals, some with bird-shaped bodies and cloven hoofs. Blocky feet may be a distinctive trait of the style.

Protohistory

Although some historic records are available, the years between A.D. 1450 and 1700 are generally considered the Protohistoric Period in the Southwest (Wilcox and Masse 1981). There is no documentary record of occupation in the Petrified Forest area during the Protohistoric Period. However, the Hopi and Zuni, both descendants of the Anasazi and Mogollon, regard the Petrified Forest area as within their territorial range (Adams 1981; Ferguson 1981) and one archeological site within the Park (a lone sandstone slab structure near the Flattops) has been attributed to the Navajo (Stewart 1980). Linguistically related to the Hopi, the Ute entered the area to the north of Petrified Forest perhaps as early as A.D. 1300 (Ambler and Sutton 1989). The Navajo and Apache are believed to have entered the Southwest by A.D. 1400 (Schaafsma 1981).

Coronado's expedition entered the region in A.D. 1540. However, the first major effect of the Spanish presence appears to have been the introduction of diseases for which the natives had no immunity. It has been estimated that within the first 100 years of contact up to 80 percent of the Western Pueblo population died due to European diseases (Cordell 1984: 353). Extensive ethnographies for the Indian groups are referenced in *The Handbook of North American Indians*, Volumes 9, 10, and 11 (D'Azevedo 1986; Ortiz 1979, 1983). Below is a brief summary of information pertinent to the Petrified Forest region.

In the 1400s the Hopi Mesa area had 14 villages with populations of between 100 and 1000 (Adams 1981). Prior to this time the large population centers at Homol'ovi, Chavez Pass (Nuvaquetaka), and other areas were abandoned; some researchers (Adams 1981; Fewkes 1898) speculate that the inhabitants moved to Hopi. Part of Coronado's expedition visited the Hopi Mesa area in 1540, but for nearly a century after the first contact, Spanish-Hopi relations were limited to small-scale trading. In 1629 the Spanish established a mission at Awatovi, which was the largest Hopi village. By that time, only six villages at Hopi were occupied by a total estimated population of 3000. Some of the village abandonments were not peaceful; inhabitants of the Hopi village of Walpi destroyed nearby Sikyatki shortly before the arrival of the Spanish (Fewkes 1898:633-636). During the 1680 Pueblo Revolt, the Spanish were forced from the Rio Grande Valley in New Mexico, and the Hopi destroyed the mission at Awatovi. When the Spanish re-established themselves in the Rio Grande Valley in 1692, some Eastern Pueblo Indians from

that area sought refuge with the Hopi, and the Hopi moved their villages to more defensible mesa tops. Most of the Rio Grande Indians returned to their homes after a series of droughts at Hopi in the 1730s, although a Tewa community at First Mesa still remains. Temporary and long-term population movements from west to east are also documented. During times of environmental stress, the Hopi moved to Zuni leaving the Hopi area virtually abandoned (Adams 1981:327). When Spanish missionaries attempted to reestablish control at Awatovi in 1700, Hopi from other villages destroyed the village and its inhabitants (Montgomery *et al.* 1949).

In the 1400s, the Zuni occupied six large villages along the Zuni River. The Zuni at that time appear to have been a recent amalgamation of several groups including the indigenous Chaco Branch of the Anasazi and Mogollon groups (Ferguson 1981; Stewart 1980). For example, the Zuni practice of cremation is thought to indicate an influx of people or ideas from the south. Coronado attacked and briefly occupied one of the Zuni pueblos in 1540 and in 1629 the Spanish established missions at two of the Zuni pueblos (Ferguson 1981:340). By the time of the Pueblo Revolt in 1680, the Zuni had coalesced into three villages. The Spanish established a new mission in 1699, at which time the Zuni occupied only one large town (the Pueblo of Zuni) and a few outlying farming villages.

The San Juan Ute, nomadic hunters and gatherers of the Numic linguistic group, occupied the area south of the San Juan River in northern Arizona possibly as early as the 1300s. It is not clear if the Ute entered a void left by departing Anasazi peoples or if they forcibly won territory from Anasazi groups. Sutton (1986) suggests that the Numic expansion was indeed warlike and only halted in historic times by superior numbers or firearms. Some researchers have suggested that the Numic spread may have caused the abandonment of the northern Anasazi area around 1300 (Ambler and Sutton 1989; Grant 1978:15). The Ute are documented in northern New Mexico by 1680, when they began raiding Taos and other villages. Ute raids against the Navajo, beginning in the 1690s, forced the Navajo to the south and west. Ute raids against the Hopi at Walpi are documented in the 1700s, and the Ute forced the partial abandonment of the Hopi farming village of Moenkopi. Both the Hopi and Ute have legends of conflict with each other.

The Navajo and Apache were nomadic Athapaskan groups, subsisting primarily on hunting. They are believed to have entered the Southwest by 1400; the earliest Navajo archeological sites date to 1490 (Schaafsma 1981). In 1582, the Spanish battled with the Apaches/Navajos at Mount Taylor in western New Mexico (Grant 1978:77). The term "Navajo" was not used regularly until 1626, when the Navajo began to be distinguished from the Apache. The earliest Spanish accounts of Apache raiding date to the early 1600s. With the acquisition of horses after the Spanish arrival, the Apache and Navajo began intensive raiding of both the Pueblo Indians and Spanish (Ferguson 1981:346). The Navajo were also practicing agriculture in northern New Mexico by 1630. After the Pueblo Revolt in 1680 some Pueblo Indians lived with the Navajo to escape reprisals. During this time the Navajo adopted many Pueblo customs. By the late 1600s, the Navajo shifted from farming to herding, and by 1750 had spread as far west as Canyon de Chelly.

History

Historic accounts indicate that the Little Colorado River and its tributaries were long used as travel corridors; Spanish expeditions that travelled from Zuni to Hopi may have followed river routes through the Petrified Forest area. In the 1830s and 1840s, fur-trappers exploited the beaver in the Zuni River and perhaps the Puerco River as well (Weber 1971). Other early historic explorations were motivated by the search for travel routes. In 1827 Richard Campbell and 35 companions went to California via the Zuni River (Maloney 1939); later emigrants frequently used the route. After the area was acquired from Mexico by the United States in the Treaty of Guadalupe Hidalgo in 1848, James Collier passed through the area, travelling with a military escort along the Zuni River.

In 1851, Captain Lorenzo Sitgreaves, exploring the navigation potential of the Zuni and Little Colorado rivers, travelled the well-worn trail down the Zuni River to a crossing of the Little Colorado River. Sitgreaves reported petrified trees in an area south of the present Park, and noted Indian ruins along the Little Colorado River (Sitgreaves 1853).

The first documented trip along the Puerco River itself was led by F.X. Aubry, a Santa Fe merchant travelling from California in 1853. In a later trip in August of 1854, petrified wood was noted along the Little Colorado River (Bieber and Berder 1938). Later that year, the same route followed by Aubry was followed by Lieutenant A.W. Whipple's exploration of the 35th parallel route, conducted to determine its feasibility for a railroad. Crossing through the Park area, Whipple named Lithodendron Creek (Ash 1972:48), where he noted petrified trees and Indian ruins.

Beginning in 1857, Navy Lieutenant E.F. Beale surveyed a wagon road route from Fort Defiance to the Colorado River, again following the route along the Puerco River. Beale also noted petrified trees in the Park area (Beale 1859, Lesley 1929). Arizona's first Territorial Governor, John N. Goodwin, followed the 35th parallel route in 1863 and formally organized the government of the Arizona Territory at Navajo Springs, just east of the Park.

Whipple's trip not only encouraged use of the 35th parallel route, it also inspired an Army expedition to investigate the unusual geological features of what was to become Petrified Forest National Park. In 1879, Lieutenant John F.C. Hegewald was ordered by General Sherman to make an expedition into the future Park area "for the purpose of collecting [Whipple's] pictured specimen" (Anon. 1963:34-35). Hegewald collected two logs for the Smithsonian Institution (which are still on display today) from near Bear Spring at the head of Lithodendron Wash, and incidentally provided some of the earliest ethnographic data on the Park; he noted that Navajo sheep herders camped near the wash believed the trees to be the bones of a slain giant (Lubick 1988:402-403).

The Atlantic and Pacific Railroad was completed along the Puerco River in 1883. Prior to this, large flocks of sheep brought into the area from California grazed in the area (Maze n.d.). These were quickly replaced by cattle as the Aztec Land and Cattle Company began to secure land from the railroad in the 1880s.

With the completion of the railroad, visitors could reach the area with relative ease. Tourism increased greatly and was promoted by the railroad to increase reve-

nues (Lubick 1988:404). In 1890, Adamana was established as a railroad fuel stop, and the town soon became the starting point for tours to the petrified forests (Dedera 1983:13). At Adamana there was a hotel. Later called the Petrified Forest Hotel; it burned down in 1966 (Maze n.d.). Tours took visitors to Jasper Forest, Agate Bridge, and Rainbow Forest, charging 50 cents extra to see the Newspaper Rock petroglyphs and Puerco Ruin (Lubick 1988: 405; Trimble 1984). Increased awareness of the area's qualities did have drawbacks. In 1892 travel writer Charles Lummis reported vandals dynamiting petrified logs in search of gems, and developers later investigated the potential of constructing a mill to produce abrasives (sand and emery paper) from the logs (Trimble 1984). Concern over the destruction of the forests led to efforts to create a preserve. The territorial legislature petitioned Congress in 1895 to make the Petrified Forest area a preserve. This drive was spearheaded by Will C. Barnes, the only Congressional Medal of Honor recipient to help establish a national monument (Terry Maze, personal communication, 1993). John Muir, attracted to Arizona's climate for the health of one of his daughters, explored the Petrified Forest area and personally lobbied President Theodore Roosevelt for creation of a preserve. Under the provisions of the Antiquities Act of 1906, Petrified Forest was made a National Monument on December 8, 1906, the second designated monument in the country. It was not until 1962 that Petrified Forest achieved National Park status by an act of Congress.

In the 1920s automobile–related tourism began to have an impact when U.S. Highway 66 to the north of the monument and U.S. Highway 180 through the Rainbow Forest were completed. At that time Park Service facilities consisted of a headquarters cabin at Crystal Forest and a ranger shelter at Rainbow Forest. North of the Park on the Painted Desert rim, private interests started construction of the Painted Desert Inn. In 1925 a wood ranger house was built at Agate Bridge, replaced by a stone residence in 1929. At Rainbow Forest a store, which was to become the Rainbow Forest Lodge, was opened in 1928 (Maze n.d.).

Expansion of the Monument in 1930 incorporated Blue Forest. The area between Puerco Ruin and the Black Forest was added to the Monument in 1932. That same year the Rainbow Forest Museum, two residences, and a bridge over the Puerco River (replaced in 1990) were completed. In 1933 the last private lands within the Park south of Puerco River were acquired by the government.

The Civilian Conservation Corps (CCC) played an important role in the development of the Park (Maze 1981a-c). Three CCC camps were located within the Park. In May 1934, the first camp was established along the Puerco River on the west side of Puerco Ruin Mesa by Lt. E.F. David and 15 men. In July the main group of enrollees arrived. In October the camp was moved to its winter location at Rainbow Forest. This company was transferred out of the Park in 1936. Shortly thereafter, the second CCC camp was established, with enrollees mostly from Texas, and Harold Cole as Superintendent. This camp, also located at Rainbow Forest, was disbanded in June 1938. The third and last camp in the Park, in operation from 1939 to 1942, was established just south of Puerco Ruin, on the east side of Puerco Ruin Mesa. Its enrollees came mostly from Pennsylvania. Most of the

buildings at the third camp were sold for scrap after World War II; however, some continued to be used by the Park until the 1950s. Today the only buildings that remain of the third camp are two explosives sheds.

In addition to these camps, the work of the CCC at Petrified Forest is still much in evidence. The CCC constructed buildings at the Rainbow Forest Headquarters, built a waterline from the Puerco River to Rainbow Forest (completed in 1940 and still in use), remodeled and enlarged the Painted Desert Inn (purchased by the Park in 1939), completed a waterline to the Inn, constructed trails, and built a way station, parking lot and ranger residence at Puerco Ruin.

Privately owned curio shops were located within the Park until the 1960s (Maze n.d.). These and other inholdings within the Park were eventually bought out or exchanged for other government land. Jacobs Trading Post, located west of the present Visitors Center, operated from 1953 to 1958. Jacobs had a tower for people to see the Painted Desert without having to actually enter the Park. It was not located along the rim, but overlooked the Park (Terry Maze, personal communication, 1993). Olson Curio, located along the Park Mainline Road just north of the Puerco River, was removed in 1966. Olson bought the salvage rights to buildings at the last CCC camp after World War II (Frank Dobell, personal communication, 1991). Charles "Indian" Miller's Lion Farm/Painted Desert Park operated from the late 1920s to the 1960s. It was located along old U.S. Route 66 on the Painted Desert rim northeast of the present Visitors Center. Miller sold his holdings to the Park when Interstate 40 was completed 3/4 mile to the south. By 1960 the Park Service, wishing to restore the natural environment of the Park, had removed the curio shops, most of the CCC camp buildings, and several old buildings at the Painted Desert Inn.

nonrandomly, one where artifact density appeared greatest and the other in an area considered more typical of the site. Estimates of total numbers and types of ceramics and other artifacts were made at each site as well. Diagnostic artifacts, such as projectile points and a grab sample of ceramics, were also collected as were shell and other unusual artifacts. Further tasks completed as part of site monitoring in 1991 (on–site lithic analysis and controlled surface collection) are briefly discussed in Chapter 5. Additional work at sites with rock art consisted of sketches and photographs of each rock art element. These were keyed to boulder or panel numbers on site sketch maps. Permanent datums (rebar) were not placed at small sites that consisted solely of rock art.

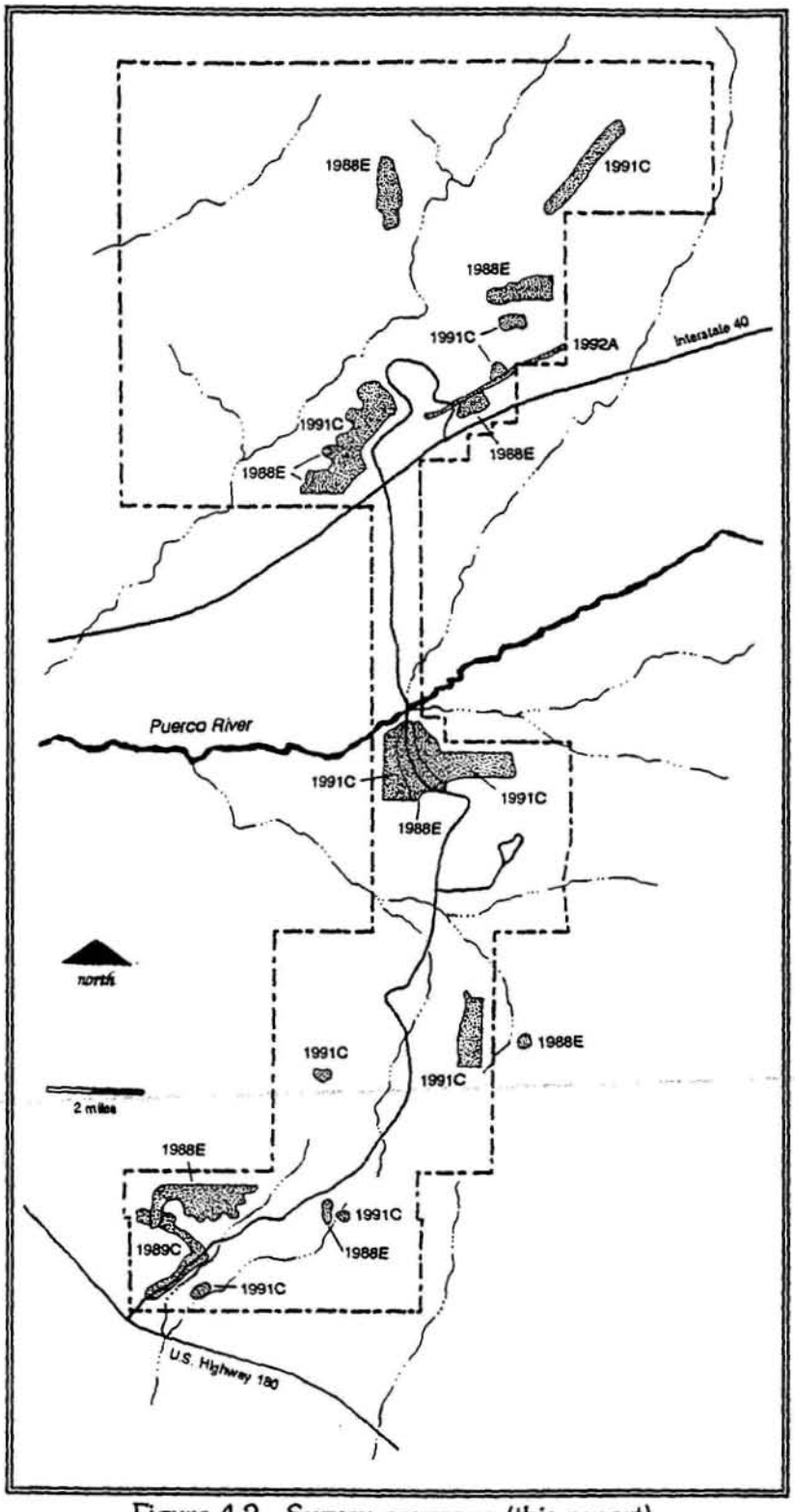


Figure 4.2. Survey coverage (this report).

A total of 4,198 acres in a variety of areas throughout the Park was examined during these projects (Figure 4.2); 131 sites and 91 isolates were discovered and recorded. Of these, 34 sites had been previously recorded by Mera (1934), Jepson (1941; Reed 1947), or Harrill (1971). A concordance of site numbers is provided in Appendix A. The 131 sites include 99 prehistoric sites, 18 historic sites, and 14 dual component sites. Following Jones (1987) and Wells (1988, 1989) the prehistoric sites can be further classified into multiple–room masonry sites, single–room masonry sites,

artifact scatters, lithic scatters, rockshelters, rock art, and other miscellaneous site types. Historic sites recorded include a small dam, hogans, structural remains, trash scatters, dumps, rock inscriptions, and CCC camps, work areas, and quarries. Summary information on each site is presented in Appendix B. The isolates recorded are listed in Appendix C. Detailed site survey records are on file in the Division of Archeology Archives at the Western Archeological and Conservation Center.

Prehistoric Sites

Of the 131 recorded sites, 113 are prehistoric or have a prehistoric component. Table 4.1 presents a summary of prehistoric site types. Rock art is the most common site type, followed by artifact scatters and multiple–room masonry sites. Dating of the sites is based predominantly on ceramic cross–dating. However, other artifacts, architecture, and rock art styles were used as well. The ceramics were analyzed by Christine Goetze and are discussed in Chapter 10.

Multiple–room Masonry Sites

This category includes 11 sites that have substantial amounts of rubble, indicating a multiple–room structure or pueblo, and 12 sites with two or more small distinct rubble areas. The latter are generally closely spaced one–, two–, or possibly three–room masonry structures that were recorded as loci of a single site.

Multiple–room Pueblos

The 11 multiple–room structures (pueblos) range in size from the 250–plus–room Stone Axe Pueblo (AZ Q:1:199) to small four–room sites. The distribution of these sites is depicted in Figure 4.3. Discounting the largest site, the average size is eight rooms. In addition to the masonry structures, there are possible kivas at two of the sites, trash mounds or midden at four, and bedrock milling slicks at one. The number of artifacts at these sites range from an estimated 200 at AZ Q:1:287 to tens of thousands at Stone Axe Pueblo (AZ Q:1:199). Again excluding Stone Axe Pueblo, the estimated mean is about 7,000 artifacts. Ground stone artifacts were noted at eight sites, and shell at three. Hammerstones, projectile points, and other tools were noted at several sites, and a carved stone zoomorph was found at one site.

Sherds outnumbered lithic debitage at only four of the 11 sites, including the three sites in the Painted Desert section of the Park and Stone Axe Pueblo, located in the grasslands. Although other formation processes may be at work, the availability of local material seems the most likely explanation for this discrepancy. At Stone Axe

Table 4.1. Prehistoric Site Types.

Site type	Total number	Number w/rock art
Multiple–room Masonry Sites	23	5
Masonry Room Sites	15	5
Artifacts Scatters	28	4
Aceramic Sites (Lithic Scatters)	10	1
Rockshelters	4	4
Rock Art Sites	29	29
Miscellaneous Sites	2	0

Pueblo there is little workable stone nearby, and in the Painted Desert stone material is generally scarcer and of lower quality than elsewhere in the Park.

Ceramics provide clues to occupation dates. Ten of the 11 multiple–room pueblos recorded during these projects have pottery that spans the mid– to late–Pueblo II and early Pueblo III (Pueblo II/III) periods, indicating occupation sometime during that time. In addition to the Pueblo II/III types, two of the multiple room pueblo sites have pottery that characterizes Pueblo II and no pottery later than Pueblo II/III types. Six have pottery that could date later, to either the entire Pueblo III period (2 sites) or the late Pueblo III period (5 sites). One site (Stone Axe Pueblo) has pottery types that fall within all pueblo periods (Pueblo I–IV). The one site without Pueblo II/III wares contains both Basketmaker II and Pueblo II wares.

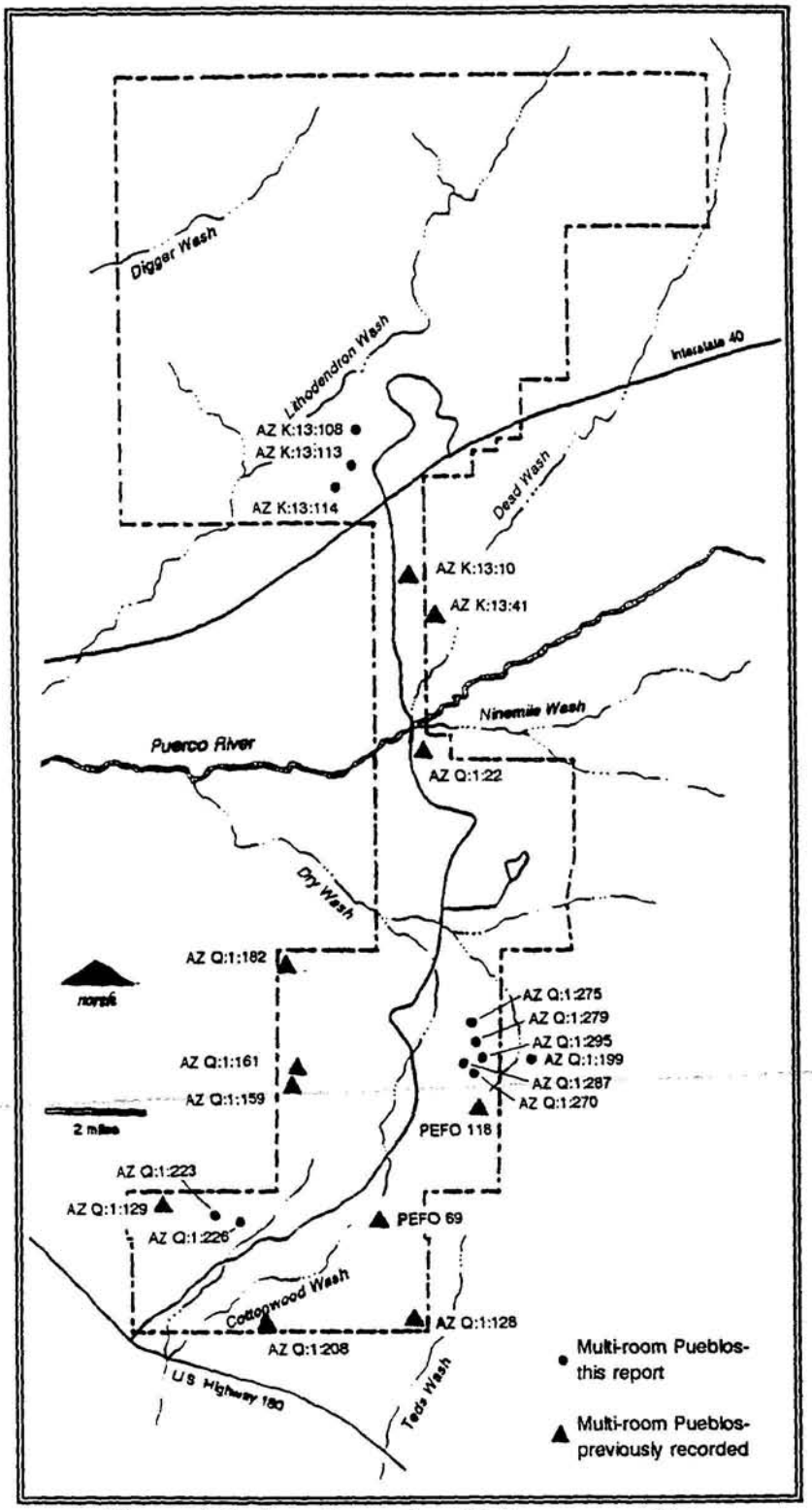


Figure 4.3. Locations of multiple-room pueblos.

The combined survey data double the number of multiple–room pueblos recorded within the Park, and suggest slightly different trends then those previously given (Jones 1987; Wells 1988, 1989). The dates on these sites suggest gradual aggregation. Three have late Pueblo III or Pueblo IV ceramics, and one has pottery that could date to late Pueblo III, as well as early Pueblo III. Six of the newly recorded multiple room pueblos have 10 rooms or more (Table 4.2, Figures

4.4–4.10), and of these, half do *not* have a definite late Pueblo III component and two of these appear to have been abandoned by late Pueblo III times. Of the 11 previously recorded, only four were estimated to be 10 rooms or larger (Table 4.3). All have Pueblo III or later components, six had possible Pueblo II components.

Survey data also provides new information on the Pueblo IV occupation of the Park area. As seen in Figure 4.10, Stone Axe Pueblo is easily twice as large as Puerco Ruin, the largest pueblo in the Park. The 250 room estimate for Stone Axe appears reasonable, if not conservative, compared to the approximately 125 rooms at Puerco. The more loosely organized layout may reflect the longer occupation of Stone Axe Pueblo, since pottery types there include Pueblo I through late Pueblo IV types. Dependable water may have been a critical factor in the settlement of both sites: Stone Axe Pueblo still has an active spring and Puerco Ruin a river. Stone Axe Pueblo differs from Puerco Ruin in its lack of rock art; however, there are no outcrops at the site or in the immediate vicinity. Perhaps Pueblo IV style rock art (kachina masks) at AZ Q:1:278, one mile northwest of Stone Axe Pueblo, and at Mountain Lion Mesa (Christensen 1989), closer to Stone Axe than it is to Puerco Ruin, were made by the Stone Axe inhabitants.

Pueblo I through Pueblo IV pottery types were identified at Stone Axe Pueblo, while Puerco Ruin contains mostly Pueblo III and early Pueblo IV wares (Burton 1990). Late Pueblo IV wares that were rare or absent at Puerco Ruin, but present at Stone Axe, include Pinedale Black-on-white, Heshotauthla Glaze-on-red, and Sikyatki Polychrome. Although Fourmile Polychrome



Figure 4.4. Multiple-room pueblo (AZ Q:1:275) on small butte.

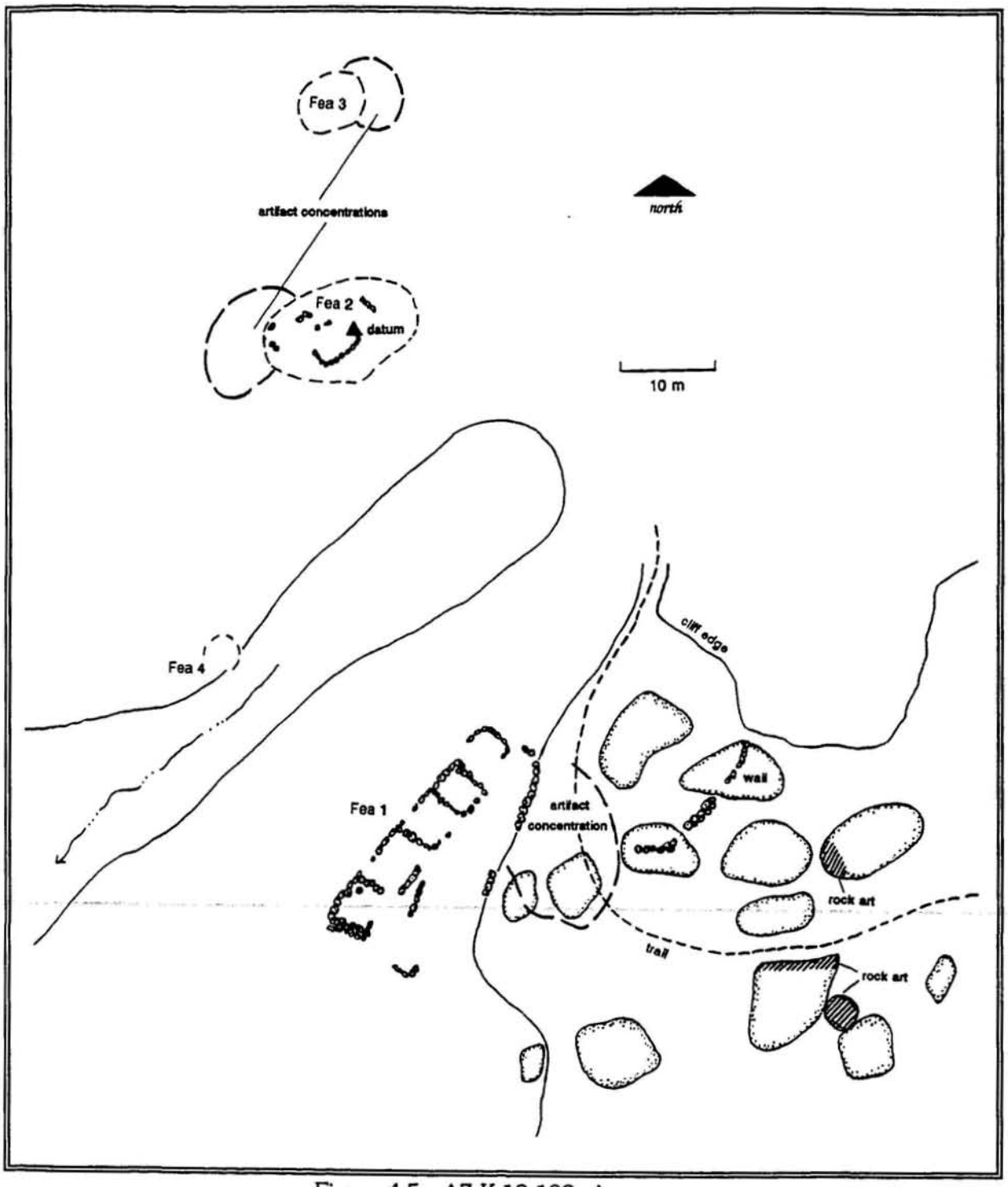


Figure 4.5. AZ K:13:108 plan map.

was present at Puerco Ruin, this mid– to late–Pueblo IV ware was much more common at Stone Axe. Notably missing at Stone Axe was Kwakina Polychrome, an early Pueblo IV ware common at Puerco Ruin. All of this indicates that Stone Axe Pueblo was occupied by a larger population earlier and abandoned later than Puerco.

Multiple Structure Sites

The 12 multiple–structure sites represent a minimum of 30 separate structures, most of

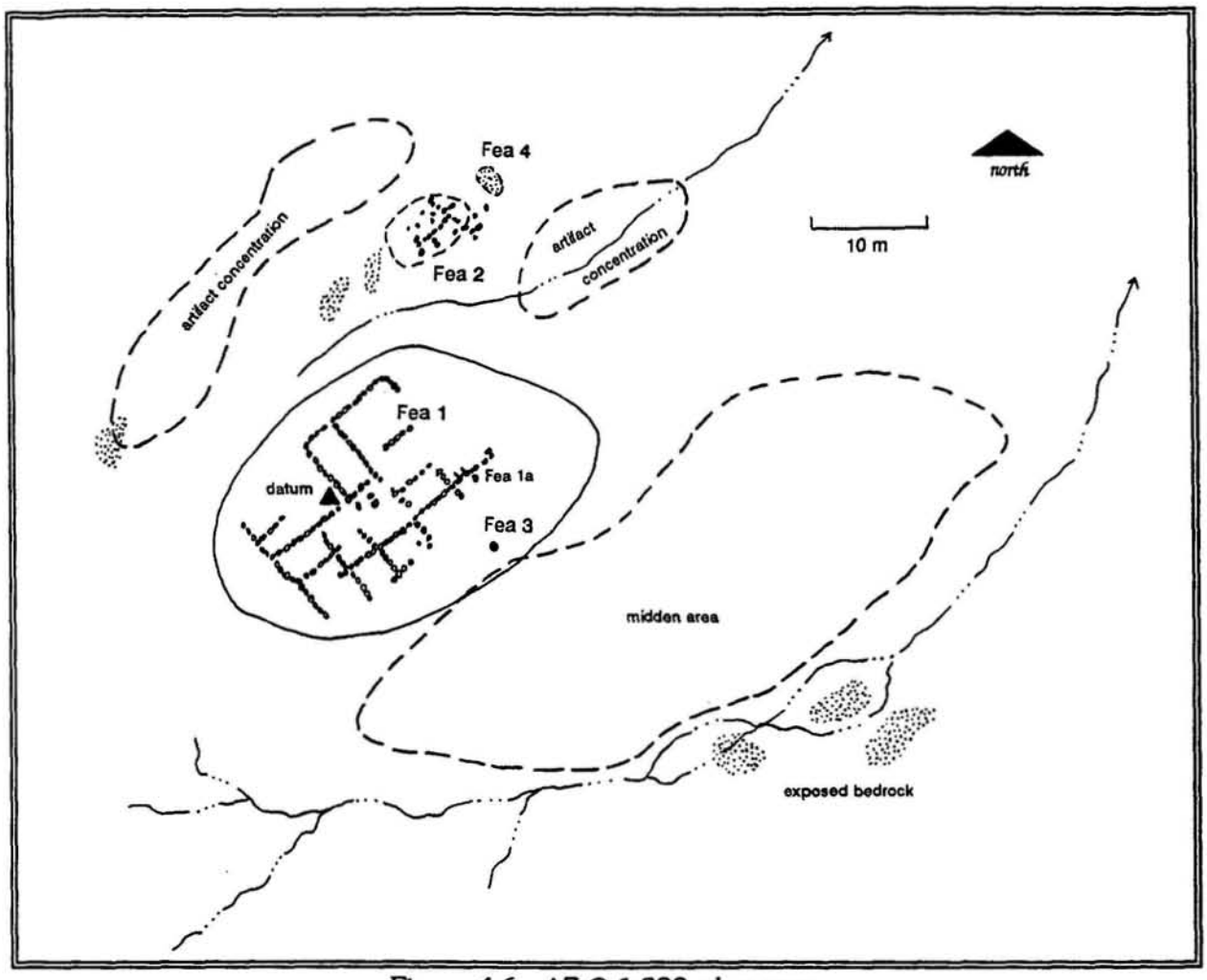


Figure 4.6. AZ Q:1:223 plan map.

one or two rooms. Most of the sites have three of these units, but one has five and several have fewer. Three are associated with rock art and one has milling slicks (see Appendix B). The distribution of these sites is depicted in Figure 4.11.

The number of artifacts estimated to be visible on the surface at these sites ranged from 150 to 20,000, with a mean of almost 6,000. Ground stone was noted at 10 of the sites, shell at two, hammerstones at seven, and projectile points or bifaces at four. A shell pendant was found at one of the sites and a stone pendant at another. The sherd to lithic ratios for the sites parallel the pattern noted with the multiple-room pueblos. All but one of the sites, AZ K:13:116, again in the Painted Desert section of the Park, have more lithics than sherds.

All but one of these sites has ceramics that characterize the mid to late Pueblo II and early Pueblo III periods. Of these, three have a significant earlier component, four have later components, and two have both earlier and later components. One site, AZ Q:1:281, has a late Pueblo III–Pueblo IV component. Given the density and diversity of artifacts at this badly eroded site, it may have been a large pueblo. The one site lacking Pueblo II/III ceramics (AZ Q:1:291) contains both Basketmaker II and Pueblo II wares. It is located in the grasslands northeast of Crystal Forest.

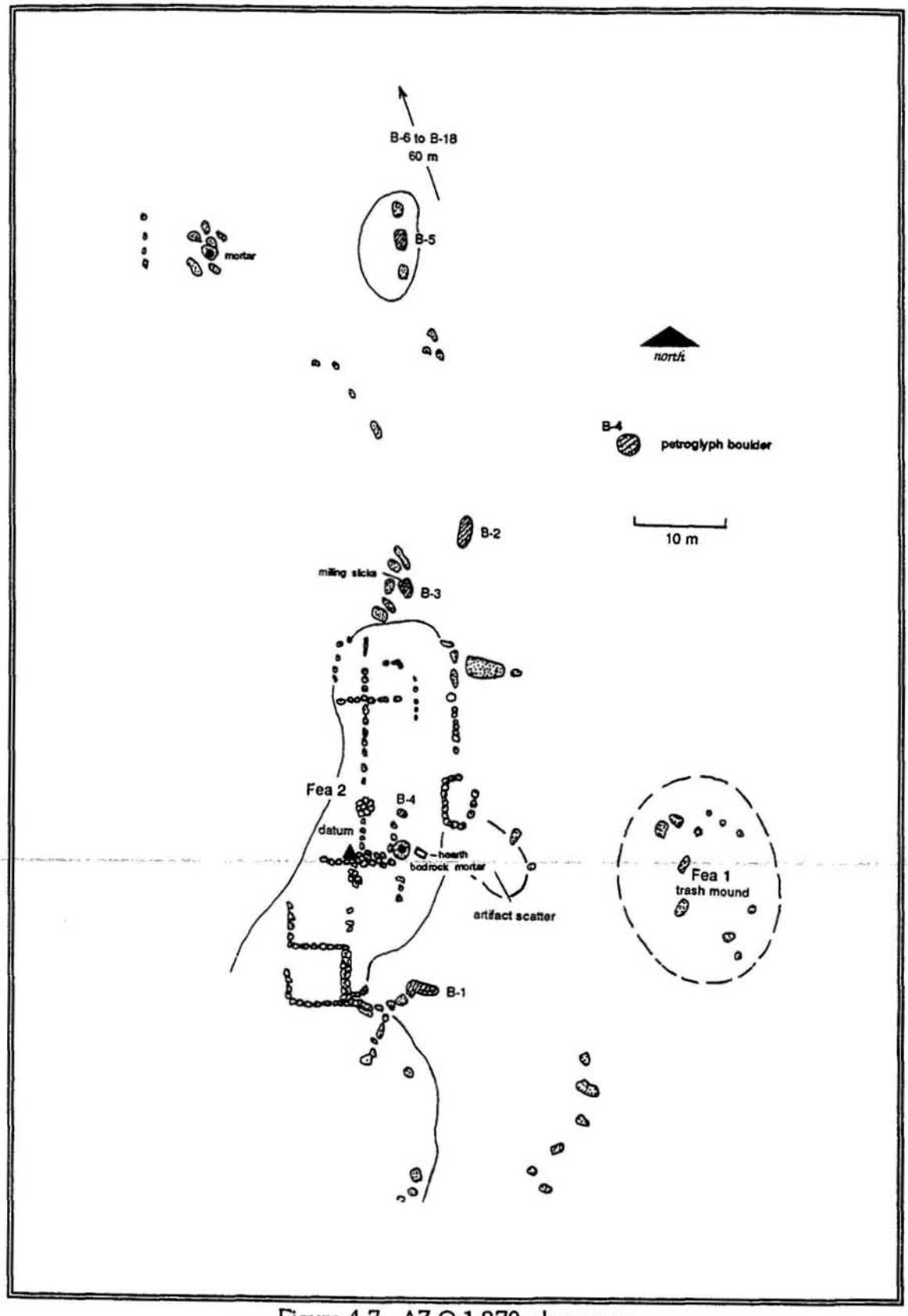


Figure 4.7. AZ Q:1:270 plan map.

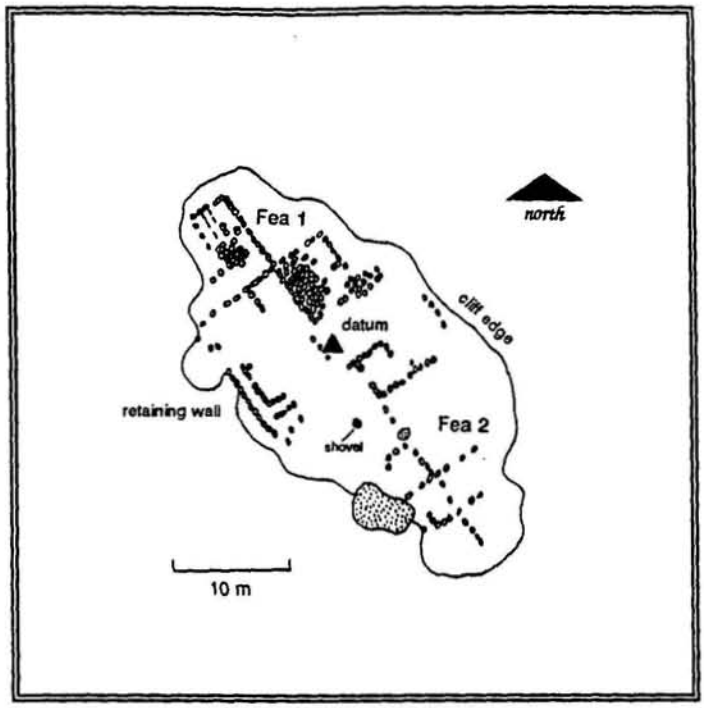


Figure 4.8. AZ Q:1:275 plan map.

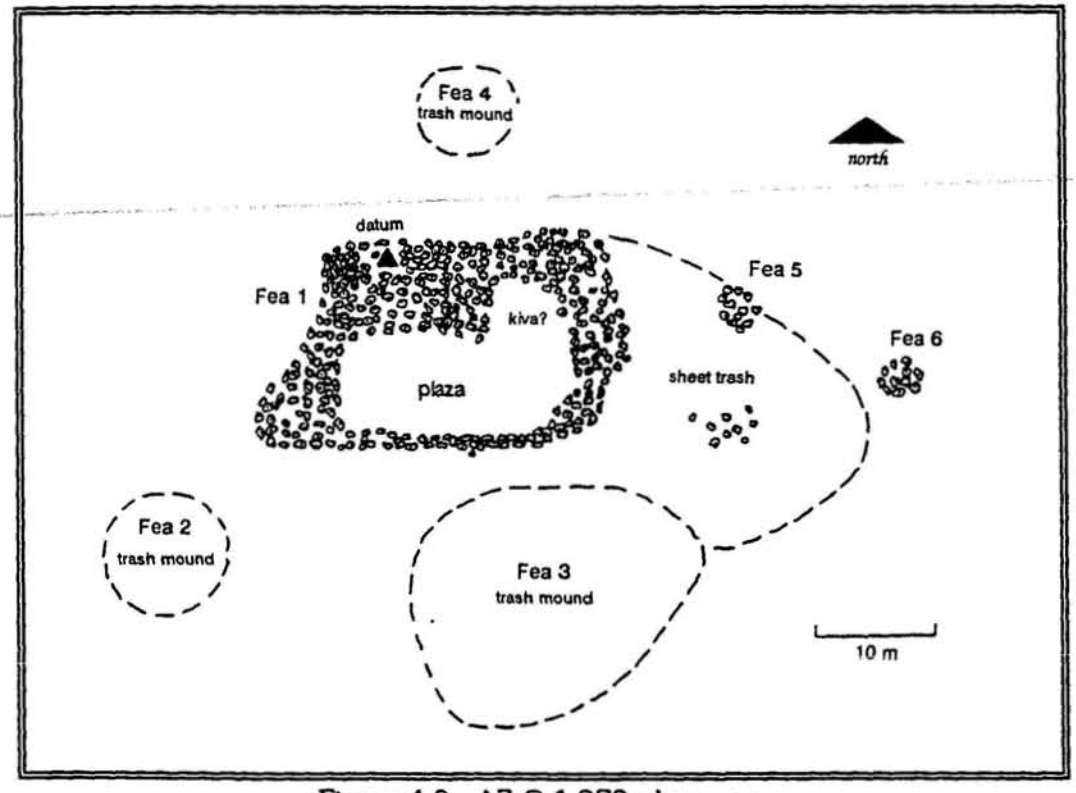


Figure 4.9. AZ Q:1:279 plan map.

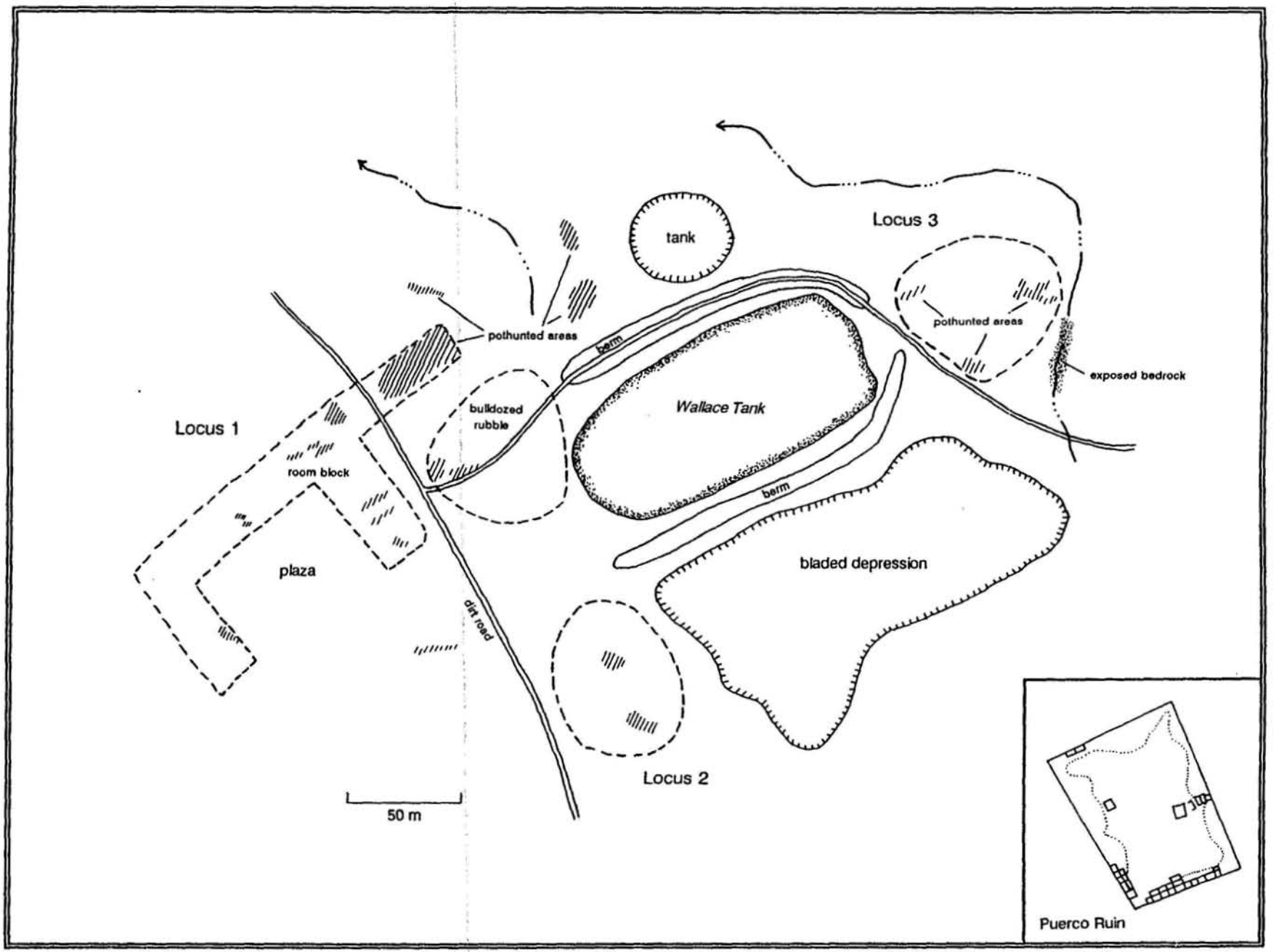


Figure 4.10. Stone Axe Pueblo (AZ Q:1:199) plan map, insert: Puerco Ruin (AZ Q:1:22) at same scale.

Table 4.2. Attributes of Recorded Multiple–room Pueblos.

Site No.	Dates	No. of rooms	Other features
AZ Q:1:199	PI–PIV	250+	Stone Axe Pueblo (see Hough 1903)
AZ Q:1:223	PI–PII/III	15±	midden, axe polishing grooves
AZ Q:1:275	PII/III–late PIII	12	slab feature (hearth?)
AZ Q:1:226	PII/III–PIII	10±	possible kiva depression, burial salvaged
AZ Q:1:295	PII/III–late PIII	10±	trash mound
AZ Q:1:279	PII/III	10±	possible kiva depression, trash mounds
AZ K:13:113	PII–late PIII	6±	
AZ K:13:108	PII–PII/III	5	one–room structure, slab feature, rock art
AZ Q:1:270	PII/III–late PIII	5	trash mound, milling slicks, rock art
AZ K:13:114	PII/III–PIII	4±	
AZ Q:1:287	BMII, PII*	4	

* Pueblo II ascription is based on Reed 1947

Table 4.3. Attributes of Previously Recorded Multiple–room Pueblos.

Site No.	Dates	No. of rooms	Other features
AZ Q:1:22	PIII–PIV	125+	Puerco Ruin (see Burton 1990)
PEFO 118*	PIII	22±	
AZ Q:1:128	late PII–late PIII	10+	two–room structure, other features
PEFO 69*	PIV	10±	
AZ K:13:41	PII–PIII	6+	great kiva, kiva, trash mound, others
AZ Q:1:129	PII–PIII	5+	
AZ Q:1:208	PIII	5	
AZ K:13:10	late PII–PIV	4+	one–room structure, trash mound, others
AZ Q:1:159	PII–early PIII	4+	
AZ Q:1:161	PIII–late PIII	4	
AZ Q:1:182	PII–PIII	4	

* data from Reed 1947

One–room Masonry Sites

These 15 sites are characterized by small rubble mounds that apparently represent single–room structures. The distribution of these sites is depicted in Figure 4.12. Size of associated artifact scatters was highly variable, ranging from 225 square meters to 10,000 square meters with a mean of about 3500 square meters. Although erosion is difficult to quantify, larger sites appear to have been more heavily eroded and their surficial extent, both real and perceived,

may reflect soil and artifact displacement. Rubble at most of the sites consists predominately of sandstone slabs and blocks, but petrified wood logs were used in the construction of AZ Q:1:239, in the Rainbow Forest area of the Park, and at AZ Q:1:276, northeast of Crystal Forest (Figure 4.13). In addition to the rubble, five of the sites had other slab features or concentrations. Rock art (discussed below) was present at five of the sites. Midden and fragments of bone were noted at one of the sites (AZ Q:1:225). Milling slicks were noted at two of the sites and axe-sharpening grooves at three (Figure 4.14).

Ceramics and lithics were present at all of the one-room sites, and ground stone was found at seven. Other artifacts noted or collected at the sites include two projectile points, two hammerstones, a chopper, and a palette. Associated artifact scatters at the sites have from 9 to over 10,000 artifacts. Excluding the two extremes (discussed below) yields a mean of 535 artifacts. Density ranges from 6 to 250 artifacts per square meter. Excluding the anomalous high of 250, the mean density per square meter is 11. Again sherd to lithic ratios suggest the importance of proximity to usable stone sources. Lithics outnumbered sherds at the eight sites located in the southern portion of the Park, and sherds outnumbered lithics at the seven sites in the Painted Desert (north-

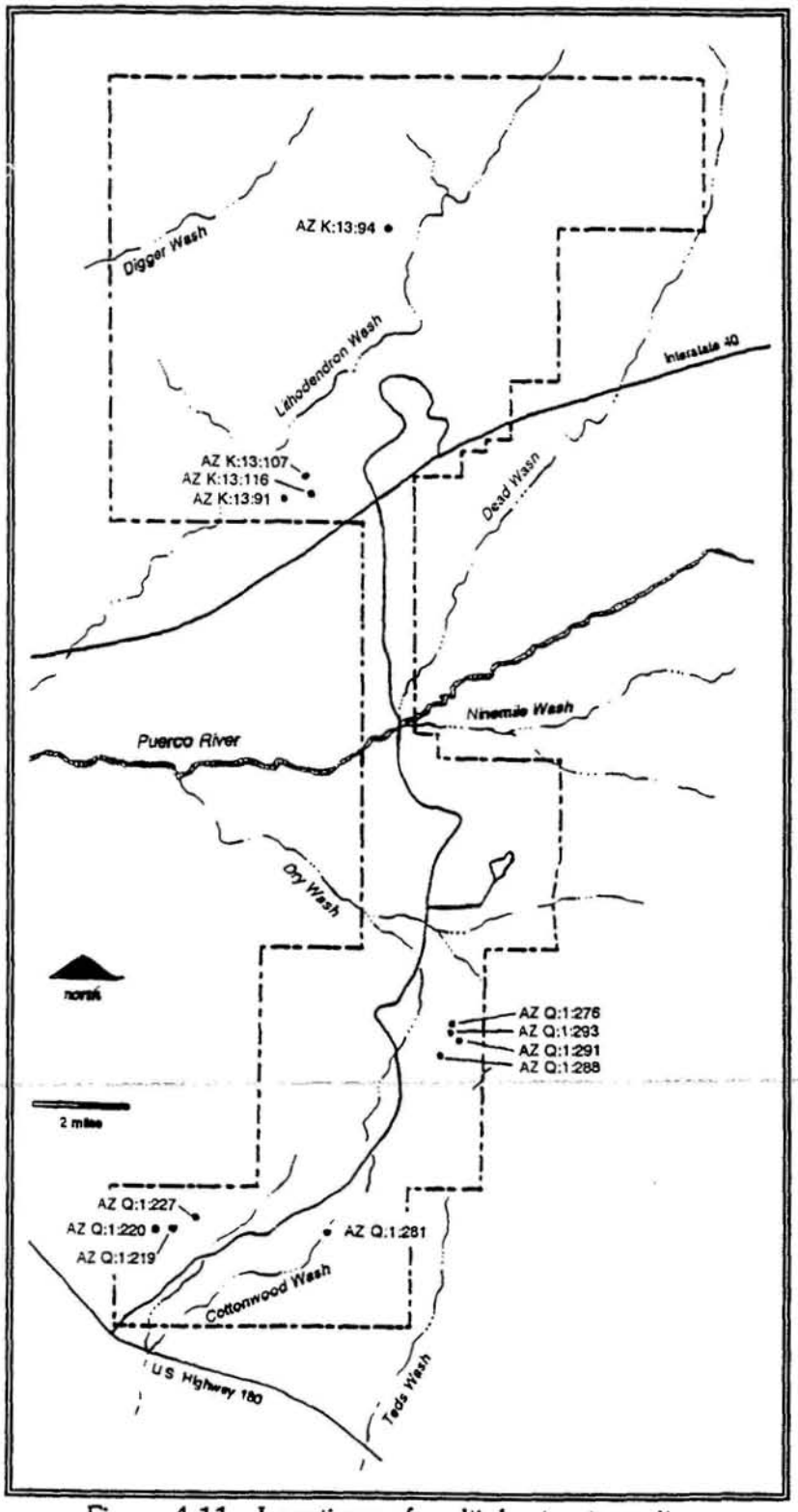


Figure 4.11. Locations of multiple structure sites.

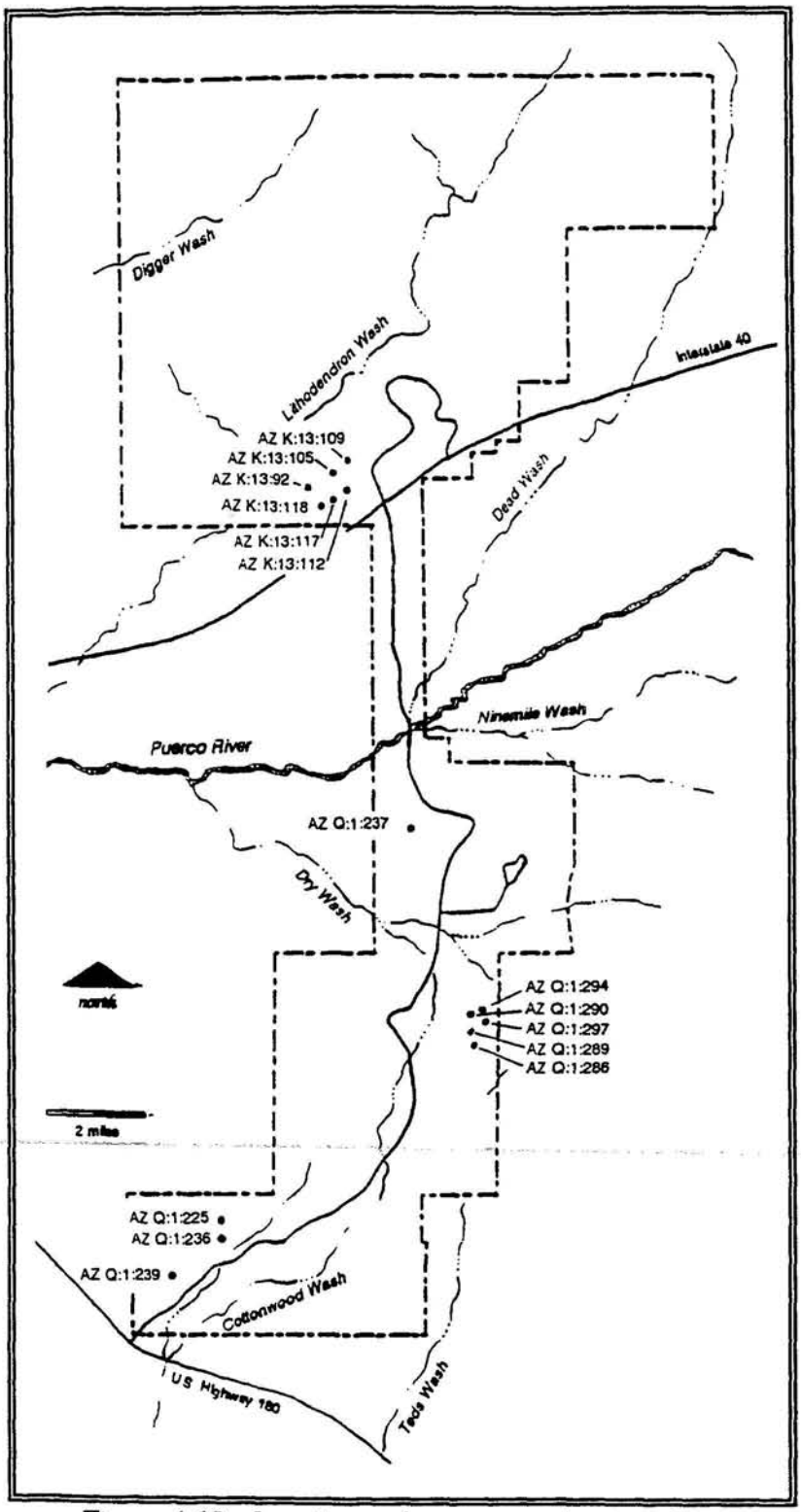


Figure 4.12. Locations of one-room structure sites.

ern) section of the Park, reflecting the relative abundance of locally available material. Petrified wood deposits are more extensive and of better quality in the southern portion of the Park.

Of the sites datable through ceramics all but one have the nearly omnipresent Pueblo II/III sherds. Three also have earlier wares, five have later wares, and three sites have both earlier and later wares. One Pueblo IV sherd (Awatovi Black-on-yellow) was found at AZ Q:1:225 and Adamana Brown sherds (Basketmaker II) were noted at AZ Q:1:294.

The two extremes in artifact numbers may both be Basketmaker sites. Site AZ Q:1:289 consists of a 2 m by 3 m oval and an attached 1 m diameter circle defined by boulders and upright slabs. Only nine artifacts were noted at this site, including four sherds and five flakes. AZ Q:1:290 includes a 45 m diameter circular rock outline, a mano fragment, Lino Gray and a few other sherds, and tens of thousands of flakes in a 20 square meter area adjacent to the structure. The density of flakes, apparently from intensive stone working, is unusual.

Artifact Scatters

Twenty-eight artifact scatters were recorded during the surveys. The distribution of these sites is depicted in Figure 4.15. The sites include small camp or special use sites, pit house

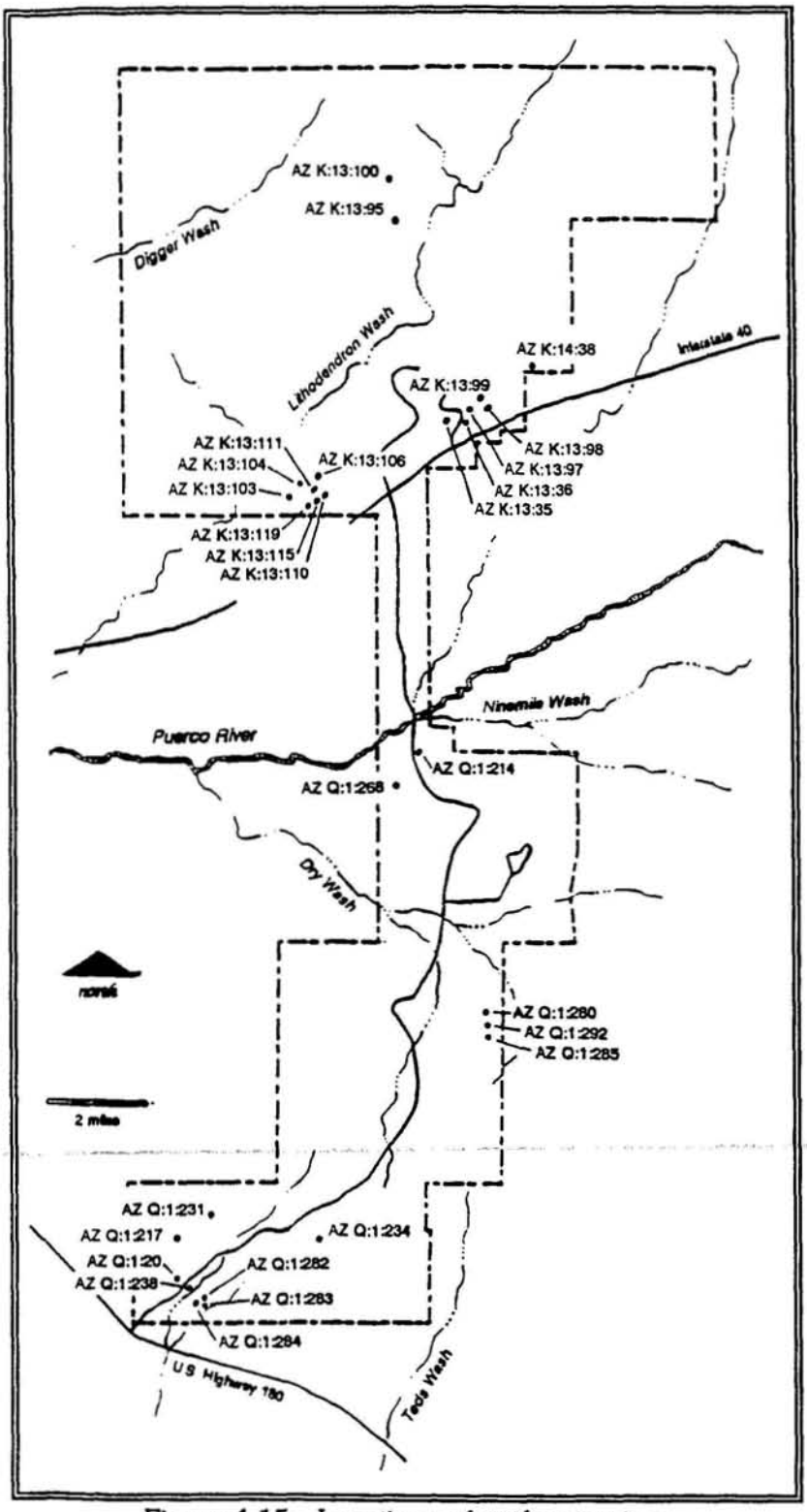


Figure 4.15. Locations of artifact scatters.

archeological record, and may indicate different architectural styles and settlement patterns, possibly due to environmental or functional differences (Harrill 1973).

A possible pit house and small rubble concentrations were noted at a site east of Crystal Forest (AZ Q:1:285). Ceramics at this site indicate a Pueblo II/III–III occupation. Two projectile points were collected; one is a small side-notched point and the other is a large corner-notched point.

Aceramic Sites (Lithic Scatters)

Nine prehistoric aceramic sites were recorded. The distribution of these sites is depicted in Figure 4.16. Characterized by the presence of flaked stone, and the absence of pottery, these can be further subdivided into four types: (1) aceramic pit house sites, (2) quarry–workshop sites, (3) hunting/kill sites, and (4) flake scatters.

Pit House Sites

Two sites (AZ K:13:65 and 98), within 300 m of each other in the northern section of the Park, have pit house architecture as well as flaked stone. AZ K:13:65, covering 450 square meters, includes a shallow depression and two slab concentrations, 20 flakes, and a shell bead. AZ K:13:98, cover-

ing 2000 square meters, includes several eroding pit houses, ashy soil, and hearths. Artifacts noted at the site included 200 flakes, 10 pieces of ground stone, an anvil, a large corner-notched projectile point, and other tools. Density of artifacts at this site ranges up to 12 per square meter. The ground stone and projectile point, as well as the pit house architecture and the lack of ceramics, indicate both sites may likely date to the Archaic Period.

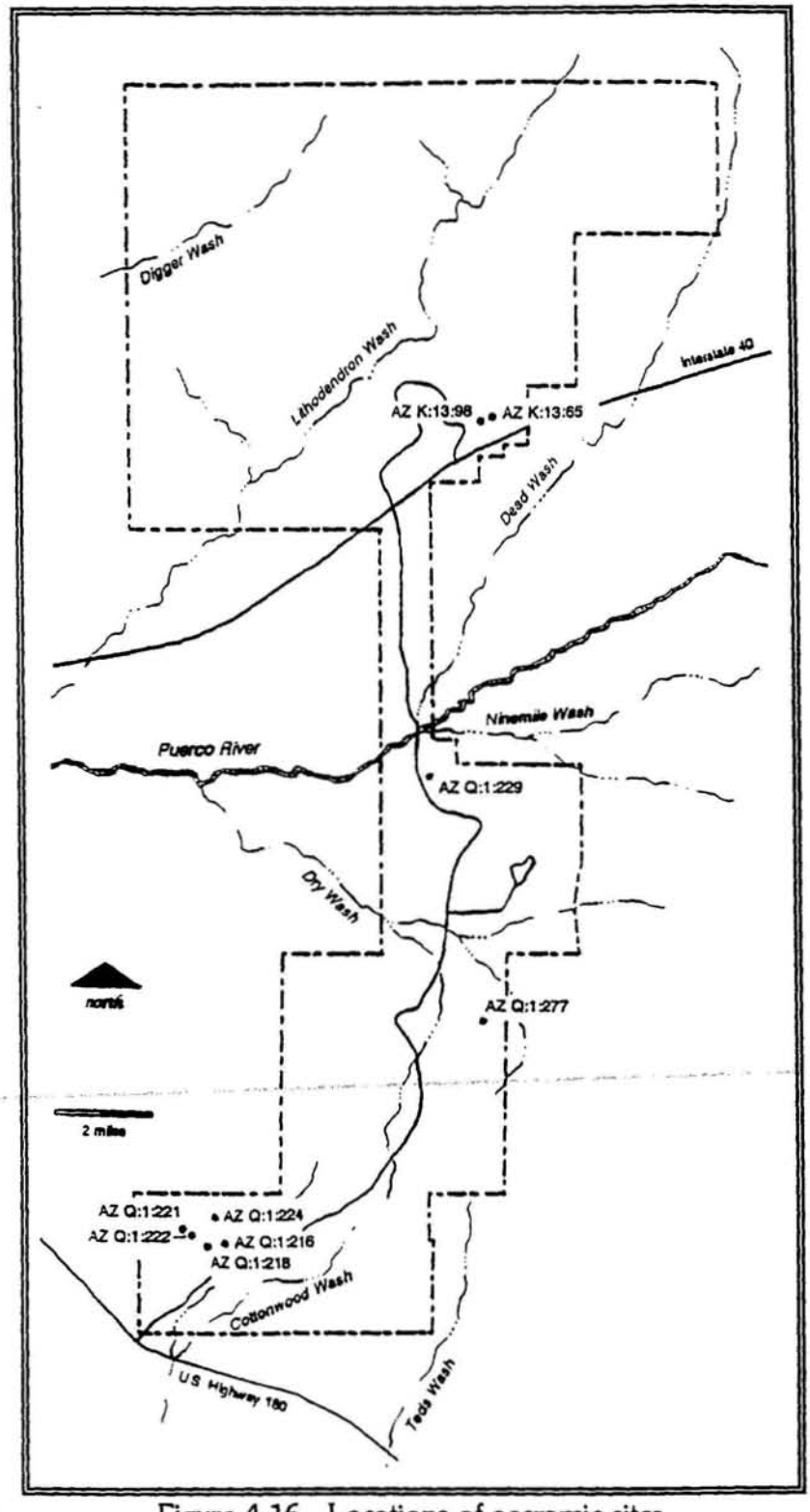


Figure 4.16. Locations of aceramic sites.

Quarry-workshop Sites

Five sites had numerous biface fragments, preforms, roughouts, hammerstones, and other tools indicative of bifacial tool production (Figures 4.17 and 4.18). Four of the sites (AZ Q:1:216, 218, 221, 222) are on a bluff overlooking Rainbow Forest and the fifth (AZ Q:1:229) is on the mesa south of Puerco Ruin. Lithic material at the Rainbow Forest sites are predominately petrified wood, while AZ Q:1:229 also has substantial quantities of cobble chert.

Sizes of the five quarry-workshop sites range from 1575 square meters to over 10,000 square meters, with a mean of 5475 square meters. Artifact density ranges from 9 to 120 per square meter. No artifacts traditionally considered temporally diagnostic were noted at the sites, but the lack of ceramics and the evidence for bifacial reduction suggests the sites date to the Archaic Period.

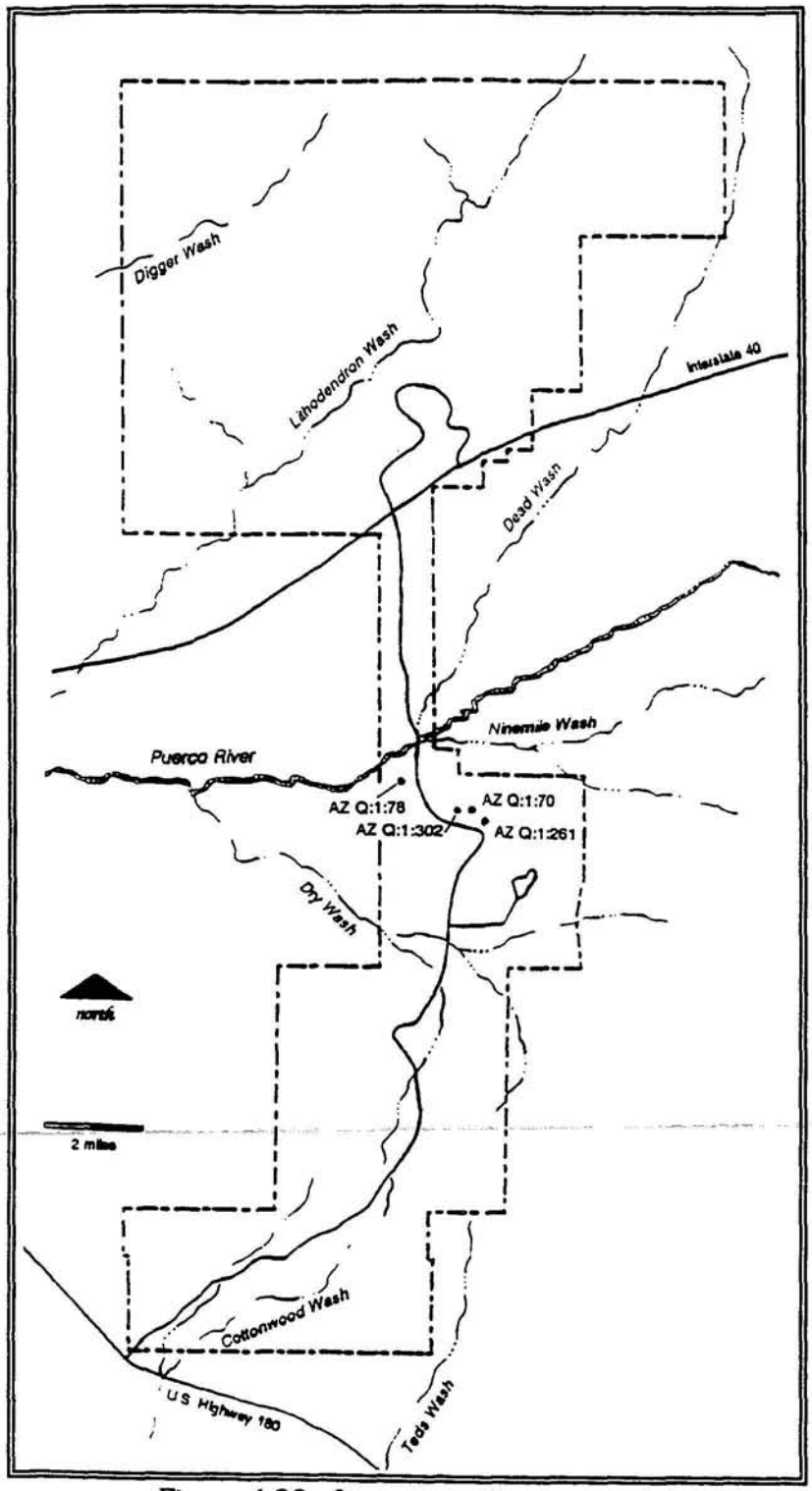


Figure 4.20. Locations of rockshelters.

than sites, each rockshelter is briefly described here.

AZ Q:1:70, also known as the Cave of Hands, is a small shelter 1.8 m high, and 12 square meters in plan, formed in an interstice between jumbled boulders. The opening is small and low, faces north, and no direct sunlight enters the shelter. Small charcoal bits and bone (both possibly recent) were noted, but no artifacts were observed. Over 400 pictographs occur on the ceiling and one side wall, while petroglyphs occur on the same sidewall and on the rear wall, as well as in the surrounding area. The antiquity of the pictographs is unknown, but the petroglyphs are typical Pueblo II–III designs.

AZ Q:1:78, also called Patio House (Martynec 1982) and Pinhole Cave (Preston and Preston 1983), is on the west side of Puerco Ruin Mesa, about halfway up the talus slope. Formed by a large perched sandstone block, the shelter encompasses a 20 square meter area, with the ceiling up to about 2.5 m high. The shelter and surrounding area includes abundant rock art. Preston and Preston believe that one design on the rockshelter ceiling is a solar marker to track the winter solstice (see Figure 4.33).

In the rock outside the shelter opening is a series of carved viga holes measuring 7.0 to 8.5 cm in diameter and 2.5 to 4 cm deep. The 10 holes, 1.8 m above current ground level, are in two

groups of five. This pattern suggests a two room structure (Figure 4.21). No architectural rubble was noted. An extensive artifact scatter is estimated to include 400 sherds, 700 flakes, 4 ground stone artifacts, and a worked slab, with a maximum density of 44 artifacts per square meter. Ceramics indicate a Pueblo II/III date. The rock art at this site, along with the rest of the rock art on the west side of the mesa, is currently being recorded by the American Rock Art Research Association.

AZ Q:1:261, located in undercut caprock, measures 1.2 m high, and 16 square meters in plan, with an opening facing east-southeast. The shelter was completely excavated in the 1940s (Gale 1941). Artifacts, all found in the upper 3 inches of the deposit, included 26 plain gray sherds, one indeterminate black-on-white sherd, a Homolovi Polychrome sherd (Reed 1947), two wood drills, a fire stick, a moccasin, and recent trash attributed to CCC enrollees working in the area. Noted throughout the fill were unworked pieces of petrified wood, corn kernels, rodent bone (some burned), and charcoal. The site was considered to date to the Pueblo IV period. Noted at the site during the 1991 recording were a smudged red ware sherd, three petrified wood core fragments, and 12 flakes. There was a packrat midden at the rear of the shelter. Intact deposits may still be present at the mouth and apron of the shelter. Rock art at the site includes two red handprints on the shelter ceiling and petroglyphs over the opening. The petroglyphs are typical Pueblo II and Pueblo III designs.

AZ Q:1:302, 1.8 m high, and 15 square meters in plan, is located under caprock.

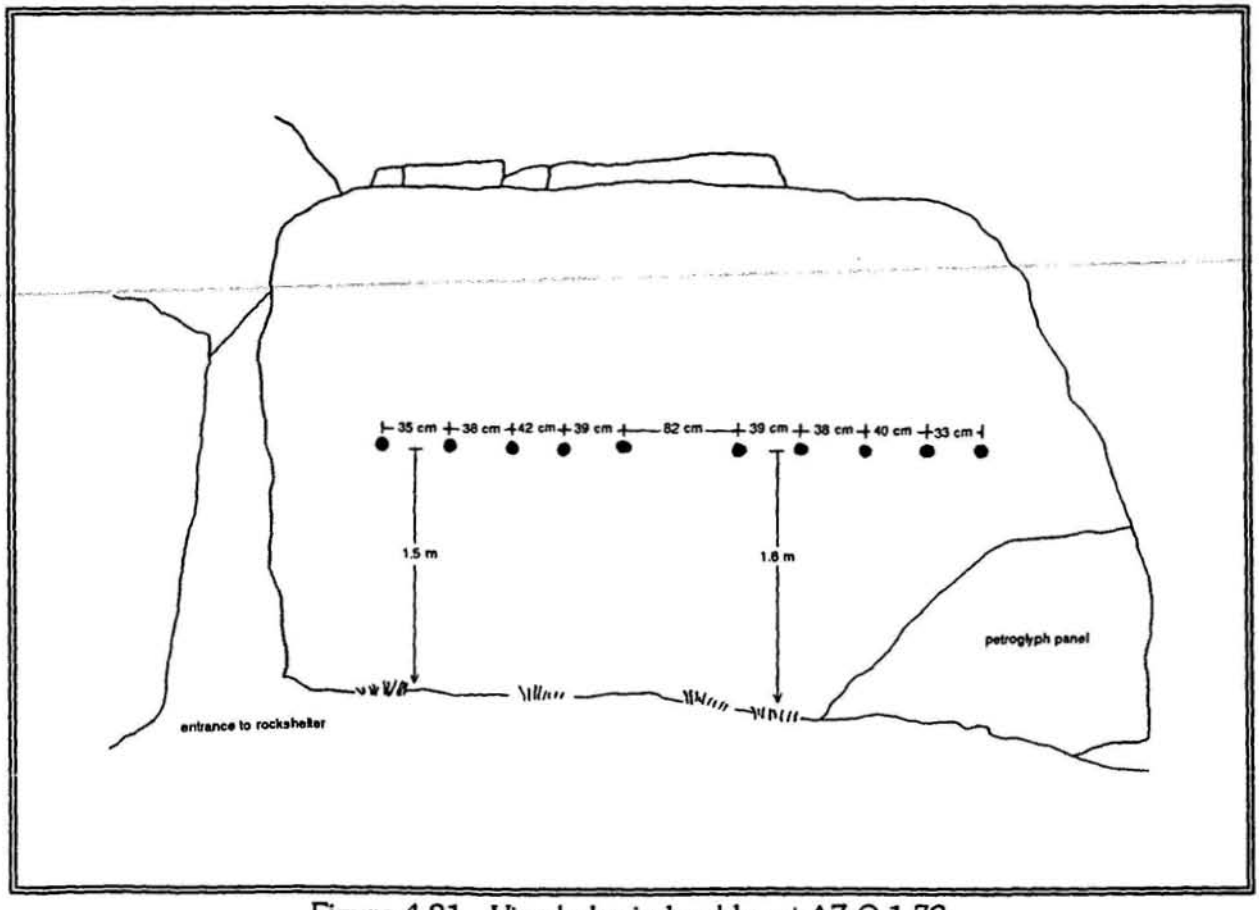


Figure 4.21. Viga holes in boulder at AZ Q:1:78.

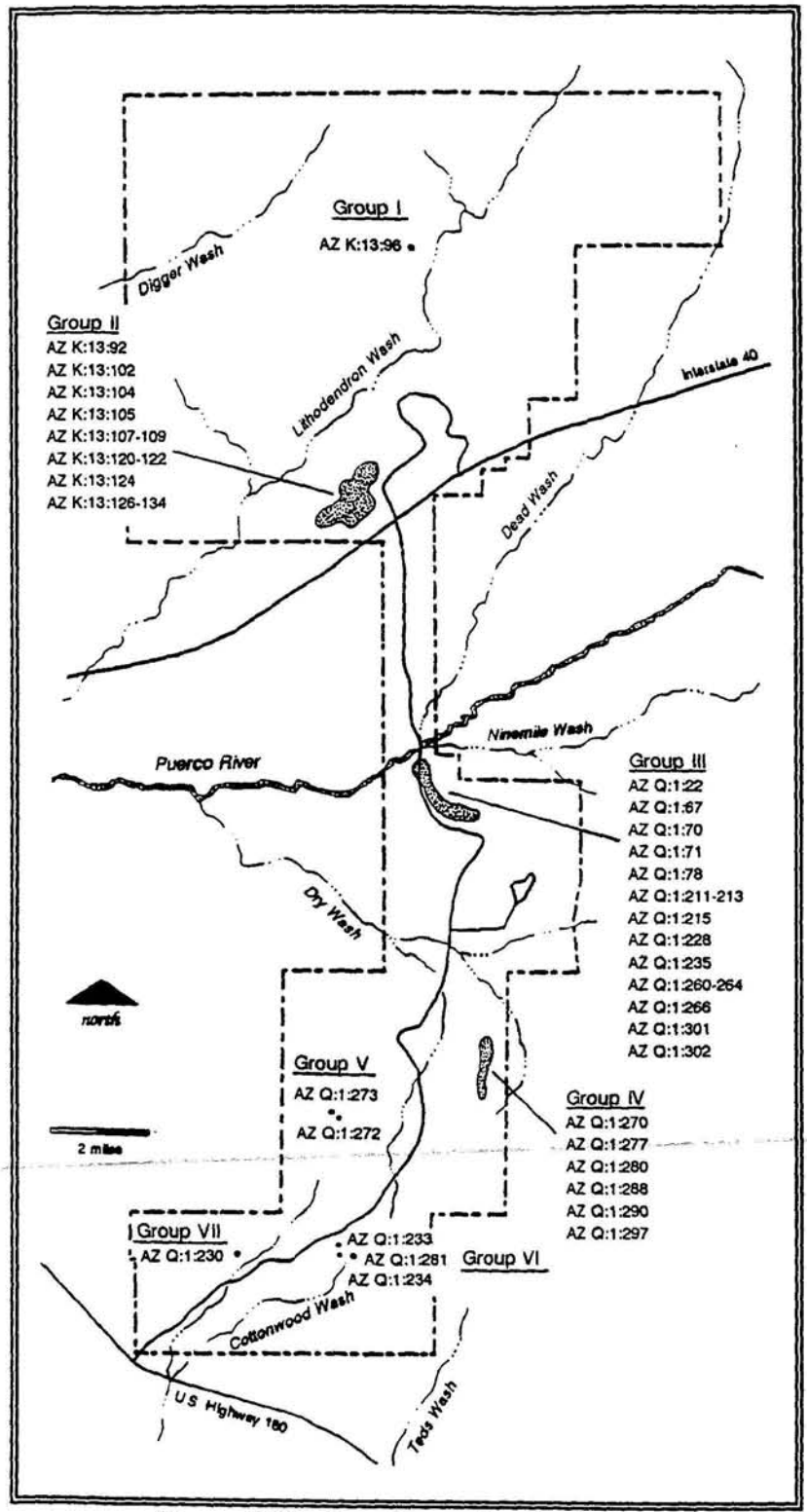


Figure 4.22. Locations of rock art sites.

The large opening faces north–northwest. There is a single red handprint on the ceiling, and petroglyphs on the back wall and over the opening. The petroglyphs are typical Pueblo Period designs. No artifacts were noted.

Rock Art Sites

During the surveys 48 prehistoric rock art sites were recorded, including 29 sites that consist solely of rock art and 19 sites that include other features and artifacts, as described above. The sites contain a total of 2,092 elements, with the number of elements at individual sites ranging from 2 to 852. Eighteen of the sites have less than 10 elements each and two (AZ Q:1:223 and AZ K:13:92) have over 100 elements.

The element typology used for this report is based on a typology devised by Christensen (1988, 1989) and adapted for rock art recording at Puerco Ruin (Burton 1990). Elements were assigned to one of six broad categories: anthropomorphs, kachinas, hands/tracks, zoomorphs, geometrics, and indeterminate. These are in turn subdivided into smaller, self–descriptive categories. Elements were assigned to these categories in the field or in the laboratory from field drawings and slides. Appendix D lists the number of element types (motifs) at each site. For ease of reference the sites are grouped by location on Figure

4.22. Group 1 consists of a single site with 12 elements in the northern portion of the Park. Group II, located just below the Painted Desert rim, includes 20 sites (556 elements). Group III, located on the east side of Puerco Ruin Mesa, consists of 16 sites (548 pecked and 747 painted elements). Group IV, located northeast of Crystal Forest, consists of six sites (288 elements). Group VI, located in the vicinity of the Flattops, includes three sites (71 elements). Group VII consists of one site with 511 elements in the Rainbow Forest section of the Park. The element motifs are summarized by group number in Tables 4.4 and 4.5 and in the discussion.

This section discusses the combined data from all prehistoric rock art sites recorded during the surveys. For comparison, tallies of rock art at Puerco Ruin (n=852) and nearby AZ Q:1:67 (n=229), recorded in 1988 by the American Rock Art Research Association (Burton 1990), are included in Group III. Both sites fall within areas surveyed and have comparable data. The 747 pictographs recorded at three sites in Group III are discussed separately, and historic rock art, here called inscriptions, is discussed under historic sites.

Petroglyphs

The petroglyphs recorded easily fit into previously defined styles typical of the Little Colorado River region (Pilles 1975). All of the recorded rock art fit descriptions for the Pueblo Period; no new Basketmaker or Archaic rock art was discovered.

Anthropomorphs

A total of 381 anthropomorphs (human–like figures) were recorded, which make up 16 percent of the identifiable elements recorded. Most anthropomorphs have complete bodies and generally lack facial features (Figure 4.23). They include stick (n=149), full–bodied (n=221), and x–ray motif (n=11, all at AZ Q:1:67) figures. Of the 53 anthropomorphs that can be identified as to sex, only six are female. One copulation scene was recorded (Figure 4.24). Further elaborations include 18 with flutes (Figure 4.25), nine with bows, two with snakes, 65 with digits or hair, and 42 with headdresses or one or more staffs. Staffs are defined as vertical sticks with one or more perpendicular cross members and include from one to five cross members (McCreery and McCreery 1986). McCreery (1992) suggests these staffs may be related to hunting ritual based on their spatial association with quadrupeds. Figures with staffs are common at late Pueblo III sites (Martynec 1982). Flute players are also common at Pueblo III sites in the Little Colorado River Valley (Pilles 1975:13).

McCreery and McCreery (1986; McCreery 1992) have noted that in the Little Colorado River Valley, quadrupeds, flute players, large female figures or "game goddesses," staff-bearers, and groups of anthropomorphs seem to be important themes. McCreery suggests that all these symbols may relate to hunting and reproduction. Possibly magical or related to ritual, the figures may also reflect the uncertainty of hunting. Anthropomorphs with staffs do seem to represent ceremonialism. The staffs, whether interpreted as hunting or agricultural symbols, could be depictions of ceremonial objects, if not ceremonial objects themselves, and many staff–bearers occur in groups, suggesting community ritual.

An interesting example of the mixing of reproduction and hunting themes is present at AZ Q:1:230 and AZ K:13:107. At both sites a large female figure occurs with a

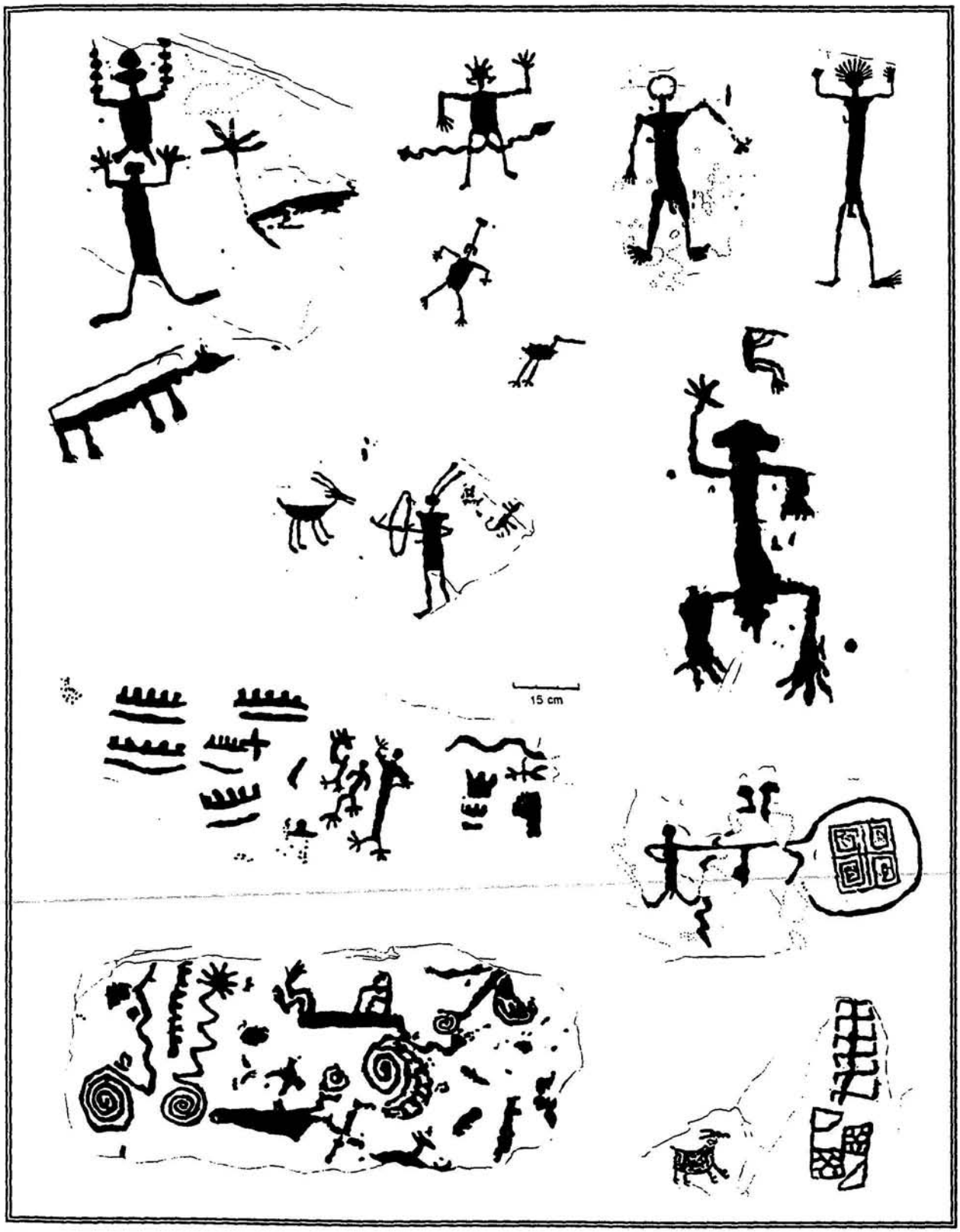


Figure 4.23. Rock art at Petrified Forest; first two rows: anthropomorphs and other elements at AZ Q:1:230, third row, left: anthropomorphs and bear paws at AZ Q:1:228, third row, right: anthropomorphs, snakes, and geometric designs at AZ Q:1:212, bottom row: flute player and other elements at AZ K:1:92.

Kachinas

Forty-one elements (2 percent) were identified as kachina representations. This includes 35 previously recorded at Puerco Ruin and nearby AZ Q:1:67 (Burton 1990: Figure 15.12). Unlike the anthropomorphs, kachina depictions usually consist of heads or masks and all have facial features. Similar elements elsewhere have been described as kachinas by Cole (1989, 1992) and Schaafsma (1975).

Besides Puerco Ruin and AZ Q:1:67, the sample includes two other Kachina elements at sites in the Puerco Ruin area (AZ Q:1:71 and AZ Q:1:235). The kachina at AZ Q:1:235, at a tinaja south of Puerco Ruin that holds water year-round, is unusual in that it includes an elaborated full body with teeth and has a snake and a parrot on its chest (Figure 4.27). The mask at AZ Q:1:71 is a simple round outline with a neck and dots for the eyes and mouth (Jones 1987: Figure 6.13). The remaining four kachinas were recorded at AZ Q:1:278, located northeast of Crystal Forest. These consist of three elaborated masks and one simple outline mask (Figures 4.28 and 4.29). A small full-bodied figure at the site, classified as an anthropomorph, may also be a kachina depiction (see Figure 4.29).

According to Schaafsma and Schaafsma (1974), kachinas were introduced during late Pueblo times during population aggregation and helped integrate large villages. Rock art data indicate the possibility of indigenous development of at least one kachina type, an ogre form. The 11 ogre kachinas with protruding mouths at Puerco Ruin are rare; none are known from other areas of the Park and few are known from other Pueblo IV sites in the region (Cole 1992; Young 1989). Perhaps the ogre was symbolically associated with the Puerco Ruin inhabitants.

Zoomorphs

The 582 zoomorphs, comprising 24 percent of the identified elements, include large and small mammals, reptiles, and birds. Most are similar to late Pueblo elements defined by Pilles (1975). The 323 classified as quadrupeds include both those with forward-curving horns, considered antelope (Figure 4.30), and those with backward-



Figure 4.27. Kachina at AZ Q:1:235.



Figure 4.28. Kachina mask at AZ Q:1:278.

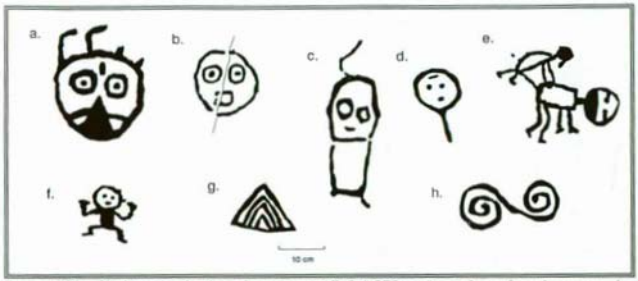


Figure 4.29. Kachinas and other elements at AZ Q:1:278; a-d. masks, e-f. anthropomorphs, g-h. geometric designs.

curving horns, considered bighorn sheep (Figure 4.31). Sixteen with a long forward-curving tail are identified as mountain lion (Figure 4.32). Of the remaining zoomorphs 49 are birds, 57 are lizards (or possibly lizard-men), and 104 are snakes. Most of the birds have long legs and many also have long necks. These appear to be water birds that once may have been abundant along the Puerco River and its tributaries. Other animals identified include bat, bear, rabbit, and possibly insects.

Zoomorphs appear evenly distributed in the sample. Quadrupeds are most common in Groups III and VII, while snakes are most common at Groups I and VI, which are composed of small sites. As McCreery (1992) noted for the Little Colorado area in general, the quadrupeds here have a similar distribution to the staff-bearing anthropomorphs. Quadrupeds likely indicate the continued importance of hunting during the Pueblo Period occupation of the area (McCreery 1992).

Hands and tracks

Twenty-one percent (n=503) of the identified elements are hands or tracks. Of these, 98 were further classified as bear paws (at least 12 different styles or variations were identified; see Figure 4.23), 17 as mountain lion, 82 as bird, 57 as cloven hooves (ungulate), 229 as human feet or prints (Figure 4.33), and 20 as hands.

Two of the animals represented (bear and mountain lion) have not been identified as food sources in faunal analysis, suggesting the rock art was not limited or motivated



Figure 4.30. Quadrupeds at AZ Q:1:213.



Figure 4.31. Bighorn sheep at AZ K:13:107.

simply by diet. Further, the distribution of these elements suggest a temporally or spatially restricted distribution for at least one motif; bear paws are common at Puerco Ruin Mesa (Group III), but rare elsewhere. Only a few others were recorded in Groups V and VI and they are absent from the recorded sample north of Puerco River. In addition, less than ten bear paws were seen by the author (out of an estimated 4,000–plus elements) during a brief reconnaissance of the Boundary Petroglyph Site in the Painted Desert section of the Park and these were limited to a few panels.

In general the recorded sample includes few tracks of any kind north of the Puerco River. An exception are human feet, which comprised 14 percent of elements in Group II. Feet are present in all groups except Group I, with high percentages in Groups IV (23%) and V (10%). Mountain lion tracks are found in Group V, where they comprise 10 percent of the identifiable elements, and at Group 3, where they comprise 0.9 percent of the elements. Mountain lions themselves were more widespread, present at all but Groups I and II. Hands and tracks may reflect clan symbols (*cf.* Michaelis 1981), marking clan territories or use areas.

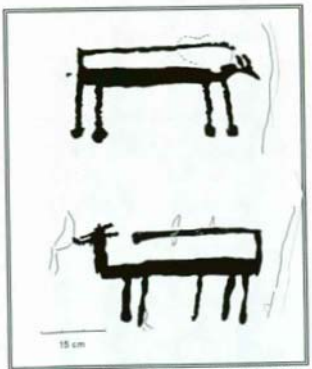


Figure 4.32. Mountain lions at AZ Q:1:230.

Geometric

Thirty–nine percent of the identified elements (n=919) are geometric designs, such as pottery or textile patterns (n=52), pahos (n=12), spirals, or circles (Figure 4.33 and 4.34). Several in the Puerco Ruin area have been recognized as solar markers (Preston and Preston 1983b).

Slab pahos, as identified by McCreery (1992), are T–shaped forms (Figure 4.35). They have been found to be associated with Pueblo III period and later sites, with a limited distribution in and around the Petrified Forest area (McCreery 1992). The present sample includes six at Puerco Ruin and AZ Q:1:67, one at AZ Q:1:233, one at AZ Q:1:277, and a possible paho at AZ K:13:130.

Textile designs are widespread throughout the Anasazi area, but in the Little Colo-



Figure 4.33. Human feet and spiral on ceiling of rockshelter at AZ Q:1:78.



Figure 4.34. Tabletas and other geometric designs at AZ K:1:120.



Figure 4.35. Paho at AZ Q:1:277.

rado River Valley they are considered a hallmark of the region because of their complexity, elaboration, abundance, and placement as a focal point of panels (Christensen 1992). By comparing textile designs found in rock art with those on pottery Christensen (1992) estimates they date from A.D. 1000 to 1300. Textile designs comprise 18 percent of the identified elements at Group I, four percent at Group VII, three percent at Group II, and two percent at Group III (Figure 4.36). Notably 14 percent of the recorded elements at Mountain Lion Mesa, in the central portion of the Park, were textile designs (Christensen 1989).

Indeterminate

A large percentage of the elements recorded (24%; n=747) were too faint or weathered to be classified. This high percentage reflects not only natural weathering, but also human-caused deterioration, including vandalism and inadvertent abrasion from Park visitors. Vandalism is most apparent at areas of high use, such as Puerco Ruin, areas near CCC-era sites, and AZ Q:1:230, which used to have an interpretative trail. Natural weathering is most pronounced in the Painted Desert section of the Park; for example, there are large areas of spalling at AZ K:13:92.

Pictographs

Three rock art sites have pictographs as well as petroglyphs. These three sites are the only known pictographs in the Park. Pictographs are rare in the region as well, with less than five other pictograph sites known (D. Christensen,



Figure 4.36. Textile/pottery design at AZ Q:1:281.

P. McCreery, and E. Malotki, personal communication, 1991). The rockshelters in which the pictographs occur are described in a separate section above. Two of the three sites in the present sample have only one or two elements. AZ Q:1:261 consists of a pair of red handprints and AZ Q:1:302 consists of a single red handprint. The Cave of Hands (AZ Q:1:70), however, has 416 elements in shades of red, orange, yellow, and black. Most are located on the ceiling but a few occur on one wall of the shelter. The pictographs in the Cave of Hands were recorded by volunteers from the American Rock art Research Association in 1988.

The Cave of Hands is located 2 km northeast of a large tinaja with rock art (AZ Q:1:235) and 2.3 km southeast of Puerco Ruin. Petroglyphs are abundant in the area, and even occur within the shelter. The petroglyphs within the shelter include a large male anthropomorph, quadrupeds, and bear paws (Figure 4.37).

The pictographs within the Cave of Hands include 18 anthropomorphs, primarily simple stick figures. One is possibly male, and three have hair whorls similar to those worn by Hopi maidens (Figure 4.38). No kachinas are present with the pictographs. The only painted zoomorphs are two possible lizards. These stick figures have tails that appear longer than their legs, but they may be smeared or eroded male stick figures. One hundred sixty-eight of the pictographs are hands or tracks. Of these 147 are handprints, 11 are what may be foot prints, and 10 are painted bird tracks (see Figure 4.39). Many of the hand prints have been abraded at the palm, with the abrasion apparently prehistoric and deliberate. Geometric elements include lines, zig–zags, wavy lines, dots, and other elements (n=205). Most of the lines and zig–zags form a single

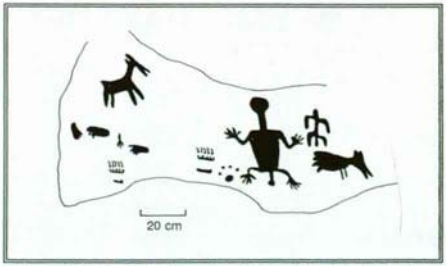


Figure 4.37. Petroglyph panel in Cave of Hands (AZ Q:1:70).

unified pattern (Figure 4.39). Twenty-five of the elements were classified as indeterminate.

The differences in motifs at the Cave of Hands, which is small and secluded, is notable when compared to the petroglyph sites, which are open and public (in the sense of Bruder 1983). Hopi men visiting the site in 1991 suggested the artists were a women's club or gang of young people (Park Superintendent Gary Cummins, personal communication, 1992). The female figures, and the lack of male anthropomorphs and zoomorphs, seems to support this notion. The site may have played a role in women's puberty ritual. However, accurate dating is needed to determine if the differences noted between the pictographs and petroglyphs are indeed functional and gender related or temporal. Radiocarbon dating of some of the pigment, as well as associated petroglyphs, is critical.



Figure 4.38. Detail of pictograph panel at Cave of Hands (AZ Q:1:70).



Figure 4.39. Pictographs on ceiling at Cave of Hands (AZ Q:1:70).

Table 4.4. Summary of Rock Art Motifs.

	Rock Art Group (see Figure 4.22)								
Motif	I	II	III	IV	V	VI	VII	Petros	Pictos
Anthropomorph	2	36	171	22	7	10	73	321	18
with staff/headdress	0	2	29	3	0	0	8	42	0
with flute	0	3	5	0	0	0	10	18	0
Kachina	0	0	37	4	0	0	0	41	0
Quadruped	0	33	166	5	2	3	117	326	0
Mountain loin	0	0	2	1	2	1	11	17	0
Bird	0	8	37	0	1	0	3	49	0
Lizard	0	5	29	4	1	8	10	57	2
Snake	2	14	48	2	3	13	22	104	0
Other	0	6	6	0	1	10	6	29	0
Bear paw	0	0	86	2	2	8	0	98	0
Mountain lion	0	0	11	0	6	0	0	17	0
Bird track	0	12	53	15	0	0	2	82	10
Ungulate (antelope)	0	0	54	3	0	0	0	57	0
Foot (human)	0	63	83	55	6	7	15	229	11
Hand	0	2	14	3	1	0	0	20	150
Textile/pottery	2	14	18	0	0	1	17	52	0
Paho	0	1	6	1	0	1	0	9	0
Geometric	5	237	344	121	30	30	90	857	205
Indeterminate	1	120	429	47	9	14	127	747	23
Total	12	556	1629	288	71	106	511	3173	419

Table 4.5. Summary of Rock Art Motifs (percent in each group).

Motif	Rock Art Group (see Figure 4.22) I	II	III	IV	V	VI	VII	Petros	Pictos
Anthropomorph	18	8	14	9	11	10	19	13	5
with staff/headdress	0	.4	2	1	0	0	2	2	0
with flute	0	.6	.4	0	0	0	3	.7	0
Kachina	0	0	3	2	0	0	0	2	0
Quadruped	0	8	14	2	3	3	30	13	0
Mountain lion	0	0	.1	.4	.3	1	3	.7	0
Bird	0	2	3	0	2	0	.7	2	0
Lizard	0	1	2	2	2	8	3	2	.5
Snake	18	3	4	.8	5	13	6	4	0
Other	0	1	.5	0	2	10	2	1	0
Bear paw	0	0	7	.8	3	8	0	4	0
Mountain lion	0	0	.9	0	10	0	0	.7	0
Bird track	0	3	4	6	0	0	.5	3	3
Ungulate (antelope)	0	0	5	1	0	0	0	2	0
Foot (human)	0	14	7	23	10	7	4	9	3
Hand	0	.4	1	1	2	0	0	.8	38
Textile/pottery	18	3	2	0	0	1	4	2	0
Paho	0	.2	.5	1	0	1	0	.3	0
Geometric	45	54	29	50	48	29	23	35	52

Miscellaneous Prehistoric Site Types

AZ Q:1:274 is a slab–lined feature located on a low sand ridge overlooking an extensive petrified wood quarry. U–shaped and open to the southeast, the feature measures 40 by 60 cm. No charcoal was noted and its dating and cultural affiliation are uncertain.

AZ Q:1:296 is an isolated milling feature located in the grasslands northeast of Crystal Forest (Figure 4.40). It consists of eight bedrock mortars and five cupules on a low sandstone outcrop. Numerous sites were recorded in the surrounding area, including several with multiple milling slicks. The dating and cultural affiliation of this site is uncertain. Mortars are not common in the Park, usually occurring at sites as isolated examples. The exception is six mortars reported at a Navajo site near the Flattops.

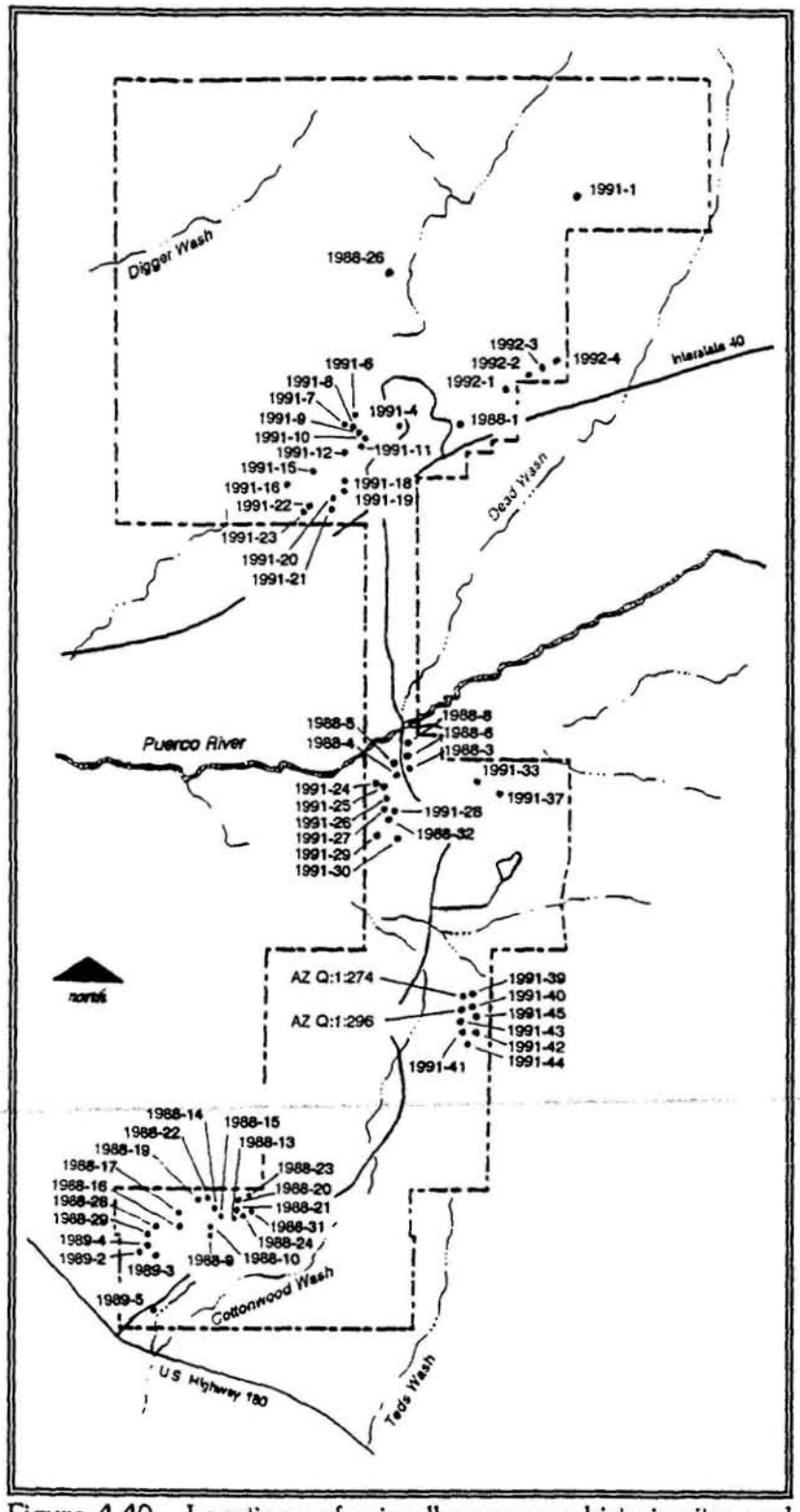


Figure 4.40. Locations of miscellaneous prehistoric sites and isolates (year recorded and isolate number).

Isolates

The 67 recorded prehistoric isolates consist of 10 isolated lithic artifacts, 14 isolated sherds, 16 sparse lithic scatters, 11 sherd scatters, 14 artifact scatters, and a single isolated rock art element (Appendix E, Figure 4.40). Also noted were three fossil long bone fragments in the Painted Desert section of the Park.

Historic Sites

Thirty-one historic sites and 24 historic isolates were recorded. Figures 4.41 and 4.42 depict the locations of these, with Figure 4.42 showing more detailed locations of sites and isolates in the Puerco Ruin area. In this discussion the historic sites and isolates are grouped into three categories: those associated with the Civilian Conservation Corps (CCC-era), other Euro-american sites, and Native American sites (Table 4.6). Several of the sites include more than one component; each component is discussed under the appropriate category.

CCC-era Sites

Nineteen of the historic sites can be attributed to activities of the Civilian Conservation Corps (CCC), which was active in the Park from 1934 to 1942. These sites include the remains of two of the three main CCC camps at Petrified Forest, five other areas of structural remains, a spike camp, a trash scatter, a trash dump, five work areas or quarries, and a small masonry dam.

CCC-era inscriptions are present at five of these sites and at three other sites. Names from these inscriptions (see Appendix E) were compared to a 1940 CCC roster and two 1939 newsletters. Elbridge Morrill, former subaltern of one of the CCC camps recorded, provided the 1940 roster (Figure 4.43). The newsletters were provided by former CCC enrollee, Robert D. Perry. Both Morrill and Perry, and former enrollee Paul LeVasseur, also provided photographs taken during their stay. Additional information was acquired from interviews with Morrill and with former camp mechanic and local resident Frank Dobell (Figure 4.44).

AZ Q:1:70

The historic component of this site includes numerous CCC inscriptions in the vicinity of a rock art site, a few pieces of lumber, and two sandstone boulders with drill holes. Of the 46 inscriptions recorded, 12 are full names, and three of these are on the 1940 CCC roster. Three dated inscriptions are from 1939 (see Appendix E). One of the names dated "8/19/39" is also at AZ Q:1:272 (a CCC spike camp) in the southern portion of the Park, where the name is associated with the date "AUG 31 1939" (Figure 4.45).

AZ Q:1:71

This site, in the vicinity of a CCC camp (AZ Q:1:82) recorded in 1986 as part of the Boundary Survey (Jones 1987), is composed primarily of prehistoric rock art. Additional prehistoric rock art elements were recorded there in 1988. The site is listed here because it has several CCC- related inscriptions including several names, dates (all in 1938), and other designs, and an apparently more recent peace sign. However, no new historic elements were noted during the 1988 work.

AZ Q:1:82

This site consists of the remains of the third and final CCC camp at Petrified Forest (designated NP-8A) which was occupied by the CCC from August 1938 to March 1942. It is located south of Puerco Ruin below the east side of the mesa. This site was first encountered in 1986 during the Boundary Survey, but due to time constraints and its large size, only a few features at the site were partially recorded (Jones 1986). In 1991 the camp was recorded, and several outlying residential and work areas were

recorded as separate sites, discussed below.

Twenty-four features, described below, were identified from surface remains at the camp. These include the former locations of at least nine buildings, sidewalk alignments and other rock features, several depressions, the former flagpole location, and other features.

Historic photographs and documents and on–site informant interviews were used to supplement the archeological evidence at the site. In some cases this information was useful in identifying the functions of existing features. But the historic and informant information was even more valuable in pointing out the discrepancy between the scant archeological evidence and the original camp layout.

By 1936 nearly all CCC camps were built of portable precut buildings which could be transported from site to site. A typical camp consisted of 24 buildings, including four barracks, a kitchen and mess hall, bath houses, a latrine, a school building, a recreational building, an infirmary, quarters for officers and enlisted personnel, and other buildings for various support services. Barracks buildings held from 40 to 50 men each (Cohen 1980:25-26).

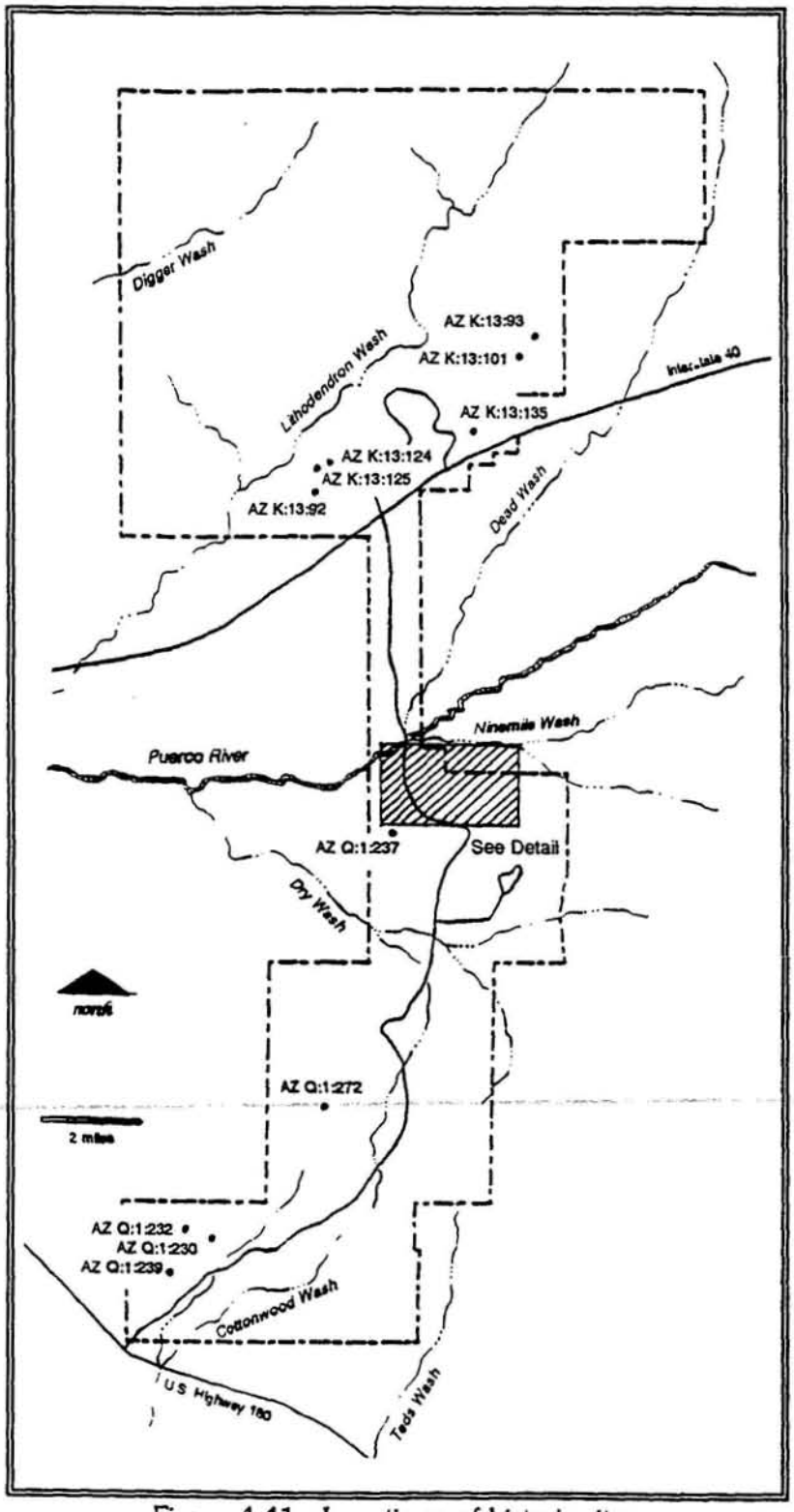


Figure 4.41. Locations of historic sites.

The NP–8A camp appears to have been divided into a maintenance/support area and the main camp. The maintenance area had its own access road and was separated

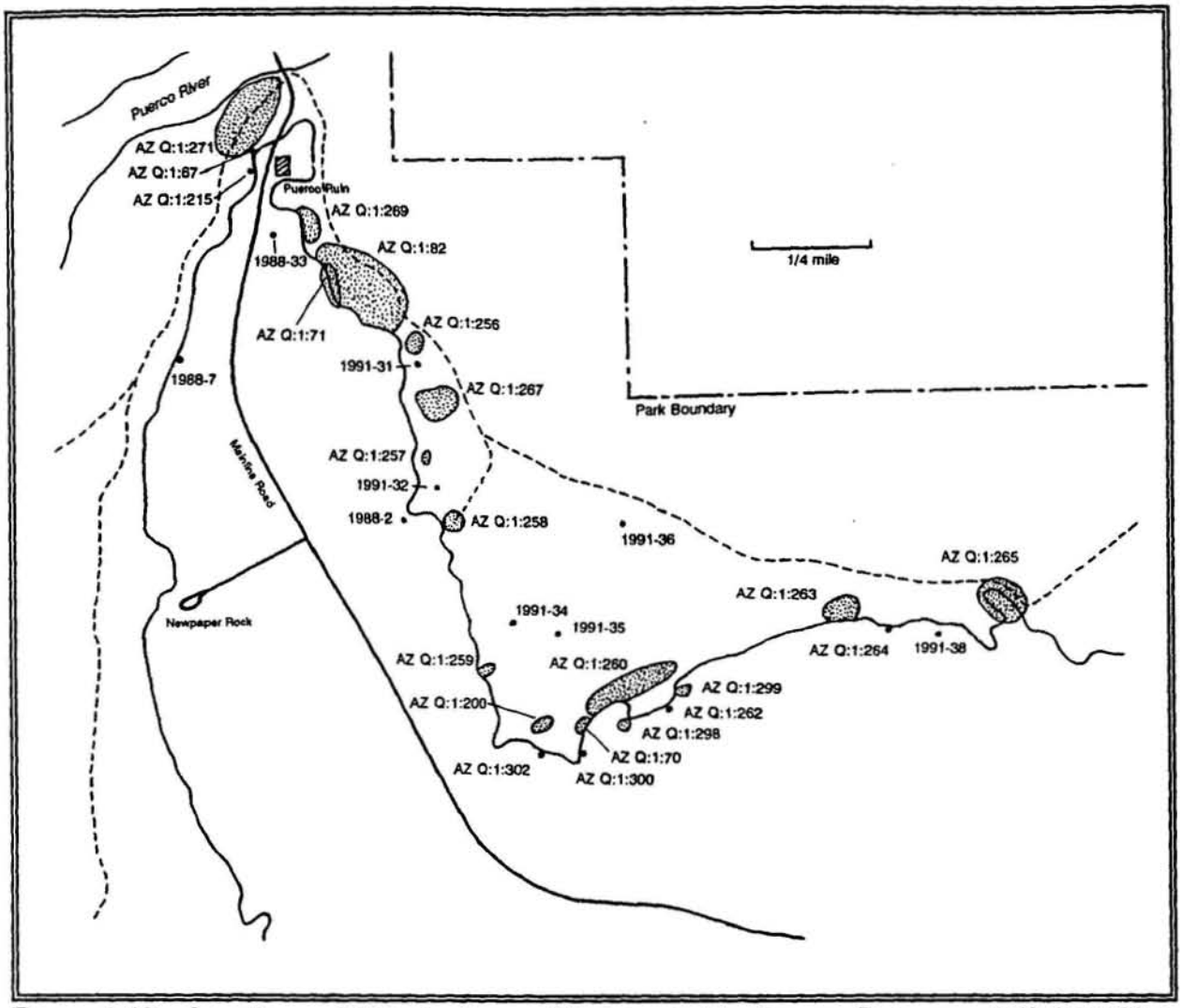


Figure 4.42. Locations of historic sites and isolates in the Puerco Ruin area (AZ Q:1:200 is reported in Wells 1989).

Table 4.6. Historic Site Types.

Site type	CCC-era	Other Euroamerican	Native American
Structural Remains	8	5	1
Artifact Scatter	2	–	–
Work area/quarry	5	–	–
Water Control	1	–	–
Inscriptions*	8	9	2

* includes sites listed under other site types above.

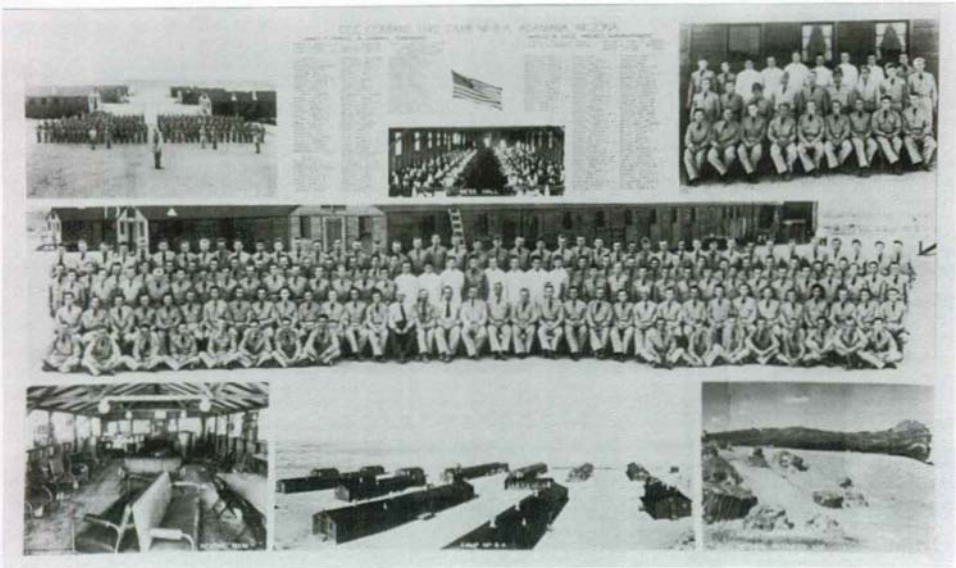


Figure 4.43. CCC Company 3342, Camp NP–8A, Adamana, Arizona.



Figure 4.44. Rainbow Forest CCC Camp staff. Frank Dobell is in second row on right end.

from the main camp by a ditch and fence. The main area of the camp consisted of two rows of six buildings each, and a few other structures (Figures 4.46-4.49). The maintenance area was composed of three main buildings and several other structures. Many of the prefabricated buildings shown in the photographs have no physical evidence today, something which has also been noted at other CCC camps (Wells 1986:6). However, further evidence of building locations may lie just below the sand and brush. Figure 4.47 is a reconstruction based on all available information.

Most of the camp was dismantled after World War II, but buildings in the camp support and maintenance area were used by the Park until they were torn down in 1953. Features 1 through 8 relate to the maintenance/support area and features 9 through 17 are associated with the main camp area. Features 18 through 24 are located east of the main camp.

Artifacts noted in the main camp area included a door knob, a door lock, and a section of sewer pipe. Beyond building debris, few other artifacts were noted. These included Army buttons, a *Dominos* aftershave bottle, two milk bottles from the *Phoenix Dairy* (one collected in 1986), an ink bottle, and a cabinet key. Artifacts were much more abundant in the camp support area around Features 1 through 8. Artifacts noted here included wire nails, bottle and window glass, lumber fragments, electrical porcelain and wiring, auto and tool parts, and other miscellaneous metal parts. The greater density of artifacts in this area of the camp most likely reflects its longer use.

Feature 1

This feature consists of low concrete mortared sandstone walls, which apparently formed the foundation for a small masonry building and wall at the entrance to the maintenance area, visible in old photographs. The building and wall were dismantled and rock removed in 1953.

Feature 2

This feature, noted in 1986, consists of two leveled areas separated by a low gravel berm. In the western area there are remnants of concrete and stone foundations. Frank Dobell identified this as the location of an office and supply room (Figures 4.50 and 4.51). Historic photographs show no building in the other area.

Feature 3

This feature is a leveled gravel area which served as a parking area. Frank Dobell indicated that an oil shed and two covered "truck ports" were at the base of the talus slope (Figures 4.52 and 4.53).

Feature 4

This feature, recorded in 1986, consists of a curving rock wall, 16 feet long, constructed of three to five loosely laid courses of sandstone slabs.



Figure 4.45. Civilian Conservation Corps (CCC) inscriptions at Petrified Forest; a-b. AZ Q:1:70, c. AZ Q:1:260, d-f. AZ Q:1:263, g-i. AZ Q:1:272, j. AZ Q:1:67, k. AZ Q:1:299 (scale varies).

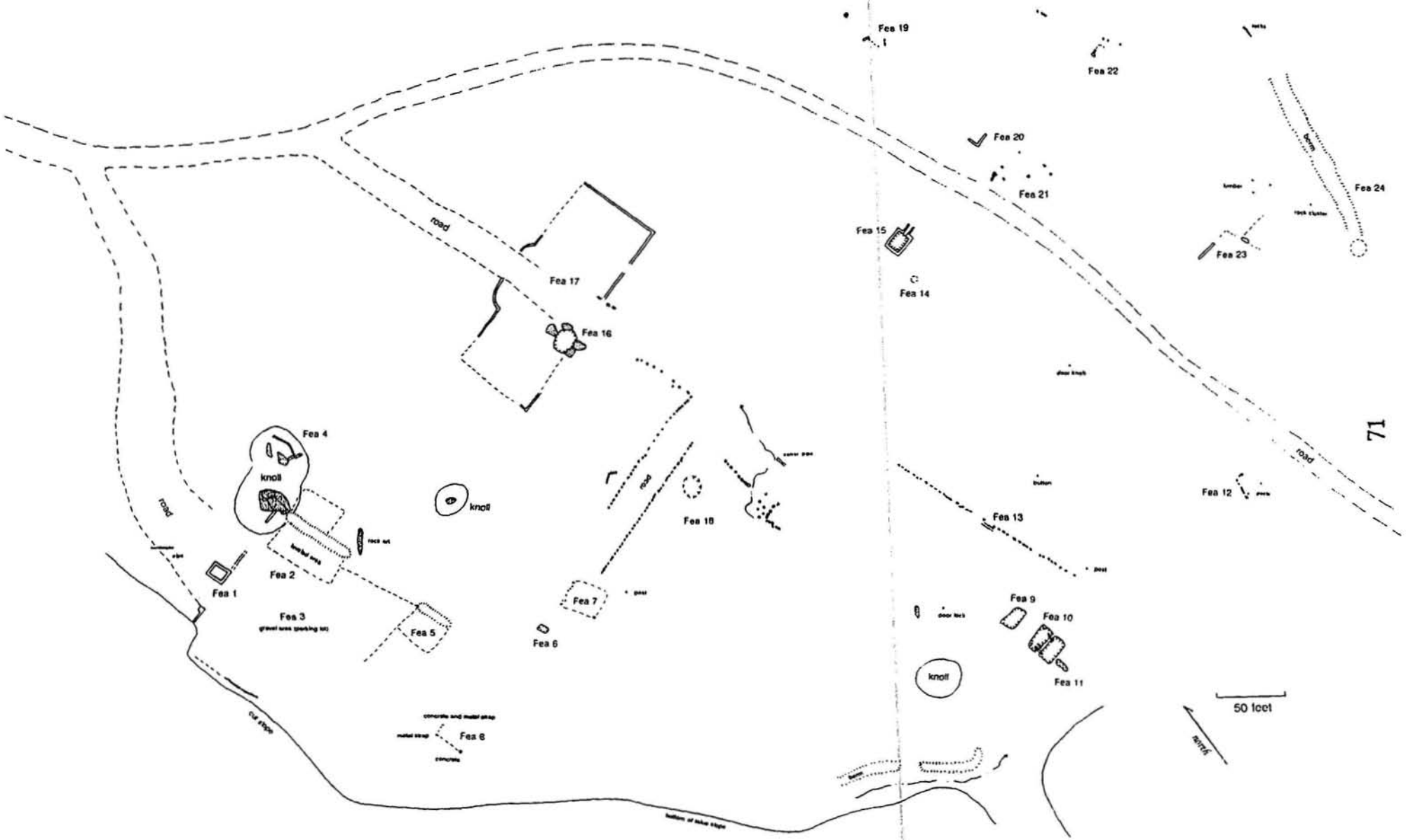


Figure 4.46. AZ Q:1:82 plan map (CCC Camp NP–8A).



Figure 4.47. CCC Camp NP–8A, Adamana, Arizona (reconstruction).



Figure 4.48. Overview of CCC camp NP-8A (Paul LeVasseur photo 1941).



Figure 4.49. Overview of AZ Q:1:82 (CCC camp NP-8A).

Feature 5
This feature is a leveled area with a low berm on its northeast side. Old Park records identify this as the location of an office.

Feature 6
This is a 3 by 6 foot depression with concrete blocks and rocks scattered in and around it.



Figure 4.50. Office and supply building in 1953.



Figure 4.51. Feature 2 at AZ Q:1:82 (office and supply building).

Feature 7
This is a leveled area, apparently a structure pad. In the southwest corner is a concrete block and on the northwest and north there are flat rocks all set in the ground as for a foundation. Frank Dobell indicated that there was a light plant (small electricity generator) in this area.

Feature 8
This is a leveled area, with concrete blocks and metal straps set in the ground on the

was located. The hole and slabs were apparently left when it was removed.

Feature 17
This feature is a low cement–mortared sandstone wall, roughly rectangular in plan, bisected by a road. Although the wall itself is not visible in early photographs, two buildings that could have been surrounded by it are depicted. The wall would have distinguished these buildings from the rest of the camp. The location of the buildings, flanking the entrance to the camp, and their proximity to the flagpole, suggests they may have served as the camp headquarters.



Figure 4.55. Feature 16 (flagpole location) at AZ Q:1:82.

Feature 18
This is a terraced area with rock alignments to north and east. From photographs it appears to have been a building location.

Features 19 through 23
To the northeast of the camp and across the road are several concentrations of building debris, including chunks of concrete, sandstone, and cement block. These may be the remains of scavenged buildings from the camp or the remains of sheds and other things that show up indistinctly in the vicinity in the historic photographs.

Feature 24
This feature, a low earthen berm 150 feet long located east of the camp, was apparently constructed for flood control.

Other Features
On the cliff face high above the camp is painted in white the word "IRISH." Water tanks on the talus slope, visible in old photographs on file at WACC, were not relocated.

AZ Q:1:239
Located in the Rainbow Forest section of the Park, the historic component of this site consists of a masonry dam on an unnamed wash. It is adjacent to a badly eroded prehistoric field house constructed of petrified wood. The cement and masonry dam is constructed of shaped sandstone blocks similar to those used in the Park Service complex at Rainbow Forest. The dam measures approximately 50 feet long by 6 feet wide by 4 feet high (Figure 4.56). Sediments have infilled behind the dam and now the wash passes around the dam's edge. Its construction by the CCC is problematical but likely, since the CCC worked on numerous other erosion control projects in the Park.

AZ Q:1:256
This site consists of two structure pads, most likely left from residences associated with the CCC Camp NP-8A. It consists of two features and trash scatters and concentrations below the eastern edge of Puerco Ruin Mesa, 0.2 mile south of the main part of the CCC camp. Feature 1 is a cement–mortared and sandstone slab pad measuring approximately 15 by 15 feet in size. It appears to be a porch or stoop to a build-

ing, since removed. Scattered trash, mostly to the rear of what would have been the building, includes wire nails, a small light bulb, fire brick, a Coke bottle base fragment, Barq's soda bottle fragments, and a strap closure (embossed with the words BROWN–FOREMAN). A faint road trace leads west from Feature 1, 230 feet to a currently used road. Along this road trace is a trash concentration of lumber, pipe, rusted iron, and a fork. Feature 2, 150 feet south of Feature 1, is a leveled area 20 by 30 feet cut into a sand bank. Four large sandstone slabs laying just north of the feature may have served as corner foundations for a structure. A trash scatter surrounding this feature contains numerous window glass fragments, some cast iron stove parts, an electric insulator, wire nails, amber glass fragments, and an electric light fixture.

AZ Q:1:257

This scatter of several hundred historic artifacts is situated at the base of the talus slope of Puerco Ruin Mesa, 0.35 mile south of CCC Camp NP–8A. It is at the toe of the eastern edge of the mesa in a small cove formed by a low sandstone ridge. It could not be determined if a structure ever existed at the location or if the material was dumped. Artifacts noted at the site included a wooden box, wire, wire nails, sheet metal, hardware cloth, nuts and bolts, window screen, lumber, metal and ceramic pipe, tin fragments, jar and bottle glass fragments, fuse board, and three whiskey bottles (embossed with Federal Law Forbids...[post 1933]). A label on the fuse board indicates it was made by the Culter–Hammer Manufacturing Company of Milwaukee. Tags on the board indicate fuses for a lathe, a grinder, lights, and a drill press.



Figure 4.56. Jim Vint sitting on left end of masonry dam at AZ Q:1:239.

AZ Q:1:258

This site consists of four features, an access road, and an extensive scatter of historic artifacts. It is located at the foot of the eastern edge of Puerco Ruin Mesa, 0.5 mile south of CCC camp NP–8A. The road and an abandoned structure are shown in this location on the 1982 USGS map.

Feature 1 is a sheltering rock about 16 by 16 by 4 feet high with a dry–laid rock wall one to three courses high, with no associated artifacts.

Feature 2 is a 16 by 32 foot scatter of milled lumber, rock footings, wire nails, sanitary seam cans, condensed milk cans, clear bottle glass, a spring, and a hinge.

Feature 3 is the remains of a tent structure, consisting of a leveled area and several tent poles (Figure 4.57). At the time of the 1991 recording, one of the poles was still standing. Within the 15 by 20 foot area defined by the tent poles are window glass fragments, four coal buckets, cast iron stove parts, leather fragments, four pie pans, and other lumber. More artifacts appear to be buried in the sand.

Feature 4 is a possible borrow pit or storage area cut into a low sand ridge. Within the excavated area are piles of broken sandstone rock. Scattered trash in the vicinity includes tobacco tins,



Figure 4.57. Feature 3 at AZ Q:1:258 (tent pad).

Table 4.7. Historic Artifacts at AZ Q:1:258 with Hallmarks or Embossing.

Embossed and painted clear glass:

STAR AUTOMATIC SUGAR DISPENSER (bottle/jar base).

HA 5242 1 (bottle base) trademark of the Hazel–Atlas Glass Co., Wheeling, West Va., used 1920–1964 (Toulouse 1971:239–242).

FEDERAL LAW FORBIDS SALE OR REUSE OF THIS BOTTLE (embossed on bottle neck) D9 69 S 42 M–169 (base) 42 may stand for 1942.

DRINK BARQ'S TRADE MARK REG. IT'S GOOD (front body of bottle) EVERY BOTTLE STERILIZED FLAG-STAFF, ARIZONA CONTENTS 12 FLU. OZS. (back body) DESIGN PAT. D–98026 6 4402 G 12 FL. OZ. 23 o 0. Trademark of the Owens–Illinois Pacific Coast Co., Los Angeles Plant (#23) used 1932–1943+. The 0 may indicate a year ending in 0, such as 1940 or 1950.

Ceramic hallmarks:

TEPO U.S.A. CHINA

D.E. McNICOL VITRIFIED CHINA CLARKSBURG, W.VA.

...NANGO ...Q.M.C. ...ECW7

WALLACE XG CHINA ...

JACKSON CHINA

Cast iron stove part:

KEEP OPEN FOR SOFT COAL (hinged vent)



Figure 4.58. Paint can and brush at AZ Q:1:258.

clear, amber, and blue glass, a small paint bottle, wire nails, lumber, and hundreds of small wire fragments.

Other artifacts noted in the site area include fragments of thick whiteware plates, cups, gravy boats, and a pitcher, whiskey bottles, light fixtures, soda bottles and jars, a paint can with a brush, window screen, brick, green-painted lumber, hardware cloth, clothes hangers, and other artifacts (Table 4.7; Figure 4.58).

AZ Q:1:259

This site is a concentration of trash dumped off the east edge of Puerco Ruin Mesa approximately 0.7 mile south of CCC camp NP-8A. The Park mainline road is 0.2 mile west. Artifacts noted included lumber, wire nails, a bucket, seven 55-gallon drums (each painted "Mobil oil"), a hose, hundreds of sanitary seal and condensed milk cans, metal parts, machine parts, pipe and culvert, stove parts, sheet metal, and a clock part. Interestingly, no glass is present. Most of the artifacts are at the top of the talus slope just below the cliff edge, but a few of the larger artifacts have made it to the valley floor. Similar artifacts were noted at other CCC sites in the vicinity.

AZ Q:1:260

This site, 1 mile southeast of CCC camp NP-8A, appears to be the remains of a CCC work area where sandstone was dressed and loaded for transport. Rock was apparently taken from the talus slope and possibly from two quarries on the mesa top (see AZ Q:1:298 and 299 below). Five loci were discerned at the site and each is described below. Also noted at the site were two large boulders with numerous inscriptions. Artifacts observed at the site were limited to lumber, 55-gallon drums, pipe, window screen, and metal fragments.

Locus 1 consists of two features. Feature 1 is a 25 by 25 foot loading dock, consisting of a built-up area with a rock retaining wall. Two 55-gallon drums are present at the feature. Feature 2 is a 23 by 32 foot leveled area adjacent to Feature 1, possibly a structure pad or storage area.

Locus 2 also contains two features. Feature 1 is a leveled area, 10 by 23 foot in size, cut into the talus slope slightly above the surrounding ground slope. It may be a loading dock or structure pad. Feature 2 is a 13 by 16 foot loading dock of built-up earth faced with a rock retaining wall.

Locus 3 consists of two large boulders with prehistoric rock art and historic inscriptions (see Figure 4.45). One of the boulders has a series of evenly spaced horizontal drill holes approximately 5 feet above the present ground surface. The area at the base of the boulder appears leveled and possibly graveled. These holes may have been from training rock drilling or formed supports for a temporary tent structure. The boulders contain 87 historic elements (Appendix B and C). This includes 19 full names, of which nine are on a 1940 CCC roster or mentioned in 1939 CCC newsletters. Of the remaining 60 names and initials, 16 could be abbreviations for names on the CCC lists. One set of initials (HC JP) is similar to one at AZ Q:1:263 and is most likely by the same person (Appendix E). Dated elements include four within 1940, one within 1939, and three within 1937. Four inscriptions, including the three 1937 dates, are believed not to be associated with the other CCC inscriptions and are discussed below under Other Euroamerican Sites. Other boulders with CCC rock art on the talus slope above Locus 3 were recorded as part of AZ Q:1:70 (see above).

Locus 4 consists of three features. Feature 1 is a 16–foot–diameter depression and adjacent rock piles. Feature 2 is a depression measuring 23 by 10 by 6 feet deep. Feature 3 consists of several rock piles north of Feature 2. The rock piles may be sandstone trimming debris.

Locus 5 consists of 11 small to large concentrations of sandstone debris located in a small alcove of the talus slope over 300 feet east of the main site area.

AZ Q:1:261

The historic component at this prehistoric rockshelter consists of a single inscription reading IDBW scratched above the entrance. The CCC site ascription is based on the presence of several CCC sites in the immediate area and the fact that the rockshelter was excavated by Park staff and CCC enrollees (Gale 1941).

AZ Q:1:262

The historic component at this small prehistoric rock art site consists of a scratched geometric design and a partially eroded name and place. They appear to be the handiwork of Neal Guntrum of Rimmersburg, Pennsylvania, who is listed on the 1940 CCC roster as a Leader (Appendix E).

AZ Q:1:263

This site consists of work areas, a sandstone quarry, and inscriptions. Three features were identified at the site: Feature 1 is a concentration of sandstone blocks in a wash at the foot of the talus slope; Feature 2 consists of three large piles of sandstone debris; and Feature 3 is a large quarried rock with numerous drill holes. On the talus slope above are six boulders with historic inscriptions (see Figure 4.45). Seven are full names, two of which are on the 1940 CCC roster. Dates include 1938, 1940, 1941, and 1944. These inscriptions include the only women's names recorded, but their context (such as within a heart) suggests the women were not necessarily present. Two of the inscriptions (one dated 1944) apparently post–date the CCC–era and are discussed below.

AZ Q:1:265

This site consists of a work area and sandstone quarry centered around a small bluff 1.5 miles southeast of CCC camp NP–8A. The bluff has been quarried. Around the base of the bluff were noted a pallet holding lumber, small auto parts, headlight glass, rebar, copper tubing, wire, and scattered lumber, rocks, and petrified wood chunks. Drainages to the north and south of the bluff have numerous small chicken wire and wood erosion control structures. On the bluff is a rock ring that could be either a fire hearth or a cairn. No charcoal was noted at the rock ring; part of a mess kit and a large iron spike were nearby.

AZ Q:1:267

This site consists of two explosives sheds 0.3 mile south of CCC camp NP–8A (Figure 4.59). Also at the site is a large shallow depression, possibly a borrow pit. A faint road trace leads to one of the sheds. Along this road trace is a faded wooden sign reading: KEEP OUT EXPLOSIVES.

AZ Q:1:269

This site consists of two stone and cement foundations 250 feet north of CCC camp NP–8A. One of these was identified from photographs as the remains of a residence occupied by the camp subaltern, Elbridge Morrill, and his wife, Genevieve (Figures 4.60 and 4.61). The other feature has not



Figure 4.59. Explosives shed at AZ Q:1:267.



Figure 4.60. Elbridge Morrill in front of his CCC home (Genevieve Morrill photo 1941).



Figure 4.61. Feature 1 at AZ Q:1:269 (Morrill home).

been identified. It does not appear in the photographs; is either outside the photograph frame or is hidden by the Morrill's home. The foundations are up against the talus slope and there is a small loose rock diversion dam to the north of the foundations to divert water away from the front of the structures. Behind and upslope of the Morrill residence is a series of stairs leading to a scatter of lumber, possibly once an outhouse.

AZ Q:1:271

This site, within the Puerco River floodplain at the base of Puerco Ruin Mesa, includes the area of the first CCC camp at Petrified Forest as well as other historic remains. The first CCC company at Petrified Forest was the 831. This camp was established in May 1934; the main group of enrollees arrived in July. Adjacent to the site is an inscription reading "LR CCC 831 7 4 34" (Figure 4.62) recorded in 1988 along with the prehistoric rock art at AZ Q:1:67 (Burton 1990). The camp was moved to Rainbow Forest in October 1934 (Maze 1981a-c).

Six features were identified at the site. Two historic photographs acquired after fieldwork indicate that the camp was more extensive than recorded, with structures as far south as the area of the present sewage ponds (Figures 4.63 and 4.64). In the photographs three permanent structures and approximately 25 tent structures can be discerned. Evidence of two of the permanent structures would have been destroyed during construction of the Puerco Ruin restroom sewage ponds. It appears that the third structure could be associated with Feature 3 or Features 4, 5, and 6, discussed below. Most of the tent structures were northeast and southwest of this structure.



Figure 4.62. CCC inscription at AZ Q:1:67.

The road through the camp apparently follows the same alignment as the current waterline road. Features 1 and 2 cannot be seen in the photographs.

Feature 1

This is a masonry and cement pumphouse structure reportedly built by the CCC, which is still in service. Overall dimensions are 16 by 26 feet. Two doorways in the east wall are boarded up. An access road and parking area lie to the east; several large rocks border the south edge of the road.



Figure 4.63. Overview of first CCC camp at Petrified Forest (Robert Perry photo 1937).



Figure 4.64. Overview of AZ Q:1:271 (first CCC camp).

Feature 2

This feature is a rock and concrete structure either set into, or later partially covered by, a sand bank. The structure, probably used for storage, measures 13 by 15 by 4.5 feet high, with walls 18 inches thick. No roof remains, but there is a wood lintel over the 3-foot-wide doorway which opens to the east (Figure 4.65).



Figure 4.65. Feature 2 at AZ Q:1:271.

Feature 3

This feature, 100 feet south of Feature 2, is apparently a foundation. Similar in construction to Feature 2, it consists of a U-shaped rock and concrete wall, open to the west. The foundation measures 6 by 12 ft. in plan and, as at Feature 2, the walls are 18 inches thick. Most of the wall has been removed to ground level, but one 2-foot-high portion is flat and flushed, apparently the maximum height. Two fragments of the wall or possibly additional foundations lie 12 feet to the north.

Features 4, 5, and 6

These three features are in a 50 by 30 foot area between the waterline road and Features 2 and 3. They may all be associated with the same structure. Feature 4 is a concrete slab, mostly buried by sand. The exposed portion measures approximately 3 feet by 6 feet. Feature 5 is a shallow depression (measuring 3 by 10 feet) with two sections of 2.5 inch pipe partially buried within it. Feature 6 is a shallow rectangular-shaped depression measuring 4.5 by 8 ft. Scattered bits of metal were noted around these features.

AZ Q:1:272

This site consists of scattered lumber, numerous inscriptions, and one boulder with prehistoric rock art in a small box canyon. The inscriptions include an 1897 inscription, described below. The CCC inscriptions are in two concentrations, one near the lumber scatter and the other 650 feet east near the Park waterline (Figure 4.66). Traces of a road can be seen leading from the lumber scatter to the waterline road. This area is reported to have been a CCC spike camp used during construction of the waterline. No structure locations could be discerned, which is not surprising since spike camps were generally composed of temporary tent structures.

Most of the dated inscriptions fall within 1939, with a few dated within 1941 and 1942. Place names all refer to cities and towns in Pennsylvania (Appendix E). Three of the names are on the 1940 CCC roster. One of the names is also at AZ Q:1:70 (see Figure 4.45).

AZ Q:1:298

This site is a large sandstone quarry at the top edge of Puerco Ruin Mesa, 1 mile southeast of CCC camp NP-8A (Figure 4.67). Numerous large blocks and slabs have been removed. Inscriptions noted at the site include: E.G., EAG, and TEXAS. These were probably done by enrollees of



Figure 4.66. CCC inscription at AZ Q:1:272.



Figure 4.67. Sandstone quarry (AZ Q:1:298).



Figure 4.68. Don Christensen and Frank Dobell (on left) inspecting rewelded CCC road grader bought by Frank in 1942 as cut-up scrap (Isolate 1991C-48).

the second CCC camp (1936–1938), made up of enrollees from Texas. ERNIE is carved on a wood beam found on the talus slope just below the quarry. The quarry overlooks a prehistoric rockshelter excavated in 1941 (Gale 1941) and a CCC work area (AZ Q:1:260).

AZ Q:1:299

This is another large sandstone quarry on the edge of Puerco Ruin Mesa, 300 feet east of AZ Q:1:298. A faint road trace was noted on the mesa top but it could not be followed for any great distance. Noted at the site were a weathered picnic table part and a sawhorse. The few historic inscriptions noted at the site include a reference to CAMP NP–8A dated 9/3/41 (Figure 4.45k), initials, and a name (Appendix E).

Isolates

Of the 24 historic isolates recorded (Appendix C), ten can be attributed to CCC activities. CCC–related artifacts recorded include a landscaping roller at the CCC golf course, a coal bucket, a large iron flywheel, and a road grader used by the CCC and now owned by Frank Dobell (Figure 4.68). CCC–related features include a sandstone quarry, an abandoned golf course built by the CCC, a leveled area perhaps associated with the golf course, a scatter of spikes and nails, a capped well, a single depression in the vicinity of the main CCC camp, and a depression with some adjacent trash. One feature recorded was a structure location marked by a few bricks (Figures 4.69 and 4.70). The structure was moved to the spot from CCC camp NP–8A for Park use; it was dismantled in 1953. Isolate locations are shown in Figure 4.71.



Figure 4.69. Park residence in 1953.



Figure 4.70. Isolate PEFO 1991C IF-47 (structure location).

Other Euroamerican Sites

Historic remains not discussed previously include 13 sites and 14 isolates. They contain artifacts or dated inscriptions that either pre- or post-date the CCC-era or sites that do not appear to be CCC-related. Sites include five with structural remains and eight with historic inscriptions. These probably relate to cattle and sheep ranching, tourism, or mining in the area. While Petri-

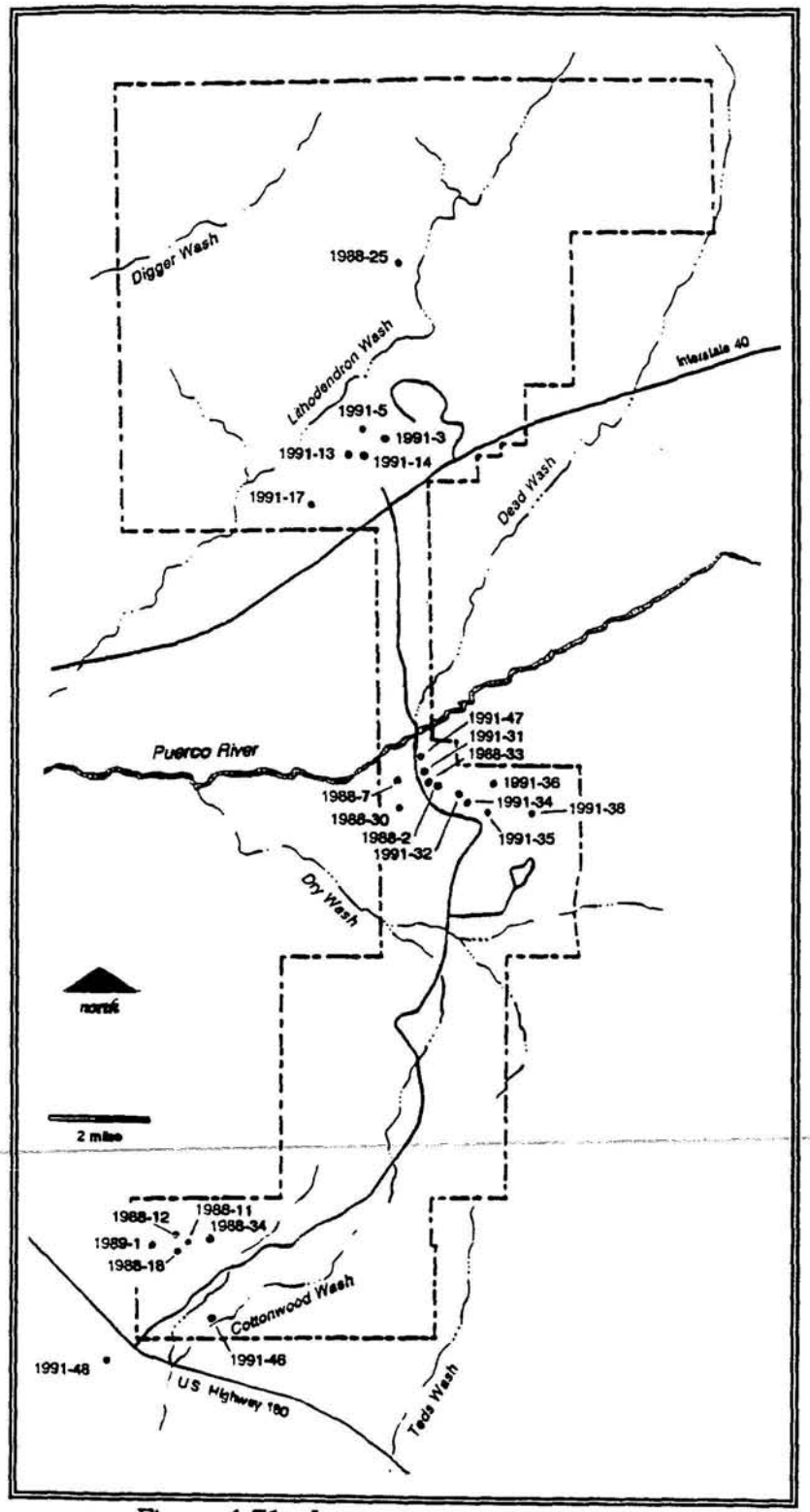


Figure 4.71. Locations of historic isolates.

fied Forest National Monument was established in 1906, the Blue Mesa and Puerco Ruin areas were not added until 1930 and the Painted Desert section was not added until 1932. Further, private inholdings were still present within the Park until the 1960s.

AZ K:13:92

This large prehistoric site contains abundant rock art and a few historic inscriptions. Most notable is one dated May 1925 by Solomon Sanchez (Figure 4.72). The remaining historic elements consist of two sets of initials. An abandoned road to Pilot Rock and Zuni Well passes just west of the site.

AZ K:13:93

This site, located in the Painted Desert portion of the Park, consists of structural remains. These ruins are noted on the current USGS map (1972). No structure is shown on the 1955 USGS map but a spring is shown. The main feature at the site is a single-room structure with standing walls over 6.5 feet high (Figure 4.73). Constructed of stone and concrete, the structure measures 15.75 feet east-west by 13 feet north-south. There is a door to the northeast and windows in the south and west walls. Varying colors of the mortar suggest more than one building episode. The north wall has collapsed. Just south of the structure is a mound of sandstone slabs, possibly once an outdoor oven.



Figure 4.72. Historic inscription at AZ K:13:92.

Also in the site area is an alignment of posts, most likely a fenceline, that extends from the structure area northeast approximately 650 feet to a seep (marked as a spring on 1955 USGS map). Just east of the seep is an abandoned barbed wire fence running north–south.

The structure is surrounded by an extensive scatter of eroding trash. Artifacts noted included a drill bit, a pipe wrench, bed springs, razor blades, a *Coleman* water cooler, a belt buckle, wire, glass beer bottle fragments, stove parts, wire nails, cans, and lumber. Identifiable cans included lard, *Calumet* baking power, tobacco, kerosene, beer (all steel), *Hercules* black blasting powder, brake fluid, and *Demand* motor oil. The artifacts suggest a relatively recent, post–1945 date for the site. The artifacts present, including the blasting powder cans, suggests use by a prospector, perhaps during the uranium prospecting boom of the 1950s and 1960s.

AZ K:13:125

This site consists of the single inscription "1924" on the sandstone caprock of a small isolated butte in the Painted Desert portion of the Park.

AZ K:13:135

This site is a small, 13 by 23 foot structural foundation of sandstone slabs and reused



Figure 4.73. Masonry ruin at AZ K:13:93.

concrete located along an old alignment of U.S. Highway 66. The walls are currently 8 to 16 inches high; wall fall along the west wall indicates an original height of at least 6.5 feet. Artifacts noted at the site included lumber, sewer pipe, sheet metal, bolts, wire, and barrel staves. While the exact use of the structure could not be determined, it may be associated with the Lion's Farm Curio shop located just northeast and across U.S. Highway 66 from the site. At one time the Lion's Farm consisted of a gas station, an overlook with a two–story tower, a curio shop, a duplex for employee housing, several storage sheds, and a parking lot. After completion of Interstate 40 3/4 mile to the south in the 1960s, the Park acquired and demolished the structures.

AZ Q:1:215

This site consists of structural remains just west of Puerco Ruin located within an enclosed area formed by a large sandstone block that has fallen away from the cliff face (see Burton 1990:figure 4.4). Features present include a slab–lined cist, a tin–lined hearth, cement, and a dry–laid rock wall that seals off one end of the area. The approximately 80 square foot area could have been easily roofed using the cliff face and block as supports. No artifacts were noted at the site. The cement in one corner may have been part of the original structure or dumped in later. The historic designation is based solely on the tin–lined hearth. The site may be associated with ranching or an early visitor to Puerco Ruin. However, the construction is more than what would be expected from a casual stay. It may be associated with the nearby CCC camp (AZ Q:1:271).

AZ Q:1:230

The historic component at this extensive prehistoric rock art site consists of abundant tourist graffiti. Most appears to post–date World War II. The CCC built an adjacent picnic area and a trail through the site in the 1930s; both were closed in the late 1950s.

AZ Q:1:232

This site is in open grassland on the mesa behind Rainbow Forest. It consists of two small concentrations of milled lumber, wire nails, tin sheeting, a square wood frame with 1/4–inch–mesh screen, and a circular depression approximately 50 feet in diameter. Most of the wood is nailed together and two posts are imbedded in the ground. The depression has a gravelly surface different than the surrounding area. Artifacts noted included an oil or kerosene can and a glass fragment with a Quaker figure embossed on it (Figure 4.74). No road or trail could be discerned leading to the site, which is about 1,000 feet west of the Park waterline road.

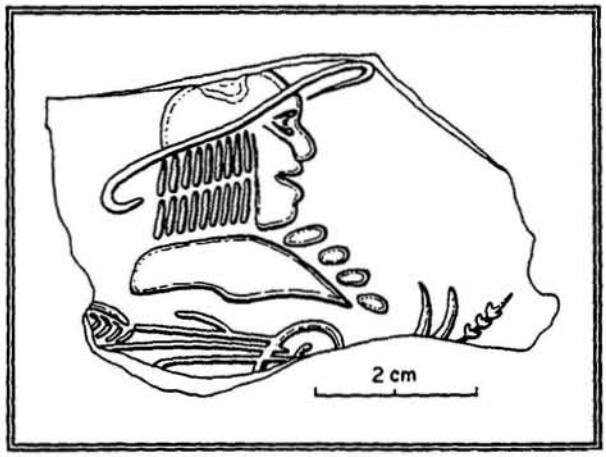


Figure 4.74. Embossed glass fragment from AZ Q:1:232.

AZ Q:1:237

The historic component of this site consists of a 20 by 30 foot alignment of sandstone blocks, one to two courses high, outlining a leveled area. It is 65 feet north of an eroding prehistoric field house, at the base of an eroding chinle clay slope. The front portion of the feature is covered by a sand dune. The feature may be a tent pad associated with a temporary corral. Three fence posts, two with barbed wire, are located nearby. The only historic artifacts noted at the site were a few can fragments and wire nails.

AZ Q:1:260

Several inscriptions at this site are different in style and spatial distribution than the abundant CCC inscriptions found here and described above. Deeply scratched rather than pecked, they include two by Vidal Moya, one dated Sept 1937 (Figure 4.75). Most of the scratched inscriptions are on the

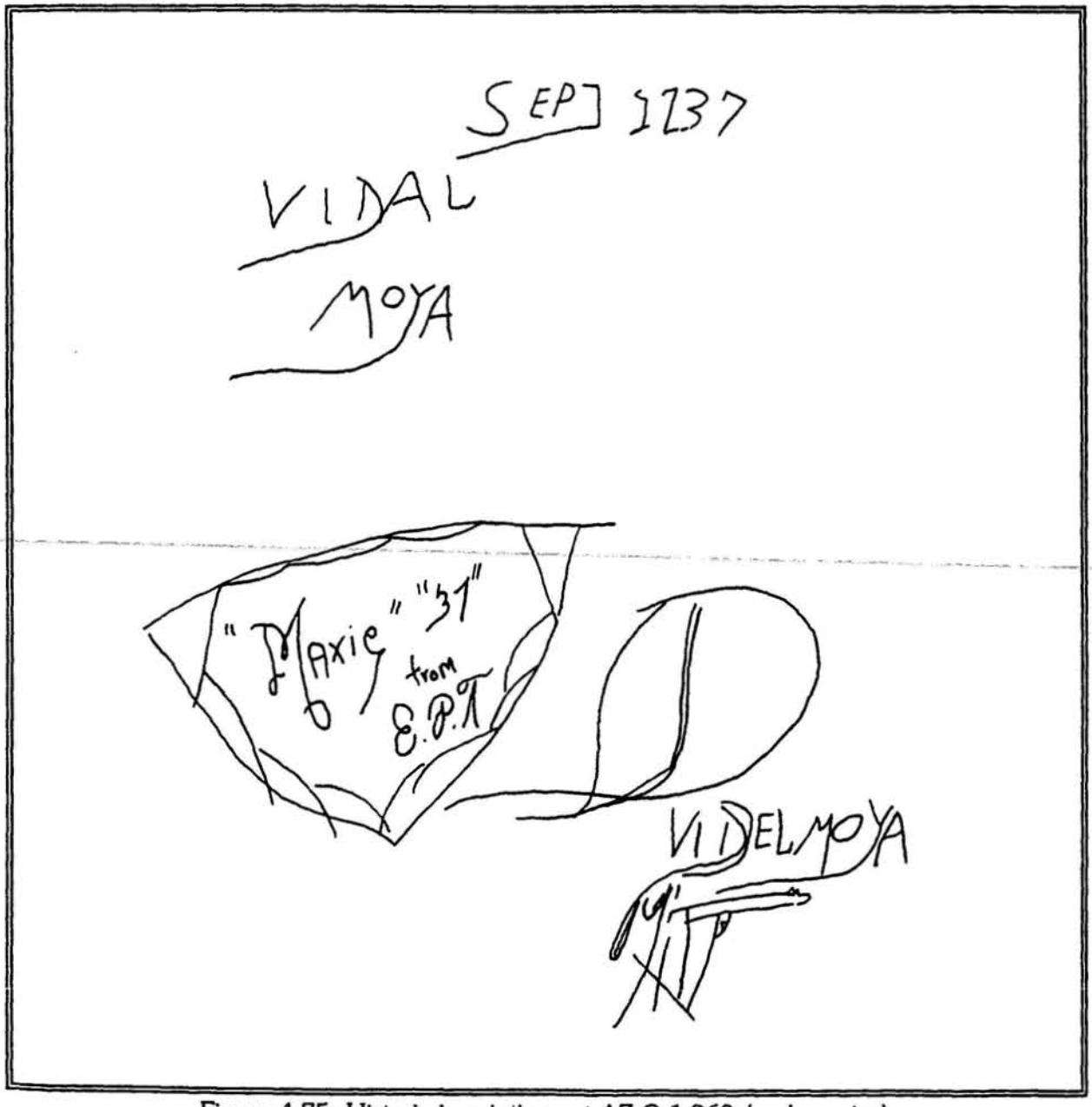


Figure 4.75. Historic inscriptions at AZ Q:1:260 (scale varies).



Figure 4.76. 1897 inscription at AZ Q:1:273.



Figure 4.77. 1927 inscription at AZ Q:1:300.

backside of a sloping boulder and are easily overlooked, while the CCC elements are bold and obvious. The scratched inscriptions may have been done by local cowboys.

AZ Q:1:263

Two inscriptions at this site post-date the CCC-era. One reads "Tucson Az RS Perez 1944" and the other, no doubt associated, "Perez."

AZ Q:1:272 and AZ Q:1:273

Two 1897 inscriptions were located in two small box canyons west of Crystal Forest. The inscription at AZ Q:1:272 is in an area of numerous CCC inscriptions and the one at AZ Q:1:273 is at a prehistoric rock art site. The inscription at AZ Q:1:272 is on the underside of a small sloping boulder, it reads "T MIEPA ..O FE 7. 1897." At AZ Q:1:273 the inscription on sandstone caprock reads "L SANTAGTUZ FE. 7. 1897" (Figure 4.76). Also with this inscription are the initials "TM," likely the T. Miepa of AZ Q:1:272. At both sites the inscriptions are accompanied by elaborated crosses, and at AZ Q:1:272 there is an additional abstract design. These individuals may have been sheep herders; the small canyons would have been excellent for short-term corralling of sheep or other animals.

AZ Q:1:300

This lone inscription south of Puerco Ruin reads "J.D. Hill 1927" (Figure 4.77). It is scratched into the sandstone caprock of the mesa.

AZ Q:1:302

These inscriptions at a small rockshelter with prehistoric rock art (described above) include two scratched hands, a framing element, and lines. The hands were likely inspired by the presence of a prehistoric handprint in red pigment on the shelter ceiling.

Isolates

Fourteen isolates, some potentially associated with the CCC, are included here (Appendix C, see Figure 4.71). Features recorded as isolates include two small rock check dams, window screen and antelope bone found in a small rockshelter, a sparse trash scatter, a borrow pit with an adjacent trash scatter, an imbedded iron pipe, an imbedded wooden stake and metal tee, a rock cairn, and an extensive dump. Artifacts recorded include a drag-type road grader (Figure 4.78), a whiskey bottle, and an

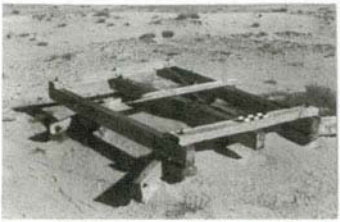


Figure 4.78. Drag–type road grader (IF 1988–25).

empty barbed wire spool, all in the Painted Desert section of the Park.

Native American Sites

Three sites in the Painted Desert portion of the Park can be attributed to historic Native American use. One, AZ K:13:101, is a Navajo habitation site. The other two sites, AZ K:13:123 and 124, are Hopi inscriptions. No other historic Hopi sites have been recorded within the Park. Previous to this project the only recorded Navajo sites in the Park consisted of a lone rock hogan near the Flattops recorded in 1975 (Stewart 1980:181-182) and a sheep corral north of Puerco Ruin (Hammack 1978:58). A Navajo basket and other artifacts recovered from a small rockshelter in 1990 are discussed in Chapter 7.

AZ K:13:101

This Navajo habitation site consists of 11 stone–walled circular to oval hogans in two loci. The site is just below the Painted Desert rim on both sides of a small canyon which is a tributary of Lithodendron Wash. A spring is noted on the USGS map 1/4 mile northeast (at site AZ K:13:93, see above). Locus 1, south of the canyon, has nine structures and Locus 2, north of the canyon, has two structures (Figure 4.79). There is a faint east–west road through Locus 1 which drops off the rim into the badlands below. At the rim the road has rock retaining walls and areas of cut and fill. A quick reconnaissance of the surrounding area did not relocate a reported corral but an adjacent steep–walled canyon would have been suitable for such use.

The hogans range in maximum dimension from 1.3 to 2.8 m, with walls of unshaped stone up to 1 m high (Figures 4.80–4.82). Doorways, where discernable, mostly open to the east, southeast, or south. Structural wood (trimmed juniper) is present at three of the hogans (Table 4.8).

At Locus 1, in addition to the nine structures there is a juniper wood post surrounded by a rock caim, axe cut juniper stumps, and two level areas apparently cleared of vegetation. A large sandstone slab just outside the opening of one structure has numerous scratches on it, but no words or designs could be discerned. Artifacts noted as possibly associated with the structures include two hole–in–cap cans (Figure 4.83), a utilized flake of petrified wood, and a worked sandstone slab. A concentration of small bone fragments (some burned) are eroding out of a small gully. Also noted at the site were cow or sheep tooth fragments, smooth wire, a piece of lumber with a wire nail, and a barbed wire spool. Locus 2 has two adjacent structures, each with a single separate exterior doorway. Artifacts noted at this locus included a beer bottle, two petrified wood flakes, and a cow or sheep tooth fragment.

The Navajo ascription of this site is based on architecture; no distinctive Navajo artifacts were encountered. The structures

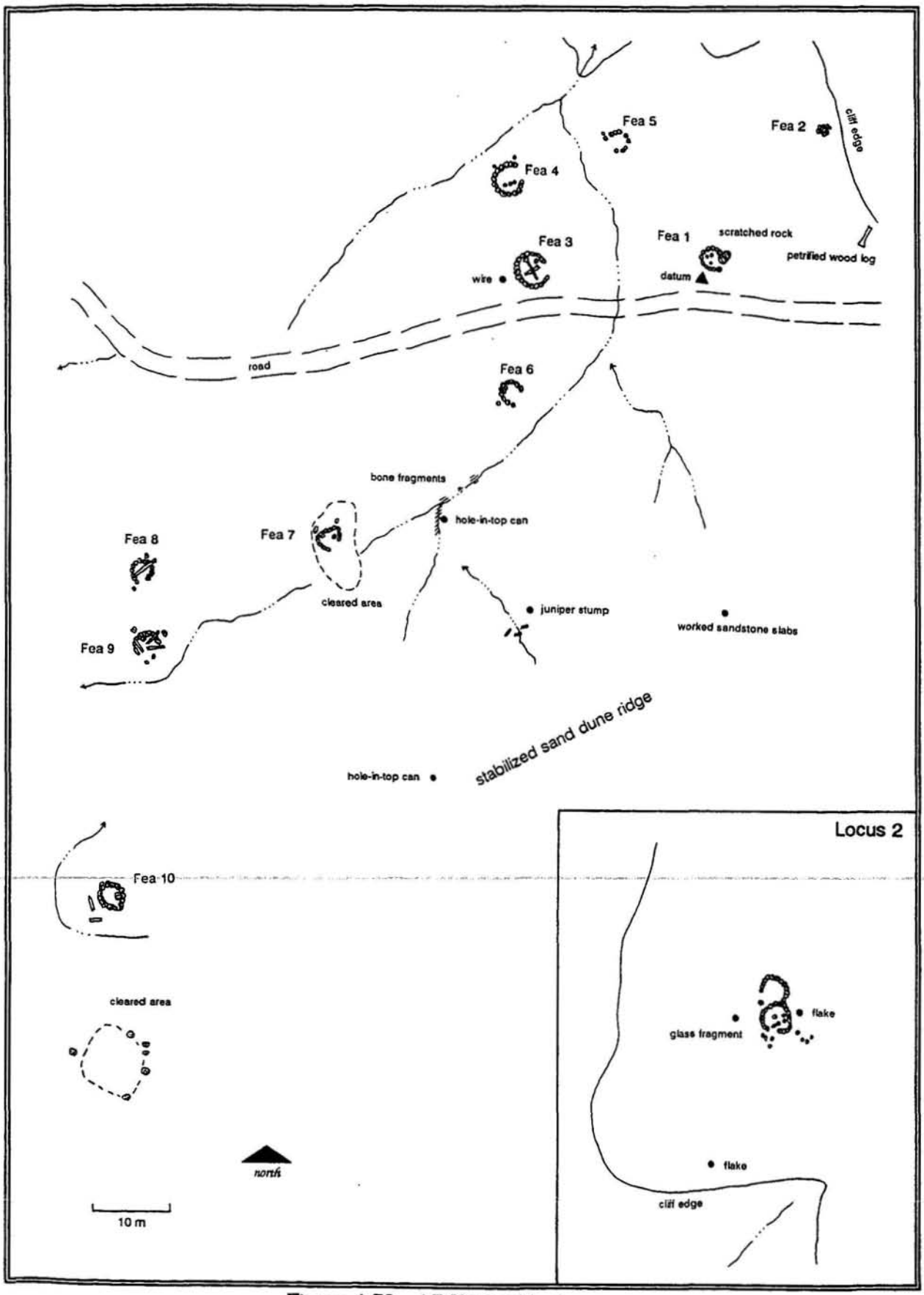


Figure 4.79. AZ K:13:101 plan map.



Figure 4.80. Feature 1-3 at AZ K:13:101.



Figure 4.81. Feature 1-7 at AZ K:13:101.



Figure 4.82. Feature 1-9 at AZ K:13:101.

recorded hogans ranged in diameter from 1.35 to 6.7 m with a mean of 2.88 m and walls up to 1.5 m high (Magers 1981:186), similar to those at AZ K:13:101. At Canyon del Muerto door openings also were generally facing east or south. AZ K:13:101 is a fairly large site; at Canyon del Muerto over two-thirds of the sites recorded had only one or two structures although some ranged up to 11 structures. The stone hogan sites at Canyon del Muerto and Wupatki generally lacked substantial amounts of trash as does AZ K:13:101.

The time of occupation of AZ K:13:101 is not clear. At Canyon del Muerto, sites with circular or semi-circular dry-laid masonry hogans made of untrimmed sandstone slabs and boulders were considered to be pre-Fort Sumner in age (1863). However, at Petrified Forest the construction method may not necessarily reflect an old date, since there is so little wood in the area. Most of the few artifacts present and the faint road may not be related to the initial site occupation. The road may be associated with prospecting, ranching, or even auto tours from the nearby Lion's Farm curio shop. The two hole-in-cap cans, if associated with the site occupation, would indicate a late nineteenth century or early twentieth century date. The general paucity of artifacts also suggests a pre-1900s date. Tree-ring dating of the juniper present in some of the structures may hold potential to date the site more securely.

are similar to ones at Wupatki (Anderson 1990) and Canyon del Muerto (Fall *et al.* 1981). At Canyon del Muerto, for example,

AZ K:13:123 and AZ K:13:124

These two sites, located in the Painted Desert section of the Park, are inscriptions



Figure 4.83. Hole-in-cap can recovered at AZ K:13:101.

attributed to the Hopi. AZ K:13:123 consists of a single large boulder with three inscriptions (Figure 4.84). The boulder is on the south side of a broad drainage at the foot of a talus slope. On one face of the boulder is a full-body depiction of a Hopi maiden next to a scratched vulva-like design. On another face of the boulder is a lightly pecked depiction of what appears to be "Crow Mother." The historic ascription of this site is based on its possible association to the dated inscriptions at nearby AZ K:13:124. Stylistically, both sites differ from prehistoric rock art in the area.

AZ K:13:124 is approximately 600 m west of AZ K:13:123 and within the same drainage. It consists of three boulders with historic inscriptions and prehistoric rock art. Boulder 1, the most elaborated, contains a detailed Kachina depiction, two birds, a stylized cloud symbol, a horse and a horse head, three names, and a 1935 date (Figures 4.85 and 4.86). Scratched into Boulder 2 are straight and wavy lines, a bird, a feather-like element, and a pecked bull's eye, the last apparently prehistoric. Boulder 3, on the slope above the other two boulders, has an apparently unfinished prehistoric design.

While this and the above site are consid-

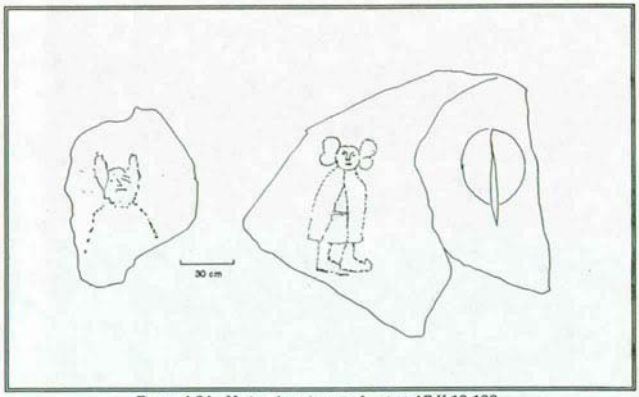


Figure 4.84. Native American rock art at AZ K:13:123.



Figure 4.85. Native American rock art at AZ K:13:124.

Table 4.8. Attributes of Hogans at AZ K:13:101.

Feature No.*	Dimensions	Wall height	Opening to	Wood present
1–1	1.8 x 1.5 m	0.8 m	E	no
1–3	2.6 x 2.5 m	0.6 m	E	yes
1–4	3.0 x 2.3 m	0.7 m	E	no
1–5	1.5 x 1.4 m	0.5 m	unk	no
1–6	1.3 x 1.3 m	0.3 m	SE	no
1–7	2.3 x 1.9 m	0.5 m	SE	no
1–8	2.8 x 1.9 m	0.8 m	S	yes
1–9	2.4 x 1.9 m	0.7 m	SE	yes
1–10	1.7 x 1.7 m	0.1 m	S	no
2–1	2.6 x 2.0 m	1.0 m	S	no
2–2	1.7 x 1.5 m	0.7 m	SW	no

* Feature 1–2 is a post and rock cairn.

ered to be Hopi, it is possible the inscriptions were produced by Zuni, or even Anglos copying Pueblo designs. The drainage the sites are in provides a direct route to Zuni Well from the Painted Desert rim. Isolated features noted in the drainage (Isolates 1991C–5 and –14) suggest a pipeline passed along this drainage at one time, which may have connected Zuni Well to the Painted Desert Inn.

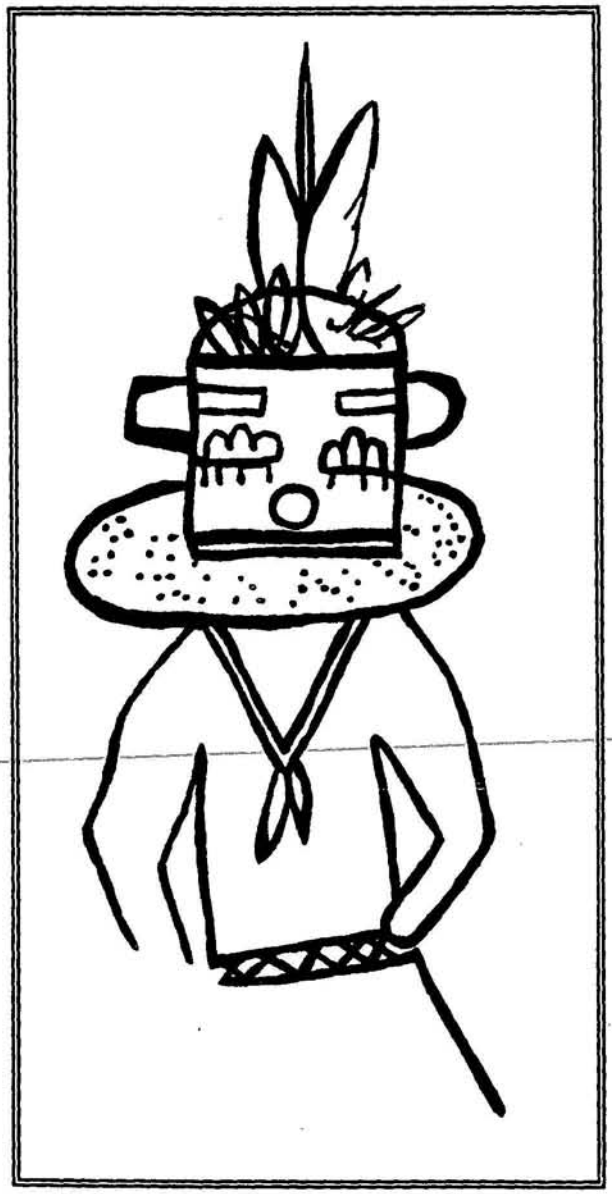


Figure 4.86. Kachina at AZ K:13:124.

Chapter 5
Site Monitoring

In 1990 a program of archeological site monitoring was begun at Petrified Forest National Park to provide data on the nature and extent of site deterioration. The site monitoring program, continued in 1991, WACC used standardized categories developed for the Archeological Resources Inventory (ARI) to collect site condition data and establish methods to measure change or deterioration. The Archeological Resources Inventory is a standardized computerized inventory of prehistoric and historic resources. The monitoring program, if continued, can help identify problem areas and establish priorities for treatment. For example, while severe erosion was noted at numerous sites during recording, it was not known where erosion had an ongoing impact and posed a continued threat.

Petrified Forest National Park is generally a degrading environment; the petrified wood itself, once buried, has been exposed by ongoing erosion. Most of the Park is at the boundary of the grasslands and badlands, and the grassland is gradually eroding into badlands. Archeological sites on this landscape suffer the same fate (Figures 5.1 and 5.2). In some areas, architectural rubble caps mounds, much as sandstone caprock and petrified wood logs cap chinle (Figures 5.3 and 5.4). In other areas pithouses and pueblos erode from sand dunes and ridges. In fact, during the initial recording of one Basketmaker period site, AZ Q:1:114, erosion was imminently threating pit house structures. WACC undertook salvage excavations in 1989 and recovered important data about early Basketmaker settlement, including the earliest dates for pottery on the Colorado Plateau (Burton 1991). Even within the badlands, artifacts are displaced or buried by erosion. Petroglyphs panels weather as well (Figure 5.5). In addition to erosion animals, such as prairie dogs, cause displacement of earth, and mixing of deposits within archeological sites.

Besides these natural impacts, human–caused damage from collection, vandalism, and past construction is also apparent. In his 1940s work, Jepson noted pothunting at several sites, some of which may have predated the establishment of the Park. In 1983 pothunters dug several holes in a large site southeast of Agate House in the Rainbow Forest area. Because the vandals had jumped the boundary fence from private land, sites along the boundary appeared most susceptible. The Boundary Survey (Jones 1987; Wells 1988, 1989) was initiated to inventory sites along the Park boundary so they could be monitored and protected.

Inadvertent damage to sites has been caused by construction. Many of the Park roads, fences, and waterlines were built before legislation and regulation protected archeological sites. The Park designation has afforded some protection. Off–road vehicle (ORV) use and grazing is prohibited, and the limited access and rigorous patrol of the Park have undoubtedly reduced vandalism, especially compared to surrounding areas.

Methods

Monitoring consisted of revisiting previously recorded sites and making a detailed examination to assess their condition and to determine current disturbances or potential threats. Priority for site monitoring was given to large sites with visible architecture or abundant ceramics, because they seemed most susceptible to vandalism. But other sites were included as opportunities arose, and it is hoped that eventually all recorded sites will be included in an on-going monitoring program. Similar data are collected at newly recorded sites so that they can be included in the monitoring program. Three tasks were completed at each site: (1) collection of baseline data for future monitoring; (2) controlled surface collection and on-site analysis of artifacts; and (3) collection of temporally-diagnostic artifacts.

The first task involved detailed mapping of impacts, and collection of Archeological Resource Inventory (ARI) data. Photography was used to document current site condition; to track future erosion the height of the iron rebar datum at each site was measured. The second task involved detailed on-site lithic analysis and collection of a sample of ceramics along transects. The third task involved collecting and point-plotting projectile points, shell, distinctive ceramics, and other artifacts encountered during other work. The second and third tasks were designed to acquire more general information about each site. Although not directly related to monitoring, the data will contribute to understanding regional prehistory, and may generate new research priorities and direction that will be used along with site condition data to determine future management.



Figure 5.1. Feature 1 (rubble mound) at AZ K:13:76.



Figure 5.2. Feature 1 (rubble mound) at AZ Q:1:173.



Figure 5.3. Overview of AZ Q:1:173.



Figure 5.4. Feature 2 (rubble mound) at AZ Q:1:237.



Figure 5.5. Toppled petroglyph boulder at AZ Q:1:281.

Definitions

Definitions used herein are from the "ARI Users Manual" (National Park Service 1991). The specific information within the data base has been chosen to support management needs by documenting the location, significance, condition, and management requirements of these resources.

Threat/disturbance

This information category lists the type of threats that pose a danger to a site's archeological remains, context and values, or the disturbances that have caused a measurable change in resource condition and value. Just a few of the many categories are visitation, vandalism, roads, trails, transportation facilities (*e.g.*, borrow pit), erosion, and rodent activities.

Degree of Disturbance

This information category assesses the relative degree of site disturbance by natural or human forces that has taken place, or is taking place, at the site. The degree of disturbance was noted as severe, moderate, or low. **Severe** indicates that the disturbance is great—the site is in the process of being irretrievably lost *in toto*, or only a small portion of the site remains. **Moderate** indicates that the disturbance is significant—the site is in the process of being lost, though a considerable portion of the site remains intact. **Low** indicates that the disturbance is minimal—only a small part of the site has been affected.

Site Condition

This information category assesses the current site condition. Site condition was estimated as good, fair, poor, excavated, or destroyed. **Good** condition indicates that the site shows no clear evidence of negative disturbance and deterioration by natural or human forces. The archeological values of a site in good condition are as well-preserved as can be expected under the given environmental conditions, and no site treatment actions are required in the near future to maintain its condition. **Fair** condition indicates that the site shows clear evidence of minor disturbance and deterioration by natural or human forces, and some degree of corrective action is needed soon to stabilize the site and prevent further harm to its

archeological values. The cumulative affect of the disturbances at a site in fair condition, if left to continue, could cause the site to degrade to a poor condition. **Poor** indicates that the site shows clear evidence of major disturbance and rapid deterioration by natural or human forces, and immediate corrective action is required to protect and preserve the remaining archeological values. **Excavated** indicates that the data from the site have been *fully* recorded. **Destroyed** indicates that a site has been totally destroyed and the archeological potential is now nil.

Results

Between 1990 and 1992 monitoring information was collected from a total of 159 sites (34% of recorded sites), including 20 multiple-room pueblos, 53 multiple structure sites, 45 artifact scatters, 20 single-room masonry sites, 13 historic sites, 4 rockshelters, and 4 other sites. At four extensive sites, data were recorded by loci, adding six masonry room structures and two artifact scatters to the total (Table 5.1).

Ninety-five sites were visited during the 1990 monitoring program. In 1991 six sites were revisited and baseline data for site monitoring were also collected from all of the sites recorded during surveys in 1991 and 1992. Data from sites consisting solely of rock art are not included in this discussion; detailed recording during the survey has effectively recovered the potential archeological data from these sites, although the rock art sites remain significant for other reasons.

The condition of the sites and loci ranged from good to poor: 36 percent (n=60) are in good condition, 44 percent (n=73) are in fair condition, and 20 percent (n=34) are in poor condition. One site has been excavated (AZ Q:1:261). None were noted as destroyed.

As expected, erosion is the single major ongoing impact noted at the sites: 20 percent (n=33) of the localities have severe erosion, 27 percent (n=45) have moderate erosion, and 53 percent (n=89) have only minor erosion. Other impacts were noted at 34 localities (nine had two each) during the course of the fieldwork. These included roads (both current and abandoned; 13 sites), pipeline trenching (two sites), a borrow pit (one site), rodent activity (19 sites; including two severe and three moderate), vandalism (six sites), excavation (one site), and trail/visitation impacts (Puerco Ruin).

Recommendations

To capitalize on the investment to date and make efficient use of the site condition data collected, the site monitoring program should be continued and expanded to include all sites within the Park. After initial inspection, future monitoring should be scheduled, with priorities based on potential urgency and significance. Although the initial inspection and data collection have generally identified the current conditions, continued monitoring is necessary to better assess the trends and rate of the deterioration.

However, recommendations for some of the sites inspected can be made based on the information in hand. These can be divided into erosional impacts requiring salvage excavations, and ongoing animal and human-caused impacts requiring data recovery excavations or other mitigation measures.

Erosion

It seems unlikely that the rate of erosion at Petrified Forest can be slowed. Even on a site-specific scale such an effort would require heroic efforts and would likely fail (see Figure 4.56). Salvage excavations to retrieve data from significant sites are recommended as the most prudent management option.

Of the 33 localities noted as having severe erosion problems, none were classified as being in good condition, 11 are in fair condition, and the remaining 22 are in poor condition. The ten sites still in fair condition should be the top priority for future salvage. These include: AZ K:13:11, AZ K:13:45a, AZ Q:1:60, AZ Q:1:114, AZ Q:1:187, AZ Q:1:197, AZ Q:1:207, AZ Q:1:227, AZ Q:1:275, AZ Q:1:276, and AZ Q:1:281. The priorities and design of salvage excavation would depend on research questions, as discussed in Chapter 11.

The 22 sites in poor condition have limited data potential. While each site would have to be reviewed on a case-by-case basis, it appears that the intensive controlled collections and on-site analysis already conducted at these sites, when completed, will effectively exhaust the research potential of most of these sites. These include: AZ K:13:51, AZ K:13:69, AZ K:13:76, AZ K:13:91, AZ K:13:105, AZ K:13:111, AZ K:13:116, AZ K:14:22, AZ Q:1:56, AZ Q:1:81/5-7, AZ Q:1:102, AZ Q:1:143, AZ Q:1:159, AZ Q:1:173, AZ Q:1:178, AZ Q:1:182, AZ Q:1:196, AZ Q:1:237, AZ Q:1:284, AZ Q:1:292, and AZ Q:1:293.

Sites with moderate erosion should be checked periodically to assess their condition and management needs.

Other Impacts

Data recovery or other mitigation measures are recommended at sites suffering from ongoing animal and human-caused impacts.

The prairie dog and other rodent populations have been expanding rapidly in the Park, partly because of the general demise of predator populations and partly because ranchers are no longer poisoning rodent populations now that grazing in the Park has ceased (Ferrell Knight, personal communication, 1991). Two sites noted in fair condition (AZ K:13:36, AZ Q:1:223) are being seriously damaged by rodent disturbance, while other disturbances at these sites are relatively minor. Since it seems unlikely that the prairie dogs responsible can be convinced to relocate, some level of data recovery is recommended to retrieve a sample of data before it is destroyed.

Close monitoring is recommended for those sites where rodent disturbance is moderate or minor, to assess the need for future work. These include two sites with moderate rodent disturbance, AZ K:13:99 in fair condition and AZ Q:1:22 (Puerco Ruin) in good condition. Monitoring is also recommended at 14 other sites with minor rodent disturbance: AZ K:13:23, AZ K:13:25, AZ K:14:18, AZ K:14:21, AZ K:14:23, AZ Q:1:81/1-2, AZ Q:1:128, AZ Q:1:185, AZ Q:1:186, AZ Q:1:189, AZ Q:1:208, AZ Q:1:214, AZ Q:1:219A, and AZ Q:1:219B.

Six sites have been impacted by unpaved roads currently in use. Roads through four of these sites are occasionally or routinely graded (Figure 5.6). These include AZ K:13:118, AZ Q:1:219, and AZ Q:1:225 in fair condition with moderate

Table 5.1. Site Condition and Impact Assessment.

Site/locus	Time Period	Site Type	Condition	Impacts (type and degree)
AZ K:13:10	Pueblo II	Multiple Structure	Fair	Minor erosion, abandoned roads, vandalism
AZ K:13:11	Pueblo II	Multiple Structure	Fair	Severe erosion
AZ K:13:17	Pueblo III	Artifact Scatter	Good	Minor erosion
AZ K:13:23	Pueblo III	Multiple Structure	Good	Minor erosion, rodents (minor)
AZ K:13:25	Pueblo III	Multiple Structure	Good	Minor erosion, rodents (minor)
AZ K:13:35	Pueblo III	Artifact Scatter	Fair	Minor erosion
AZ K:13:36	Pueblo III	Artifact Scatter	Fair	Minor erosion, rodents (severe)
AZ K:13:40	Pueblo II/III	Artifact Scatter	Good	Minor erosion
AZ K:13:41	Pueblo II/III	McCreery Pueblo	Good	Minor erosion
AZ K:13:43	Pueblo II	Multiple Structure	Fair	Moderate erosion
AZ K:13:45A	Pueblo II	Multiple Structure	Fair	Severe erosion
AZ K:13:45B	Pueblo II	Artifact Scatter	Good	Minor erosion
AZ K:13:46	Pueblo II	Multiple Structure	Fair	Minor erosion
AZ K:13:51	Pueblo II	Multiple Structure	Poor	Severe erosion
AZ K:13:53	Pueblo II/III	Multiple Structure	Good	Minor erosion
AZ K:13:56	Pueblo II	Artifact Scatter	Good	Minor erosion
AZ K:13:57	Pueblo II	Masonry Room	Good	Minor erosion
AZ K:13:63	Pueblo II	Multiple Structure	Fair	Moderate erosion
AZ K:13:69	Pueblo II/III	Multiple Structure	Poor	Severe erosion
AZ K:13:70	Pueblo II/III	Multiple Structure	Good	Minor erosion
AZ K:13:71	Pueblo II/III	Artifact Scatter	Good	Minor erosion
AZ K:13:72	Pueblo II/III	Multiple Structure	Good	Minor erosion
AZ K:13:73	Pueblo II/III	Artifact Scatter	Good	Minor erosion
AZ K:13:76	Pueblo II/III	Multiple Structure	Poor	Severe erosion
AZ K:13:77	Pueblo II/III	Artifact Scatter	Good	Minor erosion
AZ K:13:78	Pueblo II/III	Artifact Scatter	Good	Minor erosion, road
AZ K:13:80	Pueblo II/III	Multiple Structure	Poor	Minor erosion, road
AZ K:13:81	Pueblo II/III	Artifact Scatter	Good	Minor erosion
AZ K:13:91	Pueblo II/III	Multiple Structure	Poor	Severe erosion
AZ K:13:92	Pueblo II/III	Multiple Structure	Poor	Severe erosion
AZ K:13:99	Pueblo III	Artifact Scatter	Fair	Minor erosion, rodents (moderate)

Site/locus	Time Period	Site Type	Condition	Impacts (type and degree)
AZ K:13:101	Historic (Navajo)	Hogans	Good	Minor erosion
AZ K:13:103	Pueblo II/III-late III	Artifact Scatter	Fair	Moderate erosion
AZ K:13:104	Pueblo II/III-III	Artifact Scatter	Fair	Moderate erosion
AZ K:13:105	Pueblo II/III-late III	Masonry Room	Poor	Severe erosion
AZ K:13:106	Pueblo II-II/III	Artifact Scatter	Fair	Moderate erosion
AZ K:13:107	Pueblo II/III	Multiple Structure	Poor	Moderate erosion
AZ K:13:108	Pueblo II-II/III	Multi-room Pueblo	Fair	Moderate erosion, vandalism
AZ K:13:109	Pueblo II/III	Multi-room Pueblo	Fair	Moderate erosion
AZ K:13:110	Pueblo II/III-III	Artifact Scatter	Fair	Moderate erosion, abandoned road
AZ K:13:111	Pueblo II/III	Artifact Scatter	Poor	Severe erosion
AZ K:13:112	Pueblo II/III-late III	Masonry Room	Fair	Moderate erosion
AZ K:13:113	Pueblo II-late III	Multi-room Pueblo	Good	Moderate erosion
AZ K:13:114	Pueblo II/III-III	Multi-room Pueblo	Fair	Moderate erosion, abandoned road, vandalism
AZ K:13:115	Pueblo II/III	Artifact Scatter	Fair	Minor erosion
AZ K:13:116	Pueblo II/III-III	Multiple Structure	Poor	Severe erosion
AZ K:13:117	Pueblo II/III-late III	Masonry Room	Poor	Moderate erosion, abandoned road
AZ K:13:118	Pueblo II-late III	Masonry Room	Fair	Moderate erosion, road
AZ K:13:119	Pueblo II/III-III	Artifact Scatter	Poor	Minor erosion
AZ K:13:135	Historic (Anglo)	Structural Remains	Fair	Minor erosion
AZ K:14:7	Pueblo II	Multiple Structure	Good	Minor erosion
AZ K:14:10	Pueblo I-III	Artifact Scatter	Fair	Minor erosion
AZ K:14:11	Pueblo II/III	Masonry Room	Fair	Minor erosion
AZ K:14:18	Pueblo II/III	Masonry Room	Good	Minor erosion, rodents (minor), vandalism
AZ K:14:20	Pueblo II/III	Masonry Room	Fair	Moderate erosion, borrow pit
AZ K:14:21	Pueblo II/III	Masonry Room	Poor	Minor erosion, road, rodents (minor)
AZ K:14:22	Pueblo II/III	Artifact Scatter	Poor	Severe erosion
AZ K:14:23	Pueblo II/III	Artifact Scatter	Good	Moderate erosion, rodents (minor)
AZ K:14:38	Pueblo II/III	Artifact Scatter	Fair	Minor erosion
AZ Q:1:22	Pueblo III/IV	Puerco Ruin	Good	Minor erosion, rodents (moderate), trails
AZ Q:1:56	Pueblo II	Multiple Structure	Poor	Severe erosion, rodents (moderate)
AZ Q:1:60	Basketmaker III	Artifact Scatter	Fair	Severe erosion

Site/locus	Time Period	Site Type	Condition	Impacts (type and degree)
AZ Q:1:61	Basketmaker III-Pueblo II	Masonry Room	Fair	Moderate erosion
AZ Q:1:63	Historic	Structural remains	Fair	Minor erosion
AZ Q:1:70	Pueblo	Rockshelter	Good	Minor erosion
AZ Q:1:71	Pueblo II/III	Rockshelter	Fair	Minor erosion
AZ Q:1:81/1-2	Pueblo II/III	Multiple Structure	Good	Minor erosion, rodents (minor)
AZ Q:1:81/3	Pueblo II/III	Multiple Structure	Fair	Moderate erosion
AZ Q:1:81/4	Pueblo II/III	Multiple Structure	Fair	Moderate erosion
AZ Q:1:81/5,7	Pueblo II/III	Multiple Structure	Poor	Severe erosion
AZ Q:1:81/6	Pueblo II/III	Multiple Structure	Poor	Severe erosion
AZ Q:1:87	Pueblo II	Multiple Structure	Good	Minor erosion
AZ Q:1:88	Pueblo II	Masonry Room	Good	Minor erosion
AZ Q:1:90	Pueblo II/III	Artifact Scatter	Good	Moderate erosion
AZ Q:1:91	Pueblo II	Masonry Room	Good	Minor erosion
AZ Q:1:94	Pueblo II	Multiple Structure	Fair	Moderate erosion
AZ Q:1:97	Pueblo III	Artifact Scatter	Fair	Moderate erosion
AZ Q:1:99	Pueblo III	Artifact Scatter	Fair	Moderate erosion
AZ Q:1:102	Pueblo late II-early III	Artifact Scatter	Poor	Severe erosion
AZ Q:1:104	Pueblo late II-III	Artifact Scatter	Fair	Minor erosion
AZ Q:1:105	Pueblo late II-III	Multiple Structure	Fair	Minor erosion
AZ Q:1:111	Pueblo II/III	Multiple Structure	Fair	Minor erosion
AZ Q:1:113	Pueblo II/III	Multiple Structure	Fair	Minor erosion
AZ Q:1:114	Basketmaker II	Sivu'ovi	Fair	Severe erosion
AZ Q:1:117	Pueblo II/III	Multiple Structure	Good	Minor erosion
AZ Q:1:118	Pueblo III	Multiple Structure	Fair	Minor erosion
AZ Q:1:121	Pueblo II	Multiple Structure	Good	Minor erosion
AZ Q:1:122	Pueblo II	Multiple Structure	Good	Moderate erosion
AZ Q:1:123	Pueblo II	Multiple Structure	Good	Moderate erosion
AZ Q:1:124	Pueblo III	Artifact Scatter	Poor	Minor erosion
AZ Q:1:128	Pueblo II/III	Multi-room Pueblo	Good	Minor erosion, rodents (minor), vandalism
AZ Q:1:129	Pueblo II/III	Multi-room Pueblo	Good	Minor erosion
AZ Q:1:143	Pueblo II/III	Masonry Room	Poor	Severe erosion
AZ Q:1:146	Pueblo II	Multiple Structure	Fair	Moderate erosion

Site/locus	Time Period	Site Type	Condition	Impacts (type and degree)
AZ Q:1:148	Pueblo I/II	Multiple Structure	Fair	Minor erosion
AZ Q:1:149	Pueblo II	Masonry Room	Fair	Moderate erosion
AZ Q:1:153	Pueblo II/III	Artifact Scatter	Fair	Moderate erosion
AZ Q:1:156	Pueblo II/III	Multiple Structure	Good	Minor erosion
AZ Q:1:157	Basketmaker III-Pueblo I, Pueblo II/III	Artifact Scatter	Good	Minor erosion
AZ Q:1:159	Pueblo II/III	Multi-room Pueblo	Poor	Severe erosion
AZ Q:1:161	Pueblo III	Multi-room Pueblo	Good	Moderate erosion
AZ Q:1:173	Basketmaker III-Pueblo I, Pueblo II/III	Multiple Structure	Poor	Severe erosion
AZ Q:1:178	Basketmaker III-Pueblo I, Pueblo II/III	Multiple Structure	Poor	Severe erosion
AZ Q:1:181	Pueblo II/III	Artifact Scatter	Fair	Moderate erosion
AZ Q:1:182	Pueblo II/III	Multi-room Pueblo	Poor	Severe erosion
AZ Q:1:185	Pueblo I/II	Masonry Room	Good	Minor erosion, rodents (minor)
AZ Q:1:186	Pueblo II/III	Multiple Structure	Good	Minor erosion, rodents (minor)
AZ Q:1:187	Pueblo II/III	Multiple Structure	Fair	Severe erosion
AZ Q:1:189	Pueblo I/II	Artifact Scatter	Good	Minor erosion, rodents (minor)
AZ Q:1:191	Pueblo II/III	Multiple Structure	Fair	Moderate erosion
AZ Q:1:193	Pueblo II/III	Artifact Scatter	Good	Minor erosion, road
AZ Q:1:196	Pueblo I-early Pueblo III	Multiple Structure	Poor	Severe erosion, road/pipeline
AZ Q:1:197	Pueblo II/III	Masonry Room	Fair	Severe erosion
AZ Q:1:201/A	Pueblo II/III	Multiple Structure	Good	Moderate erosion
AZ Q:1:201/B	Pueblo II/III	Multiple Structure	Good	Minor erosion
AZ Q:1:201/C	Pueblo II/III	Multiple Structure	Good	Minor erosion
AZ Q:1:207	Pueblo II/III	Artifact Scatter	Poor	Severe erosion
AZ Q:1:208	Pueblo III	Multi-room Pueblo	Good	Moderate erosion, rodents (minor)
AZ Q:1:214	Basketmaker III-Pueblo I	Artifact Scatter	Fair	Minor erosion, rodents (minor)
AZ Q:1:217	Pueblo	Artifact Scatter	Fair	Moderate erosion
AZ Q:1:219/A	Pueblo III	Multiple Structure	Fair	Moderate erosion, road, rodents (minor)
AZ Q:1:219/B	Pueblo III	Artifact Scatter	Fair	Moderate erosion, road, rodents (minor)
AZ Q:1:220	Pueblo II/III	Multiple Structure	Fair	Moderate erosion
AZ Q:1:223	Pueblo III	Multi-room Pueblo	Fair	Minor erosion, rodents (severe)

Site/locus	Time Period	Site Type	Condition	Impacts (type and degree)
AZ Q:1:225	Pueblo II	Multiple Structure	Fair	Moderate erosion, road
AZ Q:1:226	Pueblo III	Multi-room Pueblo	Good	Moderate erosion
AZ Q:1:227	Pueblo II/III	Multiple Structure	Fair	Severe erosion
AZ Q:1:231	Pueblo	Artifact Scatter	Fair	Minor erosion
AZ Q:1:236	Pueblo II/III	Multiple Structure	Fair	Minor erosion
AZ Q:1:237	Pueblo II/III	Masonry Room	Poor	Severe erosion
AZ Q:1:256	Historic (CCC)	Structural Remains	Good	Minor erosion
AZ Q:1:257	Historic (CCC)	Trash Dump	Good	Minor erosion
AZ Q:1:258	Historic (CCC)	Structural Remains	Good	Minor erosion
AZ Q:1:259	Historic (CCC)	Trash Dump	Good	Moderate erosion
AZ Q:1:260	Historic (CCC)	Work Area	Poor	Minor erosion
AZ Q:1:261	Pueblo IV	Rockshelter	Good	Minor erosion, excavated
AZ Q:1:263	Historic (CCC)	Work Area	Poor	Minor erosion
AZ Q:1:265	Historic (CCC)	Work Area	Fair	Moderate erosion
AZ Q:1:268	Pueblo	Artifact Scatter	Poor	Minor erosion, pipeline
AZ Q:1:269	Historic (CCC)	Structural Remains	Poor	Minor erosion
AZ Q:1:270	Pueblo II/III-late III	Multi-room Pueblo	Good	Minor erosion
AZ Q:1:271	Historic (CCC)	CCC Camp	Fair	Minor erosion
AZ Q:1:272	Historic (CCC)	CCC Spike Camp	Fair	Moderate erosion
AZ Q:1:274	Prehistoric	Slab Feature	Good	Minor erosion
AZ Q:1:275	Pueblo III/IV	Multi-room Pueblo	Fair	Severe erosion, vandalism
AZ Q:1:276	Pueblo II/III	Multiple Structure	Fair	Severe erosion
AZ Q:1:277	Pueblo II/III	Lithic Scatter	Fair	Minor erosion
AZ Q:1:278	Pueblo II/III-IV	Milling Slicks	Fair	Minor erosion
AZ Q:1:279	Pueblo II-II/III	Multi-room Pueblo	Good	Minor erosion
AZ Q:1:280	Pueblo III	Artifact Scatter	Poor	Moderate erosion
AZ Q:1:281	Pueblo II-IV	Multiple Structure	Fair	Severe erosion
AZ Q:1:282	Pueblo	Artifact Scatter	Good	Minor erosion
AZ Q:1:283	Pueblo II-II/III	Artifact Scatter	Fair	Moderate erosion
AZ Q:1:284	Pueblo II-II/III	Artifact Scatter	Poor	Severe erosion
AZ Q:1:285	Pueblo II/III-III	Artifact Scatter	Fair	Minor erosion
AZ Q:1:286	Pueblo II-late III	Masonry Room	Fair	Minor erosion

Site/locus	Time Period	Site Type	Condition	Impacts (type and degree)
AZ Q:1:287	Basketmaker II, Pueblo II	Multi-room Pueblo	Fair	Minor erosion
AZ Q:1:288	Pueblo II-II/III	Multiple Structure	Fair	Minor erosion
AZ Q:1:289	Pueblo	Multiple Structure	Fair	Minor erosion
AZ Q:1:290	Basketmaker II, Pueblo II	Multiple Structure	Fair	Minor erosion
AZ Q:1:291	Basketmaker II, Pueblo II	Multiple Structure	Fair	Minor erosion
AZ Q:1:292	Pueblo II/III-III	Artifact Scatter	Poor	Severe erosion
AZ Q:1:293	Pueblo II/III-III	Multiple Structure	Poor	Severe erosion
AZ Q:1:294	Pueblo II/III	Masonry Room	Good	Minor erosion
AZ Q:1:295	Pueblo II/III	Multi-room Pueblo	Good	Minor erosion
AZ Q:1:296	Pueblo	Bedrock Milling	Good	Minor erosion
AZ Q:1:297	Pueblo I-II/III	Masonry Room	Good	Minor erosion
AZ Q:1:302	Pueblo	Rockshelter	Good	Minor erosion

Chapter 6
Burial Salvage

During 1988 and 1990, two eroding burials were discovered at Petrified Forest National Park. The burial found in 1990 was adjacent to site AZ K:13:51 and the burial discovered in 1988 was within site AZ Q:1:226 (Figure 6.1). Both sites are summarized below. In consultation with Park staff, the Hopi Tribe, the Arizona State Historic Preservation Office, and the National Park Service Regional Archeologist, it was decided to salvage the endangered burials. This work was considered Agency responsibility under Section 110 of the National Historic Preservation Act (NHPA), as amended in 1980.

AZ K:13:51

This burial was discovered on July 11, 1990, during monitoring of the condition of a small pueblo site east of the Mainline Road in the northern portion of the Park. The site is located on a ridge overlooking Dead Wash. The burial was located within loose sandy soil on a steep slope just southwest of the site. A portion of the cranium had been exposed by the down-cutting of a small drainage. Through consultation, it was agreed that the remains would be excavated and reburied in a protected area just off-site.

Based on ceramics present, AZ K:13:51 was considered to date to the Pueblo II Period (Jones 1986). The site was first recorded in 1941 by Jepson as PEFO site 290 (NA 4980). The rubble mound (roomblock) of petrified wood and sandstone blocks, measuring 14 m by 3 m, had no definable walls. The burial was discovered 16 m south of the rubble mound, just outside the mapped site boundary (Figure 6.2).

The burial was excavated on July 21, 1990, by trowel, dental picks, and brushes, to expose the entire burial with the least ground disturbance. Approximately 1 cubic meter was excavated. Fill, which was screened, consisted of loose sand and a few artifacts including eight small sherds (Table 6.1), sixteen petrified wood flakes (Appendix F, Table 6.2), and a few bits of charcoal.

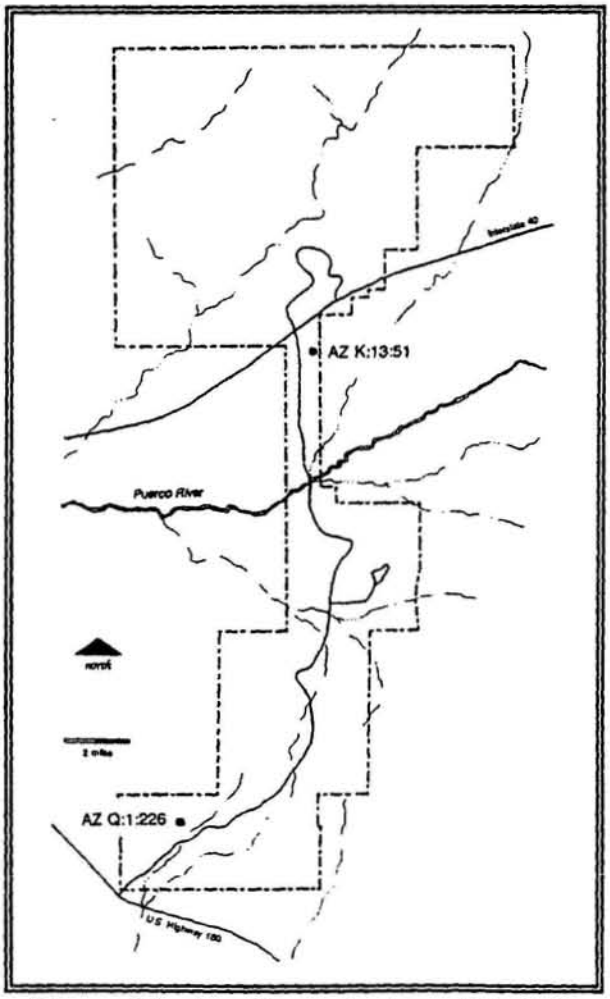


Figure 6.1. Locations of salvaged burials.

Fill artifacts are curated in the Museum Collection Repository at WACC. Except for the exposed portion of the cranium, the skeletal remains were in an excellent state of preservation, consisting of a semi-flexed adult with no associated burial goods. The head was oriented to the south, facing east (Figure 6.3).

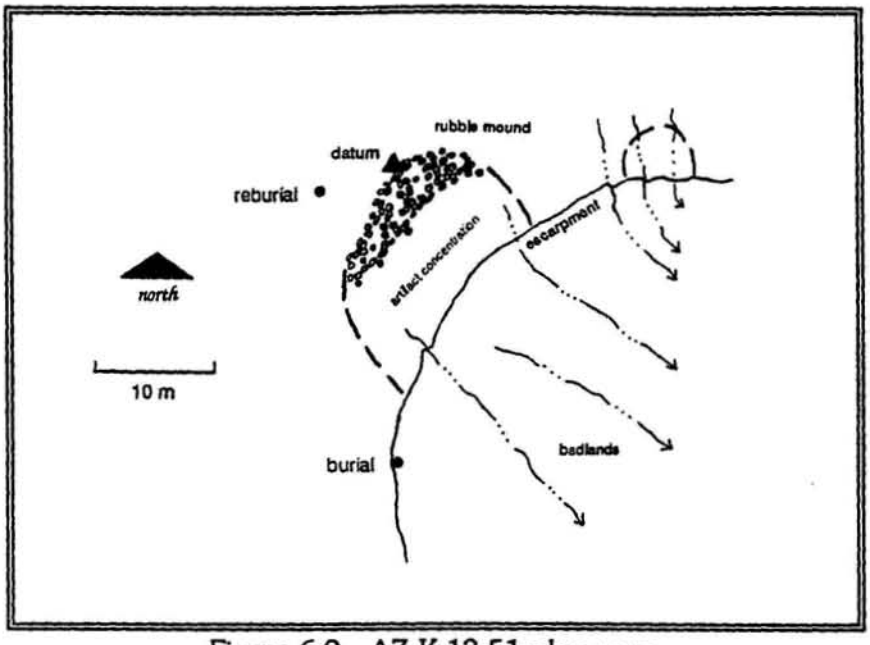


Figure 6.2. AZ K:13:51 plan map.

The burial was exposed in place, but not moved until representatives of the Hopi Tribe arrived. *In situ* analysis of the remains was conducted by physical anthropologists Laura Fulginiti and Tzipi Kahana of the Arizona State Museum. They indicated that the remains were most likely that of a male, 25 to 35 years old, 5 feet 2 inches tall. Noted were shovel-shaped incisors and a flattened occipital lobe (Appendix G). In addition, both fibulae and the left ulna were broken.

Representatives of the Hopi Tribe, Dalton and Wayne Taylor of Shongopovi, selected a reburial area uphill and north of the original location, in an area west of the rubble mound. A 1.4 m by 1 m by 1.2 m deep hole was dug for reburial. The remains were then removed and re-interred as close as possible to its original articulation and facing. Two 1990 pennies were placed in the pit for future reference. Dalton Taylor then conducted a brief ceremony and placed offerings of eagle feathers and cotton yarn, corn husks, and corn meal with the burial. The grave was filled and mounded, and the proximal end of the pit was marked with some upright slabs and a carved green cottonwood limb. A fire of juniper and grass collected from the vicinity was started in the original burial pit and everyone was invited to walk through the smoke to purify himself of contact with the deceased spirit. As requested by Dalton, the original pit was left to erode as is, rather than being backfilled.

AZ Q:1:226

This site is located near the edge of a bluff overlooking the Rainbow Forest. It was first recorded by Mera (1934) as LA 469 and later by Jepson in 1941 as PEFO site 1 (NA 4701). It consists of a large rubble mound 10 m by 25 m by 1.5 m high, suggesting a 8 to 10 room pueblo. A depression on the east side of the mound may indicate a kiva. Pottery on the surface indicates a Pueblo II/III to late Pueblo III date for the site. The burial is 25 m northeast of the rubble mound in an area of eroding trash (Figure 6.4). It was discovered on November 8, 1988, during site recording for the General Management Plan Survey (PEFO 1988E).

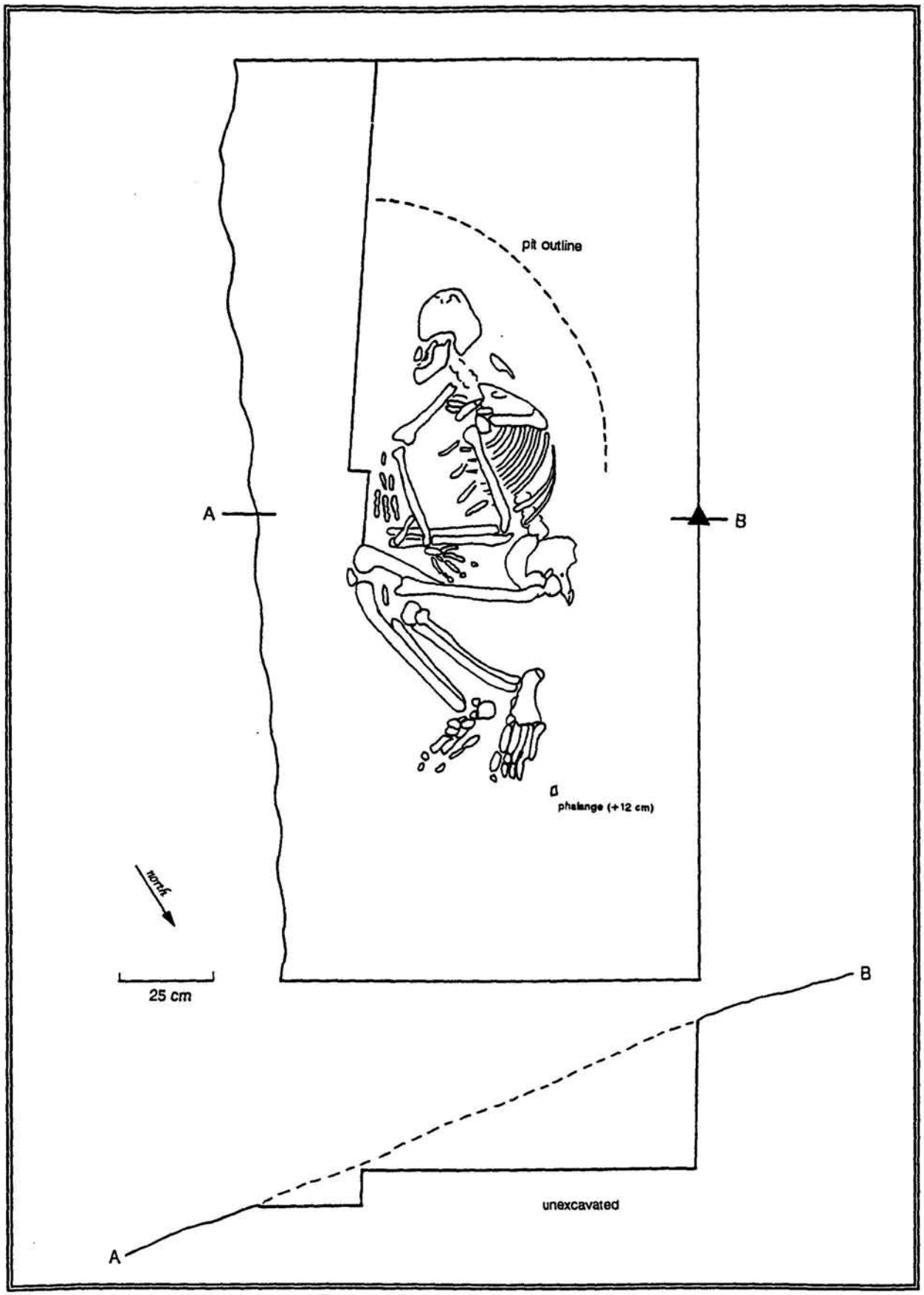


Figure 6.3. AZ K:13:51 burial.

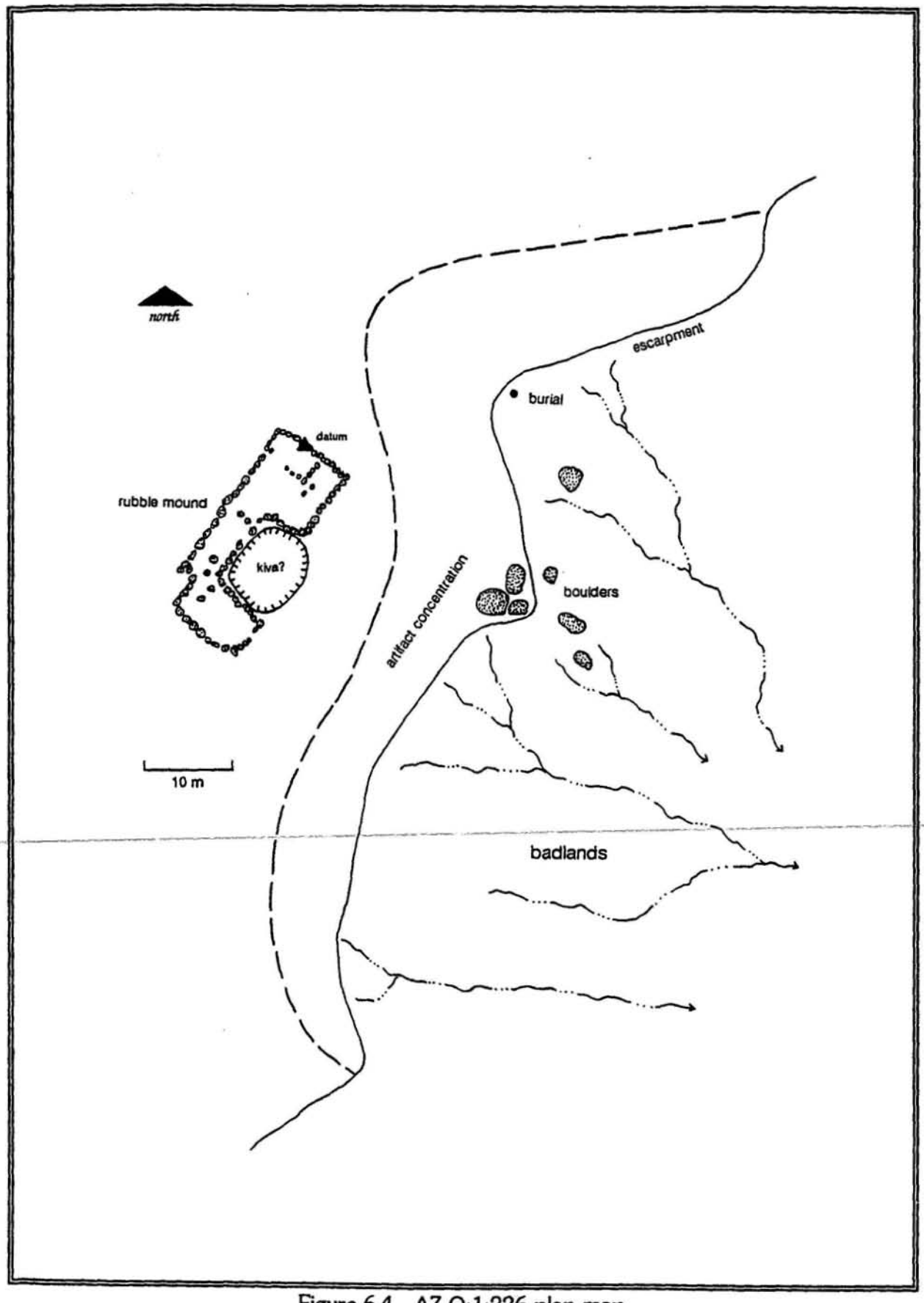


Figure 6.4. AZ Q:1:226 plan map.

wall is 0.45 cm thick at the rim and 0.40 cm thick at the base.

Vessel 2 is a small Little Colorado Gray Ware jar, with a restricted opening and short neck (see Figure 6.7b). It measures 8.2 cm high and 8.8 cm in diameter. The slightly oval opening measures 3.6 cm by 3.9 cm. The vessel wall is 0.6 cm thick at the rim. The rim is worn and has a portion chipped off.

Vessel 3 is another Showlow Red bowl with a smudged interior (see Figure 6.7c).

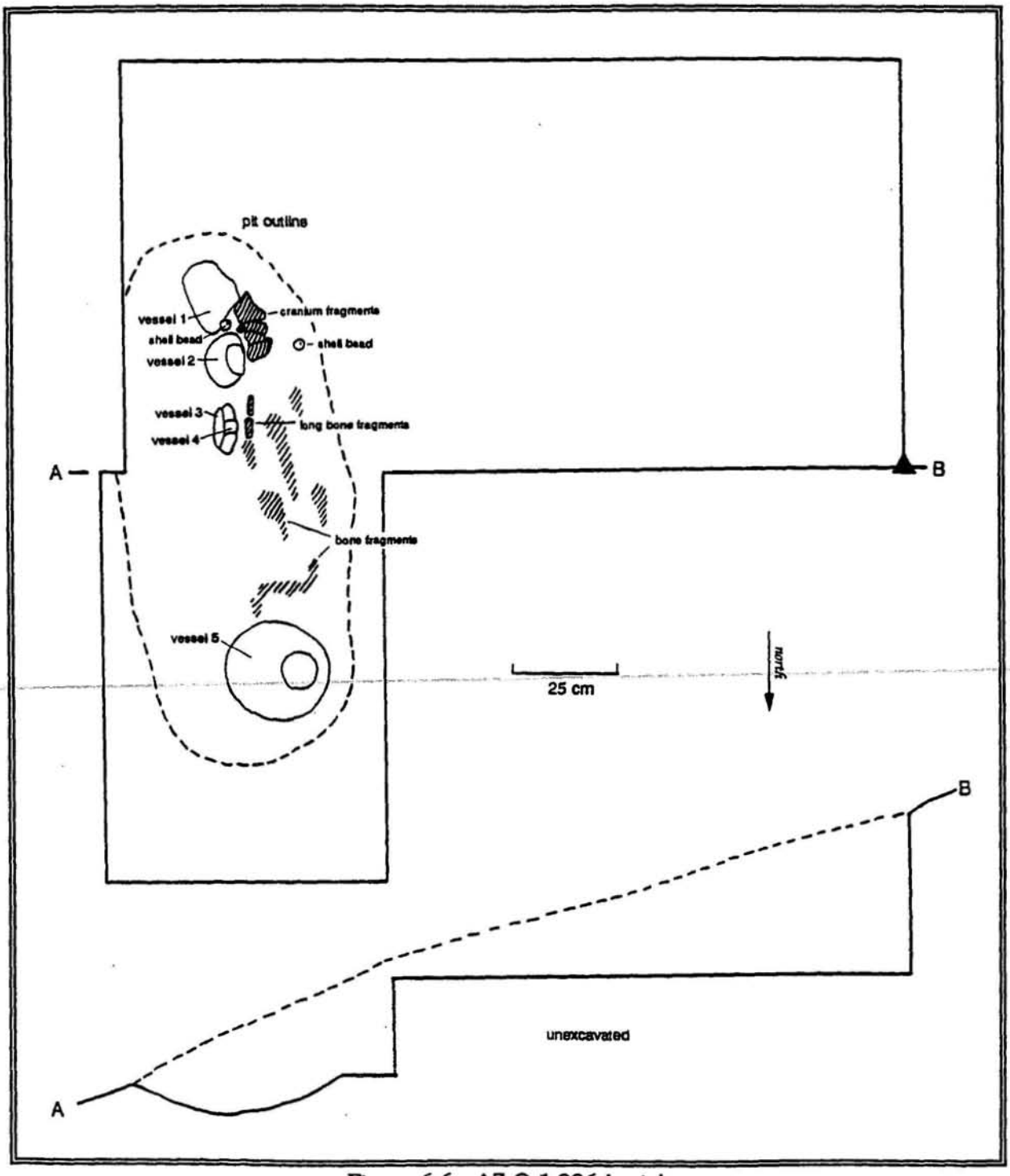


Figure 6.6. AZ Q:1:226 burial.

It measures 5.0 cm high by 10.6 cm in diameter. Slightly incurving, it has an inside diameter of 9.6 cm. The vessel wall is 0.4 cm thick at the rim. The rim is well worn.

Vessel 4 is a complete miniature Mogollon Brown Ware jar with obliterated corrugations and a restricted opening and neck (Figure 6.7d). Found placed within Vessel 3, it measures 4.5 cm high by 6.9 cm in diameter. The vessel wall is 0.4 cm thick at the rim, with a 2.9 cm diameter opening. It appears to have been hand molded. A portion of the rim has chipped off.

Vessel 5, the largest, is a Moenkopi style semi-obliterated Little Colorado Gray Ware jar (Figure 6.7e). It measures 12.5 cm high and 16.0 cm in diameter. It has a restricted opening and neck; the slightly flaring rim has a 6.1 cm opening. The vessel wall is 0.4 cm thick at the rim. The rim has a small portion chipped off.

The six beads recovered are complete immature *Glycymeris* shells. They average 12 by 14 mm in size. Each is ground at the umbo end to form a hole for stringing (Figure 6.8). Four were found on the surface and two were recovered during excavation from the head area of the burial.

Discussion

The most salient difference in the two burials is the presence of associated grave goods at AZ Q:1:226. Although the sample is too small to make broad-scale generalizations, differences could be temporal (Pueblo II vs. Pueblo III) or due to other influences such as site size, cultural affiliation, or socio-economic status differentiation. This difference is probably not due to differences in achieved status, since the burial with the pots is a juvenile. Three of the five vessels



Figure 6.7. Ceramic vessels recovered from burial at AZ Q:1:226; from left to right: Showlow Red bowl, Little Colorado Gray Ware jar, Showlow Red bowl, Little Colorado Gray Ware jar, Mogollon Brown Ware jar.

at the AZ Q:1:226 burial are Mogollon, presumably trade wares, and may reflect status or affiliation.

Although not directly associated with the burials, the other artifacts recovered provide some information on the respective sites. From the excavated area at AZ Q:1:226 thrity–nine sherds and 176 flakes were recovered. Recovered at AZ K:13:51 were eight sherds and 16 flakes. Artifact density of the fill surrounding the two burials reflects the fact that the burial at AZ Q:1:226 was interred in the trash midden, while the burial at AZ K:13:51 was interred off–site. The ceramics associated with the burials are consistent in temporal range with other artifacts found at the sites. Lithic analysis suggests expedient flake technology, which is well–documented at other Pueblo II–III period sites in the area (Jones 1983, 1986; Burton 1990).



Figure 6.8. Shell beads recovered with burial at AZ Q:1:226.

Table 6.1. Ceramic Sherds Recovered From Burial Excavations.

CERAMIC TYPE	AZ K:13:51	AZ Q:1:226
CIBOLA WW		
Undif Cibola WW	–	2
Undif PII/PIII	–	1
Reserve B/W	–	1
Tularosa B/W	–	2
TUSAYAN WW		
Undif Tusayan WW	–	1
MOGOLLON BW		
Plain Brown	1	–
Plain Brown, Smudged	1	–
Indent Corr	1	4
Indent Corr, Smudged	–	1
Obliterated Corr	–	5
SHOWLOW RW		
Showlow B/R	1	1
Showlow Red	2	1
Showlow Red, Smudged	1	–
Showlow Corr	–	1
WHITE MTN RW		
Undif White Mtn RW	1	–
Puerco B/R	–	1
Wingate Poly	–	1
Undif B/R	–	1
Undif Poly	–	1
SALADO		
Undif Salado Poly	–	1
LITTLE COLORADO WW		
Undif Little Colorado WW	–	1
LITTLE COLORADO GW		
Undif Little Colorado GW	–	1
Indent Corr	–	1
Semi-obliterated Corr	–	9
MISC		
Brown Ware, Unknown Ser	–	1
White Ware, Unknown Ser	–	1
TOTALS	8	39

Table 6.2. Lithic Analysis Summary Data.

	AZ K:13:51	AZ Q:1:226
Time period	P II	PII/III-III
Sample size	16	176
Percent petrified wood	88	97
Debitage to tool ratio	-	38
Core to debitage ratio	.27	.09
Core to tool ratio	n/a	3.5
Percent formal tools	0	0
Percent faceted platforms	0	23
Percent cortical platforms	60	15
Cortical to faceted ratio	-	1.5
Percent complete flakes	36	40
Percent flake fragments	45	38
Percent debris	18	13
Complete to fragment ratio	.80	.86

Table 6.3. Inventory of Teeth Recovered from AZ Q:1:226.

Incisors	Eight permanent, shovel-shaped, Incisor (RI^2) with complete root. Moderate to heavy wear (some exposed dentine).
Canines	Four permanent, four deciduous, one with complete root (stained). Moderate to heavy wear (two with exposed dentine).
Premolars	Eight permanent, crown only. Enamel hypoplasia noted on second largest. Little to no wear.
First molars	Three deciduous, one fragmentary. Heavy wear, dentine exposed.
Second molars	Four deciduous. Heavy wear, dentine exposed.
Third molars	Four permanent, erupted. Very little to no wear.
Fourth molars	Four permanent, partial crown only. No wear.

Chapter 7
A Navajo Basket

In 1990 a basket, a wooden artifact, and a rib bone were collected from a small rockshelter in the central portion of the Park. The rockshelter is within a prehistoric site recorded in 1988 as AZ Q:1:201 (Wells 1989). The site, 1.5 miles west of Crystal Forest, is on a small unnamed mesa locally known as Mountain Lion Mesa (Figure 7.1). The artifacts were found in May 1990 by Park Ranger Bill Wagers and his son, who were in the area looking at rock art. They used the shelter to get out of a passing thunderstorm and discovered the basket.

AZ Q:1:201 is a multiple room masonry site recorded as three separate loci. Eight possible structures, two slab features, a rock cairn, and 11 rock art panels were noted in a 10–acre area (40,700 m^2) (Figure 7.2). On the eastern edge of the site, just below and against the mesa top, is a small structure with masonry walls several courses high identified as a granary. An eroding midden deposit near the granary is over 1 m deep. Most of the ceramics indicate a Pueblo II–III time period, but a Basketmaker projectile point and a few Lino sherds were also noted (Wells 1989:13).

At first glance the shelter appears no different than the other numerous sheltering rocks noted throughout the Park, although it appears more stable. Other rock art sites in the Park include small to medium–sized shelters formed by sandstone caprock or by detached slabs and boulders on talus slopes. To date most of the shelters have no evidence of use; four notable exceptions are the four rockshelters discussed above in Chapter 4.

The shelter at AZ Q:1:201, formed by erosion under the caprock of the mesa, is approximately 20 square meters in size, with an average ceiling height of 1 m. A small offshoot, too small to enter, continues deeper for approximately 20 m. A faint spiral petroglyph, recorded during the 1988 site recording (see P 11 on Figure 7.2), is over the southeast facing opening of the rockshelter (Figure 7.3).

The floor of the shelter is composed of fairly level sediments and a few large sand-

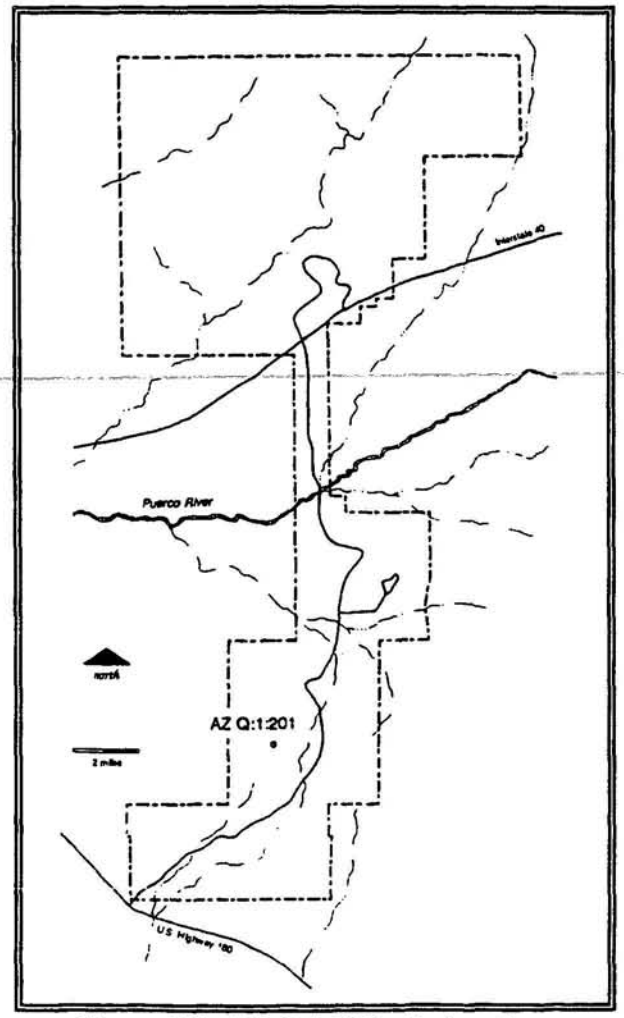


Figure 7.1. AZ Q:1:201 site location.

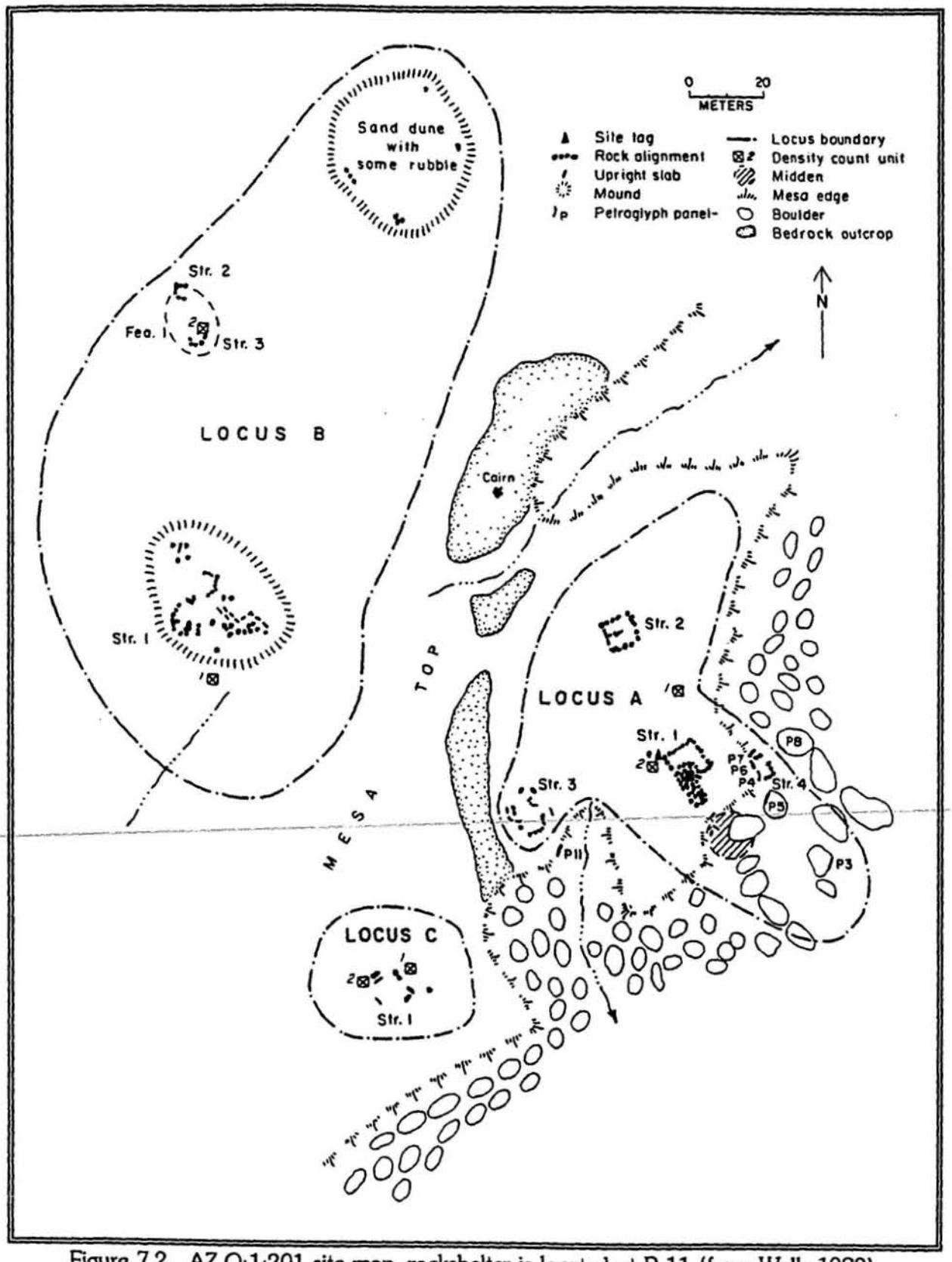


Figure 7.2. AZ Q:1:201 site map, rockshelter is located at P 11 (from Wells 1989).



Figure 7.3. Ron Beckwith at shelter entrance.



Figure 7.4. Basket *in situ*.

stone boulders. The basket was on a ledge formed by one of these boulders, next to the shelter wall (Figure 7.4). Found with the basket were a large rib bone and a few small sandstone slabs. In fact, the basket may have been hidden by slabs during the initial site recording; two sandstone slabs set vertically on the ledge touch the shelter roof, and two other slabs found lying on the ledge may also have been placed vertically and since fallen. Near the basket, in a crevice, was a worked wooden stick.

The basket is a round-bodied water bottle, identified as Navajo by Clara Lee Tanner (personal communication, 1990). It measures 32.9 cm high by 22.1 cm wide, with a neck 9.4 cm wide and 9.4 cm high (Figure 7.5). The construction is coiled with a simple non-interlocking stitch and a two-rod stacked foundation. No design elements are present. The bottle has pitch on the interior and exte-

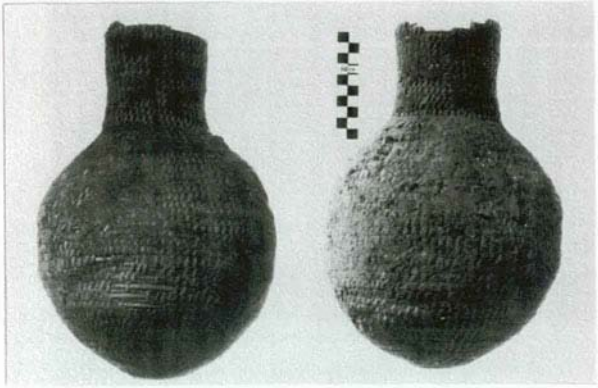


Figure 7.5. Navajo round-bodied water bottle.

rior. Rough areas in the pitch just below the neck may have once held lug handles, a common attribute on ethnographic Apache and Navajo water bottles (Ferg 1987; Kluckholn *et al.* 1971; Tanner 1976).

The wooden artifact recovered appears to be a batten used in weaving. Smoothed and flattened, with rounded edges, it measures 71.2 cm by 2.5 cm by 0.8 cm in size. Minute parallel grooves less than 1 mm apart along both edges suggest use on a loom (Figure 7.6). The batten is slightly bowed or warped from a flat plane. The rib bone, identified as horse (William Gillespie, personal communication, 1990), was unmodified and still contains traces of flesh (Figure 7.7).

The chance discovery of these artifacts provides more evidence for historic Navajo use of the Petrified Forest area. There are no known Navajo sites nearby, and the artifacts may have been cached by a sheep herder passing through the area. Accelerator (ASM) radiocarbon dating of pitch particles from the basket, a small scraping from the batten, or some of the flesh on the bone could provide more specific chronological information.

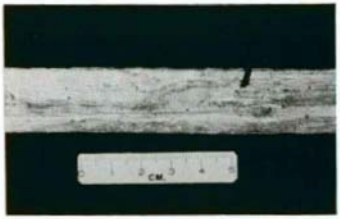


Figure 7.6. Detail of batten.



Figure 7.7. Horse rib bone.

Chapter 8
Projectile Points

Jeffery F. Burton and Mary M. Farrell

Since 1979, 112 projectile points have been recovered during archeological work at Petrified Forest National Park. This total includes 21 points recovered during site monitoring in 1990, 21 during the 1988 and 1991 surveys, 58 from previous surveys, and 12 from excavations at Sivu'ovi and Puerco Ruin. All of these collections are curated in the Museum Collections Repository at the Western Archeological and Conservation Center (WACC). The only other known collection of projectile points from the Park are 114 collected during excavations at the Flattop and Twin Butte sites (Wendorf 1953). Although these are located at the Museum of Northern Arizona and hence were not readily available for study, an adequate description is provided in Wendorf's report to allow comparison with the present collection.

Projectile points, whether actually used as projectiles or hafted for other uses, were an important item of material culture. In many parts of the West, projectile points provide the main chronological information for surface sites and surface–oriented studies such as surveys. Although ceramics provide more refined dates at most sites in the Petrified Forest area, projectile points are still useful for estimating ages of aceramic sites, and once chronologies and typologies are refined, they may provide interesting information on curation, scavenging, travel, and technological change.

This analysis is intended to complement Tagg's (1988, n.d.) study in which nearly 900 projectile points from east central Arizona, including 58 from Petrified Forest reanalyzed here, were classified based on morphological attributes. From this collection Tagg identified 22 separate types: 16 pre– or early ceramic– period spear and dart point types and six ceramic–period arrow point types. Tagg noted overlap between his identified types, which he attributed to transitional forms.

This analysis attempts to reduce the ambiguity of type overlap and to eliminate subjective interpretations by using "operational definitions" such as those developed by Thomas (1981) for projectile points from Monitor Valley, Nevada. Thomas's operational definitions key out projectile points using standardized attributes that divide the points into mutually exclusive categories. Operational definitions were applied closer to Petrified Forest by Anderson and McDonald (1990), who used this method to discern ten major types and several subtypes of projectile point types at Wupatki National Monument. The operational definitions, as developed by Thomas and applied by Anderson and McDonald, generally quantify and objectify commonly used descriptive terms (such as side–notched, corner–notched) and establish a replicable distinction.

The present study is meant to test the applicability and usefulness of operational definitions for Petrified Forest projectile points. The limited spatial distribution of the Petrified Forest projectile point collection may provide a check on more broad–based typologies. In addition, the varied temporal

and functional site contexts for the recovered points offers hope that more fine-grained temporal ascriptions can be made.

For this analysis 15 different measurements or attributes were taken from each projectile point (Appendix H). Some of the measurements are fairly standard and self-explanatory, such as length, width, thickness, weight, basal width, stem/neck width, and positioning and size of notch opening. Other measurements are less common, so Thomas's (1981:11-13) definitions are repeated here and depicted in Figure 8.1:

> *Distal Shoulder Angle – DSA.* The Distal Shoulder Angle is that angle formed between the line (A) defined by the shoulder at the distal point of juncture and line (B) drawn perpendicular to the longitudinal axis (C) at the intersection of A and C. DSA ranges between 90 degrees and 270 degrees. If points are asymmetrical, the smaller value of DSA is measured. *DSA* is recorded to the nearest 5 degrees.
>
> *Proximal Shoulder Angle – PSA.* The Proximal Shoulder Angle is that angle formed between the line (D) defined by the proximal point of juncture and line (B) plotted perpendicular to the longitudinal axis. *PSA* ranges between 0 degrees and 270 degrees. If points are asymmetrical, the smaller value of *PSA* is measured. *PSA* is recorded to the nearest 5 degrees.
>
> *Shouldered.* A point is termed shouldered if *DSA* and *PSA* can be measured. If these two angles do not apply, the point is termed unshouldered.
>
> *Basal Indentation Ratio – BIR.* Basal Indentation Ratio is the ratio of the length of the longitudinal axis (L_A) to the total length (L_T) parallel to C, *i.e.*, BIR = L_A/L_T. Basal Indentation Ratio ranges between 0.0 and about 0.9.

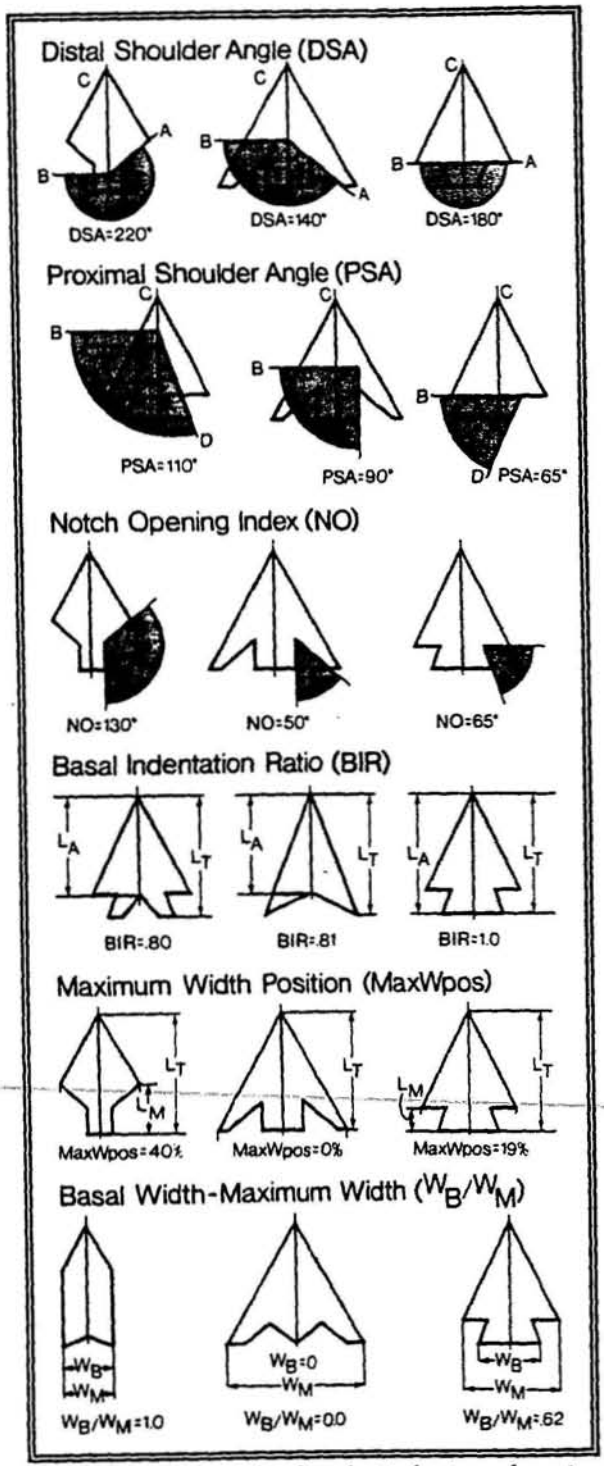


Figure 8.1. Standardized attributes of projectile points (from Thomas 1981).

Length–Width Ratio – L/W. The Length–Width Ratio is the ratio of the total length (L_T) to the maximum width (W_M), *i.e.*, Length–Width Ratio = L_T/W_M.

The *Maximum Width position* is the percentage of the total length between the proximal end and the position of maximum width (100 L_M/L_T). Range is generally between 0 and about 90%.

Basal Width–Maximum Width – W_B/W_M. The Basal Width–Maximum Width Ratio is the ratio of the width at the base (W_B) to the maximum width (W_M). Range is from 0 to 1.0.

Other attributes were developed for the Petrified Forest sample:

Maximum Thickness–Maximum Width Ratio – T_M/W_M. This measure of the relative thickness of a point ranges from about 0.15, for points that are thin and generally lenticular in cross section, to about 0.45, for points that are thick and biconvex in cross section.

Notch Position Ratio – NP. The Notch Position Ratio, measuring how high the notches occur on side–notched points, is the distance from the base to the center of the notch divided by the total point length.

Although at first the attribute definitions may seem a little cumbersome, it is believed that ultimately such definitions, once refined, will make projectile point analysis much easier. Other typologies and categorizations of points found in the Colorado Plateau and adjacent areas do not appear easily replicable. Even seemingly simple terms like corner– and side–notching are used inconsistently, and terms like "large" and "small" are difficult to implement because length, and even width, are often reduced during the use–life of a point. Operational definitions and keys can minimize the intuitive and idiosyncratic classifications that generate confusion and reduce the effectiveness of projectile points in providing information.

The resulting data for the Petrified Forest points were used to discern eleven major types (Figure 8.2, see Table 8.2). The most basic attributes, applied first, were weight, basal width, proximal shoulder angle, notch opening, and basal indentation ratios. The application of these attributes first, rather than others, is of course arbitrary and may affect the final classifications. However, it is consistent with the work of Thomas (1981) and other researchers, and appears to provide the most basic distinctions.

Other attributes, such as notch position and the maximum thickness/maximum width ratio, helped define subtypes for the Petrified Forest sample (Figure 8.2). Although most of the points could be placed into Thomas's classification, Thomas's type names have been retained only where there seems appropriate precedence in the Colorado Plateau area. Type names used by previous researchers are used as appropriate and others are introduced here. More prosaic, descriptive names, such as "Large Side–notched," are also used where type names are not warranted.

Figure 8.3 depicts the temporal context of the Petrified Forest projectile points based on spatially–associated artifacts and features such as ceramics, pit houses, and rubble mounds. However, the analyzed collection is predominantly from surface collections and temporal associations should be considered tentative. Scavenging, curation, and reuse can greatly affect temporal interpretations. The potential extent of the problem is illustrated at Wupatki, where 163 points representing ten major types dating from Paleoindian to historic times were almost

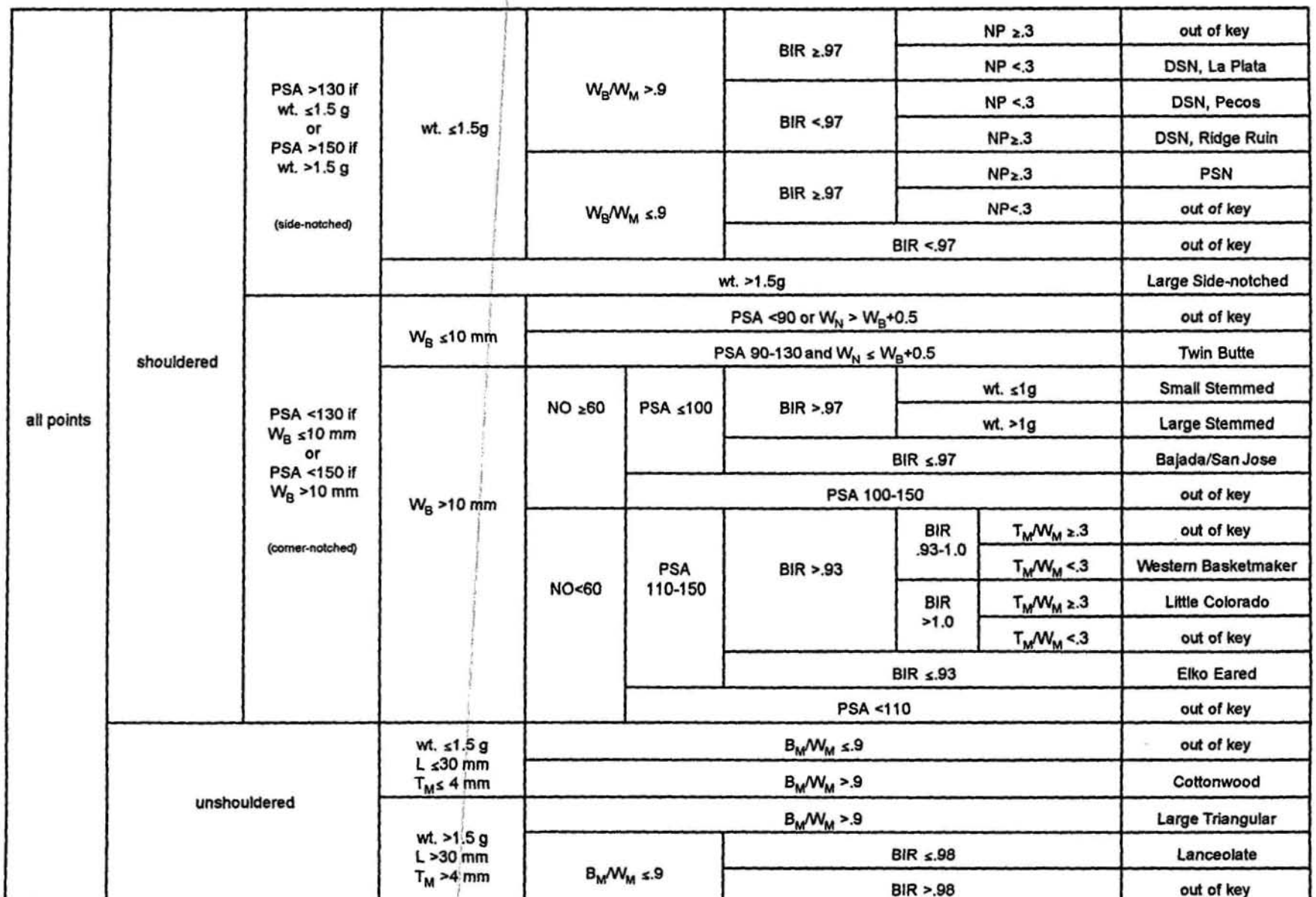


Figure 8.2. Key developed for typing projectile points from Petrified Forest National Park.

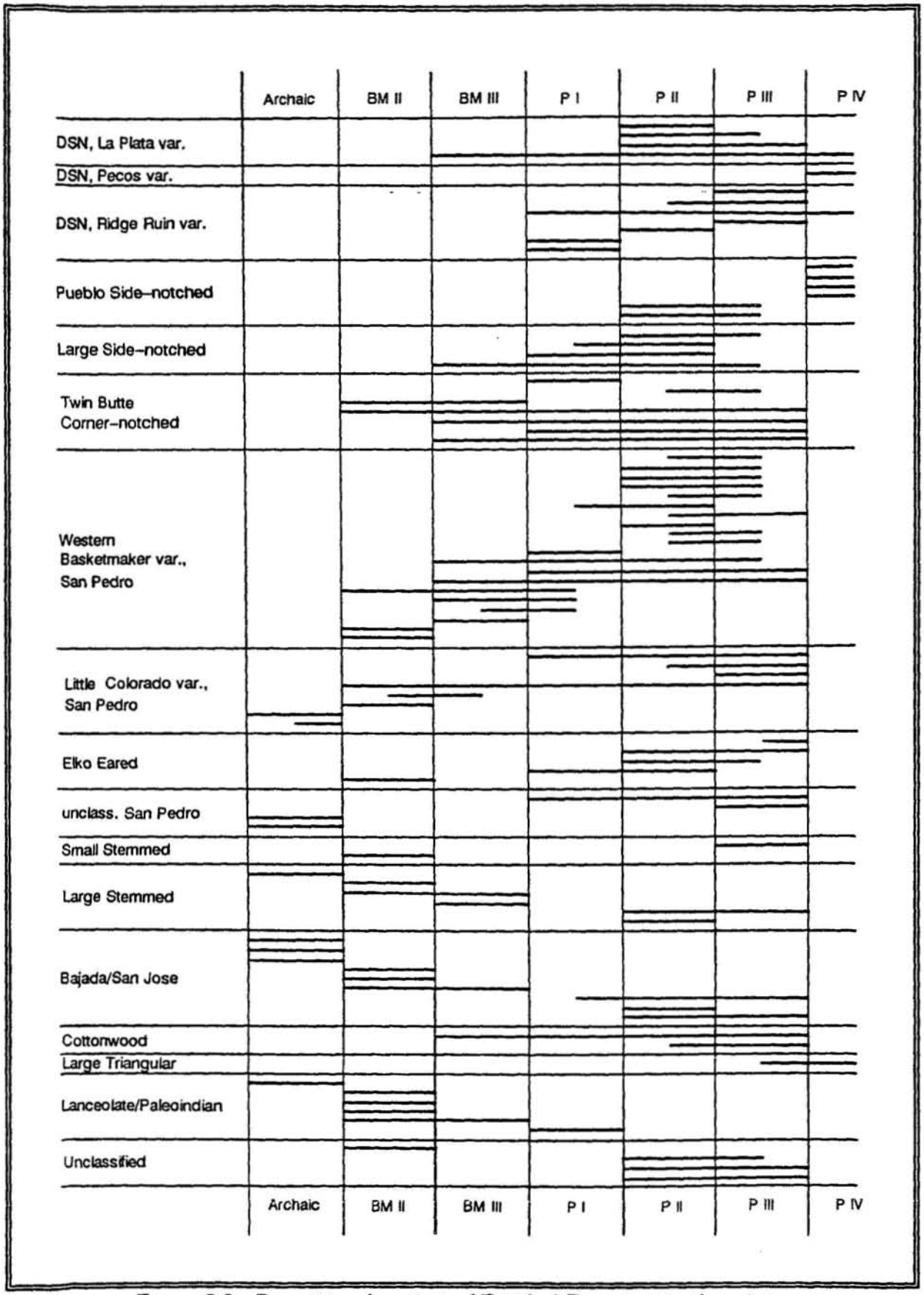


Figure 8.3. Depositional context of Petrified Forest projectile points.

all found on sites dating to the Pueblo II or Pueblo III period (Anderson and McDonald 1990:7–48). One assumption made here is that due to scavenging, early points would be more likely on late sites than late points on early sites.

Side–notched Projectile Points

Side–notched points include both small points (less than 1.5 g) with a proximal shoulder angle (PSA) greater than 130°, and large points (greater than 1.5 g) with a PSA greater than 150 degrees, following Thomas (1981). Twenty–two of the Petrified Forest specimens fit these criteria. Thomas's further division of these points into Desert Side–notched points (DSN) and Large Side–notched points (LSN), also seems appropriate for the Petrified Forest sample. Desert Side–notched points were originally defined by Baumhoff and Byrne (1959) to include Southwest specimens, and the points at Petrified Forest not only fit Thomas's key, they fall within the range of variation Baumhoff and Byrne describe. The term Large Side–notched has been used to include various forms in adjacent areas (*i.e.* Brown 1988) and this generic term subsumes the variability found in the four Petrified Forest points that fit the LSN criteria. But a third side–notched type is defined here, including several of the Petrified Forest points. While morphologically similar to Desert Side–notched points, their attributes place them in a distinct, potentially temporally significant category. Here they are termed Pueblo Side–notched points.

Desert Side–notched

Thomas defines these as small (less than or equal to 1.5 g), triangular points, with a basal width/maximum width ratio greater than 0.9. In the Great Basin this point style postdates A.D. 1300. Tagg (n.d.) indicates a Pueblo III to Pueblo IV time span for the southern Colorado Plateau, suggesting that examples with high side–notches may date to the Pueblo IV period. The 12 specimens from Petrified Forest all have a PSA greater than 130 degrees. These were further divided into three subtypes based on the notch position and base, to see if these visually– distinct categories proved to correlate with any temporal distinctions that could be discerned with current data. Two of these subtypes correspond to two subtypes previously named by Woodbury (1954), Pecos and La Plata. The third is termed here Ridge Ruin based on its abundance within a well–dated context at Ridge Ruin (McGregor 1941). Another of Woodbury's DSN subtypes, which he termed Awatovi for its common presence there (63 percent of small side–notched points), is not present in the Petrified Forest sample. Woodbury (1954:127) indicates that the Awatovi points may correlate with Hopi sites, reflecting their linguistic affiliation with the Shoshoni.

Pecos variety

This subtype is represented by one chalcedony point (Figure 8.4a) with a low notch (notch position less than 0.3) and a concave base (BIR less than 0.97). This point was recovered from a Pueblo IV context during excavations at Puerco Ruin. Similar points have been recovered at other Pueblo IV sites. The sole point found during excavations and surface collection at Homol'ovi II in 1984 (Sullivan and Madsen 1991:Figure 6.1) and 12 of 23 projectile points from a burial at Nuvakwewtaqa (Chavez Pass) appear to be of this type (Brown 1991).

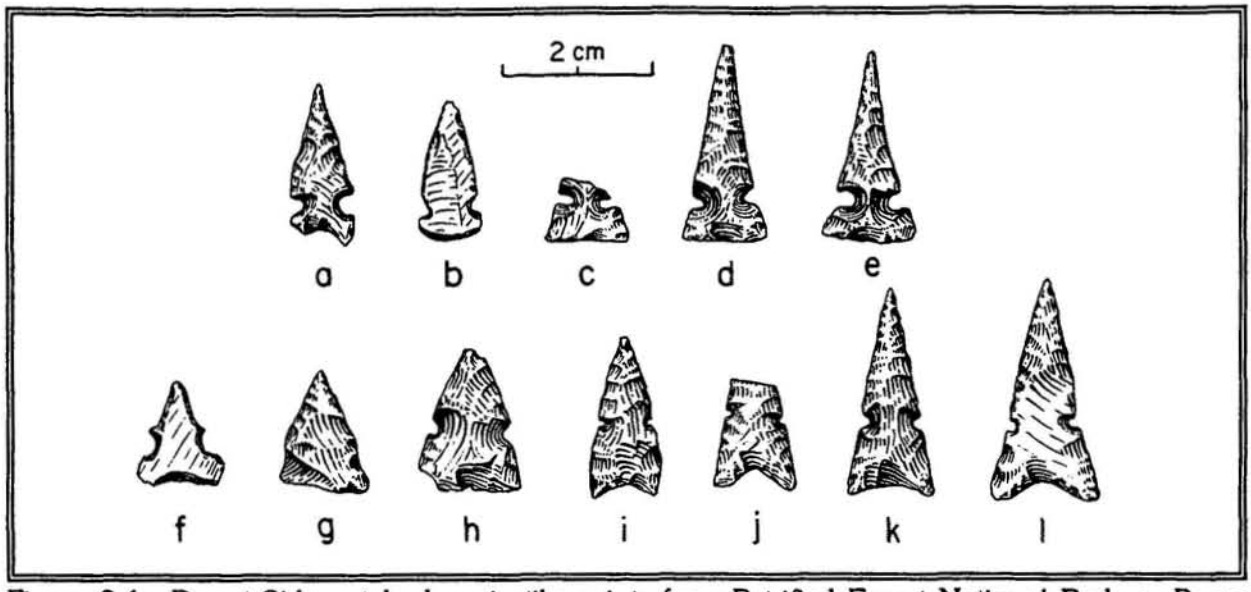


Figure 8.4. Desert Side-notched projectile points from Petrified Forest National Park; a. Pecos variety, b-e. La Plata variety, f-l. Ridge Ruin variety (catalog numbers are listed in Table 8.1).

La Plata variety

This subtype includes one chalcedony and three chert points (Figure 8.4b–e). The chalcedony specimen is only unifacially worked. The subtype is defined by a low notch (notch position less than 0.3) and a straight or convex base (BIR greater than or equal to 0.97). One was found at a Pueblo II site, two in Pueblo II–III contexts, and one at a site with Basketmaker III through Pueblo IV components (see Figure 8.3). This type is analogous to the single Type 2e point reported for Wupatki (Anderson and McDonald 1990). Eight of 23 points recovered from the burial at Nuvakwewtaqa (Brown 1991) and 77 of 406 points found associated with a Pueblo III burial at Ridge Ruin are of this type (McGregor 1941).

Ridge Ruin variety

This subtype consists of seven points, six of chert and one of chalcedony (Figure 8.4f-l). The chalcedony point is only unifacially worked. These have typically shallow high notches (notch position greater than 0.3) and a concave base (BIR less than 0.97). All were from Pueblo period sites, most commonly at ones dating to the Pueblo II and III periods (see Figure 8.3). Two hundred fifty-seven were found associated with a Pueblo III burial at Ridge Ruin (McGregor 1941), 19 were found at the Pueblo III Carter Ranch Pueblo (Martin *et al.* 1964), and three were recovered with a Pueblo IV burial at Nuvakwewtaqa (Brown 1991).

Large Side–notched

Four points, including two of petrified wood, one of chert, and one of obsidian, fit the criteria for Large Side–notched points (Figure 8.5). That is, they weigh more than 1.5 g and have a PSA greater than 150 degrees. In a review of point types of the Colorado Plateau, Rozen (1981) found no clear temporal association for Large Side–notched points. Tagg (1988) suggests they date to the Basketmaker period. The Petrified Forest examples, which exhibit a variety of sizes, base shapes, and flaking technologies, were recovered from Basketmaker III to early Pueblo III contexts.

Pueblo Side–notched

Six points, five of petrified wood (one is only unifacially worked) and one of obsidian, do not fit either the Desert Side–notched or Large Side–notched categories (Figure 8.6). They are most similar to Desert Side–notched except the basal width/maximum width ratio is less than or equal to 0.9. That is, they have a base narrower than their maximum width. Each has a high notch position (greater than or equal to 0.3) and a straight or convex base (BIR greater than or equal to 0.97). The type is provisionally designated here as Pueblo Side–notched because of their context. Further, Brown's "Pueblo Side– notched" found on the Kaibab Plateau (Brown 1988:240) bears a strong resemblance to the Petrified Forest Pueblo Side–notched points, and would likely key out the same.

Two of the points were from Pueblo II–early Pueblo III period sites, but four were from excavations at Puerco Ruin, all in definite Pueblo IV contexts. Similar points also were reported from the Pueblo IV site of Table Rock Pueblo near St. Johns (Martin and Rinaldo 1960). Therefore, although the Desert Side–notched points with high–notches (Ridge Ruin variety) do not show the Pueblo IV temporal distinction that Tagg suggests, the Pueblo Side–notched type does.

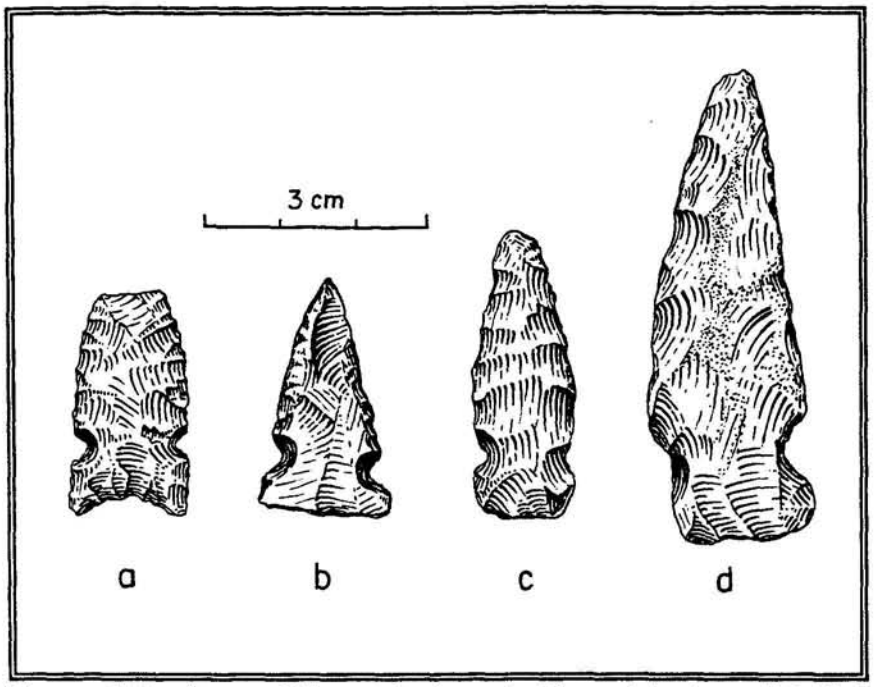


Figure 8.5. Large Side-notched projectile points from Petrified Forest National Park (catalog numbers are listed in Table 8.1).

Corner–notched Projectile Points

Thomas (1981) defines corner–notched points as small (basal width less than or equal to 10 mm) points with a PSA of 130 degrees or less and large points with a PSA of 150 degrees or less. Fifty of the Petrified Forest points fit this criteria. These are in turn divided into small corner–notched (here termed Twin Butte), large corner–notched (San Pedro/ Elko), stemmed, and split–stemmed types (Bajada/San Jose).

Twin Butte Corner–notched

Nine points, three of petrified wood (all only unifacially worked), two of chert, two of chalcedony, and two of basalt are classified as small corner–notched points (Figure 8.7). Here they are termed Twin Butte Corner–notched based on their abundance at that

Basketmaker III–Pueblo I period site (n=37). They fit Thomas's criteria for "Rosegate" points and are similar to points found elsewhere on the Colorado Plateau. They are here defined as small (basal width less than or equal to 10 mm), corner-notched (PSA between 90 and 130), with an expanding stem (neck width less than or equal to basal width plus 0.5 mm).

Tagg assigns this point style to the late Basketmaker III–Pueblo I period, which is consistent with the current sample. Four were from mixed Basketmaker and Pueblo contexts, four were from Pueblo contexts, and one was an isolate (see Figure 8.3).

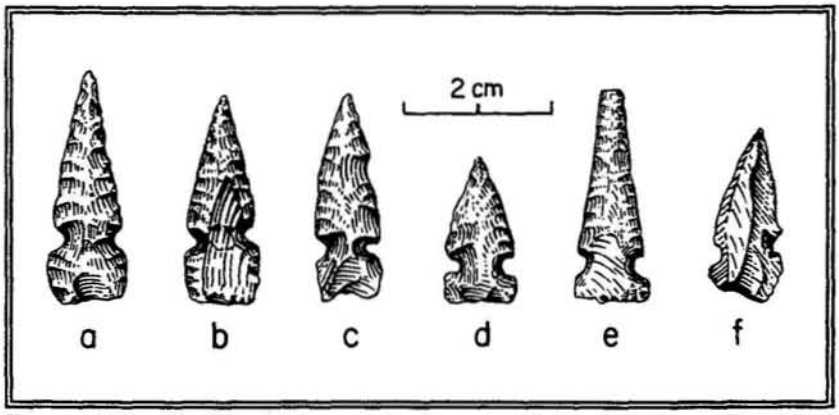


Figure 8.6. Pueblo Side-notched projectile points from Petrified Forest National Park (catalog numbers are listed in Table 8.1).

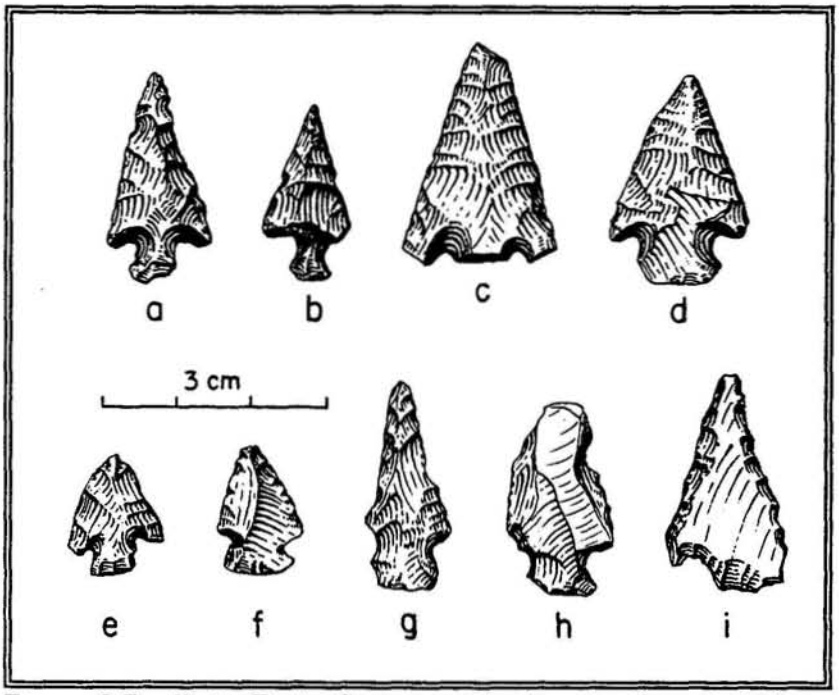


Figure 8.7. Twin Butte Corner-notched projectile points from Petrified Forest National Park (catalog numbers are listed in Table 8.1).

San Pedro Corner-notched (Elko)

Forty-one large corner-notched points are included in the Petrified Forest collection. These fit Thomas's definition of Elko Corner-notched points, with a basal width greater than 10 mm and a PSA between 110 and 150. Thirty-five of these were further classified into three subtypes: Western Basketmaker, Little Colorado, and Elko Eared. Western Basketmaker and Little Colorado were first differentiated by Berry (1987) using cluster analysis. Brown's (1988) study of points recovered in excavations on the Kaibab Plateau provides some corroboration of these two types. The third type, Elko Eared, was described by Heizer and Hester (1973) and defined by Thomas (1981) for the Great Basin, but examples have been recorded in several areas of the Southwest (Brown 1988, Huckell 1984).

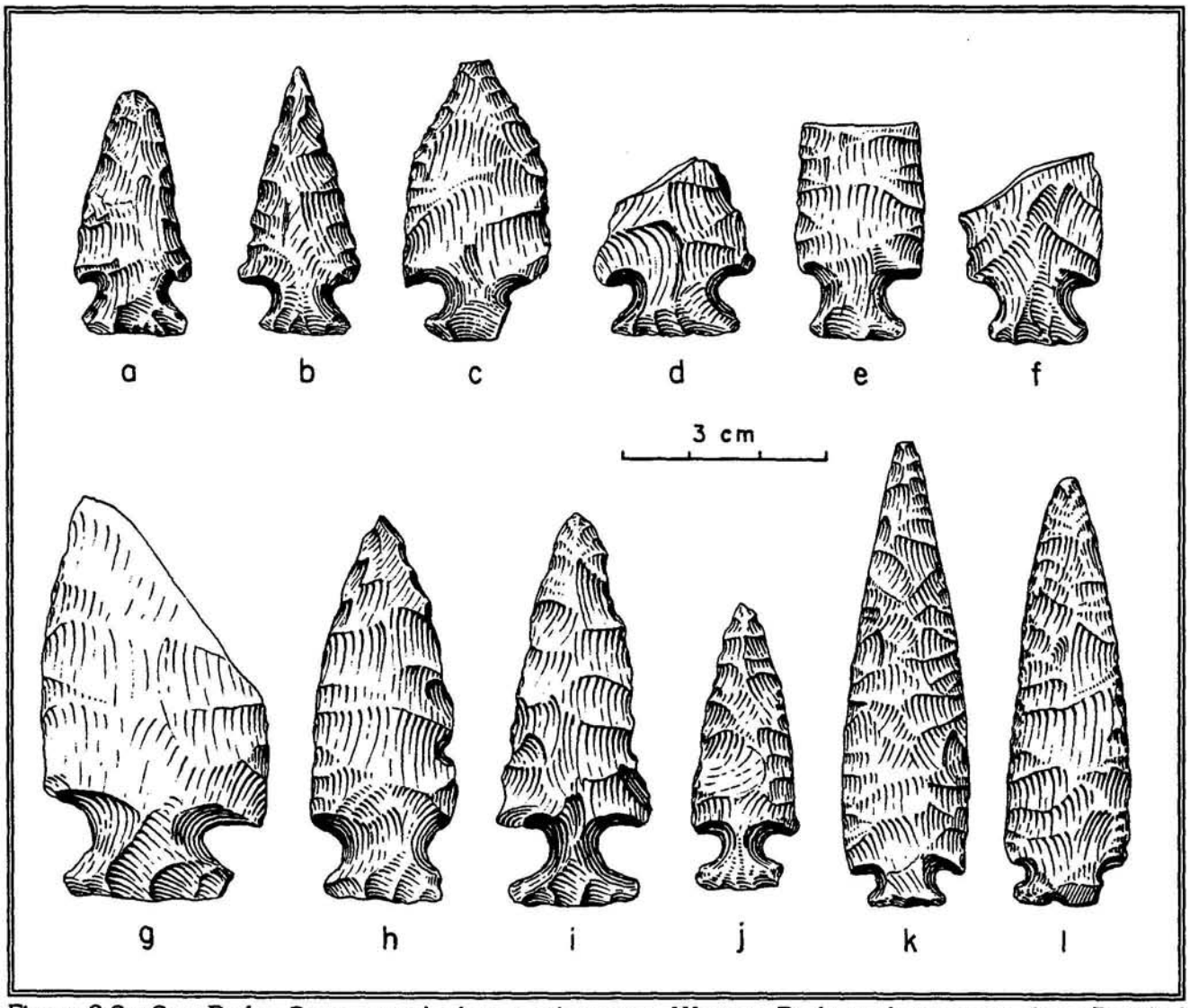


Figure 8.8. San Pedro Corner-notched projectile points, Western Basketmaker variety, from Petrified Forest National Park (catalog numbers are listed in Table 8.1).

Western Basketmaker variety

This subtype was the most common in the sample, accounting for 60 percent of identifiable large side-notched specimens. It includes ten of petrified wood, seven of chert, two of chalcedony, one of obsidian, and one of basalt (Figures 8.8 and 8.9f–n). The defining characteristics of this subtype include thinness (T_M/W_M less than 0.3) and a straight base (BIR 0.93–1.0). Notch opening also appears to be a significant, but unfortunately inconsistent, variable. Eight of the points were from Basketmaker sites or sites with a Basketmaker component, two were from Pueblo I–II contexts, ten were from Pueblo II–III sites (one of these was reworked into drill), and one was an isolated find. The contexts seem to indicate a Basketmaker date, with many projectile points scavenged and reused by later inhabitants of the area.

Little Colorado variety

This subtype is represented by five petrified wood and four chert points (Figure 8.10). These points are thick (T_M/W_M greater than

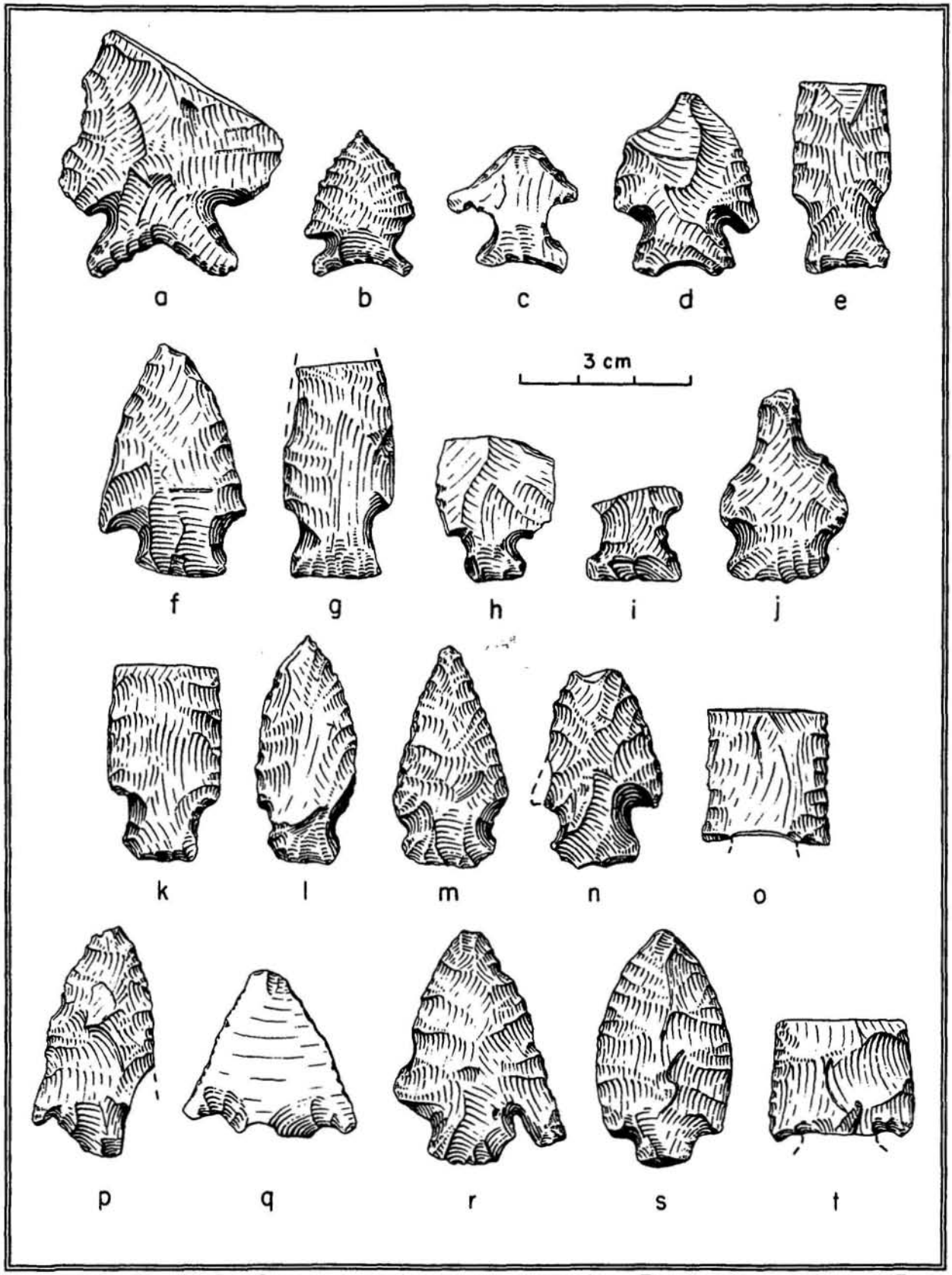


Figure 8.9. San Pedro Corner-notched projectile points from Petrified Forest National Park; a-e. Elko Eared variety, f-n. Western Basketmaker variety, o-t. unclassified (catalog numbers are listed in Table 8.1).

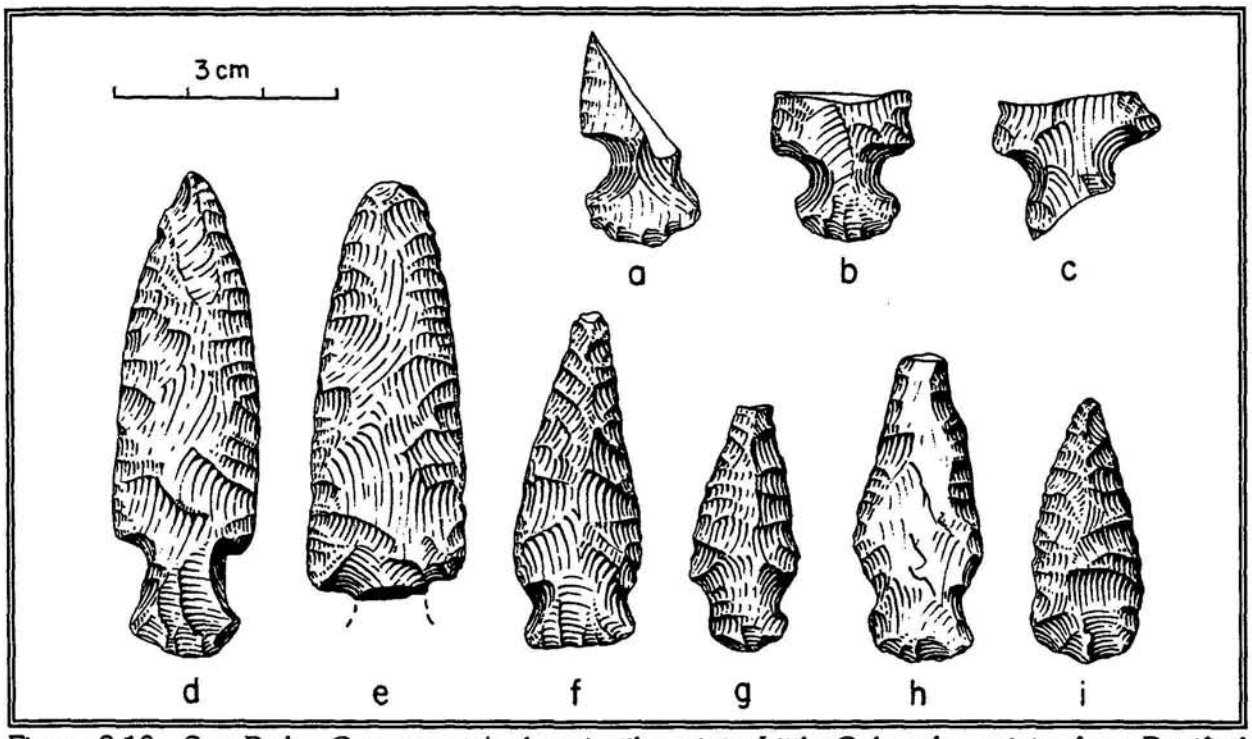


Figure 8.10. San Pedro Corner-notched projectile points, Little Colorado variety, from Petrified Forest National Park (catalog numbers are listed in Table 8.1).

or equal to 0.3), with convex bases (BIR greater than 1.0). Two were from aceramic (apparently Archaic) sites, two from Basketmaker II sites or sites with a Basketmaker II component, and four were from Basketmaker III and later sites. Most of the identifiable points from the Basketmaker II Flattop Site were of this type (Wendorf 1953).

Elko Eared variety

This subtype contains one obsidian, two chert, and two chalcedony points (Figure 8.9a–e). The defining characteristic of this subtype, which are morphologically equivalent to the Elko Eared type as defined by Heizer and Hester (1973) and Thomas (1981), is their concave base (BIR less than or equal to 0.93). One was from a Basketmaker II site, and the remainder were found at Pueblo period sites (see Figure 8.3).

Unclassified

Six large corner–notched points, three of petrified wood (one only unifacially worked) and three of chert were too fragmentary to further classify as to subtype (Figure 8.9o–t). Two each were from aceramic (Archaic), Pueblo, and isolated proveniences.

Stemmed Projectile Points

Stemmed points have a PSA less than or equal to 100° or a notch opening greater than or equal to 60° and a basal width less than 10 mm. Twenty–one of the points from Petrified Forest fit this category. These can be divided into three subtypes based on size and basal characteristics. Small stemmed points weigh less than or equal to 1.0 g and have a BIR greater than 0.97,

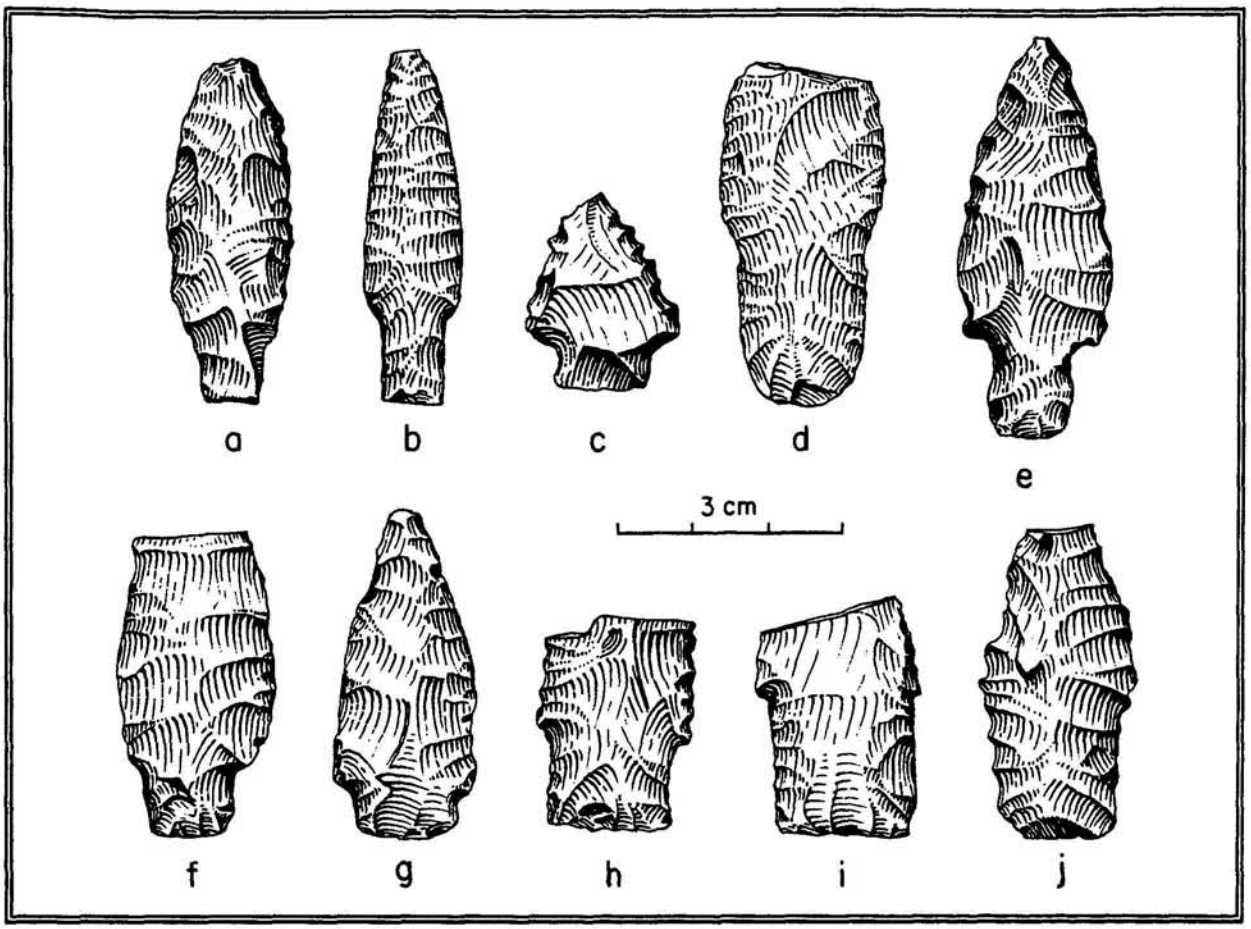


Figure 8.11. Stemmed Projectile points from Petrified Forest National Park; a-b. Small Stemmed, c-j. Large Stemmed (catalog numbers are listed in Table 8.1).

large stemmed points weigh more than 1.0 g and have a BIR greater than 0.97, and split stemmed points (Bajada/San Jose) have a BIR less than or equal to 0.97.

Small Stemmed

Two petrified wood specimens meet the small stemmed criteria (Figure 8.11a–b). One was found at a Pueblo III site, and the other was found at a Basketmaker II site.

Large Stemmed

Eight specimens key out as large stemmed points, including three of petrified wood, four of chert, and one of basalt (Figure 8.11c–j). Tagg (1988, n.d.) notes that large stemmed points are commonly found on Basketmaker III sites, and Rozen (1981) found large stemmed points to be a typical Basketmaker form. Among the Petrified Forest examples, one was from an aceramic (Archaic) site, two were from Basketmaker sites, two were from Pueblo period sites, and one is from a site of unknown temporal affiliation (see Figure 8.3).

Two of the Petrified Forest points have been previously identified as early Archaic or Paleoindian points (Tagg 1986). One (see Figure 8.11d), an isolated find, was identified as a Mojave or Jay point, a type dated elsewhere to between 6000 B.C. and ca. 4800 B.C. (Irwin–Williams 1973). The other (see Figure 8.11i) was identified as a

Table 8.1. Catalog Numbers of Illustrated Projectile Points (numbers with year prefix are field numbers).

Figure 8.4
a. PEFO-4302
b. 1990B-530
c. 1990B-265
d. 1990B-513
e. PEFO-7471
f. 1991C-33
g. PEFO-8846
h. 1991C-39
i. 1991C-39
j. 1988E-69
k. 1990B-857

Figure 8.5
a. 1990B-193
b. 1990B-90
c. PEFO-7474
d. 1990B-689

Figure 8.6
a. PEFO-4452
b. PEFO-4451
c. PEFO-4312
d. PEFO-4814
e. PEFO-8845
f. 1990B-702

Figure 8.7
a. 1990C-179
b. 1990B-353
c. PEFO-8843
d. PEFO-8896
e. 1989C-1
f. PEFO-8892
g. PEFO-7478
h. PEFO-9054
i. PEFO-7867

Figure 8.8
a. PEFO-8841
b. 1990B-623
c. PEFO-8840
d. 1990B-474
e. PEFO-8895
f. PEFO-5537
g. PEFO-8978
h. PEFO-5586
i. PEFO-8977
j. 1990B-701
k. 1990C-231
l. 1990B-688

Figure 8.9
a. PEFO-9139
b. PEFO-8838
c. 1990B-540
d. PEFO-8981
e. PEFO-5828
f. PEFO-6757
g. PEFO-7473
h. PEFO-8835
i. PEFO-8848
j. 1991C-18
k. PEFO-8894
l. PEFO-7475
m. 1991C-159
n. PEFO-7469
o. 1988E-38
p. PEFO-8990
q. PEFO-7869
r. 1991C-158
s. 1990B-888
t. PEFO-8839

Figure 8.10
a. PEFO-8842
b. 1990B-150
c. PEFO-7526
d. PEFO-7470
e. PEFO-8893
f. 1991C-212
g. PEFO-7870
h. 1990B-187
i. PEFO-9055

Figure 8.11
a. PEFO-5538
b. 1991C-37
c. 1990B-128
d. PEFO-9124
e. PEFO-7471
f. PEFO-5533
g. PEFO-7962a
h. PEFO-8849
i. PEFO-7466
j. PEFO-8983

Figure 8.12
a. PEFO-7467
b. PEFO-7468
c. 1988E-9
d. 1990B-459
e. PEFO-8836
f. 1988E-8
g. 1990C-357
h. 1988E-10
i. PEFO-5838
j. PEFO-7472
k. PEFO-8837

Figure 8.13
a. PEFO-8549
b. PEFO-7868
c. PEFO-7872
d. PEFO-8847
e. 1990B-887
f. PEFO-7525
g. PEFO-7476
h. PEFO-8984
i. PEFO-8831
j. PEFO-5571
k. PEFO-5583
l. 1991C-44

Figure 8.14
a. 1990C-41
b. 1988E-44
c. 1988E-61
d. PEFO-8891
e. PEFO-7866
f. PEFO-8844
g. 1991C-157

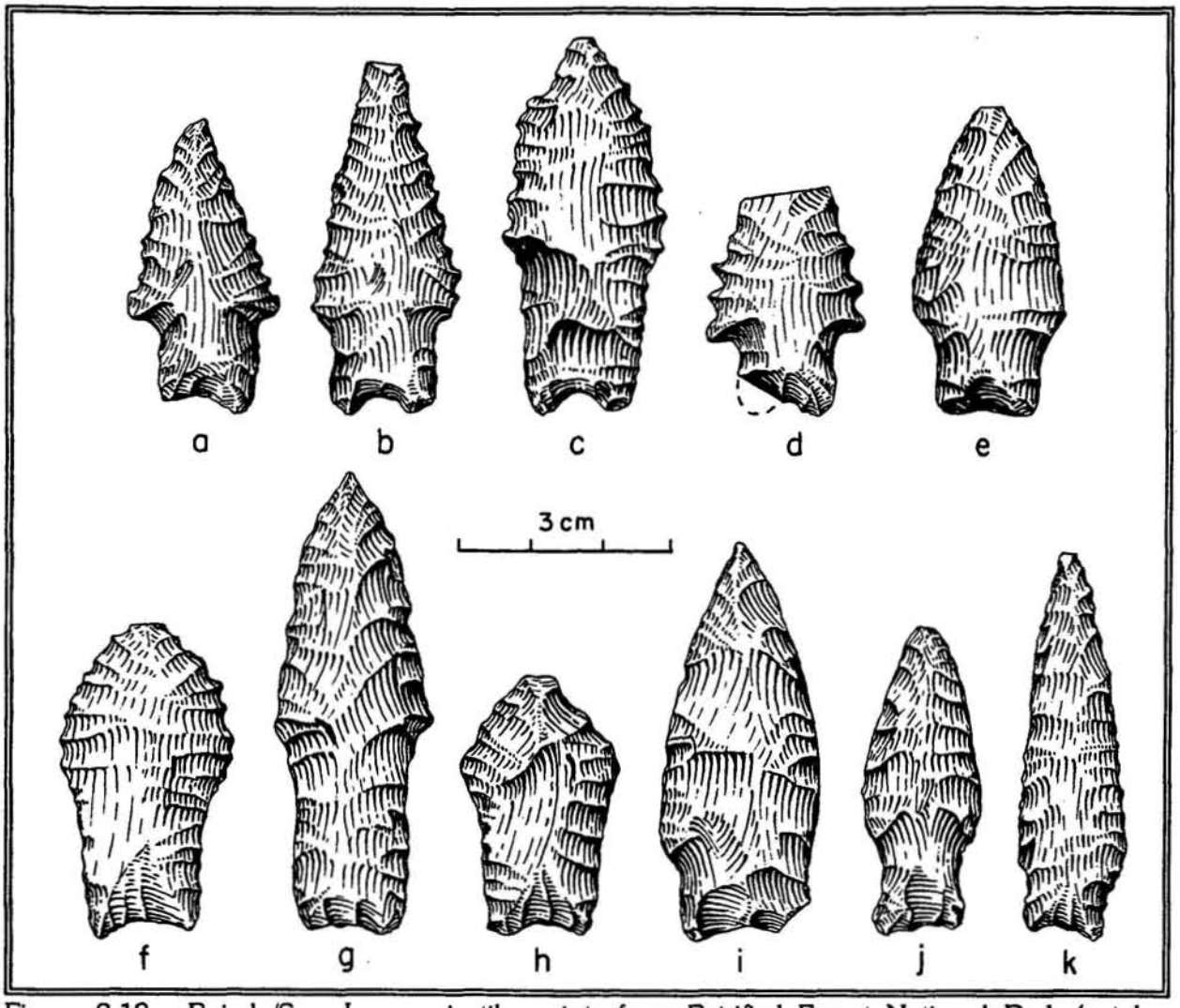


Figure 8.12. Bajada/San Jose projectile points from Petrified Forest National Park (catalog numbers are listed in Table 8.1).

Cody point dating to before ca. 6000 B.C. (Irwin–Williams 1973). It was recovered from a site with both Basketmaker and Pueblo components.

Bajada/San Jose

Of the 11 points that keyed out as split stem points, three are of petrified wood and eight are of chert (Figure 8.12). These points have been variously called Pinto, Bajada, and San Jose (the same form with serrations). Thomas uses the term Gatecliff Split-stem for his specimens. Bajada /San Jose is used here due to its common usage in the region.

Elsewhere Bajada points have been dated to between 4800 B.C. and 3200 B.C., and San Jose points to between 3200 B.C. and 1800 B.C. (Irwin–Williams 1973). The early dating of these points is supported by the Petrified Forest data. Three were from aceramic (Archaic) sites, three were from sites with Basketmaker II components, three were from Pueblo period sites, and two were isolated finds.

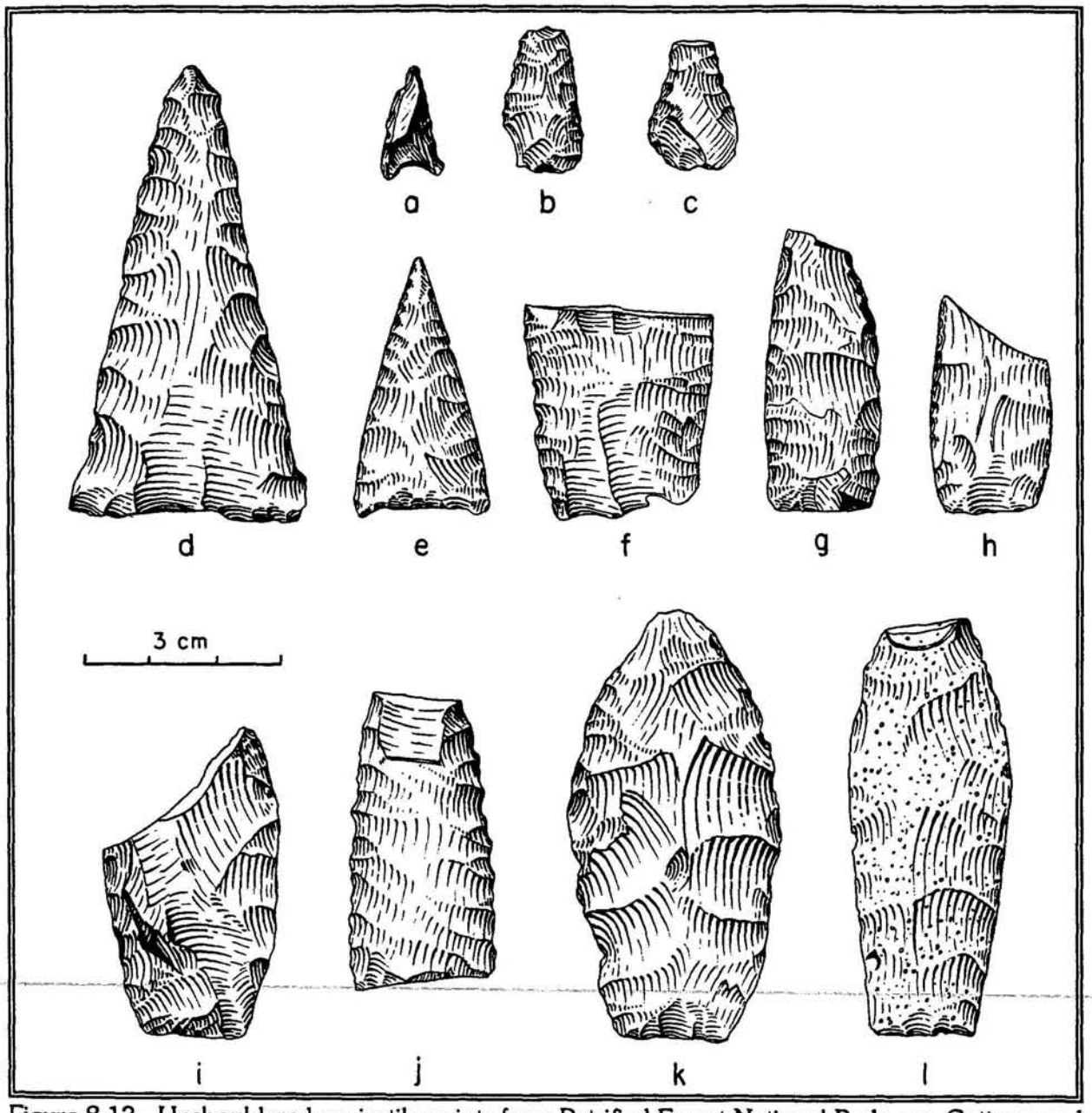


Figure 8.13. Unshouldered projectile points from Petrified Forest National Park; a-c. Cottonwood Triangular, d-e. Large Triangular, f-l. Lanceolate and Paleoindian types (catalog numbers are listed in Table 8.1).

Unshouldered Projectile Points

Unshouldered points have no notches or stem. Twelve of the Petrified Forest points fit this category. These were further classified into three types: small triangular (Cottonwood), large triangular, and lanceolate (Paleoindian).

Cottonwood Triangular

Three petrified wood specimens (Figure 8.13a–c) meet the criteria for Cottonwood Triangular points as defined by Thomas (1981). That is, they weigh less than or equal to 1.5 g, are less than 30 mm long

and 4 mm thick, and have a W_B/W_M greater than 0.9. This was the most common point type recovered during survey work at Wupatki (Anderson and McDonald 1990). This point type is also the dominant Pueblo I–III type in the Kayenta Anasazi area (Geib 1985). For the southern Colorado Plateau, Tagg (n.d.) noted two subtypes, one with straight or convex bases, dating to the Pueblo II–III period, and those with concave bases, dating to the Pueblo III–IV period.

The small sample from Petrified Forest provides little additional chronometric data. One was from a site of unknown temporal affiliation, one was from a site with Basketmaker III and late Pueblo II–Pueblo III components, and one was from a late Pueblo II–Pueblo III site. Twenty somewhat larger triangular points recovered at the Twin Butte site are likely preforms for small corner-notched points also common at the site (Wendorf 1953).

Large Triangular

This type is represented by two large triangular points with slightly concave bases (Figure 8.13d–e). They weigh more than 1.5 g, are more than 30 mm long and 4 mm thick, and have a W_B/W_M greater than 0.9.

One large triangular point, of chalcedony, was from the surface of Puerco Ruin (late Pueblo III to Pueblo IV). The other, of chert, was an isolated find.

Lanceolate and Paleoindian Types

Seven lanceolate points are in the Petrified Forest collection. These weigh more than 1.5 g, are larger than 30 mm long and 4 mm thick, have a W_B/W_M less than or equal to 0.9, and a BIR less than 0.98. Three are of petrified wood, two are of chert, one is of chalcedony, and one is made of a foraminiferous chert (Figure 8.13f–l).

One of the specimens was an isolated find, one was from the surface of a late Archaic site excavated in 1985 (Tagg 1986), four were from sites with Basketmaker II components, and one was from a Pueblo I site.

Lanceolate points are generally not considered temporally diagnostic, however two of the Petrified Forest specimens may date to the Paleoindian Period. The first specimen, from a late Archaic site (see Figure 8.13f), has been previ-

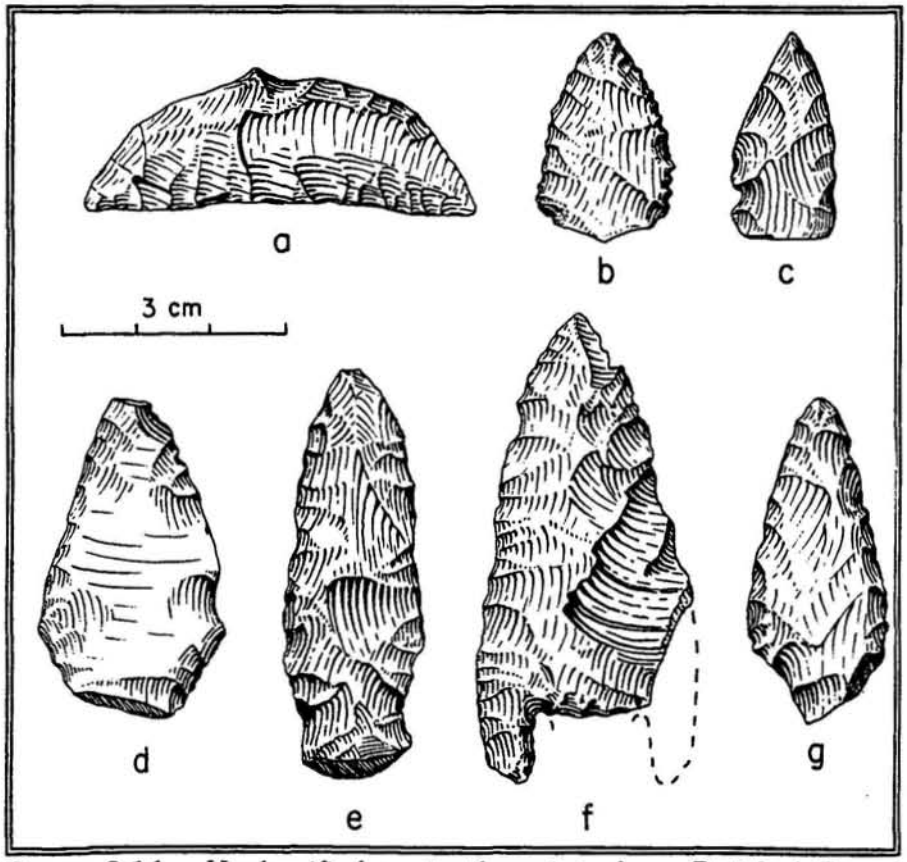


Figure 8.14. Unclassified projectile points from Petrified Forest National Park (catalog numbers are listed in Table 8.1).

ously identified as a Folsom point broken during fluting (Tagg 1986). Elsewhere Folsom points date to between 8550 B.C. and 9050 B.C. (Frison 1978).

Bruce Huckell (Personal Communication, 1992) suggests the second specimen, of foraminiferous chert (Figure 8.13l), may be a Hell Gap point. The material, found as nodules in limestone, is not locally available. Hell Gap points have been dated elsewhere to around 8050 B.C. (Frison 1978).

Unclassified Projectile Points

This includes six distal fragments, three of petrified wood, one of chert, one of chalcedony, and one of obsidian. Without bases, the points are too fragmentary to be classified. However, based on size they all appear to have been dart points (Figure 8.14b–g).

A seventh unclassified point is a chalcedony crescent (Figure 8.14a). As a single specimen, the crescent is not amenable to development of a classification of attributes, nor does it fit previously established categories. The crescent is morphologically similar to Great Basin Transverse points which potentially date as early as 9050 B.C. (Heizer and Hester 1973). It was found at a small Pueblo–period site; hence the similarity may be more fortuitous or coincidental than real. Alternatively, the crescent could have been scavenged and brought to the site by later inhabitants of the region.

Discussion

In summary, the key developed and used for the Petrified Forest projectile point collection has discriminated 11 types and six subtypes. As designed, the types generated appear consistent with types developed by other researchers. Table 8.2 depicts the type correlations, as determined by comparing the Petrified Forest types to illustrated point specimens in the respective reports. In some cases the Petrified Forest key appears to generate more types than other measures, and in some cases fewer, but the differences may reflect differences of the samples more than differences in analytical categories. For example, larger samples may encompass more variability and have more types or subtypes. The goal, eventually, is to determine which types are temporally or otherwise significant.

Assuming that scavenging has affected the distribution of the points, and that some sites are imprecisely dated, the chronometric data from Petrified Forest support previous projectile point chronologies. The Pueblo Side–notched and Pecos variety Desert Side–notched types appear to date to the Pueblo IV period, the Ridge Ruin variety Desert Side–notched type to the Pueblo III period, the La Plata variety Desert Side–notched and Cottonwood Triangular types to the Pueblo II–III period, and Twin Butte Corner–notched to the Pueblo I period. The Western Basketmaker variety San Pedro type appears to date to the Basketmaker III period, the Little Colorado variety San Pedro type to the Basketmaker II period, and the Large Stemmed, Bajada/San Jose, and Lanceolate types to the Archaic and Paleoindian periods. For other types, like Elko Eared and Small Stemmed, there is too little information to suggest temporal associations for the Petrified forest area.

The large number of Archaic points recovered during surveys at Petrified Forest National Park suggests the Archaic occupation of the area may have been more substantial than has been indicated by the small number of Archaic sites recorded to date. It is possible that many of the recorded aceramic sites in the Park are Archaic, that ceramic sites mask Archaic components, or that some Archaic sites are overlooked or

dismissed during surveys as ubiquitous petrified wood quarry debris.

Six material types are represented in the Petrified Forest projectile point collection. Forty percent are petrified wood, 39 percent are chert, 12 percent are chalcedony, 4 percent are obsidian, 4 percent are basalt, and 1 percent is foraminiferous chert (Table 8.3). Of these, only the obsidian and foraminiferous chert are definitely non–local materials. Chalcedony is likely available locally both as nodules and as heartwood of petrified wood logs.

The high percentage of chert points in the collection is somewhat surprising, since lithics at excavated sites in the Park generally run 80 percent petrified wood to 20 percent chert. Chert may have been preferred for projectile points, even in an area where petrified wood is more abundant. The few unifacial projectile points in the collection (see Appendix H) probably represent expedient points made of materials readily at hand. Six were made of petrified wood and two of chalcedony.

Table 8.2. Comparison of Petrified Forest Projectile Point Types.

Petrified Forest			Great Basin[1]	St. Johns[2]	Wupatki[3]	Colo. Plateau[4]
side–notched	DSN	La Plata	DSN	Type 5?	Type 2b-e	Type 23
		Pecos			Type 2f	Type 24
		Ridge Ruin			Type 2a	
	Large Side-notched		LSN	Type 6 & 8	Type 7	Type 18
	Pueblo Side-notched		none	none	Type 2d?	Type 23
corner–notched	Twin Butte		Rosegate	none	Type 3	Type 22
	San Pedro	Western BM	Elko	Type 4 & 10	Type 6	Types 13, 15-17
		Little Colo.				Type 19
		Elko Eared	Elko Eared			Type 14
stemmed	Small Stemmed		none	none	Type 4	Type 21
	Large Stemmed		Gatecliff	Type 3 & 9	Type 5 & 9	Types 6-10
	Bajada/San Jose		Gatecliff	Type 2 & 7	Type 8	Types 11 & 12
unshouldered	Cottonwood		Cottonwood	none	Type 1a-e	Types 20 & 25
	Large Triangular		none	none	Type 1f-g	none
	Lanceolate/Paleoindian		Humboldt	Type 1	Type 10	Types 1-5

1 - Thomas 1981
2 - Rozen 1981
3 - Anderson and McDonald 1990
4 - Tagg n.d.

Table 8.3. Projectile Point Material Types in the Petrified Forest Collection.

Point Type	Material Type						Total
	petrified wood	chert	chal-cedony	obsidian	basalt	other	
DSN, La Plata		3	1				4
DSN, Pecos			1				1
DSN, Ridge Ruin		6	1				7
Large SN	2	1		1			4
Pueblo SN	5			1			6
Twin Butte CN	3	2	2		2		8
Western BM CN	10	7	2	1	1		21
Little Colo CN	5	4					9
Elko Eared		2	2	1			5
unclass LCN	3	3					6
Small Stemmed	2						2
Large Stemmed	3	4			1		8
Bajada/San Jose	3	8					11
Cottonwood	3						3
Large Triangular		1	1				2
Lanceolate/Paleo	3	2	1			1	7
unclassified	3	1	2	1			7
Total	45	44	13	5	4	1	112

Although the small sample of points from Petrified Forest precludes any definitive conclusions, the materials used for projectile points show some interesting trends through time. Petrified wood forms 50 percent of the points that date to the Basketmaker II period and declining percentages of the points with each successive period to a low of 21 percent in the Pueblo II–III period. But in Pueblo IV, 71 percent of the points are petrified wood. Research elsewhere has suggested that with decreasing mobility, residents make increasing use of local materials (Parry and Kelly 1987). The use of more petrified wood during the Pueblo IV period at Petrified Forest fits well with the data that suggests populations apparently aggregated into a few large villages, such as

Puerco Ruin and Stone Axe Pueblo.

It is possible that low use of petrified wood at Petrified Forest indicates a high degree of mobility, perhaps with people moving in and out of the area. However, technological change may also factor into the pattern. Chert is available in the Petrified Forest area, but generally occurs as small cobbles. Such cobbles may have been too small for large dart points but increasingly appropriate for points as their size decreased with the introduction of the bow and arrow. Increasing use may suggest chert was a preferred material. Further, trade, as well as mobility, should be considered in the presence of exotic materials such as obsidian during the Basketmaker III and Pueblo IV periods.

Table 8.4. Petrified Forest Projectile Point Data by Time Period.

Time period	percent of total	Material type (percent)					
		petrified wood	chert	chalce-dony	obsidian	basalt	other
Pueblo IV	9	71		14	14		
Pueblo II–III	17	21	64	14			
Pueblo I	10	33	22	22		22	
Basketmaker III	26	48	32	10	5	5	
Basketmaker II	17	50	36	7			7
Archaic/Paleo.	20	24	70			6	

Chapter 9
Ceramics

Jeffery F. Burton and Christine E. Goetze

During the course of surveys conducted in 1988, 1989, and 1991 at Petrified Forest National Park, approximately 5,625 ceramics were recovered from the surface contexts of 60 sites. Of these, 1053 sherds were selected for analysis. All ceramic material was washed and bagged at the Western Archaeological Conservation Center. The sample chosen for analyses was then turned over to a ceramic specialist (Goetze).

A methodical and rapid approach to processing ceramic material was implemented which uses direct data entry, a method that has been demonstrated to be more accurate than the commonly used handwritten tabulations which are later entered into a data base. To facilitate direct data entry, a computer station equipped with a binocular microscope, a digital scale, and a hand–held digital caliper was used. As temper identifications and other measurements were made, the information was entered directly into a Dbase file, thus speeding the process of analysis as well as eliminating the need for a separate data entry operation.

Aside from direct data entry, standard laboratory techniques were used during the Petrified Forest analysis. Provenience information was entered into the data base from the field tag located within each bag. Tempering material was determined by breaking a corner of each sherd and examining it under the microscope. Each sherd was weighed to a tenth of a gram on a digital scale, and a thickness measurement, to a tenth of a millimeter, was taken using a hand–held digital caliper.

The selection of attributes for analysis was based on the need to identify individual sherds to a ware and type when possible, to aid in site dating, and to address future research questions regarding ceramics from the Petrified Forest region. Toward this end, a total of nine attributes were analyzed for each sherd. Two of these provide ware and type information, while the other seven provide data useful for dealing with various research questions (see Appendix I).

The classification of the ceramic material was based on standard published descriptions of various wares and types. These references are listed in Table 9.1. For recalcitrant sherds that proved difficult to classify, type collections at both the University of Arizona Archaeological Laboratory and at the Arizona State Museum were consulted. In addition, Dr. Barbara Mills was consulted on the classification of Zuni Glaze Wares, while Trixi Bubemeir provided information on the Hopi Wares.

Ceramic keys were also used to facilitate classification. Taxonomic keys as guidelines for analysis have been used successfully in a number of projects (Crown 1981; Doyel 1980; Goetze and Mills n.d.; Mills 1987; Sullivan 1984). The keys are hierarchically structured, using dimensions that contain mutually exclusive attributes. In using the keys, the initial classification of a particular sherd begins with a decision about its broad ware category. This includes determining whether the sherd is a white ware, gray ware, or red ware based on its surface color. Once the broad ware category is deter-

mined, a more specific ware identification is made based on the temper type, and the presence of either mineral or carbon paint on decorated wares. After the specific ware has been identified, it is then keyed out using various stylistic attributes that separate each type within that ware.

If a sherd could not be assigned to a specific type, intermediate categories were established. For example, small Cibola White Ware sherds with hatched designs that could be either Reserve or Tularosa were typed as Reserve/Tularosa.

Taxonomic Classification

The cultural diversity of the Petrified Forest region as reflected in ceramic assemblages has been well documented by Mera (1934), Reed (1947), and others (see Stewart 1980). The present work is no exception; over 12 wares were identified in the sample. Each of the diagnostic pottery types has been discussed in detail elsewhere. Therefore, definitions are not warranted here; rather the reader is referred to the references cited in Table 9.1. Ceramic dates used here are from Breternitz's (1966) reevaluation of ceramic data using associated dated tree-ring specimens.

The ceramics recovered during the surveys include specimens from both grab samples and controlled surface collections, from a total of 60 sites. The grab samples are biased towards decorated wares, since plain ware sherds were generally not collected unless no others were available. In the few controlled grid collections, plain ware sherds outnumber decorated ware considerably. Several sites recorded in 1988 which contained only limited numbers of ceramics were not collected. A summary of ceramic data by site is presented in Appendix J.

Table 9.1. Descriptive References for Ceramic Classifications.

Ware	References
Cibola White Ware	McKenna and Toll 1984 Mills 1987 Sullivan 1984 Windes 1977
Cibola Gray Ware	McKenna and Toll 1984 Mills 1987
Tusayan White Ware	Ambler 1985 Colton 1955
Tusayan Gray Ware	Colton 1955
Mogollon Brown Ware	Rinaldo and Bluhm 1956 Mills 1987
Showlow Red Ware	Fowler 1991
White Mtn Red Ware	Carlson 1970 Woodbury and Woodbury 1966
Hopi Wares	Hayes 1991 Smith 1971
Little Colo. White Ware	Colton 1955 Douglass 1987
Little Colo. Gray Ware	Colton 1955
Zuni Glaze	Woodbury and Woodbury 1966
Adamana Brown Ware	Mera 1934 Wendorf 1953

Decorated Wares

Eight decorated wares were identified in the collection. These include Cibola, Little Colorado, and Tusayan white wares, Show-

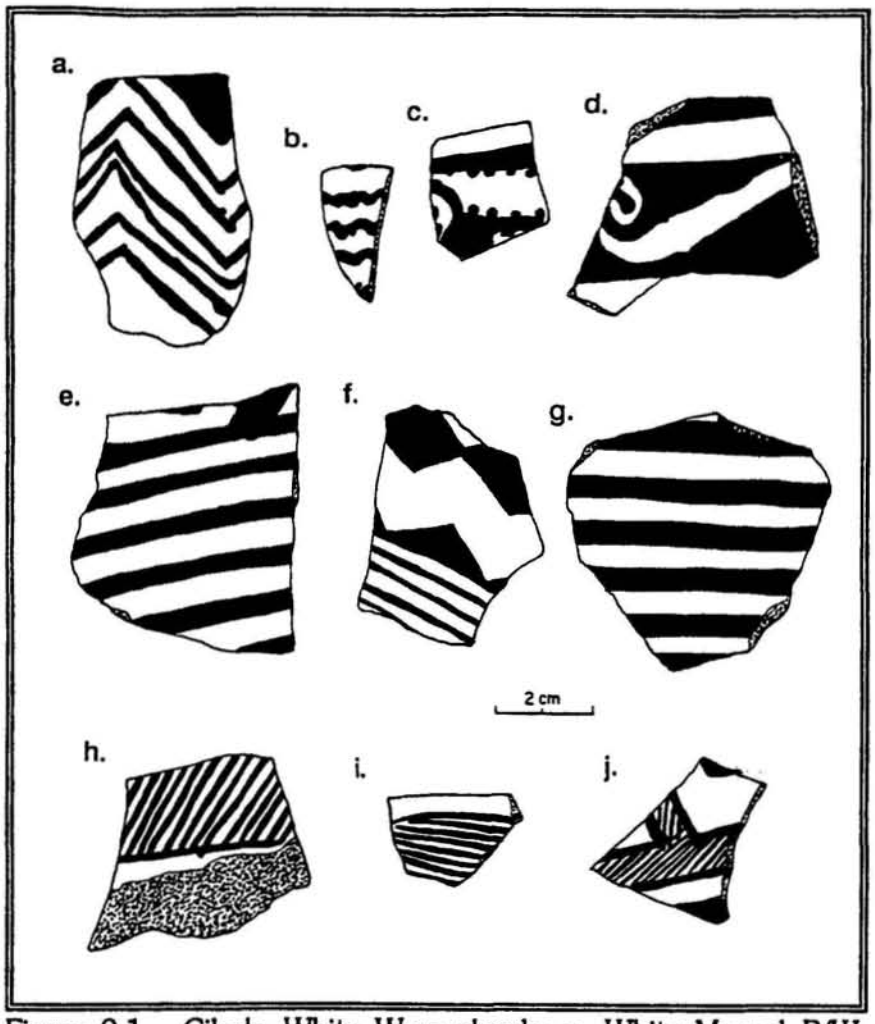


Figure 9.1. Cibola White Ware sherds; a. White Mound B/W, b. Kiatuthlana B/W, c.-d. Red Mesa B/W, e-f. Puerco B/W, g. Escavada B/W, h-i. Gallup B/W, j. Chaco B/W.

low and White Mountain red wares, and Salado, Hopi, and Zuni wares. Each is discussed below.

Cibola White Ware

A total of 196 Cibola White Ware sherds was collected from 48 sites. This is the most common decorated ware, present at 80 percent of the sampled sites and comprising 19 percent of the collection. Eleven different types were identified: White Mound, Kiatuthlana, Red Mesa, Puerco, Escavada, Gallup, Chaco, Snowflake, Reserve, Tularosa, and Pinedale Black-on-white, as well as indeterminate and undifferentiated categories. Representative sherds are depicted in Figures 9.1 through 9.3. Tularosa Black-on-white was the single most common type (n=42), followed by Reserve Black-on-white (n=14), and Escavada Black-on-white(n=13). Thirty-four sherds could not be identified to type and 51 were classified as Undifferentiated Pueblo II-III types.

The earliest Cibola White Wares are only sparsely represented in the collection. White Mound Black-on-white, dating to between A.D. 675 and 900 (Basketmaker III-Pueblo I), and Kiatuthlana Black-on-white, dating to between A.D. 825-850 (Pueblo I), are each represented by a single sherd. Red Mesa Black-on-white, dating to between A.D. 850 and 1125 (Pueblo I-II), is represented by three sherds. Twenty-nine of the sherds are classified as Pueblo II types, specifically Puerco Black-on-white (A.D. 1000 to 1125), Escavada Black-on-white (A.D. 925 to 1125), and Reserve Black-on-white (A.D. 940 to 1100). The 11 typed Pueblo II/III sherds include Gallup Black-on-white, dating to between A.D. 1000 and 1125 (Pueblo II/III), and Chaco Black-on-white, dating to between A.D. 1050 and 1125. The most numerous types of Cibola White Ware date to the Pueblo III period: Snow-

flake Black-on-white, dating to between A.D. 1100 and 1200, and Tularosa Black-on-white, dating to between A.D. 1100 and 1250, are represented by a total of 53 sherds. Late Pueblo III–IV Cibola White Ware is represented by six Pinedale Black-on-white sherds, dating to between A.D. 1300 and 1350 (late Pueblo III–IV).

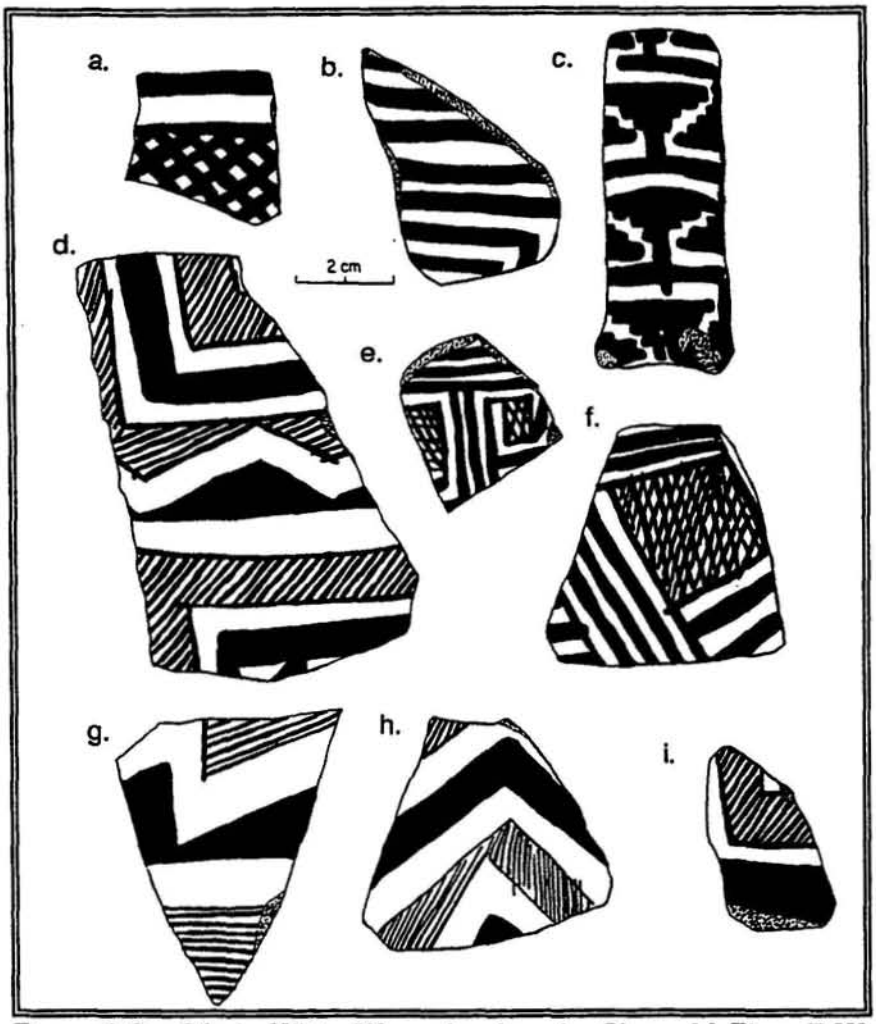


Figure 9.2. Cibola White Ware sherds; a-b. Chaco-McElmo B/W, c. Snowflake B/W (ladle handle), d. Reserve B/W, e-h. Tularosa B/W, i. Reserve/Tularosa B/W.

Little Colorado White Ware

Little Colorado White Ware is represented by 105 sherds from 39 sites (65% of sampled sites). Six types were identified: Walnut Black-on-white A and B (48% of typed Little Colorado White Ware sherds), Holbrook Black-on-white A and B (33%), Padre Black-on-white (14%), and Leupp Black-on-white (5%). Representative sherds are depicted in Figures 9.4 and 9.5. The majority of the Little Colorado White Ware sherds date to the Pueblo II–early Pueblo III period. Holbrook Black-on-white A and B have been dated to between A.D. 1070–1110 (Pueblo II), Padre Black-on-white to between 1085–1200 (Pueblo II–early Pueblo III), Walnut Black-on-white to between 1050–1200 (Pueblo II–early Pueblo III), and Leupp Black-on-white to between 1200–1300 (late Pueblo III).

Tusayan White Ware

Seven Tusayan White Ware sherds were collected from five sites (8% of sampled sites). These include a Lino Black-on-gray sherd from AZ Q:1:297, two Kana-a Black-on-white sherds from AZ Q:1:214, and one Black Mesa Black-on-white sherd each from AZ K:13:118 and AZ Q:1:214. Two undifferentiated Tusayan White Ware sherds were from AZ K:13:110 and AZ K:13:113. Representative sherds are depicted in Figure 9.6. The typed Tusayan White Ware sherds are relatively early types; Lino Black-on-gray dates to between A.D. 575 and 875

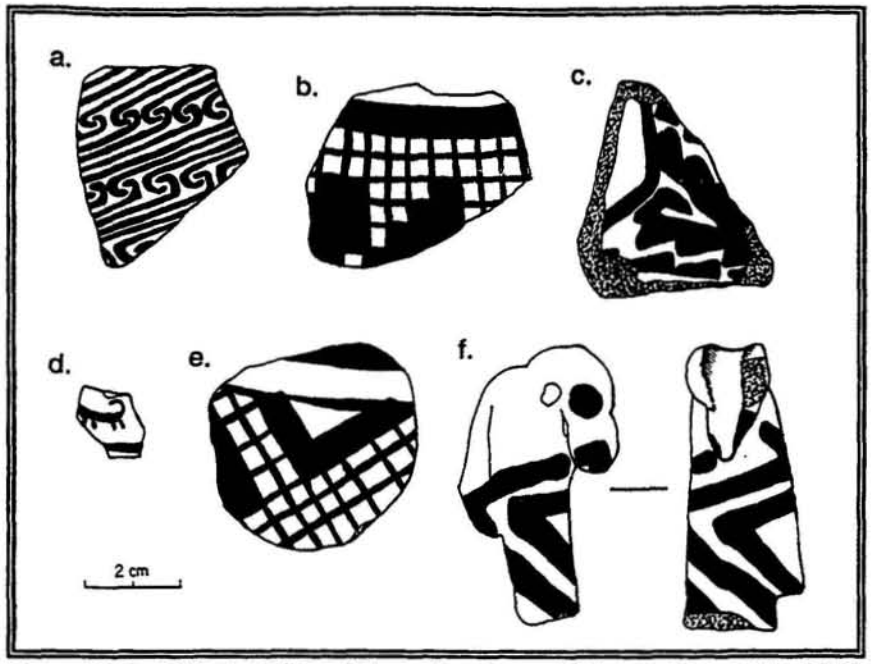


Figure 9.3. Cibola White Ware sherds; a. Tularosa/Pinedale B/W, b. Pinedale B/W, c-f. Undetermined Pueblo II-III B/W types.

(Basketmaker III to Pueblo I), Kana-a Black-on-white to between A.D. 775 and 950 (Pueblo I), and Black Mesa Black-on-white to between A.D. 875 and 1130 (Pueblo I-II). In addition, Tusayan White Ware appears to be more rare in this sample than in samples collected during previous survey work within the Park (Jones 1987; Wells 1988, 1989). Although neither the present sample nor previous samples were complete or exhaustive tallies of wares present, methods are comparable.

Showlow Red Ware

Thirty-seven Showlow Black-on-red sherds, including seven that are corrugated, were recovered from 22 of the sites. Representative sherds are depicted in Figure 9.6. Showlow Red Ware post-dates A.D. 1050 (Pueblo II and later).

White Mountain Red Ware

White Mountain Red Ware, the second most common decorated type in the collection, is represented by 128 sherds from 32 sites (53% of sampled sites). Nine types were identified, including four black-on-red types and five polychrome types. Representative sherds are depicted in Figures 9.7 and 9.8.

The black-on-red types, found at 29 of the 32 sites with White Mountain Red Ware, include Puerco Black-on-red, dating between A.D. 1000 and 1200 (Pueblo II), Wingate Black-on-red, dating between A.D. 1050 and 1200 (Pueblo II to early Pueblo III), St. Johns Black-on-red, dating between A.D. 1175 and 1300 (Pueblo III), and Pinedale Black-on-red, dating between A.D. 1275 and 1325 (late Pueblo III-early Pueblo IV).

The polychrome types were found at only 12 of the 32 sites with White Mountain Red Ware: AZ K:13:104, AZ K:13:105, AZ K:13:112, AZ K:13:113, AZ K:13:117, AZ K:13:118, AZ Q:1:199, AZ Q:1:226, AZ Q:1:238, AZ Q:1:227, AZ Q:1:281, and AZ Q:1:286. Wingate Polychrome, dating between A.D. 1125 and 1200 (early Pueblo III), is represented by 12 sherds. Seventeen sherds of St. Johns Polychrome, dating between A.D. 1175 and 1300 (Pueblo III), were recovered, and Springerville Polychrome, dating to between A.D. 1250 and 1300 (late Pueblo III) is represented by four sherds. Pueblo IV polychrome types are represented by Heshotauthla Polychrome, dating to between A.D. 1300 and 1375, and Four Mile Polychrome, dating between A.D. 1325 and 1400. Two Hesho-

tauthla Polychrome sherds were collected at AZ Q:1:281 and one was collected at AZ Q:1:199 (Stone Axe Pueblo). All 12 of the Four Mile Polychrome sherds were from Stone Axe Pueblo. Four polychrome sherds could not be assigned to a specific type.

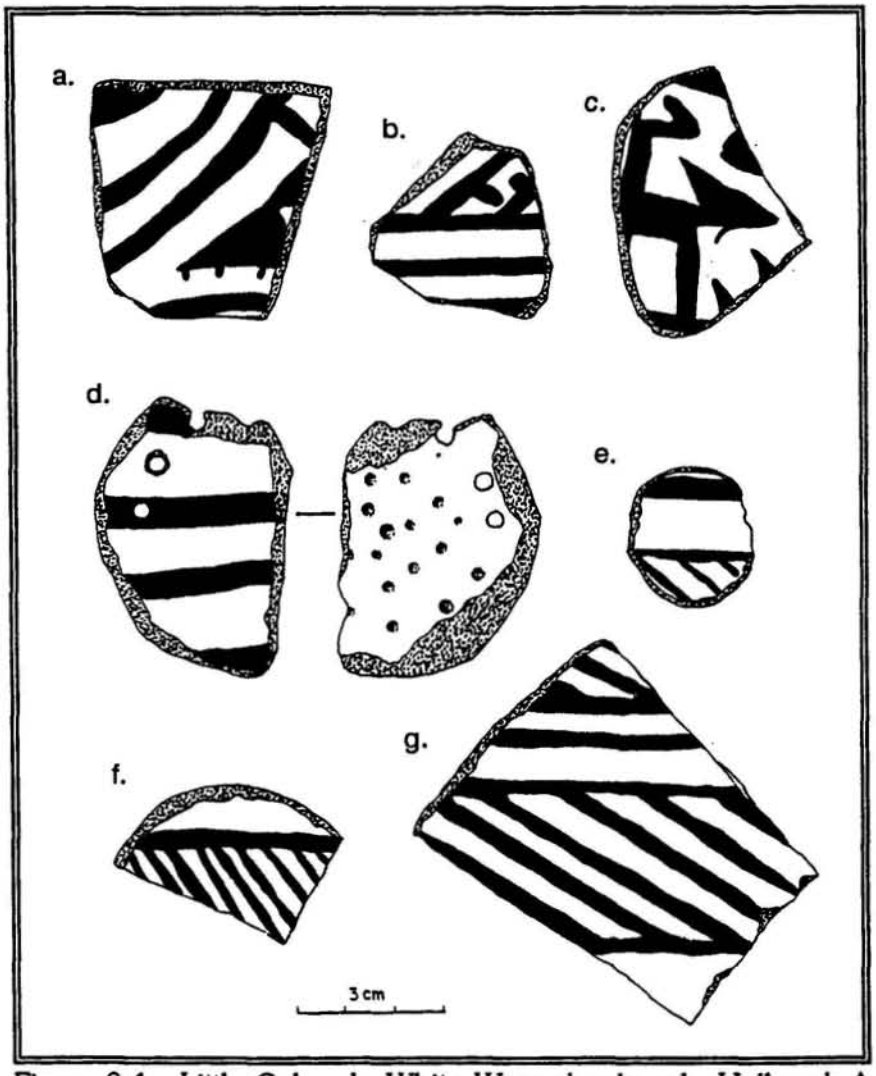


Figure 9.4. Little Colorado White Ware sherds; a-b. Holbrook A B/W, c-d. Holbrook B B/W, e-g. Padre B/W.

Salado Wares

Nine Salado polychrome sherds were collected from three sites. Pinto Polychrome (n=6) was the only identifiable type. Representative sherds are depicted in Figure 9.9. Three sherds each were collected from Stone Axe Pueblo (AZ Q:1:199) and sites AZ Q:1:226 and AZ Q:1:281. The latter two sites are located in the southern portion of the Park. Previously, Salado Polychrome has been noted at Puerco Ruin and at two other sites in the southern end of the Park. This ware is considered a late Pueblo III–early Pueblo IV time marker.

Hopi Wares

A total of 20 sherds classified as Hopi wares was collected from three sites. This includes Jeddito Yellow Ware and Homolovi Orange Ware, both considered to post-date A.D. 1300 (Pueblo IV and later). Representative sherds are depicted in Figure 9.10. All but two of the sherds came from Stone Axe Pueblo (AZ Q:1:199).

Five types of Homolovi Orange Ware were collected at Stone Axe Pueblo: Huckovi Black-on-red, Tuwiuca Black-on-orange, Homolovi Polychrome, Chavez Pass Black-on-red, and Chavez Pass Polychrome. The Jeddito series sample includes Awatovi Black-on-yellow, Jeddito Black-on-yellow, and Sikyatki Polychrome, all collected at Stone Axe Pueblo. A single Awatovi Black-on-yellow sherd was collected from both AZ Q:1:20 and AZ Q:1:227. At these two sites the Awatovi sherds were the only Pueblo IV period ceramics noted. The very small percentages of Hopi wares at

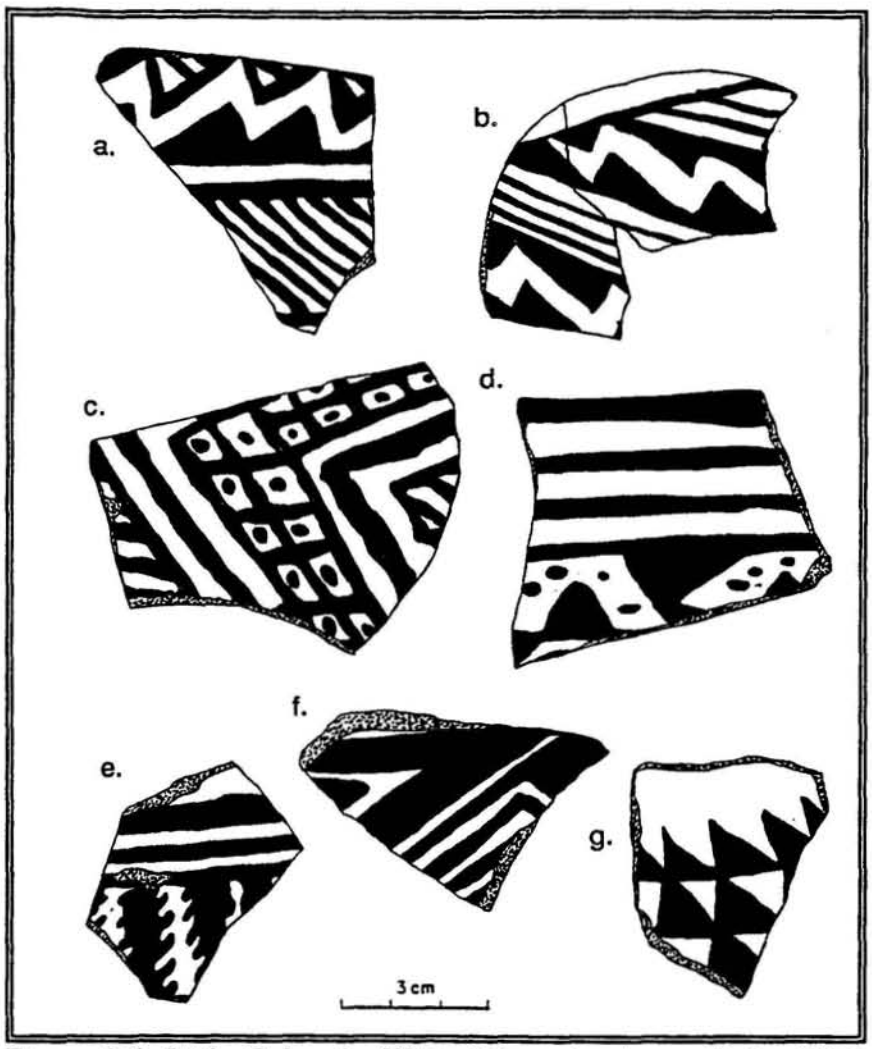


Figure 9.5. Little Colorado White Ware sherds; a. Padre B/W, b. Walnut A B/W, c-d. Walnut B B/W, e-f. Leupp B/W, g. Undifferentiated B/W type.

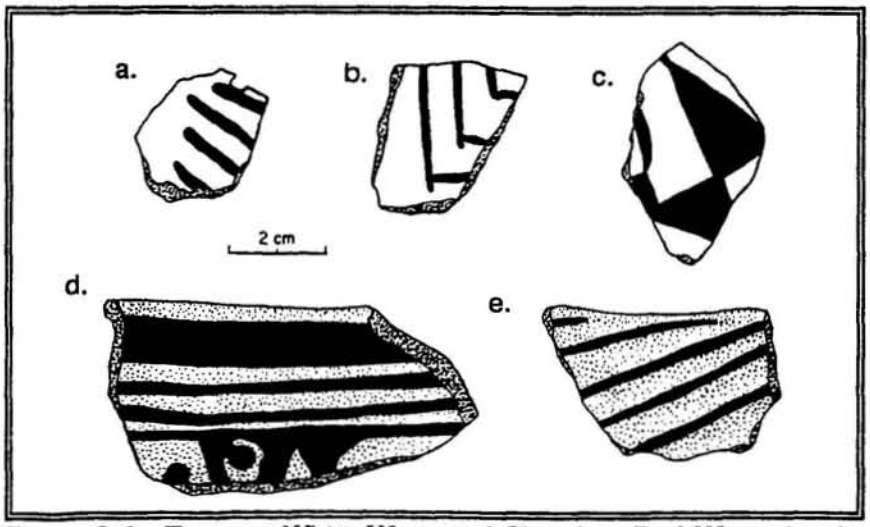


Figure 9.6. Tusayan White Ware and Showlow Red Ware sherds; a. Lino B/G, b. Kana-a B/W, c. Black Mesa B/W, d-e. Showlow B/R.

these sites is consistent with several other sites within the Park. Only at Puerco Ruin and in obvious pot breaks, have more than one or two Hopi sherds been noted at a site (Jones 1987; Wells 1988, 1989), and it is possible that the more rare Hopi sherds represent casual or intermittent use after the main occupation.

Zuni Glaze Ware

Seven sherds representing three Zuni Glaze Ware types were collected from Stone Axe Pueblo. These include one Pinnawa Glaze-on-white sherd, five Kechepawan Polychrome sherds, and one Heshotauthla Glaze-on-red sherd. All three types date to Pueblo IV or later. Representative specimens are depicted in Figure 9.11. Zuni Glaze Ware is known from only one other site in the area: Puerco Ruin (Burton 1990).

Plain Wares

Plain wares collected include Cibola, Little Colorado, and Tusayan gray wares, Mogollon and Adamana brown wares, and Showlow Red Ware. Most of the plain ware in the present sample is from

a sample of the 1991 surface collection grids. In the 1988 and 1989 surveys, grab samples were used exclusively, and plain wares were collected only if little or no decorated wares were present. Plain wares were collected from a total of 42 of the 60 sites that form the current ceramics sample.

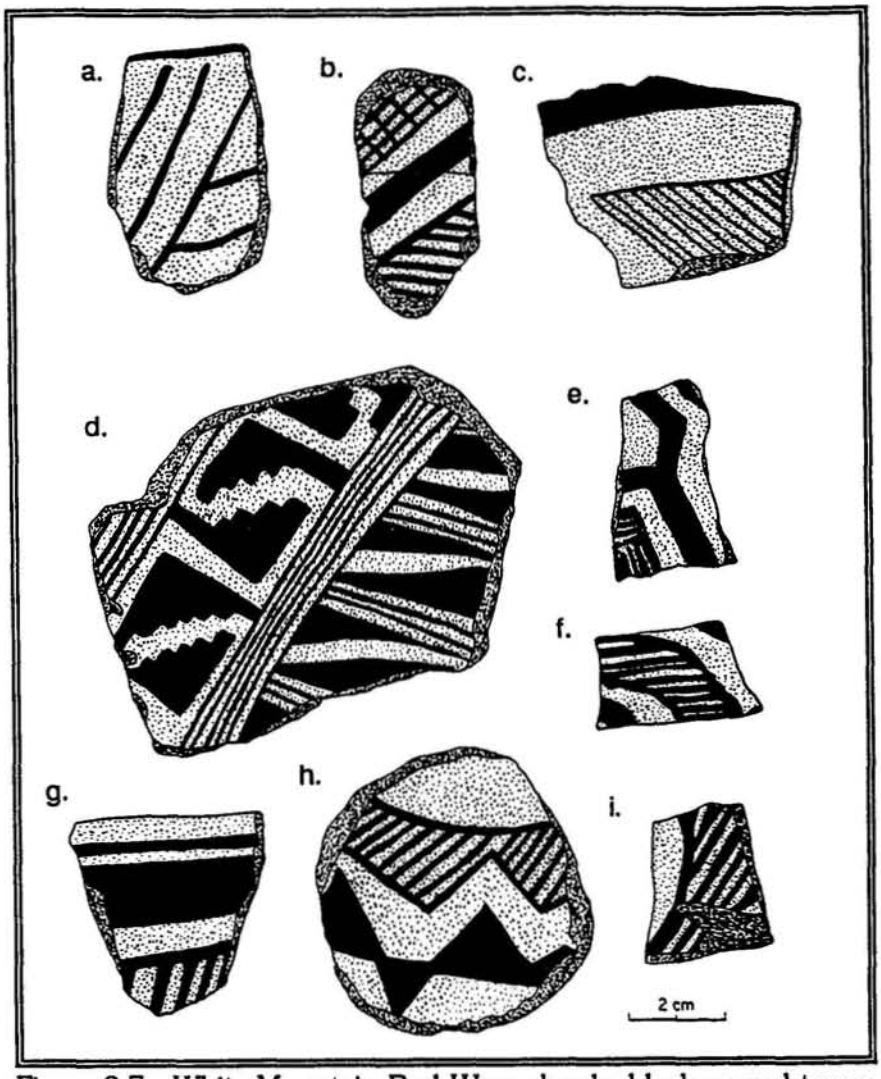


Figure 9.7. White Mountain Red Ware sherds, black-on-red types; a. Puerco, b-d. Wingate, e. St. Johns, f. Pinedale, g-i. Wingate/St. Johns.

Mogollon Brown Ware

The most common plain ware in the collection, Mogollon Brown Ware comprises 347 sherds from 32 sites (53%). Many of the plain ware sherds (n=113) are from a single broken vessel collected from AZ Q:1:237. But even discounting these sherds, Mogollon Brown Ware still outnumbers gray wares nearly two to one. The Mogollon Brown Ware includes 16 percent plain, 13 percent plain corrugated, 50 percent indented corrugated, 4 percent patterned corrugated, and 17 percent obliterated corrugated. Of the total, 12 have interior smudging.

Adamana Brown

Ten sherds identified as Adamana Brown were collected during surface collection at three sites. These sites, AZ Q:1:287, AZ Q:1:290, and AZ Q:1:291, each consist of small one–room structures with associated Pueblo–period ceramics. The Adamana Brown at these sites may indicate an earlier, buried component.

Little Colorado Gray Ware

The second most common plain ware, 109 Little Colorado Gray Ware sherds were collected from 21 sites. The types include plain (14%), indented corrugated (34%), clapboard corrugated (19%), and obliterated corrugated (34%).

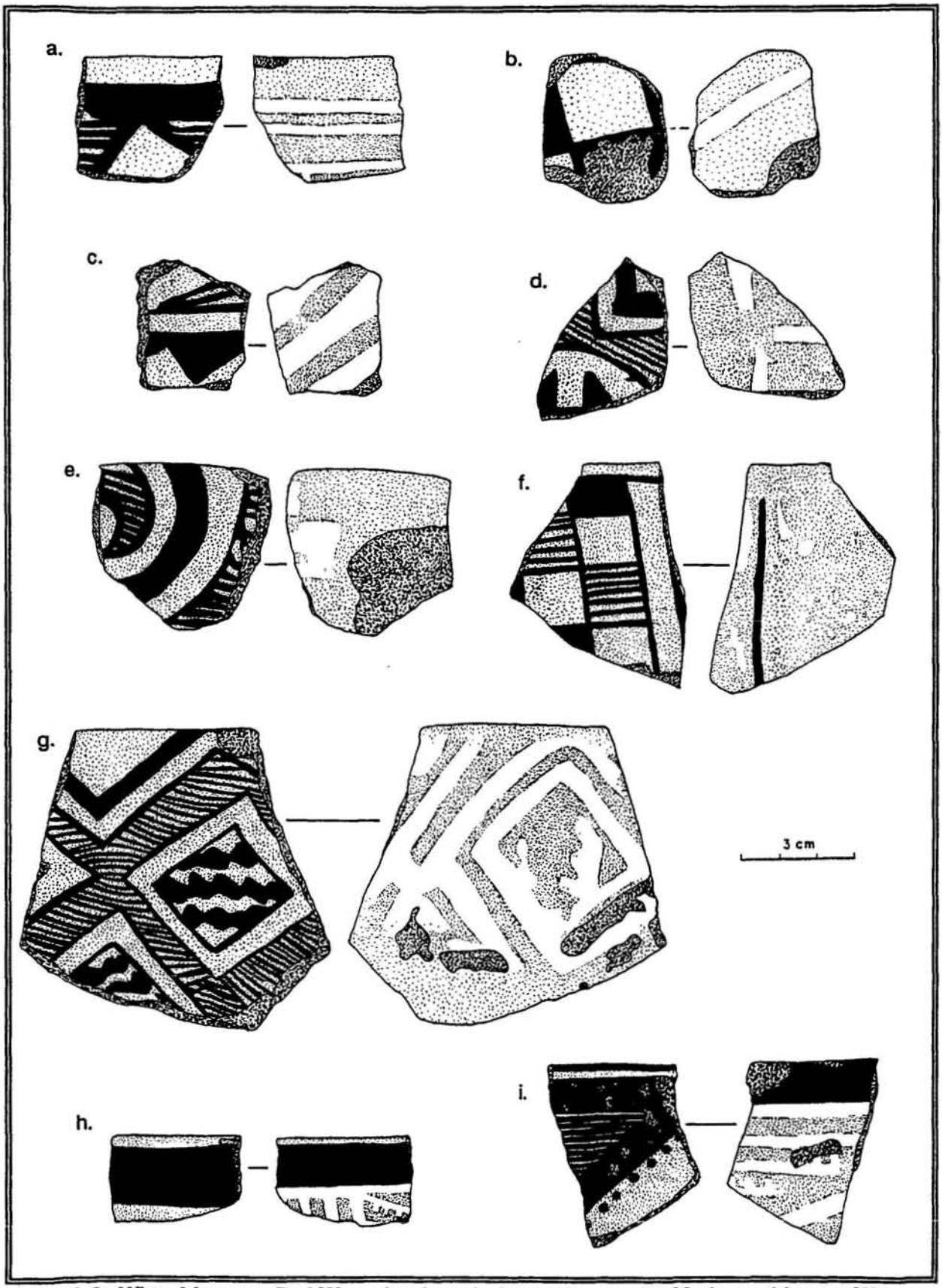


Figure 9.8. White Mountain Red Ware sherds, polychrome types; a-b. Heshotauthla, c-e. Wingate, f. Springerville, g. St. Johns, h-i. Four Mile.

Tusayan Gray Ware

Forty–four Tusayan Gray Ware sherds were collected from eight sites. These includes eight undifferentiated types, 34 Medicine Gray sherds from AZ Q:1:237, and one Lino Gray sherd each from AZ Q:1:214 and AZ Q:1:287. Medicine Gray has been dated elsewhere to between A.D. 890 and 1060 (Pueblo I–II). Lino Gray has been dated to between A.D. 575 and 875 (Basketmaker III).

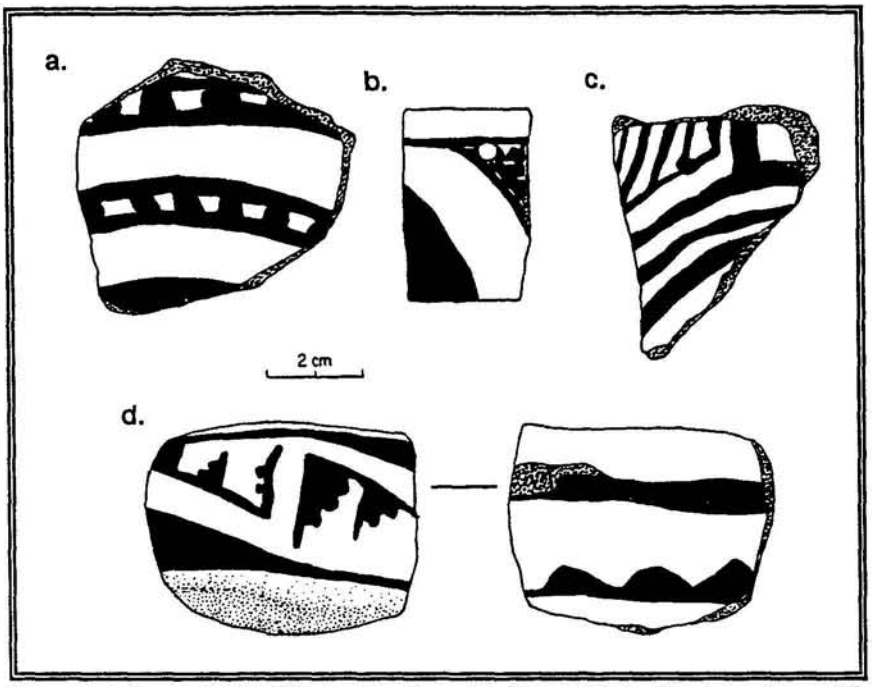


Figure 9.9. Salado Ware sherds; a-c. Pinto Polychrome, d. undifferentiated polychrome type.

Cibola Gray Ware

Only six Cibola Gray Ware sherds were collected from four sites. This type was notably rare even in the large controlled collections. Three were indented corrugated and three were undifferentiated Cibola Gray Ware.

Showlow Red Ware

A total of 19 Showlow Red Ware sherds were collected from 13 sites, this includes four Showlow Corrugated sherds collected from three sites. All were from the 1991 grid collections.

Miscellaneous Wares

Twenty–nine sherds could not be assigned to a specific series. These include six red ware sherds, one brown ware sherd, 11 white ware sherds, eight gray ware sherds, one smudged gray ware sherd, one polychrome sherd, and one unidentifiable sherd.

Discussion

Ceramics recovered during the 1988 and 1991 surveys are typical of the types found in the Little Colorado River region and all have been reported in previous surveys and excavations within the Park. In line with previous surveys (Jones 1987, Wells 1988, 1989), the ceramic data suggest a predominantly Pueblo II–III occupation. However, the current sample also differs from earlier work in that it indicates the presence of a significant late Pueblo III occupation in the Park. The only substantial number of Pueblo IV sherds was found at Stone Axe Pueblo, but isolated sherds may indicate limited Pueblo IV use of AZ Q:1:281, located near the Flattops, and AZ Q:1:227, located at Rainbow Forest. Because of the emphasis on decorated wares during the grab sampling, Pueblo I and Basketmaker use may be underrepresented. For example, during

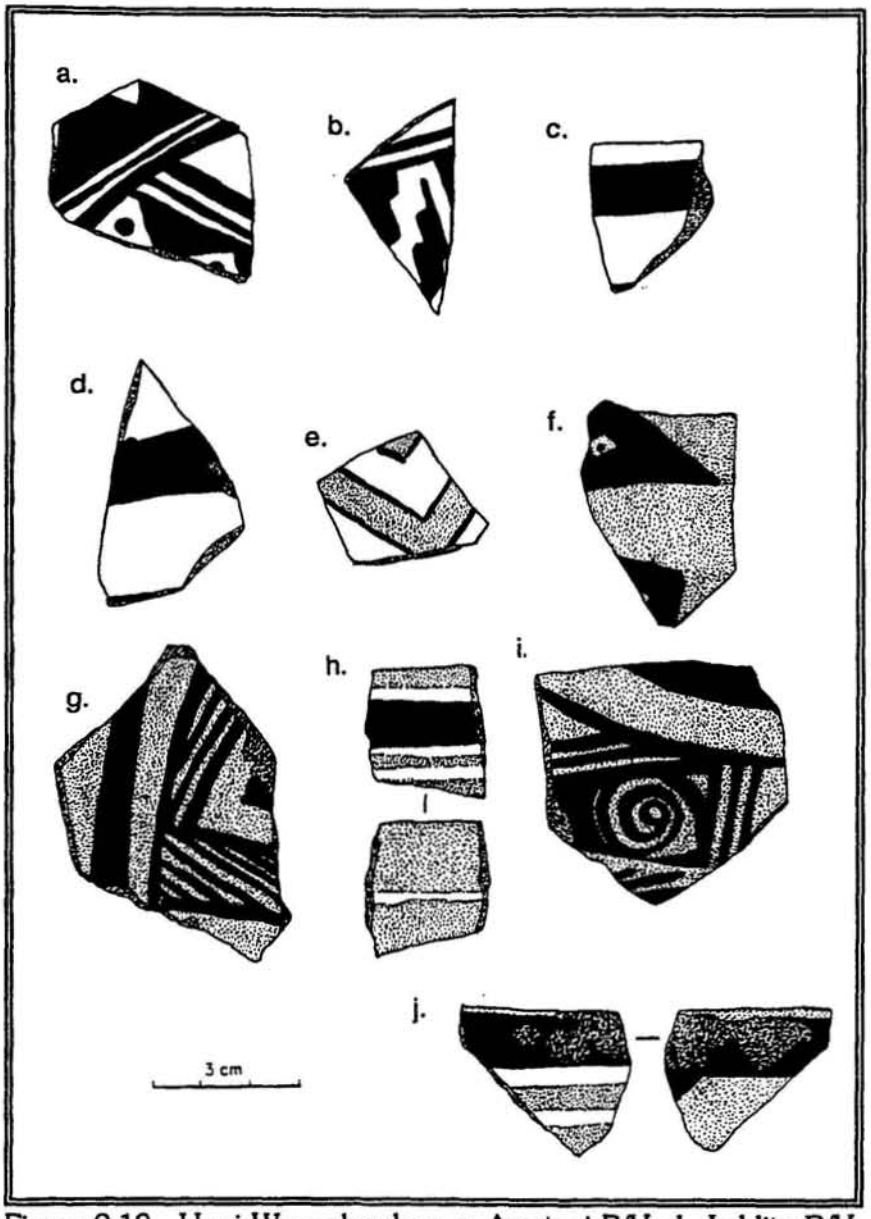


Figure 9.10. Hopi Ware sherds; a-c. Awatovi B/Y, d. Jeddito B/Y, e. Sikyatki Polychrome, f. Huckovi B/R, g. Chavez Pass B/R, h. Homolovi Polychrome, i. Tuwiuca B/O, j. Chavez Pass Polychrome.

the controlled surface collection, Adamana Brown Ware was found at three sites. The grab samples can determine the most visible occupation, but grid collection may be more accurate in determining the entire range or length of occupation.

Mogollon Brown Ware and Cibola White Ware are the predominant wares, followed by White Mountain Red Ware, Little Colorado Gray Ware, and Little Colorado White Ware. In the collection as a whole, the Tusayan and Little Colorado White Wares represented are somewhat earlier (Pueblo II and Pueblo II/III, respectively) than the Cibola White Wares (Pueblo III). Because these wares theoretically originate in different geographic areas, this pattern could reflect changes in influence, or trade, through time. Alternatively, the assigned dates and origins for these pottery types might not be applicable to the Petrified Forest area; there has been little independent dating or sourcing of these wares locally. For example, temper and refiring analyses of ceramics recovered from Puerco Ruin suggests local manufacture of some types (Vint 1990).

Frequencies of the various decorated pottery types in different areas of the Park were examined to see if any spatial patterns could be discerned. Coinciding with major survey areas, the 60 sites can be divided into four spatially distinct groups, from north to south: those in the Painted Desert area (24 sites), those in the Puerco Ruin Mesa area (4 sites), those northeast of Crystal Forest (17 sites), and those in the Rainbow Forest and Flattops areas (15 sites).

For the comparison, percentages of each ware at each site were averaged for each geographic group (Figures 9.12 and 9.13). Decorated wares and plain wares were calculated separately, to reduce the variation potentially introduced by the different collection methods (grab vs. controlled sample units). Table 9.2 shows the percentage of sites in each area from which all the different wares were collected. Note, however, that *wares collected* is not necessarily representative of *wares present* at a site. Plain wares, especially, would be underrepresented in Table 9.2, since they were not collected at all sites. But on the other hand, the plain wares frequencies depicted in Figure 9.13 may be more representative than that for the decorated wares in Figure 9.13, since most were collected from controlled sample units.

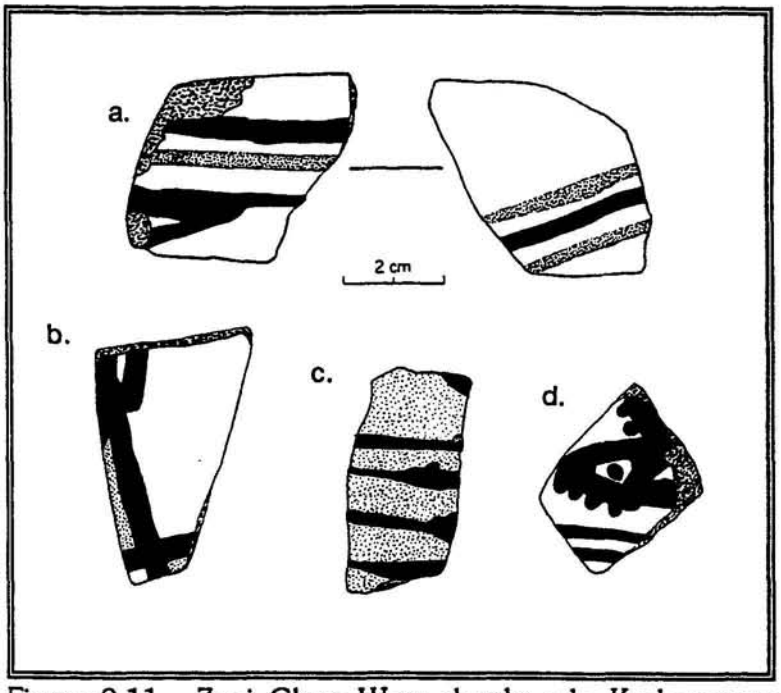


Figure 9.11. Zuni Glaze Ware sherds; a-b. Kechepawan Polychrome, c. Heshotauthla Glaze-on-red, d. undifferentiated glaze-on-white type.

Four spatial patterns are suggested. First, the frequencies of Little Colorado White Ware decrease from north to south. Discounting the Puerco Ruin Mesa Group because of the small sample size, Little Colorado White Ware averages 36 percent of the collections from the Painted Desert, in the northern portion of the Park, to 31 percent in the Crystal Forest sample, decreasing to 19 percent of collected sherds at Rainbow Forest/Flattops, in the southern portion of the Park. Second, Cibola White Ware shows the converse pattern, with frequencies increasing from north to south. Cibola White Ware averages 61 percent of the collected decorated sherds in the southern portion of the Park, and average only 34 percent at sites in the northern portion of the Park. White Mountain Red Ware shows a slightly higher frequency in central and northern areas. Hopi, Zuni, and Salado wares are limited to the southern part of the Park, but this distribution probably reflects their association with the few Pueblo IV sites in the sample.

Among the plain wares, Mogollon Brown Ware shows the most striking pattern, decreasing in frequency from south to north. Mogollon Brown Ware averages 69 percent of collected plain wares in the Rainbow Forest/Flattops area, 53 and 54 percent in the central portions of the Park, decreasing to 39 percent at the Painted Desert sites, in the northern part of the Park. Little Colorado Gray Ware exhibits a gradual increase in frequency from south to north, from eight percent at Rainbow Forest up to 30 percent at Painted Desert. Jones (1987) noted a similar spatial pattern in the distribution of Mogollon wares, based on presence and

absence of ceramic types at sites rather than frequency of collected wares.

These patterns, of course, are tentative because of the nature of the samples and gross temporal control. But they suggest gradual fall-offs in distribution, more characteristic of down-the-line trade rather than trading alliances or territorial boundaries (Renfrew 1977). More detailed analysis of the 1990 and 1991 surface collections made during site monitoring (see Chapter 5) may be able to more fully address these issues. In addition, excavation data would greatly augment the information potential of the surface ceramics. Excavation could not only refine dates and distributions for different wares and types, but also test how surface assemblages reflect subsurface materials.

Table 9.2. Percentage of Sites with each Collected Ceramic Ware.

	Painted Desert (n=24)	Puerco Ruin Mesa (n=4)	Crystal Forest (n=17)	Rainbow Forest/Flattops (n=15)
Cibola WW	79	75	81	87
Little Colo WW	88	25	50	60
Tusayan WW	13	25	6	-
White Mtn RW	63	50	44	53
Zuni	-	-	6	-
Salado	-	-	6	13
Hopi	-	-	6	13
Mogollon BW	46	75	81	33
Adamana BW	-	-	19	-
Cibola GW	-	-	6	20
Little Colo GW	46	50	25	27
Tusayan GW	4	50	31	-
Showlow RW	67	50	50	53
others	8	25	31	33

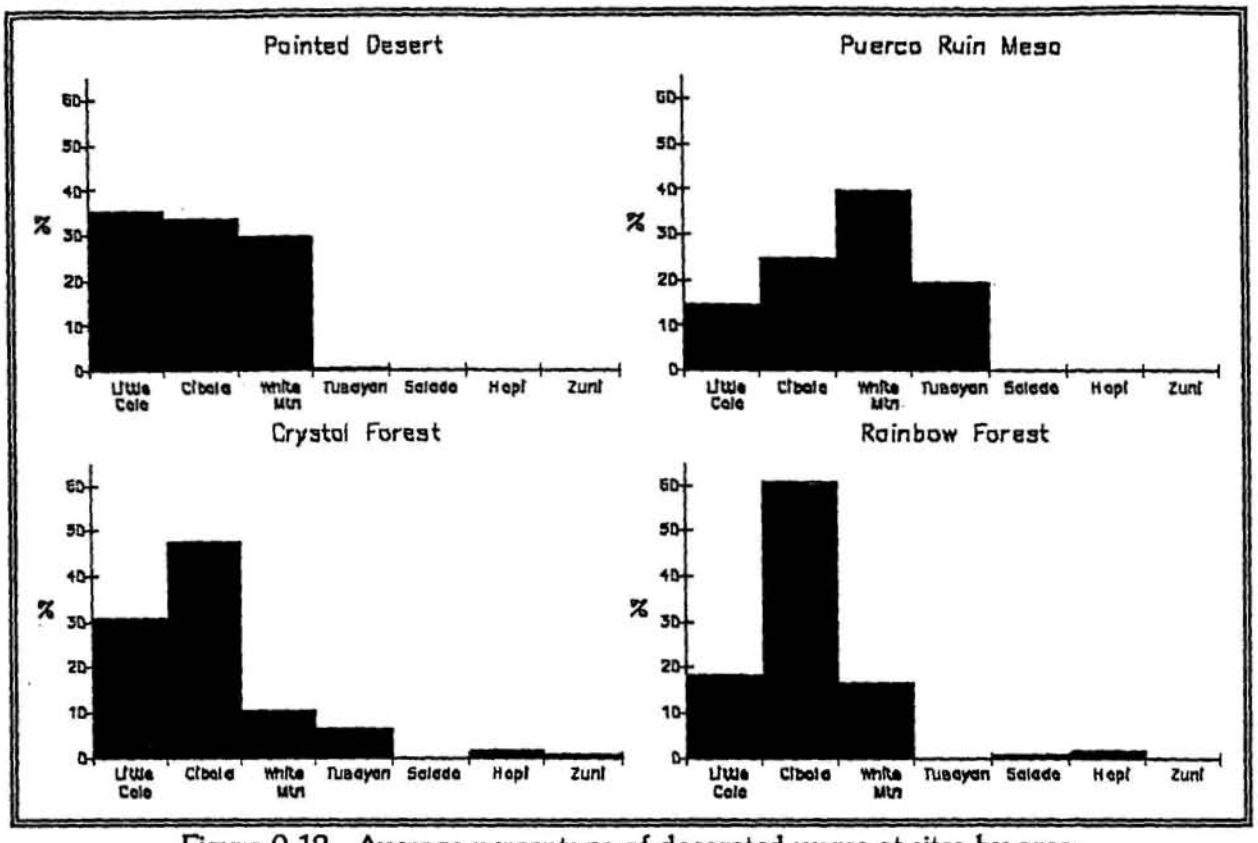


Figure 9.12. Average percentage of decorated wares at sites by area.

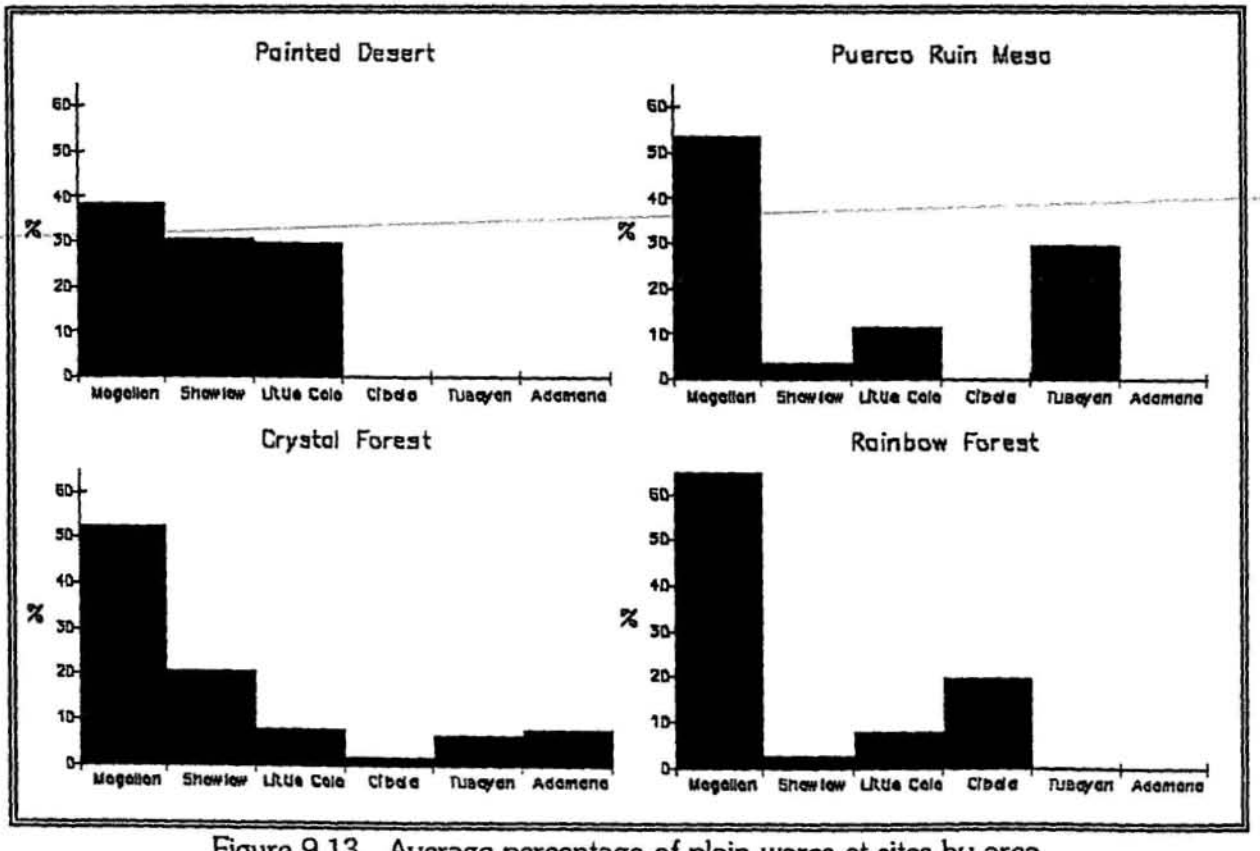


Figure 9.13. Average percentage of plain wares at sites by area.

Chapter 10
Shell and Small Stone Artifacts

During survey and site monitoring 20 shell artifacts and 10 small stone artifacts were collected. This includes one shell and two stone artifacts found during the 1988 survey, six shell artifacts and two stone artifacts found during the 1991 survey, and six shell and six stone artifacts found during the 1990 site monitoring. Six shell beads recovered from a burial salvaged in 1988 are described in Chapter 6.

Shell Artifacts

All of the recovered shell is potentially from the Gulf of California and was most likely received through trade with the Hohokam. Described here are two beads, 11 bracelet fragments, six pendants, and a ring fragment (Table 10.1).

Beads

Two whole *Olivella* shells were found. Both have holes ground in their spires for stringing. One specimen, 12.4 mm long and eroded, was found at a Pueblo Period site. The other specimen, measuring 12.6 mm long, was from an Archaic site.

Bracelets

Eleven *Glycymeris* bracelet fragments were collected from Pueblo period sites. All were less than one–third complete. Inside diameters appear to range from 50 to 80 mm. Two of the specimens with the umbo present are perforated, one by grinding and the other by drilling. The ground specimen measures 7.8 mm thick at the umbo. The drilled specimen measures 5.2 mm thick at the umbo. The remaining bracelet fragments include seven plain bands and two bands with shallow (less than 5 mm deep) notches. One of the notched specimens was notched on the exterior portion of the band and the other was notched on the interior portion. Two of the bands have one end ground to a rounded point, suggesting reuse as awls.

Pendants

The six pendants include two of whole shell, two of cut and ground shell, and two shell pendant blanks. All were recovered from Pueblo II–III period sites. Whole shell pendants (or bead pendants) consist of one *Conus* specimen and an immature specimen of *Glycymeris*.

The *Glycymeris* specimen is classified as a pendant, rather than a bead, based on the presence of an incised design. The pendant measures 18.1 by 16.6 mm in size. A hole had been formed at the umbo by grinding. The design appears to be that of a stylized frog (Figure 10.1b). Carved frog effigy pendants are common in the Hohokam area, where they are considered a Classic Period trait (Haury 1976:315).

The *Conus* shell bead pendant, from a Pueblo II–III site, measures 21.1 mm long. It is unusual in that only the apex of the spire has been removed to form a small hole, while *Conus* tinklers have the entire spire removed (Howard 1988; Tanner 1976). The internal columella structure has been removed. In the Hohokam area *Conus* pendants occur occasionally until the

Classic Period, when they become common enough to be considered a horizon marker (Howard 1988:475–476).

The four cut and ground specimens and the blanks could not be identified to genus. Two were formed by extensive carving of the shell. One, measuring 52.6 by 27.1 by 4.3 mm thick, has two drilled holes and 10 notches on one of its short margins (Figure 10.1a). Part of one edge apparently chipped off during use, but the chipped edge has been somewhat smoothed from continued use. The other cut and ground pendant is small (11.4 by 7.1 by 1.5 mm thick) and subrectangular in shape. It has a 2.1 mm hole at one end (Figure 10.1c). It may have been used as a bead.

Pendant blanks, lacking holes but otherwise similar to the other pendants, consist of two small cut and ground pieces of unidentified shell. One, subrectangular in shape, measures 16.4 by 8.8 by 2.4 mm thick. The other, rectangular in shape, measures 13.3 by 8.2 by 4.0 mm.

Ring

One *Glycymeris* fragment is classified as a ring fragment based on its small inside diameter (approximately 21 mm). It measures 5.3 mm thick at the umbo. A small off–center hole at the umbo appears to be from wear rather than purposeful grinding. It was recovered from a site with Basketmaker and Pueblo components.

Small Stone Artifacts

The ten small stone artifacts recovered consist of two beads, a pendant, a zoomorph effigy, and six miscellaneous objects. All were recovered from Pueblo Period sites.

Beads

A tubular bead fragment of an unknown dark red material was recovered from AZ Q:1:196, a site with two small one–room structures dating to between Pueblo I and Pueblo III. Split length–wise, it measures 8.0 mm long. A turquoise bead blank or possibly an inlay piece was found at a small

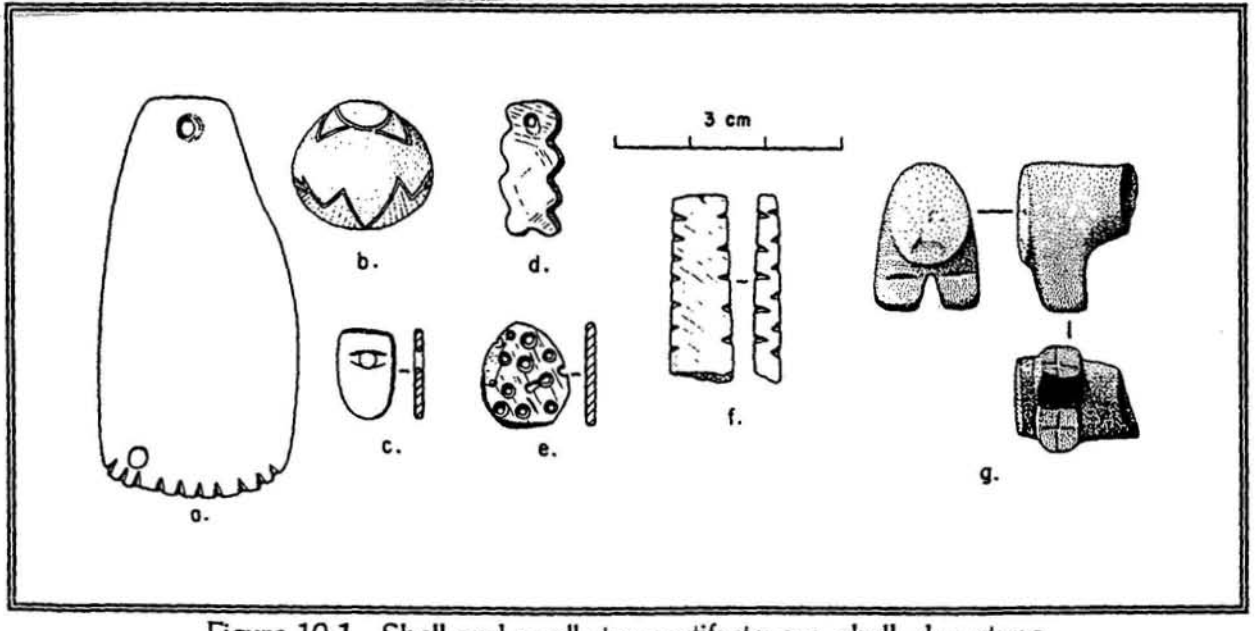


Figure 10.1. Shell and small stone artifacts; a-c. shell, d-g. stone.

Pueblo II site (AZ Q:1:122). It is triangular, measuring 8.5 by 5.9 by 2.7 mm thick.

Pendant

A geometric pendant with a drilled hole at one end (Figure 10.1d) was found at AZ Q:1:111, a badly eroded Pueblo II/III field house. Made of siltstone or mudstone, it measures 17.1 by 8.0 by 2.2 mm thick.

Zoomorph Effigy

A fragment of a quadruped effigy was found on the Painted Desert Rim at a small pueblo dating to the Pueblo II/III–III period (AZ K:13:114). Made of slate, it consists of the rear torso and legs (Figure 10.1g). The bottom of each leg has a cross incised on it.

Miscellaneous Objects

These six small items included two disks, two rectangular pieces, a subrectangular piece, and one shaped cylinder. Some of the fragments may have been pendants, or they may have served as gaming pieces.

One of the disks, of siltstone, is slightly teardroped in shape. Measuring 13.8 by 11.9 by 2.2 mm thick, it is perforated by 13 drill holes, seven drilled from one side and the remainder from the other (Figure 10.1e). It was found at AZ Q:1:111, a Pueblo II/III period field house. The other disk, a fragment, was found at AZ Q:1:156, a site with two masonry rooms dating to the Pueblo II–III period. Roughly one-half of a thin siltstone disk, it measures 21.9 mm in diameter and 1.5 mm thick.

The two rectangular pieces are from AZ Q:1:220, a one- or two-room structure, dating to the Pueblo II–III period. One piece, of siltstone, measures 33.7 by 6.7 by 2.9 mm, with one end somewhat roughened, suggesting it may have been longer. The other piece is a fragment with a series of notches along the edges of both sides that alternate in side view (Figure 10.1f). It measures 24.4 by 8.9 by 3.5 mm thick.

The subrectangular specimen was from AZ K:13:73, a late Pueblo II–early Pueblo III artifact scatter. Of pinkish siltstone, it measures 17.3 by 8.1 by 4.8 mm thick. All of its surfaces are highly polished.

The final stone artifact is a tapered cylinder of dark grayish green metamorphic rock found at AZ K:13:107, a site that includes three small structures and rock art. The cylinder measures 29.1 mm long and has a maximum thickness of 8.5 mm. It has highly polished, slightly faceted edges that taper to a pointed tip. The pointed end is worn as if through use. It is probably a small tool, possibly used in the production of ceramics. Numerous small polishing stones were noted at the site during recording.

Table 10.1. Shell Artifacts Collected During Survey and Monitoring.

Site		*Olivella* bead	Bracelet fragment	Pendant				Ring fragment
				Whole shell		cut and ground	blank	
Number	Date			*Glycymeris*	*Conus*			
AZ K:13:25	PIII		1					
AZ K:13:40	PII–III				1			
AZ K:13:46	PII		1					
AZ K:13:65	Archaic	1						
AZ K:13:113	PII–late III		1					
AZ K:13:114	PII/III–III	1					1	
AZ Q:1:123	PII						1	
AZ Q:1:129	PII–III		1					
AZ Q:1:148	PI–II		1					
AZ Q:1:157	BMIII–PIII							1
AZ Q:1:182	PII–III		1					
AZ Q:1:226	PII/III–late III		1			1		
AZ Q:1:281	PII–IV		1					
AZ Q:1:282	Pueblo		1	1		1		
AZ Q:1:285	PII/III–III		1					
AZ Q:1:297	PI–II/III		1					

Chapter 11
Summary and Conclusions

The surveys reported here covered 4,187 acres and resulted in the recording of 131 sites and 91 isolates. To date, the monitoring program has collected data from 159 sites. Two burials were salvaged and a basket discovered and collected. This chapter provides a brief summary of how these projects contribute to Petrified Forest archeology. Recommendations for future management and research are provided in Chapter 12.

The data generated by these projects and presented in this report provide information on both prehistoric and historic use of the Park. The results can be used to address the research questions proposed for the Park by Jones (1987). These have been divided into four groups: culture history, economic orientation, regional interaction and trade, and technological change. The following discussion is organized around each of these research domains, although in actuality they overlap. For example, none of the other research questions can be realistically addressed without an adequate culture history framework.

Culture History

The work reported here is most notable in the information it provides on both the earliest prehistoric and latest historic use of the Park. The 1988 General Management Plan (GMP) survey located the oldest site yet recorded site in the Park (AZ Q:1:224), which dates to the Middle Archaic. Bajada–style projectile points indicate a date of between 5000 and 3200 B.C. The site also contained bifacial tools and other flaked stone artifacts. The Middle Archaic temporal ascription for AZ Q:1:224 is bolstered by the fact that not one but several Bajada points were found at the site, and that no later temporally diagnostic artifacts or features are present. Although earlier dated Paleoindian points have been found in the Park, these have been found as isolated artifacts or at later sites, suggesting scavenging and reuse by later inhabitants.

Other Archaic use is suggested by the quarry–workshops recorded on a mesa overlooking Rainbow Forest and on Puerco Ruin Mesa. Although these sites lack traditional temporally diagnostic artifacts, the predominance of bifaces and bifacial preforms, and the dearth of ceramics, is consistent with Archaic technology documented elsewhere in the region (Parry and Kelly 1987).

The late Pueblo III occupation may be more substantial then previously documented: the 1991 volunteer survey and the 1988 GMP survey more than doubled the number of late Pueblo III sites known in the Park. On the other hand, work at Stone Axe Pueblo (AZ Q:1:199), just outside the Park, revealed a much earlier occupation at that site than previously believed. The large size of Stone Axe Pueblo, the architecture, and common ceramics had suggested a Pueblo III through Pueblo IV occupation during previous site visits (*e.g.* Schroeder 1961). During the detailed recording undertaken for the GMP survey, earlier Pueblo I and Pueblo II ceramics were discovered.

Also of note is new evidence of early

Navajo use of the Park, indicated by a site with 11 stone hogans and the chance discovery of a Navajo basket at another site. Previously, the only sites within the Park attributed to the Navajo were a lone hogan near the Flattops and a recent (*ca.* 1930s) corral north of the Puerco River along the Park Mainline Road (Stewart 1980; Hammack 1978).

Remains from Civilian Conservation Corps activities in the Park were found to be extensive and widespread. Recorded sites include the remains of two of the three main CCC camps at Petrified Forest, five other areas of structural remains, a spike camp, a trash scatter, a trash dump, five work areas or quarries, and a small masonry dam. CCC–era inscriptions are present at five of these sites and at three other sites.

Sites attributed to other historic uses of the Park, such as grazing, prospecting, and tourism, were also recorded. These include five sites with structural remains and eight with historic inscriptions.

Economic Orientation

Settlement data from these surveys fall within the model for Petrified Forest suggested by Wells (1989). Wells found sites to be evenly distributed across the landscape; access to arable land and a variety of other resources such as plant foods, water, and building stone seemed to be important factors in site location. In addition, upland areas were somewhat favored. She noted for the Pueblo II and III periods some regularity in the spacing of sites, with multiple–room sites surrounded by smaller masonry sites or artifact scatters, suggesting a satellite field house arrangement or groups of interacting sites. Within the Park the numbers of sites increased for each temporal period, until the Pueblo IV period: 2 percent of her sites had Archaic components, 5 percent Basketmaker II/III, 11 percent Basketmaker III, 12 percent Pueblo I, 69 percent Pueblo II/III, and 4 percent Pueblo IV.

Wells's sample included precious few large pueblos; most were only 2 to 5 rooms. The decrease in the number of sites dating to Pueblo IV was considered primarily due to aggregation. This interpretation is consistent with earlier survey results that yielded no evidence of aggregation until the Pueblo IV period (Jones 1987).

The combined survey data described in this report suggest slightly different trends. The dates of multiple room pueblos suggest gradual aggregation beginning in the Pueblo III period. Six of the newly–recorded multiple room pueblos have 10 rooms or more. Of these, half do *not* have a definite late Pueblo III or later component, and all three appear to have been abandoned by the late Pueblo III period. The remaining three multiple room pueblos with 10 or more rooms have late Pueblo III or Pueblo IV ceramics, and one has pottery that could date to the early Pueblo III period. This suggests some aggregation, albeit on a small scale, may be occurring in the Pueblo III period.

Of course, lack of fine–grain chronological control limits interpretations: survey data provide no clues as to whether all rooms at any of the sites were occupied simultaneously. However, the same chronometric problems may have biased previous interpretations that aggregation began only in the Pueblo IV period. On the one hand, the numerous small Pueblo II/III sites could represent many simultaneously–occupied settlements, whose inhabitants (or rather, their descendants) eventually coalesce into a few large Pueblo IV sites. But on the

other hand, the many Pueblo II/III sites could also represent short-lived settlements sequentially occupied. In this scenario, the large Pueblo IV pueblos could represent less a dramatic aggregation than a population explosion or in-migration, with new settlement stability. In any event, there are two key points. First, the evidence for some larger sites in Pueblo II and Pueblo III times may indicate the aggregation is more gradual than previous surveys indicated. Second, the fact that sites of this type have not been encountered before suggests there may be some spatial patterning or clustering and that sites are *not* evenly distributed across the landscape.

Different adaptations or settlement patterns are indicated by apparent Pueblo period pit houses at two sites in the southern portion of the Park (AZ Q:1:20 and AZ Q:1:238). Pueblo period pit houses, not within the normative pattern of Pueblo architecture, were first noted in the area at the Dobell Site just outside the southern boundary of the Park (Harrill 1973). With the recent excavations of Pueblo period pit houses at HP-36 within Homolovi State Park (Young 1988) more information on this site type will be forthcoming.

Regional Interaction and Trade

The ceramic analysis indicates a mixing of Little Colorado, Cibola, and Mogollon wares, with Mogollon Wares more common in the southern portion of the Park. The survey data, albeit crude, suggest gradual fall-offs in the distribution of different wares taht are more characteristic of down-the-line trade rather than trading alliances or territorial boundaries.

Ceramics also formed the most notable difference between the two burials salvaged. The adult burial, at a Pueblo II site, had no associated grave goods. But ceramics associated with the Pueblo III adolescent burial include two smudged Showlow Red bowls, two Little Colorado Gray Ware jars, and one Mogollon Brown Ware jar. The disparity is suggestive of a change in the acquisition of material goods, and possibly the development of ascribed, rather than achieved, status. But, with the few data at hand it cannot be determined whether the disparity can be attributed to temporal, cultural, socio-economic, or other differences.

Shell, the best indicator of pan regional trade encountered during the surveys, is most likely from the Hohokam area to the south. It was found predominately at Pueblo period sites that would correlate with the Hohokam Classic Period (A.D. 1150-1400). Few obsidian artifacts were encountered during the surveys and monitoring work. Although no chemical sourcing was conducted, visually the obsidian looks similar to that from Government Mountain, 200 km to the west.

Technological Change

The 112 projectile points collected in the Park since 1979 include types that have been dated elsewhere from the Paleoindian to historic periods. The projectile point forms follow the general trend of becoming smaller through time. The most numerous types from the Park are dart points that date to the Late Archaic. Given the abundance of naturally occurring petrified wood in the Park, it is remarkable that petrified wood does not dominate the collection. The only time period in which petrified wood accounts for more than 50 percent of the

points is the Pueblo IV period, where 71 percent of the points are petrified wood, perhaps reflecting more intensive occupation and sedentism.

Although apparently not preferred for fine tool making, petrified wood as debitage is abundant at sites, and petrified wood appears to have been used for expedient flake tools. Debitage to ceramic ratios at the sites recorded during the 1988 and 1991 surveys are highest in the southern portion of the Park where petrified wood is abundant.

The petrified wood quarry–workshops, in this sample located on high landforms overlooking the quarries, contain evidence of bifacial reduction. Since this evidence is lacking at the quarries themselves (Hammack 1979; Jones 1987), perhaps material was only minimally modified before it was removed from the quarries for further reduction at these workshop sites.

Chapter 12
Management Recommendations

The projects reported here bring the total of sites within the Park, recorded to modern standards, to 427. Some information is also available on 135 sites recorded by Jepson in the 1940s, which have not yet been rerecorded. To date about 25 percent of the Park (23,750 acres out of 93,493) has been intensively surveyed. Again, Jepson's work provides additional information on the southern portion of the Park, although that early work was much less intensive. Excavations have been conducted at 13 sites. However, many of the excavations predate modern recovery and methodological innovations.

Existing data and past recommendations by Stewart (1980) and Jones (1987) provide a basis for assessing the need for future archeological work at Petrified Forest National Park. It is noteworthy that many of Stewart's and Jones's recommendations have been completed and that progress has been made on nearly all of the other recommendations. Recommendations are divided into survey, site monitoring, salvage, research studies, and others. With the completion of the boundary survey and the surveys reported here, the most crucial actions are salvage and site monitoring. Each category is discussed below in order of priority.

Salvage of Endangered Sites

Both Stewart (1980) and Jones (1987) noted the necessity of salvage at eroding sites. Stewart recommended no specific sites but rather recommended survey to determine the extent of the problem. Based on data from the first two years of the boundary survey, Jones recommended salvage of six eroding sites. Of these, limited testing has been conducted at one (AZ Q:1:114; Burton 1991). Further progress has been hampered by a lack of clear knowledge of the extent of the problem and priorities, as well as the lack of adequate funding.

The monitoring reported here (Chapter 5) identified dozens of sites in need of immediate salvage. Priorities are based on the susceptibility of the sites to future deterioration and their potential to provide important information to fill gaps in our knowledge of Petrified Forest prehistory. Although subject to much debate, the research potential of archaeological sites would ideally consider (1) the relative abundance of the resources to be affected, (2) the degree to which specific kinds of data are confined to the study area, (3) the range of research topics to which the resources may contribute, and (4) recognized deficiencies in current knowledge of cultural history in and near the project area (Scovill *et al.* 1972:21). The first two factors are often difficult to apply, given our incomplete knowledge of the resources in the region. Developments in archaeological methodology, in general, and past research in the region provide information for the last two factors.

Existing data gaps, at least those in the cultural historical framework basic to any further study, can be assessed by examining the types of sites that have been excavated

in the Park to date. Other priorities will be identified through monitoring, discussed below.

Pueblo IV sites excavated include Puerco Ruin (Burton 1990; Cosgrove 1934; Jennings 1980; Schroeder 1961; Wells 1988) and AZ Q:1:261 (PEFO 171; Gale 1941). Excavated Pueblo II/III sites include Agate House (Cosgrove 1934), McCreery Pueblo (Burton n.d.a), NA 10,808 (Harrill 1971), and three sites along the Mainline Road (Jones 1986). Basketmaker III/Pueblo I sites excavated include the Twin Butte Site (Wendorf 1953) and AZ Q:1:42 (Jones 1983). Basketmaker II sites excavated include the Flattop Site (Cosgrove 1934; Wendorf 1953) and Sivu'ovi (Burton 1991). The only Archaic site excavated in the Park is AZ K:13:60 (Tagg 1987).

As can be seen in the preceding list the excavated sites cover a wide temporal span. However, lacking in this group are excavations at Early and Middle Archaic sites and single component Pueblo III sites with late Pueblo III ceramics. Further, a number of these sites were excavated before the advent of modern recovery and analyses methods, and more excavations at sites that date to the other periods could produce substantial and significant information. For example, the Basketmaker III/Pueblo I period is represented by major excavations undertaken at a site in the late 1940s and at another small site excavated in the 1980s. The Late Archaic is represented by excavations at a single small site.

While it can be argued that some data can be recovered from any site, such work is not always justifiable. Reliable reconstructions of past behavior rely first upon the strength of the data. Strong analytic cases are those sites that contain numerically large samples of high–resolution data that are relatively undistorted by natural and cultural formation processes. Weak analytic cases are characterized by numerically small samples of low–resolution data, distorted natural contexts, multiple occupations, or vandalism. Lack of attention to the analytic strength of archaeological cases creates decreases the reliability of the inferences generated from them and limits the data's usefulness in subsequent analysis by other researchers (Reid and Whittlesey 1982: 18–19). Archaeological sites that constitute strong analytic cases are more likely to yield important information, and are therefore more significant than sites that constitute weak analytic cases.

In National Register criteria, the distinction between strong and weak analytic cases is inherent in the requirement that National Register properties exhibit integrity. For example, sites that have been extensively disturbed may lack sufficient integrity of setting and location for National Register eligibility; sites with poor focus and context may lack sufficient integrity of association. National Register eligibility guides management of sites on federal land. Until National Register eligibility can be determined, the priorities listed below are based on whether the significance and integrity of recorded sites suggest potential eligibility.

Therefore, no salvage is recommended at this time for sites noted during monitoring as in poor condition, or at multi–component sites without apparent features or intact stratigraphy that could provide dated contexts. In addition, better information is expected at large sites with several data categories present; for example, occupation sites are more likely to address several of the noted research questions than a briefly–used campsite.

Pueblo IV

No immediate salvage needs are identified for Pueblo IV sites. Numerous excavations have already been conducted at Puerco Ruin. For recommendations concerning this site the reader is referred to Burton (1990). The only other Pueblo IV site within the Park with substantial remains is PEFO site 69. This ten–room pueblo has not been re–recorded since Jepson's original 1940 work, so its current condition is unknown. However, Jepson did note some vandalism at the site.

Late Pueblo III

AZ Q:1:275, a vandalized 12–room pueblo, would be the first choice for salvage among late Pueblo III sites. It is in fair condition but is susceptible to severe erosion, and offers the best data potential. Information from this site could provide data on each of the identified research questions for the Petrified Forest area.

Pueblo II/III

Monitoring revealed several potential candidates for salvage. All are one–room masonry structures or groups of one–room masonry structures still in fair condition but with severe erosion. These include AZ K:13:11 (also noted by Jones [1987]), AZ K:13:45 Locus A, AZ Q:1:187, AZ Q:1:197, AZ Q:1:227, AZ Q:1:276, and AZ Q:1:281. In addition, one other site noted by Jones (1987) as needing salvage has not yet been included in the monitoring program. This site, AZ Q:1:110, is a three to five room structure eroding off the edge of the badlands in the Rainbow Forest section of the Park.

Ranking of these sites should await the analysis of McCreery Pueblo, now in progress, since relevant research questions and data gaps may be identified. More urgent is salvage at AZ Q:1:239 (Vint 1989), a one–room structure in the Rainbow Forest made of petrified wood blocks. Rapidly eroding, the burned roofing material exposed holds promise for good chronometric information if retrieved soon, and the burning suggests potential for a more complete artifact inventory.

Sites dating to this period are the most abundant type in the Park. Excavation of several of these sites will be needed to test some of the settlement and social models suggested by survey data (*e.g.* Wells 1989).

Pueblo I

Monitoring revealed no Pueblo I sites with both ongoing erosion and sufficient integrity to have good research potential. However, Jones (1987) has recommended salvage at two eroding Basketmaker III/Pueblo I sites (AZ Q:1:65 and AZ Q:1:141) not yet included in the monitoring program. Her recommendation still appears relevant: the Pueblo I Period is poorly represented in survey data, and no single component Pueblo I site has yet been excavated. Salvage would provide important preliminary data on this time period.

Basketmaker III

Of the monitored Basketmaker III sites, AZ Q:1:60 appears the most likely candidate for salvage. An artifact scatter in fair condition with severe erosion, the site contains ashy areas and temporally–diagnostic artifacts on the surface. The remains of what appear to be pithouses are beginning to erode. Even a small investment here could provide invaluable information. First, the availability of data from the extensively excavated Twin Butte Site would allow extrapolations from even a relatively small sample. Second,

because the site is located near the Park Mainline Road, logistics would be easy and travel time minimal.

Basketmaker II

High priorities for salvage are AZ Q:1:114 (Burton 1991) and AZ Q:1:171 (Wells 1988). AZ Q:1:114 (Sivu'ovi) has dozens of eroding pithouses and other features. Preliminary work there has yielded the earliest independently dated pottery on the Colorado Plateau (Adamana Brown Ware, dated *ca.* A.D. 200). One eroding structure, not yet excavated, has provided evidence of even earlier dates (300 B.C.). The simple determination of whether Adamana Brown Ware is present or not, as de facto refuse on the floor of the pit house would give us a still earlier date for pottery on the Colorado Plateau, and would provide information about the Archaic to Basketmaker transition. AZ Q:1:171 has at least nine eroding features, and may contain additional information about this little known period. The restricted distribution of Adamana Brown Ware provides the unique opportunity to study technological change and innovation. The scale of erosion at these sites and the importance of this period in reconstructing the political and economic prehistory of the area (*cf.* Plog 1983, 1984) makes salvage at these sites critical.

Archaic

Several eroding pit houses and other features were noted at AZ K:13:98, a Late Archaic site, in 1988. Although a Late Archaic site (AZ K:13:60) has been recently excavated in the Park (Tagg 1987), AZ K:13:98 appears to represent an entirely different type of occupation. AZ K:13:98 is larger, with more artifacts and more substantial structures, and could provide important information on Late Archaic use of the Park.

The only site in the Park definitely dating to the Middle Archaic period is AZ Q:1:224. Since the site is undergoing only minor erosion it is not a priority for salvage at this time. However, its uniqueness makes it a priority for research.

Site Monitoring

Monitoring results must be used to identify salvage needs, and should be the initial step in planning and budgeting salvage excavations. The monitoring program, initiated in 1990, should be continued. It is recommended that each year ten percent of recorded sites (40 to 50 sites/year) should be monitored so that each site is field checked at least once every 10 years. Obviously, some sites will need more frequent visits, and the monitoring can be used to develop a schedule based on site condition. For example, the eroding AZ Q:1:114 should be monitored yearly while sites such as McCreery Pueblo, in more stable terrain, would need monitoring less frequently. Even though salvage is not recommended for sites in poor condition, some of those with severe erosion should be visited annually to ensure that the no–salvage recommendation remains valid. For example, the exposure of a burial at one such site, AZ K:13:51, necessitated salvage in 1990.

As a part of monitoring, an attempt should be made to relocate and re–record the rest of the sites originally discovered by Mera (1934) and Jepson (1941). Although these are among the most visible sites in the Park, it is recommended that survey be conducted in blocks for efficiency and accuracy, and to find less visible sites that might have been missed by these by these early surveys. Priority should be given to sites in

areas of high visitor use, such as around the Flattops, Jasper Forest, and Agate Bridge.

Site Acquisition

Stone Axe Pueblo, recorded during the 1988 GMP survey, is one of the most important sites in the region. It is the largest and latest occupied prehistoric site in the Petrified Forest Region. Located on private land, it has been subject to past vandalism, some of it authorized by the landowners. The site is located about one-half mile east of the park boundary. If acquisition of a large parcel contiguous to the Park is not feasible, the site should be acquired as a separate, non-contiguous parcel. Perhaps the Archaeological Conservancy, instrumental in adding McCreery Pueblo (PEFO site 236) to the Park, could be enlisted to aid the acquisition.

Survey

Some of the survey recommendations made by Stewart (1980) and Jones (1987) have been completed. First, the Boundary Survey, which includes a 1/4-mile-wide corridor along the 91-mile Park boundary is concluded. Second, the Developed Area Survey is completed; surveys of areas along paved roads are reported by Hammack (1979) and Vint (1989) and survey of the Headquarters and Rainbow Forest Museum areas were reported by Jones (1987). Projected development area surveys were completed for the 1988 GMP survey and are reported here. And third, some of the Painted Desert portion of the Park has been surveyed, with large areas covered by the final year of the Boundary Survey, the 1988 GMP survey, and the 1991 volunteer survey.

Both Stewart (1980) and Jones (1987) called for sample surveys of the Park. To date no random stratified sample has been completed, but previous surveys and those reported here provide a 25 percent sample of the Park. No additional general survey is recommended at this time until other more pressing needs (such as some of the salvage projects noted above) are completed.

While large and diverse areas of the Park have been examined, new survey is recommended for two additional areas to fill in data gaps. One section in need of survey is the Dry Wash area in the central portion of the Park, near the Twin Butte Site excavated by Wendorf (1953). Hammack's (1979) survey of the Mainline Road and a cursory inspection by the author suggests the area may have a high density of Basketmaker III-Pueblo I sites that were overlooked by Mera (1934) and Jepson (1941). Currently sites from this period are underrepresented in the Park.

The second area recommended for further reconnaissance is the Painted Desert. Although the final year of the Boundary Survey and the surveys reported here have provided some data, this is still the least known area of the Park. To efficiently gather information about this little known area, sample survey should only be used in conjunction with judgmental survey.

National Register Nomination

In 1980 Stewart suggested a Park-wide National Register nomination. Although no progress, beyond site recording (inventory), has yet been made on her recommendation, a Park-wide National Register nomination still appears useful. A multiple-property nomination that identifies National Register districts and sites would be much easier to complete than numerous individual nominations. A Park-wide nomination would be

comprehensive enough to allow management assessments in greater detail than provided by this report, not only for sites within the current Park boundaries, but also for sites on bordering lands that the Park may someday acquire. Further, a Park–wide nomination would streamline the compliance and consultation process, if followed by a Programmatic Memorandum of Agreement (PMOA). The PMOA could incorporate Jones's (1987) general research design for the Park, adapted as necessary, and a program for salvage work. Most importantly, a Park–wide nomination could be used as a tool to establish research goals and management (including salvage) priorities.

However, multiple property nominations are extremely costly in staff time. Given limited time and money and the rate of erosion at the Park, National Register nomination must take a lower priority than salvage, monitoring, and further inventory.

Research Studies

Other studies could contribute to some of the research questions identified for the Park. While not directly related to immediate management, research can help identify future management needs and goals, and provide information for public interpretation.

First, rock art recording by the American Rock Art Research Association (ARARA) should be continued and expanded to document weathering and vandalism, and enlarge the data base. The intensive work necessary could probably only be done by ARARA. Also, new dating techniques may provide independent dates for rock art. For example, the initial accelerator radiocarbon dating of petroglyphs in the Park by Ron Dorn (Dorn *et al.* 1993) shows promising results and should be expanded to include pictographs within the Cave of Hands (AZ Q:1:70).

Second, tree–ring dating of samples from AZ K:13:101 and accelerator radiocarbon dating of pitch particles from the Navajo basket collected at AZ Q:1:201 would provide chronological dating for early Navajo use of the Park.

Third, more fieldwork is recommended at Basketmaker II sites to better characterize the initial occupation of Park area, and the Archaic to Basketmaker transition. For more details on fieldwork and analyses proposed, the reader is referred to the recommendations in Burton (1991).

Fourth, testing of Pueblo period pithouses at AZ Q:1:239 could provide information on this unusual site type, and may illuminate settlement and cultural developments.

Fifth, Archaic site testing is recommended. A small Late Archaic camp site was excavated in 1986 and reported by Tagg (1987). Testing is recommended at a larger Late Archaic site with eroding pit structures (AZ K:13:98) to more fully characterize the settlement and subsistence patterns of the Late Archaic. Testing is also recommended at a Middle Archaic site (AZ Q:1:224) to provide data on earlier Archaic adaptations.

Sixth, quarry studies need to be pursued. Wells (1988) excavated a lithic scatter adjacent to Puerco Ruin, and Bernard (1979) conducted work at a small quarry site near Rainbow Forest. However, in each case the results were limited by the project scope; mitigation for road reconstruction. More comprehensive and conclusive data would be generated by a large–scale research project. Such a study should include workshops located away from quarries, such as those recorded during the GMP survey.

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Appendix A
Concordance of Site Numbers

Appendix A
Concordance of Site Numbers

PEFO	LA	MNA	ASM
1 & 205	469	4701 & 4905	AZ Q:1:226
2	526	4702	AZ Q:1:227
3	527	4703	AZ Q:1:225
18	1383	4718	AZ Q:1:239
30	-	4730	AZ Q:1:238
26	1310	4726	AZ Q:1:281
85	-	4785	AZ Q:1:223
87	-	4787	AZ Q:1:220
105	1472	4805	AZ Q:1:270
106	-	4806	AZ Q:1:287
107	-	4807	AZ Q:1:288
108	-	4808	AZ Q:1:289 & 290
109	1470	4809	AZ Q:1:293
111 & 112	-	4811 & 4812	AZ Q:1:297
122	-	4822	AZ Q:1:286
123	-	4823	AZ Q:1:285
124 & 125	-	4824 & 4825	AZ Q:1:291
126	-	4826	AZ Q:1:292
132	-	4832	AZ Q:1:294
133	1451	4833	AZ Q:1:279
134	1314	4834	AZ Q:1:275
135	1451	4835	AZ Q:1:276
171	-	4871	AZ Q:1:261
187	-	4887	AZ Q:1:282
188	-	4888	AZ Q:1:283
190	-	4890	AZ Q:1:284
206	-	4906	AZ Q:1:295
219	-	4919	AZ Q:1:214
220	-	4920	AZ Q:1:268
237	1312	1023 & 4937	AZ Q:1:1, AZ Q:1:199
272	-	4972	AZ Q:1:78
291	-	-	AZ K:13:36
-	1315	-	AZ K:13:91
-	1316	-	AZ K:13:114
-	1523	-	AZ K:13:94
-	-	10,808	AZ Q:1:200

PEFO - Petrified Forest National Park (Jepson 1941).
LA - Laboratory of Anthropology (Mera 1934).
MNA - Museum of Northern Arizona (Reed 1940; Harrill 1971).
ASM - Arizona State Museum (this report [PEFO 1988E, 1989C, 1990B], only those with other site numbers are listed).

Appendix B
Summary of Recorded Sites

Appendix B – Summary of Recorded Sites.

Site Number	Time Period	Site Type	Size	Features	Estimated Number of:				Maximum Artifact Density
					Ceramics	Flakes/Cores	Ground Stone	Other Artifacts	
AZ K:13:35 PEFO 1979A-42	Pueblo	Artifact Scatter	15 x 10 m 150 m^2	2 small sandstone slab concentrations	100	50	2	worked slab	7/m^2
AZ K:13:36 PEFO 1979A-43	Pueblo II/III	Artifact Scatter	35 x 25 m 875 m^2	3 sandstone slab concentrations	50	60	1	none noted	7/m^2
AZ K:13:65 PEFO 1976A-2	Archaic	Lithic Scatter	15 x 30 m 450 m^2	2 sandstone slab concentrations, depression	-	20	-	shell bead, historic trash	n/a
AZ K:13:91 PEFO 1988E-20	Pueblo II/III	Multiroom Masonry	40 x 40 m 1600 m^2	two-room structure w/exposed hearth	750	1000	10	hammerstone, other tools	8/m^2
AZ K:13:92 PEFO 1988E-21	Pueblo II/III, Historic (1925)	Masonry Room/Rock Art/ Inscriptions	130 x 75 m 9750 m^2	rubble mound, 156 petroglyphs, 13 grooves, cupule, 5 historic inscriptions on 36 boulders	200	200	-	palette, projectile point, lumber	n/a
AZ K:13:93 PEFO 1988E-22	Historic (Anglo)	Structural Remains	55 x 40 m 2200 m^2	rock structure, possible rock oven, rock concentration, fence line	2	-	-	lumber, cans, nails, glass, auto parts, etc	n/a
AZ K:13:94 PEFO 1988E-23	Pueblo II/III-III	Multiroom Masonry	90 x 45 m 4050 m^2	3 one/two-room structures	400+	500+	-	biface, hammerstones	15/m^2
AZ K:13:95 PEFO 1988E-24	late Pueblo III	Artifact Scatter	15 x 15 m 225 m^2	none	30	4	1	hammerstone	5/m^2
AZ K:13:96 PEFO 1988E-25	Pueblo II/III	Rock Art	10 x 300 m 300 m^2	12 petroglyphs in 3 loci	-	-	-	none noted	n/a
AZ K:13:97 PEFO 1988C-1	Pueblo II/III	Artifact Scatter	8 x 8 m 64 m^2	possible slab feature	40	2	-	2 can lids	6/m^2
AZ K:13:98 PEFO 1988C-2	Archaic	Lithic Scatter	80 x 25 m 2000 m^2	possible pit structures, ashy soil, hearths	-	200	10	anvil, projectile point, other tools, lumber	12/m^2
AZ K:13:99 PEFO 1988C-3	Basketmaker III-Pueblo II/III	Artifact Scatter	30 x 25 m 750 m^2	3 sandstone slab concentrations	100	100	-	none noted	30/m^2
AZ K:13:100 PEFO 1988E-IF 34	Pueblo	Artifact Scatter	20 x 50 m 1000 m^2	none	50	3	4	hammerstone	n/a

Site Number	Time Period	Site Type	Size	Features	Estimated Number of:				Maximum Artifact Density
					Ceramics	Flakes/Cores	Ground Stone	Other Artifacts	
AZ K:13:101 PEFO 1991C-16	Historic (Navajo)	Hogans	240 x 232 m 55,680 m^2	9 one-room structures, two-room structure, rock cairn, cleaned areas	-	2	-	2 hole-in-top cans, bone fragments	n/a
AZ K:13:102 PEFO 1991C-17	Pueblo II/III	Rock Art	70 x 70 m 4900 m^2	30 elements on 7 boulders	-	-	-	none noted	n/a
AZ K:13:103 PEFO 1991C-18	Pueblo II/III-late III	Artifact Scatter	130 x 60 m 7800 m^2	possible slab feature	100	2	1	none noted	4/m^2
AZ K:13:104 PEFO 1991C-19	Pueblo II/III-III	Rock Art/Artifact Scatter	50 x 40 m 2000 m^2	9 petroglyphs on 3 boulders	100	40	1	none noted	30/m^2
AZ K:13:105 PEFO 1991C-20	Pueblo II/III-late III	Masonry Room/Rock Art	15 x 15 m 225 m^2	rubble mound, 16 petroglyphs	65	60	-	none noted	18/m^2
AZ K:13:106 PEFO 1991C-21	Pueblo II-II/III	Artifact Scatter	20 x 22 m 440 m^2	possible slab feature	210	105	3	none noted	27/m^2
AZ K:13:107 PEFO 1991C-22	Pueblo II/III	Multiroom Masonry/Rock Art	110 x 130 m 14,300 m^2	3 one/two-room structures, 88 petroglyphs on 23 boulders, slab features, daub concentrations	3800	10400	22	polishing stones, points, bifaces, hammerstone	50/m^2
AZ K:13:108 PEFO 1991C-23	Pueblo II-II/III	Multiroom Masonry/Rock Art	100 x 100 m 10,000 m^2	5-room pueblo, rubble mound, slab features, 17 petroglyphs on 3 boulders	1000	200	-	hammerstone	22/m^2
AZ K:13:109 PEFO 1991C-24	Pueblo II/III	Masonry Room/Rock Art	90 x 70 m 6300 m^2	rubble mound, 46 petroglyphs and 1 groove on 7 panels	23	20	-	none noted	n/a
AZ K:13:110 PEFO 1991C-52	Pueblo II/III-III	Artifact Scatter	65 x 50 m 3250 m^2	sandstone slab concentration	250	100	2	polishing stone, beer bottle	12/m^2
AZ K:13:111 PEFO 1991C-53	Pueblo II-III	Artifact Scatter	95 x 25 m 2375 m^2	sandstone slab concentration	25	25	2	none noted	4/m^2
AZ K:13:112 PEFO 1991C-54	Pueblo II/III-late III	Masonry Room	30 x 30 m 900 m^2	rubble mounds, sandstone slab concentration	60	30	1	none noted	4/m^2
AZ K:13:113 PEFO 1991C-55	Pueblo II-late III	Multiroom Masonry	50 x 60 m 3000 m^2	6± room pueblo	500	200	3	shell	45/m^2
AZ K:13:114 PEFO 1991C-56	Pueblo II/III-III	Multiroom Masonry	60 x 100 m 6000 m^2	4± room pueblo	500	200	-	craved stone zoomorph	60/m^2

Site Number	Time Period	Site Type	Size	Features	Estimated Number of:				Maximum Artifact Density
					Ceramics	Flakes/Cores	Ground Stone	Other Artifacts	
AZ K:13:115 PEFO 1991C-57	Pueblo II/III	Artifact Scatter	15 x 15 m 225 m^2	none	50	30	2	none noted	9/m^2
AZ K:13:116 PEFO 1991C-58	Pueblo II/III-III	Multiroom Masonry	37 x 32 m 1184 m^2	3 one-room structures	370	60	6	none noted	n/a
AZ K:13:117 PEFO 1991C-59	Pueblo II/III-late III	Masonry Room	35 x 32 m 1120 m^2	rubble mound, slab feature	85	65	2	cans, glass	7/m^2
AZ K:13:118 PEFO 1991C-60	Pueblo II-late III	Masonry Room	60 x 55 m 3300 m^2	rubble mound, possible slab feature	3000	100	8	polishing stones	7/m^2
AZ K:13:119 PEFO 1991C-61	Pueblo II/III-III	Artifact Scatter	45 x 40 m 1800 m^2	none	70	30	-	none noted	4/m^2
AZ K:13:120 PEFO 1991C-62	Pueblo II/III	Rock Art	10 x 10 m 100 m^2	13 petroglyphs on 3 boulders	-	-	-	none noted	n/a
AZ K:13:121 PEFO 1991C-63	Pueblo II/III	Rock Art	10 x 10 m 100 m^2	7 petroglyphs	-	-	-	none noted	n/a
AZ K:13:122 PEFO 1991C-64	Pueblo II/III	Rock Art	10 x 10 m 100 m^2	2 petroglyphs	-	-	-	none noted	n/a
AZ K:13:123 PEFO 1991C-65	Historic (Hopi)	Inscriptions	10 x 10 m 100 m^2	3 inscriptions	-	-	-	none noted	n/a
AZ K:13:124 PEFO 1991C-66	Historic (1935), Pueblo II/III	Inscriptions/Rock Art	10 x 10 m 100 m^2	19 inscriptions and 2 petroglyphs on 3 boulders	-	-	-	none noted	n/a
AZ K:13:125 PEFO 1991C-67	Historic (1934)	Inscription	10 x 10 m 100 m^2	1 inscription	-	-	-	none noted	n/a
AZ K:13:126 PEFO 1991C-68	Pueblo II/III	Rock Art	10 x 10 m 100 m^2	2 petroglyphs on 2 boulders	-	-	-	none noted	n/a
AZ K:13:127 PEFO 1991C-69	Pueblo II/III	Rock Art	10 x 10 m 100 m^2	48 petroglyphs on 4 boulders	-	-	-	none noted	n/a
AZ K:13:128 PEFO 1991C-70	Pueblo II/III	Rock Art	10 x 10 m 100 m^2	4 petroglyphs	-	-	-	none noted	n/a

Site Number	Time Period	Site Type	Size	Features	Estimated Number of:				Maximum Artifact Density
					Ceramics	Flakes/Cores	Ground Stone	Other Artifacts	
AZ K:13:129 PEFO 1991C-71	Pueblo II/III	Rock Art	10 x 10 m 100 m^2	5 petroglyphs	-	-	-	none noted	n/a
AZ K:13:130 PEFO 1991C-72	Pueblo II/III	Rock Art	10 x 10 m 100 m^2	15 petroglyphs on 2 boulders	-	-	-	none noted	n/a
AZ K:13:131 PEFO 1991C-73	Pueblo II/III	Rock Art	10 x 10 m 100 m^2	9 petroglyphs on 3 boulders	-	-	-	none noted	n/a
AZ K:13:132 PEFO 1991C-74	Pueblo II/III	Rock Art	10 x 10 m 100 m^2	4 petroglyphs	-	-	-	none noted	n/a
AZ K:13:133 PEFO 1991C-75	Pueblo II/III	Rock Art	10 x 10 m 100 m^2	92 petroglyphs and 7 cupules on 6 boulders	-	-	-	none noted	n/a
AZ K:13:134 PEFO 1991C-76	Pueblo II/III	Rock Art	10 x 10 m 100 m^2	3 petroglyphs	-	-	-	none noted	n/a
AZ K:13:135 PEFO 1992A-3	Historic (Anglo)	Structural Remains	7 x 4 m 28 m^2	foundation	-	-	-	pipe, concrete, metal, wire, hardware, etc	n/a
AZ K:14:38 PEFO 1992A-2	Pueblo II/III	Artifact Scatter	35 x 15 m 525 m^2	none	70	35	-	historic trash	n/a
AZ Q:1:20 PEFO 1988E-31	Pueblo II/III-IV	Artifact Scatter	35 x 60 m 2100 m^2	pithouses and other features excavated by MNA (Harrill 1971)	500	10000	2	none noted	n/a
AZ Q:1:70 PEFO 1987F-1	Prehistoric/ Historic (CCC)	Rockshelter/Rock Art/ Inscriptions	100 x 50 m 5000 m^2	rockshelter, 416 pictographs, 172 petroglyphs, 46 inscriptions, drill holes, lumber	-	-	-	lumber	n/a
AZ Q:1:71 PEFO 1986A-25	Pueblo II/III-IV, Historic (CCC)	Rock Art/Inscriptions/Artifact Scatter	136 x 112 15,232 m^2	252 petroglyphs and 6 historic inscriptions on 11 panels	2	100	-	historic trash	8/m^2
AZ Q:1:78 PEFO 1991C-12	Pueblo II/III	Rockshelter/Rock Art	110 x 50 m 5500 m^2	rockshelter, viga holes, numerous petroglyphs (not recorded)	410	700	4	worked slab	44/m^2
AZ Q:1:82 PEFO 1986A-33	Historic (CCC)	CCC Camp	335 x 150 50,250 m^2	foundations, roads, walls, structural remains, depressions, leveled areas, rock alignments	-	-	-	glass, hardware, metal, tool/auto parts, etc	n/a
AZ Q:1:199 PEFO 1988E-32	Pueblo I/II-late IV	Multiroom Masonry	480 x 300 m 144,000 m^2	250+ room pueblo, midden, cemetery, plaza, rubble mounds, spring	60000	40000	500	shell, bone, historic trash, farm equipment	n/a

Site Number	Time Period	Site Type	Size	Features	Estimated Number of:				Maximum Artifact Density
					Ceramics	Flakes/Cores	Ground Stone	Other Artifacts	
AZ Q:1:211 PEFO 1988E-1	Pueblo II/III	Rock Art	14 x 10 m 140 m^2	40 petroglyphs on 3 panels	-	-	-	none noted	n/a
AZ Q:1:212 PEFO 1988E-2	Pueblo II/III	Rock Art	12 x 6 m 72 m^2	24 petroglyphs on 4 panels	-	-	-	none noted	n/a
AZ Q:1:213 PEFO 1988E-3	Pueblo II/III	Rock Art	3 x 3 m 9 m^2	22 petroglyphs	-	-	-	none noted	n/a
AZ Q:1:214 PEFO 1988E-4	Basketmaker III/ Pueblo I-Pueblo II	Artifact Scatter	55 x 50 m 2750 m^2	4 sandstone slab concentrations	800	1000	-	hammerstone	19/m^2
AZ Q:1:215 PEFO 1988E-5	Historic/ Pueblo II/III	Structural Remains/Rock Art	6 x 7 m 42 m^2	historic structural remains w/hearth, 5 petroglyphs	-	-	-	tin, cement, wire, juniper log	n/a
AZ Q:1:216 PEFO 1988E-6	Aceramic	Lithic Scatter	60 x 100 m 6000 m^2	artifact concentrations	10	15000	-	roughouts, bifaces, other tools	120/m^2
AZ Q:1:217 PEFO 1988E-7	Pueblo	Artifact Scatter	60 x 50 m 3000 m^2	2 sandstone slab concentrations, pot drop	60	500	2	none	4/m^2
AZ Q:1:218 PEFO 1988E-8	Aceramic	Lithic Scatter	75 x 60 m 4500 m^2	none	1	8000	0	bifaces, other tools	75/m^2
AZ Q:1:219 PEFO 1988E-9	Pueblo II-II/III	Multiroom Masonry	150 x 70 m 10,500 m^2	3 one/two-room structures	5000	10000	6	hammerstones, bone	180/m^2
AZ Q:1:220 PEFO 1988E-10	Late Pueblo I-III	Multiroom Masonry	60 x 60 m 3600 m^2	two-room structure, hearth	5000	15000	26	hammerstone, anvil, point, pendant, etc	270/m^2
AZ Q:1:221 PEFO 1988E-11	Pueblo	Lithic Scatter	180 x 60 m 10,800 m^2	artifact concentrations	1	20000	-	hammerstone, bifaces, other tools	95/m^2
AZ Q:1:222 PEFO 1988E-12	Aceramic	Lithic Scatter	90 x 50 m 4500 m^2	none	1	1500	-	hammerstones	9/m^2
AZ Q:1:223 PEFO 1988E-13	Pueblo I-III	Multiroom Masonry	95 x 70 m 6650 m^2	15± room structure, midden, rubble mound, slab feature, axe grinding grooves	2500	5500	12	projectile point, other tools	110/m^2
AZ Q:1:224 PEFO 1988E-14	Middle Archaic	Lithic Scatter	140 x 80 m 11,200 m^2	none	1	2500	-	points, bifaces, other tools, historic bone	25/m^2

Site Number	Time Period	Site Type	Size	Features	Estimated Number of:				Maximum Artifact Density
					Ceramics	Flakes/Cores	Ground Stone	Other Artifacts	
AZ Q:1:225 PEFO 1988E-15	Pueblo II-late III	Masonry Room	67 x 35 m 2335 m^2	rubble mound, midden	300	700	2	hammerstones, bone	14/m^2
AZ Q:1:226 PEFO 1988E-16	Pueblo II/III-late III	Multiroom Masonry	150 x 120 m 18,000 m^2	10± room pueblo with possible kiva, burial	7000	13000	18	hammerstones, anvil, abraders, shell, etc	110/m^2
AZ Q:1:227 PEFO 1988E-17	Pueblo II/III-IV	Multiroom Masonry	70 x 65 m 4550 m^2	three-room structure, one-room structure, slab feature	3000	4000	4	shell, bone	245/m^2
AZ Q:1:228 PEFO 1988E-18	Pueblo II/III	Rock Art	40 x 40 m 1600 m^2	66 petroglyphs on 15 panels	-	-	-	biface fragment	n/a
AZ Q:1:229 PEFO 1988E-19	Aceramic	Lithic Scatter	45 x 35 m 1575 m^2	none	-	10000+	-	roughouts, bifaces, other tools	10/m^2
AZ Q:1:230 PEFO 1988E-26	Pueblo II/III	Rock Art/Inscriptions	200 x 80 m 16,000 m^2	510 petroglyphs, 8 hand/toe holds, 12 inscriptions on 132 boulders, drill holes, trail	2	5	-	none noted	n/a
AZ Q:1:231 PEFO 1988E-27	Pueblo	Artifact Scatter	60 x 40 m 2400 m^2	sandstone slab feature	250	750	-	hammerstone	8/m^2
AZ Q:1:232 PEFO 1988E-28	Historic (Anglo)	Structural Remains	40 x 40 m 1600 m^2	depression, artifact concentrations	-	-	-	metal, lumber, nails, cans	n/a
AZ Q:1:233 PEFO 1988E-29	Pueblo II/III	Rock Art	7 x 6 m 42 m^2	35 petroglyphs on 3 boulders	-	-	-	none noted	n/a
AZ Q:1:234 PEFO 1988E-30	Pueblo II/III	Rock Art/Artifact Scatter	50 x 35 m 1750 m^2	21 petroglyphs on 5 boulders	45	50	1	hammerstones, other tools	n/a
AZ Q:1:235 PEFO 1988E-33	Pueblo II/III-IV	Rock Art	25 x 25 m 625 m^2	26 petroglyphs in 5 loci, tinaja	-	-	-	none noted	n/a
AZ Q:1:236 PEFO 1988E-34	Pueblo	Masonry Room	60 x 100 m 6000 m^2	rubble mound	300	700	-	projectile point, chopper	18/m^2
AZ Q:1:237 PEFO 1988E-35	Pueblo I/II, Historic	Masonry Room/Camp	50 x 20 m 1000 m^2	rubble mound, historic rock alignments, possible tent pad	200	100	2	fence posts, wire, nails	n/a
AZ Q:1:238 PEFO 1989C-1	Pueblo II-III	Artifact Scatter	240 x 260 m 62,400 m^2	possible pit houses, slab features	3000	10000+	6	projectile point, hammerstones, palette	75/m^2

Site Number	Time Period	Site Type	Size	Features	Estimated Number of:				Maximum Artifact Density
					Ceramics	Flakes/Cores	Ground Stone	Other Artifacts	
AZ Q:1:239 PEFO 1989C-2	Pueblo II/III, Historic (CCC)	Masonry Room/Water Control Feature	90 x 90 m 8100 m^2	rubble mound, historic masonry dam	25	800	-	hammerstone	n/a
AZ Q:1:256 PEFO 1991C-1	Historic (CCC)	Structural Remains	90 x 65 m 5850 m^2	remains of 2 structures and possible outhouse	-	-	-	nails, other metal, glass, concrete	n/a
AZ Q:1:257 PEFO 1991C-2	Historic (CCC)	Trash Scatter	65 x 50 m 3250 m^2	none	-	-	-	machine parts, glass, hardware, lumber, etc	n/a
AZ Q:1:258 PEFO 1991C-3	Historic (CCC)	Structural Remains	70 x 55 m 3850 m^2	structural remains, borrow pit, tent pad, rock-shelter, trash concentration	-	-	-	bottles, china, lumber, metal, glass, cans, etc	n/a
AZ Q:1:259 PEFO 1991C-4	Historic (CCC)	Trash Dump	40 x 30 m 1200 m^2	none	-	-	-	oil drums, pipe, cans, bucket, metal, etc	n/a
AZ Q:1:260 PEFO 1991C-5	Historic (CCC)/ Prehistoric	Work Area/Inscriptions/ Rock Art	400 x 50 m 20,000 m^2	loading docks, leveled areas, rock walls, depressions, drill holes, 87 inscriptions, 29 petroglyphs	-	-	-	oil drums, worked rock	n/a
AZ Q:1:261 PEFO 1991C-6	Pueblo IV	Rockshelter/Rock Art/ Inscription	20 x 7 m 140 m^2	excavated rockshelter (Gale 1941), 2 pictographs, 15 petroglyphs, and 1 inscription	1	15	-	none	n/a
AZ Q:1:262 PEFO 1991C-7	Prehistoric/ Historic (CCC)	Rock Art/Inscription	1 x 1 m 1 m^2	2 petroglyphs, 3 inscriptions	-	-	-	none	n/a
AZ Q:1:263 PEFO 1991C-8	Historic (CCC)/ Prehistoric	Work Area/Quarry/Inscriptions/Rock Art	209 x 178 m 37,202 m^2	small sandstone quarry, 38 inscriptions, 3 petroglyphs	-	-	-	none	n/a
AZ Q:1:264 PEFO 1991C-9	Prehistoric/ Historic (CCC)	Inscriptions/Rock Art	1 x 2 m 2 m^2	14 petroglyphs, 1 inscription	-	-	-	none	n/a
AZ Q:1:265 PEFO 1991C-10	Historic (CCC)	Work Area/Quarry	160 x 150 m 24,000 m^2	sandstone quarry, fire ring, trash scatter	-	-	-	mess kit, wire, auto parts, nails, lumber	n/a
AZ Q:1:266 PEFO 1991C-11	Pueblo II/III	Rock Art	32 x 5 m 160 m^2	7 petroglyphs on 2 panels	-	-	-	none	n/a
AZ Q:1:267 PEFO 1991C-IFs	Historic (CCC)	Structural Remains	100 x 125 12,500 m^2	two sheds, sign, depression, road trace	-	-	-	none noted	n/a
AZ Q:1:268 PEFO 1991C-13	Pueblo	Artifact Scatter	50 x 40 m 2000 m^2	none	8	155	-	worked slab	4/m^2

Site Number	Time Period	Site Type	Size	Features	Estimated Number of:				Maximum Artifact Density
					Ceramics	Flakes/Cores	Ground Stone	Other Artifacts	
AZ Q:1:269 PEFO 1991C-14	Historic (CCC)	Structural Remains	55 x 25 m 1375 m^2	two foundations, rubble, stone steps, diversion dam	-	-	-	lumber, nails, posts	n/a
AZ Q:1:270 PEFO 1991C-15	Pueblo II/III-late III	Multiroom Masonry/Rock Art	115 x 65 m 7475 m^2	5± room pueblo, trash mound, milling slicks/mortars, 86 petroglyphs on 18 boulders	2000	6000	2	none noted	275/m^2
AZ Q:1:271 PEFO 1991C-25	Historic (CCC)	CCC Camp	235 x 129 m 30,315 m^2	pumphouse/well, structural remains, foundations, concrete slabs, depressions	-	-	-	none noted	n/a
AZ Q:1:272 PEFO 1991C-26	Historic (CCC, 1897), Pueblo II/III	Camp/Inscriptions/, Rock Art	325 x 150 m 48,750 m^2	CCC spike camp, 41 inscriptions and 7 petroglyphs on 20 boulders	-	-	-	lumber, nails, wire	n/a
AZ Q:1:273 PEFO 1991C-27	Historic (1897), Prehistoric	Rock Art/Inscriptions	100 x 20 m 2000 m^2	71 petroglyphs and 5 historic inscriptions on 15 boulders	-	-	-	none noted	n/a
AZ Q:1:274 PEFO 1991C-28	Prehistoric?	Slab-lined Feature	2 x 2 m 4 m^2	slab-lined feature	-	1000+	-	none noted	n/a
AZ Q:1:275 PEFO 1991C-29	Pueblo II/III-late III	Multiroom Masonry	20 x 40 m 800 m^2	12 room pueblo, slab feature	1000	10000	2	hammerstone, shovel	550/m^2
AZ Q:1:276 PEFO 1991C-30	Pueblo II/III	Multiroom Masonry	35 x 20 m 700 m^2	2 two/three-room structures, one-room structure, trash scatter	410	2200	1	none noted	30/m^2
AZ Q:1:277 PEFO 1991C-31	Pueblo II/III	Rock Art/Lithic Scatter	10 x 10 m 100 m^2	35 petroglyphs on 11 boulders	-	5000+	-	none noted	n/a
AZ Q:1:278 PEFO 1991C-32	Pueblo IV	Rock Art	70 x 70 m 4900 m^2	83 petroglyphs and 2 cupules on 25 boulders, milling slicks	3	+	-	none noted	n/a
AZ Q:1:279 PEFO 1991C-33	Pueblo II-II/III	Multiroom Masonry	60 x 70 m 4200 m^2	10+ room pueblo with kiva? depression, two smaller rubble mounds, 3 trash mounds	5000	8000	12	bone	120/m^2
AZ Q:1:280 PEFO 1991C-34	Pueblo III	Rock Art/Artifact Scatter	30 x 30 m 900 m^2	9 petroglyphs on 3 boulders	5	500	-	none noted	n/a
AZ Q:1:281 PEFO 1991C-35	Pueblo II-IV	Multiroom Masonry/Rock Art	100 x 90 m 9000 m^2	3 one/two-room structures, 58 petroglyphs and 1 cupule on 14 boulders	5000	10000	4	hammerstone, shell	190/m^2
AZ Q:1:282 PEFO 1991C-36	Pueblo	Artifact Scatter	65 x 50 m 3250 m^2	none	1000+	800	25	shell, point, hammerstone, can, metal	150/m^2

Site Number	Time Period	Site Type	Size	Features	Estimated Number of:				Maximum Artifact Density
					Ceramics	Flakes/Cores	Ground Stone	Other Artifacts	
AZ Q:1:283 PEFO 1991C-37	Pueblo II-II/III	Artifact Scatter	60 x 40 m 2400 m^2	none	740	2250	10	hammerstone, projectile point, can	45/m^2
AZ Q:1:284 PEFO 1991C-38	Pueblo II-II/III	Artifact Scatter	14 x 12 m 168 m^2	none	100	225	11	hammerstone	40/m^2
AZ Q:1:285 PEFO 1991C-39	Pueblo II/III-III	Artifact Scatter	60 x 60 m 3600 m^2	rubble concentrations, possible pithouse	120	220	-	shell, polishing stone, projectile points, bifaces	25/m^2
AZ Q:1:286 PEFO 1991C-40	Pueblo II-late III	Masonry Room	25 x 30 m 750 m^2	rubble mound	50	300	-	none noted	14/m^2
AZ Q:1:287 PEFO 1991C-41	Basketmaker II, Pueblo I	Multiroom Masonry	40 x 30 m 1200 m^2	4 room structure	100	100	-	none noted	35/m^2
AZ Q:1:288 PEFO 1991C-42	Pueblo II-II/III	Multiroom Masonry/Rock Art	60 x 54 m 3240 m^2	two-room structure, 21 petroglyphs and 9 cupules on 8 boulders, milling slicks	250	250	-	hammerstone	85/m^2
AZ Q:1:289 PEFO 1991C-43	Prehistoric	Masonry Room	20 x 19 m 380 m^2	one-room structure w/attached storage? room	4	5	-	none noted	6/m^2
AZ Q:1:290 PEFO 1991C-44	Basketmaker II, Pueblo II-II/III	Masonry Room/Rock Art	70 x 40 m 2800 m^2	rubble mound, milling slicks, 16 petroglyphs on 4 boulders	20	10000	3	hammerstone	250/m^2
AZ Q:1:291 PEFO 1991C-45	Basketmaker II, Pueblo II	Multiroom Masonry	130 x 30 m 3900 m^2	2 one-room structures, bedrock milling slicks, axe polishing groove	50	100	1	none noted	15/m^2
AZ Q:1:292 PEFO 1991C-46	Pueblo II/III-III	Artifact Scatter	160 x 140 m 22,400 m^2	some rubble	8	300	-	none noted	10/m^2
AZ Q:1:293 PEFO 1991C-47	Pueblo II/III-III	Multiroom Masonry	35 x 40 m 1400 m^2	5 one-room structures, milling slicks	80	550	1	none noted	11/m^2
AZ Q:1:294 PEFO 1991C-48	Pueblo II/III	Masonry Room	28 x 33 m 924 m^2	rubble mound, 2 rock concentrations	60	325	1	none noted	12/m^2
AZ Q:1:295 PEFO 1991C-49	Pueblo II/III	Multiroom Masonry	55 x 50 m 2750 m^2	10± room pueblo, 3 smaller rubble mounds, low trash mound	450	1050	5	none noted	45/m^2
AZ Q:1:296 PEFO 1991C-50	Prehistoric	Bedrock Milling Feature	3 x 8 m 24 m^2	8 mortars, 5 cupules	1	3	-	none noted	n/a

Site Number	Time Period	Site Type	Size	Features	Estimated Number of:				Maximum Artifact Density
					Ceramics	Flakes/Cores	Ground Stone	Other Artifacts	
AZ Q:1:297 PEFO 1991C-51	Pueblo I-II/III	Masonry Room/Rock Art	50 x 200 m 10,000 m^2	rubble mound, slab feature, milling slicks, 39 petroglyphs on 5 boulders, polishing grooves	25	1900	1	biface, shell	10/m^2
AZ Q:1:298 PEFO 1991C-77	Historic (CCC)	Quarry/Inscriptions	10 x 10 m 100 m^2	sandstone quarry, 3 inscriptions on 3 boulders (plus one on wood beam)	-	-	-	lumber	n/a
AZ Q:1:299 PEFO 1991C-78	Historic (CCC)	Quarry/Inscriptions	10 x 10 m 100 m^2	sandstone quarry, 8 inscriptions, road trace	-	-	-	sawhorse, picnic table parts	n/a
AZ Q:1:300 PEFO 1991C-79	Historic (1927)	Inscriptions	10 x 10 m 100 m^2	2 inscriptions	-	-	-	none noted	n/a
AZ Q:1:301 PEFO 1988E-IF	Pueblo II/III	Rock Art	10 x 10 m 100 m^2	6 petroglyphs	-	-	-	none noted	n/a
AZ Q:1:302 PEFO 1992A-1	Prehistoric/ Historic	Rockshelter/Rock Art/ Inscriptions	10 x 4 m 40 m^2	rockshelter, 1 pictograph, 6 petroglyphs, and 2 historic inscriptions	-	-	-	none noted	n/a

Appendix C
Isolated Finds

Appendix C
List of Isolated Finds (n=91)

PEFO 1988E

No.	Type	Description.
IF–1	Artifact scatter	Mano, few sherds and flakes.
IF–2	Historic	Sandstone slab and concrete check dam.
IF–3	Artifact	Biface fragment.
IF–4	Artifact	Flake core.
IF–5	Artifact	Roughout.
IF–6	Sherd scatter	Seven brown corrugated sherds.
IF–7	Historic	Sandstone quarry.
IF–8	Artifact	Yellow ware sherd.
IF–9	Sherd scatter	Black–on–white and plain ware sherd.
IF–10	Artifact scatter	Few sherds and flakes.
IF–11	Historic	Cement–filled iron roller in vicinity of CCC–golf course.
IF–12	Historic	Leveled area, possible tent pad.
IF–13	Sherd scatter	Three black–on–white jar sherds.
IF–14	Artifact	Black–on–white sherd.
IF–15	Lithic scatter	Few flakes.
IF–16	Artifact	Large biface tip.
IF–17	Lithic scatter	Few flakes.
IF–18	Historic	Window screen and antelope bone in rockshelter.
IF–19	Lithic scatter	Twenty petrified wood flakes.
IF–20	Artifact scatter	Black–on–red and black–on–white sherd, flakes.
IF–21	Artifact scatter	Few flakes and sherds.
IF–22	Artifact scatter	Mano, black–on–white sherd, flakes.
IF–23	Lithic scatter	Scattered flakes.
IF–24	Sherd scatter	Yellow ware pot bust.
IF–25	Historic	Road grader.
IF–26	Artifact	Core/hammerstone.
IF–27	Paleotological	Four fossil bones.
IF–28	Lithic scatter	Few petrified wood flakes.
IF–29	Sherd scatter	Black–on–white sherd, corrugated sherd, few others.
IF–30	Historic	Sparse trash scatter.
IF–31	Artifact	Biface fragment.
IF–32	Lithic scatter	Flakes and a few sandstone slabs in a 1 by 1 m area.
IF–33	Historic	Capped well near Puerco Ruin.
IF–34	Historic	Ramada, wooden signs, and landscape features likely associated with abandoned CCC–era golf course, on mesa behind Rainbow Forest Museum.

PEFO 1989C

No.	Type	Description.
IF–1	Historic	Eroded check dam constructed of sandstone boulders.
IF–2	Lithic scatter	Less than 60 petrified wood flakes.
IF–3	Artifact scatter	Two black–on–white sherds and five flakes.
IF–4	Lithic scatter	Retouched flake, less than 60 pieces of petrified wood.
IF–5	Lithic scatter	Thousands of petrified wood and cobble chert flakes, one gray ware sherd (quarry).

PEFO 1991C

No.	Type	Description.
IF–1	Artifact	Petrified wood biface retouch flake.
IF–2	Artifact	White ware sherd.
IF–3	Historic	Borrow pit and trash scatter.
IF–4	Lithic scatter	Bajada projectile point and scattered petrified wood flakes.

IF–5	Historic	Imbedded iron pipe.
IF–6	Artifact	Petrified wood flake.
IF–7	Artifact	Petrified wood flake.
IF–8	Lithic scatter	Twenty petrified wood flakes.
IF–9	Lithic scatter	Twenty–five petrified wood flakes.
IF–10	Lithic scatter	Small petrified wood quarry.
IF–11	Artifact	Showlow Black–on–red sherd.
IF–12	Sherd scatter	Black–on–white, white ware, and corrugated sherd.
IF–13	Historic	One pint whiskey bottle, post 1933 (embossed with Federal law prohibits . . .).
IF–14	Historic	Wood stake with wire nail and a metal tee with smooth wire, possible pipeline remains.
IF–15	Sherd scatter	Five black–on–white and two corrugated sherds.
IF–16	Sherd scatter	Pot break (gray corrugated) and one black–on–white sherd.
IF–17	Historic	Empty barbed wire spool.
IF–18	Artifact	Plain gray sherd.
IF–19	Artifact	Gray corrugated sherd.
IF–20	Artifact	Plain gray sherd.
IF–21	Artifact	Black–on–white sherd.
IF–22	Sherd scatter	Three gray corrugated sherds.
IF–23	Artifact	Black–on–white sherd.
IF–24	Artifact	Brown corrugated sherd.
If–25	Sherd scatter	Two gray corrugated and one white ware sherd.
IF–26	Artifact	Black–on–white sherd.
IF–27	Artifact	Gray corrugated sherd.
IF–28	Artifact	Gray corrugated sherd.
IF–29	Sherd scatter	Few sherds in a drainage.
IF–30	Artifact	Petrified wood preform.
IF–31	Historic	Coal bucket.
IF–32	Historic	Large depression, 13 buckles and a few buttons and rivets, embossed with "U.S. Army."
IF–33	Artifact	Black–on–white rim sherd.
IF–34	Historic	Large flywheel.
IF–35	Historic	Large depression.
IF–36	Historic	Twenty rusted spikes and five other nails.
IF–37	Lithic scatter	Thirteen petrified wood flakes on a low knoll.
IF–38	Historic	Rock cairn.
IF–39	Artifact scatter	Few black–on–white and corrugated sherds, petrified wood flakes.
IF–40	Artifact scatter	Fifteen black–on–white and corrugated sherds, petrified wood flakes.
IF–41	Artifact scatter	Few plain ware sherds and petrified wood flakes.
IF–42	Artifact scatter	Twenty Lino white sherds, one black–on–white sherd, and a hammerstone.
IF–43	Artifact scatter	Black–on–red shed, polychrome sherd, and two petrified wood chunks.
IF–44	Lithic scatter	Few petrified wood flakes around a sandstone outcrop.
IF–45	Rock art	One petroglyph element, a spiral.
IF–46	Historic	Extensive dump along Cottonwood Wash with artifacts eroding out of cut bank (ca. 1920s–1960s).
IF–47	Historic	Fragment of brick and ceramic pipe, structure location identified from historic photographs.
IF–48	Historic	CCC road grader at Dobell Residence.

PEFO 1992A

No.	Type	Description.
IF–1	Artifact scatter	Sandstone slabs and a mano.
IF–2	Artifact scatter	Twenty flakes and sherds.
IF–3	Lithic scatter	Two projectile point fragments and two flakes.
IF–4	Artifact scatter	Fifteen sherds and flakes.

Appendix D
Rock Art Tabulation

		AZ K:13:92	AZ K:13:96	AZ K:13:102	AZ K:13:104	AZ K:13:105	AZ K:13:107	AZ K:13:108	AZ K:13:109	AZ K:13:120	AZ K:13:121	AZ K:13:122	AZ K:13:123	AZ K:13:124	AZ K:13:125	AZ K:13:126	AZ K:13:127	AZ K:13:128	AZ K:13:129	AZ K:13:130	AZ K:13:131
Anthropomorphs	stick figure	6	2								1						1				
	male stick figure	1					2														
	elaborated stick figure			1		1															
	full bodied figure										1										
	paired full bodied figure																1				
	male full bodied figure									1											
	female full bodied figure						1		1												
	open faced full bodied figure																				
	with staff/headdress	2																			
	with (bow/arrow)						(2)														
	with digits/hair						3	1		1						1	2				
	with snake																				
	flute player	1					2											1			
	copulating																				
	unfinished/partial							3	2								1				
Kachinas	plain mask																				
	elaborated mask																				
	ogre																				
	full bodied																				
Zoomorphs	quadruped/antelope/sheep	13		1		2	10	1	2		1									1	
	mountain loin																				
	bird			1		2	2													1	2
	lizard	2							1	1											
	snake	8	2								2						4				
	other	2			1		1	1													
Hands/tracks	bear																				
	mountain lion																				
	bird	1			3		1														
	human foot	7		6			11	3	18								2				
	human hand																1				
	other																				

		AZ K:13:92	AZ K:13:96	AZ K:13:102	AZ K:13:104	AZ K:13:105	AZ K:13:107	AZ K:13:108	AZ K:13:109	AZ K:13:120	AZ K:13:121	AZ K:13:122	AZ K:13:123	AZ K:13:124	AZ K:13:125	AZ K:13:126	AZ K:13:127	AZ K:13:128	AZ K:13:129	AZ K:13:130	AZ K:13:131
Geometric	pottery/textile design	4	2	1		1	2		1	4										1	
	paho	1																		1	
	rake/comb	1					1														
	cross/x	2	1			2															
	elaborated cross/x		2						1												
	zig-zag(s)																				
	wavy line(s)																			1	
	meander	2																			
	line(s)																				
	dot(s)	1					3	1									3				
	tick mark(s)																				
	dint(s)			1	2	1											1				
	bull's eye			1			2		2					1			7				
	elaborated bull's eye	2																			
	circle					1	1	1													
	concentric circles	1		1		1	1														
	elaborated concentric circles	3																			
	sun/star	6					2		2								3			1	
	other circle motif			1			2												2	1	
	spiral	6		1			3										2				
	elaborated spiral						2									1	1				
	complex curvilinear form	12	1			1	5	1	4	1							4	2		2	3
	complex rectilinear form	18	1	14	3	1	13	3	9	3		2		1			5	1	2	3	3
	indeterminate/eroded	51	1	1		2	13	2	3	3	2						10		1	5	1
Historic	name/initials	3												4							
	address/place name																				
	date/year	1												1	1						
	picture/graphic												3	8							
	other (scratches)	1					(1)							6							
	Total Historic	5					1						3	17	1						
	Total Prehistoric	156	12	30	9	16	88	17	46	13	7	2		2		2	48	4	5	15	9

		AZ K:13:132	AZ K:13:133	AZ K:13:134	AZ Q:1:22	AZ Q:1:67	AZ Q:1:70P	AZ Q:1:70A	AZ Q:1:70B	AZ Q:1:71	AZ Q:1:211	AZ Q:1:212	AZ Q:1:213	AZ Q:1:215	AZ Q:1:228	AZ Q:1:230	AZ Q:1:233	AZ Q:1:234	AZ Q:1:235	AZ Q:1:260
Anthropomorphs	stick figure		3		26	5	11	2	4	9		2			2	36				3
	male stick figure		2		6		1	1	5	1		2				4	1			
	elaborated stick figure			1	8					3						2	1		1	
	full bodied figure				32	2				1	4					4				
	paired full bodied figure				4	4										5				
	male full bodied figure				4			1		1						5				
	female full bodied figure				2											1			1	
	open faced full bodied figure					1														
	with staff/headdress				20	4			2	3						8	1			
	with bow/arrow (bow/arrow)				2				(1)	1						5				
	with digits/hair				26	3	3		10						3	9	1			
	with snake (x-ray type)					(11)										2				
	flute player									3						10			1	1
	copulating																			
	unfinished/partial						3													
Kachinas	plain mask					5				1									1	
	elaborated mask				16															
	ogre				11															
	full bodied (?)				(3)														1	
Zoomorphs	quadruped/antelope/sheep		2		104	10			17	23	1		3		6	117	1			
	mountain loin									1	1					11				
	bird				8	23			1	3						3			1	
	lizard		1		17	2	2		2	3	1					10	2	3		1
	snake				16	4		1	8	8	1	2			5	22	1	6		
	other	1			2					3						6				1
Hands/tracks	bear				27	11		4	9	8					11		7	2	1	5
	mountain lion									9		1								
	bird		7		20	1	10		10			3	10		9	2	3			
	human foot		16		38	9	11	8	12	1	2	1	1	2	3	15	3	3	1	1
	human hand (picto)		1		2	4	147						4		1				2	
	other				12			15	23											

		AZ K:13:132	AZ K:13:133	AZ K:13:134	AZ Q:1:22	AZ Q:1:67	AZ Q:1:70P	AZ Q:1:70A	AZ Q:1:70B	AZ Q:1:71	AZ Q:1:211	AZ Q:1:212	AZ Q:1:213	AZ Q:1:215	AZ Q:1:228	AZ Q:1:230	AZ Q:1:233	AZ Q:1:234	AZ Q:1:235	AZ Q:1:260
Geometric	pottery/textile design				14	3						1				17	1		1	
	paho				5	1											1			
	rake/comb				1	2	1					2				1				
	cross/x		1		14	1			7	3					1				3	
	elaborated cross/x		1															1		
	zig-zag(s)				23	4	5									3	1			
	wavy line(s)																			
	meander				4	2	5					3				1				
	line(s)						178					2			1					
	dot(s)		2		9	1	5		4	3					1	6			7	
	tick mark(s)																		1	
	dint(s)	1							1						1					
	bull's eye		2		1	1							1		1	3				
	elaborated bull's eye				2															
	circle		5												1	6				4
	concentric circles				2															
	elaborated concentric circles																			
	sun/star					2			1										1	
	other circle motif		12		28	7			1						1	1				1
	spiral		2		17				1	1					1	2				
	elaborated spiral			1					1							2	1	1		
	curvilinear form		2		27	17	3		9	13			2			13	3		2	8
	rectilinear form		9		42	5	8		5		2			3	3	52	2	3	3	2
	indeterminate/eroded	2	23	2	266	98	23		9	3	18	4	1		16	127	4	1		
Historic	name/initials								29							5				63
	address/place name								5	1										11
	date/year								4	2										6
	picture/graphic									2						6				
	other (scratches)								7	5						1				7
	Total Historic								46							12				87
	Total Prehistoric	4	92	3	852	229	416	41	131	90	40	24	22	5	66	510	35	21	28	29

		AZ Q:1:262	AZ Q:1:263	AZ Q:1:264	AZ Q:1:266	AZ Q:1:270	AZ Q:1:272	AZ Q:1: 273	AZ Q:1:277	AZ Q:1:278	AZ Q:1:280	AZ Q:1:281	AZ Q:1:288	AZ Q:1:290	AZ Q:1:297	AZ Q:1:298	AZ Q:1:299	AZ Q:1:300	AZ Q:1:301	AZ Q:1:302
Anthropomorphs	stick figure					4	1	1		2		4	1	1	1					3
	male stick figure					3		3	1	1			1							
	elaborated stick figure	1		1	1	1		1												
	full bodied figure						1													
	paired full bodied figure																			
	male full bodied figure														1					
	female full bodied figure (stick)			1								(1)								
	open faced full bodied figure									1	1									
	with staff/headdress										1		2							
	with bow/arrow (bow/arrow)																			
	with digits/hair									2		3								
	with snake (x-ray type)																			
	flute player							1												
	copulating									1										
	unfinished/partial																		1	
Kachinas	plain mask									1										
	elaborated mask									3										
	ogre																			
	full bodied (?)																			
Zoomorphs	quadruped/antelope/sheep				1	1		2		3		2			1					
	mountain loin							2				1		1						
	bird			1			1	1												
	lizard					2		1	2			3							3	
	snake		1					3		2		6								1
	other							1				1								
Hands/tracks	bear	1		1				2		2		8								
	mountain lion			1				6							1					
	bird					4				5	1			1	4					
	human foot			1	3	27		6		11	1	4	3	4	9					
	human hand			1		1		1		2										(1)
	other - antelope			2									3							

		AZ Q:1:262	AZ Q:1:263	AZ Q:1:264	AZ Q:1:266	AZ Q:1:270	AZ Q:1:272	AZ Q:1:273	AZ Q:1:277	AZ Q:1:278	AZ Q:1:280	AZ Q:1:281	AZ Q:1:288	AZ Q:1:290	AZ Q:1:297	AZ Q:1:298	AZ Q:1:299	AZ Q:1:300	AZ Q:1:301	AZ Q:1:302
Geometric	pottery/textile design																			
	paho								1											
	rake/comb																			
	cross/x								1	1			1							
	elaborated cross/x																			
	zig-zag(s)																			
	wavy line(s)																			
	meander																			
	line(s)																			
	dot(s)			1		7			1	4		1	1							
	tick mark(s)				1	2									1					
	dint(s)						1	2	2				1						3	
	bull's eye					1		1												
	elaborated bull's eye														1					
	circle					4			1	1	1		2							
	concentric circles																			
	elaborated concentric circles																			
	sun/star							3							1					
	other circle motif					3		1		2										
	spiral									3		2			2					2
	elaborated spiral			2		5		1		2					1					
	curvilinear form				1	14		15	1	12	1	5	3	3	4					
	rectilinear form					4	2	3	6	15		8		2	3					
	indeterminate/eroded		2	2		2		9	19	9	3	9	3	3	8					
Historic	name/initials (on wood)	1	23				24									2(1)	4	1		
	address/place name	1	9				2	2								1	2			
	date/year		4				8	1									1	1		
	picture/graphic	1	1	1			3	2												
	other (scratches)		1				4										1			2
	Total Historic	2	38	1			41	5								4	8	2		2
	Total Prehistoric	3	3	14	7	86	7	71	35	83	9	58	21	16	39				7	7

Appendix E
Historic Inscriptions

Appendix E
Historic Inscriptions

AZ K:13:92

MAY 1925 SOLOMON SANCHEZ
(two others-initials)

AZ K:13:123

FRANK B. APr. 29 1935
LENA C.
VICTOR C.
(kachina, birds, horse and other designs)

AZ K:13:124

1934

AZ Q:1:70 (Cave of Hands)

With Last Names
JACK HAYES
LESTER FRITZ
LESTER FRiTZ COLUMBIA, PA., SETEMBER 1939 CCC
STANLEY PANIKOW... (*Stanley S. Panikowski on 1940 CCC roster*)
GEO. RE (*George Reskey on 1940 CCC roster*)
TOMMY ROCATO
J. ROY
M. SHUSAK DICKSON CITY PENNA
NICKY SMART
DAVE SNEDEKER BIRCH ST. SCRANTON PA 8/19/39 CCC (*same name at AZ Q:1:272*)
J. TEDDiCK, OLYPHANT, PENNA. 9/19/39 (*on 1940 CCC roster; asst. leader*)
J. VitlArose T

Single Names and Initials
BILL (*15 on 1940 CCC roster*)
DOM
DOVI
ED
JACK (*Jack P. Salwach on 1940 CCC roster*)
JOE (*six on 1940 CCC roster*)
JH
GENEllO S
HALM
HARRY
HAWK
HAWK
LV
METEK DICKSON CITY PENNA
METEK
METEK 1939 2

Other
CCC

AZ Q:1:82 (CCC Camp)

IRISH (painted)

AZ Q:1:230 (Picnic Area Petroglyphs)

ALH
CRS
ELE ... BOB
UGG
(Kilroy and other designs)

AZ Q:1:260 (CCC Rock Art Site)

With Last Names
RED BERRY THROOP PA
RED BERRY THROOP PA
CHOPA FAIRON

JACK FALLON (*mentioned in Sept. 1939 CCC newsletter*)
JACK FALLON SPOOK
JACK FALLON THROOP PA
MIKE MICHAL DICKSON PA
VIDAL MOYA (w/ gun design)
VIDAL MOYA SEPT 1937
JOE MURRY ARCHBALD PA (*Joe Murry mentioned in Sept. and Oct. 1939 CCC newsletters*)
Mike Oliveri 946 Cantrell St So Phila Pa (*on 1940 CCC roster*)
JACK ORNDORF (*John W. Orndrof on 1940 CCC roster*)
S PANIKOWSKI S PILLA (*Stanley J. Panikowski on 1940 CCC roster*)
JOE RENOLDS (*on 1940 CCC roster*)
ROBLE (*George Roble on 1940 CCC roster*)
JOHN SARNO (*John Samese on 1940 CCC roster*)
DAVE FUCK SPOOKMYIR
FLAME TESTA 1940 NOV (*Louis Testa on 1940 CCC roster*)
John TRAKIMAS SCRANTON PA

Single Names and Initials

ADS
Anna
BAL
D
DAVE H
EA
EA
EO (*Elwood Otto on 1940 CCC roster*)
EG
EH (*Edward Hamaker on 1940 CCC roster*)
El (*Edward Labanauskas on 1940 CCC roster*)
EN (*Edward Nevgloski on 1940 CCC roster*)
EMB
F
FRED
GI
GP (*George L. Patterson on 1940 CCC roster*)
GREENE
GREEN...
HAL S. PHILA PA (*Henry A. Lambert on 1940 CCC roster; leader*)
HAN
HANOB
HARRY (*six on 1940 CCC roster*)
HAW
1939 HODDIE SCRANTON PA
IMOGENE
HN (*Harry J. Neiss on 1940 CCC roster*)
J
JA
JA
JA
JACK
JG
JOHN (*ten on 1940 CCC roster*)
JOHN
JOHN SEP 1937
LANSKI
LS
"MAXIE" "37" FROM E.P.T (in frame)
HC JD S PHILD 1940 (*James Devereaux on 1940 CCC roster; similar inscription at AZ Q:1:263*)
MIKE (*three on 1940 CCC roster*)
MS (*two on 1940 CCC roster*)
NG
NICH
NICKI
NS (*N.J. Saunders on 1940 CCC roster*)
OCHAL OCT 40
OK
POAOLLY
RADAWI...
RADAW...
RAYBARRY
PAT
PIROT...n
T
TONY (*three on 1940 CCC roster*)
VICTOR (*two on 1940 CCC roster*)
VM
WITT
WS BILL PHILA 494 E RISLOM 1940
"BALDY"
CCC (*William Smith on 1940 CCC roster*)

AZ Q:1:261 (PEFO site 171)

IDBW

AZ Q:1:262

NEAL GUNTRU... RIME... PENNA (*Neal R. Guntrum on 1940 CCC roster; leader*)

AZ Q:1:263

With Last Names
JOE ARMENTI PGH., PA.
GENEY DUTCH KARP
LUCKY CHESTER KNOTT SCRANTON PA (*Chester Knott on 1940 CCC roster*)
DICE DEMON GENE DUTCH KARP THROOP
MIKE GEREK PECKVILLE 19 PA 40 (*on 1940 CCC roster*)
TUCSON AZ RS PEREZ 1944
HENRY ROSENDO (in heart) PÈREZ

Single Names and Initials
A
EG 10-14-41
GE
JA
JIM (*four on 1940 CCC roster*)
JIMMY GERTY (in heart)
JOE LEN
JL
HELEN
H.C. + J.D. (*similar inscription at AZ Q:1:260*)
MO (*Michael Oliveri on 1940 CCC roster*)
M.V.F.
M.V.F.
MVF
R.S.P.
RSP
SUE
WILL-MICH + J..SSUP (*Fred Jessop on 1940 roster*)

Other
11/14/38
EAGLE

AZ Q:1:265 (on mess kit)

L. RIVERA
RYAN (*two on 1940 CCC roster*)

AZ Q:1:271 (CCC Camp)

(recorded as part of AZ Q:1:67)

LR CCC 831 7 4 34

AZ Q:1:272 (CCC Spike Camp)

With Last Names
N. HOLT + 1941
1 CCC C. JANiCKi SEPT. 1, 1939 SCRANTON PENNA (w/cross)
F. KILROY
T MiEPA ..OFE 7. 1897 (with cross and design)
DEC. PERRY (*R.D. Perry provided 1939 camp photographs; editor Sept. and Oct. 1939 CCC newsletter; on 1940 CCC roster*)
CCC DAVE SNEDEKER SCRANTON:PA AUG 31 1939 (in frame) (*same name at AZ:Q:301*)
T. WROBLEWSKI (*on 1940 CCC roster; asst. leader*)

Single Names and Initials
B
CA
CHESTER (*three on 1940 CCC roster*)
DAVE CA
F.J. SB (*Fred Jessop on 1940 CCC roster*)
G.E.M.
J.L.S. 42
L
LM
LOU 19 (*two on 1940 CCC roster*)
M
MA ....
MIKE
NORMAN N.O. (*Norman Ostroff on 1940 CCC roster*)
OR
V.J.

VRJ

Other
1 CCC
1939
1939

AZ Q:1:273 (Box Canyon)

LA SAnTAGTUZ FE.7.1897
TM
(cross)

AZ Q:1:298 (Sandstone Quarry)

EAG
E.G.
ERNIE (on wood beam)
TEXAS.

AZ Q:1:299 (Sandstone Quarry)

With Last Name
RAYE CHLMAN BEDFORD, PA

Single Name and Initials
CHARLERLTI
ERNE
P.A.
P.M.

Other
9/3/41 CAMP NP-8A co 1837

AZ Q:1:300

J D HILL 1927

AZ Q:1:302

(two hands and other designs)

Appendix F
Lithic Analysis Data

Debitage Analysis Summary Table

AZ K:13:51

		Petrified Wood				Chert			Other			Total		
		Count	Percent	Wt.(g)	Mean Wt	Count	Wt.(g)	Mean Wt	Count	Wt.(g)	Mean Wt	Count	Wt.(g)	Mean Wt
Flakes														
Complete	Cortical	3	27	5.3	1.8	0	0	-	0	0	-	3	5.3	1.8
	Plain	1	9	0.7	0.7	1	1.7	1.7	0	0	-	2	2.4	1.2
	Faceted	0	0	0	-	0	0	-	0	0	-	0	0	-
	Crushed	0	0	0	-	0	0	-	0	0	-	0	0	-
	Total	4	36	6.0	1.5	1	1.7	1.7	0	0	-	5	7.7	1.5
Proximal	Cortical	0	0	0	-	0	0	-	0	0	-	0	0	4.6
	Plain	1	9	4.6	4.6	0	0	-	0	0	-	1	4.6	-
	Faceted	0	0	0	-	0	0	-	0	0	-	0	0	-
	Crushed	0	0	0	-	1	2.3	2.3	0	0	-	1	2.3	2.3
	Total	1	9	4.6	4.6	1	2.3	2.3	0	0	-	2	6.9	3.5
Medial-Distal		4	36	22.4	5.6	0	0	-	0	0	-	4	22.4	5.6
Split		0	0	0	-	0	0	-	0	0	-	0	0	-
Debris		2	18	6.9	3.5	0	0	-	0	0	-	2	6.9	3.5
Total		11		39.9	3.6	2	4.0	2.0	0	0	-	13	43.9	3.4
Platform														
	Cortical	3	60			0	0		0	-		3	43	
	Plain	2	40			1	50		0	-		3	43	
	Faceted	0	0			0	0		0	-		0	0	
	Crushed	0	0			1	50		0	-		1	14	
	Total	5				2			0			7		

Debitage Analysis Summary Table

AZ Q:1:226

		Petrified Wood				Chert			Other			Total		
		Count	Percent	Wt.(g)	Mean Wt	Count	Wt.(g)	Mean Wt	Count	Wt.(g)	Mean Wt	Count	Wt.(g)	Mean Wt
Flakes														
Complete	Cortical	11	7	59.8	5.4	3	9.1	3.0	0	0	-	14	68.9	4.9
	Plain	25	16	74.0	3.8	3	12.9	4.3	0	0	-	28	106.9	3.8
	Faceted	17	11	84.0	4.9	0	0	-	0	0	-	17	84.0	4.9
	Crushed	8	5	36.4	4.6	0	0	-	0	0	-	8	36.4	4.6
	Total	61	40	274.2	4.5	6	22.0	3.7	0	0	-	67	296.2	4.4
Proximal	Cortical	0	0	0	-	0	0	-	0	0	-	0	0	-
	Plain	8	13	36.2	4.5	0	0	-	0	0	-	8	36.2	4.5
	Faceted	4	3	17.8	4.5	0	0	-	0	0	-	4	17.8	4.5
	Crushed	1	1	4.3	4.3	0	0	-	0	0	-	1	4.3	4.3
	Total	13	9	58.3	4.5	0	0	-	0	0	-	13	58.3	4.5
Medial-Distal		52	34	212.5	4.1	0	0	-	0	0	-	52	212.5	4.1
Split		6	4	26.9	4.5	0	0	-	0	0	-	6	26.9	4.5
Debris		20	13	117.0	5.9	0	0	-	0	0	-	20	117.0	5.9
Total		152		688.9	4.5	6	22.0	3.7	0	0	-	158	710.9	4.5

Platform														
	Cortical	11	15			3	50		0	-		14	18	
	Plain	33	34			3	50		0	-		36	45	
	Faceted	21	23			0	0		0	-		21	26	
	Crushed	9	11			0	0		0	-		9	11	
	Total	74				6			0			80		

Appendix G

Burial Analysis Data

Laura C. Fulginiti
and
Tzipi Kahana

ARIZONA STATE MUSEUM

THE UNIVERSITY OF ARIZONA

TUCSON, ARIZONA 85721
Human Identification Laboratory

July 19, 1990

Trinkle Jones
Western Archaeological Conservation Center
1415 N. 6th Avenue
Tucson, AZ 85705

On July 18, 1990 at approximately 1330 hours we are asked to examine skeletonized adult human remains excavated at the Petrified National Forest. The remains appear to be those of a possible prehistoric or early historic burial based on the condition and position of the material. The skeleton is resting on its right side with the legs flexed and appears to be mostly complete.

Skeletal Analysis

Sex:	Male.
Age:	25-35.
Race:	Mongoloid.
Stature:	5 feet 2 inches $\pm$ 2 inches (Genoves, 1967). (x - 158.59 cm.)
Dentition:	The dentition appears to be complete. The right side only is examined (see enclosed dental chart). There appears to be moderate wear on the teeth and an extensive caries involving the entire crown of the mandibular left 2nd molar (#18) is observed. The maxillary incisors have a characteristic "shovelled" appearance. There is some postmortem chipping of the dental enamel. Striations due to nutritional stress are observed on the anterior dentition.
Osseous pathology:	None observed.
Osseous anomaly:	None observed.
Traumata:	None observed.

Cause of death: Not determined.

General Description

The skeletal remains appear to be complete. The material is extremely friable and there is a moderate degree of postmortem fracture on many of the skeletal elements. The cranium has occipital flattening which is characteristic of "cradle-boarding". The following measurements are taken to determine stature:

Left Femur:	40.8 cm
Left Tibia:	32.4 cm
Right Tibia:	35.8 cm
Left Fibula:	34.2 cm
Left Humerus:	29.3 cm
Left Radius:	22.8 cm
Right Radius:	22.7 cm

Laura C. Fulginiti

Laura C. Fulginiti, M.A.
Forensic Anthropology

Tzipi Kahana

Tzipi Kahana, M.Sc., M.A.
Forensic Anthropology

LCF:TK/sr
Enclosure

HUMAN IDENTIFICATION LABORATORY

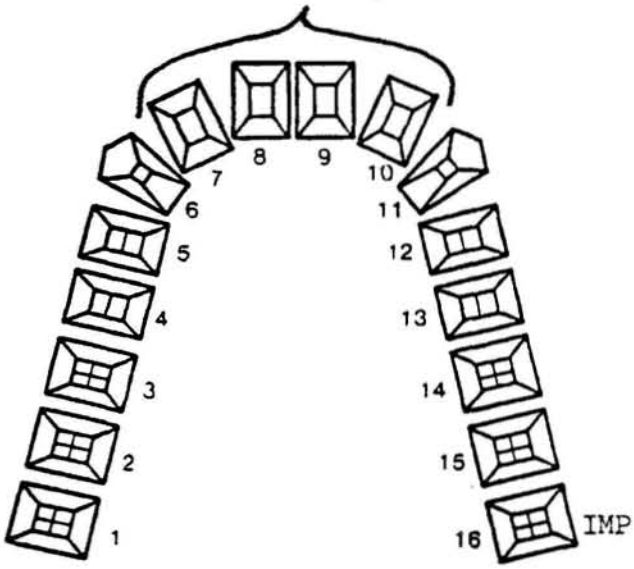
ARIZONA STATE MUSEUM
UNIVERSITY OF ARIZONA
TUCSON, AZ 85721
[redacted]
(602) 621-2827

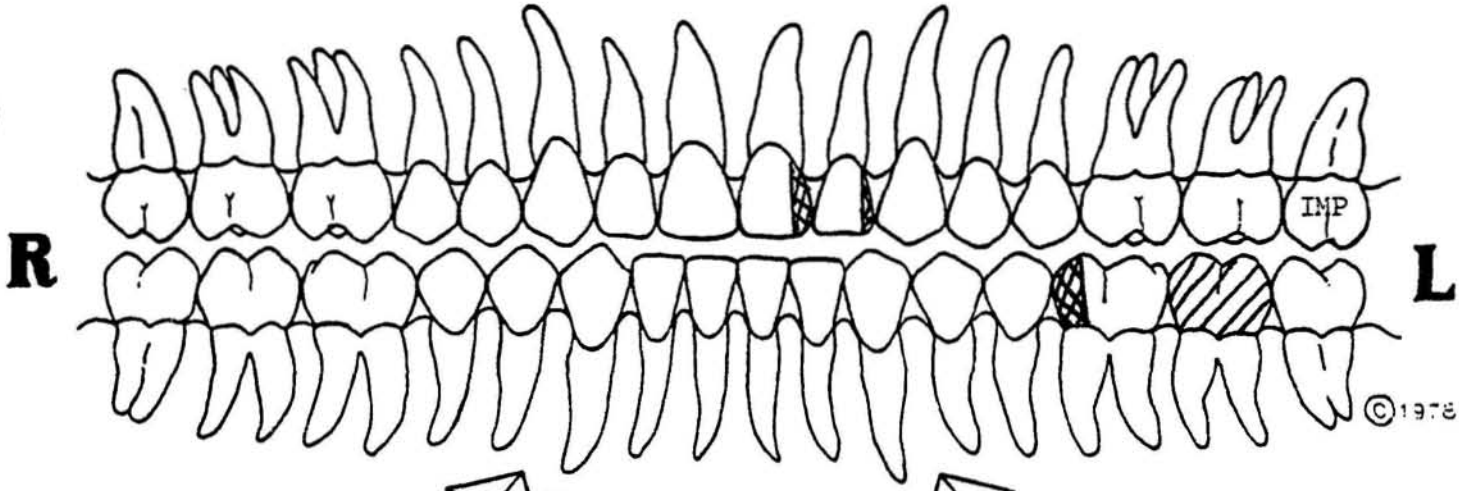
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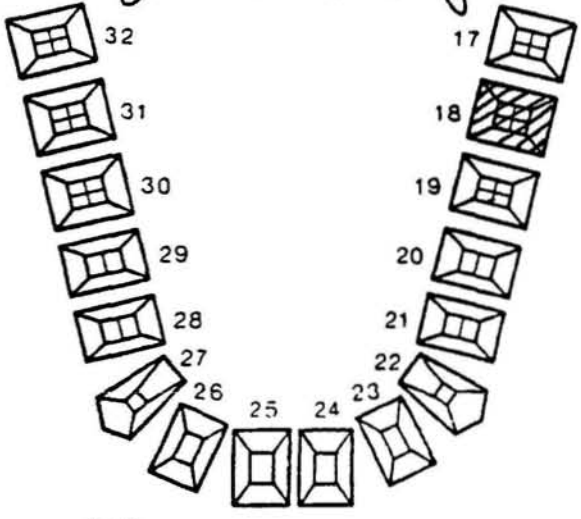
Date: 18July 1990

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Shovelling







IMP = Impacted

= Missing Postmortem

= Missing Antemortem /Caries

Appendix H
Projectile Point Metrical Data

Projectile Point Metric Atributes

Site No.	Type	ML	BL	BEL	MW	MWP	SL	NW	BW	MT	DSA	PSA	NO	NP	BIR	ML/ MW	BW/ MW	MT/ MW	Weight (g)	Mat'l	Cat. No.
AZ K:13:55	1	25	18	19	12	0	7	5	12	3	210	190	20	.28	+	2.08	1.0	.25	0.4	Chert	PEFO-7477
AZ Q:1:94	1	(9)	-	-	11	0	6	3	11	2	200	150	20	-	1.0	-	1.0	.18	(0.1)	Chert	1990B-265
AZ Q:1:146	1	27	20	20	12	0	7	6	12	3	205	160	30	.26	1.0	2.3	1.0	.27	0.5	Chert	1990B-513
AZ Q:1:81 A	1	19	14	15	9	11	5	6	9	2	230	160	90	.26	+	2.1	1.0	.22	0.3	Chal Flake	1990B-530
AZ Q:1:22	2	21	15	15	10*	0	6	5	10*	2	200	165	35	.29	0.9	2.1	1.0	.2	0.2	Chal	PEFO-4302
AZ K:13:119	3	19	9	10	16*	0	10	8	16*	3	220	180	30	.52	.95	1.2	1.0	.19	0.6	Chert	1991C-355
AZ K:13:92	3	28	18	17	11	0	10	6	11	2	220	160	20	.36	.93	2.5	1.0	.18	0.6	Chert	1991C-356
AZ Q:1:223	3	(14)	-	-	11	0	9	6	11	2	220	160	15	-	.86	-	1.0	.18	(0.3)	Chert	1988E-69
AZ Q:1:123	3	28	18	19	14	0	10	8	14	2	220	160	25	.36	.92	2.0	1.0	.14	0.6	Chert	1990B-857
AZ Q:1:279	3	14	7	8	12	14	7	6	11	2	210	160	50	.50	.93	1.2	.92	.17	0.3	Chal Flake	1991C-(33)
AZ Q:1:285	3	20	11	11	9	15	9	6	9	2	200	160	20	.45	.9	2.2	1.0	.22	0.3	Chert	1991C-232
AZ Q:1:168	3	16	11	12	13*	0	5	10	12	3	250	150	100	.31	1.0-	1.23	.92	.23	0.4	Chert	PEFO-8846
AZ Q:1:148	4	(30)	-	-	16*	0	11	12	16	3	200	160	30	-	.87	-	1.0	0.2	(1.5)	Chert	1990B-193
AZ Q:1:60	4	62	46	47	22	27	16	15	22*	6	220	140	80	-	1.0	4.1	1.00	.27	7.2	Obsidian	1990B-689
AZ Q:1:159	4	31	22	24	18*	6	9	12	18	4	220	160	50	-	1.0	1.7	1.0	0.2	2.1	PW	1990B-90
AZ Q:1:81	4	38	28	28	14	16	10	11	13	4	230	155	85	.26	1.0	2.7	.93	.29	2.3	PW	PEFO-7474
AZ Q:1:187	5	23	14	15	9	22	9	6	8*	2	230	160	25	.39	+	2.3	.88	.20	0.3	PW Flake	1990B-702
AZ Q:1:22	5	27	19	20	9	11	8	5	8	2	210	165	30	.30	0.8	3	.89	.22	0.5	PW	PEFO-4312
AZ Q:1:22	5	28	21	19	10	21	9	6	8	3	220	150	60	.32	1.0	2.8	.8	.3	0.7	PW	PEFO-4451
AZ Q:1:22	5	30	21	21	11	17	9	7	9	4	220	160	50	.3	1.0	2.73	.82	.36	1.0	PW	PEFO-4452
AZ Q:1:22	5	19	13	14	9	0	6	5	8	3	190	185	25	.32	1.0	1.9	.88	.3	0.4	PW	PEFO-4814
AZ Q:1:159	5	30*	24	24*	10	0	6	6	9	3	190	160	20	.2	1.0	3	.9	.3	0.6	Obsidian	PEFO-8845
Isolate	6	28	22	24	18	21	6	10	10	5	180	140	50	-	1.0	1.56	.67	.28	1.6	Chal	PEFO-8896
AZ K:13:91	6	23	17	18	13*	30	6	4	7*	4	170	120	40	-	1.0	1.8	0.5	0.3	0.6	Basalt	1990B-353
AZ Q:1:279	6	28	21	24	15	18	7	5	9*	4	150	120	30	-	.927	1.9	0.6	0.3	1.0	Basalt	1991C-179

Site No.	Type	ML	BL	BEL	MW	MWP	SL	NW	BW	MT	DSA	PSA	NO	NP	BIR	ML/ MW	BW/ MW	MT/ MW	Weight (g)	Mat'l	Cat. No.
AZ Q:1:133	6	28	17	20	12	32	11	8	10*	4	210	130	60	-	1.0	2.33	.83	.33	0.9	Chal	PEFO-7478
AZ Q:1:133	6	29	21	26	16	34	8	11	10	3	140	85	70	-	1.0	1.81	.63	.19	1.2	PW Flake	PEFO-7867
AZ Q:1:176	6	(29)	-	29+	21	-	-	7	-	4	130	-	60±	-	-	-	-	.19	(2.1)	Chert	PEFO-8843
AZ Q:1:200	6	17	6	14	12	35	11	9	10	3	210	160	50	-	+	1.42	.83	.25	0.5	PW Flake	PEFO-8892
AZ Q:1:91	6	25	18	20	15	32	7	8	10	3	185	120	50	-	1.0	1.67	.73	.2	1.3	PW Flake	PEFO-9054
AZ Q:1:238	6	16	11	13	13	30	5	5	6	2	140	110	65	-	+	3.0	.46	.15	0.6	Chert	PEFO-5985
Isolate	7	42*	33	36*	26*	26	9	9	12*	5	175	160	40	-	1.0	1.6	.46	.19	4.7	Chal	PEFO-8840
AZ K:13:18	7	(26)	-	-	24	-	8	12	19	4	190	140	40	-	1.0	-	0.8	0.2	(2.8)	Chert	1990B-474
AZ K:13:43	7	40	31	32	18	25	9	9	14	5	190	135	60	-	1.0	2.2	0.8	0.27	2.6	Chert	1990B-623
AZ K:13:107	7	39	27	30	20	31	12	15	16	5	230	140	120	-	1.0	2.0	.8	.25	3.9	PW	1991C-159
AZ K:13:49	7	(35)	25	-	22*	-	10	12	16	6	165	120	60	-	1.0	-	.73	.27	(3.8)	Obsidian	PEFO-7469
AZ K:13:59	7	40	30	31	18	43	10	11	14*	4	220	110	100	-	1.0	2.22	.78	.22	3.0	Basalt	PEFO-7475
AZ K:14:8	7	(25)	16	-	21	-	9	9	11	5	90	140	50	-	1.0	-	-	.24	(2.8)	PW Flake	PEFO-8835
AZ K:14:8	7	36	28	30	18	28	8	10	11	3	155	140	20	-	1.0	2	.61	.17	2.5	Chert	PEFO-8841
AZ K:13:12	7	(59)	44	-	35	-	15	17	28*	5	190	150	70	-	1.0	-	.8	.14	(11.6)	PW	PEFO-8978
AZ Q:1:60	7	68	63	64	18	7	5	9	12	4	160	150	40	-	1.0	3.5	.66	.22	5.4	PW	1990B-688
AZ Q:1:187	7	42	35	34	16	24	7	6	13	4	150	140	40	-	1.0	2.6	.81	.22	2.3	PW	1990B-701
AZ Q:1:267	7	(34)	-	-	22	-	10	16	18	5	210	130	100	-	1.0	-	.82	.2	4.5	PW	1991C-18
AZ Q:1:285	7	63	57	57	19	11	6	11	15*	4	180	160	30	-	1.0	3.3	0.8	0.2	4.5	PW	1991C-231
AZ Q:1:114	7	(28)	18	-	21	-	10	10	15	4	200	140	60	-	1.0	-	.71	.19	(2.3)	Chert	PEFO-5537
AZ Q:1:114	7	57	45	47	22	32	12	12	20*	5	220	150	70	-	1.0	2.59	.91	.23	6.9	PW	PEFO-5586
AZ Q:1:60	7	40	30	34	26	28	10	15	17*	6	160	120	50	-	1.0	1.54	.65	.23	5.8	Chert	PEFO-6757
AZ Q:1:81	7	(38)	25	-	20	-	13	12	16	5	220	120	110	-	1.0	-	.8	.25	(4.8)	PW	PEFO-7473
AZ Q:1:131	7	(17)	5+	-	-	-	12	11	17	3	210	130	90	-	1.0	-	-	-	(1.1)	PW	PEFO-8848
AZ Q:1:60	7	58	45	47	23	24	13	7	20	5	180	140+	50±	-	1.0	2.52	.87	.22	5.6	Chert	PEFO-8877
AZ Q:1:200	7	34	23	-	20	47	11	12	13	4	180	100	110	-	1.0	1.7	.65	.2	(3.4)	Chert	PEFO-8894

Site No.	Type	ML	BL	BEL	MW	MWP	SL	NW	BW	MT	DSA	PSA	NO	NP	BIR	ML/ MW	BW/ MW	MT/ MW	Weight (g)	Mat'l	Cat. No.
AZ Q:1:200	7	(32)	22	-	19	-	10	9	15	4	180	130	50	-	1.0	-	.8	.21	(2.8)	Chal	PEFO-8895
AZ K:13:60	8	(18)	-	-	23	-	-	11	-	6	200	130	70	-	-	-	-	.36	(2.2)	Chert	PEFO-7526
AZ Q:1:236	8	(20)	-	(9)	19	-	13	9	13	6	100	135	50	-	1.0	-	.68	.32	(2.2)	PW	1990B-150
AZ Q:1:113	8	*	32	(29)	17	30	14	11	14	6	230	130	110	-	+	2.7	.82	.35	4.3	PW	1990B-787
AZ Q:1:282	8	44	34	35	18	30	10	12	15	7	230	125	100	-	1.0	2.4	.8	.39	5.0	Chert	1991C-212
AZ Q:1:2	8	64	49	50	20	33	15	11	15	6	190	110	80	-	+	3.2	.75	.3	7.2	PW	PEFO-7470
AZ Q:1:29	8	36*	25	28*	15	36	11	9	11	5	230	140	85	-	+	2.4	.73	.33	2.3	Chert	PEFO-7870
AZ Q:1:160	8	(28)	15	-	-	-	13	9	16	4	220	140	60	-	+	-	-	-	(1.3)	Chert	PEFO-8842
AZ Q:1:201	8	(56)	46	55	20	-	-	10	-	6	175	-	-	-	-	-	-	.3	(7.3)	PW	PEFO-8893
AZ Q:1:60	8	35	26	26	16	46	9	14	14	7	250	100	140	-	+	2.19	0.88	.44	3.4	PW	PEFO-9055
AZ K:13:16	9	(32)	21	27+	28*	-	11	14	18	5	140	130	20	-	0.93	-	.64	.18	(3.7)	Chert	PEFO-8981
AZ Q:1:81 D	9	22	10	15*	23	59	12	10	16	4	170	130	50	-	.91	1.0	0.7	0.2	2.0	Chal	1990B-540
AZ Q:1:114	9	(24)	9+	-	18	-	15	11	15	6	230	120	110	-	0.9	-	.83	.33	(4.2)	Chal	PEFO-5828
AZ Q:1:168	9	25	18	21	19	32	7	12	18	5	180	140	40	-	0.92	1.32	.95	.26	1.7	Obsidian	PEFO-8838
AZ Q:1:51	9	(42)	28	-	40	-	14	19	26	5	160	130	40	-	0.88	-	.65	.13	(8.7)	Chert	PEFO-9139
Isolate	10	(21)	9+	-	26	-	-	12±	-	5	150	-	-	-	-	-	-	.19	(2.8)	Chert	PEFO-8839
Isolate	10	(40)	-	38	-	-	-	-	-	5	120	-	-	-	-	-	-	-	(3.4)	PW	PEFO-8990
AZ K:13:98	10	(23)	-	(23)	23	-	-	11	-	5	160	-	-	-	1.0	-	-	.22	(4.2)	PW	1988E-38
AZ K:13:36	10	(41)	-	32	23	*	-	10	-	5	160	-	-	-	-	-	-	.22	(4.7)	Chert	1990B-888
AZ K:13:107	10	41	32	40	34*	15	9	14	16*	4	120	110	20	-	+	1.2	0.5	0.1	4.4	Chert	1991C-158
AZ Q:1:29	10	(29)	16	31	30	-	-	13	-	5	130	-	-	-	-	-	-	.17	(2.9)	PW Flake	PEFO-7869
AZ Q:1:283	11	(48)	-	37*	13	-	14+	9	-	4	230	90	115	-	-	-	-	0.3	2.3	PW	1991C-209
AZ Q:1:114	11	(46)	-	37	17		-	8	-	6	240	95±	130	-	-	-	-	.35	(4.9)	PW	PEFO-5538
Isolate	12	44	36	38	19	30	8	13	13	5	210	85	100	-	+	2.32	.68	.26	4.8	PW	PEFO-7962a
Isolate	12	46	21	-	23	72	25	17	16	6	240	90	145	-	+	2.0	.70	.26	(7.9)	PW	PEFO-9124
AZ K:13:32	12	(42)	25	-	21	-	17	17	15	7	230	85	150	-	1.0-	-	.71	.33	5.7	Chert	PEFO-8983

Site No.	Type	ML	BL	BEL	MW	MWP	SL	NW	BW	MT	DSA	PSA	NO	NP	BIR	ML/ MW	BW/ MW	MT/ MW	Weight (g)	Mat'l	Cat. No.
AZ Q:1:219 B	12	26	18	22	20	38	8	12	13	5	200	85	60	-	1.0	1.3	0.7	0.3	2.3	Basalt	1990B-128
AZ Q:1:114	12	(40)	30	-	21	-	10	12	10	5	230	95	120	-	1.0	-	.48	.23	(5.6)	Chert	PEFO-5535
AZ Q:1:129	12	(32)	12	-	22	-	20	19	19	4	180	85	100	-	1.0	-	.86	.18	(4.2)	PW	PEFO-7466
AZ Q:1:32	12	53	38	41	20	49	15	10	10	4	180	90	95	-	-	2.65	.5	.2	4.7	Chert	PEFO-7471
AZ Q:1:131	12	(29)	-	-	21	-	14	16	16	7	210	90	110	-	1.0	-	.76	.33	(4.8)	Chert	PEFO-8849
Isolate	13	65	36	38	23	46	29	17	16	9	230	95	150	-	.98	2.8	0.7	0.4	11.5	Chert	1991C-357
AZ K:13:22	13	(32)	-	-	23		12	14	-	7	180	110	80	-	.97	-	-	0.3	(5.0)	Chert	1990B-459
AZ K:13:48	13	54*	41	40*	22	30	13	15	15	6	230	100	110	-	0.94	2.45	.68	.27	5.5	Chert	PEFO-7468
AZ K:14:6	13	44	29	32	21	36	15	15	14	6	230	100	145	-	0.98	2.10	.67	.29	6.3	Chert	PEFO-8836
AZ K:14:6	13	54	46	45	15	22	8	12	12	6	230	95	120	-	0.98	3.6	.8	.4	5.0	Chert	PEFO-8837
AZ Q:1:224	13	37	14	18	22	66	23	17	14	7	250	80	165	-	.95	1.7	0.6	0.3	5.8	PW	1988E-10
AZ Q:1:224	13	44	20	24	25	65	24	19	16	6	250	85	130	-	.95	1.8	0.6	0.2	6.6	Chert	1988E-8
AZ Q:1:224	13	53	29	32	23	49	24	17	15	7	230	85	130	-	.94	2.3	0.7	0.3	7.9	Chert	1988E-9
AZ Q:1:114	13	56	43	46	24	29	13	18	20*	6	230	95	120	-	0.96	2.33	0.83	.25	7.7	PW	PEFO-5838
AZ Q:1:29	13	42	27	30	22	38	15	13	13	6	190	80	100	-	0.93	1.91	.59	.27	4.7	Chert	PEFO-7467
AZ Q:1:32	13	43	30	31	17	47	13	11	13	5	230	110	120	-	0.98	2.53	.76	.29	3.3	PW	PEFO-7472
Isolate	14	(20)	-	-	13	-	-	-	13	4	-	-	-	-	.95	-	1.0	.31	(1.0)	PW	PEFO-7872
AZ K:13:44	14	17	-	17	10	0	-	-	10	3	-	-	-	-	.94	1.7	1.0	.3	0.4	PW Flake	PEFO-8549
AZ Q:1:133	14	22	-	22	14*	0	-	-	14*	3	-	-	-	-	-	1.57	1.0	.21	0.8	PW	PEFO-7868
Isolate	15	69		71	37	0	-	-	37	7	-	-	-	-	.99	1.86	1.0	.19	5.1	Chert	PEFO-8847
AZ Q:1:22	15	39	-	40	21	0	-	-	-	4	-	-	-	-	.97	1.9	-	0.2	2.8	Chal	1990B-887
Isolate	16	33	-	-	19	30	-	-	15	4	-	-	-	-	1.0	1.74	.79	.21	(2.9)	Chal	PEFO-8984
AZ K:13:60	16	(32)		-	(30)	-	-	-	23	6	-	-	-	-	?	-	-	-	(7.0)	PW	PEFO-7525
AZ Q:1:290	16	*	33	-	26	54	39	25-	17	7	-	-	-	-	1.0	2.8	0.7	0.3	12.0	Chert**	1991C-262
AZ Q:1:114	16	(45)		-	23	-	-	(23-	14)	7	-	-	-	-	-	-	-	.3	(8.7)	Chert	PEFO-5571
AZ Q:1:114	16	65	32	38	33	54	33	33-	20	10	-	-	-	-	.98	1.97	.61	.3	19.4	PW	PEFO-5583

Site No.	Type	ML	BL	BEL	MW	MWP	SL	NW	BW	MT	DSA	PSA	NO	NP	BIR	ML/ MW	BW/ MW	MT/ MW	Weight (g)	Mat'l	Cat. No.
AZ Q:1:125	16	(42)	33	-	18	-	9	12	16	5	230	130	120	-	1.0	-	.89	.28	5.1	Chert	PEFO-7476
AZ Q:1:160	16	(47)		-	29	-	-	-	12	7	-	-	-	-	1.0	-	.41	24	8.1	PW	PEFO-8831
Isolate	17	(43)	-	34+	25	-	-	-	-	5	-	-	-	-	-	-	-	.2	5.3	PW	PEFO-8891
Isolate	17	(28)	-	26	19	-	-	14*	-	4	190	-	-	-	-	-	-	0.2	2.2	PW	1988E-44
AZ K:13:107	17	(43)	-	34	19	-	-	10	-	5	220	-	-	-	-	-	-	.26	(4.1)	PW	1991C-157
AZ K:14:23	17	(63)	50	62	32+	16?	-	12	-	4	90	-	-	-	-	-	-	.13	(6.1)	Obsidian	PEFO-8844
AZ Q:1:220	17	(27)	-	21	14	-	-	12	-	5	230	160	70	-	-	-	-	0.4	2.1	Chal	1988E-61
AZ Q:1:287	17	53	-	64	18	-	-	-	-	6	-	-	-	-	-	-	-	0.3	5.9	Chal	1991C-248
AZ Q:1:125	17	(54)	41	41	19	-	-	13	-	7	245	95?	130?	-	-	-	-	.37	(7.8)	Chert	PEFO-7866

KEY

Measurements in mm

ML - Maximum Length
BL - Blade Length (ML-SL)
BEL - Blade Edge Length
MW - Maximum Width
MWP - Maximum Width Position
SL - Stem Length
NW - Neck Width
BW - Base Width
MT - Maximum Thickness

DSA - Distal Shoulder Angle
PSA - Proximal Shoulder Angle
NO - Notch Opening Index
NP - Notch Position
BIR - Basal Indentation Ratio
( ) - Incomplete
* - Estimated
PW - Petrified Wood
Chal - Chalcedony
Chert** - Foraminifurous Chert

Type

1 DSN, La Plata
2 DSN, Pecos
3 DSN, Ridge Ruin
4 Large Side-notched
5 Pueblo Side-notched
6 Twin Butte Corner-notched
7 Western Basketmaker
8 Little Colorado
9 Elko Eared
10 Unknown San Pedro
11 Small Stemmed
12 Large Stemmed
13 Bajad/San Jose
14 Cottonwood
15 Large Triangular
16 Lanceolate/Paleoindian
17 Unclassified

Appendix I
Ceramic Analysis Data

Christine E. Goetze

PETRIFIED FOREST CERAMIC CODES
10-25-92

FIELD #	FIELD NAME	CODES
1	FIELDNO	As on bag
2	BAGNO	As on bag
3	TEMPER	1 = Sherd 2 = Sand 8 = Crushed Rock 12 = Sherd/Sand 13 = Sand/Sherd 19 = Sand/Crushed Rock 23 = Fine paste with unidentified fragments 25 = Sand/Sandstone 28 = Sand/Mica (Adamana Brown) 32 = Sherd/Crushed Rock
4	TYPE	Ceramic Type (See separate list)
5	FORM	1 = Bowl, Undifferentiated 5 = Ladle 7 = Jar, Undifferentiated 8 = Jar, Necked 9 = Jar, Seed 99 = Unidentifiable
6	PART	1 = Rim 2 = Neck 3 = Body 5 = Handle 6 = Whole Vessel 9 = Unidentifiable
7	WEIGHT	Sherd Weight (g) to nearest 0.1 g
8	THICK	Wall Thick. (mm) to nearest 0.01 mm; rims taken at opposite end of sherd from lip
9	COMMENTS	Note any vessel matches, unusual surface treatments, etc. here

PETRIFIED FOREST CERAMIC TYPE CODES
10-25-92

CIWW	100 = Undif. Cibola White Ware
	110 = Undif. CIWW, BMIII-PI
	112 = White Mound B/W
	121 = Kiatuthlanna B/W
	122 = Red Mesa B/W
	131 = Puerco B/W
	132 = Escavada B/W
	140 = Undif. CIWW, PII-III
	141 = Gallup B/W
	142 = Chaco B/W
	151 = Chaco-McElmo B/W
	152 = Snowflake B/W
	153 = Reserve B/W
	154 = Tularosa B/W
	155 = Pinedale B/W
	157 = Tularosa/Pinedale
	158 = Reserve/Tularosa
CIGW	200 = Undif. Cibola Gray Ware
	250 = Indented Corrugated CIGW
TUWW	800 = Undif. Tusayan White Ware
	805 = Lino B/G
	812 = Kana-a B/W
	821 = Black Mesa B/W
TUGW	901 = Undif. Plain TUGW
	911 = Lino Gray, Tusayan Series (rims and necks only)
	931 = Medicine Gray (neck only)
	950 = Tusayan Corrugated
MGBW	1400 = Undif. Plain Mogollon Brown Ware
	1440 = Plain Brown
	1441 = Plain Brown, Smudged
	1445 = Plain Corrugated, Smudged
	1446 = Plain Corrugated
	1449 = Indented Corrugated
	1450 = Indented Corrugated, Smudged
	1452 = Patterned Corrugated
	1455 = McDonald Corrugated, Smudged
	1456 = Obliterated Corrugated
SLRW	1510 = Show Low B/R
	1511 = Show Low B/R Corrugated
	1520 = Show Low Red
	1521 = Show Low Red, Smudged
	1530 = Show Low Corrugated

WMRW 1600 = Undif. White Mountain Red Ware
1611 = Puerco B/R
1612 = Wingate B/R
1613 = St. Johns B/R
1615 = Pinedale B/R
1619 = Wingate/St. Johns B/R
1621 = Wingate Polychrome
1622 = St. Johns Polychrome
1623 = Heshotauthla Polychrome
1624 = Springerville Polychrome
1628 = Four Mile Polychrome
1629 = Wingate/St. Johns Poly
1630 = Undif. WMRW B/R
1640 = Undif. WMRW Polychrome

HOPW
1710 = Awatovi B/Y
1714 = Jeddito B/Y
1720 = Sikyatki Poly
1725 = Huckovi B/R
1762 = Tuwiuca B/O
1763 = Homolovi Poly
1771 = Chavez Pass B/R
1772 = Chavez Pass Poly

SALR
1900 = Undifferentiated Salado Poly
1903 = Pinto Poly

LCWW
2100 = Undif. Little Colorado White Ware
2131 = Holbrook 'A' B/W
2135 = Holbrook 'B' B/W
2141 = Padre B/W
2142 = Walnut 'A' B/W
2143 = Walnut B/W, Undifferentiated
2144 = Walnut 'B' B/W
2145 = Leupp B/W

LCGW
2200 = Undif. Little Colorado Gray Ware
2201 = Undif. Plain LCGW
2250 = Indented Corrugated LCGW
2260 = Clapboard Corrugated LCGW
2270 = Semi-Obliterated Corrugated LCGW (Moenkopi style)

ZUNI
4001 = Undifferentiated Zuni Glaze Ware
4002 = Kechipawa Poly
4003 = Heshotuthla Glaze-on-Red

MISC
9500 = Red Ware, unknown series
9600 = Brown Ware, unknown series
9601 = Adamana Brown
9650 = White Ware, unknown series
9801 = Gray Ware, Smudged, unknown series
9810 = Plain Gray Ware, unknown series
9993 = Polychrome; Unknown series
9999 = Unidentifiable

Site	bag #	temper	type	form	part	wt.	thick	comments
1979A-43	42	19	1510	1	3	43.0	4.97	
1988C-1	36	13	1511	1	1	3.7	4.62	
1988C-1	36	13	1520	1	3	11.9	5.28	
1988C-1	36	13	1520	1	1	7.8	5.41	
1988C-1	36	13	1520	1	1	7.3	5.63	
1988C-1	36	1	2131	8	1	9.3	5.01	
1988C-3	41	2	112	8	1	14.0	4.41	
1988C-3	41	1	2142	1	3	6.7	4.36	SAME AS NEXT
1988C-3	41	1	2142	1	3	10.7	4.94	SAME AS NEXT
1988C-3	41	1	2142	1	3	1.2	5.38	SAME AS LAST
1988E-4	45	2	110	1	1	4.6	5.33	
1988E-4	45	2	121	1	3	2.0	3.93	
1988E-4	45	2	812	7	3	6.4	5.89	
1988E-4	45	2	812	7	3	4.3	4.95	
1988E-4	45	2	821	8	1	6.6	4.95	
1988E-4	45	2	911	9	1	31.1	4.85	
1988E-9	7	12	132	7	3	7.2	4.69	
1988E-9	7	1	140	7	3	13.4	4.69	
1988E-9	7	1	140	7	3	25.1	6.52	WORKED
1988E-9	7	12	140	9	1	6.0	5.18	
1988E-9	7	12	158	7	3	10.3	4.49	
1988E-9	7	13	1510	1	3	12.0	5.05	
1988E-9	7	13	1510	1	1	1.1	4.55	
1988E-9	7	2	1511	1	3	11.6	5.08	
1988E-9	7	1	2135	1	1	9.1	6.93	
1988E-10	59	12	140	7	3	2.2	3.88	
1988E-10	59	12	140	1	1	2.7	3.96	
1988E-10	59	12	140	7	3	1.1	3.04	
1988E-10	59	13	140	7	3	1.7	4.39	
1988E-10	59	1	152	7	3	7.1	4.83	
1988E-10	59	2	1510	1	1	5.2	4.97	
1988E-10	59	13	1510	1	3	4.5	5.02	
1988E-10	59	1	1630	1	3	2.1	5.18	
1988E-10	59	1	2100	7	3	1.8	3.78	
1988E-10	59	1	2143	7	3	6.1	4.72	
1988E-10	59	1	2143	1	3	4.5	3.97	
1988E-10	59	1	9993	1	1	5.3	4.64	
1988E-10	64	1	100	7	3	2.7	4.29	
1988E-10	64	1	122	1	3	3.2	4.49	
1988E-10	64	2	1446	7	3	23.9	6.52	
1988E-10	64	1	2100	7	3	1.9	5.23	
1988E-10	64	1	2142	1	1	10.7	3.53	
1988E-11	72	12	9500	99	5	25.6	15.29	SAME AS NEXT
1988E-11	72	12	9500	99	5	1.4	9.93	SAME AS LAST
1988E-13	66	1	122	1	1	15.2	5.84	
1988E-13	66	12	158	8	2	5.0	4.85	
1988E-13	66	19	1510	1	1	9.3	9.42	
1988E-13	66	12	2100	1	3	10.8	4.63	
1988E-13	66	12	2131	1	3	6.3	4.24	
1988E-13	68	2	100	7	3	19.3	6.45	WORKED
1988E-15	18	1	140	7	3	10.4	4.44	
1988E-15	18	12	153	1	1	6.5	4.97	
1988E-15	18	1	2135	1	1	20.1	6.12	
1988E-15	18	1	2260	7	3	26.8	5.38	
1988E-15	66	1	155	7	3	8.9	3.45	
1988E-16	1	12	1521	1	6	115.8	3.47	ABOUT HALF
1988E-16	1	1	1900	1	1	8.2	5.42	MEND HOLE
1988E-16	5	13	2200	8	6	190.0	6.24	
1988E-16	8	12	1521	1	6	134.5	4.29	
1988E-16	10	2	1456	8	6	89.4	4.64	
1988E-16	11	1	2270	8	6	514.1	5.23	
1988E-16	19	1	100	1	3	9.2	4.62	
1988E-16	19	1	140	99	1	6.3	4.38	
1988E-16	19	1	151	1	3	7.0	4.83	
1988E-16	19	1	151	7	3	8.1	4.12	WORKED
1988E-16	19	1	153	7	3	26.7	5.00	
1988E-16	19	1	153	7	3	11.9	3.51	
1988E-16	19	1	154	1	3	5.2	4.20	
1988E-16	19	1	158	7	3	4.0	3.37	
1988E-16	19	2	1510	1	1	13.8	5.08	SAME AS NEXT
1988E-16	19	2	1510	1	1	43.5	4.63	SAME AS LAST
1988E-16	19	1	1621	1	3	15.1	6.66	
1988E-16	19	1	1622	1	1	59.3	6.17	

Site	bag #	temper	type	form	part	wt.	thick	comments
1988E-16	19	1	1622	1	1	18.0	5.15	
1988E-16	19	1	1624	1	3	2.9	6.01	
1988E-16	19	1	1629	1	3	7.0	5.15	
1988E-16	19	2	1640	1	3	3.2	3.96	
1988E-16	19	13	1900	1	3	6.0	4.08	
1988E-16	19	1	1903	1	1	8.3	4.72	
1988E-16	19	1	2250	7	3	30.4	6.73	WORKED
1988E-16	20	1	152	5	5	43.4	4.74	
1988E-16	20	1	152	5	5	8.5	5.34	
1988E-17	28	1	140	7	3	8.0	4.38	
1988E-17	28	12	140	7	3	9.9	4.95	
1988E-17	28	1	142	7	3	8.9	4.68	
1988E-17	28	1	142	7	3	5.2	4.74	
1988E-17	28	1	151	1	3	14.2	4.14	
1988E-17	28	12	1510	1	3	14.2	5.32	
1988E-17	28	12	1510	1	1	20.1	4.57	
1988E-17	28	12	1511	1	1	14.3	5.96	
1988E-17	28	1	1612	1	3	16.0	5.63	
1988E-17	28	1	1621	1	3	11.2	5.99	
1988E-17	28	1	1629	1	1	6.2	6.32	
1988E-17	28	12	1710	1	1	5.4	4.98	
1988E-17	28	1	2143	1	1	17.1	5.51	
1988E-20	29	1	2131	7	3	8.8	4.78	WORKED
1988E-20	29	1	2143	1	1	22.8	4.85	
1988E-20	29	1	2144	7	3	31.1	5.89	
1988E-20	29	1	2144	7	3	11.0	4.22	
1988E-21	31	1	100	7	5	13.6	5.89	
1988E-21	31	1	132	7	3	16.7	4.34	
1988E-21	31	1	140	7	3	3.6	4.16	
1988E-21	31	1	152	7	3	8.0	4.74	
1988E-21	31	1	153	7	3	40.4	6.32	
1988E-21	31	2	1511	1	3	13.2	5.70	
1988E-21	31	1	1611	1	1	12.1	5.52	
1988E-21	31	1	1612	1	1	23.4	6.80	
1988E-21	31	1	1612	1	3	19.5	6.09	
1988E-21	31	1	2131	7	3	47.4	4.87	
1988E-23	32	1	152	1	3	6.0	3.91	MEND HOLE
1988E-23	32	19	1520	1	1	29.2	3.97	
1988E-23	32	1	1630	1	3	6.7	4.55	
1988E-23	32	2	2250	7	3	5.6	5.35	
1988E-23	33	1	1600	1	1	3.2	6.32	
1988E-23	33	1	1630	1	1	3.7	5.94	
1988E-23	33	1	1630	1	3	5.3	5.75	
1988E-24	34	12	155	7	3	36.4	4.92	
1988E-24	35	2	1456	7	3	8.4	5.94	
1988E-24	35	13	1520	8	2	7.0	4.71	
1988E-24	35	13	2270	7	3	6.8	5.74	
1988E-24	35	2	2270	7	3	7.8	5.11	
1988E-30	30	1	140	7	3	12.3	4.41	
1988E-31	70	1	152	7	3	6.7	6.29	
1988E-31	70	1	154	1	1	3.4	6.01	
1988E-31	70	1	1612	1	1	11.8	5.96	
1988E-31	70	1	1619	1	3	8.2	3.75	
1988E-31	70	1	1630	1	3	3.9	5.09	
1988E-31	70	1	1710	1	1	5.1	5.81	
1988E-31	70	1	2144	1	3	10.3	6.14	
1988E-32	74	12	1710	7	3	11.6	5.79	
1988E-32	74	12	1710	1	3	11.9	5.89	
1988E-32	74	12	1714	1	3	8.5	4.96	
1988E-32	78	1	154	7	3	17.0	6.45	
1988E-32	78	1	155	7	3	27.0	5.58	
1988E-32	78	1	155	7	3	8.8	4.29	
1988E-32	78	13	1520	7	3	9.0	5.91	
1988E-32	78	1	1628	7	3	8.2	5.61	
1988E-32	78	1	1628	1	3	5.7	5.67	
1988E-32	78	1	1628	1	1	12.8	4.92	
1988E-32	78	1	1628	1	1	15.1	6.09	
1988E-32	78	1	1628	1	1	4.1	4.54	
1988E-32	78	2	1710	1	3	8.8	4.92	
1988E-32	78	2	1710	1	3	2.7	4.12	
1988E-32	78	2	1710	1	3	11.3	5.10	
1988E-32	78	12	1725	7	3	10.0	4.52	
1988E-32	78	1	4001	1	3	5.8	4.90	

Site	bag #	temper	type	form	part	wt.	thick	comments
1988E-32	78	1	4002	1	1	4.3	5.13	
1988E-32	78	1	4002	1	1	11.5	5.18	
1988E-32	78	1	4002	1	3	3.0	5.14	
1988E-32	78	1	4002	1	3	8.3	4.52	
1988E-32	78	1	4002	1	3	4.1	4.52	
1988E-32	78	1	4003	7	3	7.5	4.61	
1988E-32	79	1	122	1	1	3.9	4.34	
1988E-32	79	2	132	7	3	8.8	4.36	
1988E-32	79	1	140	7	3	7.5	4.90	
1988E-32	79	12	140	1	3	1.3	4.58	
1988E-32	79	12	152	7	3	16.4	5.53	
1988E-32	79	1	153	7	3	28.5	6.85	
1988E-32	79	1	154	7	3	3.5	4.82	
1988E-32	79	1	154	7	3	10.6	6.37	
1988E-32	79	1	154	7	3	9.4	5.81	
1988E-32	79	1	154	7	3	8.8	6.05	
1988E-32	79	1	155	7	3	7.5	4.64	
1988E-32	79	1	1623	1	3	10.0	5.32	
1988E-32	79	12	1628	1	3	4.2	5.28	
1988E-32	79	1	1628	1	1	6.6	6.09	
1988E-32	79	12	1628	1	1	7.2	5.53	
1988E-32	79	12	1628	1	1	7.4	5.71	
1988E-32	79	12	1628	1	1	11.3	6.75	
1988E-32	79	12	1628	1	1	5.0	4.90	
1988E-32	79	1	1628	1	1	11.3	4.59	
1988E-32	79	12	1710	1	3	10.8	5.47	
1988E-32	79	12	1710	5	5	61.4	5.99	
1988E-32	79	12	1710	1	3	5.3	4.38	
1988E-32	79	1	1720	7	3	3.9	4.12	
1988E-32	79	12	1725	7	3	3.6	3.70	
1988E-32	79	12	1762	1	1	13.9	5.56	
1988E-32	79	1	1762	7	3	18.3	5.20	
1988E-32	79	12	1762	7	3	13.6	4.68	
1988E-32	79	12	1763	7	3	4.8	2.89	
1988E-32	79	12	1771	1	3	18.6	5.28	
1988E-32	79	25	1772	1	1	6.3	6.35	
1988E-32	79	2	1900	1	1	16.5	4.08	
1988E-32	79	13	1903	1	1	6.9	4.12	MEND HOLE
1988E-32	79	13	1903	1	3	22.1	5.91	
1988E-35	81	2	931	8	3	18.8	5.28	SAME AS NEXT
1988E-35	81	2	931	8	1	5.6	5.11	SAME AS NEXT
1988E-35	81	2	931	8	3	0.4	4.62	SAME AS LAST
1988E-35	81	2	931	8	3	0.9	3.98	SAME AS NEXT
1988E-35	81	2	931	8	3	82.1	4.92	SAME AS NEXT
1988E-35	81	2	931	8	3	1.6	5.25	SAME AS NEXT
1988E-35	81	2	931	8	3	99.9	5.67	SAME AS NEXT
1988E-35	81	2	931	8	3	0.8	4.96	SAME AS NEXT
1988E-35	81	2	931	8	1	201.1	5.86	SAME AS NEXT
1988E-35	81	2	931	8	3	43.9	5.57	SAME AS NEXT
1988E-35	81	2	931	8	3	0.2	3.35	SAME AS NEXT
1988E-35	81	2	931	8	3	5.8	6.31	SAME AS NEXT
1988E-35	81	2	931	8	3	11.6	5.38	SAME AS NEXT
1988E-35	81	2	931	8	3	0.4	4.66	SAME AS NEXT
1988E-35	81	2	931	8	3	0.2	4.77	SAME AS NEXT
1988E-35	81	2	931	8	1	7.5	4.62	SAME AS NEXT
1988E-35	81	2	931	8	3	1.0	4.74	SAME AS NEXT
1988E-35	81	2	931	8	3	138.1	4.96	SAME AS NEXT
1988E-35	81	2	931	8	3	0.5	5.09	SAME AS NEXT
1988E-35	81	2	931	8	3	0.2	4.19	SAME AS NEXT
1988E-35	81	2	931	8	3	0.9	5.11	SAME AS NEXT
1988E-35	81	2	931	8	3	86.6	5.28	SAME AS NEXT
1988E-35	81	2	931	8	3	51.2	5.25	SAME AS NEXT
1988E-35	81	2	931	8	3	158.8	5.46	SAME AS NEXT
1988E-35	81	2	931	8	3	0.2	3.81	SAME AS NEXT
1988E-35	81	2	931	8	3	0.3	4.92	SAME AS NEXT
1988E-35	81	2	931	8	3	1.9	5.05	SAME AS NEXT
1988E-35	81	2	931	8	3	3.1	5.61	SAME AS NEXT
1988E-35	81	2	931	8	3	2.3	4.82	SAME AS NEXT
1988E-35	81	2	931	8	3	146.9	5.28	SAME AS NEXT
1988E-35	81	2	931	8	3	43.2	5.58	SAME AS NEXT
1988E-35	81	2	931	8	3	43.4	5.20	SAME AS NEXT
1988E-35	81	2	931	8	3	19.9	5.41	SAME AS NEXT
1988E-35	81	2	931	8	3	1.5	4.64	SAME AS LAST

Site	bag #	temper	type	form	part	wt.	thick	comments
1988E-35	82	2	1440	7	3	0.8	4.73	
1988E-35	82	2	1440	7	3	0.8	4.20	
1988E-35	82	2	1440	7	3	1.3	5.56	
1988E-35	82	2	1440	99	3	0.5	2.97	
1988E-35	82	2	1440	7	3	0.8	5.38	
1988E-35	82	2	1440	7	3	1.7	5.65	
1988E-35	82	2	1440	7	3	1.2	5.53	
1988E-35	82	2	1440	7	3	0.5	4.62	
1988E-35	82	2	1446	7	3	2.0	4.69	
1988E-35	82	2	1446	7	3	1.5	5.02	
1988E-35	82	2	1446	7	3	1.7	5.53	
1988E-35	82	2	1446	7	3	6.0	5.20	
1988E-35	82	2	1446	7	3	1.3	5.15	
1988E-35	82	2	1446	7	3	7.0	6.07	
1988E-35	82	2	1446	7	3	1.2	5.09	
1988E-35	82	2	1446	7	3	1.9	5.43	
1988E-35	82	2	1446	7	3	10.0	5.24	
1988E-35	82	2	1446	7	3	4.2	5.93	
1988E-35	82	2	1446	7	3	0.9	4.77	
1988E-35	82	2	1446	7	3	1.8	5.23	
1988E-35	82	2	1446	7	3	2.2	4.52	
1988E-35	82	2	1446	7	3	5.1	4.57	
1988E-35	82	2	1446	7	3	4.8	4.87	
1988E-35	82	2	1446	7	3	6.9	4.49	
1988E-35	82	2	1446	7	3	2.3	4.94	
1988E-35	82	2	1446	7	3	1.8	5.58	
1988E-35	82	2	1446	7	3	1.4	4.77	
1988E-35	82	2	1446	7	3	5.3	5.35	
1988E-35	82	2	1446	7	3	5.0	5.09	
1988E-35	82	2	1446	7	3	4.7	4.45	
1988E-35	82	2	1446	7	3	5.8	5.15	
1988E-35	82	2	1446	7	3	3.1	4.92	
1988E-35	82	2	1446	7	3	4.8	5.18	
1988E-35	82	2	1446	7	3	1.0	5.71	
1988E-35	82	2	1446	7	3	1.3	5.92	
1988E-35	82	2	1446	7	3	2.1	5.48	
1988E-35	82	2	1446	7	3	10.7	5.88	
1988E-35	82	2	1446	7	3	4.7	4.43	
1988E-35	82	2	1446	7	3	1.6	6.07	
1988E-35	82	2	1446	7	3	7.8	5.29	
1988E-35	82	2	1449	7	3	3.1	4.52	
1988E-35	82	2	1449	7	3	1.1	5.04	
1988E-35	82	2	1449	7	3	1.8	5.75	
1988E-35	82	2	1449	7	3	6.2	6.62	
1988E-35	82	2	1449	7	3	1.1	4.92	
1988E-35	82	2	1449	7	3	2.0	5.00	
1988E-35	82	2	1449	7	3	6.8	5.43	
1988E-35	82	2	1449	7	3	1.3	4.47	
1988E-35	82	2	1449	7	3	4.4	4.62	
1988E-35	82	2	1449	7	3	19.4	4.83	
1988E-35	82	2	1449	7	3	8.6	4.54	
1988E-35	82	2	1456	7	3	2.3	4.80	
1988E-35	82	2	1456	7	3	7.5	5.72	
1988E-35	82	2	1456	7	3	3.9	5.27	
1988E-35	82	2	1456	7	3	2.4	5.15	
1988E-35	82	2	1456	7	3	2.5	5.23	
1988E-35	82	2	1456	7	3	1.9	5.79	
1988E-35	82	2	1456	7	3	1.0	5.58	
1988E-35	82	2	1456	7	3	11.0	5.43	
1988E-35	82	2	1456	7	3	1.7	5.74	
1988E-35	82	2	1456	7	3	2.7	5.81	
1988E-35	82	2	1456	7	3	3.7	5.34	
1988E-35	82	2	1456	7	3	1.7	5.82	
1988E-35	82	2	1456	7	3	1.6	5.08	
1988E-35	82	2	1456	7	3	2.3	5.84	
1988E-35	82	2	1456	7	3	1.8	5.79	
1988E-35	82	2	1456	7	3	3.2	5.76	
1988E-35	82	2	1456	7	3	1.5	6.15	
1988E-35	82	2	1456	7	3	10.2	5.80	
1988E-35	82	2	1456	7	3	4.4	5.80	
1988E-35	82	2	1456	7	3	1.4	5.41	
1988E-35	82	2	1456	7	3	15.3	5.43	
1988E-35	82	2	1456	7	3	7.6	5.46	

Site	bag #	temper	type	form	part	wt.	thick	comments
1988E-35	82	2	1456	7	3	2.2	5.80	
1988E-35	82	2	1456	7	3	1.9	4.90	
1988E-35	82	2	1456	7	3	5.2	5.18	
1988E-35	82	2	1456	7	3	1.4	5.94	
1988E-35	82	2	1456	7	3	2.5	4.44	
1988E-35	82	2	1456	7	3	9.4	5.63	
1988E-35	82	2	1456	7	3	2.0	4.76	
1988E-35	82	2	1456	7	3	1.1	5.96	
1988E-35	82	2	1456	7	3	2.8	5.56	
1988E-35	82	2	1456	7	3	2.4	5.68	
1988E-35	82	2	1456	7	3	2.1	5.53	
1988E-35	82	2	1456	7	3	2.1	5.74	
1988E-35	82	2	2200	8	1	7.5	6.51	
1988E-35	82	2	2200	8	1	5.6	5.66	
1988E-35	82	2	2250	7	3	2.5	4.03	
1988E-35	82	2	2250	7	3	2.6	4.41	
1988E-35	82	2	2250	7	3	1.2	4.80	
1988E-35	82	2	2250	7	3	5.9	5.00	
1988E-35	82	2	2250	7	3	0.9	5.42	
1988E-35	83	1	158	1	3	39.5	6.60	
1988E-35	83	2	1440	7	3	2.4	5.79	
1988E-35	83	2	1440	7	3	1.9	5.89	
1988E-35	83	2	1440	7	3	2.5	5.81	
1988E-35	83	2	1449	7	3	0.7	4.87	
1988E-35	83	2	1449	7	3	3.2	5.47	
1988E-35	83	2	1449	7	3	1.1	4.99	
1988E-35	83	2	1449	7	3	1.0	4.96	
1988E-35	83	2	1449	7	3	1.8	5.08	
1988E-35	83	2	1449	7	3	1.7	5.67	
1988E-35	83	2	1449	7	3	0.5	4.77	
1988E-35	83	2	1449	7	3	1.2	5.94	
1988E-35	83	2	1449	7	3	1.6	5.19	
1988E-35	83	2	1449	7	3	2.1	5.38	
1988E-35	83	2	1449	7	3	4.1	5.84	
1988E-35	83	2	1449	7	3	1.8	5.56	
1988E-35	83	2	1449	7	3	2.3	5.77	
1988E-35	83	2	1449	7	3	0.5	5.53	
1988E-35	83	2	1449	7	3	4.0	5.94	
1988E-35	83	2	1449	7	3	2.9	5.48	
1988E-35	83	2	1449	7	3	1.2	5.28	
1988E-35	83	2	1449	7	3	0.9	5.51	
1988E-35	83	2	1449	7	3	1.1	5.21	
1988E-35	83	2	1449	7	3	1.1	5.00	
1988E-35	83	2	1449	7	3	0.7	5.15	
1988E-35	83	2	1449	7	3	2.1	4.95	
1988E-35	83	2	1449	7	3	2.3	5.48	
1988E-35	83	2	1449	7	3	2.3	4.83	
1988E-35	83	2	1449	8	1	6.9	6.32	
1988E-35	83	19	1530	7	3	2.4	4.86	
1988E-35	83	19	1530	7	3	3.1	5.06	
1988E-35	83	1	2100	1	3	2.1	4.57	
1988E-35	83	1	2100	7	3	1.6	6.24	
1988E-35	83	1	2100	7	3	1.8	4.63	
1988E-35	83	1	2250	7	3	6.5	5.48	
1988E-35	83	13	2250	7	3	23.4	6.40	
1988E-35	83	1	2260	7	3	31.1	7.54	
1988E-35	83	1	2260	7	3	12.1	5.80	
1988E-35	83	1	2260	7	3	9.6	5.86	
1988E-35	83	1	2260	7	3	34.1	6.40	
1988E-35	83	1	2260	7	3	13.2	5.14	
1988E-35	83	1	2260	7	3	26.1	6.68	
1988E-35	83	1	2260	7	3	10.9	4.87	
1988E-35	83	1	2260	7	3	24.9	5.63	
1988E-35	83	1	2260	7	3	24.9	6.35	
1988E-35	83	1	2260	7	3	2.7	6.29	
1988E-35	83	1	2260	7	3	4.9	6.65	
1988E-35	83	1	2260	7	3	4.2	6.22	
1988E-35	83	1	2260	7	3	6.3	6.21	
1988E-35	83	1	2260	7	3	11.4	6.80	
1988E-35	83	1	2260	7	3	9.4	6.14	
1988E-35	83	13	2270	7	3	9.4	4.62	
1989C-1	5987	1	131	7	3	10.3	4.49	
1989C-1	5987	13	140	7	3	5.9	6.50	

Site	bag #	temper	type	form	part	wt.	thick	comments
1989C-1	5987	12	151	1	1	12.2	4.41	
1989C-1	5987	1	154	7	3	8.5	5.24	
1989C-1	5987	1	154	7	3	1.9	4.45	
1989C-1	5987	1	154	7	3	3.7	4.62	
1989C-1	5987	1	154	7	3	13.2	4.85	
1989C-1	5987	1	154	7	3	7.0	4.44	
1989C-1	5987	1	158	7	3	6.9	5.15	
1989C-1	5987	1	158	7	3	7.6	3.81	
1989C-1	5987	1	1611	1	3	9.5	5.18	
1989C-1	5987	1	1619	1	3	5.0	4.59	
1989C-1	5987	1	1621	1	3	16.3	6.70	
1989C-1	5987	1	1621	1	3	14.0	6.75	
1989C-1	5987	1	1621	1	1	28.5	6.04	
1989C-1	5987	1	1630	1	3	1.7	3.98	
1989C-1	5987	12	1630	1	3	3.4	4.82	
1989C-1	5990	1	154	7	3	7.4	4.41	
1989C-1	5990	1	154	5	1	11.5	4.08	
1989C-1	5990	1	154	5	1	15.5	4.41	
1989C-1	5991	1	2135	1	3	10.3	4.14	WORKED
1989C-1	5993	1	152	8	1	13.8	4.72	WORKED
1989C-1	5993	13	9650	1	1	17.7	5.37	WORKED
1989C-2	5988	12	141	1	3	3.8	5.18	
1989C-2	5988	12	141	1	3	8.0	5.53	
1989C-2	5992	1	2131	1	3	11.2	4.77	WORKED
1991C-12	12	12	140	7	3	4.0	5.04	
1991C-12	12	13	1441	1	3	4.7	5.53	
1991C-12	12	1	1449	7	3	4.8	5.10	
1991C-12	12	2	1449	7	3	5.8	5.20	
1991C-12	12	13	1530	1	3	6.7	4.96	
1991C-12	12	1	1600	1	1	0.3	4.19	
1991C-12	12	1	1600	1	1	3.4	5.51	
1991C-12	12	1	1600	1	3	0.4	4.54	
1991C-12	12	1	1600	1	3	1.5	5.53	
1991C-12	12	1	1600	1	1	1.5	3.42	
1991C-12	12	1	2100	1	3	1.6	3.82	
1991C-12	12	12	2100	1	3	6.6	4.29	
1991C-12	12	1	2100	1	3	0.9	4.08	
1991C-12	12	12	2100	1	3	1.5	4.01	
1991C-12	12	1	2135	7	3	3.0	3.68	
1991C-12	12	12	2250	7	3	2.0	5.84	
1991C-12	12	12	2250	7	3	2.4	5.41	
1991C-12	12	2	9650	7	3	6.4	5.27	
1991C-13	8	1	1449	7	3	6.1	6.29	
1991C-13	8	1	1449	7	3	8.6	5.90	
1991C-13	8	1	1449	7	3	3.1	5.05	
1991C-13	8	1	1449	7	3	5.2	5.56	
1991C-13	10	2	1440	7	3	2.3	4.21	
1991C-15	17	12	140	7	3	12.9	4.96	WORKED
1991C-15	19	1	2100	7	3	1.2	4.52	
1991C-15	19	1	2100	7	3	8.7	6.04	
1991C-15	19	1	2145	8	2	12.8	5.28	
1991C-15	21	1	154	7	3	3.2	4.20	SAME AS NEXT
1991C-15	21	1	154	7	3	0.8	4.06	SAME AS LAST
1991C-15	21	2	1446	7	3	3.9	7.11	
1991C-15	21	2	1449	7	3	11.6	5.86	
1991C-15	21	13	1456	8	2	2.3	4.92	
1991C-15	21	2	1456	7	3	10.1	6.19	
1991C-15	21	2	1456	7	3	2.7	3.89	
1991C-15	21	13	1456	7	3	2.6	4.55	
1991C-15	21	12	1456	7	3	2.4	4.85	
1991C-15	21	13	1456	7	3	1.9	5.23	
1991C-15	21	2	1456	7	3	8.2	6.42	
1991C-15	21	2	1456	7	3	6.5	6.21	
1991C-15	21	2	1456	7	3	3.2	5.05	
1991C-15	21	1	1630	1	3	8.9	4.29	
1991C-15	21	12	2250	8	2	6.9	5.98	
1991C-15	21	1	2270	7	3	6.7	5.81	
1991C-15	21	12	2270	7	3	6.8	5.82	
1991C-15	21	12	9650	7	3	2.5	4.38	
1991C-18	26	13	1510	1	1	24.6	5.60	
1991C-18	26	1	1619	1	1	13.7	6.90	
1991C-18	27	1	153	7	3	3.7	4.44	
1991C-18	28	1	2142	1	1	14.6	4.83	

Site	bag #	temper	type	form	part	wt.	thick	comments
1991C-18	29	1	141	1	1	2.7	4.54	
1991C-18	29	1	2142	7	3	9.0	3.32	
1991C-18	30	1	152	7	3	18.1	5.08	
1991C-18	30	1	1615	1	3	4.6	4.02	
1991C-18	31	1	1613	1	3	5.9	4.26	
1991C-18	31	1	2100	1	1	8.7	4.39	
1991C-18	31	1	2141	7	3	16.7	4.90	
1991C-19	32	12	140	8	2	13.4	4.29	
1991C-19	32	1	154	1	1	2.9	5.29	
1991C-19	33	1	1510	1	3	4.7	3.70	
1991C-19	33	1	1510	1	3	6.9	4.31	
1991C-19	33	2	1510	1	3	3.5	4.97	
1991C-19	33	2	1510	1	3	5.4	4.97	
1991C-19	34	1	1621	1	3	1.9	4.66	
1991C-19	34	1	1621	1	3	4.1	5.14	
1991C-20	35	2	140	8	2	7.2	5.00	
1991C-20	35	19	2141	7	3	16.6	4.80	
1991C-20	35	32	2141	7	3	37.7	5.96	
1991C-20	358	1	158	7	3	7.5	4.34	
1991C-20	358	1	1621	1	3	1.4	3.73	
1991C-20	358	1	1621	1	3	2.1	4.82	
1991C-20	358	1	1621	1	3	0.2	2.52	
1991C-20	359	12	1452	7	3	26.4	5.41	
1991C-20	359	12	1452	7	3	19.8	5.54	
1991C-20	360	1	1622	1	3	8.4	5.94	
1991C-20	361	2	140	7	3	9.1	4.69	
1991C-20	361	23	140	7	3	8.3	3.73	
1991C-20	361	1	1621	1	3	10.3	6.50	
1991C-21	147	12	132	7	3	5.6	4.48	
1991C-21	147	12	132	7	3	3.0	4.26	
1991C-21	147	13	140	7	3	6.1	4.39	
1991C-21	147	13	1449	7	3	7.6	6.12	
1991C-21	147	12	1449	7	3	11.3	6.26	
1991C-21	147	13	1449	7	3	1.6	4.59	
1991C-21	147	2	1449	7	3	2.3	5.20	
1991C-21	147	12	1600	1	3	6.9	4.87	
1991C-21	147	1	1600	1	1	3.9	6.26	
1991C-21	147	1	2100	7	3	7.8	6.83	
1991C-21	147	12	2250	7	3	7.7	5.71	
1991C-21	147	13	2250	7	3	2.4	5.35	
1991C-21	147	1	2260	7	3	26.9	6.75	
1991C-21	147	1	2260	7	3	0.9	6.09	
1991C-21	147	13	2270	7	3	2.8	4.58	
1991C-22	149	1	100	7	3	5.7	6.57	
1991C-22	149	1	100	7	3	3.9	4.95	
1991C-22	149	1	100	7	3	5.5	3.91	
1991C-22	149	1	100	8	1	5.6	6.07	
1991C-22	149	12	100	7	3	4.1	5.56	
1991C-22	149	2	100	99	9	1.5	2.05	
1991C-22	149	1	100	7	3	4.6	5.30	
1991C-22	149	8	140	8	2	13.9	7.26	
1991C-22	149	13	1400	8	1	11.9	5.25	
1991C-22	149	1	1440	7	3	1.9	3.42	
1991C-22	149	19	1446	7	3	5.9	6.88	
1991C-22	149	12	1449	7	3	13.7	4.95	
1991C-22	149	19	1449	7	3	3.8	4.57	
1991C-22	149	32	1449	7	3	4.0	5.38	
1991C-22	149	13	1449	7	3	9.2	6.32	
1991C-22	149	13	1449	7	3	19.0	7.16	
1991C-22	149	19	1449	8	2	3.4	4.87	
1991C-22	149	2	1449	8	2	7.5	4.97	
1991C-22	149	19	1449	7	3	1.2	3.68	
1991C-22	149	13	1449	7	3	17.4	5.91	
1991C-22	149	2	1449	7	3	5.3	5.80	
1991C-22	149	13	1449	8	2	4.5	6.92	
1991C-22	149	2	1449	7	3	2.6	5.52	
1991C-22	149	2	1449	8	2	1.9	3.88	
1991C-22	149	1	1449	7	3	2.6	6.43	
1991C-22	149	12	1449	7	3	8.5	5.18	
1991C-22	149	1	1600	1	1	4.1	5.82	
1991C-22	149	12	2100	7	3	5.0	5.65	
1991C-22	149	1	2270	7	3	3.3	3.56	OXIDIZED
1991C-22	149	13	2270	7	3	2.5	3.88	

Site	bag #	temper	type	form	part	wt.	thick	comments
1991C-23	44	1	1440	1	3	3.9	4.25	
1991C-23	44	2	1446	7	3	9.8	5.49	
1991C-23	44	1	1449	7	3	0.6	4.91	
1991C-23	44	2	1449	7	3	18.0	5.58	
1991C-23	44	13	1456	8	1	13.8	6.07	
1991C-23	44	1	1612	1	3	32.5	4.62	WORKED
1991C-23	44	2	9650	8	2	4.7	5.56	
1991C-23	44	12	9810	1	3	4.1	4.76	
1991C-23	48	12	132	7	3	5.2	4.47	
1991C-23	48	13	1449	7	3	3.9	5.16	
1991C-23	48	2	1456	7	3	2.9	5.38	
1991C-23	48	1	1630	1	3	15.9	5.08	
1991C-23	53	12	1511	1	1	14.2	6.27	
1991C-23	53	12	2100	1	1	20.3	4.27	
1991C-24	54	1	140	7	3	4.0	4.44	
1991C-24	54	13	1446	7	3	15.5	6.40	
1991C-24	54	13	1449	7	3	6.6	6.80	
1991C-24	54	13	1449	7	3	11.3	6.03	
1991C-24	54	13	1449	7	3	17.5	6.29	
1991C-24	54	13	1449	7	3	10.4	5.66	
1991C-24	54	13	1449	7	3	11.8	7.27	
1991C-24	54	13	1452	7	3	27.7	5.35	
1991C-24	54	1	2100	7	3	6.8	4.59	
1991C-24	54	1	2142	1	1	6.7	4.80	WORKED
1991C-24	54	1	2250	7	3	13.5	5.14	
1991C-24	54	12	2250	7	3	28.9	4.95	
1991C-24	54	1	2250	7	3	17.4	6.65	
1991C-29	170	1	100	7	3	1.7	4.26	
1991C-29	170	1	100	7	3	4.6	5.18	
1991C-29	170	1	154	7	3	2.7	3.69	
1991C-29	170	1	154	7	3	1.4	4.83	SAME AS NEXT
1991C-29	170	1	154	7	3	1.7	4.57	SAME AS LAST
1991C-29	170	12	1449	7	3	1.3	5.49	
1991C-29	170	2	1449	7	3	11.8	5.76	
1991C-29	170	2	1510	1	1	1.5	4.52	
1991C-29	170	2	1520	1	3	8.3	4.62	
1991C-29	170	1	1600	1	3	1.5	5.13	
1991C-29	170	1	1600	1	3	0.8	5.08	
1991C-29	170	1	1612	1	3	55.8	5.80	
1991C-29	170	1	1615	1	3	4.4	4.85	
1991C-29	170	1	1615	1	3	1.4	5.21	
1991C-29	170	1	1619	7	3	2.7	5.63	
1991C-29	170	1	1619	1	1	3.3	5.99	
1991C-29	170	1	1630	1	1	7.1	5.28	
1991C-29	170	1	2250	7	3	6.0	6.46	
1991C-29	170	12	2270	7	3	4.9	6.37	
1991C-29	170	12	2270	7	3	5.6	5.86	
1991C-29	170	32	9500	99	3	2.2	5.23	
1991C-29	173	1	140	5	5	28.2	6.32	SAME AS NEXT
1991C-29	173	1	140	5	5	1.9	5.47	SAME AS LAST
1991C-30	165	1	100	99	5	8.6	8.22	
1991C-30	165	1	140	7	3	17.6	4.47	
1991C-30	165	12	140	8	1	15.6	4.82	
1991C-30	165	12	1600	1	3	2.7	4.74	
1991C-30	165	1	2270	7	3	26.6	6.52	VERY BROWN
1991C-30	165	1	2270	8	1	14.8	6.70	VERY BROWN
1991C-30	165	1	2270	7	3	5.0	5.02	VERY BROWN
1991C-30	165	1	2270	7	3	20.2	5.68	VERY BROWN
1991C-30	165	1	2270	7	3	4.7	5.58	VERY BROWN
1991C-30	165	1	2270	7	3	4.1	4.38	VERY BROWN
1991C-33	181	1	132	1	3	12.0	5.44	
1991C-33	181	2	140	7	3	2.7	5.18	
1991C-33	181	1	141	7	3	5.0	4.29	HANDLE ATTACHED
1991C-33	181	2	901	7	3	9.1	4.25	
1991C-33	181	2	1449	7	3	3.1	5.90	
1991C-33	181	2	1449	7	3	4.4	5.46	
1991C-33	181	2	1456	7	3	1.5	5.00	
1991C-33	181	2	1520	1	1	8.4	5.70	
1991C-33	181	2	2250	8	1	12.6	5.99	
1991C-33	181	13	2250	7	3	2.7	5.70	
1991C-33	181	12	2250	7	3	3.6	5.19	
1991C-33	181	2	2270	7	3	3.8	5.91	
1991C-33	181	1	2270	7	3	4.6	5.46	

Site	bag #	temper	type	form	part	wt.	thick	comments
1991C-33	181	12	2270	7	3	1.2	4.36	
1991C-34	178	1	2141	1	3	4.0	4.53	WORKED
1991C-35	196	12	100	7	3	4.3	4.72	
1991C-35	196	1	100	8	2	5.7	5.71	
1991C-35	196	1	100	1	3	3.4	4.91	
1991C-35	196	1	100	7	3	5.0	3.63	
1991C-35	196	1	100	7	3	3.1	4.47	
1991C-35	196	12	132	7	3	4.1	5.18	
1991C-35	196	12	132	7	3	3.5	4.58	
1991C-35	196	13	154	7	3	9.1	4.86	
1991C-35	196	12	154	7	3	3.0	4.21	
1991C-35	196	2	1440	7	3	4.1	4.54	
1991C-35	196	19	1440	99	3	8.0	4.88	
1991C-35	196	2	1440	1	1	5.1	6.55	
1991C-35	196	2	1440	8	1	6.6	7.95	
1991C-35	196	2	1449	7	3	2.4	4.41	
1991C-35	196	2	1449	7	3	4.7	5.75	
1991C-35	196	2	1449	8	1	3.9	8.73	
1991C-35	196	2	1449	7	3	4.6	5.53	
1991C-35	196	2	1449	7	3	2.2	4.50	
1991C-35	196	19	1449	1	1	8.7	4.59	
1991C-35	196	2	1456	7	3	3.1	4.64	
1991C-35	196	2	1456	7	3	2.5	5.63	
1991C-35	196	2	1456	7	3	2.7	4.31	
1991C-35	196	12	1456	7	3	10.8	6.03	
1991C-35	196	2	1456	7	3	9.0	4.61	
1991C-35	196	2	1456	7	3	1.7	4.72	
1991C-35	196	13	1510	1	1	7.3	5.35	
1991C-35	196	1	1600	1	3	4.2	5.33	
1991C-35	196	1	1611	1	1	5.9	4.87	
1991C-35	196	1	1611	1	3	3.6	5.75	SAME AS NEXT
1991C-35	196	1	1611	1	3	3.4	4.59	SAME AS LAST
1991C-35	196	1	1611	1	3	5.0	3.89	
1991C-35	196	1	1612	1	3	3.4	4.82	
1991C-35	196	12	1630	1	3	2.1	5.76	
1991C-35	196	1	1630	1	3	3.6	5.46	
1991C-35	196	1	1630	1	3	8.4	6.65	
1991C-35	196	1	1640	1	1	6.0	6.37	
1991C-35	196	1	2200	1	3	2.8	3.91	
1991C-35	196	12	2200	7	3	6.7	3.87	
1991C-35	196	12	2200	99	3	10.6	5.81	
1991C-35	196	1	2200	7	3	3.8	5.02	
1991C-35	210	12	100	7	3	1.5	5.48	
1991C-35	210	12	140	8	1	96.5	7.08	
1991C-35	210	1	140	7	5	12.0	4.62	
1991C-35	210	1	140	7	3	4.4	4.49	
1991C-35	210	1	140	7	3	10.8	5.30	
1991C-35	210	1	140	7	3	19.9	5.38	
1991C-35	210	1	154	7	3	18.2	4.92	
1991C-35	210	1	154	5	5	29.6	7.72	
1991C-35	210	1	154	7	3	42.9	4.39	
1991C-35	210	1	154	8	1	4.4	3.88	
1991C-35	210	12	154	7	3	12.2	5.41	
1991C-35	210	19	155	7	3	19.5	5.33	
1991C-35	210	1	157	7	3	6.9	3.97	
1991C-35	210	1	250	7	3	12.3	5.91	
1991C-35	210	2	1445	1	1	7.8	5.39	
1991C-35	210	2	1449	7	3	18.9	5.76	
1991C-35	210	2	1449	7	3	20.2	5.84	
1991C-35	210	2	1449	7	3	22.8	4.80	
1991C-35	210	2	1449	7	3	15.2	4.95	
1991C-35	210	2	1449	7	3	47.1	4.74	
1991C-35	210	2	1449	7	3	21.3	5.47	
1991C-35	210	2	1449	7	3	32.5	5.81	
1991C-35	210	1	1600	1	3	18.9	5.89	
1991C-35	210	1	1622	1	3	21.0	4.62	
1991C-35	210	1	1622	1	1	27.6	7.20	
1991C-35	210	1	1622	7	3	8.9	4.90	
1991C-35	210	1	1622	1	1	7.3	5.94	
1991C-35	210	1	1622	1	1	28.3	6.70	
1991C-35	210	1	1622	1	3	9.3	5.74	
1991C-35	210	1	1622	1	1	34.6	7.26	
1991C-35	210	12	1622	1	3	6.7	5.33	

Site	bag #	temper	type	form	part	wt	thick	comments
1991C-35	210	1	1622	1	1	55.3	4.64	
1991C-35	210	12	1623	1	1	34.6	4.54	
1991C-35	210	1	1623	1	3	12.6	5.10	
1991C-35	210	1	1624	1	3	2.1	4.87	
1991C-35	210	1	1624	1	1	19.0	4.44	
1991C-35	210	13	1903	1	1	54.9	5.27	SAME AS NEXT
1991C-35	210	13	1903	1	3	29.2	4.54	SAME AS LAST
1991C-35	210	1	1903	1	3	13.4	5.35	
1991C-36	226	13	1456	7	3	2.3	4.19	WORKED
1991C-37	201	1	153	7	3	2.0	4.41	
1991C-37	201	2	250	7	3	4.1	4.14	
1991C-37	201	12	1450	1	3	5.4	4.14	
1991C-37	201	12	1450	1	1	15.7	4.52	
1991C-37	201	12	2100	1	3	1.5	3.23	
1991C-37	201	12	2100	7	3	3.4	4.05	
1991C-37	201	1	2100	1	3	4.7	3.82	
1991C-37	201	1	2100	7	3	3.4	3.91	
1991C-37	201	1	2250	7	3	5.7	6.23	
1991C-37	201	12	9650	7	3	4.5	5.48	
1991C-37	201	12	9650	7	3	6.6	4.82	
1991C-37	201	12	9650	7	3	14.8	6.60	
1991C-37	207	1	100	1	3	2.1	4.62	
1991C-37	207	12	100	8	1	13.3	4.83	
1991C-37	207	12	140	7	3	4.0	4.95	
1991C-37	207	13	1440	7	3	2.3	4.62	
1991C-37	207	13	1449	7	3	39.4	6.96	
1991C-37	207	2	1510	1	1	8.1	5.89	
1991C-37	207	1	1600	7	3	3.3	5.02	
1991C-37	207	19	2200	99	3	2.0	7.73	
1991C-37	207	1	2250	7	3	12.0	6.22	
1991C-37	207	19	9650	1	3	2.5	4.14	
1991C-38	228	12	100	7	3	8.4	5.52	
1991C-38	228	13	100	1	3	4.2	4.96	
1991C-38	228	12	100	7	3	4.6	3.47	WORKED
1991C-38	228	12	100	7	3	6.3	4.74	
1991C-38	228	2	140	7	3	8.8	4.53	
1991C-38	228	1	153	7	3	8.7	4.24	
1991C-38	228	2	200	8	1	1.5	3.34	SAME AS LAST
1991C-38	228	2	200	8	1	6.9	7.34	
1991C-38	228	2	200	8	1	1.1	5.51	SAME AS NEXT
1991C-38	228	1	1440	1	3	11.1	4.19	
1991C-38	228	1	1440	7	3	8.4	4.08	
1991C-38	228	1	1440	7	3	6.9	5.96	
1991C-38	228	13	1440	7	3	3.2	4.91	
1991C-38	228	13	1440	7	3	6.4	5.56	
1991C-38	228	13	1440	7	3	5.0	4.52	
1991C-38	228	2	1446	7	3	8.3	6.89	
1991C-38	228	2	1446	7	3	4.2	5.84	
1991C-38	228	13	1446	7	3	22.5	7.50	
1991C-38	228	2	1446	7	3	2.9	6.32	
1991C-38	228	2	1446	7	3	5.6	8.53	
1991C-38	228	2	1446	7	3	12.0	8.15	
1991C-38	228	12	1446	7	3	4.0	5.10	
1991C-38	228	2	1446	7	3	9.1	8.85	
1991C-38	228	2	1449	7	3	4.2	6.12	
1991C-38	228	12	1449	7	3	10.8	5.63	
1991C-38	228	12	1449	7	3	3.6	5.56	
1991C-38	228	2	1449	7	3	6.0	6.42	
1991C-38	228	2	1449	8	1	10.9	6.87	
1991C-38	228	12	1449	7	3	2.7	5.84	
1991C-38	228	12	1449	7	3	4.3	6.13	
1991C-38	228	12	1449	7	3	3.9	5.46	
1991C-38	228	2	1449	7	3	6.3	6.37	
1991C-38	228	12	1449	7	3	5.7	4.90	
1991C-38	228	12	1449	7	3	8.8	5.41	
1991C-38	228	2	1449	7	3	2.9	6.47	
1991C-38	228	12	1449	7	3	5.6	4.77	
1991C-38	228	2	1449	7	3	11.0	5.48	
1991C-38	228	2	1449	7	3	10.4	6.54	
1991C-38	228	12	1449	7	3	17.0	4.88	
1991C-38	228	12	1449	7	3	4.9	5.30	
1991C-38	228	2	1449	7	3	7.8	7.01	
1991C-38	228	2	1449	7	3	24.2	5.30	

Site	bag #	temper	type	form	part	wt.	thick	comments
1991C-38	228	12	1449	7	3	3.5	5.19	
1991C-38	228	2	1449	7	3	9.4	6.47	
1991C-38	228	12	1449	7	3	6.4	5.02	
1991C-38	228	12	1449	7	3	7.0	4.85	
1991C-38	228	2	1449	7	3	7.0	6.43	
1991C-38	228	2	1449	8	1	10.4	6.01	
1991C-38	228	12	1449	7	3	4.0	5.30	
1991C-38	228	12	1449	7	3	8.6	5.91	
1991C-38	228	2	1449	7	3	7.6	8.10	
1991C-38	228	12	1449	7	3	4.2	5.79	
1991C-38	228	2	1449	7	3	14.5	5.99	
1991C-38	228	12	1449	7	3	8.0	6.01	
1991C-38	228	2	1449	7	3	4.7	6.14	
1991C-38	228	2	1449	7	3	5.0	6.07	
1991C-38	228	12	1449	7	3	11.9	5.65	
1991C-38	228	12	1449	7	3	3.3	7.67	
1991C-38	228	12	1449	7	3	3.0	5.82	
1991C-38	228	12	1449	7	3	4.4	5.71	
1991C-38	228	12	1449	7	3	7.4	5.65	
1991C-38	228	12	1449	7	3	3.1	5.13	
1991C-38	228	12	1449	7	3	15.7	5.66	
1991C-38	228	12	1449	7	3	7.9	5.24	
1991C-38	228	1	1449	7	3	28.4	5.61	
1991C-38	228	12	1449	7	3	7.5	5.71	
1991C-38	228	2	1449	7	3	9.3	5.24	
1991C-38	228	12	1449	7	3	7.1	5.81	
1991C-38	228	12	1449	7	3	5.7	5.42	
1991C-38	228	12	1449	7	3	4.3	4.17	
1991C-38	228	12	1449	7	3	6.8	5.70	
1991C-38	228	12	1449	8	2	8.0	7.44	
1991C-38	228	12	1449	7	3	6.1	4.58	
1991C-38	228	12	1449	7	3	6.9	6.62	
1991C-38	228	12	1449	7	3	4.1	4.91	
1991C-38	228	12	1449	7	3	7.8	5.25	
1991C-38	228	2	1449	7	3	26.8	5.18	
1991C-38	228	12	1449	7	3	4.4	5.63	
1991C-38	228	12	1449	7	3	8.0	6.57	
1991C-38	228	12	1449	7	3	3.6	6.01	
1991C-38	228	2	1449	7	3	9.0	6.61	
1991C-38	228	12	1449	7	3	2.2	4.47	
1991C-38	228	12	1449	7	3	6.5	5.34	
1991C-38	228	2	1450	1	3	20.5	6.84	
1991C-38	228	2	1450	1	3	9.5	5.62	
1991C-38	228	12	1452	7	3	6.2	5.77	
1991C-38	228	12	1452	7	3	2.1	5.38	
1991C-38	228	12	1452	7	3	10.0	5.48	
1991C-38	228	1	1510	1	1	29.2	6.90	
1991C-38	228	12	1511	1	3	2.5	4.38	
1991C-38	228	12	1511	1	3	2.4	4.67	
1991C-38	228	13	1520	7	3	11.2	5.79	
1991C-38	228	12	1530	1	3	23.5	4.38	
1991C-38	228	13	9500	1	3	4.2	5.00	
1991C-39	234	13	140	7	3	4.6	4.29	
1991C-39	234	2	9650	7	3	3.9	5.58	
1991C-39	234	13	9810	7	3	9.3	5.30	
1991C-39	234	13	9810	7	3	6.4	5.74	
1991C-39	234	13	9810	7	3	18.0	6.61	
1991C-39	236	12	154	7	3	5.3	3.70	
1991C-39	236	12	1440	7	3	13.4	7.54	
1991C-39	236	2	1440	7	3	2.6	4.41	
1991C-39	236	2	9810	7	3	5.2	4.08	
1991C-39	236	2	9810	7	3	8.5	5.20	
1991C-39	236	2	9810	7	3	1.7	5.23	
1991C-40	244	13	132	1	3	6.8	4.80	
1991C-40	244	12	154	7	3	2.7	3.55	
1991C-40	244	2	1441	1	1	2.1	3.31	
1991C-40	244	2	1520	1	1	6.4	4.94	
1991C-40	244	1	1630	1	1	12.7	4.92	
1991C-40	244	1	2135	7	3	10.9	5.47	
1991C-40	244	2	9801	8	1	8.5	5.38	
1991C-40	245	12	140	7	3	19.2	5.18	
1991C-40	245	19	1449	7	3	17.5	5.91	
1991C-40	245	2	9810	7	3	9.7	5.80	

Site	bag #	temper	type	form	part	wt	thick	comments
1991C-40	246	1	1622	1	3	17.0	4.57	
1991C-41	247	2	901	7	3	3.4	4.10	
1991C-41	247	2	901	7	3	3.7	4.59	
1991C-41	247	2	911	9	1	3.9	4.16	
1991C-41	247	2	1440	7	3	4.9	5.94	
1991C-41	247	2	1440	7	3	3.3	4.96	
1991C-41	247	2	9600	1	3	8.1	5.21	
1991C-41	247	28	9601	7	3	9.9	6.52	
1991C-41	247	28	9601	7	3	2.1	6.87	
1991C-42	249	12	153	7	3	10.9	5.02	WORKED
1991C-42	249	2	1440	7	3	3.6	5.65	
1991C-42	249	2	1510	1	3	6.3	5.54	
1991C-42	249	12	2250	8	1	5.5	6.66	
1991C-42	249	2	2250	7	3	2.5	4.92	
1991C-42	252	13	250	7	3	6.1	6.35	
1991C-42	252	2	1440	99	9	6.5	4.39	
1991C-42	252	12	1611	1	3	6.6	4.06	SAME AS LAST
1991C-42	252	12	1611	1	1	11.5	4.90	SAME AS NEXT
1991C-42	252	1	2131	1	3	19.2	5.75	
1991C-42	252	1	2131	7	3	19.1	5.86	
1991C-42	252	2	2250	7	3	2.0	4.94	
1991C-42	252	1	2250	7	3	1.6	5.46	
1991C-42	252	12	9500	7	3	5.9	4.21	
1991C-43	259	2	1440	7	3	12.0	7.55	
1991C-43	259	19	1440	7	3	5.4	6.17	
1991C-43	259	2	1449	7	3	5.3	5.99	
1991C-43	259	32	2100	7	3	16.7	6.04	
1991C-43	259	32	2100	7	3	4.2	5.89	
1991C-43	259	1	2100	7	3	5.0	4.54	
1991C-43	260	2	1440	7	3	7.4	4.67	
1991C-43	260	13	1449	7	3	0.6	6.40	
1991C-43	260	13	1449	7	3	14.8	6.14	
1991C-43	260	13	1449	7	3	2.8	6.04	
1991C-43	261	13	1449	7	3	6.9	5.84	
1991C-44	264	1	140	7	3	5.0	5.11	
1991C-44	264	1	153	7	3	6.3	5.79	
1991C-44	264	2	901	7	3	6.8	4.86	
1991C-44	264	2	1440	7	3	2.2	5.33	
1991C-44	264	2	1510	99	5	5.5	8.00	
1991C-44	264	1	1600	1	1	25.4	5.30	
1991C-44	264	1	2144	1	3	5.0	4.77	
1991C-44	264	28	9601	1	3	2.7	4.34	
1991C-44	264	28	9601	7	3	6.5	5.90	
1991C-44	264	28	9601	1	3	3.2	4.08	
1991C-44	264	28	9601	7	3	2.7	4.54	
1991C-44	264	28	9601	7	3	4.5	5.62	
1991C-44	264	28	9601	7	3	4.4	4.67	
1991C-45	265	2	901	7	3	5.7	4.96	
1991C-45	265	2	901	7	3	5.1	6.12	
1991C-45	265	2	1440	7	3	7.4	5.23	
1991C-45	265	19	1510	1	1	14.9	4.77	OXIDIZED
1991C-45	265	1	2135	7	3	10.5	5.67	
1991C-45	265	28	9601	7	3	4.9	6.73	
1991C-45	265	28	9601	7	3	5.2	5.84	
1991C-45	266	2	131	7	3	19.7	5.20	
1991C-45	266	2	153	7	3	4.8	4.36	
1991C-45	266	1	153	7	3	13.6	5.13	
1991C-45	266	19	1510	1	3	8.9	5.04	
1991C-45	266	12	1520	1	3	30.5	6.04	
1991C-45	266	1	2100	1	3	5.0	5.08	
1991C-45	267	1	2135	7	3	18.2	5.79	WORKED
1991C-46	268	1	100	7	3	44.7	6.68	
1991C-46	268	1	154	7	3	15.1	5.15	
1991C-46	268	1	1449	7	3	11.7	6.38	
1991C-46	268	13	1449	7	3	5.7	3.70	
1991C-46	268	1	1600	1	3	4.2	3.98	
1991C-47	269	1	140	1	3	6.5	5.29	
1991C-47	269	2	140	8	2	17.8	3.97	
1991C-47	269	1	140	8	1	24.6	6.50	
1991C-47	269	1	154	5	5	26.7	7.74	
1991C-47	269	1	1452	7	3	31.0	7.39	
1991C-47	269	12	2135	7	3	8.6	6.03	
1991C-47	269	1	2142	1	3	7.7	4.62	

Site	bag #	temper	type	form	part	wt.	thick	comments
1991C-48	270	13	140	8	2	15.9	5.28	
1991C-48	270	12	140	7	3	2.7	4.38	
1991C-48	270	19	1510	1	1	11.9	5.43	
1991C-48	270	2	1520	1	1	5.5	5.96	
1991C-48	270	12	2100	1	3	4.4	3.68	
1991C-49	271	2	100	7	3	3.6	4.71	
1991C-49	271	13	1449	7	3	5.9	5.79	
1991C-49	271	2	1520	1	3	2.9	4.72	
1991C-49	271	1	1600	1	3	4.5	5.08	
1991C-49	277	2	1440	7	3	0.9	3.44	
1991C-49	277	2	1449	7	3	2.4	5.13	
1991C-49	277	2	1449	8	1	2.3	6.14	
1991C-49	277	12	1449	7	3	3.3	6.70	
1991C-49	277	2	1449	7	3	5.1	7.36	
1991C-49	277	12	1449	7	3	1.9	5.32	
1991C-49	277	2	1452	7	3	5.9	4.80	
1991C-49	277	1	2100	7	3	2.2	3.64	
1991C-49	277	13	2100	1	3	1.7	4.61	
1991C-49	277	13	2131	1	1	5.7	4.92	
1991C-49	277	13	2135	8	1	17.1	7.51	
1991C-51	281	2	805	1	3	3.1	3.50	
1991C-51	281	2	901	7	3	2.7	4.74	
1991C-51	281	2	1440	7	3	6.4	4.86	
1991C-51	281	2	1440	7	3	6.2	4.21	
1991C-51	281	2	1441	1	3	2.3	3.96	
1991C-51	281	2	1510	1	3	4.0	3.35	
1991C-51	281	19	9650	8	1	21.4	5.61	
1991C-51	281	1	9999	7	3	11.1	4.67	
1991C-52	285	2	800	7	3	3.3	4.68	
1991C-52	285	12	2100	7	3	10.0	5.54	
1991C-52	285	12	2100	7	3	6.6	5.46	
1991C-52	285	12	2100	1	3	11.2	8.03	
1991C-52	285	12	2100	7	3	5.5	4.78	
1991C-52	285	12	2141	7	3	4.7	4.62	
1991C-52	285	1	2141	1	3	2.4	5.34	
1991C-52	285	12	2142	7	3	4.7	4.82	
1991C-52	285	12	2142	7	3	7.2	5.61	
1991C-52	285	1	2143	7	3	10.2	5.74	
1991C-52	285	12	2200	7	3	3.6	5.56	
1991C-52	285	12	2200	7	3	2.5	5.22	
1991C-52	285	12	2200	8	2	7.5	6.68	
1991C-52	285	12	2200	7	3	0.5	4.58	
1991C-52	285	12	2201	7	3	1.8	4.41	
1991C-52	285	1	2201	7	3	2.5	5.43	
1991C-52	285	1	2250	7	3	17.4	6.17	
1991C-52	285	12	2260	7	3	3.5	4.81	
1991C-52	285	12	2260	7	3	3.4	5.47	
1991C-52	285	1	2270	7	3	1.6	4.03	
1991C-52	285	12	2270	7	3	9.0	5.25	
1991C-52	285	12	2270	7	3	2.6	5.30	
1991C-52	285	12	2270	7	3	5.8	5.49	
1991C-52	285	12	2270	7	3	1.4	6.00	
1991C-52	285	1	2270	7	3	8.4	4.86	
1991C-52	285	12	2270	7	3	4.6	4.40	
1991C-52	285	12	2270	7	3	0.9	5.08	
1991C-52	285	12	2270	7	3	5.8	5.19	
1991C-52	285	12	2270	7	3	1.3	4.38	
1991C-53	295	1	132	7	3	5.6	3.93	
1991C-53	295	1	140	1	1	7.7	4.16	
1991C-53	295	12	152	7	3	5.0	4.34	
1991C-53	295	13	1510	1	3	5.6	4.90	
1991C-53	295	1	2100	7	3	13.1	5.28	
1991C-53	295	1	2143	1	3	3.6	4.10	
1991C-53	295	1	2270	7	3	5.0	3.63	
1991C-54	296	1	154	7	3	17.1	5.51	
1991C-54	296	12	154	7	3	8.1	6.23	
1991C-54	296	2	1510	1	1	9.0	4.78	
1991C-54	296	1	1622	1	3	8.5	4.77	
1991C-54	296	1	1630	1	3	5.9	5.95	
1991C-54	296	1	2100	1	1	17.2	5.84	EQUIVICAL
1991C-54	296	1	2144	7	3	14.9	4.82	
1991C-54	296	1	2270	8	1	29.3	5.58	
1991C-55	297	1	100	7	3	2.2	4.85	

Site	bag #	temper	type	form	part	wt.	thick	comments
1991C-55	297	12	100	1	3	3.6	5.51	SAME AS NEXT
1991C-55	297	12	100	1	3	4.1	6.04	SAME AS LAST
1991C-55	297	1	132	7	3	9.3	5.10	
1991C-55	297	12	140	7	3	2.8	5.11	
1991C-55	297	1	140	7	3	2.0	4.30	
1991C-55	297	12	151	7	3	1.2	3.87	
1991C-55	297	12	153	7	3	7.5	4.06	
1991C-55	297	2	800	7	3	6.6	5.51	
1991C-55	297	2	1440	7	3	3.4	4.55	
1991C-55	297	2	1449	7	3	4.2	5.88	
1991C-55	297	2	1456	7	3	2.8	4.73	
1991C-55	297	1	1600	7	3	1.5	5.74	
1991C-55	297	1	1611	1	1	13.5	6.54	
1991C-55	297	1	1619	1	1	13.5	7.03	
1991C-55	297	1	1622	1	1	12.9	6.18	
1991C-55	297	1	1630	1	3	8.6	5.91	
1991C-55	297	1	1630	1	3	6.0	5.61	
1991C-55	297	1	2131	1	3	3.2	6.80	
1991C-55	297	1	2135	7	3	10.0	5.01	
1991C-55	297	1	2135	7	3	5.1	4.21	WORKED
1991C-56	310	13	1400	8	1	3.2	7.03	
1991C-56	310	1	1400	8	1	5.3	7.32	
1991C-56	310	2	1440	1	3	0.3	2.92	
1991C-56	310	12	1452	7	3	3.1	5.63	
1991C-56	310	2	1452	7	3	8.0	6.09	
1991C-56	310	2	1456	7	3	10.5	5.68	
1991C-56	310	2	1456	7	3	5.2	5.23	
1991C-56	310	2	1456	7	3	6.7	4.90	
1991C-56	310	13	1510	1	3	0.5	5.29	
1991C-56	310	13	1510	1	3	10.0	4.94	
1991C-56	310	1	2100	8	2	7.1	6.32	
1991C-56	310	1	2142	1	3	1.2	3.02	
1991C-56	310	1	2142	1	3	0.2	3.02	
1991C-56	310	1	2250	7	3	2.3	4.08	
1991C-56	310	13	2250	7	3	9.5	6.68	
1991C-56	310	12	2250	7	3	12.6	7.49	PATTERNED
1991C-56	310	12	2270	7	3	2.3	4.80	
1991C-56	310	12	2270	7	3	2.8	4.94	
1991C-56	315	12	100	7	3	4.7	6.18	
1991C-56	315	12	154	7	3	1.5	4.36	
1991C-56	315	1	1400	8	2	3.1	5.79	
1991C-56	315	13	1449	7	3	6.8	5.79	
1991C-56	315	13	1456	7	3	2.9	4.39	
1991C-56	362	1	2142	1	3	9.4	4.59	WORKED
1991C-57	321	12	1510	1	3	7.1	5.00	
1991C-57	321	1	1611	1	3	6.5	4.82	
1991C-57	321	1	1612	1	1	16.4	5.09	
1991C-57	321	1	2100	1	3	7.9	4.78	
1991C-57	321	12	2250	8	2	33.0	5.01	
1991C-57	322	1	1619	1	3	23.0	5.47	WORKED
1991C-58	330	2	1441	1	3	31.8	6.37	POSS INT DEC
1991C-58	330	2	1450	7	3	2.7	5.25	
1991C-58	330	13	1452	7	3	4.1	4.54	
1991C-58	330	1	2100	1	1	5.4	4.05	
1991C-58	330	1	2100	7	3	2.6	3.83	
1991C-58	330	1	2100	7	3	2.1	4.61	
1991C-58	330	19	2100	5	5	4.1	5.94	
1991C-58	330	1	2142	7	3	9.0	4.31	
1991C-58	330	1	2143	8	2	7.5	4.74	
1991C-58	330	1	2143	7	3	7.0	4.27	
1991C-58	330	1	2143	7	3	4.6	3.68	
1991C-58	330	1	2144	7	3	13.6	5.75	
1991C-58	330	12	2270	7	3	1.9	4.41	
1991C-58	332	12	154	1	3	9.2	4.68	
1991C-58	332	1	154	7	3	7.1	4.41	
1991C-58	332	12	1520	5	5	49.3	8.28	
1991C-58	332	1	1600	1	3	0.4	5.14	
1991C-58	332	1	2100	1	3	2.0	4.54	
1991C-58	332	12	2200	8	2	3.2	6.88	
1991C-58	332	1	2250	8	2	4.5	5.96	
1991C-58	332	12	2250	7	3	1.4	4.47	
1991C-58	332	12	2250	7	3	1.7	5.93	
1991C-58	332	12	2260	7	3	4.6	5.95	

Site	bag #	temper	type	form	part	wt.	thick	comments
1991C-58	332	1	2270	7	3	2.0	4.76	VERY BROWN
1991C-58	332	1	2270	7	3	2.0	5.67	VERY BROWN
1991C-59	341	1	152	1	3	12.8	4.14	
1991C-59	341	1	154	7	3	6.9	3.69	
1991C-59	341	12	154	7	3	10.9	5.15	
1991C-59	341	19	1440	8	1	12.6	6.12	
1991C-59	341	2	1520	7	3	6.9	4.82	
1991C-59	341	1	1600	7	3	8.2	4.62	
1991C-59	341	1	1619	1	3	4.0	5.08	
1991C-59	341	1	1622	1	3	6.7	4.36	
1991C-59	341	1	1624	1	3	4.5	5.63	
1991C-59	341	1	2141	7	3	3.0	5.05	
1991C-59	341	1	2142	1	3	9.7	4.97	
1991C-59	341	1	2250	8	1	25.3	7.79	
1991C-60	224	12	100	7	3	1.0	4.01	
1991C-60	224	1	132	7	3	5.0	3.50	
1991C-60	224	1	158	1	3	3.5	4.34	
1991C-60	224	2	821	7	3	5.7	4.67	
1991C-60	224	2	901	7	3	3.4	5.33	
1991C-60	224	2	1440	7	3	4.7	6.19	
1991C-60	224	2	1440	7	3	3.7	4.47	
1991C-60	224	2	1440	7	3	4.3	6.70	
1991C-60	224	2	1440	7	3	9.1	7.53	
1991C-60	224	2	1440	7	3	2.1	4.03	
1991C-60	224	2	1440	7	3	2.5	4.49	
1991C-60	224	2	1449	7	3	15.2	4.82	
1991C-60	224	2	1449	1	1	9.8	5.30	
1991C-60	224	2	1449	7	3	6.4	7.06	
1991C-60	224	2	1449	7	3	2.9	4.52	
1991C-60	224	12	1452	7	3	12.6	7.59	
1991C-60	224	12	1452	7	3	6.3	6.98	
1991C-60	224	2	1520	7	3	2.6	6.19	
1991C-60	224	1	2100	1	3	1.4	3.91	
1991C-60	224	12	2200	7	3	10.6	4.31	WORKED
1991C-60	224	1	2200	9	1	3.2	4.77	
1991C-60	224	1	2270	7	3	3.7	4.62	
1991C-60	224	12	9650	7	3	3.1	4.44	
1991C-60	343	1	140	1	3	6.8	4.67	SAME AS NEXT
1991C-60	343	1	140	1	3	0.9	5.08	SAME AS LAST
1991C-60	343	1	141	7	3	4.9	4.85	
1991C-60	343	1	2250	7	3	18.1	5.86	
1991C-60	343	1	2250	8	2	6.2	6.24	
1991C-60	343	1	2250	7	3	2.4	6.14	
1991C-60	343	12	2260	7	3	6.7	5.89	ZONED
1991C-60	343	1	2270	7	3	5.9	5.25	
1991C-60	343	1	2270	7	3	8.5	5.54	
1991C-60	352	1	154	8	1	38.9	5.29	
1991C-60	352	1	154	1	3	2.3	4.33	
1991C-60	352	2	1452	7	3	4.6	5.30	
1991C-60	352	2	1455	1	1	14.5	5.57	
1991C-60	352	19	1520	7	3	3.2	5.25	SAME AS NEXT
1991C-60	352	19	1520	7	3	2.9	4.59	SAME AS NEXT
1991C-60	352	19	1520	7	3	2.8	5.32	SAME AS LAST
1991C-60	352	1	1611	1	3	9.7	4.01	
1991C-60	352	1	1611	1	3	14.7	4.72	
1991C-60	352	1	1621	1	3	5.9	4.83	
1991C-60	352	1	1622	1	3	4.2	4.53	
1991C-60	352	1	2141	7	3	28.1	4.21	
1991C-60	352	1	2144	1	1	3.2	4.94	
1991C-60	352	1	2145	7	3	7.3	4.94	
1991C-60	352	1	2145	7	3	11.6	4.86	
1991C-60	363	1	1612	1	3	8.7	4.49	WORKED
1991C-61	353	2	140	7	3	5.6	5.00	
1991C-61	353	12	154	7	3	3.3	4.16	
1991C-61	353	12	1445	7	3	7.5	7.89	
1991C-61	353	12	1600	1	3	12.7	6.38	
1991C-61	353	12	2100	5	5	6.6	5.79	
1991C-61	353	1	2131	1	3	7.6	4.99	
1991C-61	353	1	9500	1	3	14.1	4.61	
1991C-61	354	1	2141	7	3	8.3	4.82	WORKED

Appendix J
Ceramic Tabulation by Site

Christine E. Goetze

CERAMIC TYPE	K:13:97	K:13:99	Q:1:220	Q:1:221	Q:1:223	Q:1:225	Q:1:226	Q:1:227	K:13:91
CIBOLA WW									
Undif Cibola WW	-	-	1	-	1	-	2	-	-
Undif BMIII/PI	-	-	-	-	-	-	-	-	-
White Mound	-	1	-	-	-	-	-	-	-
Kiatuth	-	-	-	-	-	-	-	-	-
Red Mesa	-	-	1	-	1	-	-	-	-
Puerco	-	-	-	-	-	-	-	-	-
Escavada	-	-	-	-	-	-	-	-	-
Undif PII/PIII	-	-	4	-	-	1	1	2	-
Gallup	-	-	-	-	-	-	-	-	-
Chaco	-	-	-	-	-	-	-	2	-
Chaco-McElmo	-	-	-	-	-	-	1	1	-
Snowflake	-	-	1	-	-	-	2	-	-
Reserve	-	-	-	-	-	1	3	-	-
Tularosa	-	-	-	-	-	-	1	-	-
Pinedale	-	-	-	-	-	1	-	-	-
Tularosa/Pinedale	-	-	-	-	-	-	-	-	-
Reserve/Tularosa	-	-	-	-	1	-	1	-	-
CIBOLA GW									
Undif Cibola GW	-	-	-	-	-	-	-	-	-
Indent Corr	-	-	-	-	-	-	-	-	-
TUSAYAN WW									
Undif Tusayan WW	-	-	-	-	-	-	-	-	-
Lino B/G	-	-	-	-	-	-	-	-	-
Kana-a	-	-	-	-	-	-	-	-	-
Black Mesa	-	-	-	-	-	-	-	-	-
TUSAYAN GW									
Undif Plain	-	-	-	-	-	-	-	-	-
Lino Gray	-	-	-	-	-	-	-	-	-
Medicine Gray	-	-	-	-	-	-	-	-	-
MOGOLLON BW									
Undif Plain	-	-	-	-	-	-	-	-	-
Plain Brown	-	-	-	-	-	-	-	-	-
Plain Brown, Smudged	-	-	-	-	-	-	-	-	-
Plain Corr, Smudged	-	-	-	-	-	-	-	-	-
Plain Corr	-	-	1	-	-	-	-	-	-
Indent Corr	-	-	-	-	-	-	-	-	-
Indent Corr, Smudged	-	-	-	-	-	-	-	-	-
Patterned Corr	-	-	-	-	-	-	-	-	-
McDonald Corr, Smudged	-	-	-	-	-	-	-	-	-
Obliterated Corr	-	-	-	-	-	-	-	-	-
SHOWLOW RW									
Showlow B/R	-	-	2	-	1	-	2	2	-
Showlow B/R Corr	1	-	-	-	-	-	-	1	-
Showlow Red	3	-	-	-	-	-	-	-	-
Showlow Corr	-	-	-	-	-	-	-	-	-
WHITE MTN RW									
Undif White Mtn RW	-	-	-	-	-	-	-	-	-
Puerco B/R	-	-	-	-	-	-	-	-	-
Wingate B/R	-	-	-	-	-	-	-	1	-
St. Johns B/R	-	-	-	-	-	-	-	-	-
Pindeale B/R	-	-	-	-	-	-	-	-	-
Wingate/St Johns B/R	-	-	-	-	-	-	-	-	-
Wingate Poly	-	-	-	-	-	-	1	1	-

(Continued)	K:13:97	K:13:99	Q:1:220	Q:1:221	Q:1:223	Q:1:225	Q:1:226	Q:1:227	K:13:91
St Johns Poly	-	-	-	-	-	-	2	-	-
Hesho Poly	-	-	-	-	-	-	-	-	-
Springerville Poly	-	-	-	-	-	-	1	-	-
Four Mile Poly	-	-	-	-	-	-	-	-	-
Wingate/St Johns Poly	-	-	-	-	-	-	1	1	-
Undif B/R	-	-	1	-	-	-	-	-	-
Undif Poly	-	-	-	-	-	-	1	-	-
HOPI WARE									
Awatovi B/Y	-	-	-	-	-	-	-	1	-
Jeddito B/Y	-	-	-	-	-	-	-	-	-
Sikyatki Poly	-	-	-	-	-	-	-	-	-
Huckovi B/R	-	-	-	-	-	-	-	-	-
Tuwiuca B/O	-	-	-	-	-	-	-	-	-
Homolovi Poly	-	-	-	-	-	-	-	-	-
Chavez Pass B/R	-	-	-	-	-	-	-	-	-
Chavaz Pass Poly	-	-	-	-	-	-	-	-	-
SALADO									
Undif Salado Poly	-	-	-	-	-	-	2	-	-
Pinto Poly	-	-	-	-	-	-	1	-	-
LITTLE COLORADO WW									
Undif Little Colorado WW	-	-	2	-	1	-	-	-	-
Holbrook "A"	1	-	-	-	1	-	-	-	1
Holbrook "B"	-	-	-	-	-	1	-	-	-
Padre	-	-	-	-	-	-	-	-	-
Walnut "A"	-	3	1	-	-	-	-	-	-
Undif Walnut	-	-	2	-	-	-	-	1	1
Walnut "B"	-	-	-	-	-	-	-	-	2
Leupp	-	-	-	-	-	-	-	-	-
LITTLE COLORADO GW									
Undif Little Colorado GW	-	-	-	-	-	-	-	-	-
Plain	-	-	-	-	-	-	-	-	-
Indent Corr	-	-	-	-	-	-	1	-	-
Clapboard Corr	-	-	-	-	-	1	-	-	-
Obliterated Corr	-	-	-	-	-	-	-	-	-
ZUNI GLAZEWARE									
Pinnawa Glaze-on white	-	-	-	-	-	-	-	-	-
Kechepawan Poly	-	-	-	-	-	-	-	-	-
Hesho Glaze-on-red	-	-	-	-	-	-	-	-	-
MISC									
Red Ware, Unknown Ser	-	-	-	2	-	-	-	-	-
Brown Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Adamana Brown	-	-	-	-	-	-	-	-	-
White Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Gray Ware Smudged, Unknown	-	-	-	-	-	-	-	-	-
Gray Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Poly, Unknown Ser	-	-	1	-	-	-	-	-	-
Unidentifiable	-	-	-	-	-	-	-	-	-
TOTALS	5	4	17	2	6	5	23	13	4

CERAMIC TYPE	K:13:92	K:13:94	K:13:95	Q:1:234	Q:1:20	Q:1:199	Q:1:237	Q:1:214	Q:1:219
CIBOLA WW									
Undif Cibola WW	1	-	-	-	-	-	-	-	-
Undif BMIII/PI	-	-	-	-	-	-	-	1	-
White Mound	-	-	-	-	-	-	-	-	-
Kiatuthlana	-	-	-	-	-	-	-	1	-
Red Mesa	-	-	-	-	-	1	-	-	-
Puerco	-	-	-	-	-	-	-	-	-
Escavada	1	-	-	-	-	1	-	-	1
Undif PII/PIII	1	-	-	1	-	2	-	-	3
Gallup	-	-	-	-	-	-	-	-	-
Chaco	-	-	-	-	-	-	-	-	-
Chaco-McElmo	-	-	-	-	-	-	-	-	-
Snowflake	1	1	-	-	1	1	-	-	-
Reserve	1	-	-	-	-	1	-	-	-
Tularosa	-	-	-	-	1	5	-	-	-
Pinedale	-	-	1	-	-	3	-	-	-
Tularosa/Pinedale	-	-	-	-	-	-	-	-	-
Reserve/Tularosa	-	-	-	-	-	-	1	-	1
CIBOLA GW									
Undif Cibola GW	-	-	-	-	-	-	-	-	-
Indent Corr	-	-	-	-	-	-	-	-	-
TUSAYAN WW									
Undif Tusayan WW	-	-	-	-	-	-	-	-	-
Lino B/G	-	-	-	-	-	-	-	-	-
Kana-a	-	-	-	-	-	-	-	2	-
Black Mesa	-	-	-	-	-	-	-	1	-
TUSAYAN GW									
Undif Plain	-	-	-	-	-	-	-	-	-
Lino Gray	-	-	-	-	-	-	-	1	-
Medicine Gray	-	-	-	-	-	-	34	-	-
MOGOLLON BW									
Undif Plain	-	-	-	-	-	-	-	-	-
Plain Brown	-	-	-	-	-	-	11	-	-
Plain Brown, Smudged	-	-	-	-	-	-	-	-	-
Plain Corr, Smudged	-	-	-	-	-	-	-	-	-
Plain Corr	-	-	-	-	-	-	32	-	-
Indent Corr	-	-	-	-	-	-	36	-	-
Indent Corr, Smudged	-	-	-	-	-	-	-	-	-
Patterned Corr	-	-	-	-	-	-	-	-	-
McDonald Corr, Smudged	-	-	-	-	-	-	-	-	-
Obliterated Corr	-	-	1	-	-	-	34	-	-
SHOWLOW RW									
Showlow B/R	-	-	-	-	-	-	-	-	2
Showlow B/R Corr	1	-	-	-	-	-	-	-	1
Showlow Red	-	1	1	-	-	1	-	-	-
Showlow Corr	-	-	-	-	-	-	2	-	-
WHITE MTN RW									
Undif White Mtn RW	-	1	-	-	-	-	-	-	-
Puerco B/R	1	-	-	-	-	-	-	-	-
Wingate B/R	2	-	-	-	1	-	-	-	-
St. Johns B/R	-	-	-	-	-	-	-	-	-
Pindeale B/R	-	-	-	-	-	-	-	-	-
Wingate/St Johns B/R	-	-	-	-	1	-	-	-	-
Wingate Poly	-	-	-	-	-	-	-	-	-

(Continued)	K:13:92	K:13:94	K:13:95	Q:1:234	Q:1:20	Q:1:199	Q:1:237	Q:1:214	Q:1:219
St Johns Poly	-	-	-	-	-	-	-	-	-
Hesho Poly	-	-	-	-	-	1	-	-	-
Springerville Poly	-	-	-	-	-	-	-	-	-
Four Mile Poly	-	-	-	-	-	12	-	-	-
Wingate/St Johns Poly	-	-	-	-	-	-	-	-	-
Undif B/R	-	3	-	-	1	-	-	-	-
Undif Poly	-	-	-	-	-	-	-	-	-
HOPI WARE									
Awatovi B/Y	-	-	-	-	1	8	-	-	-
Jeddito B/Y	-	-	-	-	-	1	-	-	-
Sikyatki Poly	-	-	-	-	-	1	-	-	-
Huckovi B/R	-	-	-	-	-	2	-	-	-
Tuwiuca B/O	-	-	-	-	-	3	-	-	-
Homolovi Poly	-	-	-	-	-	1	-	-	-
Chavez Pass B/R	-	-	-	-	-	1	-	-	-
Chavaz Pass Poly	-	-	-	-	-	1	-	-	-
SALADO									
Undif Salado Poly	-	-	-	-	-	1	-	-	-
Pinto Poly	-	-	-	-	-	2	-	-	-
LITTLE COLORADO WW									
Undif Little Colorado WW	-	-	-	-	-	-	3	-	-
Holbrook "A"	1	-	-	-	-	-	-	-	-
Holbrook "B"	-	-	-	-	-	-	-	-	1
Padre	-	-	-	-	-	-	-	-	-
Walnut "A"	-	-	-	-	-	-	-	-	-
Undif Walnut	-	-	-	-	-	-	-	-	-
Walnut "B"	-	-	-	-	1	-	-	-	-
Leupp	-	-	-	-	-	-	-	-	-
LITTLE COLORADO GW									
Undif Little Colorado GW	-	-	-	-	-	-	2	-	-
Plain	-	-	-	-	-	-	-	-	-
Indent Corr	-	1	-	-	-	-	7	-	-
Clapboard Corr	-	-	-	-	-	-	15	-	-
Obliterated Corr	-	-	2	-	-	-	1	-	-
ZUNI GLAZEWARE									
Pinnawa Glaze-on-white	-	-	-	-	-	1	-	-	-
Kechepawan Poly	-	-	-	-	-	5	-	-	-
Hesho Glaze-on-red	-	-	-	-	-	1	-	-	-
MISC									
Red Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Brown Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Adamana Brown	-	-	-	-	-	-	-	-	-
White Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Gray Ware Smudged, Unk	-	-	-	-	-	-	-	-	-
Gray Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Poly, Unknown Ser	-	-	-	-	-	-	-	-	-
Unidentifiable	-	-	-	-	-	-	-	-	-
TOTALS	10	7	5	1	7	56	178	6	9

CERAMIC TYPE	Q:1:78	Q:1:268	Q:1:270	K:13:103	K:13:104	K:13:105	K:13:106	K:13:107	K:13:108
CIBOLA WW									
Undif Cibola WW	-	-	-	-	-	-	-	7	-
Undif BMIII/PI	-	-	-	-	-	-	-	-	-
White Mound	-	-	-	-	-	-	-	-	-
Kiatuthlana	-	-	-	-	-	-	-	-	-
Red Mesa	-	-	-	-	-	-	-	-	-
Puerco	-	-	-	-	-	-	-	-	-
Escavada	-	-	-	-	-	-	2	-	1
Undif PII/PIII	1	-	1	-	1	3	1	1	-
Gallup	-	-	-	1	-	-	-	-	-
Chaco	-	-	-	-	-	-	-	-	-
Chaco-McElmo	-	-	-	-	-	-	-	-	-
Snowflake	-	-	-	1	-	-	-	-	-
Reserve	-	-	-	1	-	-	-	-	-
Tularosa	-	-	2	-	1	-	-	-	-
Pinedale	-	-	-	-	-	-	-	-	-
Tularosa/Pinedale	-	-	-	-	-	-	-	-	-
Reserve/Tularosa	-	-	-	-	-	1	-	-	-
CIBOLA GW									
Undif Cibola GW	-	-	-	-	-	-	-	-	-
Indent Corr	-	-	-	-	-	-	-	-	-
TUSAYAN WW									
Undif Tusayan WW	-	-	-	-	-	-	-	-	-
Lino B/G	-	-	-	-	-	-	-	-	-
Kana-a	-	-	-	-	-	-	-	-	-
Black Mesa	-	-	-	-	-	-	-	-	-
TUSAYAN GW									
Undif Plain	-	-	-	-	-	-	-	-	-
Lino Gray	-	-	-	-	-	-	-	-	-
Medicine Gray	-	-	-	-	-	-	-	-	-
MOGOLLON BW									
Undif Plain	-	-	-	-	-	-	-	1	-
Plain Brown	-	1	-	-	-	-	-	1	1
Plain Brown, Smudged	1	-	-	-	-	-	-	-	-
Plain Corr, Smudged	-	-	-	-	-	-	-	-	-
Plain Corr	-	-	1	-	-	-	-	1	1
Indent Corr	2	4	1	-	-	-	4	15	3
Indent Corr, Smudged	-	-	-	-	-	-	-	-	-
Patterned Corr	-	-	-	-	-	2	-	-	-
McDonald Corr, Smudged	-	-	-	-	-	-	-	-	-
Obliterated Corr	-	-	9	-	-	-	-	-	2
SHOWLOW RW									
Showlow B/R	-	-	-	1	4	-	-	-	-
Showlow B/R Corr	-	-	-	-	-	-	-	-	1
Showlow Red	-	-	-	-	-	-	-	-	-
Showlow Corr	1	-	-	-	-	-	-	-	-
WHITE MTN RW									
Undif White Mtn RW	5	-	-	-	-	-	2	1	-
Puerco B/R	-	-	-	-	-	-	-	-	-
Wingate B/R	-	-	-	-	-	-	-	-	1
St. Johns B/R	-	-	-	1	-	-	-	-	-
Pindeale B/R	-	-	-	1	-	-	-	-	-
Wingate/St Johns B/R	-	-	-	1	-	-	-	-	-
Wingate Poly	-	-	-	-	2	4	-	-	-

(Continued)	Q:1:78	Q:1:268	Q:1:270	K:13:103	K:13:104	K:13:105	K:13:106	K:13:107	K:13:108
St Johns Poly	-	-	-	-	-	1	-	-	-
Hesho Poly	-	-	-	-	-	-	-	-	-
Springerville Poly	-	-	-	-	-	-	-	-	-
Four Mile Poly	-	-	-	-	-	-	-	-	-
Wingate/St Johns Poly	-	-	-	-	-	-	-	-	-
Undif B/R	-	-	1	-	-	-	-	-	1
Undif Poly	-	-	-	-	-	-	-	-	-
HOPI WARE									
Awatovi B/Y	-	-	-	-	-	-	-	-	-
Jeddito B/Y	-	-	-	-	-	-	-	-	-
Sikyatki Poly	-	-	-	-	-	-	-	-	-
Huckovi B/R	-	-	-	-	-	-	-	-	-
Tuwiuca B/O	-	-	-	-	-	-	-	-	-
Homolovi Poly	-	-	-	-	-	-	-	-	-
Chavez Pass B/R	-	-	-	-	-	-	-	-	-
Chavaz Pass Poly	-	-	-	-	-	-	-	-	-
SALADO									
Undif Salado Poly	-	-	-	-	-	-	-	-	-
Pinto Poly	-	-	-	-	-	-	-	-	-
LITTLE COLORADO WW									
Undif Little Colorado WW	4	-	2	1	-	-	1	1	1
Holbrook "A"	-	-	-	-	-	-	-	-	-
Holbrook "B"	1	-	-	-	-	-	-	-	-
Padre	-	-	-	1	-	2	-	-	-
Walnut "A"	-	-	-	2	-	-	-	-	-
Undif Walnut	-	-	-	-	-	-	-	-	-
Walnut "B"	-	-	-	-	-	-	-	-	-
Leupp	-	-	1	-	-	-	-	-	-
LITTLE COLORADO GW									
Undif Little Colorado GW	-	-	-	-	-	-	-	-	-
Plain	-	-	-	-	-	-	-	-	-
Indent Corr	2	-	1	-	-	-	2	-	-
Clapboard Corr	-	-	-	-	-	-	2	-	-
Obliterated Corr	-	-	2	-	-	-	1	2	-
ZUNI GLAZEWARE									
Pinnawa Glaze-on-white	-	-	-	-	-	-	-	-	-
Kechepawan Poly	-	-	-	-	-	-	-	-	-
Hesho Glaze-on-red	-	-	-	-	-	-	-	-	-
MISC									
Red Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Brown Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Adamana Brown	-	-	-	-	-	-	-	-	-
White Ware, Unknown Ser	1	-	1	-	-	-	-	-	1
Gray Ware Smudged, Unknown	-	-	-	-	-	-	-	-	-
Gray Ware, Unknown Ser	-	-	-	-	-	-	-	-	1
Poly, Unknown Ser	-	-	-	-	-	-	-	-	-
Unidentifiable	-	-	-	-	-	-	-	-	-
TOTALS	18	5	22	11	8	13	15	30	14

CERAMIC TYPE	K:13:109	Q:1:275	Q:1:276	Q:1:279	Q:1:280	Q:1:281	Q:1:282	Q:1:283	Q:1:284
CIBOLA WW									
Undif Cibola WW	-	2	1	-	-	6	-	2	4
Undif BMIII/PI	-	-	-	-	-	-	-	-	-
White Mound	-	-	-	-	-	-	-	-	-
Kiatuthlana	-	-	-	-	-	-	-	-	-
Red Mesa	-	-	-	-	-	-	-	-	-
Puerco	-	-	-	-	-	-	-	-	-
Escavada	-	-	-	1	-	2	-	-	-
Undif PII/PIII	1	2	2	1	-	5	-	1	1
Gallup	-	-	-	1	-	-	-	-	-
Chaco	-	-	-	-	-	-	-	-	-
Chaco-McElmo	-	-	-	-	-	-	-	-	-
Snowflake	-	-	-	-	-	-	-	-	-
Reserve	-	-	-	-	-	-	-	1	1
Tularosa	-	3	-	-	-	7	-	-	-
Pinedale	-	-	-	-	-	1	-	-	-
Tularosa/Pinedale	-	-	-	-	-	1	-	-	-
Reserve/Tularosa	-	-	-	-	-	-	-	-	-
CIBOLA GW									
Undif Cibola GW	-	-	-	-	-	-	-	-	3
Indent Corr	-	-	-	-	-	1	-	1	-
TUSAYAN WW									
Undif Tusayan WW	-	-	-	-	-	-	-	-	-
Lino B/G	-	-	-	-	-	-	-	-	-
Kana-a	-	-	-	-	-	-	-	-	-
Black Mesa	-	-	-	-	-	-	-	-	-
TUSAYAN GW									
Undif Plain	-	-	-	1	-	-	-	-	-
Lino Gray	-	-	-	-	-	-	-	-	-
Medicine Gray	-	-	-	-	-	-	-	-	-
MOGOLLON BW									
Undif Plain	-	-	-	-	-	-	-	-	-
Plain Brown	-	-	-	-	-	4	-	1	6
Plain Brown, Smudged	-	-	-	-	-	-	-	-	-
Plain Corr, Smudged	-	-	-	-	-	1	-	-	-
Plain Corr	1	-	-	-	-	-	-	-	8
Indent Corr	5	2	-	2	-	13	-	1	60
Indent Corr, Smudged	-	-	-	-	-	-	-	2	2
Patterned Corr	1	-	-	-	-	-	-	-	3
McDonald Corr, Smudged	-	-	-	-	-	-	-	-	-
Obliterated Corr	-	-	-	1	-	6	1	-	-
SHOWLOW RW									
Showlow B/R	-	1	-	-	-	1	-	1	1
Showlow B/R Corr	-	-	-	-	-	-	-	-	2
Showlow Red	-	1	-	1	-	-	-	-	1
Showlow Corr	-	-	-	-	-	-	-	-	1
WHITE MTN RW									
Undif White Mtn RW	-	2	1	-	-	2	-	1	-
Puerco B/R	-	-	-	-	-	4	-	-	-
Wingate B/R	-	1	-	-	-	1	-	-	-
St. Johns B/R	-	-	-	-	-	-	-	-	-
Pindeale B/R	-	2	-	-	-	-	-	-	-
Wingate/St Johns B/R	-	2	-	-	-	-	-	-	-
Wingate Poly	-	-	-	-	-	-	-	-	-

(Continued)	K:13:109	Q:1:275	Q:1:276	Q:1:279	Q:1:280	Q:1:281	Q:1:282	Q:1:283	Q:1:284
St Johns Poly	-	-	-	-	-	9	-	-	-
Hesho Poly	-	-	-	-	-	2	-	-	-
Springerville Poly	-	-	-	-	-	2	-	-	-
Four Mile Poly	-	-	-	-	-	-	-	-	-
Wingate/St Johns Poly	-	-	-	-	-	-	-	-	-
Undif B/R	-	1	-	-	-	3	-	-	-
Undif Poly	-	-	-	-	-	1	-	-	-
HOPI WARE									
Awatovi B/Y	-	-	-	-	-	-	-	-	-
Jeddito B/Y	-	-	-	-	-	-	-	-	-
Sikyatki Poly	-	-	-	-	-	-	-	-	-
Huckovi B/R	-	-	-	-	-	-	-	-	-
Tuwiuca B/O	-	-	-	-	-	-	-	-	-
Homolovi Poly	-	-	-	-	-	-	-	-	-
Chavez Pass B/R	-	-	-	-	-	-	-	-	-
Chavaz Pass Poly	-	-	-	-	-	-	-	-	-
SALADO									
Undif Salado Poly	-	-	-	-	-	-	-	-	-
Pinto Poly	-	-	-	-	-	3	-	-	-
LITTLE COLORADO WW									
Undif Little Colorado WW	1	-	-	-	-	-	-	4	-
Holbrook "A"	-	-	-	-	-	-	-	-	-
Holbrook "B"	-	-	-	-	-	-	-	-	-
Padre	-	-	-	-	1	-	-	-	-
Walnut "A"	1	-	-	-	-	-	-	-	-
Undif Walnut	-	-	-	-	-	-	-	-	-
Walnut "B"	-	-	-	-	-	-	-	-	-
Leupp	-	-	-	-	-	-	-	-	-
LITTLE COLORADO GW									
Undif Little Colorado GW	-	-	-	-	-	4	-	1	-
Plain	-	-	-	-	-	-	-	-	-
Indent Corr	3	1	-	3	-	-	-	2	-
Clapboard Corr	-	-	-	-	-	-	-	-	-
Obliterated Corr	-	2	6	3	-	-	-	-	-
ZUNI GLAZEWARE									
Pinnawa Glaze-on-white	-	-	-	-	-	-	-	-	-
Kechepawan Poly	-	-	-	-	-	-	-	-	-
Hesho Glaze-on-red	-	-	-	-	-	-	-	-	-
MISC									
Red Ware, Unknown Ser	-	1	-	-	-	-	-	-	1
Brown Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Adamana Brown	-	-	-	-	-	-	-	-	-
White Ware, Unknown Ser	-	-	-	-	-	-	-	4	-
Gray Ware Smudged, Unknown	-	-	-	-	-	-	-	-	-
Gray Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Poly, Unknown Ser	-	-	-	-	-	-	-	-	-
Unidentifiable	-	-	-	-	-	-	-	-	-
TOTALS	13	23	10	14	1	79	1	22	94

CERAMIC TYPE	Q:1:285	Q:1:286	Q:1:287	Q:1:288	Q:1:289	Q:1:290	Q:1:291	Q:1:292	Q:1:293
CIBOLA WW									
Undif Cibola WW	-	-	-	-	-	-	-	1	-
Undif BMIII/PI	-	-	-	-	-	-	-	-	-
White Mound	-	-	-	-	-	-	-	-	-
Kiatuthlana	-	-	-	-	-	-	-	-	-
Red Mesa	-	-	-	-	-	-	-	-	-
Puerco	-	-	-	-	-	-	1	-	-
Escavada	-	1	-	-	-	-	-	-	-
Undif PII/PIII	1	1	-	-	-	1	-	-	3
Gallup	-	-	-	-	-	-	-	-	-
Chaco	-	-	-	-	-	-	-	-	-
Chaco-McElmo	-	-	-	-	-	-	-	-	-
Snowflake	-	-	-	-	-	-	-	-	-
Reserve	-	-	-	1	-	1	2	-	-
Tularosa	1	1	-	-	-	-	-	1	1
Pinedale	-	-	-	-	-	-	-	-	-
Tularosa/Pinedale	-	-	-	-	-	-	-	-	-
Reserve/Tularosa	-	-	-	-	-	-	-	-	-
CIBOLA GW									
Undif Cibola GW	-	-	-	-	-	-	-	-	-
Indent Corr	-	-	-	1	-	-	-	-	-
TUSAYAN WW									
Undif Tusayan WW	-	-	-	-	-	-	-	-	-
Lino B/G	-	-	-	-	-	-	-	-	-
Kana-a	-	-	-	-	-	-	-	-	-
Black Mesa	-	-	-	-	-	-	-	-	-
TUSAYAN GW									
Undif Plain	-	-	2	-	-	1	2	-	-
Lino Gray	-	-	1	-	-	-	-	-	-
Medicine Gray	-	-	-	-	-	-	-	-	-
MOGOLLON BW									
Undif Plain	-	-	-	-	-	-	-	-	-
Plain Brown	2	-	2	2	3	1	1	-	-
Plain Brown, Smudged	-	1	-	-	-	-	-	-	-
Plain Corr, Smudged	-	-	-	-	-	-	-	-	-
Plain Corr	-	-	-	-	-	-	-	-	-
Indent Corr	-	1	-	-	5	-	-	2	-
Indent Corr, Smudged	-	-	-	-	-	-	-	-	-
Patterned Corr	-	-	-	-	-	-	-	-	1
McDonald Corr, Smudged	-	-	-	-	-	-	-	-	-
Obliterated Corr	-	-	-	-	-	-	-	-	-
SHOWLOW RW									
Showlow B/R	-	-	-	1	-	1	2	-	-
Showlow B/R Corr	-	-	-	-	-	-	-	-	-
Showlow Red	-	1	-	-	-	-	1	-	-
Showlow Corr	-	-	-	-	-	-	-	-	-
WHITE MTN RW									
Undif White Mtn RW	-	-	-	-	-	1	-	1	-
Puerco B/R	-	-	-	2	-	-	-	-	-
Wingate B/R	-	-	-	-	-	-	-	-	-
St. Johns B/R	-	-	-	-	-	-	-	-	-
Pindeale B/R	-	-	-	-	-	-	-	-	-
Wingate/St Johns B/R	-	-	-	-	-	-	-	-	-
Wingate Poly	-	-	-	-	-	-	-	-	-

(Continued)	Q:1:285	Q:1:286	Q:1:287	Q:1:288	Q:1:289	Q:1:290	Q:1:291	Q:1:292	Q:1:293
St Johns Poly	-	1	-	-	-	-	-	-	-
Hesho Poly	-	-	-	-	-	-	-	-	-
Springerville Poly	-	-	-	-	-	-	-	-	-
Four Mile Poly	-	-	-	-	-	-	-	-	-
Wingate/St Johns Poly	-	-	-	-	-	-	-	-	-
Undif B/R	-	1	-	-	-	-	-	-	-
Undif Poly	-	-	-	-	-	-	-	-	-
HOPI WARE									
Awatovi B/Y	-	-	-	-	-	-	-	-	-
Jeddito B/Y	-	-	-	-	-	-	-	-	-
Sikyatki Poly	-	-	-	-	-	-	-	-	-
Huckovi B/R	-	-	-	-	-	-	-	-	-
Tuwiuca B/O	-	-	-	-	-	-	-	-	-
Homolovi Poly	-	-	-	-	-	-	-	-	-
Chavez Pass B/R	-	-	-	-	-	-	-	-	-
Chavaz Pass Poly	-	-	-	-	-	-	-	-	-
SALADO									
Undif Salado Poly	-	-	-	-	-	-	-	-	-
Pinto Poly	-	-	-	-	-	-	-	-	-
LITTLE COLORADO WW									
Undif Little Colorado WW	-	-	-	-	3	-	1	-	-
Holbrook "A"	-	-	-	2	-	-	-	-	-
Holbrook "B"	-	1	-	-	-	-	2	-	1
Padre	-	-	-	-	-	-	-	-	-
Walnut "A"	-	-	-	-	-	-	-	-	1
Undif Walnut	-	-	-	-	-	-	-	-	-
Walnut "B"	-	-	-	-	-	1	-	-	-
Leupp	-	-	-	-	-	-	-	-	-
LITTLE COLORADO GW									
Undif Little Colorado GW	-	-	-	-	-	-	-	-	-
Plain	-	-	-	-	-	-	-	-	-
Indent Corr	-	-	-	4	-	-	-	-	-
Clapboard Corr	-	-	-	-	-	-	-	-	-
Obliterated Corr	-	-	-	-	-	-	-	-	-
ZUNI GLAZEWARE									
Pinnawa Glaze-on-white	-	-	-	-	-	-	-	-	-
Kechepawan Poly	-	-	-	-	-	-	-	-	-
Hesho Glaze-on-red	-	-	-	-	-	-	-	-	-
MISC									
Red Ware, Unknown Ser	-	-	-	1	-	-	-	-	-
Brown Ware, Unknown Ser	-	-	1	-	-	-	-	-	-
Adamana Brown	-	-	2	-	-	6	2	-	-
White Ware, Unknown Ser	1	-	-	-	-	-	-	-	-
Gray Ware Smudged, Unknown	-	1	-	-	-	-	-	-	-
Gray Ware, Unknown Ser	6	1	-	-	-	-	-	-	-
Poly, Unknown Ser	-	-	-	-	-	-	-	-	-
Unidentifiable	-	-	-	-	-	-	-	-	-
TOTALS	11	11	8	14	11	13	14	5	7

CERAMIC TYPE	Q:1:294	Q:1:295	Q:1:297	K:13:110	K:13:111	K:13:112	K:13:113	K:13:114	K:13:115
CIBOLA WW									
Undif Cibola WW	-	1	-	-	-	-	3	1	-
Undif BMIII/PI	-	-	-	-	-	-	-	-	-
White Mound	-	-	-	-	-	-	-	-	-
Kiatuthlana	-	-	-	-	-	-	-	-	-
Red Mesa	-	-	-	-	-	-	-	-	-
Puerco	-	-	-	-	-	-	-	-	-
Escavada	-	-	-	-	1	-	1	-	-
Undif PII/PIII	2	-	-	-	1	-	2	-	-
Gallup	-	-	-	-	-	-	-	-	-
Chaco	-	-	-	-	-	-	-	-	-
Chaco-McElmo	-	-	-	-	-	-	1	-	-
Snowflake	-	-	-	-	1	-	-	-	-
Reserve	-	-	-	-	-	-	1	-	-
Tularosa	-	-	-	-	-	2	-	1	-
Pinedale	-	-	-	-	-	-	-	-	-
Tularosa/Pinedale	-	-	-	-	-	-	-	-	-
Reserve/Tularosa	-	-	-	-	-	-	-	-	-
CIBOLA GW									
Undif Cibola GW	-	-	-	-	-	-	-	-	-
Indent Corr	-	-	-	-	-	-	-	-	-
TUSAYAN WW									
Undif Tusayan WW	-	-	-	1	-	-	1	-	-
Lino B/G	-	-	1	-	-	-	-	-	-
Kana-a	-	-	-	-	-	-	-	-	-
Black Mesa	-	-	-	-	-	-	-	-	-
TUSAYAN GW									
Undif Plain	-	-	1	-	-	-	-	-	-
Lino Gray	-	-	-	-	-	-	-	-	-
Medicine Gray	-	-	-	-	-	-	-	-	-
MOGOLLON BW									
Undif Plain	-	-	-	-	-	-	-	3	-
Plain Brown	-	1	2	-	-	-	1	1	-
Plain Brown, Smudged	-	-	1	-	-	-	-	-	-
Plain Corr, Smudged	-	-	-	-	-	-	-	-	-
Plain Corr	-	-	-	-	-	-	-	-	-
Indent Corr	-	6	-	-	-	-	1	1	-
Indent Corr, Smudged	-	-	-	-	-	-	-	-	-
Patterned Corr	-	1	-	-	-	-	-	2	-
McDonald Corr, Smudged	-	-	-	-	-	-	-	-	-
Obliterated Corr	-	-	-	-	-	-	1	4	-
SHOWLOW RW									
Showlow B/R	1	-	1	-	1	1	-	2	1
Showlow B/R Corr	-	-	-	-	-	-	-	-	-
Showlow Red	1	1	-	-	-	-	-	-	-
Showlow Corr	-	-	-	-	-	-	-	-	-
WHITE MTN RW									
Undif White Mtn RW	-	1	-	-	-	-	1	-	-
Puerco B/R	-	-	-	-	-	-	1	-	1
Wingate B/R	-	-	-	-	-	-	-	-	1
St. Johns B/R	-	-	-	-	-	-	-	-	-
Pindeale B/R	-	-	-	-	-	-	-	-	-
Wingate/St Johns B/R	-	-	-	-	-	-	1	-	1
Wingate Poly	-	-	-	-	-	-	-	-	-

(Continued)	Q:1:294	Q:1:295	Q:1:297	K:13:110	K:13:111	K:13:112	K:13:113	K:13:114	K:13:115
St Johns Poly	-	-	-	-	-	1	1	-	-
Hesho Poly	-	-	-	-	-	-	-	-	-
Springerville Poly	-	-	-	-	-	-	-	-	-
Four Mile Poly	-	-	-	-	-	-	-	-	-
Wingate/St Johns Poly	-	-	-	-	-	-	-	-	-
Undif B/R	-	-	-	-	-	1	2	-	-
Undif Poly	-	-	-	-	-	-	-	-	-
HOPI WARE									
Awatovi B/Y	-	-	-	-	-	-	-	-	-
Jeddito B/Y	-	-	-	-	-	-	-	-	-
Sikyatki Poly	-	-	-	-	-	-	-	-	-
Huckovi B/R	-	-	-	-	-	-	-	-	-
Tuwiuca B/O	-	-	-	-	-	-	-	-	-
Homolovi Poly	-	-	-	-	-	-	-	-	-
Chavez Pass B/R	-	-	-	-	-	-	-	-	-
Chavaz Pass Poly	-	-	-	-	-	-	-	-	-
SALADO									
Undif Salado Poly	-	-	-	-	-	-	-	-	-
Pinto Poly	-	-	-	-	-	-	-	-	-
LITTLE COLORADO WW									
Undif Little Colorado WW	1	2	-	4	1	1	-	1	1
Holbrook "A"	1	-	-	-	-	1	-	-	-
Holbrook "B"	-	1	-	-	-	-	2	-	-
Padre	-	-	-	2	-	-	-	-	-
Walnut "A"	-	-	-	2	-	-	-	3	-
Undif Walnut	-	-	-	1	1	-	-	-	-
Walnut "B"	-	-	-	-	-	1	-	-	-
Leupp	-	-	-	-	-	-	-	-	-
LITTLE COLORADO GW									
Undif Little Colorado GW	-	-	-	4	-	-	-	-	-
Plain	-	-	-	2	-	-	-	-	-
Indent Corr	-	-	-	1	-	-	-	3	1
Clapboard Corr	-	-	-	2	-	-	-	-	-
Obliterated Corr	-	-	-	10	1	1	-	2	-
ZUNI GLAZEWARE									
Pinnawa Glaze-on-white	-	-	-	-	-	-	-	-	-
Kechepawan Poly	-	-	-	-	-	-	-	-	-
Hesho Glaze-on-red	-	-	-	-	-	-	-	-	-
MISC									
Red Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Brown Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Adamana Brown	-	-	-	-	-	-	-	-	-
White Ware, Unknown Ser	-	-	1	-	-	-	-	-	-
Gray Ware Smudged, Unknown	-	-	-	-	-	-	-	-	-
Gray Ware, Unknown Ser	-	-	-	-	-	-	-	-	-
Poly, Unknown Ser	-	-	-	-	-	-	-	-	-
Unidentifiable	-	-	1	-	-	-	-	-	-
TOTALS	6	14	8	29	7	9	20	24	6

CERAMIC TYPE	K:13:116	K:13:117	K:13:118	K:13:119	K:13:36	Q:1:238	Q:1:239
CIBOLA WW							
Undif Cibola WW	-	-	1	-	-	-	-
Undif BMIII/PI	-	-	-	-	-	-	-
White Mound	-	-	-	-	-	-	-
Kiatuthlana	-	-	-	-	-	-	-
Red Mesa	-	-	-	-	-	-	-
Puerco	-	-	-	-	-	1	-
Escavada	-	-	1	-	-	-	-
Undif PII/PIII	-	-	2	1	-	1	-
Gallup	-	-	1	-	-	-	2
Chaco	-	-	-	-	-	-	-
Chaco-McElmo	-	-	-	-	-	1	-
Snowflake	-	1	-	-	-	1	-
Reserve	-	-	-	-	-	-	-
Tularosa	2	2	2	1	-	8	-
Pinedale	-	-	-	-	-	-	-
Tularosa/Pinedale	-	-	-	-	-	-	-
Reserve/Tularosa	-	-	1	-	-	2	-
CIBOLA GW							
Undif Cibola GW	-	-	-	-	-	-	-
Indent Corr	-	-	-	-	-	-	-
TUSAYAN WW							
Undif Tusayan WW	-	-	-	-	-	-	-
Lino B/G	-	-	-	-	-	-	-
Kana-a	-	-	-	-	-	-	-
Black Mesa	-	-	1	-	-	-	-
TUSAYAN GW							
Undif Plain	-	-	1	-	-	-	-
Lino Gray	-	-	-	-	-	-	-
Medicine Gray	-	-	-	-	-	-	-
MOGOLLON BW							
Undif Plain	-	-	-	-	-	-	-
Plain Brown	-	1	6	-	-	-	-
Plain Brown, Smudged	1	-	-	-	-	-	-
Plain Corr, Smudged	-	-	-	1	-	-	-
Plain Corr	-	-	-	-	-	-	-
Indent Corr	-	-	4	-	-	-	-
Indent Corr, Smudged	1	-	-	-	-	-	-
Patterned Corr	1	-	3	-	-	-	-
McDonald Corr, Smudged	-	-	1	-	-	-	-
Obliterated Corr	-	-	-	-	-	-	-
SHOWLOW RW							
Showlow B/R	-	-	-	-	1	-	-
Showlow B/R Corr	-	-	-	-	-	-	-
Showlow Red	1	1	4	-	-	-	-
Showlow Corr	-	-	-	-	-	-	-
WHITE MTN RW							
Undif White Mtn RW	1	1	-	1	-	-	1
Puerco B/R	-	-	2	-	-	1	-
Wingate B/R	-	-	1	-	-	-	-
St. Johns B/R	-	-	-	-	-	-	-
Pindeale B/R	-	-	-	-	-	-	-
Wingate/St Johns B/R	-	1	-	-	-	1	-
Wingate Poly	-	-	1	-	-	3	-

(Continued)	K:13:116	K:13:117	K:13:118	K:13:119	K:13:36	Q:1:238	Q:1:239
St Johns Poly	-	1	1	-	-	-	-
Hesho Poly	-	-	-	-	-	-	-
Springerville Poly	-	1	-	-	-	-	-
Four Mile Poly	-	-	-	-	-	-	-
Wingate/St Johns Poly	-	-	-	-	-	-	-
Undif B/R	-	-	-	-	-	2	-
Undif Poly	-	-	-	-	-	-	-
HOPI WARE							
Awatovi B/Y	-	-	-	-	-	-	-
Jeddito B/Y	-	-	-	-	-	-	-
Sikyatki Poly	-	-	-	-	-	-	-
Huckovi B/R	-	-	-	-	-	-	-
Tuwiuca B/O	-	-	-	-	-	-	-
Homolovi Poly	-	-	-	-	-	-	-
Chavez Pass B/R	-	-	-	-	-	-	-
Chavaz Pass Poly	-	-	-	-	-	-	-
SALADO							
Undif Salado Poly	-	-	-	-	-	-	-
Pinto Poly	-	-	-	-	-	-	-
LITTLE COLORADO WW							
Undif Little Colorado WW	5	-	1	1	-	-	-
Holbrook "A"	-	-	-	1	-	-	1
Holbrook "B"	-	-	-	-	-	1	2
Padre	-	1	1	1	-	-	-
Walnut "A"	1	1	-	-	-	-	-
Undif Walnut	3	-	-	-	-	-	-
Walnut "B"	1	-	1	-	-	-	-
Leupp	-	-	2	-	-	-	-
LITTLE COLORADO GW							
Undif Little Colorado GW	1	-	2	-	-	-	-
Plain	-	-	-	-	-	-	-
Indent Corr	3	1	3	-	-	-	-
Clapboard Corr	1	-	1	-	-	-	-
Obliterated Corr	3	-	3	-	-	-	-
ZUNI GLAZEWARE							
Pinnawa Glaze-on-white	-	-	-	-	-	-	-
Kechepawan Poly	-	-	-	-	-	-	-
Hesho Glaze-on-red	-	-	-	-	-	-	-
MISC							
Red Ware, Unknown Ser	-	-	-	1	-	-	-
Brown Ware, Unknown Ser	-	-	-	-	-	-	-
Adamana Brown	-	-	-	-	-	-	-
White Ware, Unknown Ser	-	-	1	-	-	1	-
Gray Ware Smudged, Unknown	-	-	-	-	-	-	
Gray Ware, Unknown Ser	-	-	-	-	-	-	-
Poly, Unknown Ser	-	-	-	-	-	-	-
Unidentifiable	-	-	-	-	-	-	-
TOTALS	25	12	48	8	1	23	6

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