Projectile Points as Indicators of Preceramic Occupation of the Coconino Plateau

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ABSTRACT

Projectile Points as Indicators of Preceramic Occupation of the Coconino Plateau

Michael G. Lyndon

The study presented here represents the first regional analysis of how preceramic site distributions on the Coconino Plateau changed through time. Although a growing body of literature focuses on the ceramic-era Cohonina people that inhabited the area after A.D. 700, only a few projects have offered any insight into the 12,000 year period of human occupation prior to that time. The paucity of data regarding the preceramic period on the Coconino Plateau has long frustrated attempts to develop a complete culture-history for the region. As Hanson (1996:2) notes, "[t]he chronology of the Archaic west of the [San Francisco] Peaks is not well developed and the identity of the antecedent Archaic populations is not possible with the current evidence." This study seeks to identify such populations by using the temporally diagnostic projectile points they left on the landscape in order to develop an initial culture chronology for the Coconino Plateau.

I argue throughout this thesis that the absence of such a chronology coupled with the lack of archaeological investigation into the preceramic periods on the Coconino Plateau has biased archaeological site data for the region. I further argue that such biases have heavily influenced the development of the current culture-historical model for the research area. I have attempted here to test such assertions by compiling data on the preceramic periods of prehistory in the region and performing a spatial analysis of where preceramic sites appear on the landscape and how these patterns shifted over time. Specifically, I use temporally diagnostic projectile points as evidence of occupation of

the study area during the preceramic era in contrast to current culture-historical models that rely upon the temporal designations of archaeological sites.

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Chapter 1 : Introduction

> **A sound cultural chronology is the necessary first step to further archaeological investigation of any sort and, as archaeological goals become increasingly sophisticated, our temporal controls will require periodic reworking. [Thomas 1981:11]**

The study presented here represents the first regional analysis of how preceramic site distributions on the Coconino Plateau changed through time. Although a growing body of literature focuses on the ceramic-era Cohonina people that inhabited the area after A.D. 700 (see for example Ahlstrom 1984; Bone 2002; Cartledge 1979, 1987; Christensen 2004; Fairley 1979; Garcia 2004; Hanson 1996; Horn-Wilson 1997; McGregor 1950, 1951, 1967; McNamee 2003; Samples 1992; Schwartz 1956a, 1956b; Sorrell 2005; Weintraub et al. 2005), only a few projects have offered any insight into the 12,000 year period of human occupation prior to that time (Bartlett 1930; Ferg 1977; James 1976; Jennings 1971; Landis 1993). The paucity of data regarding the preceramic period on the Coconino Plateau has long frustrated attempts to develop a complete culture-history for the region. As Hanson (1996:2) notes, "[t]he chronology of the Archaic west of the [San Francisco] Peaks is not well developed and the identity of the antecedent Archaic populations is not possible with the current evidence." This study seeks to identify such populations by using the temporally diagnostic projectile points they left on the landscape in order to develop an initial culture chronology for the Coconino Plateau.

I argue throughout this thesis that the absence of such a chronology coupled with the lack of archaeological investigation into the preceramic periods on the Coconino Plateau has biased archaeological site data for the region. I further argue that such biases

have heavily influenced the development of the current culture-historical model for the region. For example, following Schwartz (1956a, 1956b) subsequent researchers (see for example Fairley 1979, Hanson 1996) have continued to assert that the Cohonina represent a population that immigrated to the Coconino Plateau sometime after A.D. 600. Such an interpretation is primarily supported by a perceived lack of Early Agricultural or Early Ceramic sites (roughly 1500 B.C. to A.D. 700) in the region. However, I would question whether such gaps in the preceramic site data exist due to an almost total lack of archaeological investigation devoted to that period of time.

Therefore, I have attempted here to test such assertions by compiling data on the preceramic periods of prehistory in the region and performing a spatial analysis of where preceramic sites appear on the landscape and how these patterns shifted over time. Specifically, I used projectile points derived from an artifact collection curated by the Kaibab National Forest representing over 30 years of surface collection. Projectile points represent an excellent means for understanding such a lengthy history, as human groups have produced such tools throughout all of the temporal periods discussed in this volume. Indeed, due to the durability of lithic materials and the great antiquity of the various preceramic phases of human history, projectile points and the lithic debitage resulting from their manufacture are often the only evidence remaining at such sites.

More significantly, humans have produced projectile points in morphological styles that have changed over time. Such "temporal types" have been defined by Thomas (1981:14) as "morphological types that are found consistently to be associated with a particular span of time in a given area." Therefore, such temporally diagnostic projectile points serve as an excellent means of tracking human populations through both space and

time and are commonly used for this purpose (see Adams and Adams 1991:220-221). I have used such a technique for the current project, utilizing provenience data for temporal projectile point types to perform a spatial analysis that tests the current culture-historical model of the research area.

The Utility of Using an Artifact-Level Analysis for the Spatial Modeling of Culture-History on the Coconino Plateau

For any temporal-spatial analysis, the researcher must utilize the most suitable data for the research design. For temporal-spatial analyses in archaeology, perhaps the two most common data sources are the archaeological site and the artifact. Current culture-historical models on the Coconino Plateau tend to use temporal-spatial site data in order to reconstruct culture-histories of the region (Cartledge 1979, 1987; Fairley 1979; Hanson 1996; Horn-Wilson 1997; Samples 1992; Schwartz 1956a, 1956b). For example, the absence of early agriculturalists on the Coconino Plateau is supported by an apparent absence of Basketmaker sites in the research area as discussed above (Hanson 1996:2). In fact, a site-level analysis of the region reveals only minimal numbers of sites dated to any of the preceramic periods of the greater Southwest, except for a high frequency of sites simply termed "Archaic" (Figure 1.1).

Figure 1.1 represents the total number of sites currently dated to each temporal period in the Geographic Information System (GIS) database maintained by the Kaibab National Forest. For the depicted graphic, I excluded all multi-component sites,[1] all sites located outside of the current research area, and all sites for which temporal data was not

[1] Multiple component sites, as used here, are sites which archaeologists have dated to two or more temporal periods based on surface materials. For example, some sites have been assigned broad date ranges such as "Basketmaker to Pueblo IV" which would misrepresent the number of sites dated to each period if included in the bar graph.

available. The remaining 3,956 sites provide an excellent summary of data available at the site-level of analysis for regional syntheses. Sixty-three percent (n = 2,503) of these archaeological sites have been dated to the Ceramic Period. An additional 24% of these sites represent lithic scatters that have either been dated as "Archaic," or for which no temporal range has been assigned. Only 29 sites (.007%) have been dated to any of the preceramic temporal periods used within the Southwest, reflecting approximately 12,000 years or 90% of human history in the region.

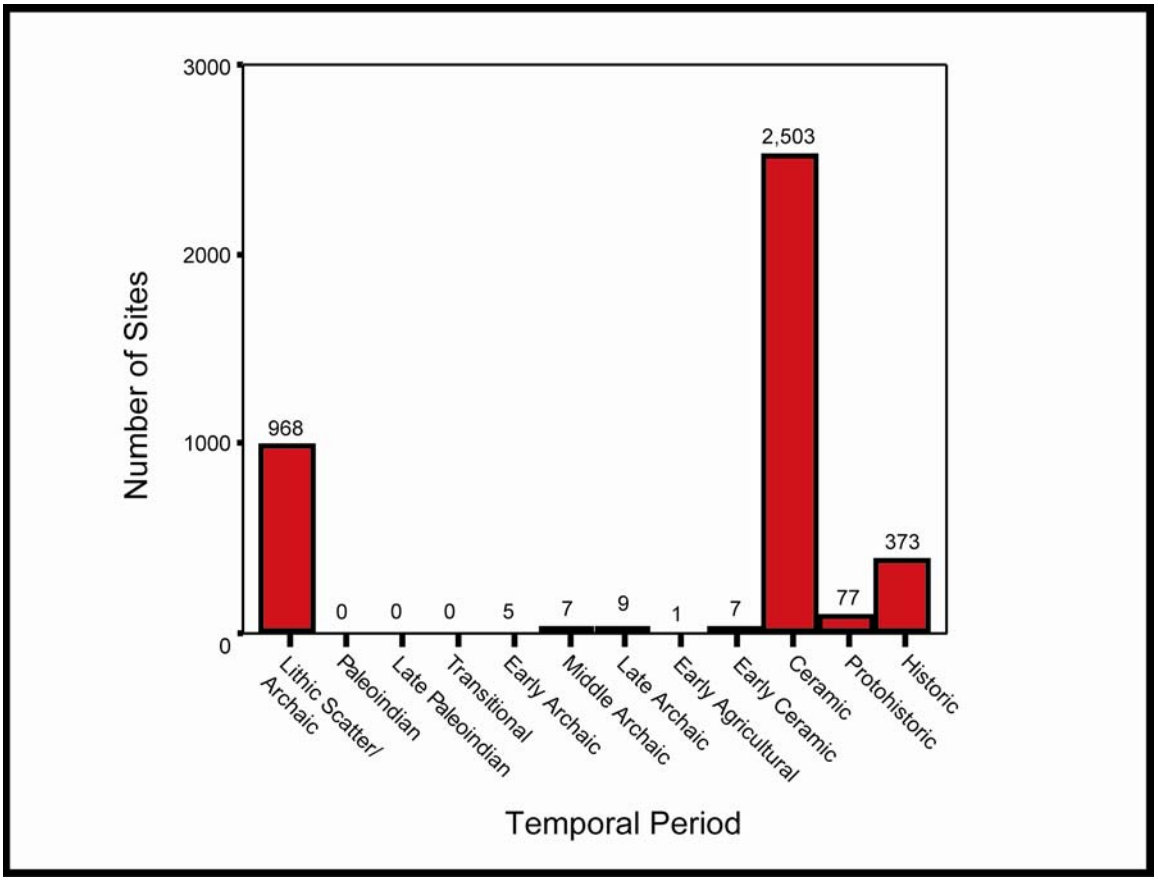

Figure 1.1. Bar graph depicting the number of archaeological sites dated to each temporal period on the South Zone of the Kaibab National Forest.

However, it must be noted that the data used for the graph above represent only a fraction of the available information for the region. Individual artifacts at a given site may represent a variety of temporal ranges, while only a generality of such data may be

used to assign the site to a temporal range. In such a manner, small numbers of artifacts from one temporal period (generally earlier periods) tend to become "masked" by large quantities of artifacts from other (generally later) occupations. In the case of preceramic period artifacts, small numbers of isolated projectile points may be observed by archaeologists but considered to be anomalous or unrepresentative of the temporal range of a particular region due to overwhelming numbers of Ceramic Period artifacts.

This masking effect is compounded by the heavy reliance by cultural resource managers on the "site" as a management category and tool. The practice of grouping cultural resources into "sites" hinders the ability to track occurrences of specific artifact types. Isolated artifact finds are generally documented in separate survey or excavation reports, obliging researchers to sift through hundreds of such reports to collect data on specific artifact types. Furthermore, the methods archaeologists employ to assign temporal ranges to sites tend to de-emphasize artifact types that occur infrequently as discussed above. For example, investigators may rightly hesitate to assign a temporal range to a lithic scatter consisting of thousands of flakes of lithic debitage and only one temporally diagnostic projectile point. In such cases, the only temporally significant data for the site becomes lost at the site level of analysis. Referring back to Figure 1.1, one might wonder how many temporally diagnostic projectile points were observed at the 968 un-dated, or "Archaic" lithic scatters that represent 24% of the sites in the sample.

Pilles and Geib (2004) have previously noted the probability that preceramic sites, in this case Paleoindian Period sites, have been under-represented in the archaeological site data due to such a masking effect. They state that

> Numerous lithic sites extending out from the obsidian source localities of the Kaibab National Forest east to Flagstaff are probably multi-component quarry and processing sites as well. Hence, Paleo-Indian sites may be masked by a classification as "Archaic" or "Lithic" sites in archaeological survey records unless they have yielded fluted points [Pilles and Geib 2004:20].

Indeed, the identification of two fluted Clovis points during the course of the current study seems to support the assertion of Pilles and Geib. Both Clovis points identified by this study were collected from sites dated to relatively recent temporal periods based on heavy concentrations of artifacts derived from those periods.

Therefore, the project presented here is an attempt to analyze data from the study area at the artifact level to discern if such data support the current culture-historical model. As such, the study is large in scope and exploratory in nature. However, I would argue that such general studies are crucial to developing at least a working framework on which to base further research. As Kamp and Whittaker (1999:86) note "[t]he Flagstaff area was a zone of ethnic contacts, and the [projectile] point types may reflect that, although no one has done the regional study that would be necessary to examine their spatial distributions and possible ethnic affinities." It is my hope that the work presented here may in some way contribute to that framework.

Overview of the Report

This study represents a regional study of projectile point distributions in the area enacted through use of a GIS analysis. The following overview provides a framework of methods used during the course of this thesis. I initiated this project by collecting data from 1,117 stone tools curated by the Kaibab National Forest. During the data collection

phase of this project, I developed a set of specific selection criteria that resulted in the final selection of 624 projectile points for use during this study. I collected metric data on a sub-sample of these for comparative purposes during the classification portion of the project. I created a polythetic and open-ended classification system for projectile points within the research area. The typological system presented here currently consists of 35 defined projectile point types that occur on the south Kaibab.

Next, I conducted a literature search in order to establish date ranges for defined projectile point types on the South Kaibab. Date ranges were determined by comparing projectile point types with morphologically similar types from dated contexts elsewhere in the Southwest. In all, 28 of the projectile point types as I have defined them were assigned dates based on data from other regions. Seven projectile point types remain undated at this time. In addition to classifying each artifact by type, I visually sourced lithic materials for the 624 remaining artifacts. Raw material sources for all of the specimens were identified based on published descriptions of materials coupled with personal experience from working on the south Kaibab for one year prior to initiating the project.

Finally, I designed a GIS database to manage and analyze all of the data. Data included projectile point types, measurements, archaeological site characteristics, ceramic type counts, and lithic raw materials. I conducted exploratory spatial analyses in GIS to look at distributions of archaeological sites, projectile points, and lithic raw materials. I also looked at distributions of specific lithic raw material types in relation to corresponding raw material sources.

Research Questions

As stated above, the primary emphasis of this project was to test current ideas about the nature of preceramic occupation on the Coconino Plateau by changing the unit of analysis from the archaeological site to the individual artifact. However, several specific research questions were also investigated during the course of the study. A list of research questions includes the following.

1) How will a model generated from using artifacts as the unit of analysis differ from models using the archaeological site?
2) Will an artifact-level analysis support or refute the current culture-historical model for the region that views the area as anomalous and disconnected from cultural adaptations documented in other sub-regions of the Southwest?
3) What is the earliest evidence for occupation of the Plateau?
4) Does an artifact-level analysis support the assertion that no Early Agricultural occupation took place on the Plateau?
5) Does an artifact-level analysis support the assertion that no Early Ceramic occupation took place on the Plateau?
6) What, if any, changes in lithic raw material procurement strategies can be seen over time in the region?
7) What, if any, changes in spatial distributions of artifacts derived from particular lithic raw material sources can be seen over time?

A Brief Explanation of Temporal Period Names Used in this Volume

Before further discussion, it would be useful to provide an explanation of the temporal period names and ranges of dates used in this volume. In most cases, I have used terms that are common to the greater Southwest rather than regional period/phase/focus names. My reason for doing so is to avoid confusion for the majority of readers who may be unfamiliar with the specific temporal divisions on the Coconino Plateau. In addition, the more general pan-Southwestern terminology helps to stress the

similarities between cultural change and adaptation on the Coconino Plateau with the culture-historical timeline of the greater Southwest. All date ranges for the periods cited in this volume are general ranges derived from the archaeological literature and primarily focused on the Colorado Plateau as explained below.

I have referred to the period of time characterized by the occupation of the Cohonina culture on the Coconino Plateau as the Ceramic Period (A.D. 700-1100). The Ceramic Period on the Coconino Plateau has traditionally been divided into the Coconino (A.D. 700-900) and Medicine Valley (A.D. 900-1100) Foci of the Cohonina sequence (Colton 1939:25-29), or into Early (A.D. 850-1000), Late (A.D. 1000-1075) (Samples 1992) and Very Late (A.D. 1075-1200) (Horn-Wilson 1997) periods. However, such divisions are unnecessary within the context of the present discussion and might only serve to confuse readers unfamiliar with Cohonina prehistory. The Ceramic Period, as used here, is also roughly analogous to the better-known Pueblo I, II, and III periods of the Pecos Classification for the Anasazi sequence.

I have used the term Early Ceramic (A.D. 400 to 700) to refer to the three-hundred year period of time preceding the Ceramic Period. Schwartz (1956b:29-30) proposed the name Hermit Focus for the period of time dating from A.D. 600 to 700, which he characterized as the date range for the first "exploration" and settlement of the area by Cohonina groups. Jennings (1971:476-480) offered the term Hupmobile Phase (A.D. 250 to 700) to refer to this period, considering it to represent a transitional phase between earlier preceramic populations and later Cohonina groups. Neither of these terms has enjoyed much usage within the literature. Much of what I have proposed concerning this period draws from the much-better documented Basketmaker III period

of the Anasazi sequence. While I have used the term Early Ceramic to avoid confusion between Anasazi and early Cohonina groups, I have also employed the term "Basketmaker III era" in some cases to highlight possible similarities between the two cultures.

In regards to the period of time characterized by the initial use of agriculture on the Colorado Plateau, I have used the term Early Agricultural, to which I have arbitrarily assigned a date range of 450 B.C. to A.D. 400. Jennings (1971:468-476) proposed the name Red Horse Phase be used to refer to the period of time dating from 700 B.C. to A.D. 250. However, Jennings was not able to demonstrate any evidence of early farming from his excavation data. Jennings states

> The data neither support nor deny the possibility of horticulture of some very rudimentary sort. No evidence of the use of corn in the form of cobs or kernels was found at either of the sites. As with the Red Butte Phase [1900 to 1000 B.C.], it is possible that the Red Horse Phase diet was supplemented with corn grown on a casual basis in other areas. [Jennings 1971:472]

Again, on the Plateau this period is currently best understood as a correlate of the Anasazi cultural sequence (Basketmaker II period). However, I felt it might be unwise to use the Anasazi term to refer to cultural deposits in the Cohonina area at this time. The term "Early Agricultural" has commonly been used to refer to such occupations in the Basin and Range province to the south of the research area.

The remaining temporal period names used within this volume should need little explanation since such terms are used pan-regionally and local terms have not been proposed. The one exception to this may be the Red Butte phase dating from 1900 B.C. to 1000 B.C. proposed by Jennings (1971:460-468) for use on the Coconino Plateau.

Temporally, the Red Butte phase corresponds with the Late Archaic period used throughout the Southwest. I considered it more appropriate at this time to maintain the widely-used Early, Middle, and Late Archaic period classification to refer to the great expanse of time preceding the introduction of agriculture on the Coconino Plateau. As a further note, I have offered some discussion on what Matson (1991:129) has termed the "Earliest Archaic" to refer to the transitional period linking the Paleoindian and Early Archaic periods. I have tentatively offered evidence of artifacts potentially dating to this time, and have referred to these below as possible "Transitional Period" artifacts.

Chapter Summaries

This thesis is organized into five additional chapters and four appendices. Chapter 2 consists of a description of the research area, as well as a brief summary of previous archaeological research in the study area. Most of the literature discussed relates to the current culture-history of the region, especially regarding postulated population abandonments or hiatuses during the preceramic period. Although investigations into the preceramic occupations of the region have been extremely limited, the few projects conducted in the research area are also reviewed. Chapter 3 discusses the methods used for the current analysis, particularly those used during the data collection portion of this project. In addition, descriptions of lithic raw materials and a discussion regarding the expected accuracy of visually sourcing such materials are included in Chapter 3.

Chapter 4 consists of an overview of the projectile point typology created for this thesis. First, I discuss the methods used in creating the classification system. I then

provide descriptions and illustrations of the 35 projectile point types generated during the classification process, as well as corresponding temporal ranges where available. Chapter 5 includes results of a spatial analysis of the data as generated by GIS. For that chapter, I have started with the earliest period of human occupation on the Plateau (the Paleoindian Period) and worked forward through time. In Chapter 5, the reader will find discussions of how patterns in site distribution and lithic raw material procurement change through time. Finally, Chapter 6 consists of a summary of conclusions for the project. In addition, this volume includes three appendices. Appendix A consists of color plates of the 822 projectile points and stone tools derived from the artifact collections of Kaibab National Forest. Appendix B presents data associated with each individual artifact, including raw material type, metric data, and provenience information. Appendix C consists of the data for each archaeological site used for the analysis. Finally, Appendix D illustrates a proposed timeline of culture-history on the Coconino Plateau and projectile points used as temporal markers for this study.

Chapter 2 : The Physical Environment of the Coconino Plateau and Previous Research within the Study Area

In this chapter I describe the research area both in terms of the physical environment and in terms of the history of research within the study area. In outlining the environment, I have focused on the biotic, climatic and geographic factors that are most pertinent to archaeologists working within the region. Of these factors, one of the most significant may be the relatively high elevation of the study area (averaging over 7,000 ft). For example, Matson (1991) has proposed that agricultural development for the Southwest was largely influenced by the gradual adaptation of maize to higher elevations. Therefore, a synopsis of indirect and direct effects of high elevation areas on environmental and cultural factors is included below. Additionally, I have also presented an overview of previous research pertaining to the research area or particularly important for the current project.

The Study Area: The South Zone of the Kaibab National Forest

The study area for the project is defined by the boundaries of the South Zone of the Kaibab National Forest (KNF) consisting of the Williams, Chalender, and Tusayan Ranger Districts (referred to below as the South Kaibab) in North-Central Arizona. The modern towns of Ash Fork, Flagstaff, Tusayan, Valle, and Williams are located within or surrounding the boundaries of the forest (see Figure 2.1). The South Kaibab consists of 944,887 acres (1,426 square miles) of land located at the center of the Coconino Plateau.

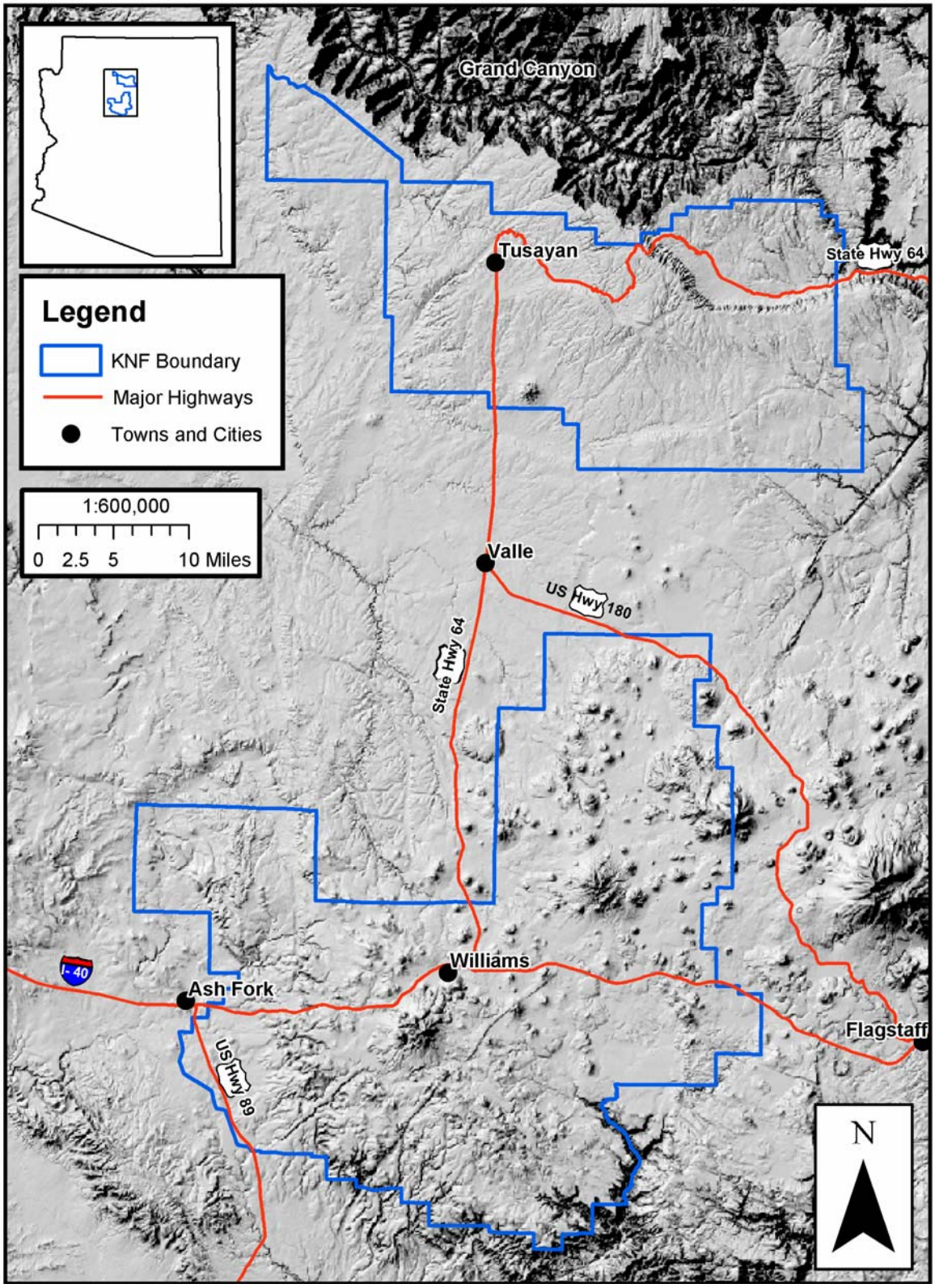

Figure 2.1. The boundary of the South Zone of the Kaibab National Forest that defines the study area.

A number of prominent topographic features referred to in this volume are located within or near the study area (Figure 2.2). The South Zone is bounded by the Grand Canyon and Sycamore Canyon to the north and south respectively. Other prominent landmarks include Kendrick Mountain, Sitgreaves Mountain, the San Francisco Peaks, Bill Williams Mountain, Red Butte and the Upper Basin. Additionally, the obsidian sources at Government Mountain, Presley Wash, Partridge Creek and Black Tank, as well as several other lithic raw material sources, are critical to the current discussion and are described in detail in Chapter 3.

The Coconino Plateau: Environmental, Geological, Geographic, and Climactic Data

Several sub-regions make up the greater Colorado Plateau that covers much of the Four-corners region. The Coconino Plateau, at the southernmost tip of the Colorado Plateau, is one of these. The Coconino Plateau and the Kaibab Plateau to the north both represent the product of the same set of geomorphological processes and essentially form two halves of the same formation, divided by the Colorado River and the Grand Canyon. The Coconino Plateau extends from the southern rim of the Grand Canyon, southward to the Mogollon Rim and the Verde River. Eastward, the Coconino Plateau extends from the Aubrey Cliffs, west to the Little Colorado River drainage. In all, the Plateau consists of roughly 9,300 square miles of upland area in North Central Arizona (Lesko 1989:385).

Topographically, the Coconino Plateau resembles a large basin. That is, while the elevation for the Plateau averages roughly 7,000 feet, the center of the Plateau has an elevation of only 5,000 feet. Generally, elevations gradually increase moving from the center of the Coconino Plateau toward the edges (Cartledge 1987:5). While much of the

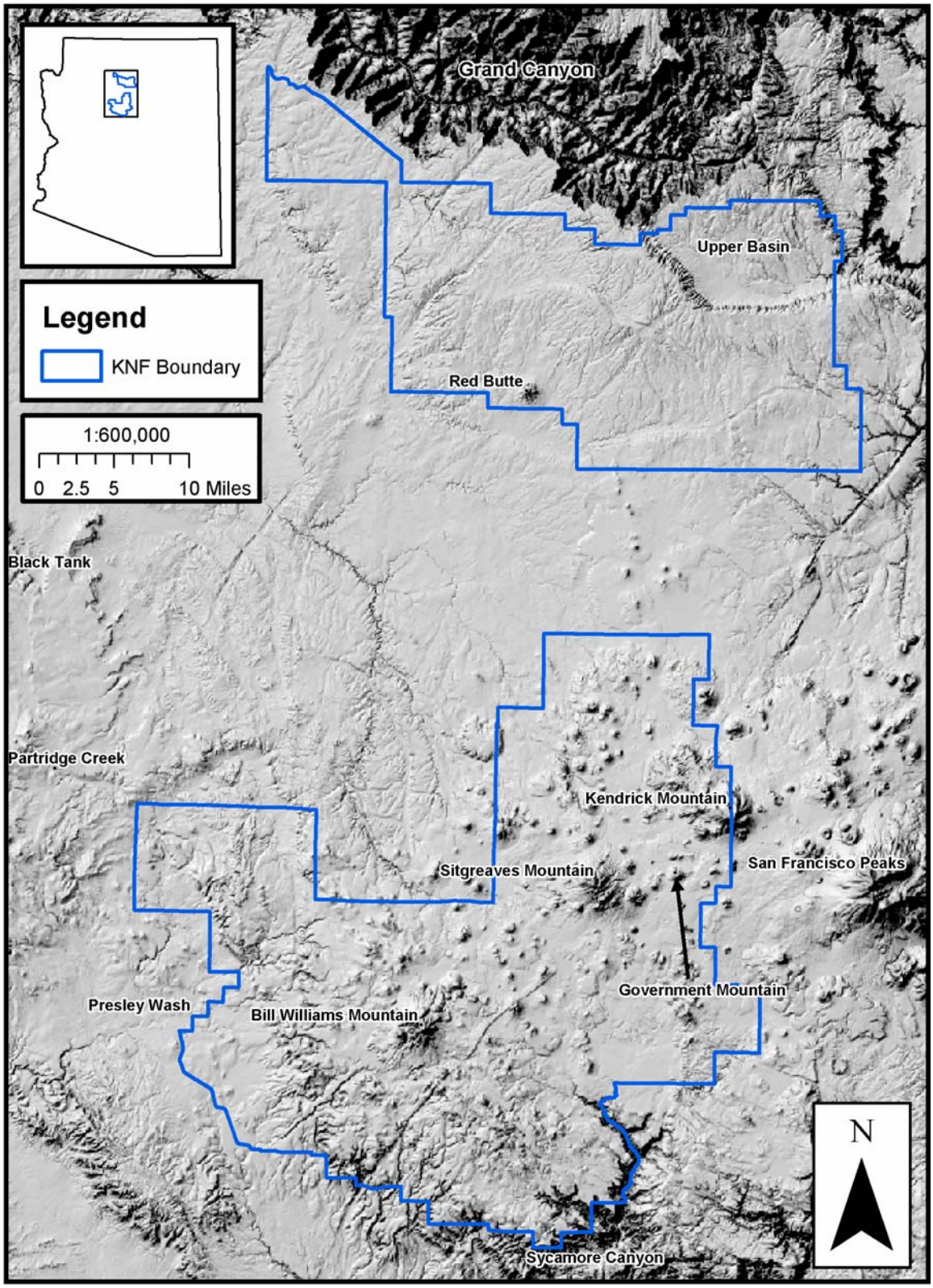

Figure 2.2. Prominent topographic features within or around the study area.

Coconino Plateau displays a minimal amount of topographic relief (Jennings 1971:14), the southern portion of the region varies greatly in elevation. Extensive prehistoric volcanic activity in the southern area resulted in a vast array of small hills and peaks rising up to 9,000, even 12,000 feet in elevation.

Due to the high elevation of the region, drainages on the Coconino Plateau supply water to the bordering lowlands through three major drainage systems (USGS: Arizona Rural Watersheds Initiative, http://www.daztcn.wr.usgs.gov/rwi/coco/coco-samap.htm). The combination of high elevation and a general basin shape would normally imply the existence of ample water sources. However, Cartledge (1987:5) notes that in actuality "surface waters and springs are rare to uncommon" due to the porosity of underlying limestone and volcanic basalt beds across the Plateau. Therefore, as with other areas of the Southwest, access to reliable water supplies was probably an important factor for prehistoric inhabitants. Possibly, the uncommon set of water conditions on the Plateau necessitated unique adaptations for the indigenous residents.

The majority of the Plateau is dominated by Piñon and Juniper forests although Ponderosa pine, Douglas fir, Aspen, and Gambel Oak are also found at higher elevations. Fauna of major importance to prehistoric communities include deer, antelope, bear, rabbit, coyote, and various birds and rodents (see Plog 1983:42 and Jennings 1971:22 for comprehensive lists of flora and fauna respectively). Other natural resources on the Coconino Plateau of particular importance to humans include lithic raw materials such as hematite, Kaibab chert, and obsidian. Obsidian sources such as Government Mountain, Presley Wash, and Partridge Creek seem to have been heavily exploited by prehistoric populations (Lesko 1989:385-388).

Climate on the Plateau is "typical of the highland Southwest" (Jennings 1971:18). Precipitation follows a bimodal distribution with relatively heavy moisture during the winter and again during the summer monsoons. Precipitation not only varies greatly from year to year but, as is characteristic of the Southwest in general, exhibits a high degree of spatial variability. The mean total annual precipitation equals 15.81 inches while the average temperatures range from 29.4 degrees F in January to 69.2 degrees F in July (Jennings 1971:18-19). Approximately 140 frost-free days a year is typical.

High Elevation on the Coconino Plateau

One of the most interesting considerations for archaeologists working on the various plateaus of the Southwestern highlands is the effect of high elevations on cultural adaptations by prehistoric populations. High elevation locations are rare for the Southwest (with less than 1% of lands having an elevation over 8,000 feet) so prehistoric cultural adaptations to high elevations are comparably scarce in the archaeological record. In order to understand the effects of high elevation environments on cultural adaptations, archaeologists must have some notion of the characteristics of high elevation locations as compared to the lower regions that compose most of the Southwest.

Agricultural production presents one example of the possible effects of high elevation environments on prehistoric human adaptation. Generally speaking, higher elevations correlate with worse conditions for agricultural exploitation of the environment. Berlin et al. (from Hevly 1983:22) note that at high elevations "soils suitable for agriculture are…of restricted occurrence, variable quality (often requiring careful husbandry and fertilization) and slow to rehabilitate following disturbance." High

elevation locations not only receive more yearly precipitation but also are located near the sources of spring run-off. Therefore, many high elevation locations enjoy more permanent annual flow of drainages than lower elevations. However, fewer frost-free days per year, lower temperatures, and thinner soils, create a delicate situation for prehistoric agriculturalists. Additionally, Matson (1991) proposes that maize was gradually adapted to become viable at high elevations. While such a characterization certainly does not apply to the Plateau as a whole, the effects of high elevations on human behavior in the region remain an important consideration for archaeologists.

One additional indirect effect of high elevations relates to the quality of obsidian deposits compared to other areas in the Southwest. According to Shackley (1988) colder temperatures at high altitudes resulted in the rapid cooling of lava flows that formed obsidian within the study area. The accelerated cooling process had the effect of forming much larger but less vitreous obsidian deposits on the Coconino Plateau compared to other areas in the Southwest. There is no doubt that the quality, size, and abundance of obsidian in the research area affected human populations living on the Plateau. As Shackley (1988:753) puts it, outside the Coconino Plateau obsidian occurred only as small nodules that promoted "rather specialized technology such as bipolar reduction and conservation." In contrast, human populations on the Coconino Plateau were able to utilize much larger nodules, although the quality of the material was somewhat reduced.

Previous Research for the Coconino Plateau

While the work presented here focuses on the preceramic era of occupation, projectile points in the collection span the complete cultural timeline of the Coconino

Plateau. Indeed, one of the main objectives of the proposed research is to understand the transition from an Archaic style lifeway to the more sedentary, agriculturally-based culture of the Cohonina. Therefore, I have included here a discussion of previous research in Cohonina archaeology focusing on proposed population abandonments within the region. In particular, I have focused on two temporal periods. First, I will discuss that period of time which immediately precedes the appearance of the Cohonina within the archaeological record, a temporal phase equivalent to the better-known Basketmaker II and III phases of the Anasazi sequence. Second, I have included a discussion of hypothetical hiatuses as proposed for the preceramic period within the greater Southwest, particularly as concerned with the Middle Archaic period dating from 5,000 to 3,000 B.P.

The Late Preceramic Period on the Coconino Plateau: The Search for a Cohonina Predecessor

> **Some of the apparently pre-pottery sites in the area south of the Grand Canyon should be adequately tested to see just what they consist of. This would be arduous, and not productive digging, but it might demonstrate what is the earliest part of Cohonina history. The problem would be to try to find pottery-bearing sites superimposed on non-pottery-bearing sites. Although sites in such a relationship have not been found, there is every reason to believe that they could be located here. Extensive surveying is certainly indicated for this purpose, and it should be accompanied by test pitting [McGregor 1951:150].**

Exhaustive reviews of the Cohonina culture are available elsewhere (Cartledge 1979, 1987; Hanson 1996; Fairley 1979; Samples 1992) and are not relevant to the current discussion. However, the body of literature that addresses possible antecedent cultures to the Cohonina is important for the current discussion and is reviewed below. Until recently, investigators have observed little evidence within the archaeological

record to indicate an antecedent culture to the Cohonina that is comparable to the Basketmaker phases of the Anasazi sequence. As discussed in the introduction to this thesis, the absence of Basketmaker era sites on the Coconino Plateau has indicated a lack of continuity between preceramic and Ceramic Period populations to some researchers (Schwartz 1956a, 1956b; Fairly 1979; Hanson 1996). However, new data, including the results of the current project, indicate a possible in situ development of the Cohonina culture out of indigenous preceramic populations.

One prevalent idea regarding the Cohonina has been that the group migrated to the area sometime during the Ceramic or Early Ceramic period. Schwartz (1956a, 1956b) proposed a model in which the Cohonina entered the Coconino Plateau area from the west around A.D. 600. As Schwartz states,

> In the earliest period, between A.D. 600 and 700, there was an extremely low habitation density. This might be termed the period of exploration, when the water sources were being located, when favorable agricultural areas were being sought, and, in general, when a few pioneering families were learning the all-important lessons of survival [Schwartz 1956b:29].

Other investigators have continued to propose that the Cohonina migrated to the Plateau from some other region although ideas regarding the nature of such a migration vary. For example, Fairley (1979) proposed an in-migration of Cohonina people to the Plateau from the Virgin Anasazi area based largely on similarities between ceramic decoration, particularly the unfired hematite-based slip known as Fugitive Red, within the two areas. In this way, Fairley addresses one of the weaknesses of the migration model, the fact that if the Cohonina migrated to the area, archaeological investigations have yet to reveal where they came from.

At least one more recent interpretation focuses more on the movement of technology or stylistic attributes of material culture than on the migration of human populations. Hanson states

> Current data indicate that the beginnings of sedentism (in the form of pithouses), ceramic manufacture and agriculture (significant dependence) began west of the Peaks in the late 8th century AD...[W]hile extensive Basketmaker occupations are known from various locations north of the Grand Canyon, no such remains have been found south of the Canyon. This in turn suggests the very real possibility that Basketmaker peoples moved across the Canyon south onto the Coconino Plateau...[Hanson 1996:2]

Again, the interpretation above cites an apparent absence of any Basketmaker-equivalent sites on the Coconino Plateau and posits a possible in-migration of people sometime during the Early Ceramic period to account for this absence. This interpretation continues to be cited in the most recent culture-histories of the Cohonina (see for example Garcia 2004:58-59).

Though the migration model for Cohonina origins accounts for a lack of Basketmaker-era data within the archaeological record, the model is not without faults. First, although Fairley (1979) demonstrates possible links between Cohonina and Virgin Anasazi technology, no investigation has revealed proof of a Cohonina predecessor in any neighboring area. Additionally, the migration model implies that either A) the Coconino Plateau was abandoned at the time of Cohonina arrival and therefore open for colonization or B) the Cohonina effectively replaced an in situ population of Archaic hunter-gatherers on the Plateau. However, the former scenario seems unlikely considering the abundance of resources as discussed previously in this chapter. In the latter case, the model implies a hunter-gatherer population living on the Coconino Plateau

that remained completely disassociated from the adoption of new technologies in subsistence (agriculture) and weaponry (the bow-and-arrow) in neighboring areas.

The migration model relies on a supposed lack of evidence dating to these Basketmaker equivalent periods. I argue here that this negative evidence may result from a combination of three influencing factors rather than representing what exists "on the ground." First, only minimal investigation has been devoted to looking for such evidence. Much of the little evidence that does support a Basketmaker-era occupation has been largely overlooked or masked by heavy deposition from subsequent time periods. Second, Basketmaker-era sites, particularly Basketmaker II sites, are notoriously ephemeral. Smiley (2002) states that the ephemeral quality of Basketmaker sites prevented archaeologists from recognizing a sizeable Basketmaker occupation on Black Mesa until excavation yielded materials from that period. As Smiley notes

> In the beginning, and for several years into BMAP [Black Mesa Archaeological Project], no one thought that preceramic farmers had occupied Black Mesa....In the end, however, nearly 20 percent of excavated BMAP sites consisted of the remains of settlements and camps of the "Basketmaker II" peoples...[Smiley 2002:37]

Finally, as I argue throughout this paper, most regional models are based on using the archaeological site as the unit of analysis. I propose that the majority of the evidence that might exist indicating a Basketmaker-era occupation of the region may be masked at the site-level of analysis.

One notable exception to the body of work suggesting that the Cohonina migrated to the Plateau from another location is Jennings' (1971) dissertation outlining excavations carried out in the northern part of the project area. Jennings (1971:497) identified three

preceramic levels of occupation, starting around 700 B.C., and postulated a developmental continuity between preceramic peoples and the Cohonina. Jennings concludes

> At Harbison Cave there is no break in the stratigraphic record between the preceramic Hupmobile phase [A.D. 250 to 700] and the Cohonina period. Likewise there is no physical gap between the Hupmobile and Red Horse [700 B.C. and A.D. 250] levels...[T]he stratigraphic evidence from NA9528 supports the hypothesis of direct relationship between the Cohonina culture and that of the Red Horse and Hupmobile phase [Jennings 1971:493].

Unfortunately, Jennings work has not been well accepted by Cohonina researchers, seemingly due to his use of questionable obsidian hydration dating techniques. Cartledge (1979:299) states that, "[a]lthough Jennings (1971:493-97) claims to have demonstrated direct continuity between preceramic peoples and the Cohonina, the evidence he presents is unconvincing or weakly suggestive at best." Other investigations, such as James' (1976) excavation at the Mule Shoe Bend site and Ferg's (1977) work at the Pineveta Tanks site have similarly been ignored in the literature due to their reliance on Jennings proposed phase scheme.

At least one project has explored the possibility that the Cohonina developed in situ out of a Late Archaic hunter-gatherer population as postulated by Jennings (1971). Landis (1993:417) noted that lithic debitage analyzed at sites from both periods (Late Archaic and Ceramic) were similar implying that "these two populations did much the same things with much the same raw materials." Investigators were unable to demonstrate the relationship between the two groups based on data generated by the project and that particular research domain remained largely unresolved. However,

Landis (1993:417) states, "[t]here simply is no conclusive evidence that the Cohonina were a new and intrusive population supplanting Late Archaic people on the Coconino Plateau." It must also be noted that Landis (1993:66) defined the period immediately preceding the Ceramic Period[2] as a pre-agricultural period. Therefore, the culture-historical model employed by Landis did not account for the possibility that populations of early farmers may have occupied the Plateau between the Late Archaic and Ceramic Periods as investigated in this thesis.

Other Proposed Hiatuses during the Preceramic Period

Besides the proposed absence of a Basketmaker era occupation of the Coconino Plateau, other hiatuses have been proposed for the preceramic period of the Southwest, most notably by Berry (1982) and Berry and Berry (1986). In *Time, Space and Transition in Anasazi Prehistory*, Michael S. Berry (1982) presented a new model for population movement in the Southwest that differed markedly from the dominant model of the time. Berry's model is essentially a migration model in which human populations are thought to have moved over time to varying locales influenced primarily by changing environmental conditions. Conflicting with what Berry considered a gradualist view of the Southwest, which proposes a generally steady population increase throughout the region over time, Berry's model proposed that some areas experienced occasional hiatuses (abandonments) as people migrated between locales. According to Berry (1982:116), one such hiatus is evident on the Colorado Plateau during the transition from the Basketmaker II to Basketmaker III periods.

[2] Landis (1993) uses the term Formative Era to refer to the same period of time.

Berry's (1982) model on population migration based on environmental fluctuations has not gone unchallenged. In a critical review of Berry's work, Dean (1985) attacks most of the underlying theoretical assumptions to Berry's analysis as well as his interpretations of the data. In addition, Dean criticizes Berry for excluding significant amounts of radiocarbon dates that would likely fall within the theoretical abandonment periods postulated by Berry. Additionally, Dean disputes Berry's characterization of the relationship between environmental factors and population movement on the Plateau. Dean states

> Five of the six critical droughts that supposedly induced abandonment of large areas of the Plateau were only ten years long. It is hard to see how one decade of subnormal precipitation could cause widespread population dislocation [Dean 1985:705].

While Berry's initial model was constrained to the Anasazi cultural sequence, Berry and Berry (1986) expanded upon the model to propose similar hiatuses during the preceding Archaic period. Again, Berry and Berry (1986:256) proposed an intermittent occupation of the Archaic Southwest rather than the continuous inhabitation proposed by a "gradualist" model. Berry and Berry state

> The most obvious and, therefore, attractive explanation of this phenomenon is that the Southwest is essentially an arid and inhospitable environment that invited exploitation by hunter-gatherers only during specific periods of increased effective moisture and proportionately greater biotic productivity. At other times, vast tracts of this region remained uninhabited or intermittently occupied during lengthy periods of low resource availability. [Berry and Berry 1986:311]

Perhaps the most significant hiatus proposed by the Berrys was one during the Middle Archaic Period lasting from 4,000 to 3,000 B.C. The Berrys also saw a repopulation of

the Plateau at 3,000 B.C. and posited that immigrating populations may have differed culturally from previous occupants on the Plateau, possibly originating from Central Mexico and the Eastern Great Basin (Berry and Berry 1986:317-318).

However, subsequent researchers have questioned the accuracy of the "migration model" discussed above. Based on his work in western New Mexico, Wills (1988) has repudiated the migration/hiatus model at least for that particular geographic area. Rather than the fragmented radiocarbon record predicted by the migration/hiatus model, Wills (1988:64) sees a more or less consistent growth in radiocarbon dates over time during the Archaic period. Furthermore, Wills (1988:61) finds that while some temporal periods do exhibit a reduction in radiocarbon dates, no decline in the radiocarbon record represents a "significant deviation from general trends." Therefore, Wills' interpretation of the data supports a continual occupation of the area, devoid of periods of abandonment as postulated by the migration model. As Wills (1988:61) summarizes, "the lack of distinctive steps or plateaus in the curve again confirms the absence of any periods when hunter-gatherers were not present in the region."

Geib (1997) has likewise demonstrated a failure of the migration/hiatus model to account for radiocarbon dates in the Glen Canyon region. Geib (1997:35) points out that while some types of sites (particularly "stratified shelters") in the Glen Canyon region do exhibit a gap in the chronometric record, other "open sites" indicate a "lack of wholesale abandonment at the end of the late Archaic." Referring to Berry and Berry's (1986) migration/hiatus model, Geib (1997:35) notes that in Glen Canyon the "basis for concluding that there was an occupational discontinuity at about 3000 B.P. is not, therefore, evident in the chronometric data." Geib's inference that much of the apparent

gap in radiocarbon dates may be attributable to an alteration in site type and location rather than regional abandonment is also interesting considering the fact that a significant portion of the dates used by Berry and Berry (1986:285-306) appear to derive from cave or rockshelter sites.

In sum, two population abandonments are proposed for the research area during the preceramic period. Hanson (1996) has cited a lack of Basketmaker sites on the Plateau indicating a hiatus during the Early Agricultural and Early Ceramic periods. I have proposed that while Basketmaker sites may indeed be lacking in the region, other evidence at the artifact level may indicate occupation of the region during that time. Additionally, Berry and Berry (1986) have proposed an abandonment of the Colorado Plateau (including the Coconino Plateau) during the Middle Archaic period. However, both Wills (1988) and Geib (1997) report that no such hiatus is evident in their respective research areas in the radiocarbon record. Again, the artifact analysis presented here seeks to quantify the number of temporally diagnostic projectile points for proposed abandonment periods that have been identified within the project area.

Chapter 3 : Methods of Analysis

This chapter summarizes the methods I employed to collect and analyze the data entered into the GIS database. Below, I outline the selection criteria that I developed for including artifacts in the study. Additionally, I discuss the method and theory behind the visual sourcing of lithic materials used for this study. I also discuss how the selection criteria may have affected the representativeness of the sample in regards to the population. The sample population, or universe, for the current analysis consists of all of the artifacts within the Kaibab National Forest collections. I will argue that the selection methods I used result in a sample that is representative of the population as a whole. However, it must be noted that the population itself represents only a sample of a greater universe, consisting of all of the artifacts that exist within the boundary of the South Zone of the KNF. Therefore, some discussion of the population is warranted before discussing the effects of sampling strategies used for the analysis.

The artifact collections of the Kaibab National Forest consist of thousands of artifacts collected from the forest over a period of approximately 30 years. During that period, archaeologists collected large numbers of ceramic, groundstone, and flaked stone artifacts as well as lesser amounts of less-common items such as shell and mineral pigment. For projectile points specifically, archaeologists generally collected complete and fragmented points that appeared to be stylistically diagnostic (Neil Weintraub, personal communication 2005). However, it is undeniable that attributes considered to be diagnostic must have varied somewhat between archaeologists based on the personal experience of the researchers. In the early 1990s, archaeologists on the Kaibab began to

question the utility of continuing to add artifacts to the sizeable collection already compiled by that time, and the practice was discontinued altogether by 1993.

Therefore, all of the artifacts derive from cultural resource surveys conducted prior to 1993. In the GIS database I designed for the study, I isolated all archaeological surveys that yielded artifacts used in the current analysis. These surveys total 126,711 acres or 13.4% of the total area of the South Kaibab (Figure 3.1). Additionally, it should be noted that provenience information for these artifacts is excellent. Site locations where the projectile points were collected have been plotted on aerial photographs with excellent precision. Numerous recent visits to such sites on the South Kaibab with GPS equipment have confirmed the accuracy of site locations generated using this method (personal experience, 2001-2003).

However, the population effectively consists of thousands of "grab" samples collected over a long period of time by a number of individuals possibly utilizing varying selection criteria. Drennan (1996:88) warns that such samples are likely to be misrepresentative of a given population in some way. For example, surveyors may collect artifacts that are highly visible due to size or color more frequently than less-visible artifacts, biasing the sample for such types. Moreover, Drennan cautions that such biases cannot be eliminated subsequent to collection. Drennan states

> There is no statistical technique for eliminating such bias once the sample has been selected. The appropriate statistical tool for avoiding sample bias is random selection of the sample, and this tool must be used at the time the sample is selected. It cannot be applied retroactively. Haphazard or grab samples are simply not the same as random samples [Drennan 1996:88].

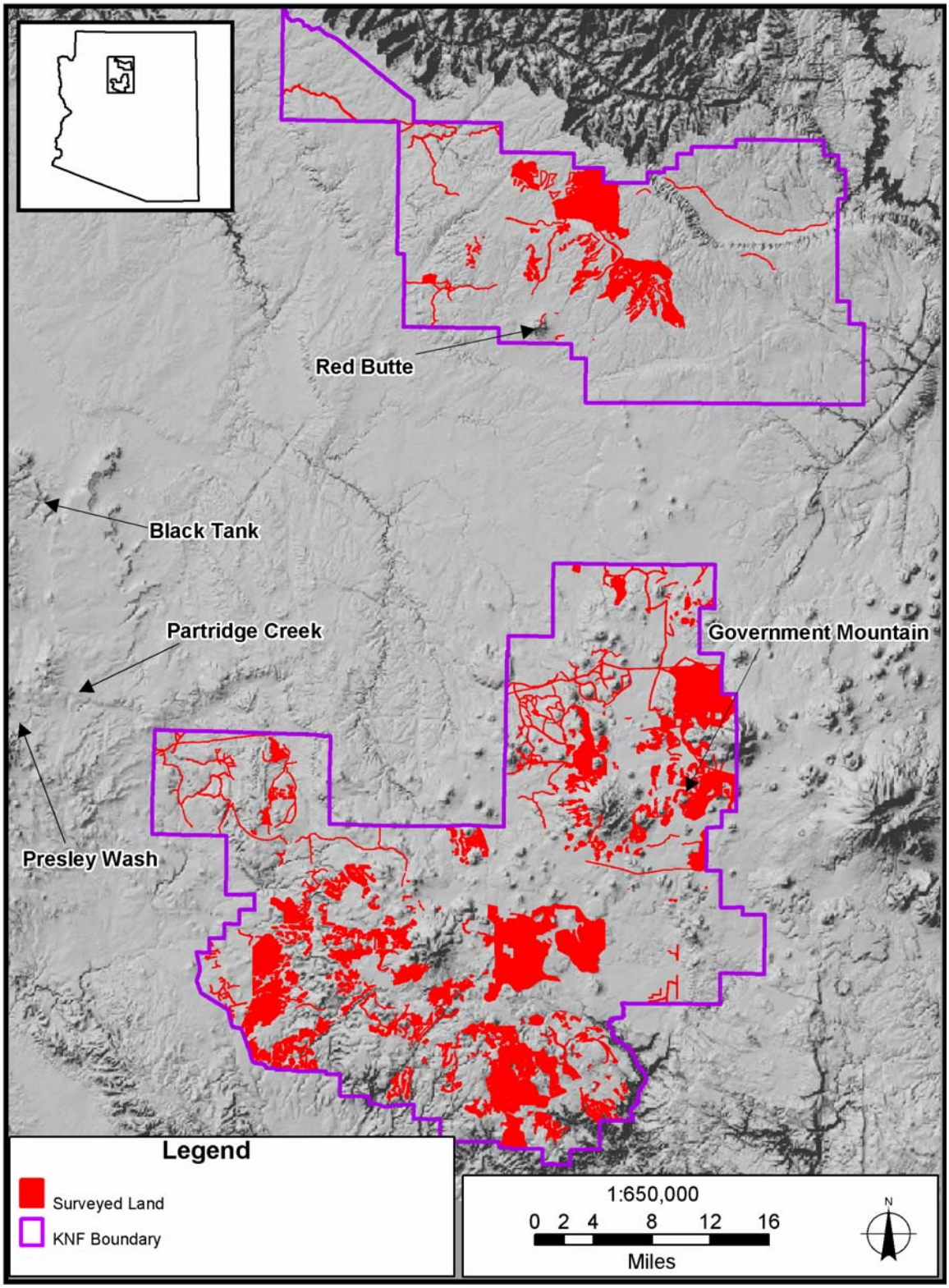

Figure 3.1. Geographic coverage of archaeological surveys yielding projectile points utilized for the study.

Therefore, it can be expected that the artifacts curated by the KNF may be misrepresentative of the artifacts on the forest as a whole. However, I would argue that such bias does not impact the current study, nor should the factors listed above discourage the use of such samples to further archaeological inquiry. Indeed, it is common for archaeologists to work with samples collected under similar circumstances. However, it is perhaps uncommon to utilize a sample that is so large, so well-provenienced, and derives from so large a geographic extent than the collection used for this analysis. Additionally, I would argue that the study infers little from the proportions of artifact types represented in the sample, and therefore remains unaffected by the possibility that such proportions may be biased. While some comparison of the frequencies of artifacts during distinct temporal periods is offered in the Conclusion to this volume, that comparison is ancillary to the central theme of the project.

Developing Artifact Selection Criteria for the Analysis

During the course of this project I developed a set of selection criteria in order to efficiently collect data from the artifact collection that was appropriate for the research design. At the beginning of the project such criteria were broad in scope but became narrower in focus as the analysis progressed. In the end, 626 artifacts were used to conduct the spatial analysis for this project. The following discussion outlines the selection criteria I developed and employed during the course of the study. Figure 3.1 is a conceptual drawing outlining the selection process using the described criteria.

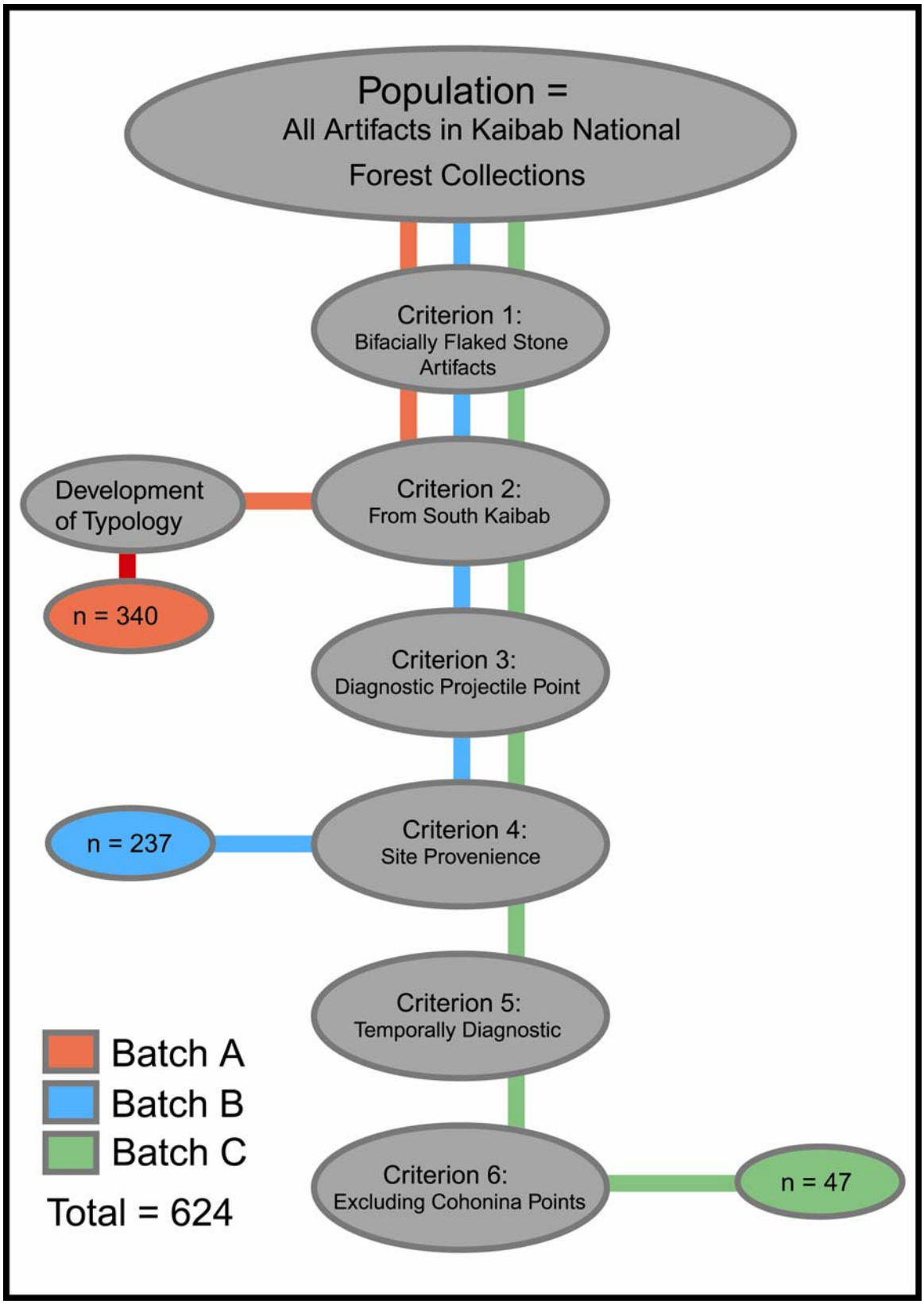

Figure 3.2. Conceptual drawing of the criteria employed to select artifacts for analysis.

Criterion 1: Prior to the current project no typological system for the classification of projectile points had been developed for the research area. Therefore, I was initially hesitant to use only what I recognized as "diagnostic" projectile points for the analysis. Without good descriptions of projectile point types for the region, how could one know the range of attributes that might be diagnostic of a given type? Therefore, I initially began collecting data on all bifacially-flaked stone artifacts within the population. My goal during the selection of artifacts under Criterion 1 was to gather enough points to develop a typology for the region so that future selections of artifacts would rely on established diagnostic attributes. I therefore selected 822 artifacts for use during the typological process, all of which were scanned at 1200 dpi (dots per inch) on a Visioneer Onetouch 8700 flatbed scanner and appear as Appendix A in this volume.

Criterion 2: After scanning the 822 artifacts selected under Criterion 1, I next removed all artifacts collected from the North Zone of the Kaibab National Forest. During the scanning process it became apparent that both morphological styles and lithic raw material types differed significantly between the two zones. The disparity of styles and material types between the two zones obviated the need to remove the North Zone materials prior to developing a typology focused only on the South Kaibab. I then developed a classification system for the South Zone materials as outlined in Chapter 4 of this thesis. The initial typology classified 340 projectile points into 33 morphological types. All unidentifiable points were removed from further analysis. Therefore, Batch A consisted of 340 artifacts that adhere to Criteria 1 and 2.

Criterion 3: After the development of a typology for projectile points on the South Kaibab, I could be reasonably confident of recognizing diagnostic attributes during

further selection. Therefore, I returned to the Kaibab collections and began to select all projectile points that could be classified under the current system. Although I had assumed that the artifacts in Batch A would represent all of the types within the population, I unexpectedly identified two additional types during further selection under Criterion 3. I therefore was obliged to add two new types to the current typology, the Jay and Cohonina types. Ultimately only one Jay point was found within the collections from the South Zone. Cohonina points on the other hand are ubiquitous within the project area, but all such points had been previously removed from the portion of the collection that I initially searched by another researcher (Horn-Wilson 1997).

Criterion 4: A small number of the artifacts I collected under Criteria 1-3 were recorded as isolated finds rather than collected from archaeological sites. Unfortunately, as I attempted to plot these artifacts in the GIS database, I discovered that provenience data for such isolated finds is not maintained to the same standards as for archaeological sites. While locations for archaeological sites on the Kaibab have been generated through the use of aerial photographs and Global Positioning System (GPS) units, locations of isolated finds were commonly generated by the Township and Range system and therefore much less accurate than site locations. Therefore, I decided to exclude isolated finds from the remainder of the analysis. In addition to the 340 artifacts included in Batch A, I selected an additional 237 artifacts that satisfy Criteria 1-4 (Batch B).

Criterion 5: Throughout the process of developing selection criteria for the inclusion of artifacts in the analysis, I was conducting research aimed at assigning temporal ranges to each morphological type. Eventually, I was able to assign temporal ranges to all but seven types. Because the current analysis relies only on temporally

diagnostic types, I completed the selection of artifacts from the collection using only temporally diagnostic artifacts.

Criterion 6: I utilized one final criterion to exclude Cohonina points from the sample. As discussed above, the distribution of Cohonina points within the sample had already been significantly biased by the removal of a number of Cohonina points for an earlier study (Horn-Wilson 1997). Furthermore, it became evident that the majority of the projectile points that remained within the collections were Cohonina points. Given the fact that the project focuses on the preceramic era (while Cohonina points are temporally diagnostic of the Ceramic Period) it was simply neither practical nor useful to continue to expend time on cataloging a large amount of artifacts derived from this temporal category. The exclusion of Cohonina points allowed me to select all remaining projectile points within the collection that conformed to Criteria 1-6 as Batch C (n = 47) .

By developing selection criteria throughout the data gathering process I was able to focus on the projectile points that are temporally diagnostic of the preceramic period as required by this study. This process ensured that I was able to collect data on every projectile point that met the defined selection criteria. That is, with the exception of the ubiquitous Cohonina point, every temporally diagnostic projectile point (under the current typological system) collected from an archaeological site on the South Kaibab was examined for this thesis. Therefore, in regards to artifacts that satisfy the selection criteria, the sample is completely representative of the population.

That is not to say that the sample is without bias. As I have stated above, the final sample is expected to be significantly under-representative of the Cohonina point type. However, I would argue that due to the temporal focus of this study, such a bias has little

effect on the current analysis except when distributions of all points are compared across temporal periods as discussed in the Conclusion. The most significant bias to the sample probably derives from the necessary exclusion of points collected as isolated finds. It could be argued that such isolated finds are deposited on the landscape in different ways and for different reasons than projectile points are deposited on archaeological sites. Therefore, it is undeniable that the exclusion of such points must bias the sample in some way, although the effects of such a bias on the sample are unknown at this time.

Visual Sourcing of Lithic Raw Materials

Several distinctive obsidian sources exist within or near the confines of the research area. At least some evidence of prehistoric quarrying of raw materials has been reported at each source (Lesko 1989; Shackley 1988) and the sites no doubt were important to prehistoric residents as lithic procurement areas. For this project, I was interested in the possibility of sourcing artifacts within the sample in order to analyze the spatial distributions of specific raw material types during varying temporal periods. Therefore, I attempted to include raw material source data for each of the artifacts included in the study.

Ideally, each artifact in the collection would have been chemically sourced by some technique such as x-ray fluorescence (XRF) so that chemical signatures for individual artifacts could be matched with each raw material source (at least for obsidian artifacts) on the Coconino Plateau. Unfortunately, such an analysis was not possible for this thesis primarily due to the costs involved in sourcing such a large sample. Therefore, I visually sourced all artifacts in the sample. My efforts relied upon published

descriptions of materials from each obsidian source as well as the personal experience of visiting some of the sources. Lesko (1989) has shown that the visual sourcing of obsidians in the research area can potentially be extremely reliable. This is largely due to the distinctive attributes exhibited by the local obsidians that make them "more amenable to visual sourcing" (Shackley 1988:768) than other obsidians in the Southwest. However, the success rate in visually sourcing Northern Arizona obsidians is always inferior to chemical sourcing methods and results can obviously be highly variable depending on the particular individual doing the sourcing.

I made two sets of categories for raw materials in this study. The first classification attempt consisted of categorizing artifacts into general raw material types rather than specific sources. Categories for this attribute include the types Obsidian, Chert, Rhyolite, Chalcedony, and Unknown/Other, and are numbered one through five respectively in the data table (Table 1). All siliceous material that was not classifiable as rhyolite, obsidian, or chalcedony was included in the chert category. In addition to identifying general raw material types for each artifact, I also attempted to visually source each artifact by specific raw material type/source. Below, I include brief definitions of the raw material types used for this study as well as the sorting criteria that I relied on in order to classify specific artifacts. See Lesko (1989) and Shackley (1988) for a more descriptive and complete definition of the obsidian types.

Table 1. General Raw Material Types

Identifier	General Raw Material
1	Obsidian
2	Chert
3	Rhyolite
4	Chalcedony
6	Unknown/Other

Local Raw Material Sources

Government Mountain Obsidian: Government Mountain is probably the major source of obsidian in the Flagstaff area. Shackley (1988:756) notes that the type is "aphyric [lacking phenocrysts], but the fabric megascopically is granular and distinctive." Generally, Government Mountain material is opaque, black rock, with a relatively large grain size and no phenocrysts.

RS Hill Obsidian: RS Hill obsidian is very similar to the Government Mountain type except that large phenocrysts are often present in the material (Shackley 1988:755). Therefore, I used the presence of phenocrysts as the sole classification attribute for the type.

Partridge Creek Obsidian: Partridge Creek obsidian is an "aphyric...vitreous opaque black" obsidian (Shackley 1988:755). Shackley (1988:755) also notes that Partridge Creek obsidian may be the best material of the local varieties for knapping, and the Partridge Creek source was second only to Government Mountain in overall numbers of artifacts represented.

Black Tank Obsidian: Also known as Rose Well obsidian, Black Tank obsidian is a very glassy material, lacking phenocrysts, varying in color from black to gray to brownish-red or mahogany (Lesko 1989:390). I identified small amounts of the

mahogany and gray varieties within the sample, but was probably unsuccessful at differentiating any of the black variety from the glassy, black obsidians derived from the Partridge Creek source.

Presley Wash Obsidian: Obsidian from the Presley Wash source is primarily distinguished from other local obsidians by a gray color and the opacity of the glass (Lesko 1989:389). Presley Wash obsidian is distinguished from the gray variety of Black Tank obsidian by the vitreous quality of the latter compared to the cloudy gray matrix exhibited by the former (Phil Geib, personal communication 2004).

Rhyolite: This material is a black, fine-grained igneous rock commonly observed on prehistoric sites in the study area. I referred to this material as rhyolite following Lesko (1989:389) although it also resembles fine-grained basalt. Several sources of the material may be present on the Coconino Plateau. However, I was able to find only one published account of a rhyolite source on the Coconino Plateau (Lesko 1989:389). Therefore, for the purposes of spatial analysis, I treated all samples of this material as if they derived from the source near Presley Wash reported by Lesko.

Kaibab Chert: Kaibab chert is a white, sometimes pinkish chert that occurs in nodules within the Kaibab limestone formation that overlies the Coconino Plateau. Therefore, the material is presumably ubiquitous throughout the research area and Kaibab chert artifacts were excluded from the spatial analysis of raw materials described in Chapter 5.

Red Butte Chert: I have used the term Red Butte chert to refer to the distinctive cherts that occur in the Tusayan District of the Kaibab National Forest in the northern section of the study area. The material has not been previously named although it has

been previously described as “native brown to red” (Jennings 1971:274) or “red brown to pale red-orange” (McNutt and Euler 1966:410) in color. In addition to these colors, I have also observed dark reds and purples in some samples, especially in heat-treated materials (see Appendix A, artifacts 20030041-43, 20030258, 20030264, 20030270 for examples). I have observed several sources of the material in the area surrounding Red Butte, although the geographic boundaries of the distribution of such sources are unknown. It is also possible that specific sources will prove chemically distinctive as are the obsidian sources found to the south. However, for the current analysis I have grouped all cherts of this type and arbitrarily designated Red Butte as the center of their distribution for the purposes of spatial analysis.

Perkinsville Jasper: Perkinsville Jasper is a highly recognizable silicate ranging in color from yellow to purple. Specimens of this material occur rarely in the study area and are often characterized by small flecks of black or a mottled appearance (see Appendix A, artifact 20030235).

Chalcedony: Chalcedony is a silicate that differs from chert by exhibiting a waxy luster (Sorrell 1973:208). All of the chalcedony identified during the project was white in color and identified solely based on luster. However, it should be noted that heat-treated cherts (such as Kaibab chert) also take on a waxy, lustrous quality so that distinguishing between heat-treated cherts and chalcedony can be difficult in some cases.

Unknown/Other: I categorized all artifacts that did not appear to exhibit the defining attributes of the raw material types listed above into the Unknown/Other category. This category included such non-local materials such as Owl Rock chert. One

of my underlying assumptions for the spatial analysis portion of the project was that these artifacts largely represent non-local imported materials.

A Note Regarding Other Obsidian Sources near the Project Area

Researchers familiar with the Coconino Plateau may notice that several known sources of obsidian within or near the study area do not appear in the list above. In general, the absence of such sources from the current study results from the low "workability" of these materials for stone tools. I have assumed here that such materials, while possibly utilized as expedient stone tools, were rarely used for highly specialized tools such as projectile points. For example, obsidian sources have been documented by Shackley (1988) at Sitgreaves Mountain, Kendrick Mountain, the San Francisco Peaks, and O'Leary Peak/Robinson Crater. However, Shackley (1988:755-757) reports that such materials range from poor to useless in knapping quality. An additional obsidian source exists at Slate Mountain that produces a black and red obsidian similar to that at Black Tank. However, the Slate Mountain material reportedly contains phenocrysts (Shackley 1988:756) and I observed no such material within the sample.

Therefore, the sources of lower-quality obsidian in the Flagstaff area were not included as possible sources for the sample data. However, the possibility remains that some of these sources may be represented in the sample, and have as yet remained unidentified. In all likelihood, such artifacts would have been misidentified as deriving from Government Mountain, the type most closely approximating the physical characteristics of the other materials. Clearly, the study would benefit from a chemical sourcing of each artifact, so that less-easily-identified material types such as these could

be discerned more easily. A chemical sourcing analysis of the same data would prove enlightening, and is recommended as a possibility for future research in the project area.

In sum, this chapter has outlined the methods used for selecting artifacts for inclusion in the study and determining the type of lithic raw material used in the production of each point. I have argued that the selection criteria employed have resulted in the inclusion of all temporally diagnostic, preceramic-era points collected from archaeological sites on the South Zone of the Forest. Therefore, I have argued that despite the exclusion of isolated finds from the current study, the sample is representative of the preceramic materials within the greater population. Furthermore, I have argued that the population, defined as the artifact collections of the KNF, is not unrepresentative of the material culture on the South Kaibab in any way that affects this study. The following chapter describes the methods and results of creating a typological system of classification for these materials, as well as descriptions of the 35 morphological types generated under this system.

Chapter 4 : Projectile Point Types of the Coconino Plateau

We need always to keep in mind that artefacts were made and used by bygone peoples for the purposes of theirs, which we may or may not be able to fathom, but typologies are made by us for purposes of ours (Adams 1988:47)

By far, the most daunting task for this thesis was to place all of the artifacts within a typological framework useful for the specific research area. I ultimately make inferences about preceramic human settlement based on where specific projectile point types appear on the landscape. Therefore, the process of classifying artifacts into types was of primary concern. Unfortunately, the literature regarding the typological classification of lithic artifacts can often be vague or inconsistent. Although an exhaustive analysis of such issues lies outside the scope of the project, a general review of the literature regarding artifact classification was necessary to ensure that I developed a typology that was functional for the research area.

Below I briefly outline the two primary theoretical methods of Southwestern lithic classification. The first method is that of quantitative or statistical typology. The quantitative method seeks to develop a system of classification that relies on objectively determined attribute data, such as measurement values for clearly defined, morphological features. The second method varies by relying on the intuitive skills of the typologist to sort artifacts into meaningful types based on perceived traits. For the current project, the research design and scope of the research questions necessitated use of an intuitive typology. Below, I briefly outline the development of the current typology and the rationale behind using an intuitive approach. Finally, the remainder of the chapter is

essentially a catalogue of the 35 projectile point types used for this study including illustrations, metric data, temporal ranges, and brief descriptions for each type.

Contrasting Methods of Lithic Artifact Classification in the Southwest

Since the 1960s some archaeologists have advocated increasingly objective methods of artifact classification (Binford 1963) and several researchers have developed objectively defined projectile point typologies for sub-regions of the Southwest and Great Basin (see for example Berry 1987, Holmer 1987; Phagan 1988). Objective methods of classification attempt to minimize the effects of the typologist on the classification process and thus remove possible bias from the analysis. The potential benefits of such an approach are numerous and should not be understated. For example, objectively determined types are clearly defined and easily replicable, allowing for a consistency of classification between numerous investigators in varying locations.

To date, a lack of consistency in classification between researchers continues to hamper projectile point studies in the region. It is common for investigators to attribute different names and temporal designations to points exhibiting identical morphological attributes based on personal experience or geographic emphasis. For example, Huckell (1997) conducted a projectile point workshop in which he asked 18 archaeologists to identify five projectile points. The results show a significant disparity between type distinctions among Southwestern archaeologists leading to the conclusions that

> 1) Many rather common points can easily be assigned to one or more types; 2) use of a particular type is often determined by where you received training or have most of your field experience or the geographic area in which you work; and 3) in the absence of objective morphological criteria and clear definitions of types, we will continue to have this problem. [Huckell 1997]

This type of confusion is an old problem in the region and in projectile point studies in general. Four decades ago Binford (1963:195) attempted to develop a universal projectile point classification system so that types could "be understandable and recognizable by other investigators so that comparative typological studies can be conducted with as little dependence upon individual opinions as possible." While a universal system has not been, and perhaps never will be developed, subsequent investigators have made crucial contributions to projectile point studies by increasing the consistency of the classification process.

One such example is Holmer's (1987) work on objective methods of projectile point classification for the Great Basin. Holmer's approach consisted of

> 1) digitizing the profiles of projectile points used for original type definitions, 2) isolating the statistically significant differences among those types by the use of a discriminate function computer program, and 3) mathematically categorizing the projectile points...[Holmer 1987:92].

Through the use of objective classification techniques, Holmer succeeded in standardizing a wide range of projectile point types for that region. Southwestern archaeologists have similarly adopted most of Holmer's types, several of which appear later in this chapter. Using methods similar to those employed by Holmer, investigators have developed other typologies for specific regions of the Southwest. Two such

typologies derive from regions in relatively close proximity to the research area and were likewise consulted for the current project (Berry 1987, Tagg 1994).

However, despite some of the theoretical benefits of an objective method of classification, its application is not problem-free. One primary concern regarding computer-aided typologies in particular is that such processes have the potential to produce large numbers of types, many of which are statistically supported but which are not meaningful as categories. As Adams (1988:43) states, a "statistically significant attribute cluster is usually *necessary* but not a *sufficient* condition for the designation of a type; statistical significance is also a matter of degree rather than something absolute." In other words, computer-aided analyses can potentially generate numerous types that are statistically viable but of little utility to the researcher. Conversely, such methods have been known to group morphologically similar points of significantly disparate sizes into a single type (Phagan 1988), while intuitive methods easily distinguish between such artifacts. Although such size difference may not prove statistically significant, one might argue that the functional aspect of projectile point size must not be overlooked when developing typologies.

More importantly for the current project, computer-aided typologies require significantly more time and resources than do intuitive typologies. Given this fact, the researcher must weigh the desire for an objectively defined typology against the practicality of using a computer-aided analysis. Often, such a method can require so much time that the creation of a typology itself becomes the end product of a research project. While some may argue that such classification schemes are superior in that they

are consistent and free of bias, perceived benefits of a statistical approach must be weighed against practicality and the over-arching research objectives.

For example, both Berry (1987) and Tagg (1994) have developed comprehensive, statistically-derived typologies for sub-regions very near to the research area. Unfortunately, neither of these two typologies is suitable for use on the Coconino Plateau. The list of 35 types used for the current project includes several examples of culturally or temporally significant types that do not appear in one or both of Berry and Tagg's typologies. Therefore, for projectile point studies on the Coconino Plateau one is faced with two choices: 1) develop yet another statistical typology for use specifically in the research area with the hope that at some future date some researcher will utilize that typology to pursue current research questions, or 2) synthesize what is already known in areas surrounding the research area to develop an intuitive typology so that research can progress towards an analysis of temporal and spatial distributions of projectile points in the area.

In contrast to an objective typology, an intuitive typology can be less replicable, but more practical. Whallon (1971) observes that such processes are polythetic, employing criteria that exhibit varying importance, occur in various stages of the classification process, and shift from type to type. Therefore, computer aided typologies, which rely on monothetic classification systems, cannot easily replicate most typologies devised by people. In the case of projectile points, known types have developed out of a "continual dialectic, or feedback, between induction and deduction, object clustering and attribute clustering, lumping and splitting (Adams 1988:45, see also Adams and Adams

1991)." In essence, types are developed and modified over time dependant upon observational data.

For the research project described here, I developed an intuitive typology for two reasons. Again, the intuitive method is much faster and more practical than the statistical method for typing large amounts of artifacts. Developing and implementing a statistical classification method is a large-scale research project unto itself. In the case of my current research, the typology is ancillary (Adams 1988:51) in that it has been developed as an aid in answering questions about the Coconino Plateau and is not in itself the endpoint of the investigation. Therefore, the research design requires the ability to quickly classify a large quantity of artifacts so that broader questions of spatial distribution can be addressed. Second, I would argue that an intuitive typology encourages the use of previously defined types that have been shown to be viable in the Southwest. The use of such types relates to a large body of existing data and thus contributes to the dialectic process of lithic analysis in the Southwest.

Development of the Current Classificatory System

The current classification is an open typological system based on the intuitive sorting of projectile points into types. An open typology assumes that future types may be discovered within the research area. In most cases, I used published type definitions from outside of the research area to identify points within the collection. In such cases, I attempted to use the most common name associated with each projectile point type for the following discussion. In some cases, I grouped artifacts into types for which I could find no analog in the existing literature and assigned new names to these types.

The current typology evolved slowly out of a number of steps. As discussed in Chapter 3, I developed the typology using 340 artifacts from the Kaibab collections selected under Criteria 1 and 2 (Batch A). I began the classification by sorting artifacts into easily recognizable types or into groups that shared some general characteristics. I then utilized published descriptions and personal correspondence with other researchers to sub-divide some of these groups. In all, the classification process took several months, during which time I was constantly defining and re-defining type categories.

On March 12, 2004, I conducted a Projectile Point Typology Workshop with the aid of six participants. The participants were Dr. Francis Smiley and Dr. Christian Downum of the Northern Arizona University, Department of Anthropology, Dr. Stan Ahler of the Paleocultural Research Group, Phil Geib and Mick Robbins of the Navajo Nation Archaeological Department, and Peter Pilles, Forest Archaeologist for the Coconino National Forest. Collectively these participants represent decades of experience in projectile point identification and/or lithic analysis and have published extensively on a wide range of relevant topics. Additionally, at least one of the individuals listed above is particularly proficient in each of the major time divisions examined for this thesis (Paleoindian, Archaic, Basketmaker, and Puebloan).

The purpose of the classification exercise was to test the typology I had created and also to attempt to develop a classification system that was satisfying to all of the participants. My underlying assumption was that if six individuals with such a range of experience could agree on most of my typological decisions, then the majority of these types would likewise satisfy most lithic analysts within the Southwest. The group examined the artifacts within each category I had constructed and offered

recommendations on transferring specimens between types, creating new types, or eliminating existing groups. Artifacts that proved particularly problematic were removed from the sample altogether. Most changes were made by consensus of the group. However, all of the final type designations were my own and should not be interpreted as reflecting the opinion of any other individual.

Figure 4.1. The author and Coconino National Forest Archaeologist Peter Pilles examine artifacts during the Projectile Point Typology Workshop held at Northern Arizona University (photograph by F. Smiley).

Projectile Point Types on the Coconino Plateau

Below is a description and discussion of the 35 projectile point types developed for the current analysis. Claudia Berry (1987:5) notes several factors that "add to the typological confusion" of projectile point studies in the Southwest: "[1] Poor artifact descriptions, [2] omission of adequate metric data, [3] lack of photographs, and [4] and

inability to recognize the products of reworking." I have tried to some extent to anticipate each of these for the current analysis and to address such issues within the following pages.

Below, I have arranged types in chronological order to the extent that such an arrangement is possible given the temporal data currently available. All projectile points are referred to, where possible, by the "common" name associated with that point style within the general literature. I have included brief descriptions of each type, but the reader is referred to sources cited in the text for formalized descriptions. Most useful to the reader will be the images of each type included below. Rather than show only the "best" example of each type, I wanted to show the entire sample in order to give the reader a sense of the range of variability (or potentially the lack thereof) within each type category.

In addition to descriptive data, base metric data are provided for specific types. Tables of descriptive statistics based on the metric data are provided for most types with multiple specimens. In many cases, metric data are used to bolster typological distinctions between two or more categories. However, metric data are primarily provided for comparative purposes for other researchers. It is important to note that I only took measurements on the 340 points from Batch A used to develop the current typology, so metric data do not represent every known point of a given type within the collection. Specific measurements for each projectile point are provided in Appendix B. Finally, each projectile point type description includes the temporal category that I have assigned it to and my justification for doing so.

Paleoindian Period Types (11,900 to 9,000 B.P.)

Type Name: Clovis
Temporal Range: 11,500 to 10,900 B.P.

Clovis points are large, fluted, lanceolate points associated with the Paleoindian period. Two Clovis point basal fragments were identified during the study[3] (Figure 4.2). Artifact # 20030643 is fashioned out of Government Mountain obsidian and measures 28.06 mm in maximum width and 5.84 mm in thickness, well within the size range of 20 other Clovis points from the Flagstaff area reported by Pilles and Geib (2000). The specimen is fluted, although refurbishing along the basal edge has obscured the flute somewhat. In addition to displaying lateral and basal grinding, longitudinal

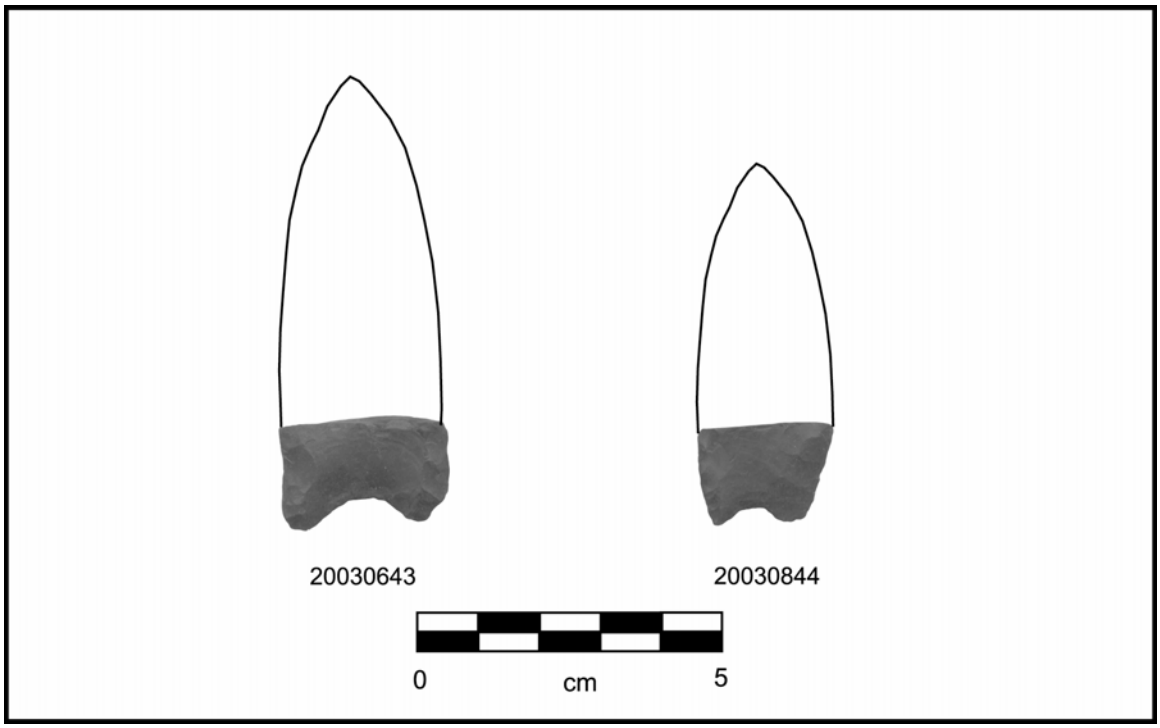

Figure 4.2. Clovis

[3] Avocational archaeologist Curtis Porter conducted an inventory of some of the projectile points in the Kaibab collections and graciously shared his findings for use in the current analysis. In that inventory, Mr. Porter reported the existence of one Clovis point from the Williams District, and it is assumed that one of the points reported here is the same observed by Mr. Porter.

scratching is observable within the flute. Such scratching occurs on Clovis points made of obsidian and may represent an attempt to roughen the surface of the point to increase adhesion to the haft (Phil Geib, personal communication 2003).

Artifact 20030844 appears to be a heavily patinated example of banded Black Tank obsidian. The artifact has undergone extreme weathering, resulting in differential erosion of the flow bands within the obsidian sample causing a "rippled effect" on the artifact surface (Phil Geib, personal communication 2004). At first glance, specimen 20030844 appears to be leaf-shaped rather than parallel-sided, a trait that would seem to exclude Clovis as a possible type. However, like point 20030643, flakes have been detached subsequent to the fluting of the projectile point. One large flake in particular truncates the base somewhat and has resulted in the slightly abnormal leaf shape displayed by the point. Radiocarbon dates for Clovis points indicate a temporal range for the type of 11,500 to 10,900 B.P. (Stanford 1999:289). The two Clovis points described here are the first two artifacts presumed to date to this time period found on the South Kaibab.

Type Name: Indeterminate, Large Stemmed Points
Temporal Period: Unknown

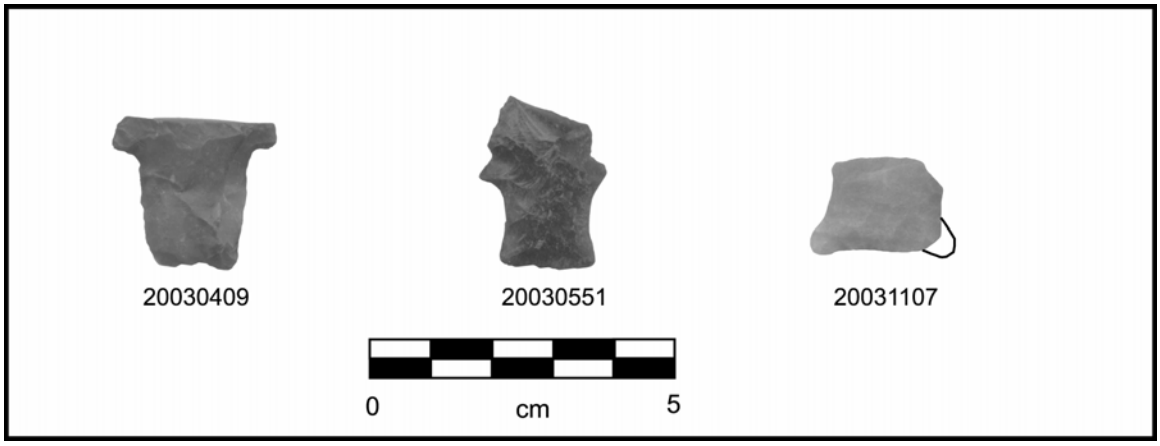

Figure 4.3. Indeterminate Large, Stemmed Points

This type consists of three stemmed points of unknown, but probably very early temporal affiliation (Figure 4.3). The three artifacts discussed below exhibit significant morphological differences, and should only be considered a type in the sense that they are all large, stemmed points that appear to be unique within the current sample. All three artifacts deserve special mention because of shared attributes with some Early Archaic and Paleoindian forms. For the current analysis, I have considered such forms to represent possible indicators of a Late Paleoindian or Transitional Period occupation.

Artifact 20030409 is a large, shouldered point with a slightly contracting stem and a slight basal concavity. Shoulders of the point are squared and prominent and the point has been finished by percussion flaking only (no pressure flaking is evident). In addition, no basal or lateral edge grinding is evident on the artifact. The artifact was made of heat-treated Red Butte chert. The hafting element measures 20.37 mm from shoulder to stem and the maximum width of the point, measured at the shoulder is 27.23 mm.

This artifact is enigmatic since it represents an anomalous form for the project area yet was manufactured from local materials. The form itself appears most similar to the Jay type although it lacks grinding along the stem, which is a primary diagnostic attribute of the type. Morphologically, artifact 20030409 appears similar to at least one example of Berry's (1987:333, 335, Figure 32l) Rio Grande Stemmed type, a type that includes both the Bajada and Jay types. Berry (1987:339) also notes that for Rio Grande Stemmed points, "there are several examples of prominent, square shoulders."

Artifact 20030551 is an anomalous stemmed point of Government Mountain obsidian. Artifact 20030551 displays heavy grinding along the lateral edges of the hafting element resulting in a concave-sided stem. The point is shouldered and shows

evidence of reworking/refurbishing along the blade edge, implying a potentially long use-life for the artifact. Artifact 20030551 has a shorter hafting element than 20030409 at 13.92 mm and measures 21.29 mm in width at the shoulders. The heavy degree of grinding coupled with the precision of the pressure flaking implies that the point may date to the Late Paleoindian or Early Archaic period although I could find no example of similar morphology in the literature.

Finally, artifact 20031107 is a stemmed point of Red Butte chert. Like 20030551, the point exhibits evidence of heavy grinding along the basal and lateral edges of the hafting element. Likewise, the point displays concave sides, resulting from the presence of ears that extend at right angles from the stem along the basal edge. The artifact has been fractured significantly after deposition, probably as a result of at least one forest fire (Phil Geib, personal communication 2004). Again, the presence of heavy grinding may indicate a Late Paleoindian or Early Archaic temporal affiliation. I could find no examples of dated points to confirm this statement, although the point appears similar to one reported by Spurr et al. (2004:40) from the Little Colorado River drainage.

Type Name: Jay
Other Names: Lake Mojave
Temporal Period: 11,000 to 8,000 B.P.

Jay points are large, stemmed points that exhibit straight or convex bases and generally are ground along the lateral and basal edges of the stem (Moore and Brown 2002:4). Like Paleoindian points, Jay points are exceptionally rare within the collection. Only one Jay point from the South Kaibab was identified within the collection (Figure 4.4). Artifact 20040864 is a large point of Government Mountain obsidian. A slight

basal indentation exists on the point and light grinding along the lateral and basal edges is also evident.

Jay points are generally accepted as the "characteristic projectile point style of the Early Archaic period in Arizona (Tagg 1994:98). However, an exact date range for the type is not known. Since Irwin-William's (1973) Oshara typology, Jay points have been considered a predecessor to other Early Archaic forms such as the Bajada point. Justice (2002b:97-103) makes a good case for assigning a date range of 11,000 to 8,000 B.P. for the type based on associations of Jay (Lake Mojave) points with dated assemblages from San Dieguito complex and Western Pluvial Lakes tradition sites in the Western states. If such a temporal designation holds, Jay points could be considered a bridge between the

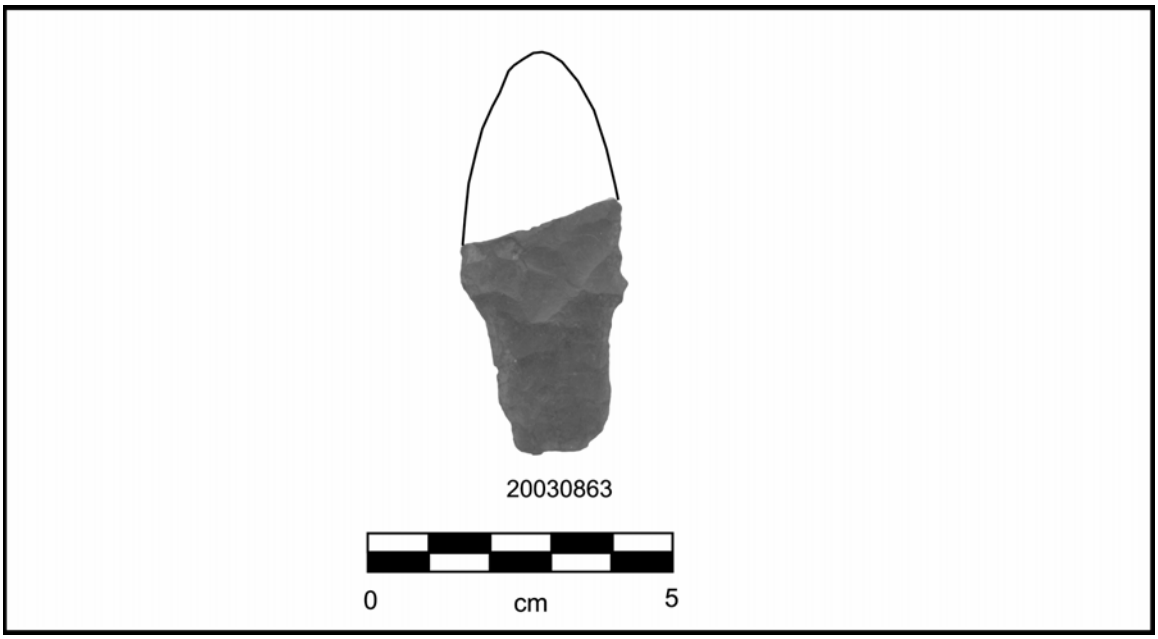

Figure 4.4. Jay Point

Paleoindian and Early Archaic periods as Justice (2002b:98) suggests. For the current analysis, I have placed Jay points chronologically in the Transitional Period between Late Paleoindian and Early Archaic in order to acknowledge recent early dates.

Early Archaic Projectile Point Types (9,000 B.P. to 6,200 B.P.)

Type Name: Bajada
Temporal Range: 8,000(?) to 5,000 B.P.

Fifteen Bajada points were identified during the project, eight of which were included in Batch A (Figure 4.5). Bajada points are shouldered dart points with ground lateral and basal haft element margins and concave bases. Basal concavity can be slight on some specimens, as in 20030080, 20030308, 20030341, and 20030592. In most cases, narrower bases distinguish Bajada points from earlier, concave-based points. All of the measured specimens are narrower than the two Clovis points, ranging in width from 16.10 mm to 23.32 mm (mean = 19.10 mm). Additionally, following Moore and Brown (2002) I used the length of the hafting element to differentiate between Bajada points and later Pinto/San Jose points, generally classifying longer stemmed specimens as Bajada points.

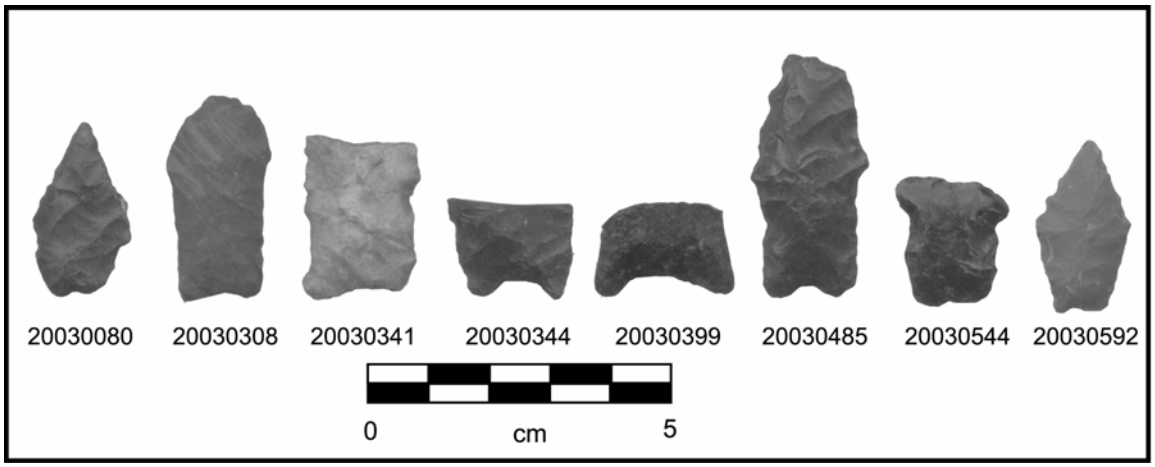

Figure 4.5. Bajada

Points of this type within the sample are primarily obsidian (66.66%, n = 10) although chert (26.66%, n = 4) and rhyolite (6.66%, n=1) are also represented. Obsidian artifacts derive from the Government Mountain, Partridge Creek, and Presley Wash sources. Both local and exotic cherts are represented within the sample as well. One Bajada point (200301108) is made of Owl Rock chert, the closest exposures of which occur in the Painted Desert east of Leupp and northeast of Cameron, Arizona (Phil Geib, personal communication 2004).

Table 2. Metric Data for Bajada Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	8	...	...	...	...
Blade Length	4	14.681	22.327	18.88490	3.501302
Stem Length	5	9.550	21.336	15.97660	4.740214
Total Length	4	28.727	40.310	33.03270	5.425244
Maximum Width	8	16.104	23.317	19.09763	2.351718
Maximum Thickness	8	3.556	7.874	5.73723	1.504305

The Bajada type was originally defined by Irwin-Williams (1973) and assigned an age of 6,800-5,200 B.P. This date range is commonly cited within the literature (Sliva 1997:49, Tagg 1994:98) although new data may indicate an earlier start date for the type (Justice 2002b:123). For example, Parry and Smiley (cited in Justice 2002b:123) report an early date range of 8,300-8,000 B.P. for some Bajada sites on Black Mesa. For the purposes of this analysis, I have offered an earlier start date for this type of 8,000 B.P. that reflects the most recent data available with the caveat that this earlier date remains somewhat tentative.

Type Name: Northern Side-notched
Temporal Range: 7,500-6,400 B.P.

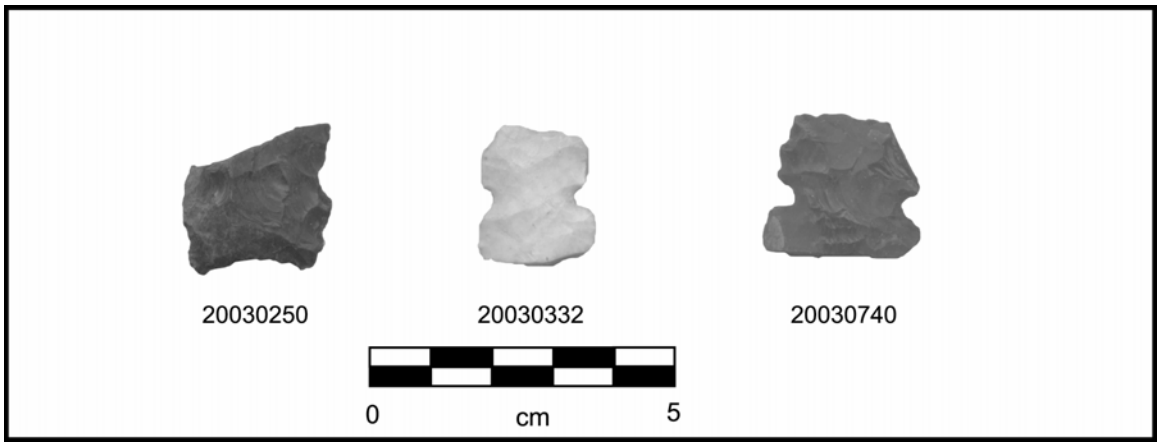

Figure 4.6. Northern Side-notched

The Northern Side-Notched point type was defined by Gruhn (1961, cited in Holmer 1986:104) and consists of medium to large points with notches placed high on the sides and flat or slightly concave bases (Figure 4.6). A total of six Northern Side-notched points were identified within the collection. The type is differentiated from later Sudden Side-notched points primarily by the morphology of the base. Northern Side-notched points exhibit concave-bases while Sudden Side-notched points exhibit bases that are "contracting- to well-rounded" Holmer (1986:104). Additionally, Northern Side-notched points are typically notched lower to the basal edge than Sudden Side-notched points.

Within the sample, Northern Side-notched points reflect a disparate use of raw materials including Partridge Creek obsidian (n = 1), chalcedony (n = 1), rhyolite (n = 1), and local and exotic chert (n = 2). Holmer (1986:104) assigns a date range of 7,500-6,400 B.P. to this artifact type and Northern Side-notched points are a generally accepted indicator of the Early Archaic Period (see Fairley 1989:92-94, Tipps 1988:80).

Therefore, I have likewise considered Northern Side-notched points to be indicators of an Early Archaic occupation within the research area.

Table 3. Metric Data for Northern Side-notched points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	3	...	...	...	...
Stem Length	2	13.462	15.494	14.47800	1.436841
Maximum Width	3	20.244	26.187	23.82520	3.153796
Maximum Thickness	3	4.318	5.994	5.38480	.927013

Middle Archaic Projectile Point Types (6,200 B.P. to 4,600 B.P.)

Type Name: Pinto/San Jose
Other Names: Pinto, San Jose
Temporal Period: 5,200? to 3,200 B.P.

The Pinto/San Jose type represents one of the most problematic types within the sample. Descriptions of morphological differences between the Pinto and San Jose types appear to rely primarily on the presence of edge serration on San Jose points (Lorentzen 1998:145). Such a distinction is of little use for classification purposes due to: 1) the large number of basal fragments within the sample and, 2) the high frequency of reworked/refurbished blades exhibited by artifacts of this type. At present, lithic analysts are split between those who distinguish between the two types (see for example Justice 2002b; Matson 1991) and those who do not (Berry 1987; Christensen 1987:170; Lorentzen 1998:145; Sliva 1997:50; Smiley 1995; Tagg 1994:98). Due to a lack of clearly defined attributes that enable the differentiation between the two types, I have similarly combined the types for this analysis.

A total of 33 Pinto/San Jose points exist within the current collection. Of these, 66% (n = 20) are obsidian, 12.1% (n = 4) chert, and 27.3% (n = 9) rhyolite. This type is

similar to the Bajada type, in that projectiles are shouldered dart points exhibiting concave bases (Figure 4.7). Irwin-Williams (1973:7-8, Figs. 3-4 in Tagg 1997:98) notes a differentiation between "weakly" and "sharply" defined shoulders between San Jose and Bajada points. However, due to the large number of reworked and incomplete specimens present in the sample, this attribute was of little utility during the study. As discussed above, I primarily differentiated between the two types based on overall size,

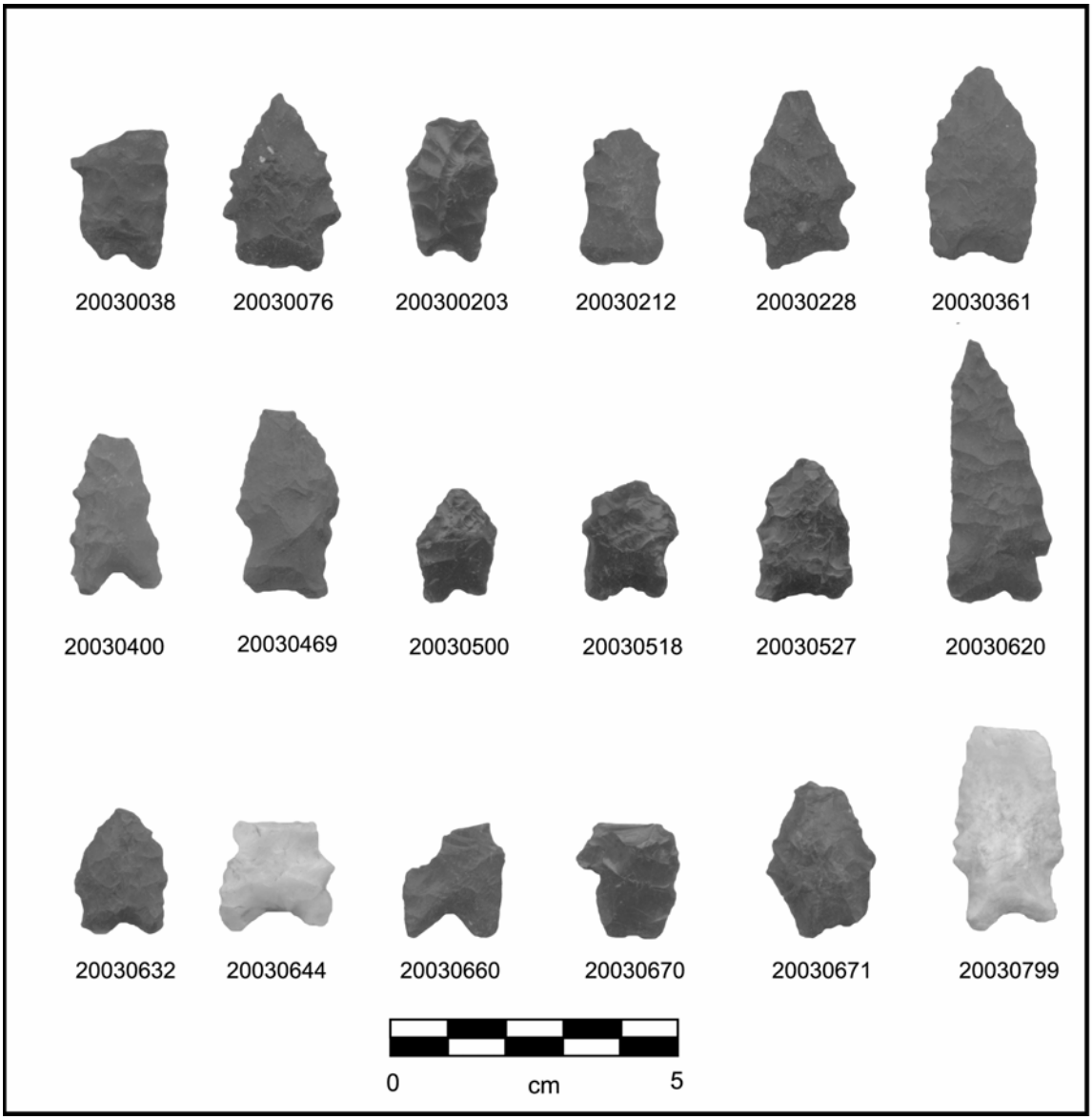

Figure 4.7. Pinto/San Jose

particularly the length of the stem, classifying longer stemmed specimens to the Bajada category (see Moore and Brown 2002).

A review of the literature reveals a significant disparity in temporal range cited by archaeologists for Pinto/San Jose points (Fairley 1989:91, 8,300 to 6,200 B.P.; Holmer 1987:97-99, 8,300 to 6,200 B.P.; Sliva 1997:50 7,000 to 3,500 B.P.[4] ; Lorentzen 1998:145 9,500-2,800 B.P.[5]; Tagg 1997:98 5,200-3,800 B.P.). Some of the difference in temporal designation may relate to geographic location as Tipps (1988:80) notes that Pinto points are early (8,300 to 6,200 B.P.) on the northern Colorado Plateau but occur later in the Great Basin area. As Berry states

> Attempts to plot the distribution of San Jose/Pinto or Grants points [referred to below as Armijo points] across the Southwest or to assess the chronometric evidence for their temporal placement is frustrated by the magnitude of the typological problem. That is, it is not clear at all that we are dealing with analog types throughout this large region. It is also apparent that we are probably dealing with a series of point types whose distribution changes fairly dramatically through time and which exhibits morphological variation that reflects both temporal and geographic characteristics [Berry 1987:417].

Despite the disparity in Pinto/San Jose date ranges cited in the literature, researchers generally consider the type to represent a descendant of the Bajada point, and often associate the Pinto/San Jose points with the Middle Archaic period (see for example Tagg 1994:95, 98). In addition, Berry (1987:418-423) argues convincingly that the earliest dates for this type may not apply on the Colorado Plateau and that the best local evidence for the type implies a post- 5,000 B.P. start date. Therefore, I have likewise

[4] Includes the Gatecliff Split-stemmed type.
[5] Includes the Gatecliff Split-stemmed type.

dated the type to the Middle Archaic period here with the caveat that the temporal range of Pinto\San Jose points remains poorly understood.

Table 4. Metric Data for Pinto/San Jose points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	18	...	...	...	...
Blade Length	12	11.735	39.675	19.09868	7.924019
Stem Length	13	7.874	15.392	11.44368	2.586763
Total Length	12	19.888	46.126	28.28502	7.315172
Maximum Width	18	14.376	20.853	17.94651	1.823880
Maximum Thickness	18	4.445	7.061	5.84623	.743510

Type Name: Sudden Side-notched
Temporal Range: 6,400 to 4,400 B.P.

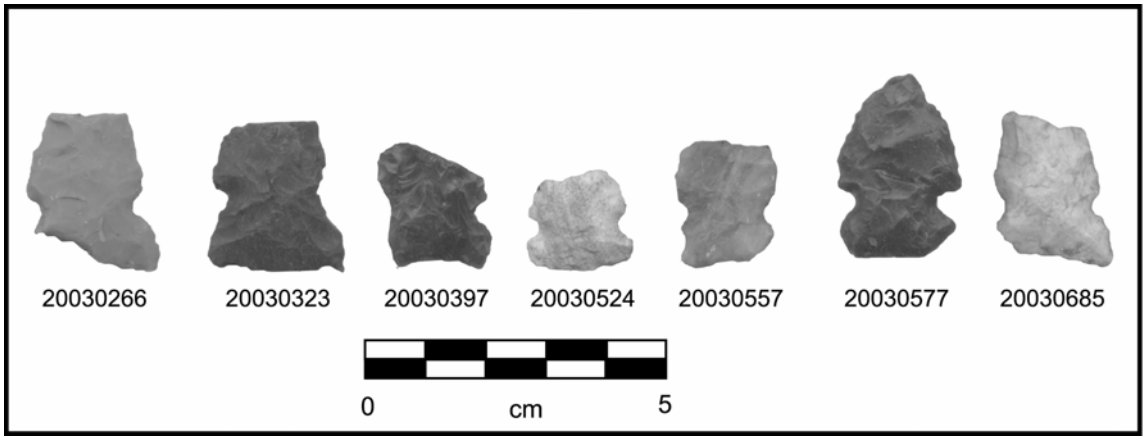

Figure 4.8. Sudden Side-notched

Ten Sudden Side-notched points exist within the analyzed collection. As discussed above, such points are primarily distinguished from Northern Side-notched points by their straight-to-convex bases and notches placed higher on the point. According to Holmer (1986:104) Sudden Side-notched points replace the Northern Side-notched form around 6,400 B.P. and continue until 4,400 B.P. Fairley (1989:93-96) associates the type with the Middle Archaic period based on Holmer's dates. Within the collection, 60% of the Sudden Side-notched points are obsidian, representing the

Government Mountain (n = 2), Partridge Creek (n = 3), and Presley Wash (n = 1) sources. The remaining points are local (n = 3) or exotic chert (n = 1).

Table 5. Metric Data for Sudden Side-notched Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	7	...	...	...	...
Blade Length	1	21.082	21.082	21.08200	...
Stem Length	7	9.119	14.935	11.40460	1.770181
Total Length	1	30.963	30.963	30.96260	...
Maximum Width	7	17.145	22.911	19.79023	2.323993
Maximum Thickness	7	3.861	5.791	4.69900	.672820

Late Archaic Projectile Point Types (4,600 B.P. to 2,400 B.P.)

Type Name: Gatecliff Split Stem
Temporal Range: 5,000 to 3,300 B.P.

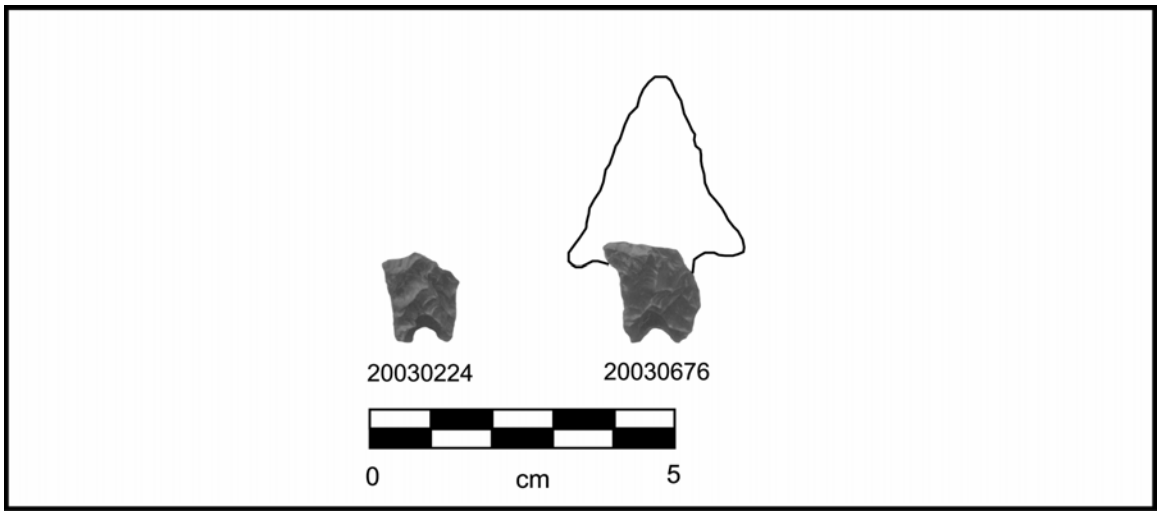

Figure 4.9. Gatecliff Split-stemmed

Two Gatecliff Split-stemmed, basal point fragments exist within the collection. The Gatecliff Split-stemmed type is similar morphologically to the Pinto/San Jose type in that such artifacts are stemmed, shouldered dart points with concave bases. However, the type is distinguished from Pinto/San Jose based on exhibited "pointed basal projections"

(Holmer 1986:97) and prominent shoulders with a large, triangular blade (see Figure 4.9[6]). Both specimens within the sample are Partridge Creek obsidian. Holmer (1986:97) originally offered a date range of 5,000-3,300 B.P. for the Gatecliff Split-stemmed type, placing the type within the Late Archaic period. I have maintained Holmer's date range for the current analysis. Obviously, lacking a complete specimen, metric data for the type are limited but are provided below nonetheless (Table 6).

Table 6. Metric Data for Gatecliff Split-stemmed

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	2	...	...	...	...
Maximum Width	2	12.903	15.240	14.07160	1.652367
Maximum Thickness	2	5.309	5.537	5.42290	.161645

Type Name: San Rafael Side-notched
Temporal Range: 4,400-3,600 B.P.

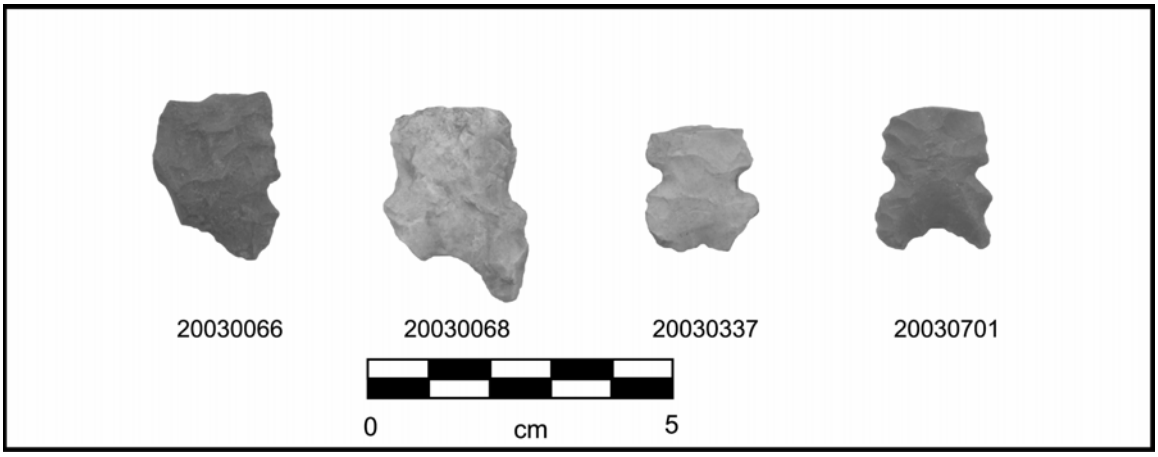

Figure 4.10. San Rafael Side-notched

San Rafael Side-Notched points are medium-to-large dart points with notches placed high on the side and deeply concave bases (Figure 4.10). A total of seven San

[6] Illustration of blade derived from Holmer 1986:98, Figure 8, d.

Rafael Side-notched points exist within the collection. Of these, five are cherts from the Kaibab (n = 3), Red Butte (n = 1), and unknown (n = 1) sources. Additionally one Presley Wash obsidian point and one rhyolite point exist within the sample.

Holmer (1986:104) assigns a date range of 4,400-3,600 B.P. to this artifact type based on excavation data from Sudden Shelter. Fairley (1989:96-97) considers the type to be indicative of the Late Archaic period based on Holmer's dates. While Justice (2002b:165) offers a slightly different date range of 4,600 to 3,850 B.P. the type appears to be well accepted as temporally diagnostic of the Late Archaic period and I have maintained this temporal placement for the current analysis.

Table 7. Metric Data for San Rafael Side-notched Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	4	...	...	...	...
Stem Length	4	11.786	21.641	15.20825	4.409632
Maximum Width	4	19.025	24.765	21.07565	2.595392
Maximum Thickness	4	4.013	5.080	4.52120	.474738

Type Name: Gypsum Cave
Temporal Range: 4,500 to 1,450 B.P.

A total of 34 Gypsum Cave points were identified within the Kaibab National Forest collections. Gypsum points are large, stemmed, shouldered points with convex bases (see Figure 4.11). Small lateral notches or serrations are often observable near the shoulders of a given point (see artifacts 20030052, 20030293, 20030314). In addition, the majority of Gypsum points show evidence of considerable re-use. Eighty percent (n = 20) of the Gypsum points within Batch A exhibit evidence of reworking/re-sharpening resulting in high variability in blade length, stem length, total length, and maximum thickness values. Obsidian is overwhelmingly favored as a material for this type within

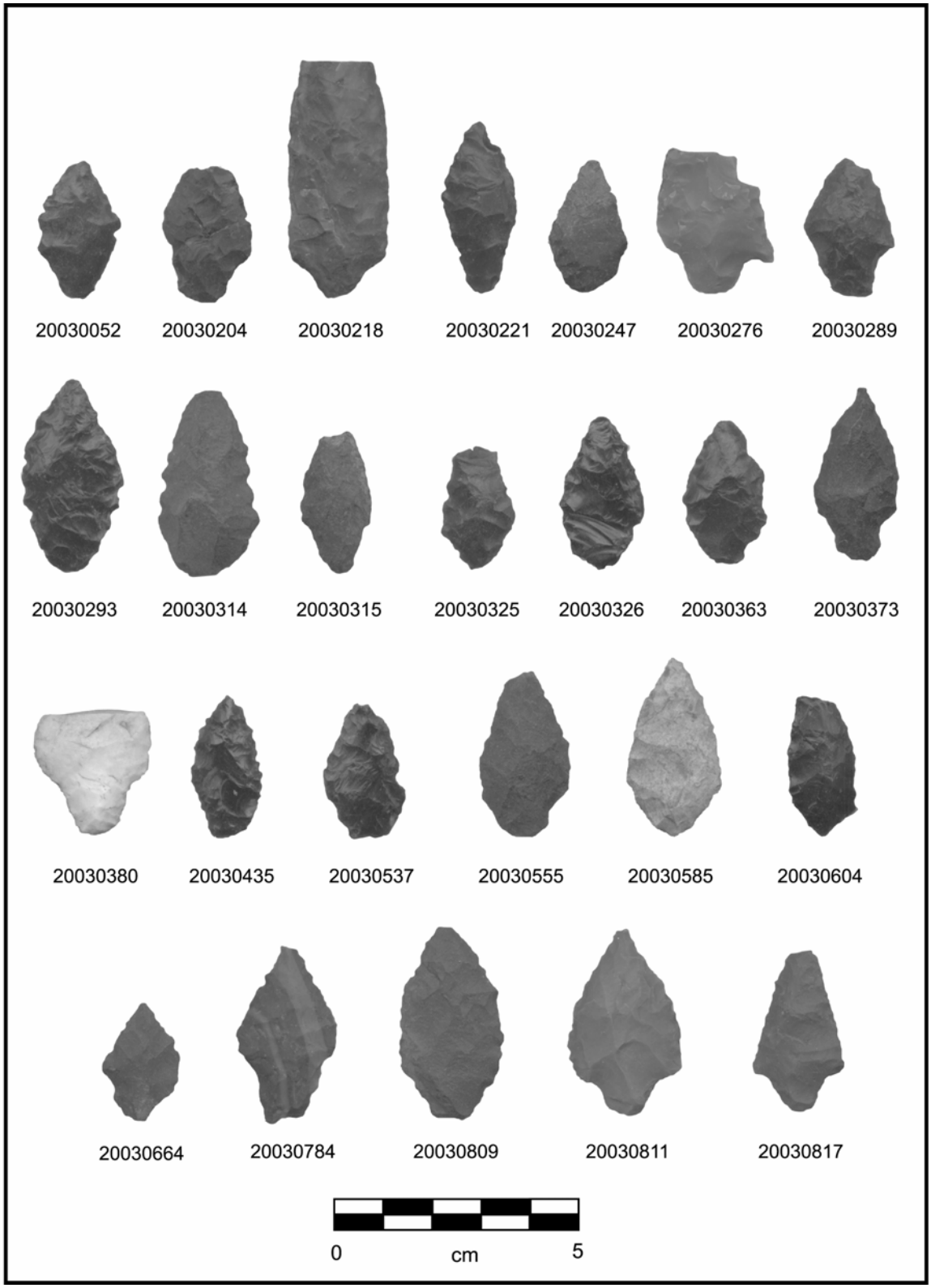

Figure 4.11. Gypsum Cave Points

the research area. Sixty-eight percent (n = 17) of the artifacts within Batch A are obsidian deriving from the Government Mountain (n = 6), Partridge Creek (n = 6), and Presley Wash (n = 5) sources. The remaining eight artifacts are made of rhyolite (n = 6), Kaibab chert (n = 1), or unidentified chert (n = 1).

Gypsum points are commonly associated with split twig figurines and appear to be well accepted as diagnostic of the Late Archaic period. Holmer (1986:105) notes that the "temporal placement [of Gypsum points] is remarkably consistent" and posits a date range of 4,500-1,450 B.P. However, it is important to note that Gypsum points appear to be continually produced into the Basketmaker II period. Fairley (1989:97) notes that evidence from southeastern Nevada "suggests that Gypsum points continued to be manufactured, or at least were in common use, during the Basketmaker II period." Considering the fact that the start date for the Basketmaker II period may be as early as 4,000 B.P. (Smiley 2002), it may be helpful to view Gypsum points as Late Archaic to Basketmaker transitional points rather than a type firmly entrenched within the Late Archaic period.

Table 8. Metric Data for Gypsum Cave Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	25	...	...	...	...
Blade Length	21	10.135	31.293	20.41434	5.345654
Stem Length	25	6.502	26.162	13.42136	5.623586
Total Length	21	25.222	39.751	32.42008	4.559894
Maximum Width	25	14.529	24.435	18.79498	3.010851
Maximum Thickness	25	4.369	7.772	5.92226	.821736

Type Name: Elko Eared
Temporal Range: 3,740 to 3,300 B.P.

Twenty-three points within the collection were classified as Elko Eared points. Elko Eared points are "corner notched point[s] made from a trianguloid preform with indented or concave base[s] and basal ears" (Justice 2002a:298). Of the Elko Eared points analyzed for the current project, 65.2% (n = 15) were obsidian and 21.7% (n = 5) were rhyolite. The remaining three points consisted of one chert point, one chalcedony

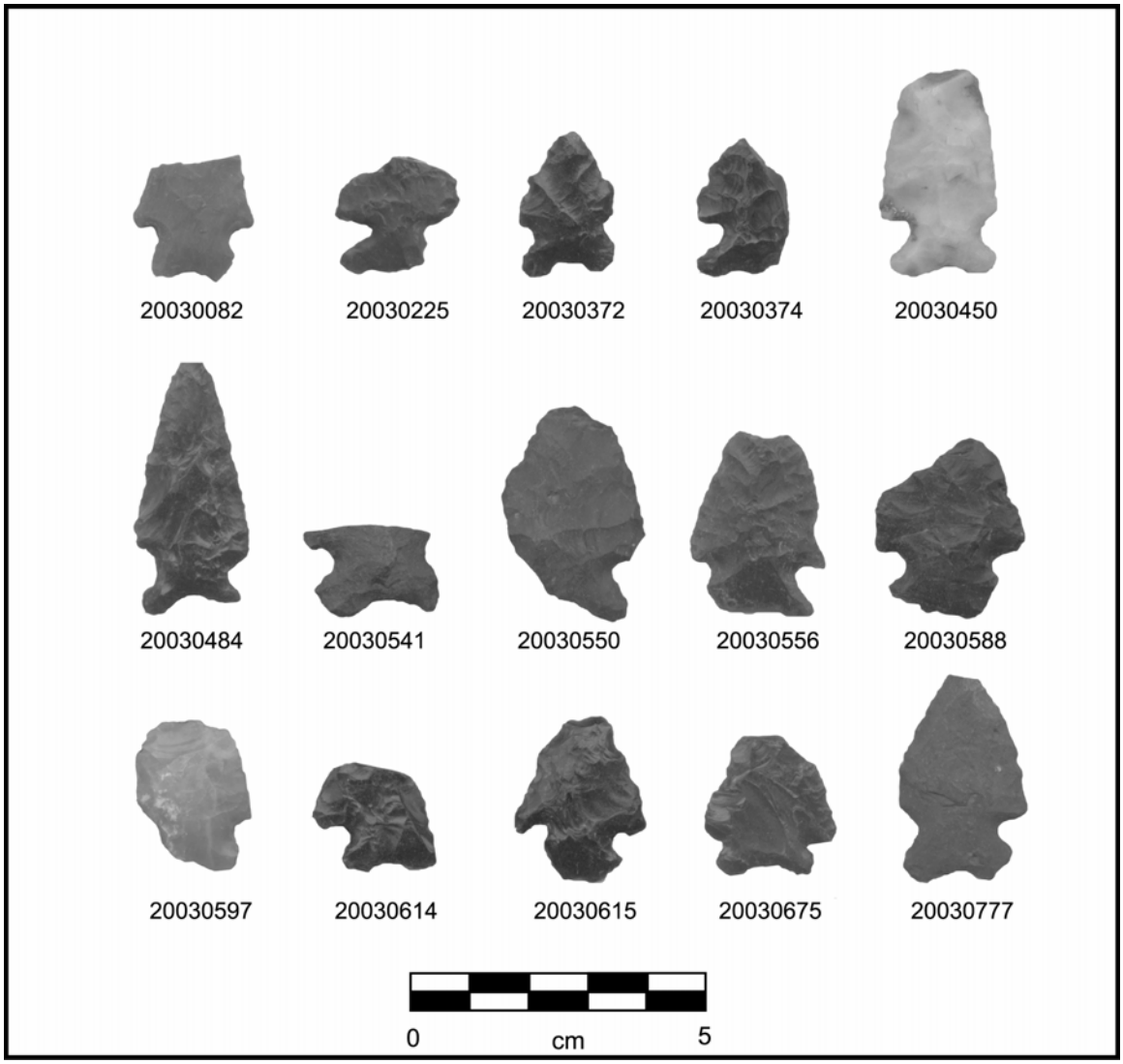

Figure 4.12. Elko Eared Points

point, and one point of unknown material. Elko Eared points are generally recognized as belonging to the Late Archaic period in Arizona (Fairley 1989:96-97; see also Smiley:1995:49, Figure 3.8). Fairley (1989:96) has tentatively offered a date range of approximately 3,740 to 3,300 B.P. for Elko Eared points on the Arizona Strip and I have adopted this date range for the current analysis.

Table 9. Metric Data for Elko Eared Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	15	...	...	...	...
Blade Length	3	18.694	37.846	27.21187	9.749675
Stem Length	15	6.020	12.573	9.54193	1.422810
Total Length	3	25.095	45.669	35.43300	10.287376
Maximum Width	15	15.799	25.654	21.22085	2.725722
Maximum Thickness	15	3.480	6.401	5.14604	.916957

Type Name: Chiricahua
Temporal Range: 4,800 to 2,500 B.P.

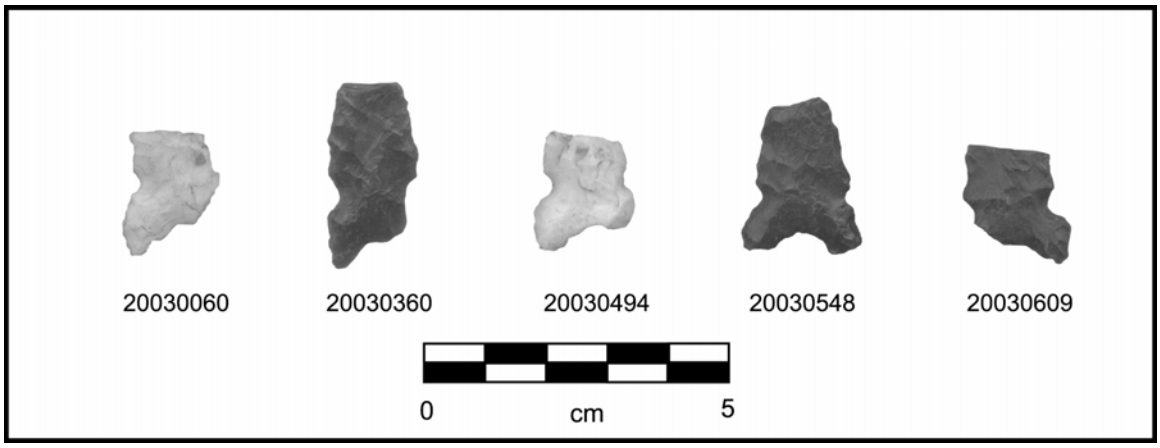

Figure 4.13. Chiricahua Points

Nine Chiricahua points are represented within the Kaibab collection. Chiricahua points are side-notched dart points with deeply concave bases. Of the nine examples of this type within the data set, six are obsidian. All six obsidian artifacts are from the local obsidian sources Government Mountain (n = 4), Partridge Creek (n = 1), and Presley

Wash (n = 1). The remaining artifacts are Kaibab chert (n = 3). Lorentzen (1998:146) notes a date range of 4,800 to 2,500 B.P. for the type based on the work of several authors. Given this date range, Chiricahua points, like Gypsum points, may represent a useful diagnostic of the Basketmaker II period in addition to the Late Archaic period.

Table 10. Metric Data for Chiricahua Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	5	...	...	...	...
Stem Length	5	9.398	15.011	12.53236	2.081917
Maximum Width	5	16.916	19.990	18.11020	1.149613
Maximum Thickness	5	4.343	4.953	4.69900	.263965

Type Name: Armijo
Temporal Range: 3,800 to 2,800 B.P.

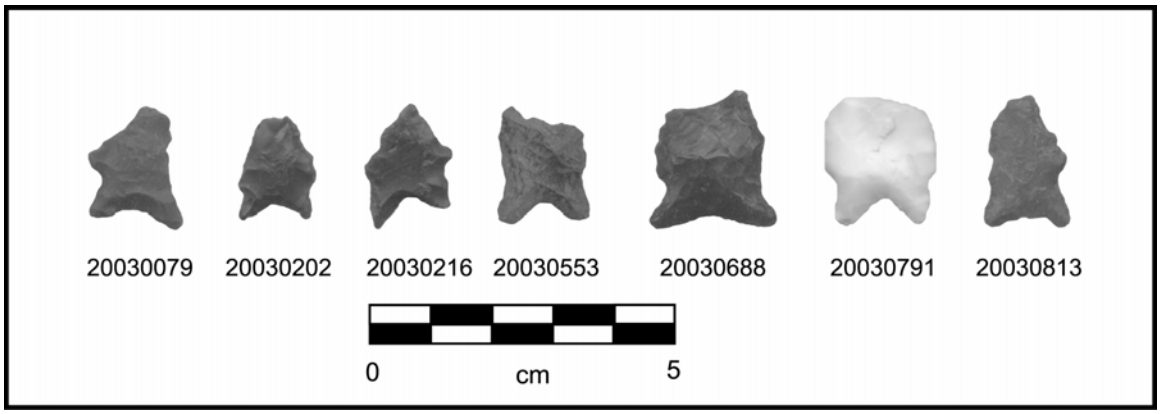

Figure 4.14. Armijo Points

Eight Armijo points are represented within the sample. Six of these are obsidian and the remaining two are chert. The Armijo type category is another problematic and poorly understood group, and for primarily the same reasons as the Pinto/San Jose type. The type was originally defined by Irwin-Williams (1973) as part of the Oshara tradition sequence but is poorly defined and is notably absent from most of the typologies I

examined for the project. The one exception to this rule are Berry's (1987:354-355, see Figure 36v-aa) Grants Points, which appear morphologically identical to the illustrations above (Figure 4.14). I have classified artifacts as Armijo based primarily on the presence of basal ears that protrude from the hafting element, often at nearly right angles to the stem itself.

All of the problems that Berry (1987) notes for assigning a temporal range to Pinto/San Jose points apply to the Armijo type as well. Irwin-Williams (1973) considered this type to be diagnostic of the Armijo phase of the Oshara tradition and assigned a temporal range of 3,800 to 2,800 B.P. There are several potential problems with these dates, not the least of which is the poor definition of the type itself leading to confusion among researchers regarding the differences between the Armijo and Pinto/San Jose categories. At the moment, it appears best to maintain Irwin-Williams dates in spite of potential problems because at the very least this date range splits the Pinto/San Jose and Armijo types into temporally sensitive, and chronological categories. Again, this date range extends into the Basketmaker II period and may reflect a contemporary style to that of the Western Basketmaker tradition discussed below.

Table 11. Metric Data for Armijo Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	7	...	...	...	...
Blade Length	1	14.529	14.529	14.52880	...
Stem Length	6	6.045	10.846	8.60213	1.748263
Total Length	1	20.549	20.549	20.54860	...
Maximum Width	7	12.675	20.980	15.99474	2.939265
Maximum Thickness	7	3.302	6.629	4.55386	1.071398

Early Agricultural Projectile Point Types (2,400 B.P. to 1,550 B.P.)

Type Name: Western Basketmaker II
Temporal Range: 2,750 to 1650 B.P.

There are 17 Western Basketmaker II points within the sample. Projectile points belonging to this type are large, side-notched dart points that are differentiated from other large, side-notched points (see Elko Side-notched type below), by the relatively narrow neck and distinctive square notching (Figure 4.15). Stems are relatively short, averaging 9.80 mm in length (+/- 1.02 mm). Roughly one third of the

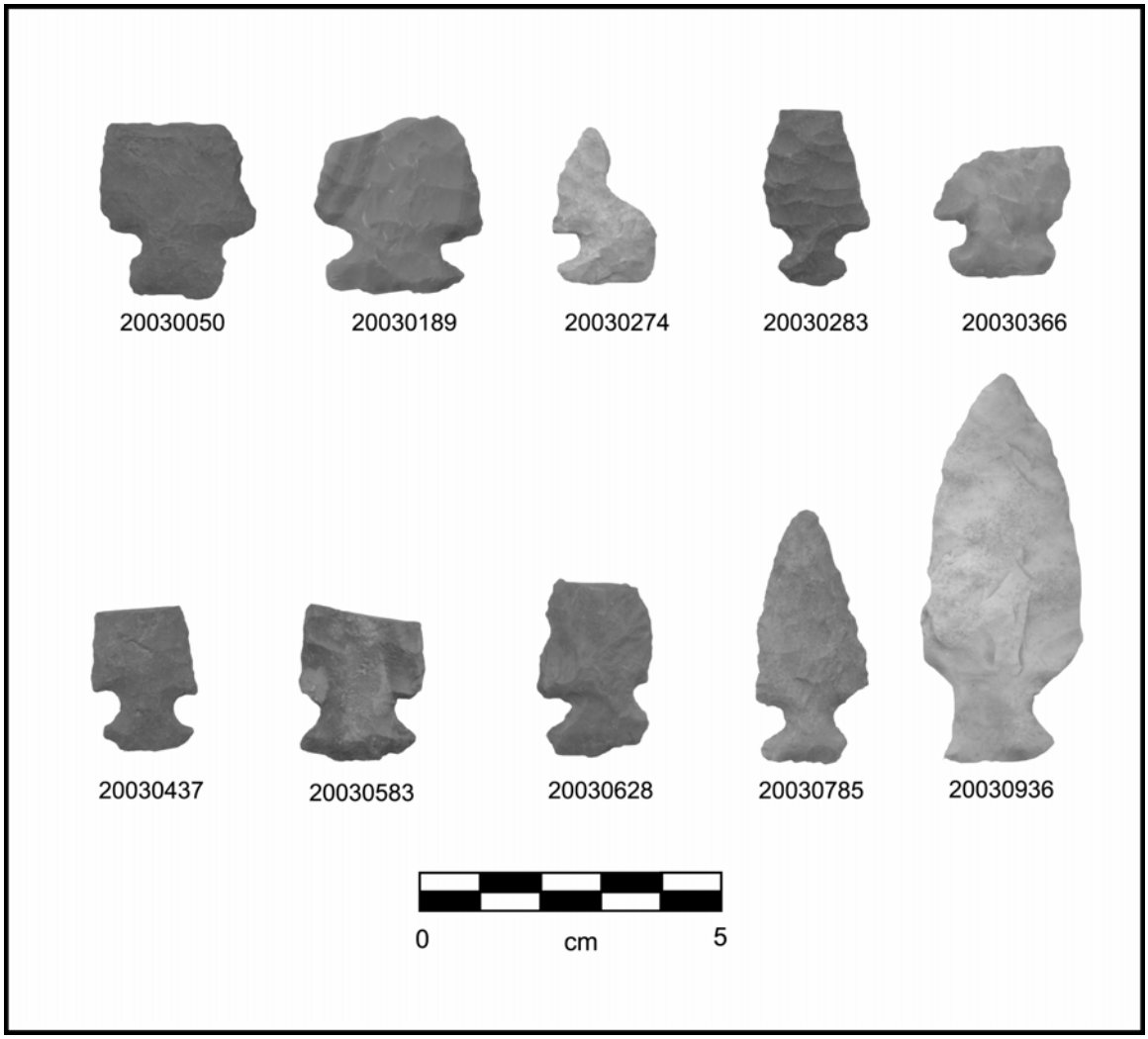

Figure 4.15. Western Basketmaker II Points

artifacts show evidence of reworking/refurbishing. Raw materials for this type are split between obsidian at 23.5 % (n = 4), chert at 52.9% (n = 9), and rhyolite at 23.5% (n = 4). Five of the nine chert points derive from unknown or exotic chert sources. Based on reliable chronometric dates from Black Mesa, Christensen (1987:153) considers such points to be diagnostic of the Basketmaker II period on Black Mesa, dating from about 2,750 to 1,650 B.P.

Table 12. Metric Data for Western Basketmaker II Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	9	...	...	...	...
Blade Length	1	33.249	33.249	33.24860	...
Stem Length	9	8.255	11.049	9.80440	1.022488
Total Length	1	42.113	42.113	42.11320	...
Maximum Width	9	17.628	27.838	21.15820	3.784941
Maximum Thickness	9	4.140	6.045	4.98969	.590804

Type Name: Basketmaker Knives
Temporal Range: 2,750 to 1650 B.P.

A total of 25 artifacts within the sample have been tentatively categorized as Basketmaker knives. These are large, corner-notched points that appear much too large to be used as dart points. The majority of artifacts in this type appear to match Berry's (1987:444) definition for Diagonal-Notched points in that they are "made on leaf-shaped preforms notched diagonally from the preform corners or base." Berry (1987:443-444) argues convincingly that such forms appear to be diagnostic of a "late preceramic and early ceramic period occupation of the southern Colorado Plateau." As evidence, Berry cites the common occurrence of such points on Basketmaker II sites. Additionally, Berry (1987:445) notes the discovery of several "large diagonally notched points ...attached to wooden knife handles" within a dated Basketmaker II context at White Dog Cave.

Table 13. Metric Data for Basketmaker II Knives

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	11	...	...	...	...
Stem Length	11	9.195	14.859	11.05131	1.755192
Maximum Width	11	29.972	43.967	34.15376	4.067432
Maximum Thickness	11	6.045	8.407	6.80951	.738127

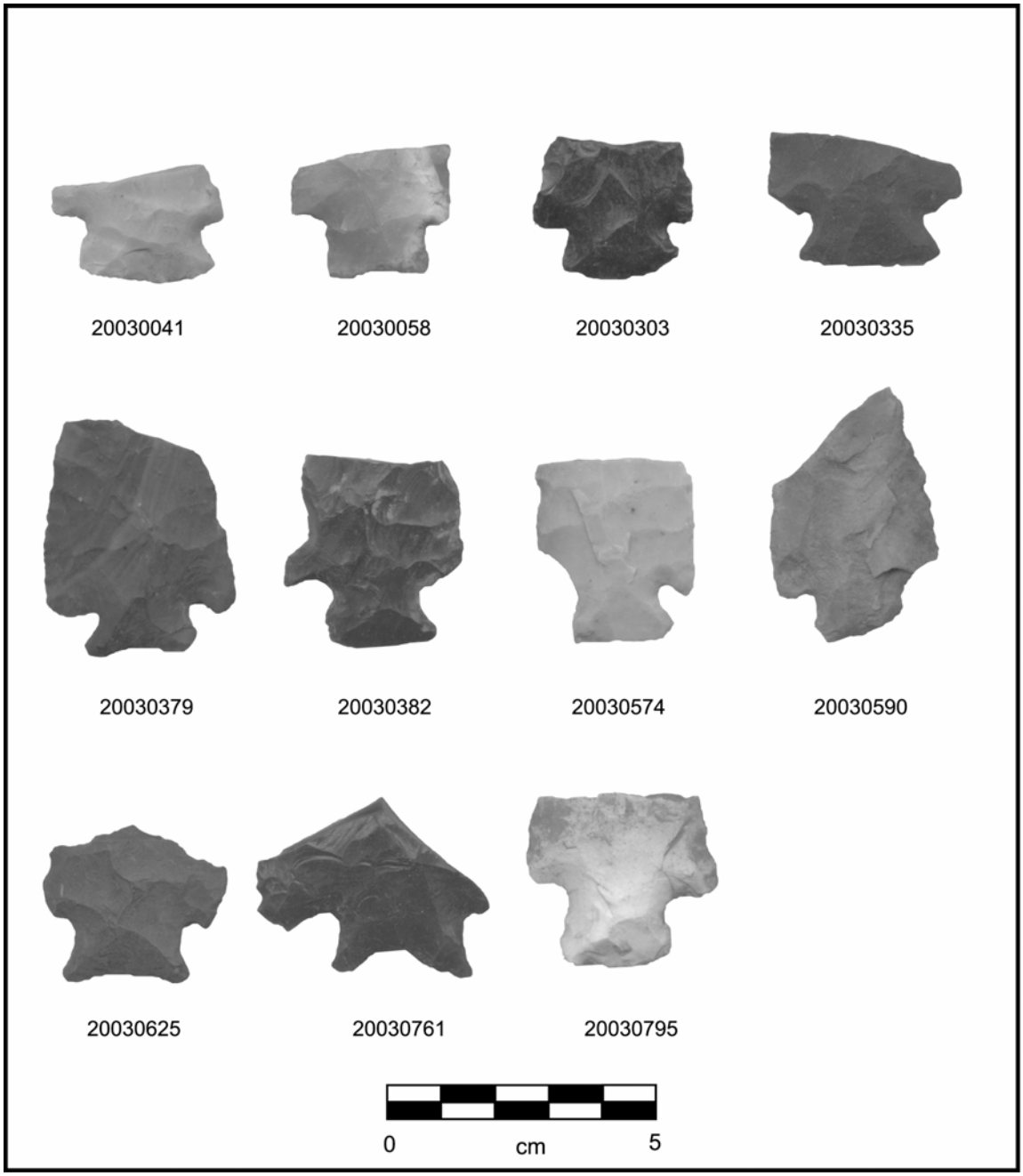

Figure 4.16. Basketmaker II Knives

Type Name: Cienega
Temporal Range: 2,750 to 1,400 B.P.

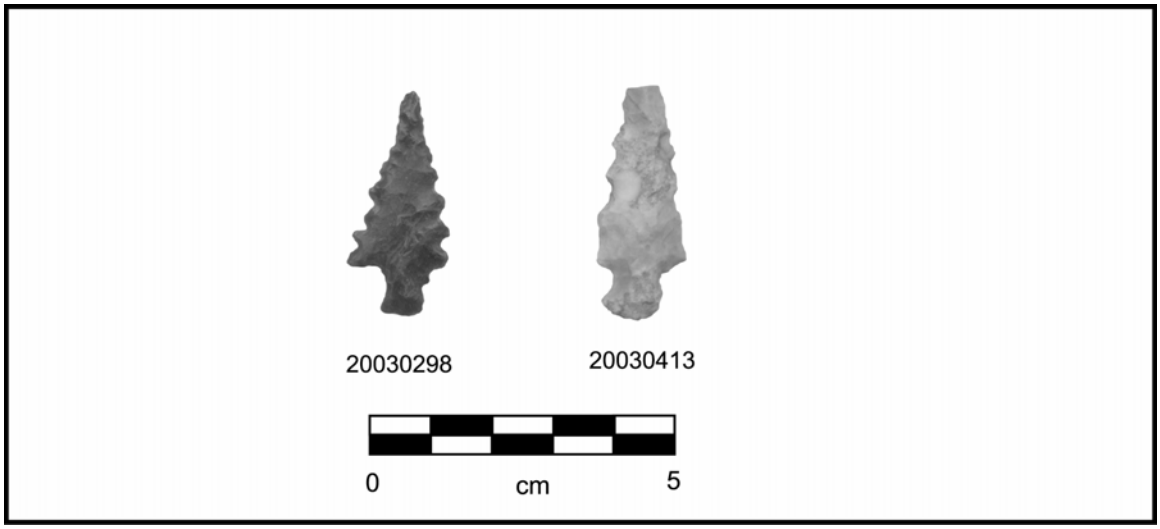

Figure 4.17. Cienega Points

Cienega points are stemmed dart points with convex bases and "long triangular blade[s] (Sliva:1997:51)." Cienega points are commonly recognized in the southern Southwest but are rare on the Colorado Plateau. Two Cienega points exist within the collection. Both points appear to be what Sliva (1999:343, see also 1997:51) terms "Cienega Flared" (one of four subtypes of the Cienega type). Points of this subtype have expanding stems resulting from deep notching at the corners and markedly serrated blade edges. Sliva (1999:343) reports that Cienega Flared points derive primarily from Cienega Phase sites in the southern Southwest although she also lists one Early Ceramic period site that yielded such points. Stevens and Sliva (2002:300-301) cite date ranges of 2,750 to 1,900 B.P. for the Cienega Phase, which corresponds with the Early Agricultural (or Basketmaker II) Period used in this volume.

Table 14. Metric Data for Cienega Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	2	...	...	...	...
Stem Length	2	7.772	7.899	7.83590	.089803
Maximum Width	2	15.189	16.713	15.95120	1.077631
Maximum Thickness	2	4.013	5.944	4.97840	1.364999

Early Ceramic Projectile Point Types (A.D. 400 to A.D. 700)

Type Name: Rosegate
Temporal Range: A.D. 300 to A.D. 900

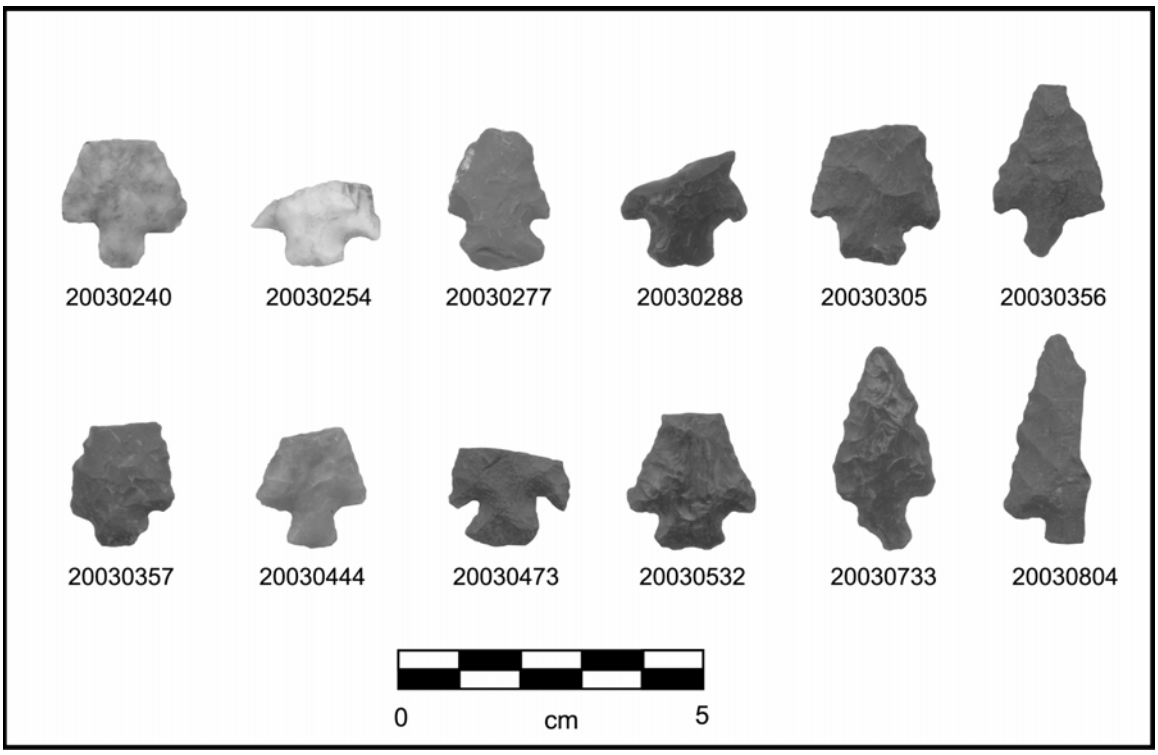

Figure 4.18. Rosegate, Variety A

Rosegate points are small, corner notched or stemmed points with straight or expanding stems (Figure 4.18) associated with the initial spread of the bow-and-arrow (Holmer 1986:107). While the terms Rose Spring and Eastgate also appear in the literature, I have used the term Rosegate following Thomas (1981:19). I differentiated between Rosegate Variety A, and Rosegate, Variety B (see below) points based on the

overall size of the artifact. While both varieties appear to fit the morphological definition of the Rosegate type, Rosegate, Variety A points are clearly larger in general. Possibly some as-yet-unknown temporal distinction exists between the two varieties.

A total of 22 Rosegate, Variety A points exist within the sample. Average maximum width for Rosegate, Variety A points is 19.25 mm (+/- 2.23 mm) and total length averages 34.07 mm (.80 mm). General raw material types for specimens within the sample are fairly evenly split, with 45.5 % (n = 10) of obsidian, 31.8 % (n = 7) chert, and 22.7 % (n = 5) rhyolite. Local raw material sources represented include Government Mountain (n = 3), Partridge Creek (n = 3) and Presley Wash (n = 3).

Holmer (1986:107) offers a date range of A.D. 300 - 1300 for this type but notes that most specimens occur in contexts dated to A.D. 300 – 900/1000. Horn-Wilson (1997:77) describes 13 Rosegate points from within the project area dated to varying stages of the Ceramic Period. Due to the widely accepted association of Rosegate points with the initial stages of the spread of the bow-and-arrow, I used Rosegate points primarily as an indicator of the Early Ceramic Period (A.D. 400-700).

Table 15. Metric Data for Rosegate, Variety A

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	13	...	...	...	...
Blade Length	2	25.959	31.166	28.56230	3.681905
Stem Length	13	5.385	9.804	7.42266	1.439165
Total Length	2	33.503	34.646	34.07410	.808223
Maximum Width	12	15.062	22.073	19.25108	2.227010
Maximum Thickness	13	4.445	7.823	5.54111	.901721

Type Name: Rosegate, Variety B
Temporal Range: A.D. 300 to A.D. 900

Forty-seven Rosegate Variety B points were identified within the sample. Points of this type are morphologically similar to Rosegate, Variety A but are much smaller in size (Figure 4.19). Possibly, this type reflects a later derivative of the Rosegate type. Maximum width for this type averages only 11.08 mm (+/- 1.65 mm) and total length averages only 22.89 mm (+/- 4.53). Only one artifact from Batch A (4%) appears to have been heat-treated and 12% (n = 3) show evidence of being re-sharpened/reworked. Additionally, 16% of the artifacts in Batch A (n = 4) exhibit serration of the blade edge.

As with Rosegate, Variety A, points of this type are considered to be arrow points associated with the original spread of the bow-and-arrow and are diagnostic of the Early Ceramic (Basketmaker III) Period. Traditionally, the adoption of the bow-and-arrow has been dated to around A.D. 500. However, there is a growing body of evidence compiled by Geib and Spurr (2000:194-195) indicating that these points may occur as early as the first centuries A.D. in some areas. Based on associations of arrow points with radiocarbon-dated excavated materials, Geib and Spurr (2000:194) argue that bow-and-arrow technology may have occurred on the Rainbow Plateau "as early as the second century [A.D.]" and perhaps even earlier. For the purposes of the current analysis I have maintained the "traditional" dating scheme for this type as diagnostic of the Early Ceramic Period with the caveat that additional evidence may eventually push the start date for the type backward by three to five-hundred years on the Colorado Plateau.

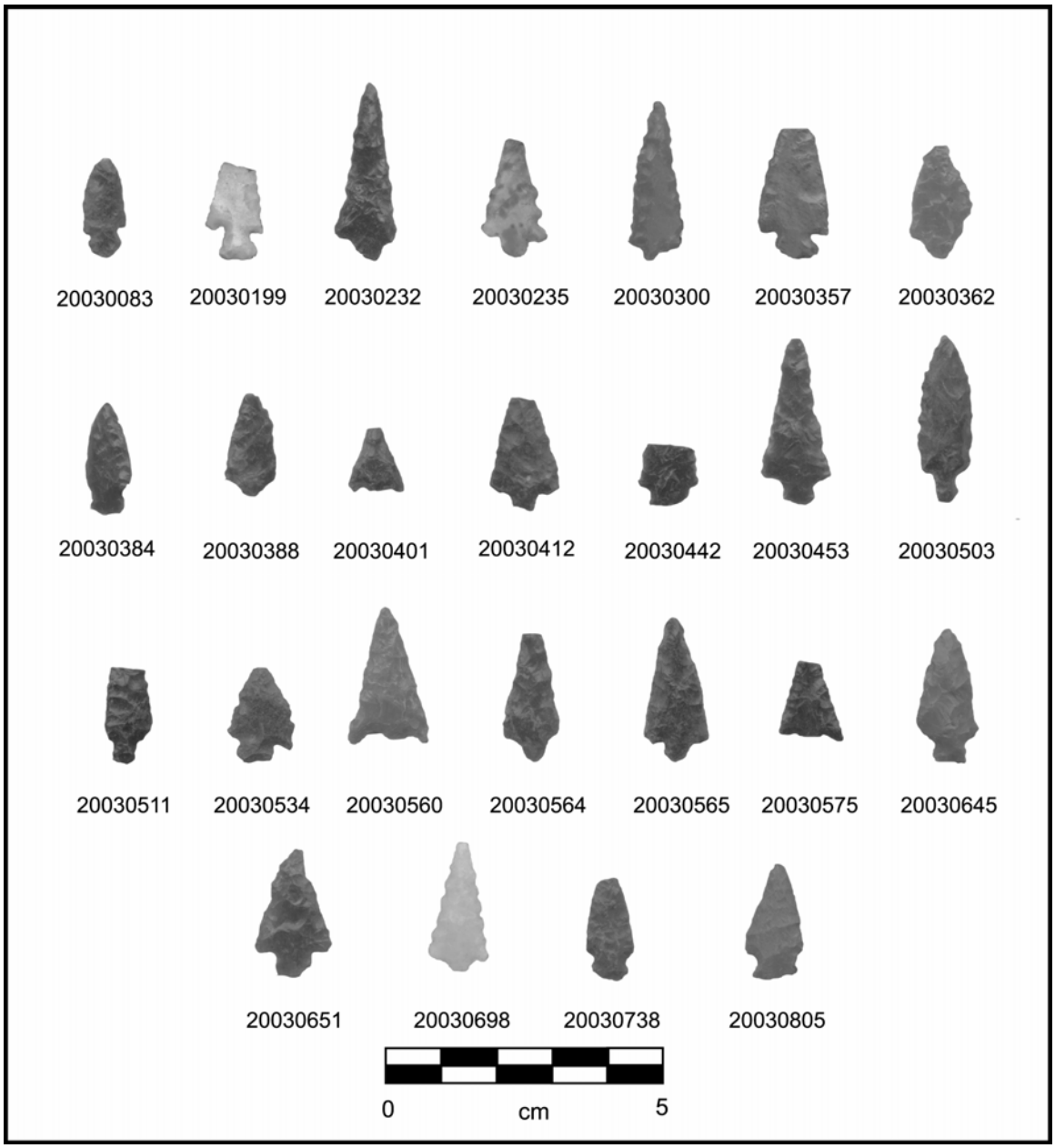

Figure 4.19. Rosegate, Variety B Points

Table 16. Metric Data for Rosegate, Variety B Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	25	...	...	...	...
Blade Length	19	10.058	28.626	19.95638	4.870049
Stem Length	20	2.261	5.842	4.26720	1.017069
Total Length	17	17.120	32.360	22.89287	4.532982
Maximum Width	25	8.407	14.757	11.08456	1.651846
Maximum Thickness	25	2.337	4.724	3.34467	.640636

A majority of the artifacts (78.7 %, n = 37) of this type are made of obsidian while chert, rhyolite and chalcedony artifacts are also present in small numbers. Of particular interest, is the fact that this type includes artifacts from rare raw material sources. The Rosegate, Variety B type includes one of only two examples of the Black Tank mahogany obsidian source and the only artifact within the data set made of Perkinsville Jasper. In addition, three Rosegate, Variety B points derive from the Black Tank gray obsidian source. Other prominent raw material sources for the type include Partridge Creek (36.2 %, n = 17) and Government Mountain obsidian (29.8 %, n = 14).

Ceramic Period Projectile Point Types (A.D. 700 to A.D. 1300)

Type Name: Un-notched Triangular
Temporal Range: A.D. 850 to 1150

Projectile points of this type are small, un-notched, triangular arrow points with a straight to slightly concave basal edge. Un-notched Triangular points are commonly found within the region under a variety of names (see for example Medicine Valley Triangular, Horn-Wilson 1997:73-74; Classic Thin Triangular, Sliva 1997:54-55; Kahorsho Triangular Series, Rondeau 1979:16-20; Long Unnotched/Short Unnotched, Kamp and Whittaker 1999:83-84). For the purposes of this analysis, I grouped all triangular, un-notched projectile points into one type category. Approximately 70 % (n = 17) of the artifacts in this category are obsidian, 20.8 % (n = 5) are chert and 8.3 % (n = 2) are rhyolite. Of the obsidian artifacts, the majority derive from the Partridge Creek source (n = 11) while the remainder derive from the Government Mountain and Presley Wash sources.

I placed twenty-four artifacts into the Un-notched Triangular category. As noted above, points of this type are similar to other established types in the Flagstaff region and date to about the same time period. For example, Horn-Wilson's (1997:74-75) type "Medicine Valley Triangular" appears on sites dated from A.D. 850 to approximately 1200 but most commonly occur on sites dating from A.D. 1075 to approximately A.D. 1200. Holmer (1986:108) notes that Bull Creek points occur in contexts dating from A.D. 950 to A.D. 1250. Additionally, Sliva (1997:54-55) notes several small, triangular Hohokam forms that date from A.D. 1050 to 1450. Given the current dates cited above it appears reasonable to assign a general date of A.D. 850 to 1150 to the Un-notched Triangular point form corresponding with the Medicine Valley Focus of the Cohonina sequence.

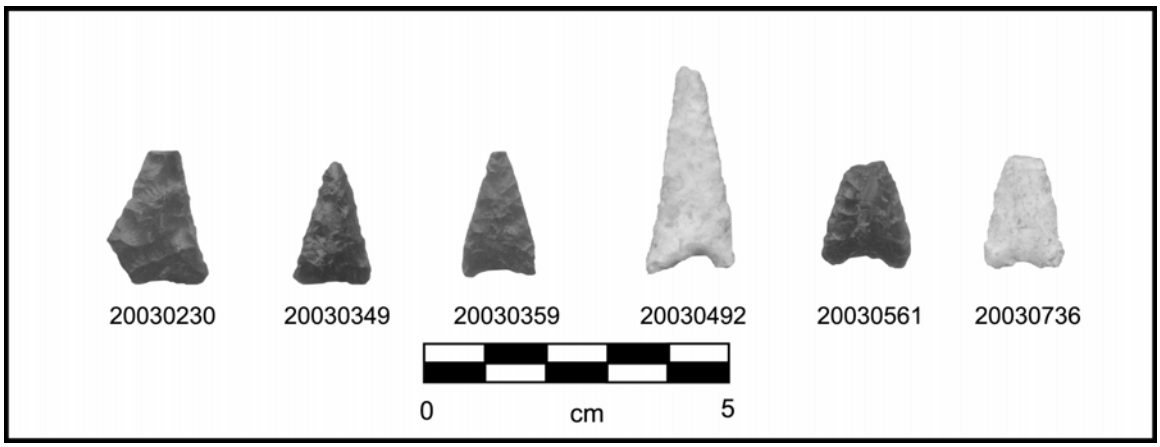

Figure 4.20. Un-notched, Triangular Points

Table 17. Metric Data for Un-notched Triangular Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	6	...	...	...	...
Blade Length	4	20.828	33.426	24.42210	6.033217
Total Length	4	20.472	33.858	24.35860	6.393640
Maximum Width	6	12.192	17.729	14.41873	1.919519
Maximum Thickness	6	2.921	4.115	3.60680	.543346

Type Name: Kahorsho Serrated
Temporal Range: A.D. 950-1,150

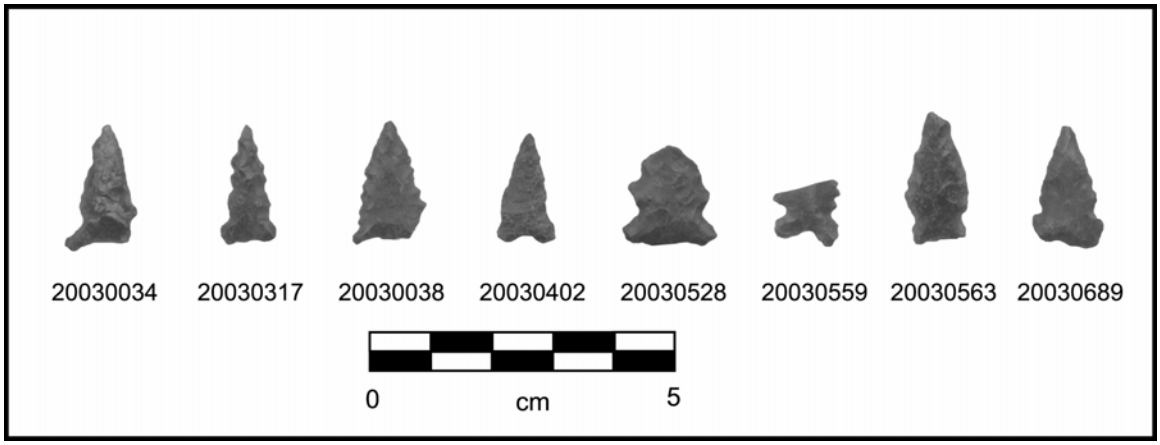

Figure 4.21. Kahorsho Serrated Points

Kahorsho Serrated Points were originally defined by Rondeau (1979:12-15). Such points are small, triangular points with eared projections placed along the basal edge extending at a nearly perpendicular angle from the lateral edges. As such, the width from the tip of one projection to the other is usually the widest measurement of the point. In some cases, shallow notches exist along the lateral edges placed just above the ears. Additionally, blade serration is a common attribute of the type. Ten Kahorsho Serrated points exist within the collection, nine of which are obsidian.

Rondeau (1979:12-15) assigns a date range of A.D. 950-1150 for the type, a range that appears to be supported by associations of ceramics with Kahorsho serrated points within the data set. Of the Kahorsho serrated points within the sample, five are associated with ceramics dated to the Medicine Valley Focus (A.D. 900-1100) of the Cohonina culture. An additional four points appear on Cohonina sites dated between A.D. 700-1100. Therefore, the ceramic data for sites exhibiting Kahorsho serrated points based on surface assemblages appears to support the date range offered by Rondeau.

Table 18. Metric Data for Kahorsho Serrated Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	8	...	...	...	...
Blade Length	7	11.354	21.006	16.37211	3.576949
Stem Length	5	4.318	7.747	6.14172	1.256260
Total Length	7	16.586	21.666	19.57977	1.752381
Maximum Width	8	9.296	15.545	11.49985	1.954303
Maximum Thickness	8	2.057	4.445	3.57188	.755311

Type Name: Nawthis Side-notched
Temporal Range: A.D. 800-1200

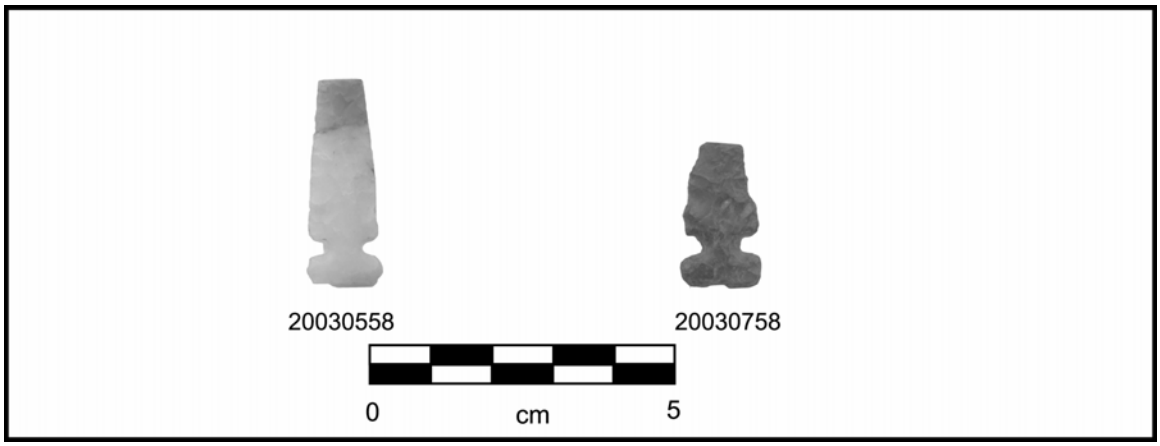

Figure 4.22. Nawthis Side-notched Points

Nawthis Side-notched points are long, slender arrow points, notched low relative to the length of the blade. Three such points were identified within the collection. Nawthis side-notched points were originally identified in the Great Basin (Holmer and Weder 1980, cited in Holmer 1986). Holmer (1986:108) depicts a spatial distribution for Nawthis side-notched points that spans from the Grand Canyon, north to Central Utah. While, such points are commonly observed at both Fremont and Anasazi sites north of the Grand Canyon (Claudia Berry, personal communication 2004), the type appears to be exceedingly rare south of the Grand Canyon.

In addition, such points appear even less frequently moving east towards the Flagstaff area. For example, Kamp and Whittaker (1999:83-87) report no examples of

Nawthis Side-notched points among 261 projectile points excavated at Lizard Man Village. Additionally, Rondeau's (1979:140-145) illustrations of over 300 points from the Kahorsho site similarly lack the Nawthis Side-notched type. Therefore, the spatial data support Holmer's use of the Grand Canyon as a southern boundary for the type, with only occasional incidences of the type appearing south of the Canyon. Based on Holmer's (1986:107) date range of A.D. 800 to 1200 for Nawthis side-notched points, I have considered the type to be diagnostic of the Ceramic Period for the current study.

Table 19. Metric Data for Nawthis Side-notched Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	2	...	...	...	...
Stem Length	2	7.112	8.509	7.81050	.987828
Maximum Width	2	12.217	13.411	12.81430	.844144
Maximum Thickness	2	2.896	3.708	3.30200	.574736

Type Name: Parowan
Temporal Range: A.D. 850-1150

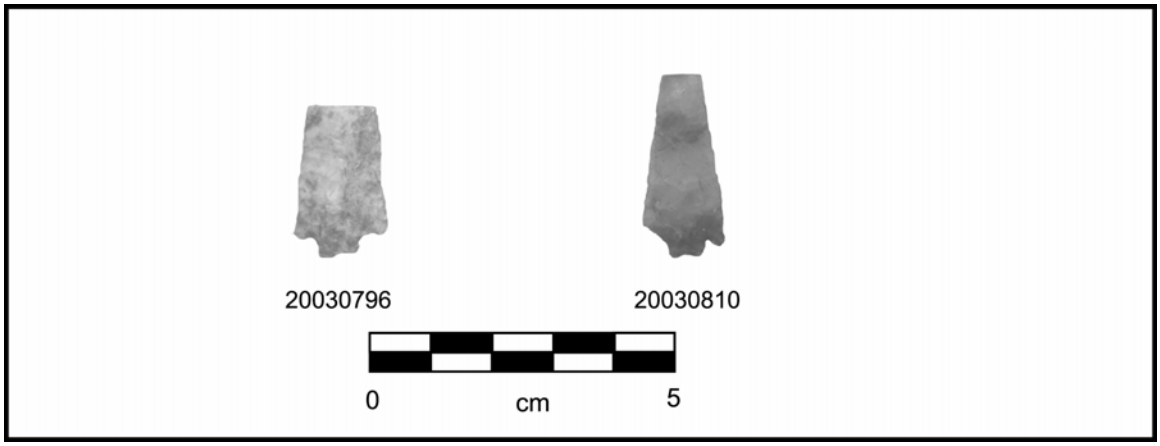

Figure 4.23. Parowan Basal-notched Points

Parowan Basal-notched points are similar to Nawthis Side-notched points in length and width except that notches are placed along the basal edge, parallel to the blade edge. Only two examples of the type exist within the sample. Both points are made of

unidentified, presumably non-local cherts. Like the Nawthis side-notched type (above) Parowan Basal-notched points are associated with both Fremont and Western Anasazi sites located to the north of the research area and date between A.D. 850 and 1150 (Holmer and Weder, in Holmer 1986:107). Again, such points appear to be confined spatially to an area north of the Grand Canyon (Holmer 1986:109) although some occasional overlap of this boundary is implied by the occurrence of the two artifacts pictured here. As with the Nawthis Side-notched points, I grouped Parowan Basal-notched points with other Ceramic period points for the current analysis.

Table 20. Metric Data for Parowan Basal-notched

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	2	...	...	...	...
Stem Length	2	2.819	3.327	3.07340	.359210
Maximum Width	2	11.684	14.402	13.04290	1.921775
Maximum Thickness	2	3.099	3.912	3.50520	.574736

Type Name: Basal and Side-Notched
Temporal Range: A.D. 1000-1075

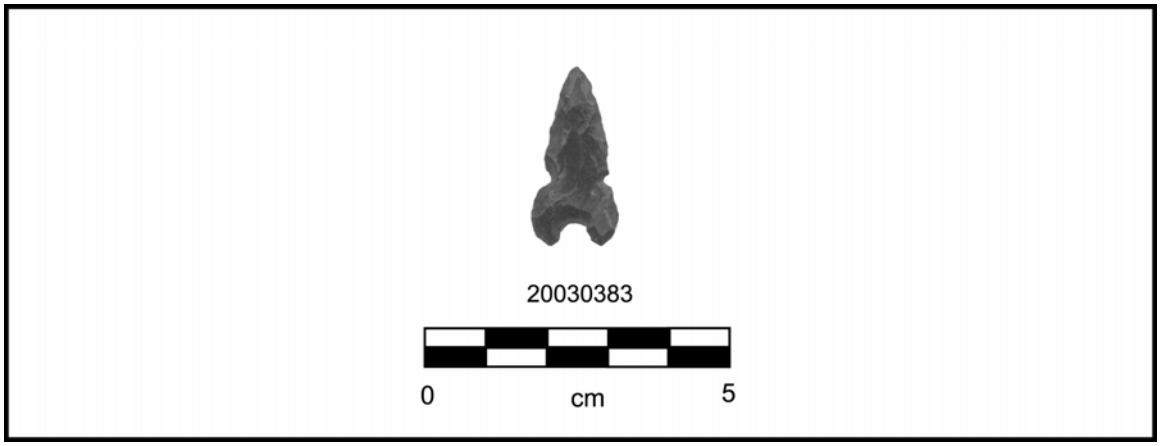

Figure 4.24. Basal and Side-notched Points

This is a type category defined by Horn-Wilson (1997:75) as "side and basal-notched points lacking serrations." Only one Basal and Side-notched point exists within

the sample, no doubt resulting from the removal of a significant portion of small points in the Kaibab collection for the Horn-Wilson study. Such points were subsequently re-curated by the Kaibab National Forest as a separate collection. Horn-Wilson (1997:76) reports that this type "correlates very well with Late period sites." Samples (1992) dates the Late period of the Cohonina occupation to A.D. 1000-1075 correlating with the Ceramic Period used for the current analysis.

Type Name: Sitgreaves Serrated
Temporal Range: A.D. 1000 to 1200

Points of this type were originally defined by Horn-Wilson (1997:75) as laterally and basally notched points with markedly serrated blades. Again, only one example of the type exists within the collection. However, like the Basal and Side-notched category above, frequencies of Sitgreaves Serrated points have presumably been reduced as a result of the Horn-Wilson sample. Horn-Wilson (1997:75) reports that such points occur "only in Late and Very Late period sites" indicating a date range of A.D. 1000-1200 (Samples 1992, Horn-Wilson 1997:38). Therefore, I grouped the lone example of this type with other Ceramic Period artifacts for the current analysis.

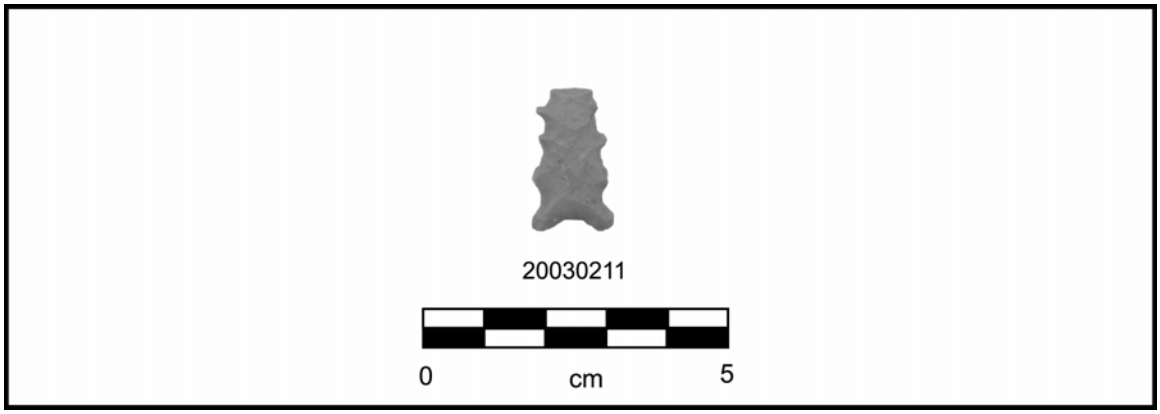

Figure 4.25. Sitgreaves Serrated Points

Type Name: Cohonina Point (Not Pictured)
Temporal Range: A.D. 700-1150

The "Cohonina Point" has long been considered the diagnostic projectile point of the Cohonina culture. However, Horn-Wilson's (1997) recent study of Cohonina projectile points has shown that the term may be a misnomer, as several temporally distinct subtypes of small projectile points exist that have been subsumed under this label. For information regarding the variability of projectile point types the reader is referred to Horn-Wilson's (1997) thesis on the topic. For the current analysis I have included both Horn-Wilson's Red Lake Serrated and Red Lake Nonserrated points in the Cohonina point group. My reason for grouping the two types is that under the current analysis the temporal resolution gained by separating the types is unnecessary. Horn-Wilson's Medicine Valley Triangular, Basal and Side-notched, and Sitgreaves Serrated types are addressed separately above.

As discussed in Chapter 3, such points are under-represented within the sample due to a previous study (Horn-Wilson 1997). However, I collected data on 43 Cohonina points prior to introducing Selection Criterion 6 to exclude the remainder of the Cohonina points within the collections. Roughly 95 % of the points from this type are obsidian (n = 41) implying a strong preference for this material during the Ceramic Period (see Chapter 5).

Protohistoric Projectile Points (A.D. 1300 to A.D. 1600)

Type Name: Desert Side-notched, Sierran Subtype
Temporal Range: A.D. 1300 to 1600

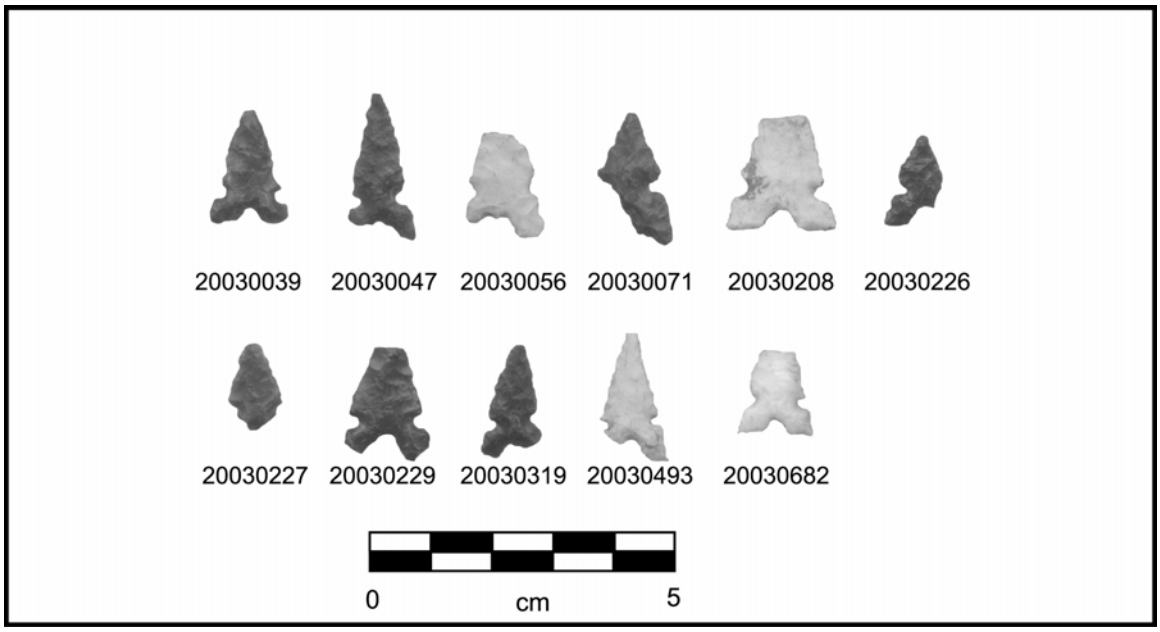

Figure 4.26. Desert Side-notched, Sierra Variety

There are 28 Desert Side-notched, Sierran Subtype[7] (Baumhoff and Byrne 1959) points within the collection. Of these, 71.4 % are obsidian points (n = 20), with the remainder consisting of seven chert points and one rhyolite point. Desert Side-notched, Sierran Subtype points are small, triangular, side-notched arrow points distinguished from other Desert Side-notched types by the addition of a third basal notch (Homer 1986:107). In general, Desert Side-notched points are well accepted as a Protohistoric (A.D. 1300 to 1600) "horizon marker" in the Southwest. On the Kaibab National Forest, such points are considered to be affiliated with the various Pai groups (Hualapai, Havasupai and Yavapai) that inhabited the region during the Protohistoric period (Cleeland et al. 1992:22-23).

[7] Also referred to below as Sierra Side-notched

Table 21. Metric Data for Desert Side-notched, Sierran Subtype Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	11	...	...	...	...
Blade Length	6	9.017	17.069	13.68637	2.846678
Stem Length	10	5.588	10.414	7.62254	1.642291
Total Length	6	15.113	24.079	20.27767	3.326049
Maximum Width	10	9.398	17.983	12.56030	2.425349
Maximum Thickness	11	2.311	3.378	2.68316	.354013

Type Name: Buck Taylor Notched
Temporal Range: A.D. 1300 to 1600

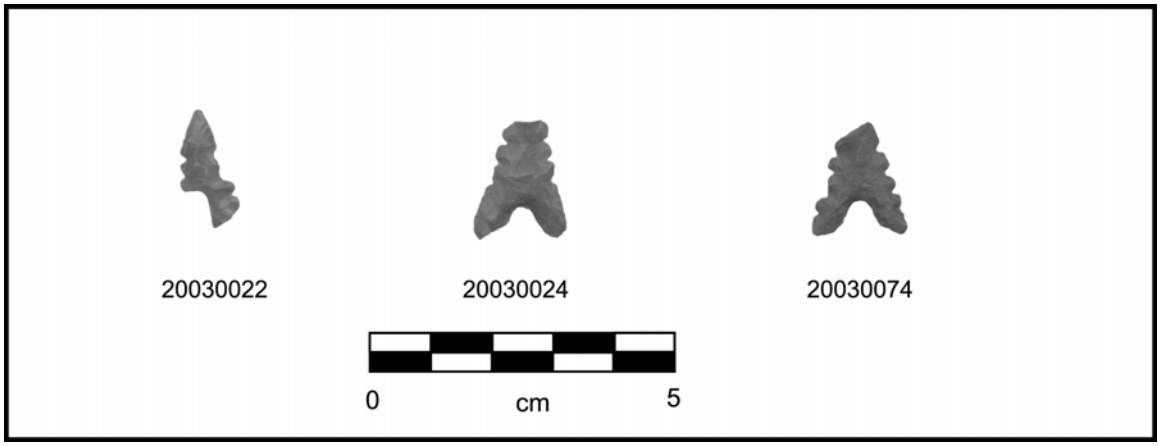

Figure 4.27. Buck Taylor Notched

Buck Taylor Notched points are "small triangular arrow points with single to multiple notches and deep concave bases" (Justice 2002b:313). Such points are relatively small in size averaging 2.97 mm (+/- .71 mm) in thickness and 13.25 mm (+/- 3.45 mm) in width. Four such points exist within the current sample, all of which are serrated as a result of multiple notches placed at consistent intervals along the blade edge.

Buck Taylor Notched points are commonly listed as "Pai" points (Cleeland et al. 1992:23, Pilles 1981:173) and appear to be a variant of the Desert Side-notched type. Justice (2002b:295, Figures 34.42-34.46, 313-314) offers a unique type description for such points and assigns the name Buck Taylor after a spring of that name in the Flagstaff

area. Interestingly, Pilles (1981:170) observes that Pai points with "multiple side notches" (Buck Taylor Notched) are more common on Yavapai sites than single notched points (such as the Sierra Side-notched type above). The Buck Taylor Notched type appears to be exceptionally rare on the South Kaibab, primarily inhabited during the protohistoric period by the Havasaupai (Cleeland et al. 1992:13-25; Schwartz 1956a). Khera and Mariella (1983:38-39) report that the northern boundary of Yavapai territory runs east to west somewhere across the southern part of the project area. Therefore, it is interesting that all four Buck Taylor Notched points within the collection occur on the extreme southern edge of the research area, within traditional Yavapai territory. Although a larger sample of such points is needed, current data suggest that the Buck Taylor Notched may be culturally diagnostic of the protohistoric Yavapai within the Flagstaff region.

Table 22. Metric Data for Buck Taylor Notched Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	3	...	...	...	...
Maximum Width	3	9.271	15.443	13.25033	3.452189
Maximum Thickness	3	2.489	3.785	2.97180	.708018

A Solitary Historic Projectile Point (A.D. 1,600 to A.D. 1,950)

Type Name: Historic Metal Arrow Point
Temporal Range: A.D. 1650 to 1850

I identified one metal arrow point within the collection. To date, I have found no other reference to metal arrow points collected from the South Kaibab (although Formby 1986:106 reports that he observed two metal arrow points on an archaeological site somewhere south of Ash Fork). Therefore, although my selection criteria excluded this

artifact from the analysis portion of the project, its inclusion within this Chapter is warranted. This artifact may be attributable to the Historic Pai but is more likely to be of Navajo origin. Christensen (1987:309, Plate 13.z) reports a metal arrow point from Black Mesa that is morphologically comparable to the one pictured below (Figure 4.28). Based on solid ethnographic evidence, Christenson (1987:181) concludes that the point is "undeniably of Navajo manufacture." Similar metal arrow points are occasionally collected southeast of the research area on the Apache-Sitgreaves National Forest and are attributed to the Apache, the Athabaskan cousins of the Navajo (Heather Provencio, personal communication 2003).

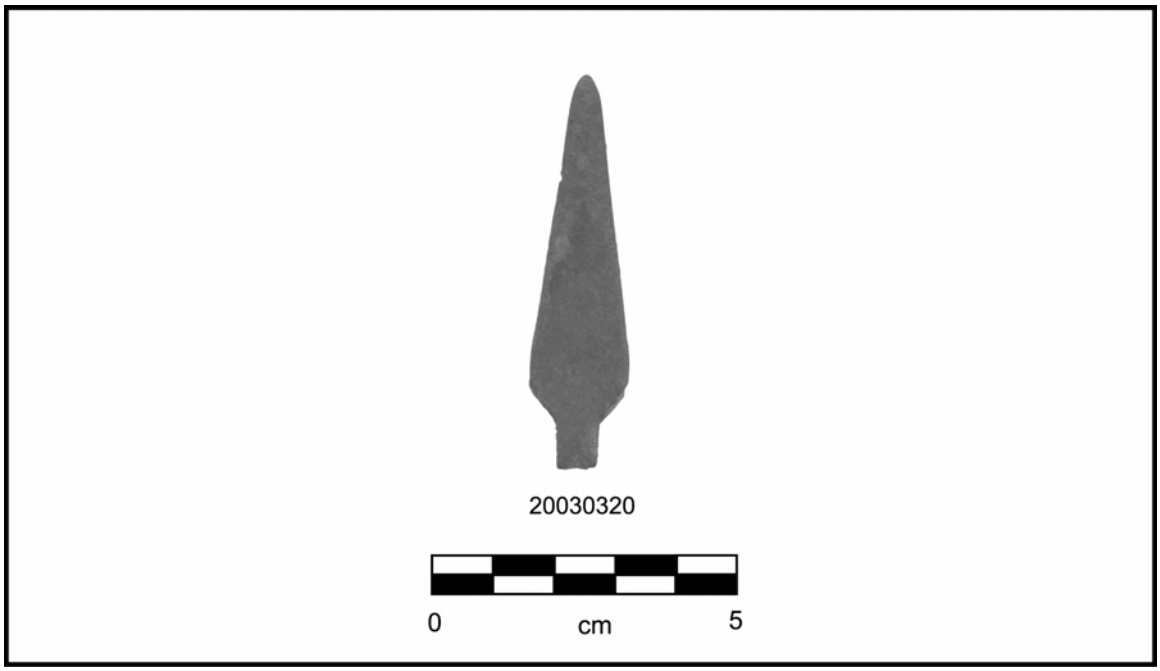

Figure 4.28. Historic Metal Arrow Point

This single metal artifact has a blade length of 53.21 mm and a stem length of 7.41 mm for a total length of 64.67 mm. The artifact measures 16.13 mm wide and only 1.65 mm thick. Therefore, the artifact exhibits the longest total length and blade length in

the sample and is also the thinnest projectile point in the collection including the tiny Desert Side-notched points. Christenson (1987:181) states that "[t]he use of metal not only reduces breakage but allows an extremely thin point with a long cutting edge" and cites a date range of roughly A.D. 1650 to A.D. 1850 for the type.

Undated Projectile Point Types

Type Name: Elko Corner-notched

Points of this type are large, corner-notched dart points. I classified 115 artifacts as Elko Corner-notched for the current analysis. Lorentzen (1998:148) notes a "considerable variability in size and shape" among specimens of this type and his statement is affirmed by the sample, which shows variation in nearly every attribute including overall size, basal form, and angle and depth of notches.

Currently, Elko Corner-notched points appear to span practically the entire continuum of projectile point manufacture in the Southwest and thus make poor temporal indicators. While intuitively Elko Corner-notched points appear to resemble Late Archaic and Early Agricultural forms, some evidence suggests that such points continued to be manufactured well into the Ceramic period (Lorentzen 1998:148). Holmer (1986:101) offers two different time sequences for the type based on differences in dates between the Eastern and Western Great Basin. Holmer's date range for the Eastern Great Basin seems more appropriate for the research area and would indicate a punctuated timeline from 8,000 to 6,200 B.P., 5,000 to 3,400 B.P., and 1,750 to 950 B.P. for Elko Corner-notched points.

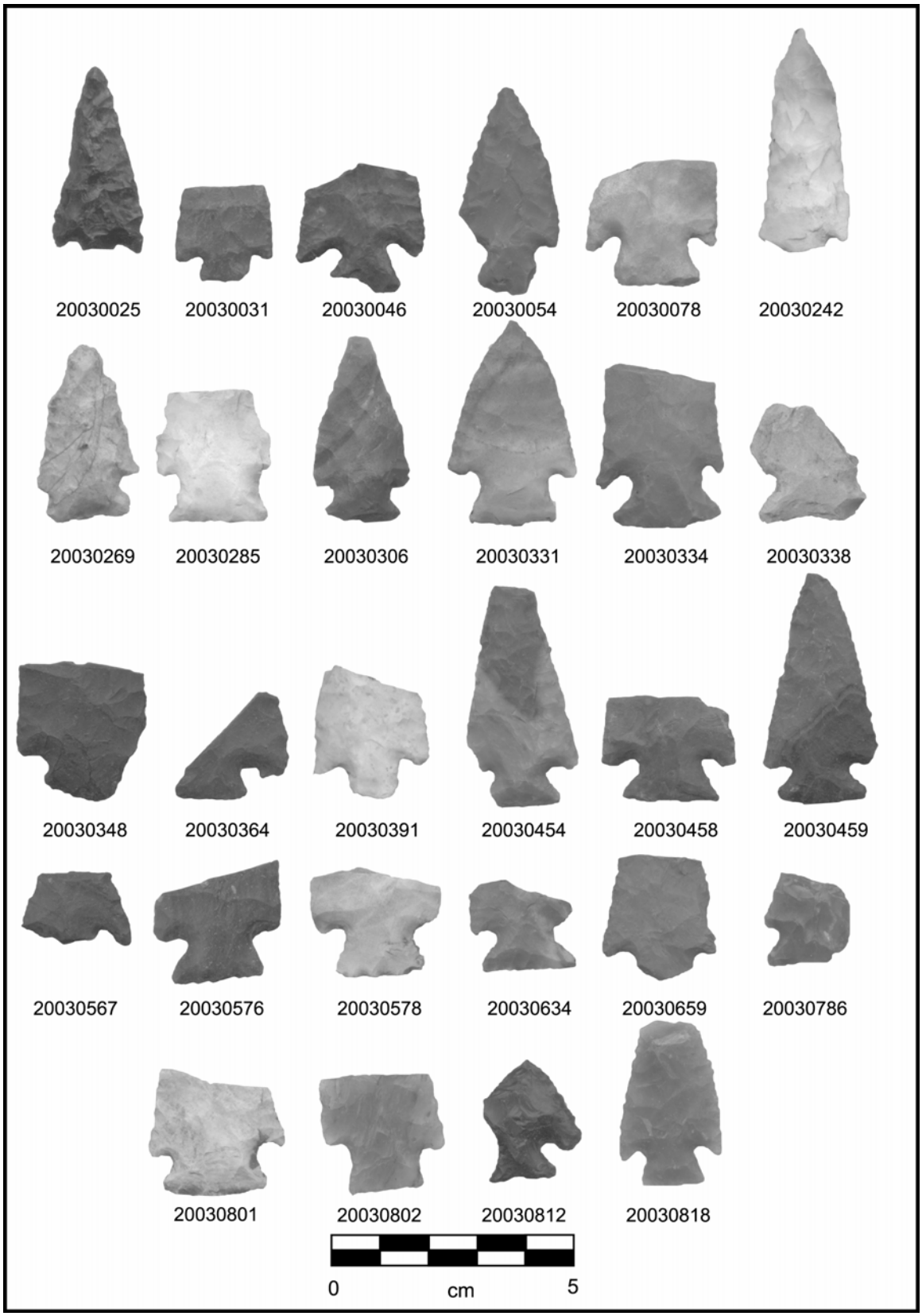

Figure 4.29. Elko Corner-notched

Table 23. Metric Data for Elko Corner-notched Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	28	...	...	...	...
Blade Length	7	31.293	45.212	36.54334	5.214609
Stem Length	24	4.699	11.684	8.86672	1.581517
Total Length	5	36.779	47.752	41.68648	4.270804
Maximum Width	28	17.729	28.194	23.58753	3.060168
Maximum Thickness	28	3.480	6.020	4.84142	.677839

Perhaps the lengthy timeline and considerable morphological variability within the type imply that in actuality, several temporally sensitive projectile point types exist within the group. One such type, Elko Eared, appears to be justifiable and is used for the current typology. However, due to the current problems associated with assigning dates to Elko Corner-notched points, I have refrained from using the type as a temporal marker.

Type Name: San Rafael Stemmed

Thirty projectile points in the collection were classified as San Rafael Stemmed. The San Rafael Stemmed category represents a catch-all of large, straight stemmed, shouldered points within the collection. The type was first defined by Tipps (1988:85-86) to differentiate stemmed points with straight, square bases from contracting-stemmed Gypsum points. Other archaeologists in the region have used the type (see Horn Wilson 1997:146; Smiley 1995:47) although an exact temporal range for the type remains unknown. Morphologically, many of these points appear identical to what Justice (2002b:174-179, see especially Figure 21, pg. 177) refers to as Datil points.

Again, an exact temporal range for this type is unknown. Tipps (1988:86) states, "San Rafael Stemmed points occur on the surface with Pinto, Elko and Gypsum points and apparently date to the Archaic period. Additional investigations and the recovery of

similar points from well-dated, stratified deposits will be necessary to refine and confirm the temporal range suggested by the surface evidence." However, Justice (2002b:174) offers a date range of 3,600 to 1,650 B.P. for Datil points based primarily on excavated artifacts from Bat and Ventana Caves. This range would attribute the type to a Late Archaic to Basketmaker temporal sequence. Additionally, these points seem to be

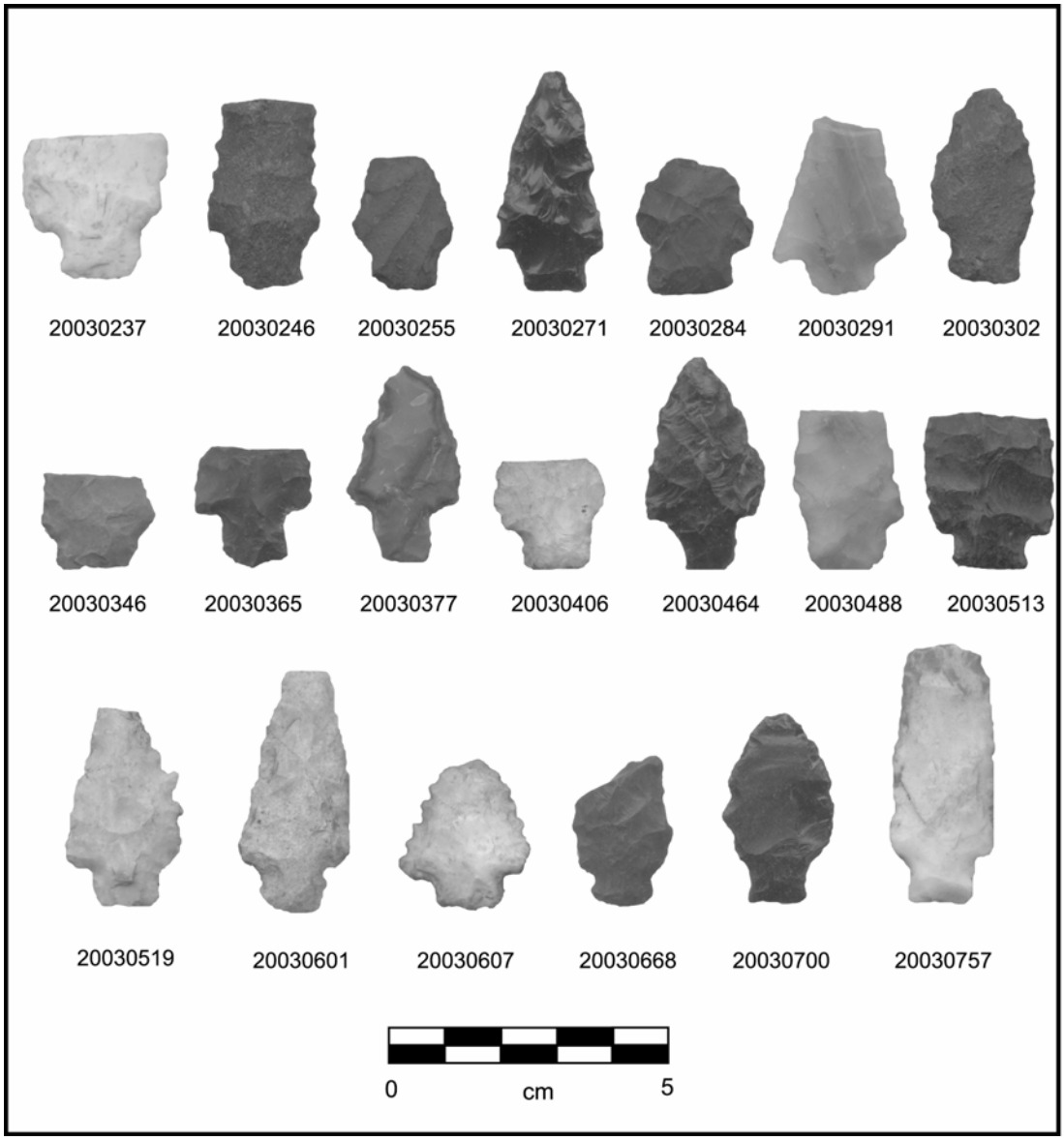

Figure 4.30. San Rafael Stemmed

Table 24. Metric Data for San Rafael Stemmed Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	20	...	...	...	...
Blade Length	6	20.955	33.122	26.69540	4.296461
Stem Length	20	5.309	10.389	7.99338	1.382452
Total Length	6	27.254	39.802	35.18323	4.512528
Maximum Width	20	17.983	26.137	20.93849	2.097992
Maximum Thickness	20	4.267	7.671	5.58038	.853877

morphologically similar to Tagg's (1994:90, 105) Triangular, narrow stemmed type. Tagg (1994:103) likewise tentatively offers a date range of "Late Archaic/Basketmaker" for the type.

Type Name: Indeterminate, Medium Stemmed

This type consists of medium, stemmed dart points. A wide range of morphological variability exists within the type, evidenced most prominently in the convex to concave basal forms. Indeterminate, Medium Stemmed points are primarily distinguished by their overall size, falling somewhere between the San Rafael Stemmed type, which is much larger, and the Rosegate varieties, which are much smaller. Tagg's (1994:90, 108-111) stemmed Type 21, which he dates to A.D. 800-900, appear to be somewhat similar. However, the points I analyzed have been produced primarily by percussion rather than the pressure flaking noted by Tagg (1994:111) and appear generally larger.

Thirty Indeterminate, Medium Stemmed points exist within the collection occurring on twenty-nine archaeological sites. Of these, six sites are aceramic, one site is Historic, and the remaining twenty-three sites are Ceramic Period sites.

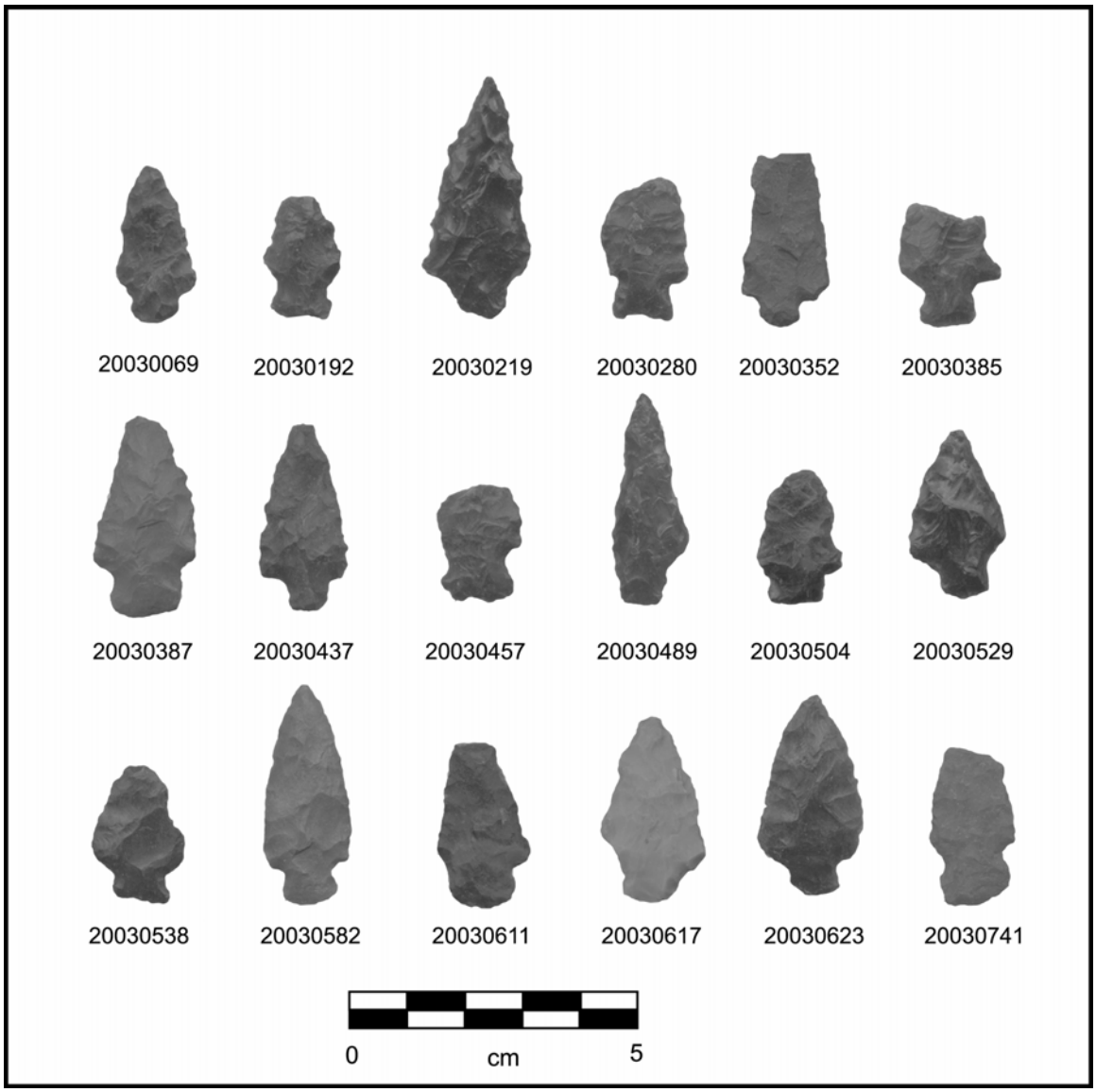

Figure 4.31. Indeterminate, Medium Stemmed

Table 25. Indeterminate, Medium Stemmed

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	18	...	...	...	...
Blade Length	11	18.567	36.093	26.67231	5.198921
Stem Length	18	4.699	10.668	7.40692	1.905630
Total Length	11	23.520	42.240	32.43118	5.892765
Maximum Width	18	13.487	19.177	16.15863	1.763862
Maximum Thickness	18	3.886	6.172	4.94312	.603225

Type Name: Elko Side-notched
Other Names: San Pedro, Moquino Side-Notched

This is a category that encompasses all side-notched dart points within the collection that cannot be assigned to another group. Side notching is a common attribute that may simply reflect a practical way of re-using an artifact in many cases (Berry 1987). Berry (1987:360) states that the occurrence of such reworked, side-notched points at sites from varying temporal periods "attests to the widespread practice of reutilization of available fragments of sufficient size." For example, Hesse (1995) reports a Clovis point found near Chevelon Ruin in Arizona that has been notched along the lateral edge near the base. Hesse (1995:87) posits that the point was collected by Puebloan occupants of the area and notched for re-use at that time. Such side notching appears on a wide range of morphologically dissimilar points, and as Berry (1987:360) notes "the range of morphological variation remains a frustrating typological problem."

Given the current problems with side-notched points, my approach for this analysis has simply been to classify all typable side-notched points into separate categories (Northern side-notched, Sudden side-notched, San Rafael side-notched, Western Basketmaker II) and to leave the remainder in the over-arching category of "Elko Side-notched" points. The remaining assemblage includes points that might also be called En Medio Side-notched, or San Pedro points but which could not be isolated within the current collection by any objective criteria. Other typologists have taken similar approaches to the problem of side-notched points. For example, Berry (1987:359-389) splits all side-notched points within her collection into reworked points and non-

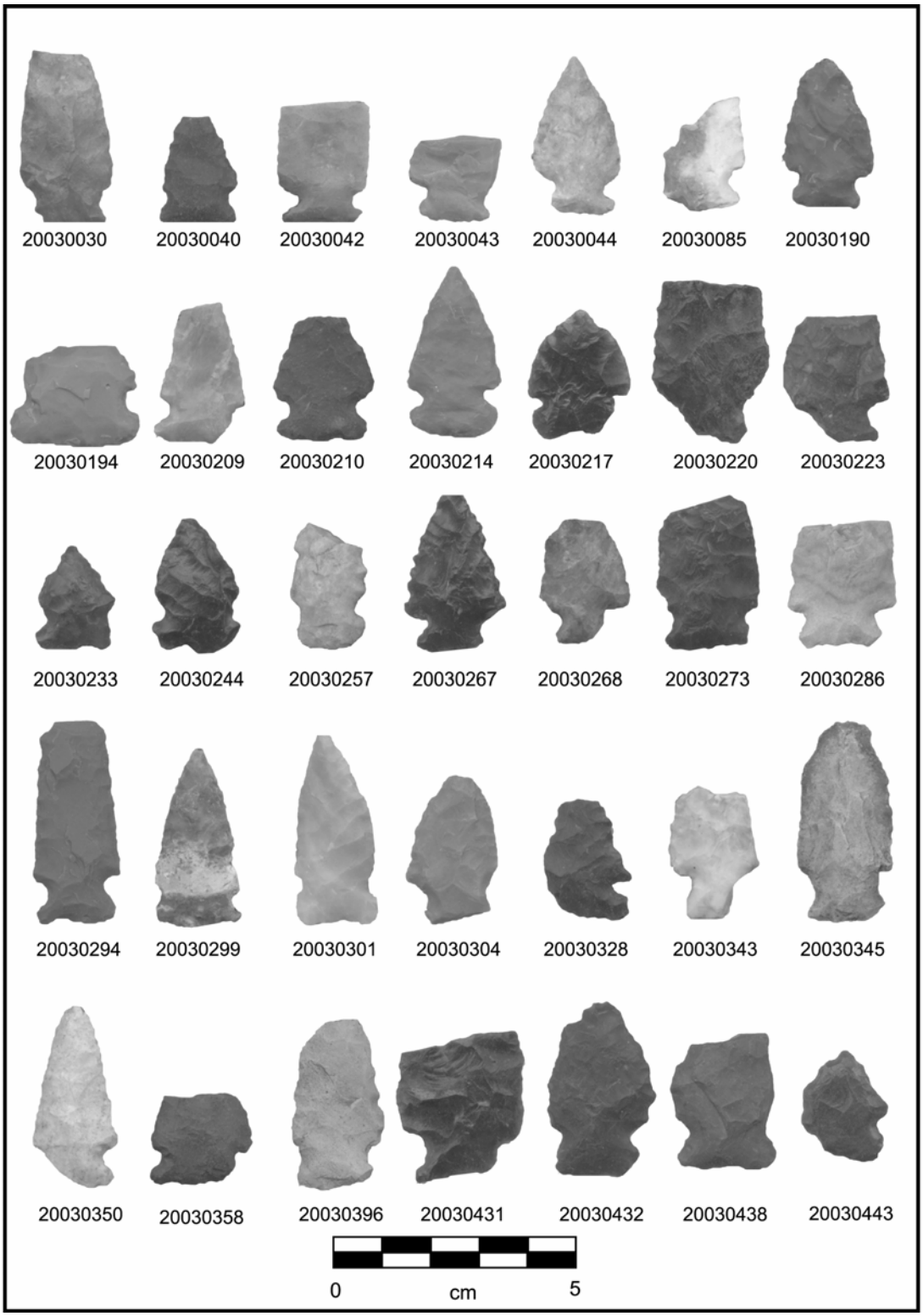

Figure 4.32. Elko Side-notched (Plate 1)

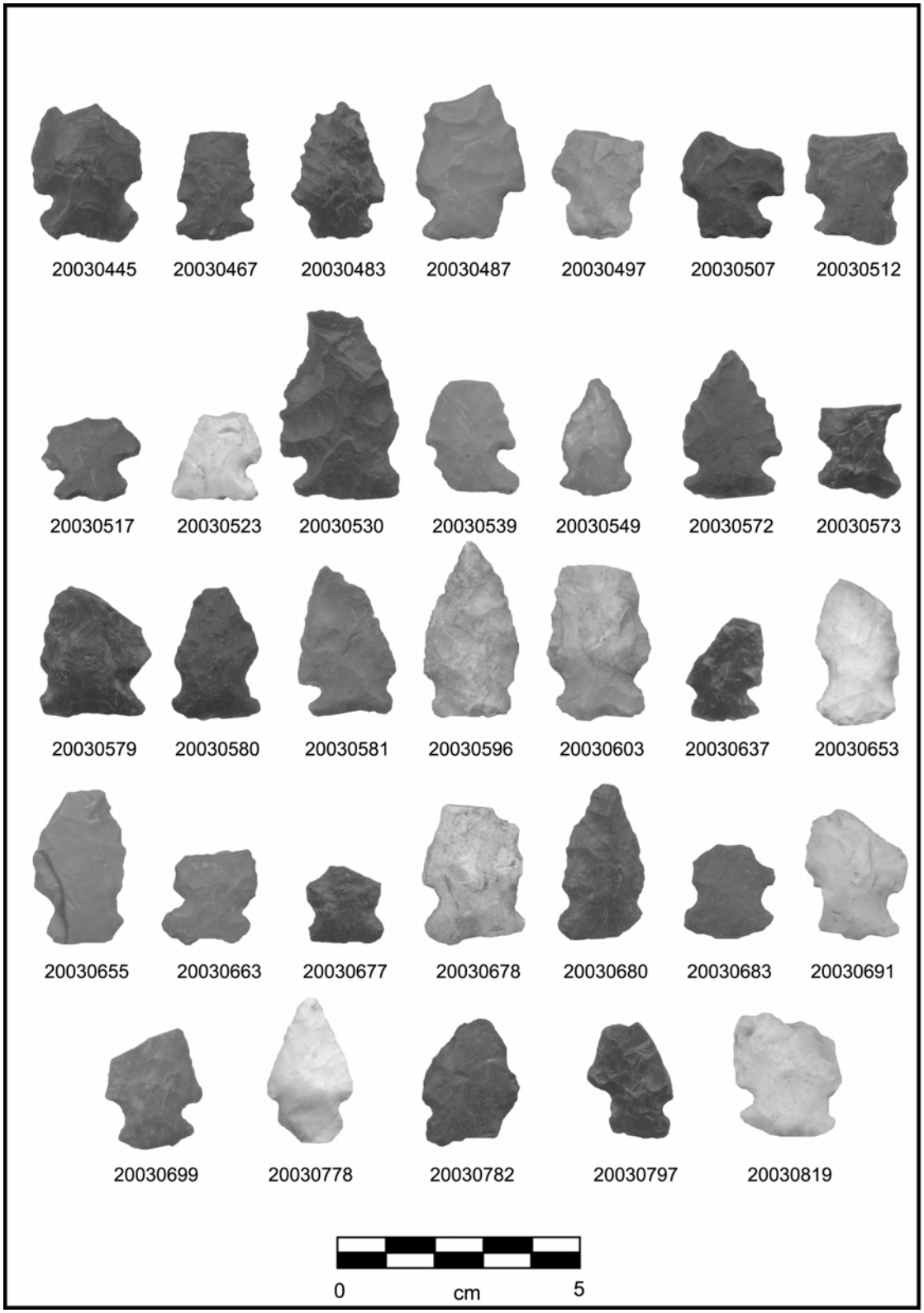

Figure 4.33. Elko Side-notched (Plate 2)

reworked points (Moquino side-notched, Variants 1 and 2), which exhibit a wide range of morphological variability. Such a range of variability appears evident in the current sample as well.

Table 26. Metric Data for Elko Side-notched Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	68	...	...	...	...
Blade Length	21	15.011	31.420	24.06469	5.327856
Stem Length	68	6.502	12.268	8.89112	1.479451
Total Length	21	11.532	41.605	30.22842	6.863416
Maximum Width	68	14.402	26.899	19.86616	2.488596
Maximum Thickness	68	3.404	9.068	5.34371	1.033376

Type Name: Coconino Stemmed, Variety A

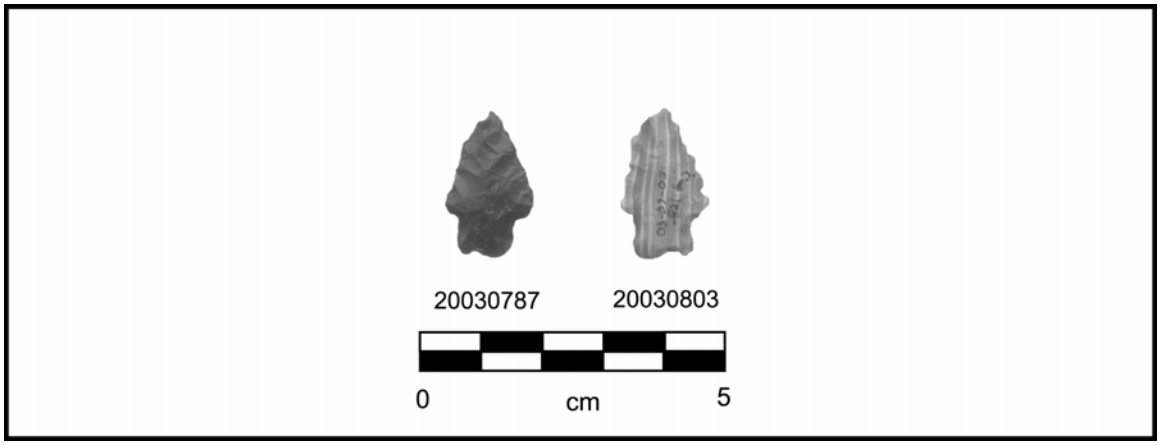

Figure 4.34. Coconino Stemmed, Variety A

I classified three artifacts as Coconino Stemmed, Variety A, named after the Coconino Plateau. Coconino Stemmed, Variety A points exhibit extreme morphological similarity among specimens. All three artifacts of this type have prominent shoulders, a slight basal concavity, and serrated blade edges. Interestingly, while two of the artifacts are made of Government Mountain obsidian, the third point is made from a gray and

white striped, non-local chert which appears to derive from a source near Payson, Arizona (Jim Holmlund, personal communication, 2004).

Table 27. Metric Data for Coconino Stemmed, Variety A Points

	Number	Minimum	Maximum	Mean	Std. Deviation
Total Number	2	...	...	...	...
Blade Length	2	17.983	18.288	18.13560	.215526
Stem Length	2	6.604	7.137	6.87070	.377171
Total Length	2	24.003	24.765	24.38400	.538815
Maximum Width	2	14.427	14.605	14.51610	.125724
Maximum Thickness	2	4.953	5.436	5.19430	.341250

Coconino Stemmed, Variety B

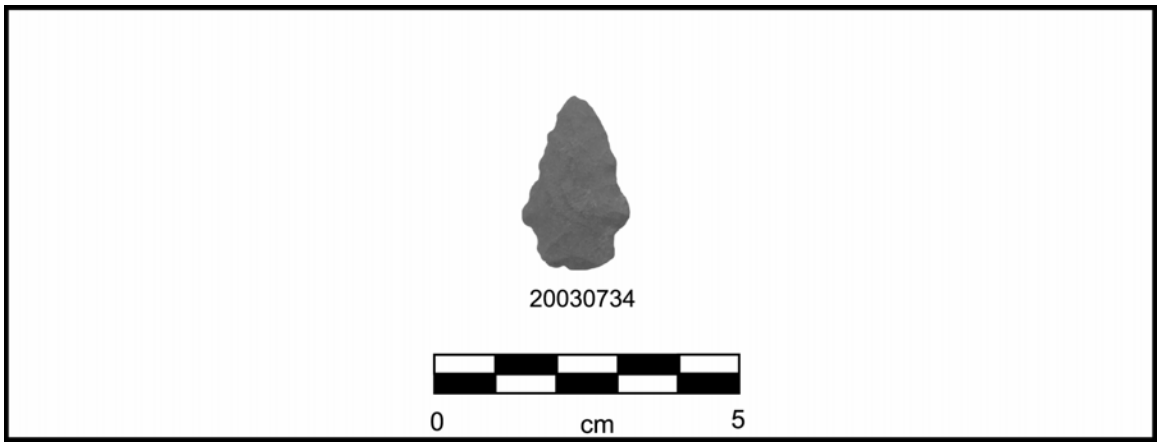

Figure 4.35. Coconino Stemmed, Variety B

I classified three points as Coconino Stemmed, Variety B. Such points differ from Variety A points by lacking a basal concavity and by being somewhat larger overall. Two of the artifacts are of Government Mountain obsidian and one is of rhyolite.

Chapter Summary

Above, I have outlined the 35 types defined or adapted for use during the current study. I have listed all of the temporally diagnostic types by period, and have stated my justification for assigning such dates. Illustrations of the 340 artifacts from Batch A have been included to portray the range of variability within each category. Full-color images of every point can be found in Appendix A. In the next chapter, I discuss how the temporally diagnostic projectile points outlined above are distributed on the landscape of the South Kaibab during the preceramic periods. I also examine how distributions of raw materials change over time within the research area.

Chapter 5 : Changing Distributions of Preceramic Artifacts on the Coconino Plateau Over Time

This chapter represents conclusions drawn from the spatial distributions of the temporally diagnostic projectile points described in the preceding chapter. I have organized the chapter into summaries of data for each temporal period, beginning with the oldest (Paleoindian Period) and working forward through time up until the Early Ceramic period that immediately preceded the florescence of the Cohonina culture around A.D. 700. Although this study focuses on the period of time preceding the use of ceramics on the Plateau, I have also included maps of spatial distributions of artifacts for the Ceramic and Protohistoric periods for comparative purposes. In addition, I discuss possible trends in lithic raw material preferences during different temporal periods towards the end of the chapter.

For the analysis presented below, I found it necessary to split the data set into two groups of sites based on the presence or absence of ceramic artifacts. The underlying assumption for such a split is that preceramic artifacts collected from Ceramic Period sites are likely to represent items that were transported to the site by Ceramic Period people. Therefore, while such items provide evidence on the regional level of preceramic occupation, transported items are unlikely to represent accurate spatial distributions of preceramic sites. Conversely, artifacts collected from aceramic sites are more likely to reflect distributions of preceramic sites. Below, I have included maps showing the distributions of both aceramic sites, and those bearing ceramic artifacts. Most of the discussion regarding site distributions during the preceramic period derives primarily from aceramic site distributions.

The Paleoindian Period (11,900 to 9,000 B.P.)

As recently as 1996, Hanson's (1996:2) culture-history of the Coconino Plateau began with the Archaic period due to a complete absence of Paleoindian sites on the South Kaibab. However, recent isolated finds of Paleoindian artifacts on the Plateau, though scant, collectively indicate that the area was indeed utilized by Paleoindian groups. It is possible that much of this early use of the area focused on the obsidian sources that occur within the region. Although at present no confirmed Paleoindian sites exist on the South Kaibab, I would argue that the combination of fluted points located on the Kaibab and Paleoindian artifacts derived from local raw materials found elsewhere, suggests the existence of a Paleoindian occupation of the area. The occurrence of Paleoindian artifacts but complete lack of sites dating to this period highlights the disparity between site-level and artifact level analyses from which culture-historical models are developed.

As discussed in the preceding chapter, the artifact-level analysis conducted here identified two Clovis point basal fragments. Significantly, both artifacts are derived from local raw material sources. One specimen is made of Government Mountain obsidian, and was discovered 35.78 kilometers from that material source. The other Clovis point appears to be a highly weathered projectile point of Black Tank obsidian collected 82.15 kilometers southeast of the Black Tank source (Figure 5.1).

In addition to the two Clovis points identified by this analysis, at least some other evidence supports the presence of fluted points on the Kaibab. Brown (1994:305) reports another possible fluted point located within a few miles of the Government Mountain

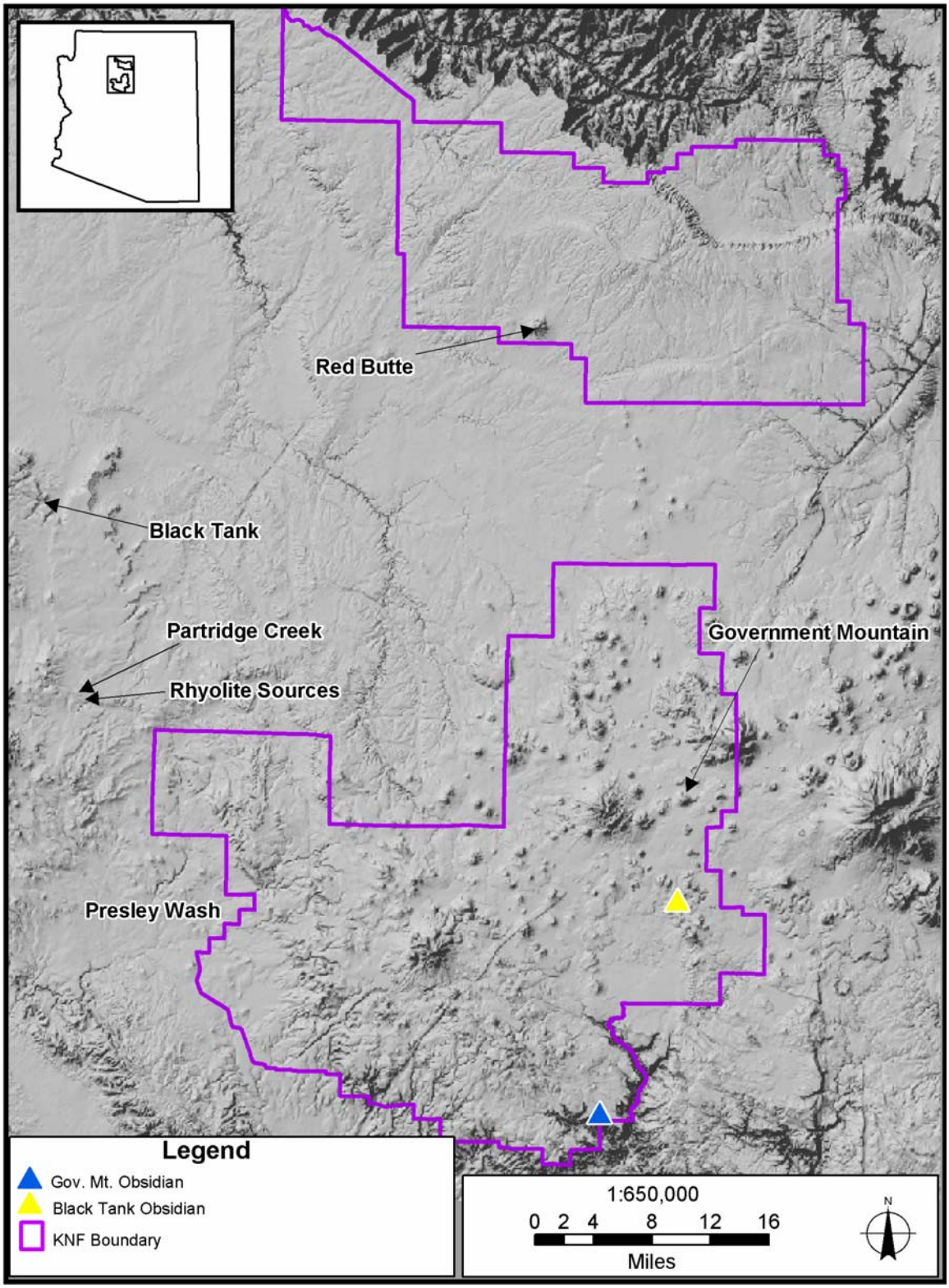

Figure 5.1. Distribution of lithic raw materials during the Paleoindian Period

obsidian source. Landis (1993:246) also documented a chalcedony channel flake[8] from a KNF site near Partridge Creek, although Landis posits the flake could derive from basally thinning a Pinto point. Perhaps most significantly, Pilles and Geib (2000) have summarized the data for 20 Clovis points found in the Flagstaff region (but outside of the boundaries of the KNF). Of those listed, three points reportedly derive from the Government Mountain source, three are from the Presley Wash source, and two additional points are probably Government Mountain obsidian as well.

Therefore some evidence supports an occupation of the area by Clovis people from the period of time dating between 11,500 and 10,900 B.P. However, the same cannot be said for the following 700 years as evidenced by an absence of temporally-diagnostic Folsom points that date to this period (10,900 to 10,200, Stanford 1999:296). It is perhaps premature to make too much of this absence given the corresponding lack of archaeological investigation into preceramic sites on the KNF. The research area is not outside of the general region described as the "core area" of Folsom occupation by Stanford (1999:298-299). However, Stanford (1999:289-305) also notes a considerable difference in paleoclimactic trends during the Clovis and Folsom periods which may have influenced human settlement of the region.

In addition to fluted points, I also tentatively suggest that four artifacts identified for this study may represent either unidentified Paleoindian (particularly Late Paleoindian) forms or those from the earliest part of the Archaic. Three of these comprise the Large, Indeterminate Stemmed type category discussed in Chapter 4. The Later Paleoindian Period is not well understood, and projectile point styles during the

[8] Channel flakes result from the process of fluting a projectile point. As such, channel flakes are generally considered to be diagnostic of the Paleoindian period, during which fluted points were produced.

time appear to represent a high degree of variability and divergence from earlier forms (Stanford 1999:326). However, all of the points classified in this category appear to share stylistic traits with other Late Paleoindian/Transitional Period points found elsewhere. It should be noted that Mick Robbins (personal communication, 2004) has documented two other probable Late Paleoindian artifacts within the study area.

The last artifact that may indicate very early occupation of the region is the single Jay point found on the South Kaibab. As I discussed in the previous chapter, such points were not well-dated originally, and recent evidence indicates that Jay points may be older than previously thought. New date ranges for the type might place the artifact within what Matson (1991:129) refers to as the "Earliest Archaic," a transitional phase between the Paleoindian and Archaic periods. Significantly, of the four artifacts potentially belonging to the Late Paleoindian or Transitional periods, two are of Government Mountain obsidian and are located within 6 kilometers of the Government Mountain obsidian source while the remaining two points are made of Red Butte chert (Figure 5.2). Therefore all six Paleoindian and Transitional period points occur in the southeast section of the research area and are clustered around Government Mountain (Figure 5.3). In addition, five of the artifacts occur at relatively high elevations, at an average elevation of approximately 7,100 feet.

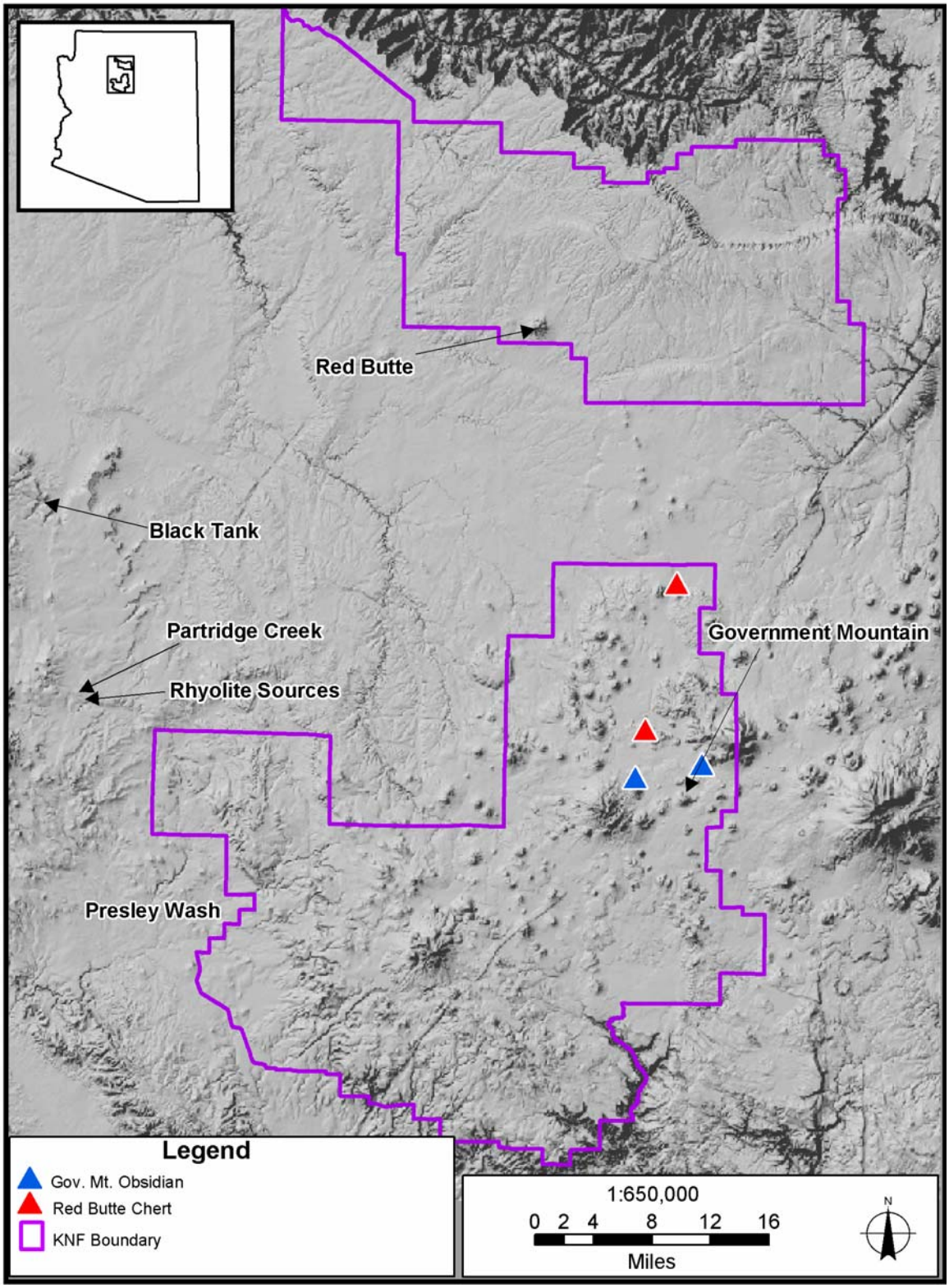

Figure 5.2. Distribution of lithic raw materials during the Transitional Period

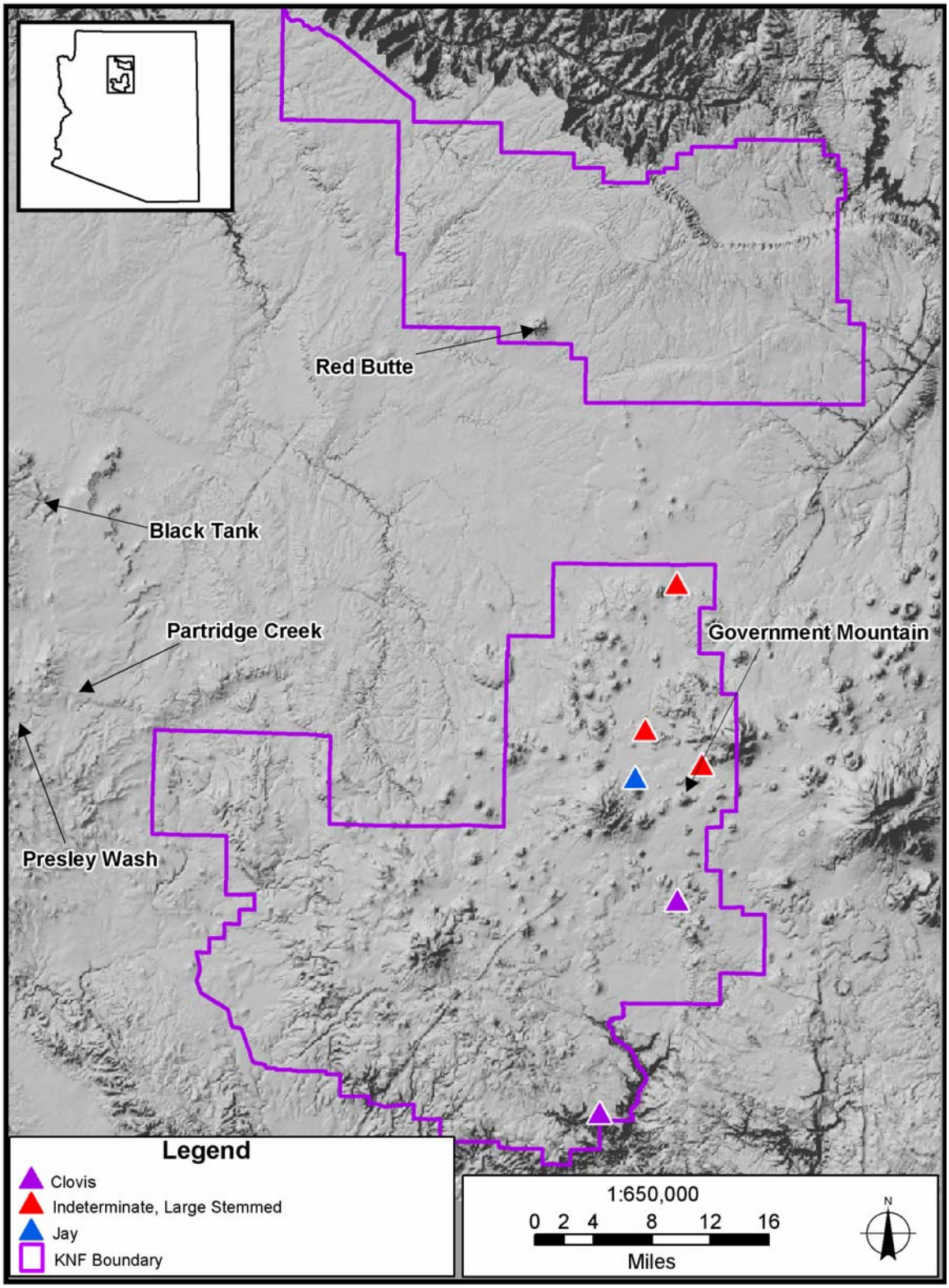

Figure 5.3. Distribution of Paleoindian, and Transitional Period projectile point types

Therefore, although evidence is limited at this time, data from the Plateau do indicate that the area was utilized during the earliest periods of human occupation. Pilles and Geib (2000:19) have stated that the use of local raw materials in the region during this time, as confirmed by the current study, suggest a pattern of "residential" occupancy of the region as a whole by Paleoindian groups. They state

> Kaibab chert, Government Mt. and Presley Wash obsidian, petrified wood, and Tolchaco chert [cherts from the Little Colorado River drainage east of the project area] are all raw materials local to the region and no more than a few days travel separated a point from the source of its material. This implies the points were produced in the general region and indicates a "residential" occupation of this region by the Paleo-Indians, rather than an occasional passing through the region from areas of major Paleo-Indian settlement , [Pilles and Geib 2000:19].

Interestingly, the data from this study suggest that these earliest periods of use within the south Kaibab were largely concentrated within the high-elevation, ponderosa pine forests surrounding the Government Mountain obsidian source. As Figure 5.4 indicates, all of the Paleoindian and "Transitional" period artifacts derived from aceramic sites clustered around Government Mountain. The only artifact collected at an elevation lower than 6,500 feet, and outside of this cluster of sites, is the one Clovis point (artifact #20030643) that was found on a large Ceramic Period settlement. This artifact was almost certainly transported to the site by Ceramic Period people. As discussed in Chapter 1, Pilles and Geib (2000:20) have suggested that there may be numerous Paleoindian sites near the obsidian sources of the KNF that remain unidentified due to the masking effect of later use. The artifact data for this analysis support that statement, indicating a rare but significant Paleoindian to Transitional Period occupancy clustered around the obsidian sources in the southeastern portion of the research area.

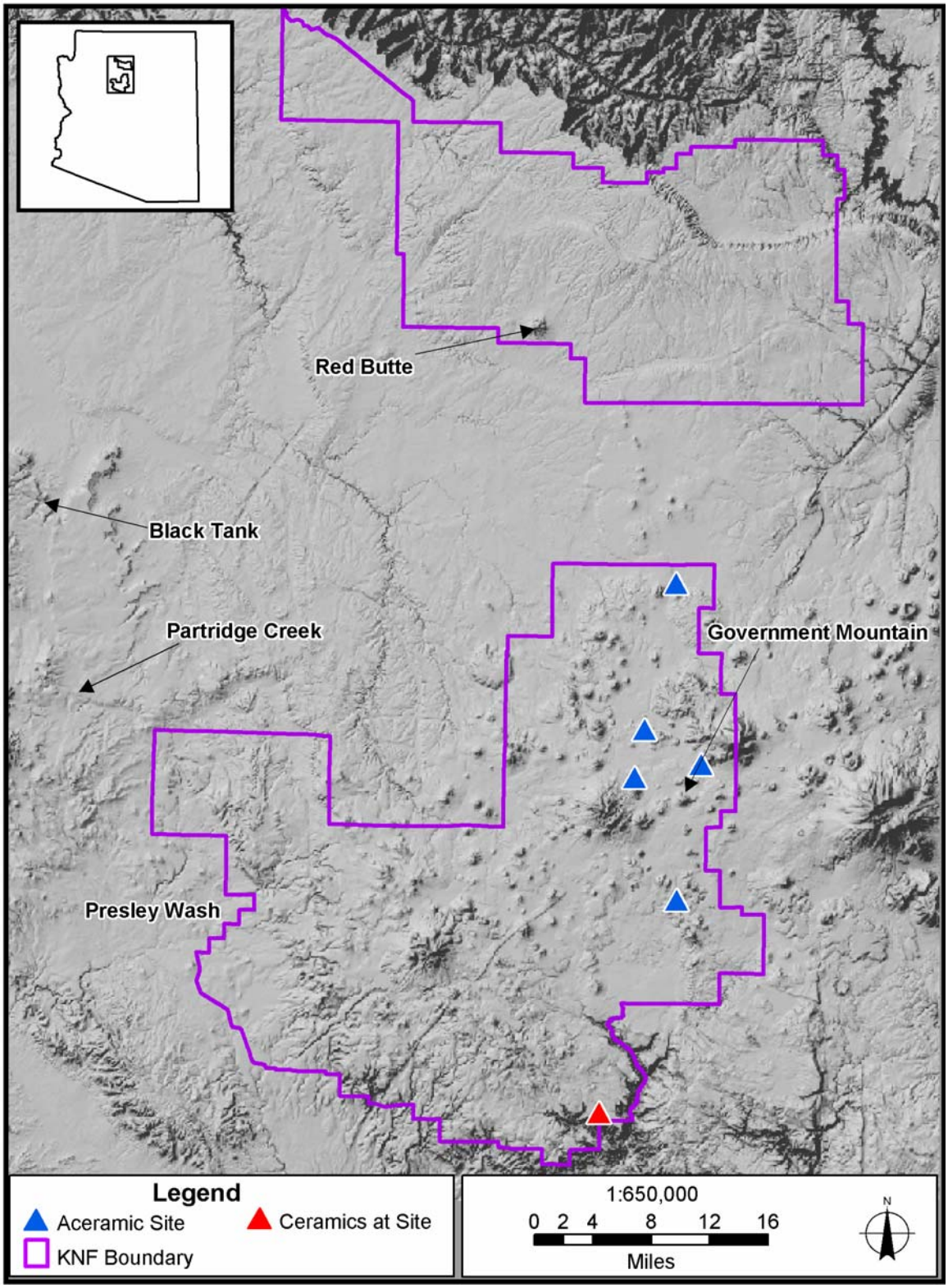

Figure 5.4. Distribution of ceramic and Ceramic Period sites yielding Paleoindian and Transitional Period points

Overview of the Archaic Period

Prior to discussing results for the Early, Middle and Late Archaic periods of occupation on the south Kaibab, I include below a brief overview of the Archaic period as whole. In general, it is believed that Archaic populations became increasingly sedentary over time compared to Paleoindian groups. However, it should be noted that Archaic groups still maintained a high level of mobility compared to later agriculturalists. Below, I have included a general dating scheme for the period, along with a brief summary of environmental data. Following the introduction, I have outlined data from the study pertaining to each of the three sub-periods of the Archaic, including a discussion of how such patterns change over time and also relate to what is known within the greater Southwest.

The Archaic period of the prehistory of the southwestern United States represents a period of increased human adaptation to fluctuating environmental patterns of the middle to late Holocene. Archaic populations reacted to such fluctuations by developing an increasingly sedentary settlement pattern, coupled with significant changes to subsistence strategies. The results of such changes appear in the material culture and site distribution for the time. The adaptations made by Archaic period people in the Southwest reveal marked change from the Paleoindian period. However, like Paleoindian groups, Archaic populations continued to practice a hunting and gathering subsistence, although changing environmental conditions necessitated specializing in different food sources. Therefore, the Archaic period is primarily defined as being pre-agricultural, and ends with the appearance of cultigens into the archaeological record.

The Archaic period begins as early as 9,000 B.P. in the Southwest, quickly following the end of the Pleistocene era. The Paleoindian cultures of the Pleistocene specialized in the hunting of large game animals, particularly mammoth, and later, bison. However, what archaeologists perceive of as a general drying trend during the Holocene encouraged human populations to concentrate on areas with readily available water, such as lakes and rivers. As a result, populations became increasingly less mobile than their Paleoindian forbearers. This decreased mobility resulted in increased specialization in smaller game and more importantly, an increased dependence on local plant materials for subsistence. Such a shift probably influenced changes in settlement organization from highly mobile groups, to a pattern in which semi-sedentary groups dispatched "task specific excursions" for the exploitation of resources, including occasional big game and lithic raw materials. (Smiley 2002:26).

The Archaic Environment

In order to fully understand the adaptations mentioned above, one must take a detailed look at the environmental conditions of the Holocene. The earliest interpretations of Holocene environmental conditions in Southwestern archaeology derive from a framework developed in 1955 by Ernst Antevs. Antevs posits three general climactic stages within the Holocene (Antevs 1955). According to Antevs, the Anathermal dates from 10,000 to 7,500 years B.P. and corresponds with increasing average temperatures in response to withdrawing ice sheets. The Altithermal dates from 7,500 to 4,000 B.P. and corresponds with relatively xeric (arid) conditions. Finally, the Medithermal, dating from 4,000 years B.P. to the present, turned to the relatively mesic

(moist) conditions evident today. Currently, paleoenvironmental data suggest that the nature of fluctuations between mesic and xeric conditions in Antev's proposed scheme is at the very least, oversimplified (Smiley 2002:16, Geib 1996:32). Still, current palynological and geological evidence indicate general environmental transitions at the beginning and end of the Altithermal and the Early, Middle, and Late Archaic periods continue to be defined largely as correlates of Antev's Anathermal, Altithermal and Medithermal phases.

For example, general drying trends, as proposed for the Altithermal, fit with current archaeological evidence for the Middle Archaic period. Site distributions seem to indicate that Archaic populations shifted towards areas with year-round access to water in response to general drying trends (Geib 1996:33). In addition, Smiley (2002:21-22) has noted shifting patterns of vegetation types on Black Mesa during the Archaic period which suggest corresponding shifts in environmental conditions.

The Early Archaic Period (9,000 B.P. to 6,200 B.P.)

The Early Archaic period dates from the end of the Pleistocene around 9,000 B.P. to approximately 6,000 years ago. At present, archaeologists have tentatively dated six sites on the Kaibab National Forest to the Early Archaic period based on surface assemblages. This number equates to only one tenth of one percent of all sites on the South Kaibab. The artifact-level analysis used for this study identified 21 Early Archaic projectile points derived from 20 sites on the forest, thereby increasing the inventory of possible Early Archaic sites by over 300%.

For this analysis, I used Bajada and Northern Side-notched points as indicators of an Early Archaic occupation. Figure 5.5 shows that the spatial data are clearly split between the two point types. All of the Northern Side-notched projectile points are located in the Pinyon-Juniper vegetation zone along the western portion of the study area. In contrast, most of the Bajada points are clustered within the high-elevation, ponderosa pine forests in the eastern portion of the south Kaibab. The average elevation for Northern Side-notched points equals 6059.7 ft (+/-518.3 ft). The average elevation for Bajada points equals 7309.7 ft (+/-376.1 ft), a difference of about 1300 ft. Additionally, a map of the lithic material sources for each type clearly indicates a division between sources located on the western and eastern sides of the research area (Figure 5.6).

Significantly, all of the Northern Side-notched points were collected from Ceramic Period sites and therefore likely represent transported items. In fact, considering the 100% correlation of Northern Side-notched points with Ceramic period sites, it appears likely that several of these may actually be recycled, side-notched bifaces as discussed in Chapter 4. In other words, some or all of the Northern Side-notched points may have been incorrectly assigned to the Early Archaic Period during the classification process of this study. If one isolates artifacts collected exclusively from aceramic sites, the resulting spatial pattern appears extremely similar to the pattern displayed by Paleoindian and Transitional period artifacts as discussed above (Figure 5.7) with the exception of a few sites being located in the Red Butte area. Therefore, the aceramic site data indicate that prehistoric land-use during the Early Archaic period, like the preceding

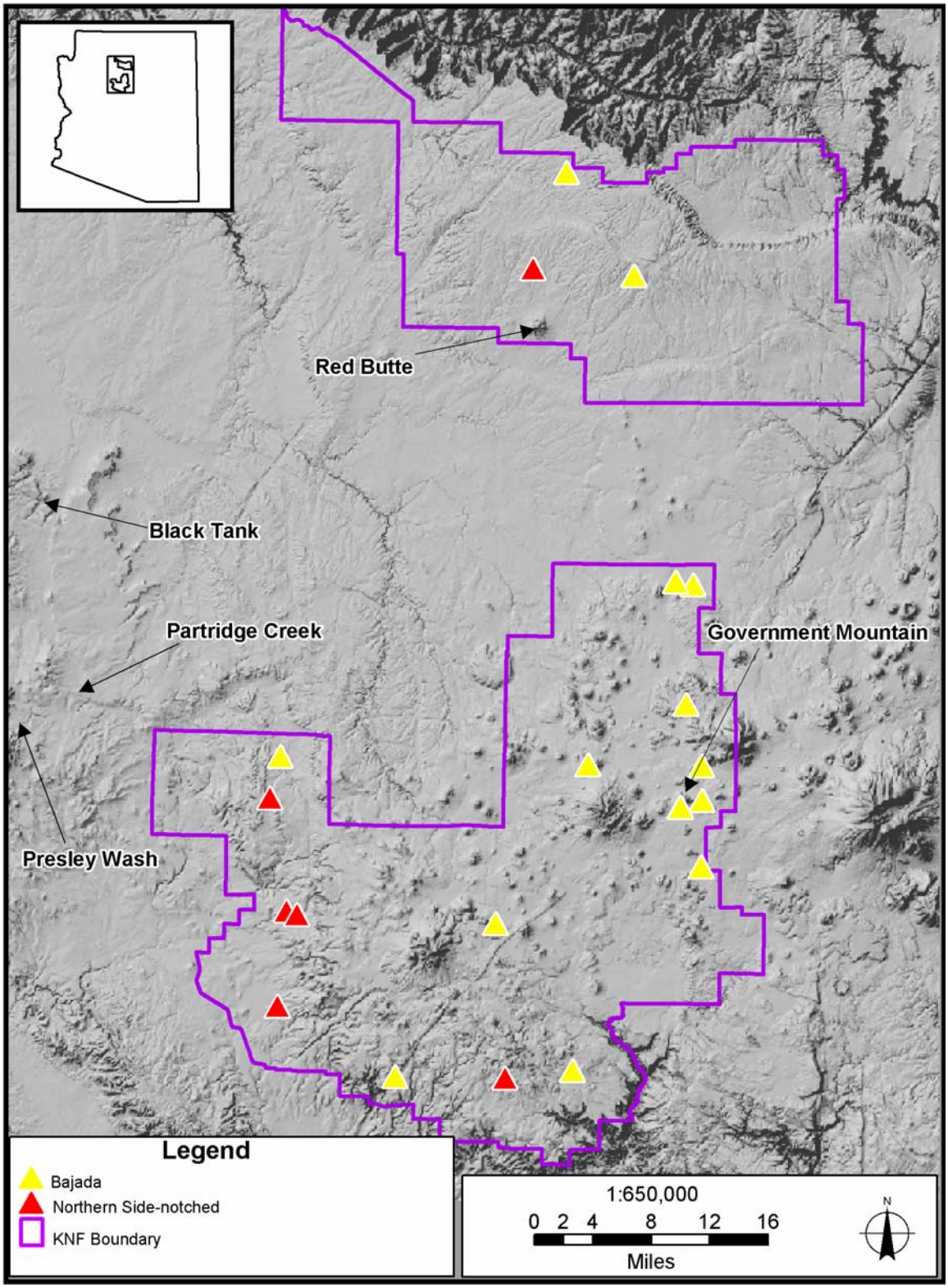

Figure 5.5. Distribution of Early Archaic projectile point types

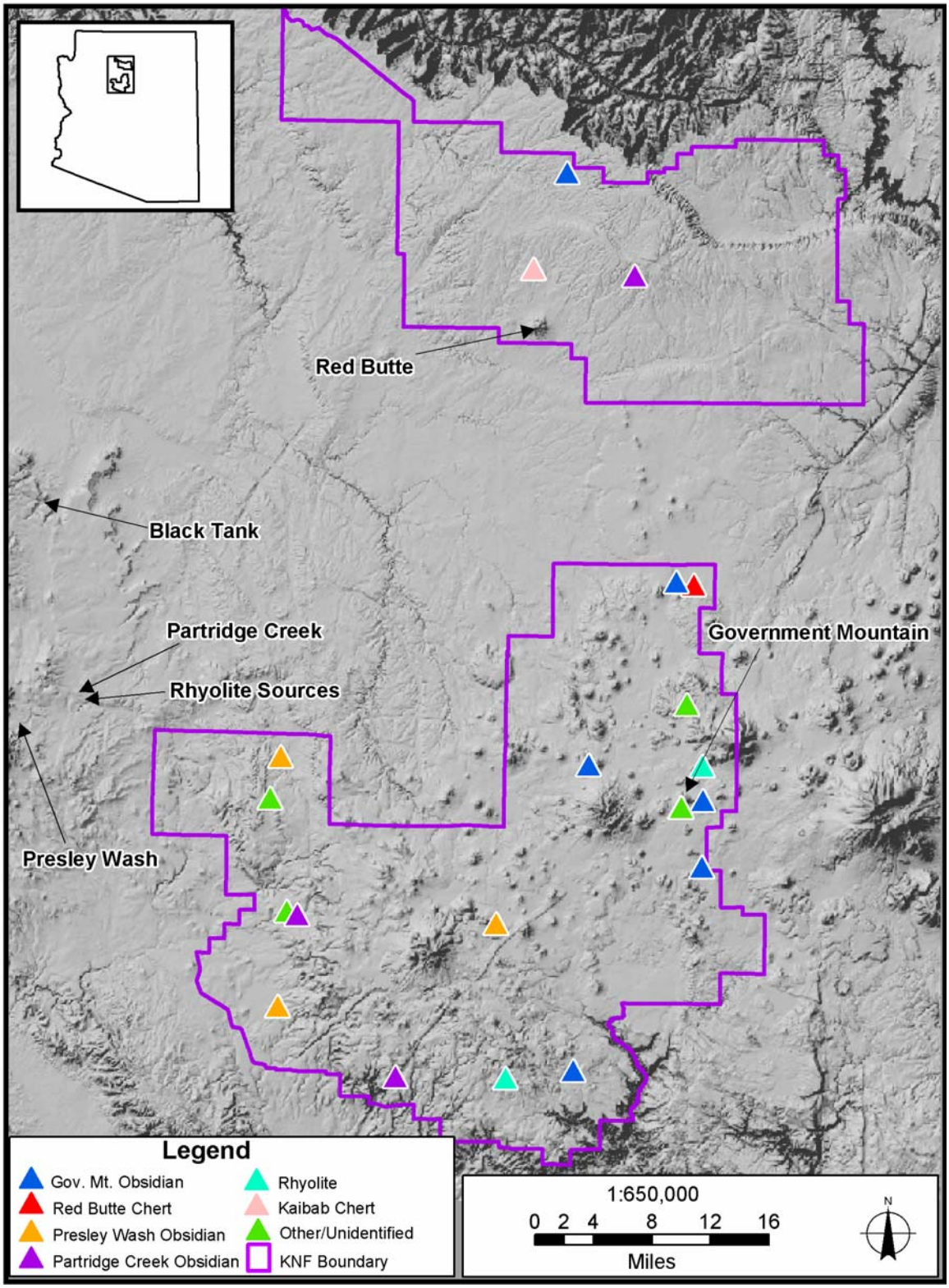

Figure 5.6. Distribution of lithic raw materials during the Early Archaic Period

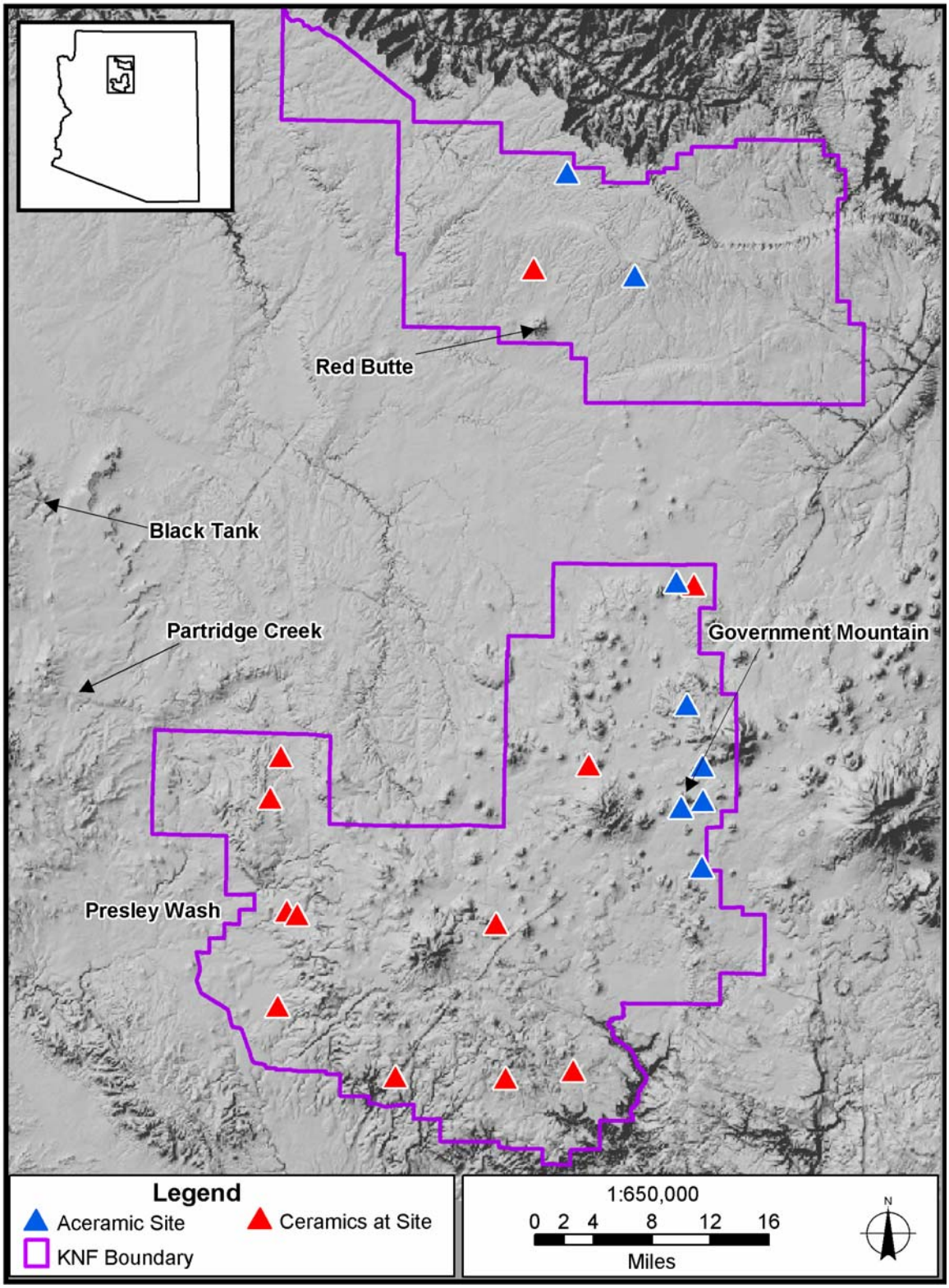

Figure 5.7. Distribution of aceramic and Ceramic Period sites yielding Early Archaic projectile points

Paleoindian and Transitional periods, centered within the mountainous ponderosa pine forests in the southeastern portion of the research area.

Matson (1991:132-133) notes a complete absence of pinyon pine from Early Archaic strata at Sudden Shelter and Cowboy Cave. Sudden Shelter and Cowboy Cave are high-elevation sites, at 7,400 and 5,800 ft respectively (Matson 1991:132-133), that Matson has cited in support of a seasonal mobility pattern for Early Archaic humans. Matson (1991:129-150) suggests that Early Archaic people practiced a seasonal mobility pattern of gathering and processing plant foods at low elevations during the winter, and then hunting at higher elevations during the remainder of the year. To support this idea, he compares data from a wide range of Early Archaic sites and notes an abundance of groundstone artifacts compared to projectile points at low elevations, with a corresponding decrease in groundstone and increase of projectile points at higher elevations.

In the study area only one of the aceramic sites exhibits groundstone artifacts. By comparison, 83.33% (n = 10) of the remaining sites also have groundstone artifacts. This pattern is somewhat supportive of Matson's model, although it is problematic to equate surface assemblages with excavated materials. It is also important to note that Matson considers Pinto and Elko Corner-notched points to be representative of the Early Archaic period. In contrast, I have argued above that Pinto/San Jose points occur primarily during the Middle Archaic period in the research area and have declined to assign a date to Elko Corner-notched points due to problems with dating the type.

In sum, the best interpretation of the data at this time is that an Early Archaic Period occupation of the study area is well-represented at the artifact-level. Aceramic

sites, those most likely to reveal accurate distributions of Early Archaic sites, indicate a clustering of sites within the high elevation, ponderosa pine forests in the southeastern portion of the study area. This distribution clusters around the Government Mountain obsidian source, and appears similar spatially to that displayed by earlier Paleoindian and Transitional period sites. While an influx of lithic materials from the western side of the study area appears evident during this period, aceramic sites appear to confirm a clustered distribution surrounding Government Mountain and a primary use of that material for stone tool manufacture. In light of Matson's theory of seasonal mobility discussed above, the south Kaibab may represent an area where Early Archaic groups visited seasonally to procure game and lithic raw materials.

The Middle Archaic Period (6,200 B.P. to 4,600 B.P.)

The Middle Archaic Period, dates from roughly 6,200 B.P. to 4,600 B.P. and falls within the xeric Altithermal stage discussed above. At the moment, only eight sites are identified within the Kaibab National Forest GIS database as potentially dating to the Middle Archaic period. Again, this number is approximately one tenth of one percent of all of the sites on the South Kaibab. The current analysis revealed 41 Middle Archaic projectile points derived from 36 archaeological sites on the forest. The majority of these artifacts are Pinto/San Jose style projectile points although nine Sudden Side-notched points were also represented in the sample (Figure 5.8). The identification of 36 sites potentially dating to the Middle Archaic represents a 450% increase in Middle Archaic sites on the forest.

Eighteen (43.9%) of the Middle Archaic projectile points were collected from aceramic sites and therefore are more likely to accurately reflect site distributions. However, no difference in spatial patterning is readily discernable between Ceramic Period and preceramic sites yielding Middle Archaic points (Figure 5.9). In contrast to earlier periods discussed above, spatial data of Middle Archaic artifacts indicate an expansion of sites throughout the Plateau during this time period. In particular, Middle Archaic site distributions reflect the transition of sites to lower elevations in what are now Pinyon-Juniper woodland zones. In fact, few Middle Archaic sites remain within the ponderosa pine forests in which Early Archaic sites were clustered. This shift in site distributions is reflected by the mean elevation value for Middle Archaic points of 6,292 ft (+/- 734 ft) a drop of over 1,000 ft compared to aceramic Early Archaic sites.

As discussed above, the Middle Archaic period appears to correlate with an extended climactic drying trend that continued until the Medithermal, at approximately 4,000 B.P., brought increased moisture to the Southwest. Following Berry and Berry (1986) Matson (1991:150-165) argues that the period was characterized by a drastic reduction in human population across the Colorado Plateau, possibly indicating a shift in settlement patterns towards high altitude (over 10,000 ft) areas (see also Geib 1996:33 "Altithermal refugia model"). As Matson puts it

> During the Middle Archaic there was a much-reduced intensity of occupation if not "abandonment" on the Colorado Plateau. Benedict (1979; Benedict and Olson 1978) has shown that in the Rocky Mountains there was an increased occupation of high-elevation areas (typically above 3000 m (10,000 ft) at this time. One wonders whether the Plateau was really depopulated, or whether the settlement pattern was "adjusted" so drastically that locations that were previously-and subsequently occupied were not used. If this were so, one would expect single component sites in

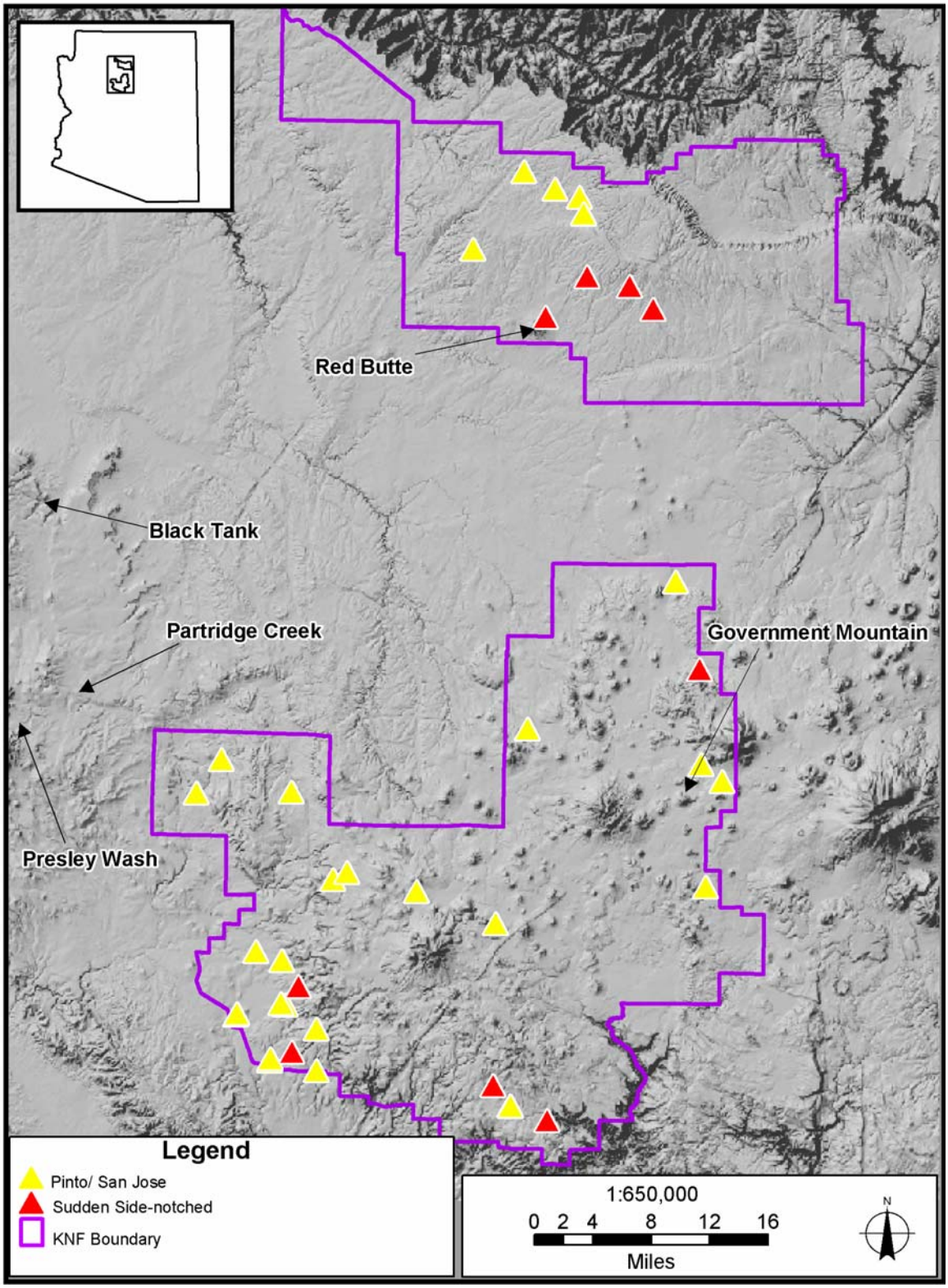

Figure 5.8. Distribution of Middle Archaic Projectile Point Types

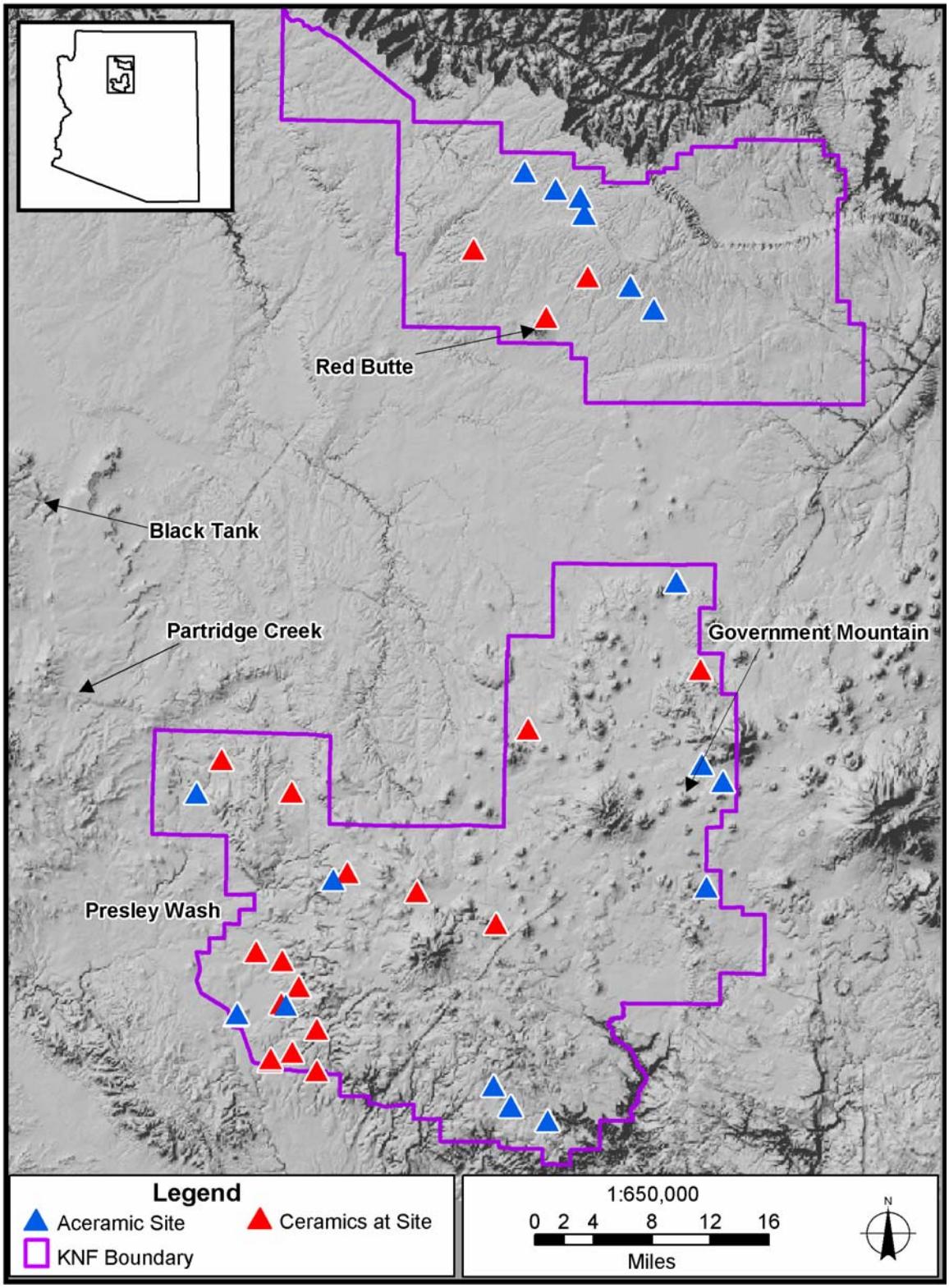

Figure 5.9. Distribution of Primary and Secondary Context Middle Archaic Points

> areas that did not have other Archaic remains, such as reported by Benedict and Olson (1978) for the Mt. Albion Complex. There is little doubt, though, that the Altithermal did occur and had a dramatic effect on Archaic settlement [Matson 1991:165].

In contrast to the statement above, Figure 5.9 indicates an increase in the relative number of Middle Archaic artifacts compared to Early Archaic points, presumably correlating with an increased population of the area during the period. However, it is important here to note that Matson uses a slightly different typological system to classify Middle Archaic points. Matson (1991:150-165) considers the San Jose point to be primarily representative of the Middle Archaic period, while he places Pinto points within the Early Archaic period. For the current analysis, I have grouped the two types on the basis that distinctions between Pinto and San Jose points are problematic at best. Indeed, Matson (1991:158) states "[b]ecause of the overlap in appearance, I find it often difficult to decide whether any single point is 'San Jose' or 'Pinto,' which is not helped by the lack of useful illustrated and described points from excavated contexts."

However, while Matson considers Pinto points to be indicative of the Early Archaic period, it is also apparent that much of what he has typed as "Pinto" have been classified here as Bajada points. In fact, Matson's (1991:351) index entry for "Bajada points" simply states, "*See* Pinto points." Therefore, it seems reasonable to assume that many of Matson's early dates for Pinto points would actually refer to what I have called Bajada points. Likewise, it seems likely that much of what have been typed here as Pinto/San Jose points correspond primarily with Matson's San Jose type and subsequently are well-dated to the Middle Archaic period. In other words, while type categories used for the two analyses differ, it appears as though there is a general

agreement on the assigned dates of particular points, enabling comparisons of Matson's data with the current analysis. Therefore, the statement that frequencies of Middle Archaic points increase in the study area appears valid and contrasts sharply with Matson's characterization of the Colorado Plateau in general.

Geib (1996:31-34) reviews evidence from several cave and rock shelter sites (Cowboy, Dust Devil, Old Man, Atlatl Rock, Rock Bar, and Good Hope) as well as an expansive array of paleoclimactic data and likewise concludes that there seems to be a significant abandonment of cave and rockshelter sites during the Middle Archaic that corresponds with increasingly hotter and drier environmental trends. In addition, Geib (1996:31) notes a "significant reduction of radiocarbon dates" for the Glen Canyon region during the Middle Archaic. However, in contrast to the "Altithermal refugia model" (Geib 1996:33) posited by Berry and Berry (1986) and Matson (1991), Geib proposes that human groups may have confined land use to areas near permanent water supplies in response to prolonged drought. In such a scenario, Middle Archaic groups responding to drought would have shifted sites to open-air locations with reliable access to water rather than abandoning the region altogether.

If one accepts that Pinto/San Jose projectile points, as I have defined them here, are suitable indicators of the Middle Archaic period, the spatial data within the project area are clearly more supportive of Geib's model of changing adaptive strategies than the abandonment theory postulated by Matson. The data indicate an increase in Middle Archaic artifacts on the South Kaibab compared to Early Archaic points, and an overall decrease in elevation (rather than an increase in elevation values over eight or ten-thousand feet). Interestingly, archaeologists on the Kaibab have long observed an

apparent correlation between ephemeral lakebeds and sites yielding Pinto/San Jose style projectile points on the South Kaibab. Sorrell states

> Interestingly, there is conspicuous evidence of Early and/or Middle Archaic use of the project area – a presence not often seen in the higher volcanic fields of the Coconino Plateau. The author believes that the location of nearby seasonal lakes (perhaps year-round water sources during the early Holocene) such as Moritz Lake and Raymond Lake were obvious attractions to game, which in turn were obvious attractions to Archaic hunters. (Similar Archaic manifestations have been noted around Mormon and Rogers Lakes on the Coconino National Forest, and near other smaller lakes on the Kaibab Forest) [Sorrell 2002:7].

As Sorrell states above, it is currently unknown whether these lakebeds were permanent sources of water during the Middle Archaic, but the association of such lakes and Middle Archaic points fits nicely with Geib's theory.

Lithic raw material data for the Middle Archaic period corroborate the apparent expansion of site distributions out of the Government Mountain area. While fine-grained rhyolite and Government Mountain obsidian are heavily utilized during the period, Presley Wash and Partridge Creek obsidian, procured just west of the study area, are also well represented (Figure 5.10). Distances of Middle Archaic points on aceramic sites from lithic material sources also seem to increase compared to earlier periods. Finally, spatial distributions indicate that potential Middle Archaic sites, in addition to being at generally lower elevations than previous periods, tend to cluster towards the north and south end of the study area. Possibly, such spatial organization derives from the permanent water supplies offered by the Colorado and Verde River drainages located just north and south of the region.

In sum, contrary to models that propose a hiatus or abandonment of the Plateau during the Middle Archaic, projectile point data on the south Kaibab appear to indicate a

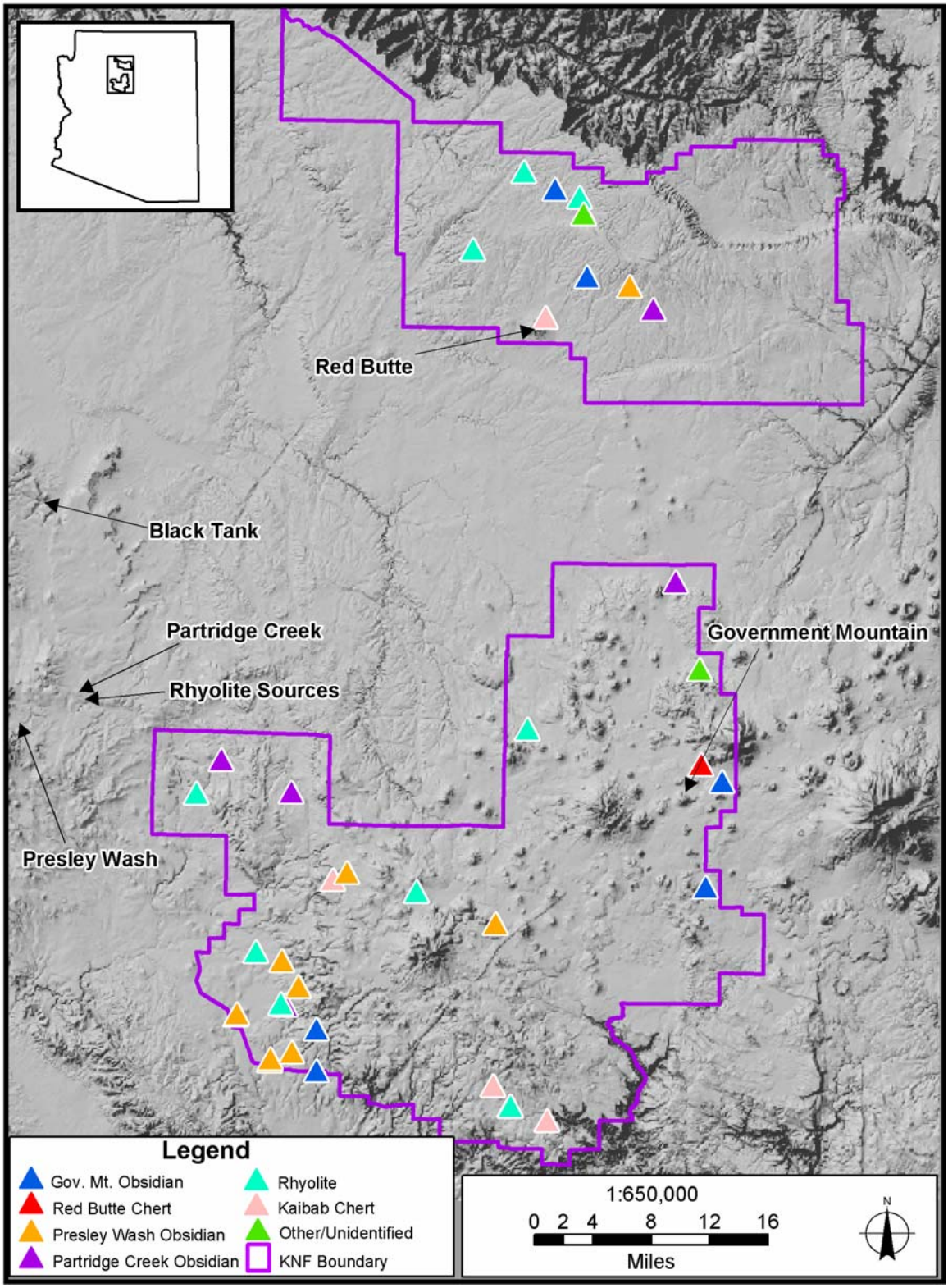

Figure 5.10. Distribution of lithic raw materials during the Middle Archaic Period

relative increase in sites during this time. In certain respects it is problematic to compare spatial distributions of projectile points used for this study with the chronometric data used to both support and refute hiatus models (Berry and Berry 1986, Geib 1996, Wills 1988) for the Colorado Plateau. However, if a hiatus model was reliable for the research area, one would expect a complete lack of temporally-diagnostic points dated to the Middle Archaic. In contrast, numbers of Middle Archaic projectile points increase during the period, and may indirectly support the assertion by Geib that a significant shift in land use took place at the time within the confines of the Colorado Plateau.

Possibly, the Coconino Plateau represents one area that remained viable during the hot and dry Altithermal period. I would speculate that perhaps the proximity of major drainages like the Colorado and Verde river, as well as possible ephemeral lakes, offered crucial water sources to Middle Archaic inhabitants. In general, site distributions indicate a spread of sites into lower elevation, Pinyon-Juniper woodlands during the Middle Archaic and an increased use of lithic raw material sources west of the study area.

The Late Archaic Period (4,600 B.P. to 2,400 B.P.)

The Late Archaic Period dates from approximately 4,600 to 2,400 B.P., theoretically terminating with the development or introduction of agriculture. However, dates for the introduction of agriculture have recently been pushed back so far that a significant amount of overlap has become evident between the Late Archaic and later Early Agricultural period (see Smiley 2002). Currently, 11 sites are identified within the Kaibab National Forest GIS database as potentially dating to the Late Archaic period. The current analysis revealed 83 Late Archaic projectile points derived from 68

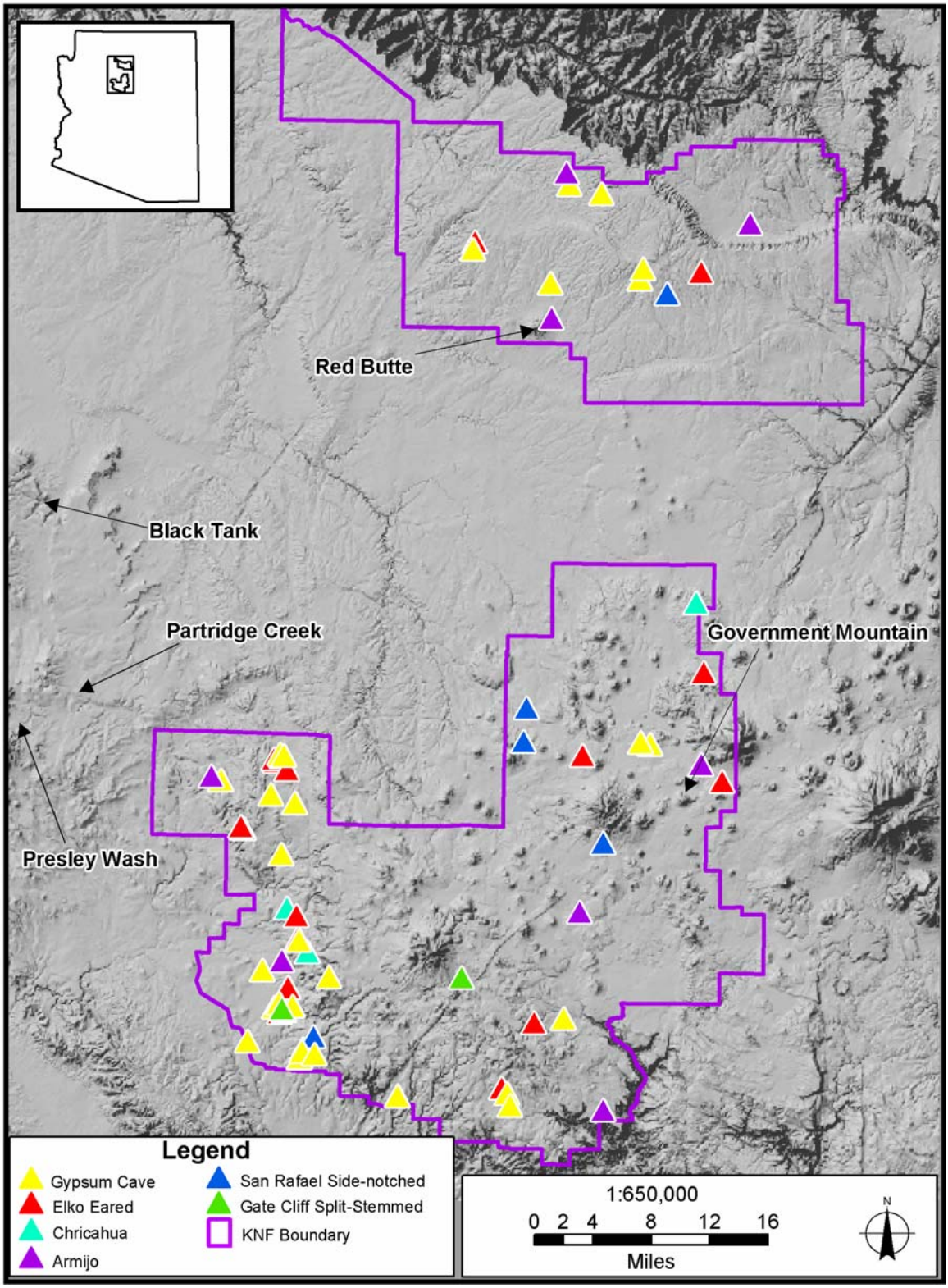

Figure 5.11. Distribution of Late Archaic projectile point types

archaeological sites on the forest, increasing the number of sites potentially dated to the Late Archaic by 600%. I used Chiricahua, Armijo, San Rafael Side-notched, Gypsum Cave, Elko Eared and Gatecliff Split-stemmed projectile points as temporal markers for the Late Archaic (Figure 5.11).

Thirty-three of the Late Archaic projectile points in the sample were collected from aceramic sites. No difference in spatial patterning is readily discernible between such sites and Ceramic Period sites yielding Late Archaic points (Figure 5.12). The mean elevation value for Late Archaic artifacts equals 6,327 ft (+/- 701.5 ft), which is essentially the same as for Middle Archaic points. In addition, the same general spatial patterning for raw materials seems apparent for Late Archaic artifacts as for those of the Middle Archaic (Figure 5.13).

Elsewhere on the Colorado Plateau, human populations are thought to have increased substantially during the Late Archaic Period, corresponding with the generally more mesic conditions associated with the Medithermal period. Geib (1996:34) sees a "noticeable increase in radiocarbon dates" around 4,000 B.P. Geib (1996:37) notes that many such sites are open air sites and that the frequency of dates from this time period indicates that the Late Archaic supported "perhaps the greatest population during the entire Archaic period." In the study area, the spatial data seem to support the view of the Late Archaic as a period of population growth, as numbers of Late Archaic artifacts increase significantly over all previous periods.

Matson (1991:167) notes that in addition to an increase in population, the Late Archaic period is also marked by the introduction of new projectile point technology

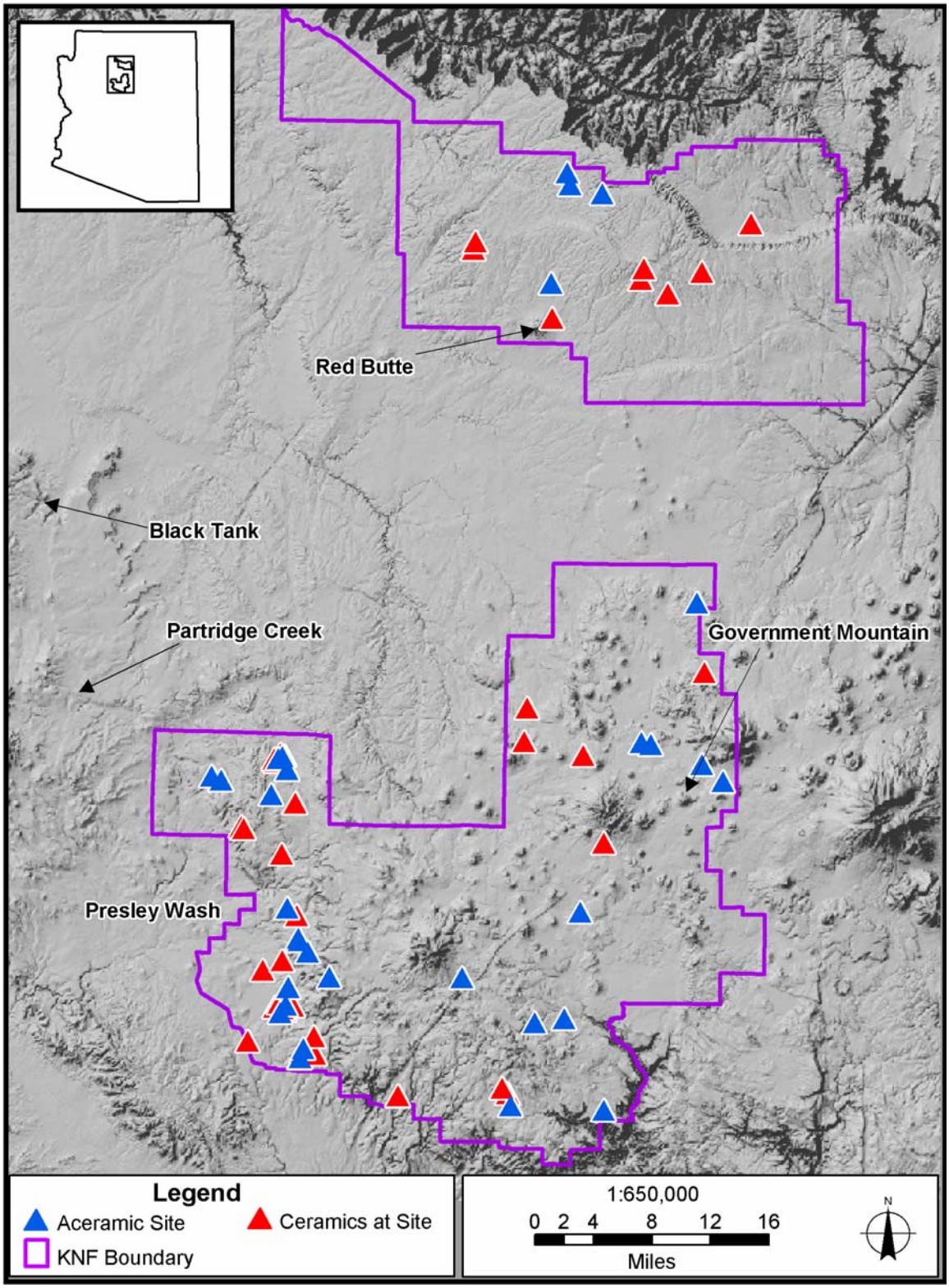

Figure 5.12. Distribution of aceramic and Ceramic Period sites yielding Late Archaic points

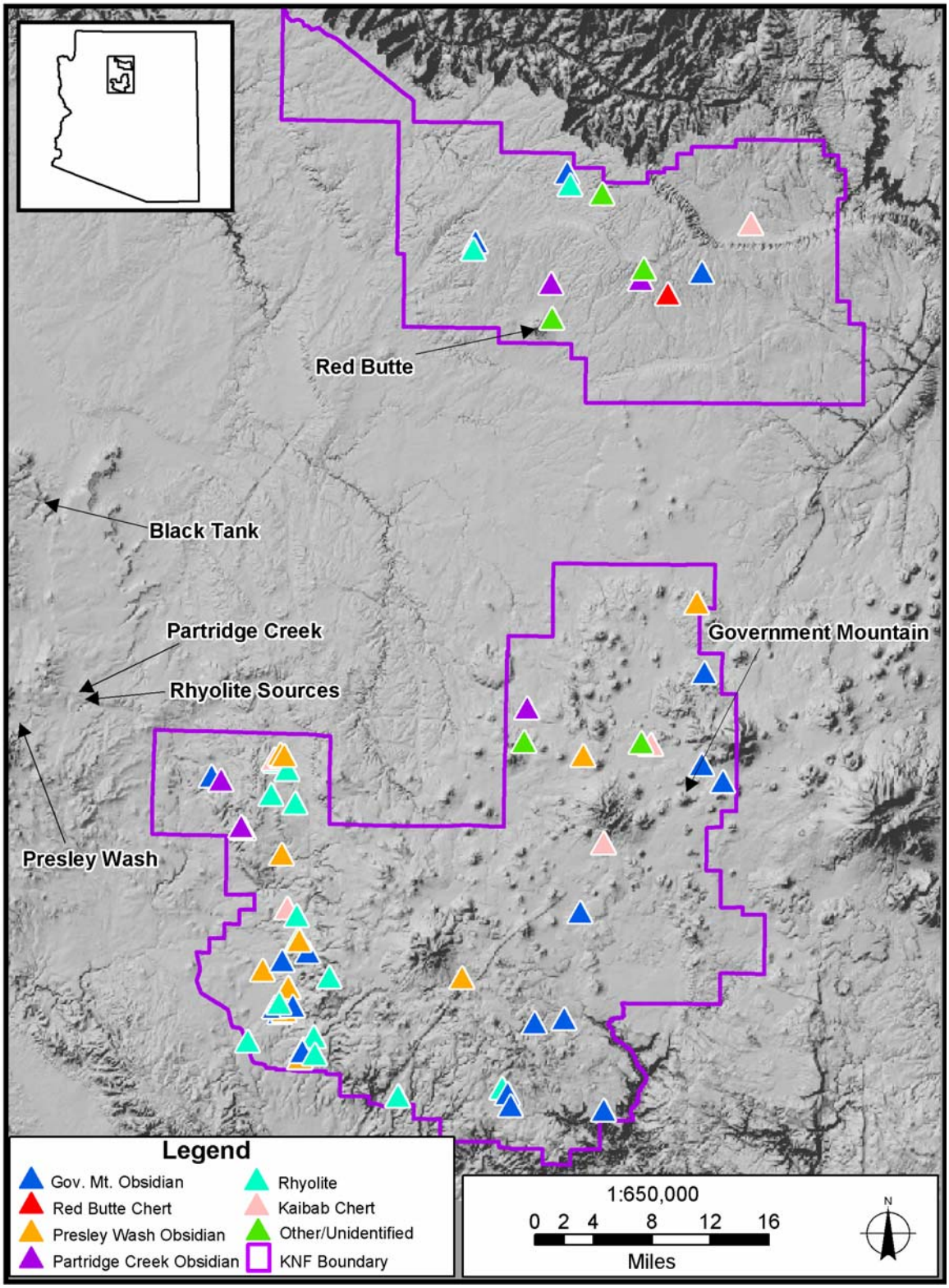

Figure 5.13. Distribution of lithic raw materials during the Late Archaic Period

on the Colorado Plateau. Specifically, contracting stemmed Gypsum Cave points are hafted to the projectile shaft using an adhesive rather than bound to the shaft with sinew. According to Matson (1991:168) this technology appears to originate in Mexico where it occurs earlier than in the American Southwest. However, it is unknown whether Gypsum Cave points represent an influx of people from the south or simply the adaptation of a new technology. As Geib (1996:34) points out, "it has yet to be demonstrated that a point style equals a people, and there are many examples of point styles spreading rapidly between different cultural groups."

In addition to Gypsum Cave points, split-twig figurines also appear for the first time during the Late Archaic. Historically, radiocarbon dates derived from such figurines have been used to establish "the earliest known occupation of the area [South Kaibab] at between 2145 B.C. +/-100 [roughly 4100 B.P.]" (Jennings 1971:117). Although no split-twig figurines have been found within the study area, split-twig figurines are well represented within the Grand Canyon to the north (Schwartz et al. 1958) and have also been identified within Walnut Canyon a few miles southeast of the study area.

What remains poorly understood is the nature of Late Archaic period occupation on the Plateau, defined by a hunting and gathering subsistence strategy, in relation to subsequent, or possibly contemporary populations of early farmers. As I discuss below, this project documents the existence of Western Basketmaker II projectile points in the research area. These points are not only temporally diagnostic, but are culturally diagnostic of early farming groups in the Anasazi area. Therefore, it remains possible that early agriculturalists may have occupied the study area long before the presence of the Cohonina in A.D. 700. However, the introduction of agriculture does not necessarily

rule out a continued hunter-gatherer occupation of the area. Indeed, judging from the large number of Late Archaic artifacts identified by this study compared to relatively low numbers of Early Agricultural artifacts, some sort of co-habitation of the area by both hunter-gatherers and agriculturalists appears possible.

In sum, the Late Archaic period appears to be well represented within the research area, and the abundance of Late Archaic sites corresponds with a theoretical growth of human populations as observed elsewhere on the Colorado Plateau. Late Archaic assemblages include the Gypsum Cave point, which represents a new technology that probably spread northward from Mexico. In addition, split-twig figurines are diagnostic of the time period, although none have been reported within the confines of the study area. Site distributions during the Late Archaic are similar to the earlier Middle Archaic period. Artifact distributions span the extent of the study area, but are generally spread out amid the lower elevation Pinyon-Juniper woodlands along the west and northern portions of the south Kaibab. It is not currently known whether Late Archaic groups abandoned the area coinciding with the arrival of the first agriculturalists, or continued to inhabit the area up until, and possibly after, the proliferation of the ceramic Cohonina culture about 1300 years ago.

An Overview of the Early Agricultural Period

Prior to discussing results for the Early Agricultural period of occupation on the South Kaibab, I have included a brief synopsis of the period below. On the Colorado Plateau, the Early Agricultural period is primarily manifested in the Basketmaker II phase of the Anasazi cultural sequence. It is important to note that significant differences exist

between Early Agricultural manifestations on and off the Colorado Plateau. For the current discussion, I will draw primarily from the literature regarding Early Agricultural adaptations on the Plateau (Basketmaker II). Obviously, the Early Agricultural period is characterized primarily by the reliance on agriculture as a subsistence method. While Early Agricultural bands remained highly mobile, their commitment to cultigens dictated the adoption of increasingly sedentary settlement patterns compared to Archaic hunter-gatherer groups.

The Early Agricultural period in the Southwestern United States begins with evidence of agriculture throughout the region as early as 4,000 B.P. (Smiley 2002)and lasts until the Early Ceramic Period (Basketmaker III) on the Colorado Plateau. Early agricultural endeavors were probably aided by the more mesic conditions associated with the Medithermal period as discussed above for the Late Archaic period. As previously discussed, on the Colorado Plateau, this period correlates with the Basketmaker II period of the Anasazi sequence. In the Sonoran Desert to the south, the Early Agricultural period coincides with the San Pedro, Cienega, and Agua Caliente phases of the Cochise culture.

Climatic Considerations for the Early Agricultural Period

Again, the Early Agricultural period seems to correlate with amelioration of the Altithermal resulting in increased moisture levels starting somewhere between 5,000 and 4,000 B.P. In addition, current paleoenvironmental evidence indicates a cyclical pattern of coinciding high levels of precipitation and groundwater every 550-600 years during the period, starting at 2,000 B.P. (Smiley 2002:41). Obviously, increased moisture would

have aided prehistoric populations in crop production after the introduction of agriculture in the Southwest. However, Smiley notes an additional benefit to prehistoric farming populations in the Black Mesa area. Increased moisture levels may have also influenced the spread of pinyon pine forests within the northern Southwest (Smiley 2002:42). The increased availability in nutrients from pinyon harvests may have been crucial in supplying a supplement for Early Agricultural societies. Therefore, high risks associated with early experimentation with agriculture may have been mitigated by the reliance on pinyon as a supplementary food source.

The Early Agricultural Period (400 B.C. to 1550 A.D.)

Early Agricultural and Early Ceramic sites have historically remained elusive on the South Kaibab. As Hanson (1996:2) states, "while extensive Basketmaker occupations are known from various locations north of Grand Canyon, no such remains have been found south of the Canyon [on the Kaibab]." The apparent paucity of Basketmaker sites has stimulated a fair amount of discussion regarding the Cohonina, as the ceramic-using, agriculturalists appear to have been unlike any previous inhabitants of the area. As discussed in the Introduction of this thesis, several researchers have suggested that the Cohonina migrated to the area from some other location based on the similarity of the Cohonina culture with other neighboring Ceramic Period groups and their dissimilarity with Archaic groups (Fairley 1989; Hanson 1996).

However, the current analysis has identified 43 artifacts that I have assigned to the Early Agricultural period. Twenty-four of these artifacts have been classified as "Basketmaker Knives" and are only tentatively dated to this period. Two other points are

Cienega points associated with the Hohokam culture to the south of the study area. However, the seventeen remaining artifacts have been typed as Western Basketmaker II dart points (Figure 5.14). These points are morphologically highly-distinctive, and are well-dated to Basketmaker contexts in other areas such as Black Mesa (Smiley 2002). Additionally, nine of the Western Basketmaker II points derive from aceramic sites implying that the points were initially deposited during the Early Agricultural period rather than being transported to the site by some later human action (Figure 5.15). Furthermore, twelve of the Western Basketmaker II points are made of materials found locally on the Coconino Plateau, while the remaining five derive from some unidentified source of chert.

While the evidence from the artifact-level analysis presented here remains limited in some respects, it also indicates that an Early Agricultural, or Basketmaker II, presence on the Plateau cannot yet be ruled out. At a minimum, the data indicate that the region was utilized by early agriculturalists for lithic raw materials. Data from elsewhere on the Colorado Plateau indicate an increase in the use of local raw materials during the Early Agricultural Period (Christensen 1987:168) and that pattern also appears to potentially be manifested in the study area. Such a pattern implies an occupation by early agriculturalists rather than limited use of the area for lithic resource procurement and is discussed in detail below. Figure 5.16 illustrates lithic raw material distributions in the region during the period.

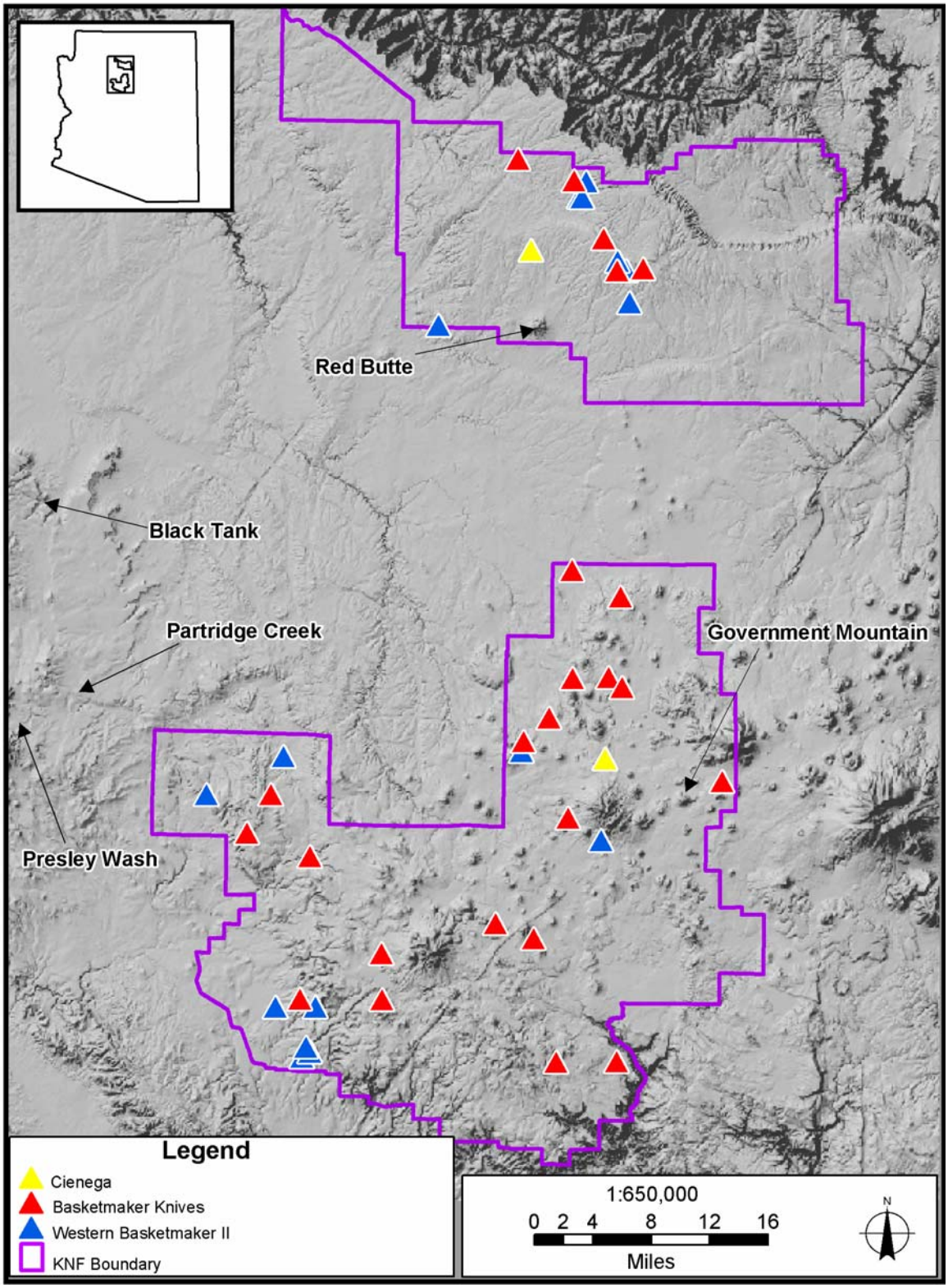

Figure 5.14. Distribution of Early Agricultural artifact types

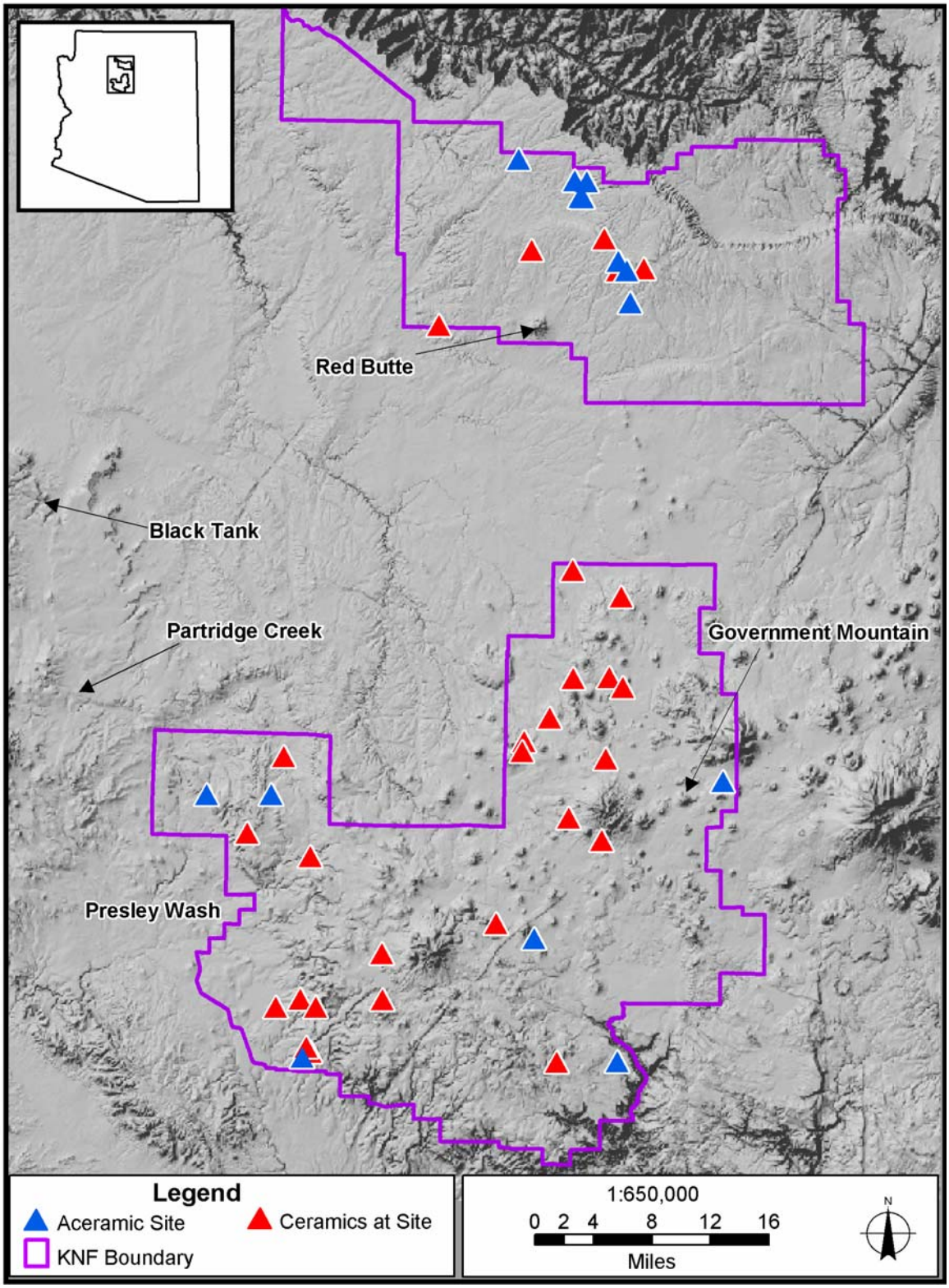

Figure 5.15. Distribution of aceramic and Ceramic Period sites yielding Early Agricultural Period projectile points.

In sum, while current culture-histories cite a lack of Basketmaker sites to support an absence of early agriculturalists in the region, an artifact-level analysis reveals evidence of such an occupation on the Plateau. Evidence to support this assertion rests on two statements. First, aceramic (likely initial deposition) sites exist on the Kaibab exhibiting highly diagnostic and well-dated Basketmaker II projectile point forms. The Tusayan District at the north end of the research area displays a particularly good concentration of such sites. Second, lithic raw material patterns may indicate preference for materials found locally on the Coconino Plateau. Such a pattern may be comparable to documented lithic material patterns observed elsewhere on the Colorado Plateau for this period.

The data presented here contribute to a growing body of evidence for a much more prolific occupation of the region by early farmers than has originally been proposed. For example, Keller and Dosh (1997) excavated two sites on Anderson Mesa (southeast of the Project area on the southern rim of the Colorado Plateau) that appear to date to the Early Agricultural period based on two radiocarbon dates. In addition, the sites yielded projectile points that are stylistically equivalent to the Western Basketmaker II and Cienega points used as temporal indicators for this thesis, confirming the usefulness of such types as temporal indicators in an area much closer to the South Kaibab than Black Mesa.

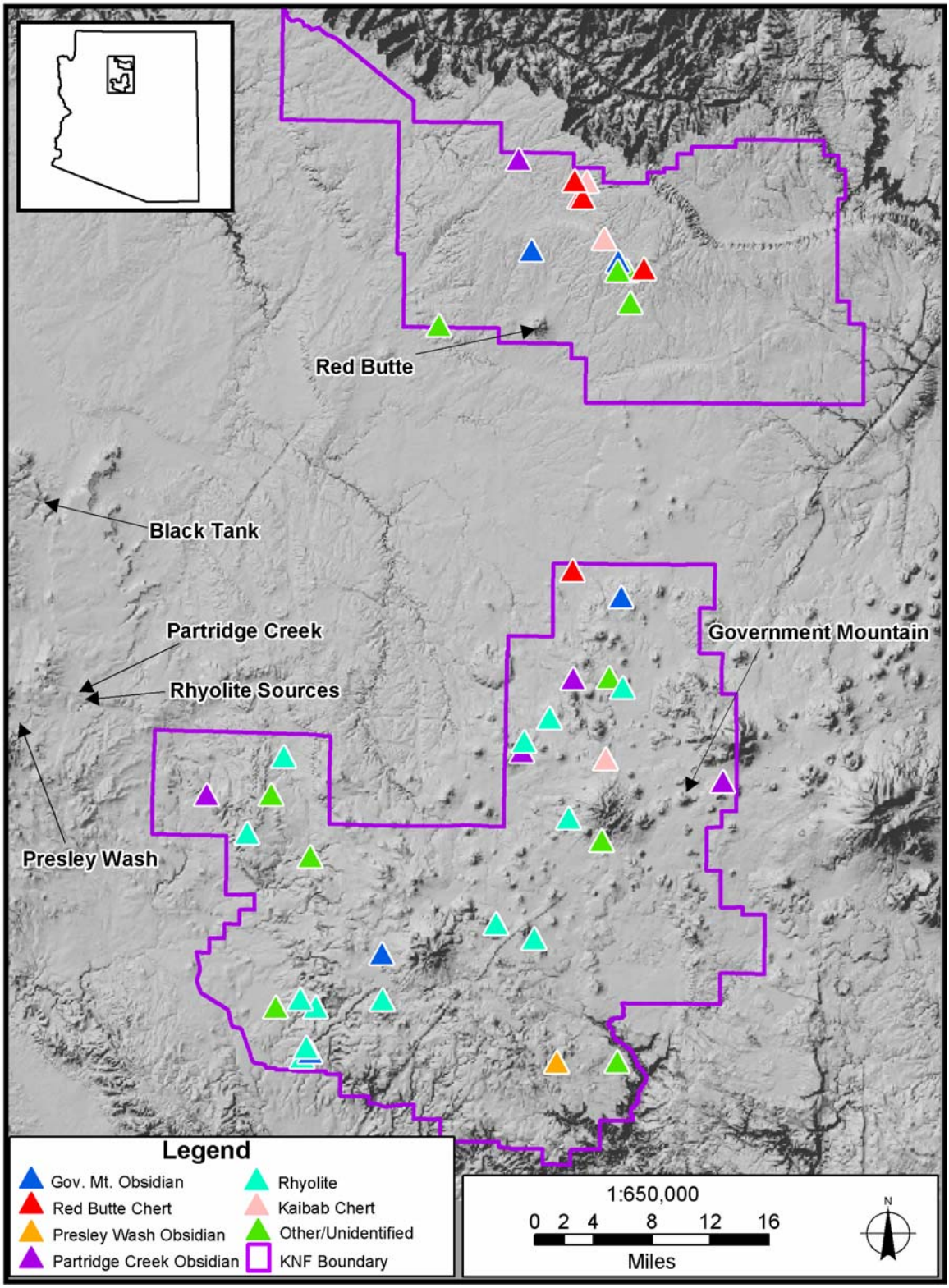

Figure 5.16. Distribution of lithic raw materials during the Early Agricultural Period

The Early Ceramic Period (A.D. 400 to 700)

The Early Ceramic period, correlating with the Basketmaker III period of the Anasazi cultural sequence, is the last period of time discussed in this thesis. Like the preceding Early Agricultural period, evidence of Early Ceramic occupation within the study area has been minimal. Of the 3,905 single-component sites within the GIS database currently maintained by the South Kaibab, only seven have been tentatively dated to the Early Ceramic Period based on surface artifacts. However, the presence of such an occupation has yet to be confirmed through excavation and therefore the presence of Early Ceramic sites on the Kaibab remains unproven. However, 63 Rosegate points, which I have considered primarily temporally diagnostic of the Early Ceramic Period were located within the collections of the South Kaibab.

Unlike the other temporal periods previously discussed, evidence of an Early Ceramic occupation can also be corroborated using temporally diagnostic ceramics. The ceramic types Lino Gray, and especially Lino Black-on-gray, are well-recognized indicators of the Basketmaker III period of the Anasazi sequence. McGregor (1967) reports considerable amounts of Lino Gray ceramics on Cohonina sites in the Mt. Floyd area. McGregor (1967:104) reported that one site (NA 5172) exhibited 80% Lino Gray Ware and postulated that it "may represent a small circular structure built long before the other longer rooms and not destroyed in their construction."

The presence of Lino Gray Wares is by no means isolated to this site. Figure 5.18 depicts all of the sites in the research area that exhibit the ceramic type Lino Black-on-gray (in red). I similarly plotted all sites that yielded Rosegate projectile points of both varieties for comparative purposes (in blue). The map illustrates two points. First, at the

artifact-level of analysis, a large quantity of typically Basketmaker III-era artifacts exist on the Kaibab while almost no sites have been attributed to the Basketmaker period. Second, the distributions of Early Ceramic projectile points and ceramics seem somewhat correlated spatially.

In addition, to Lino Gray Wares, Sorrell (2005) has identified a large percentage of unidentified brown wares associated with the earliest sites in the ceramic assemblage on the south Kaibab. This fact is intriguing considering that recent evidence suggests that a previously unidentified brown ware (Obelisk Utility, Reed et al. 2000) is now being associated with Basketmaker II and III sites. Reed et al. state,

> Across the Anasazi region, accumulating evidence shows that gray, white, and red ware traditions associated with Anasazi ceramic technology evolved from an earlier pan-Southwestern brown ware technology. The growing number of early sites containing brown ware produced from local resources suggests that much of the brown ware identified in late Basketmaker II and early Basketmaker III sites is of local origin...The addition of temper and experimentation with geologic clays (as opposed to iron-rich alluvial clays for brown ware) resulted in the transition from brown ware to gray/brown ware and, finally, to the gray ware pottery common in late Basketmaker III (A.D. 600-700) assemblages. [Reed et al. 2000:203]

Therefore, the presence of previously unidentified brown wares in association with Lino Gray on the earliest Ceramic Period sites contributes to the idea of an underlying Basketmaker III or even Basketmaker II occupation. In most cases, the presence of unidentified brown wares has probably been ignored or treated as anomalous by most researchers and has therefore gone largely unnoticed.

One such example may be represented by the Innominado Negro site (NA 9541) excavated by Jennings (1971). At Innominado Negro, Jennings (1971:421-2, Tables 52 and 53) notes that the majority of ceramics at the site consisted of San Francisco

Mountain Gray Ware, Tizon Brown Ware, and other Pueblo I and Pueblo II ceramics. However, Innominado Negro also exhibited small amounts of Lino Gray, Lino Black-on-gray, and 15 sherds of an unidentified plain brown ware. Jennings (1971:428) describes these sherds as appearing to be "intermediate between Tizon Brown Ware and San Francisco Mountain Gray Ware." Jennings (1971:428) goes on to tentatively suggest that the unidentified brown wares may represent a new type, although he opted to refrain from adding a new type name "to the already overloaded literature" at that time.

At the time of the excavation at Innominado Negro, it was probably inconceivable to Jennings or any other researcher that a plain brown pottery type would be discovered that pre-dated the Lino Gray ceramics of the Basketmaker III period. Jennings (1971:491) concluded at the time that the unidentified ware represented an intergrade between the Ceramic Period San Francisco Mountain Gray Ware and Tizon Brown Ware, and indeed, that assessment may prove to be accurate. My primary point in discussing Innominado Negro is to highlight the co-occurrence of unidentified brown wares and Lino Gray in excavated contexts in the research area. The co-occurrence of such wares at sites like Innominado Negro, combined with Sorrell's (2005) observation of the same phenomenon at several sites in the region, may provide the first glimpse of a Basketmaker era component that has previously gone unnoticed on the Coconino Plateau.

Additionally, the two sites discussed above are excellent examples of how earlier site components may become masked by later cultural deposits. Both sites (NA 5172, and 9541) exhibited temporally diagnostic Basketmaker III era ceramics. Yet, both sites were dated to later temporal periods (Pueblo I-II) based primarily on a greater frequency

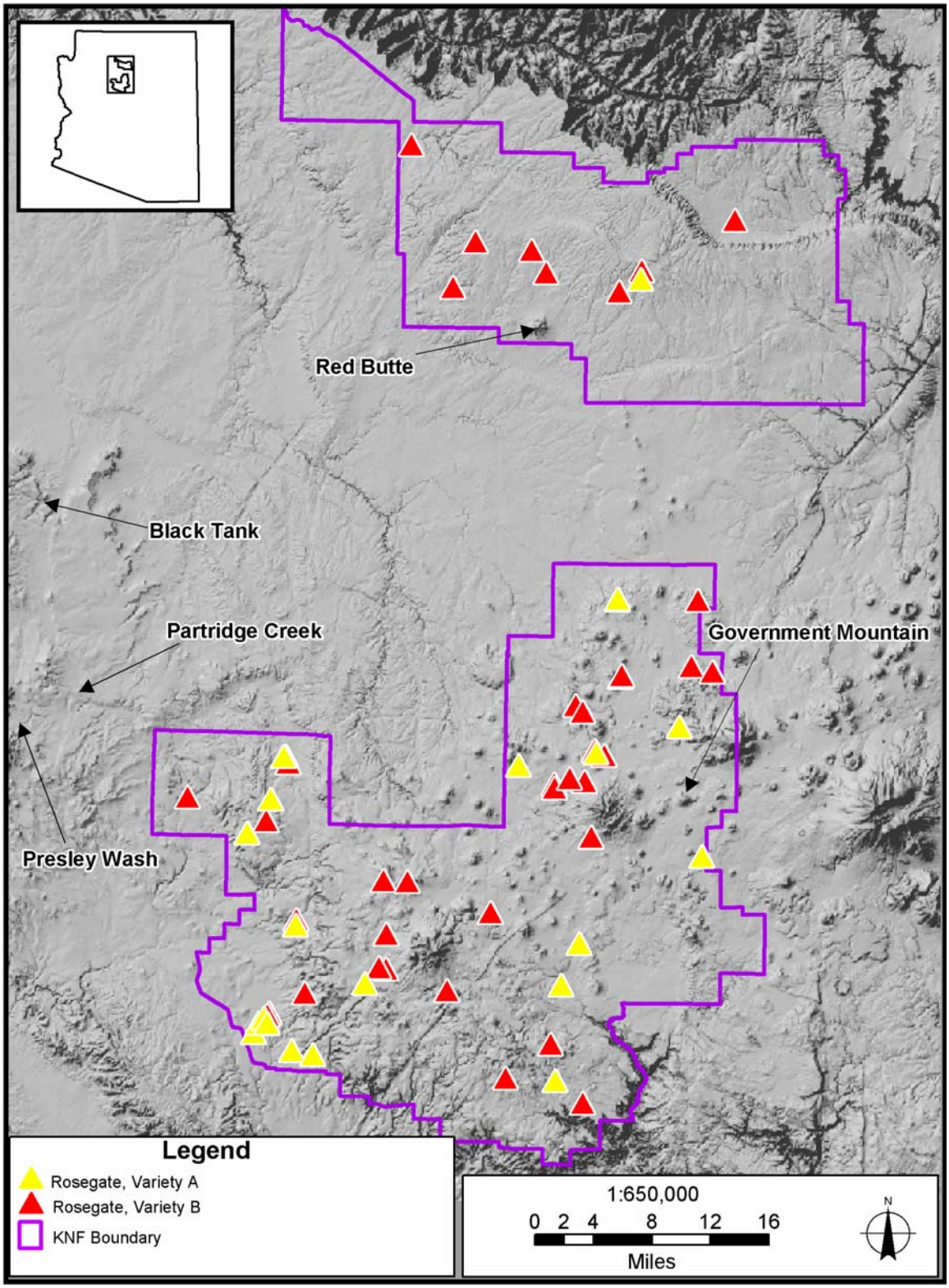

Figure 5.17. Distribution of Early Ceramic projectile point types

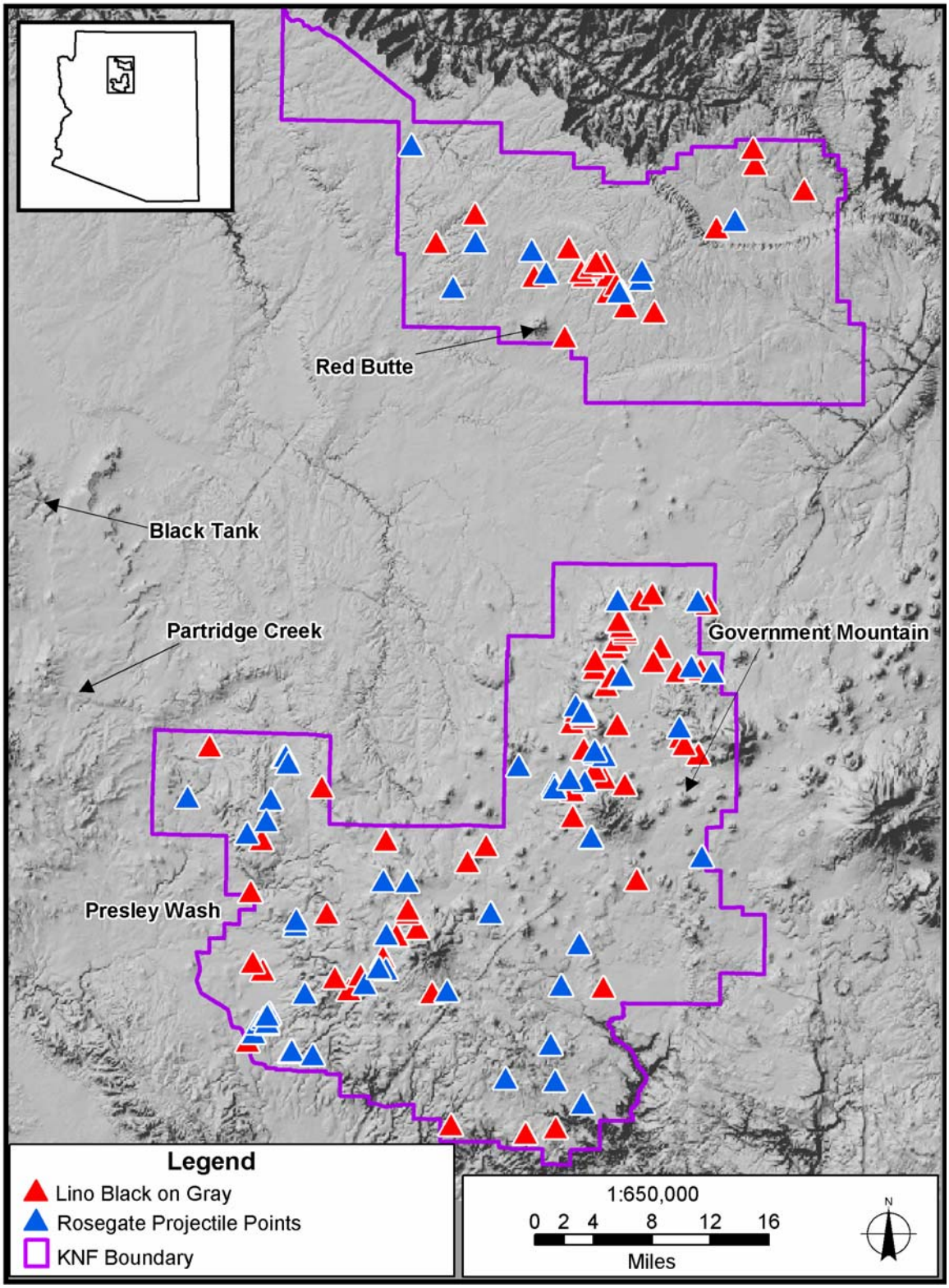

Figure 5.18. Distribution of Rosegate projectile points and Lino Black-on-gray ceramics.

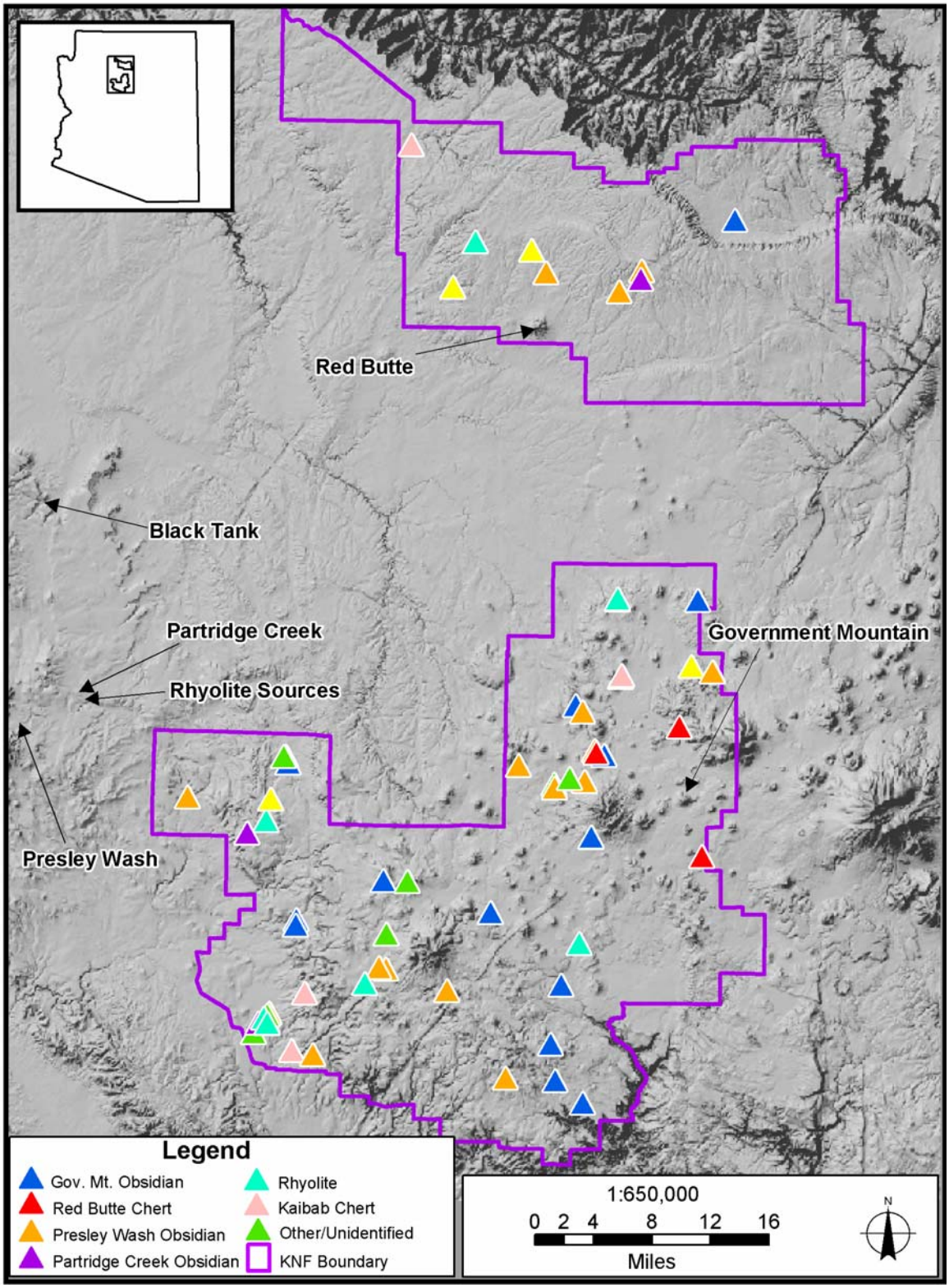

Figure 5.19. Distribution of lithic raw materials during the Early Ceramic Period

of later ceramics. Once again, I would argue that such a temporal designation effectively masks all evidence of earlier occupations at the site-level. The cumulative effect of the repeated masking of early component artifacts is a disparity in the site and artifact data as illustrated within this volume. Despite the extensive documentation of Lino Black-on-gray, and Rosegate style projectile points (again, see Figure 5.18), the Coconino Plateau remains without confirmed Basketmaker III-era sites to account for such deposits.

Artifact and Lithic Raw Material Distributions During the Ceramic and Protohistoric Periods

A discussion of spatial distributions of Ceramic and Protohistoric Period artifacts lies well beyond the scope of this paper. However, due to the nature of the current project, artifacts from the two periods invariably became involved in the spatial analysis process. Therefore, I have decided to include maps that I have generated for these two periods for comparative purposes for other researchers. As a caveat, it is important to remember that distributions of Ceramic Period sites are grossly underrepresented due to the exclusion of a large number of Ceramic Period Cohonina points from the study as discussed in Chapter 3.

Figure 5.20 depicts the spatial distribution of all Ceramic Period projectile points. Again, the frequencies of such points, especially Cohonina points, are not considered to be representative for this analysis. Figure 5.21 illustrates the spatial patterning of lithic raw materials as exhibited by Ceramic Period artifacts. Figure 5.22 illustrates the spatial distribution of the Protohistoric projectile point types Sierra Side-notched and Buck

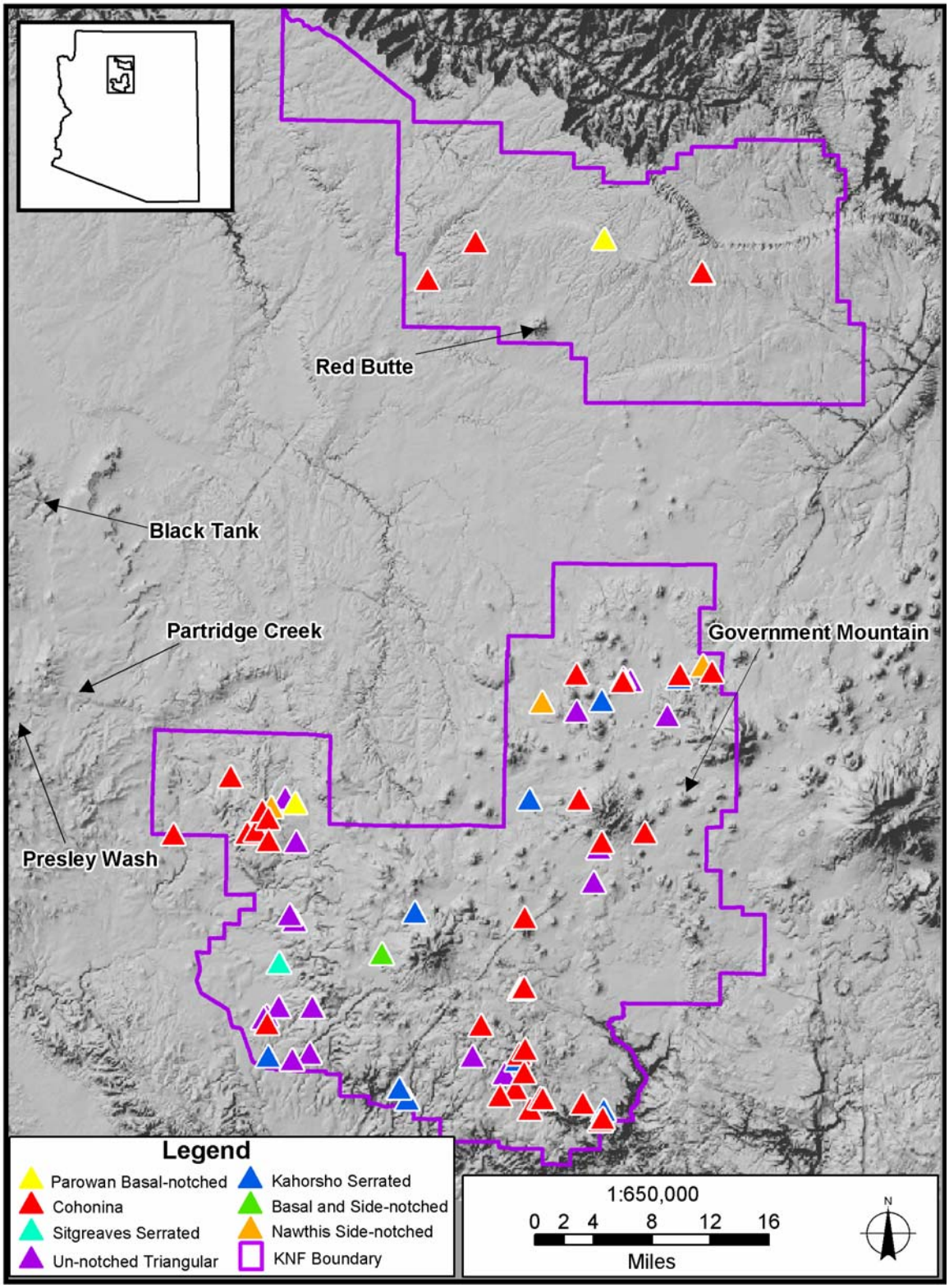

Figure 5.20. Distribution of Ceramic Period projectile point types

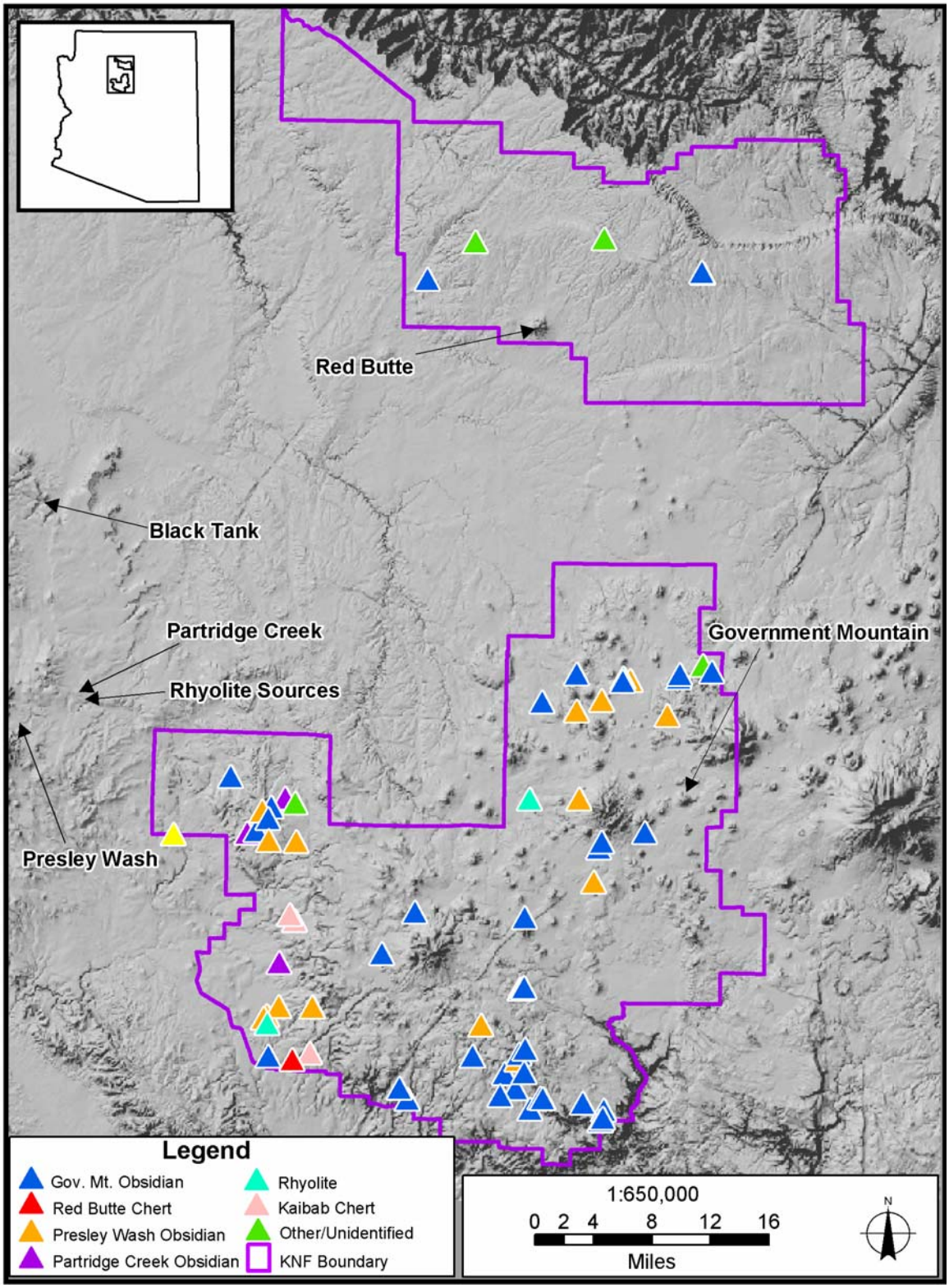

Figure 5.21. Distribution of lithic raw materials during the Ceramic Period

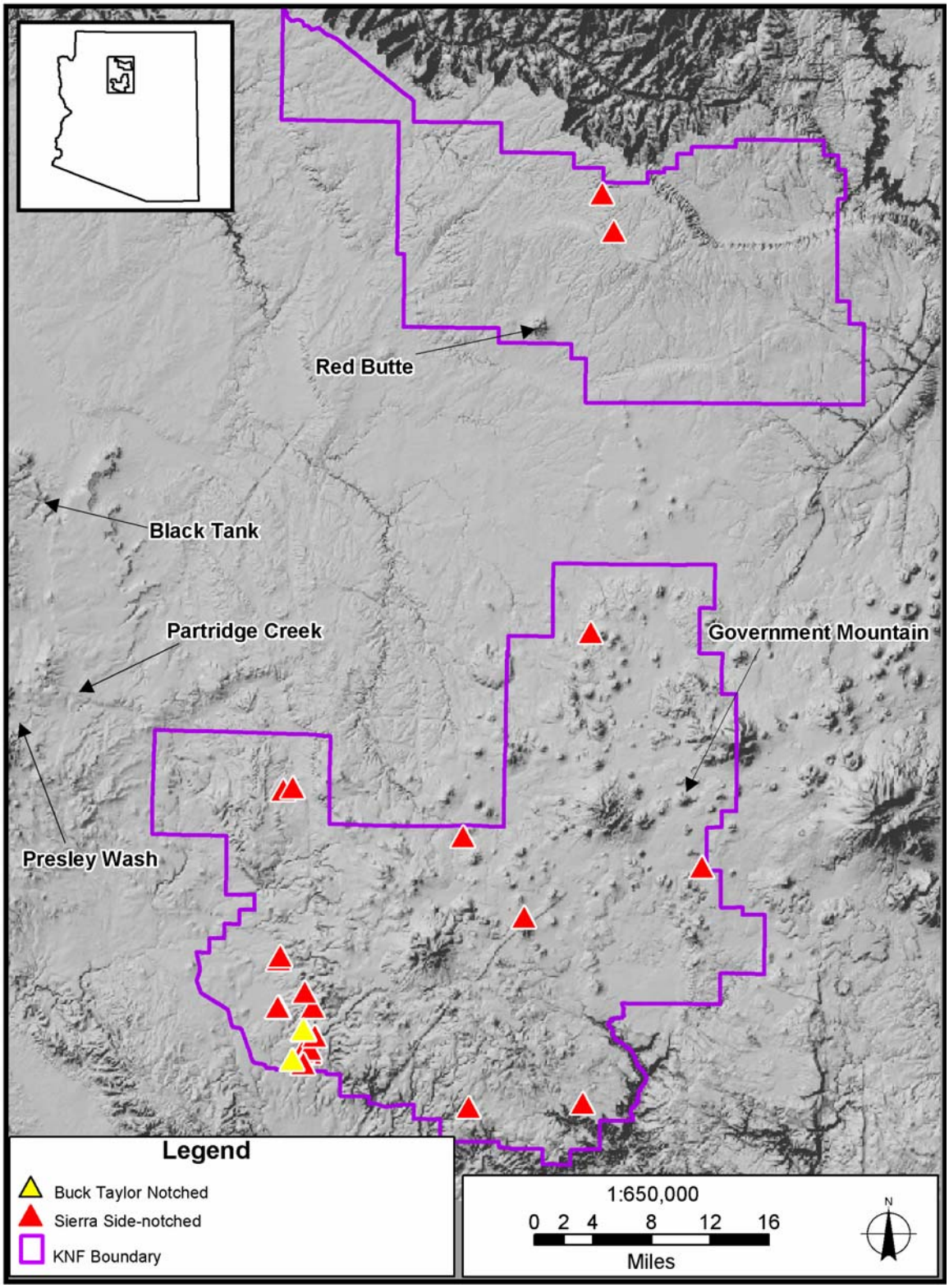

Figure 5.22. Distribution of Protohistoric projectile point types

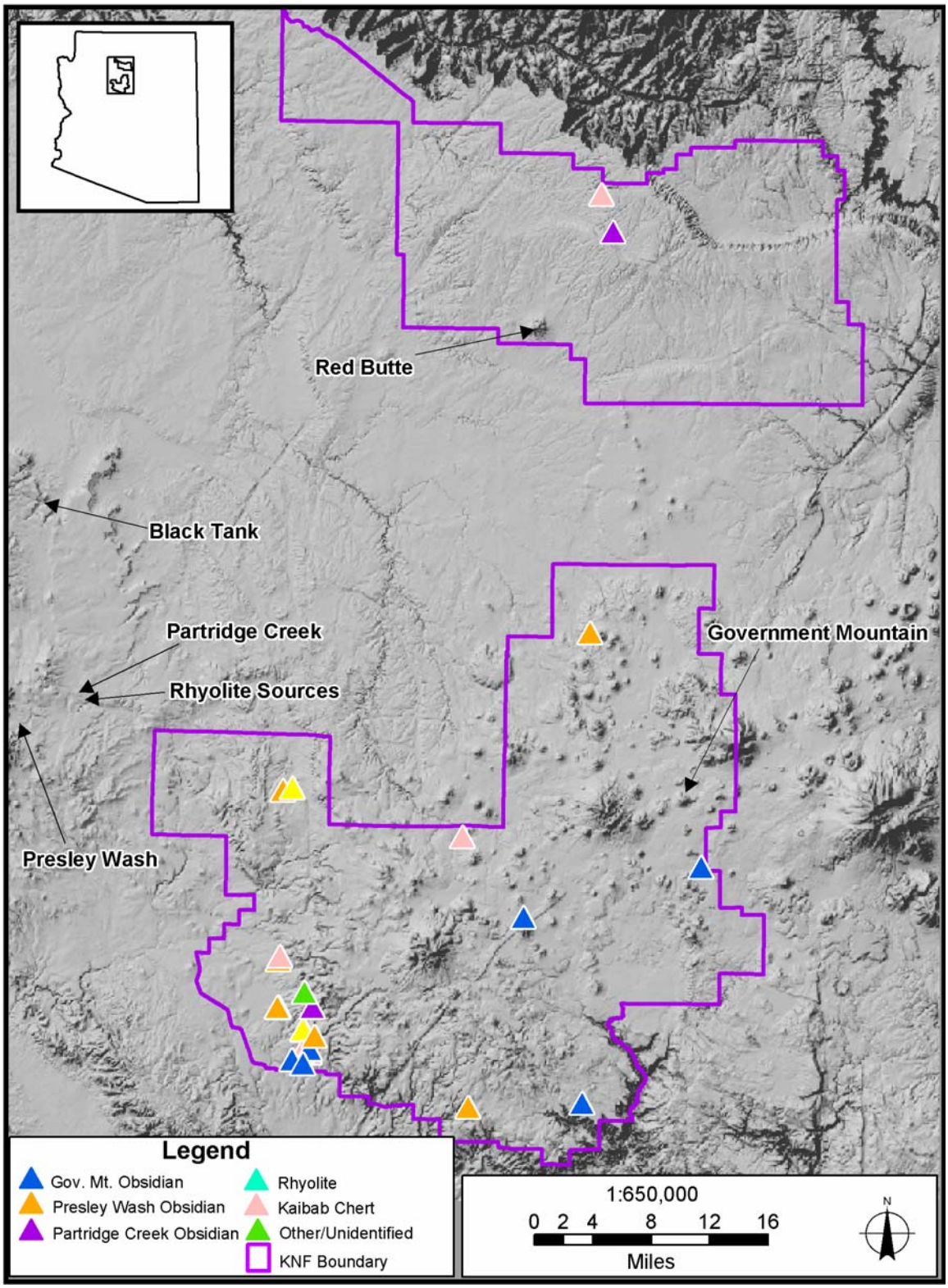

Figure 5.23. Distribution of lithic raw materials during the Protohistoric Period

Taylor Notched. Finally, Figure 5.23 depicts spatial distributions of lithic raw materials during the Protohistoric Period.

Summary of Changes in Lithic Raw Material Frequencies and Spatial Distributions Over Time

One of my primary goals for this study was to perform an initial analysis of the frequencies and spatial distributions of the various local lithic material types in the study area. Below, I have included relevant data on both the sample as a whole, and also on spatial patterns within the data according to temporal period. Significant patterns do exist in the data, especially when viewed as discrete temporal periods. Most significant may be the fluctuating levels of obsidian use compared to the utilization of lower-quality, but more readily available materials over time. However, due to the relatively small sample size compared to the large size of the study area, coupled with the vagaries of visual sourcing of lithic materials, the results below remain tentative. Further work specifically aimed at lithic raw material studies will be necessary to more confidently discuss the topics outlined below.

Frequencies of Raw Material Types within the Sample

Table 28 shows the frequencies of general raw material types observed within the sample as a whole. The majority of lithic artifacts are derived from obsidian at 57.4 percent (n = 358). The preponderance of obsidian within the sample is not surprising considering that the material is more vitreous, and therefore more workable, than some of the other materials such as chert or rhyolite. However, percentages of specific obsidian types within the sample are interesting. Table 29 lists the frequencies and percentages of

the sample, differentiating between the specific raw material sources discussed in Chapter 3. Approximately 29% of the sample consists of obsidian from the Government Mountain source (n = 182), followed closely by artifacts derived from the Partridge Creek source at 16% (n = 100). Presley Wash obsidian (9.8%, n = 61), Black Tank obsidian (1.7%, n = 11), and RS Hill obsidian (.3%, n = 2) are also represented in smaller numbers.

The relatively high proportions of Partridge Creek obsidian compared to Government Mountain obsidian are important for researchers in the Flagstaff area. As Lesko (1989:385) states...

> Partridge Creek obsidian has probably gone unnoticed until recently because its source lies in a little-visited, remote area. If observed on an archaeological site, this obsidian would likely be presumed to be one of the San Francisco Volcanic Field sources. For this reason, it is possible that archaeologists overrate the distribution of Government Mountain obsidian.

Lesko (1989:395-396) argues that researchers have historically underestimated the frequency and range of distribution of Partridge Creek obsidian. Because of an unfamiliarity of some researchers with the Partridge Creek source, much of the obsidian derived from the study area is attributed to the Government Mountain source, while the importance of the Partridge Creek, and other nearby sources may remain underrated. The sample data supports Lesko's assertion, indicating a fairly even split between obsidians derived from the Government Mountain source (n = 182) and those from the Partridge Creek and Presley Wash sources to the west of the study area (n = 161).

Table 28. General Raw Material Type Counts for the Sample

Material Type	Frequency	Percentage
Obsidian	358	57.4
Chert	168	26.9
Rhyolite	87	13.9
Chalcedony	9	1.4
Unknown/Other	2	.4
Total	624	100.0

Table 29. Specific Raw Material Counts for the Sample

Raw Material	Frequency	Percentage
Obsidians		
Black Tank (Red)	**1**	**.3%**
Black Tank (Gray)	**4**	**1.2%**
Government Mountain	**82**	**24.5%**
Partridge Creek	**63**	**18.8%**
Presley Wash	**33**	**9.9%**
R.S. Hill	**2**	**.6%**
Chert		
Chalcedony	8	2.4%
Jasper	1	.3%
Kaibab Chert	**39**	**11.6%**
Moss Agate	1	.3%
Perkinsville Jasper	**1**	**.3%**
Red Butte Chert	**21**	**6.3%**
Rhyolite	37	11.0%
Unidentified	5	1.5%
Total	335	100%

Raw Material Frequencies Through Time

When the same data outlined above is divided by temporal period, such raw material frequencies indicate that preferences for lithic raw material sources are not static but fluctuate significantly over time. Figure 5.24 illustrates the frequencies of projectile points divided by general raw material type. It is apparent from the figure that obsidian is the preferred material in the research area for much of its human history. However, it is also apparent that the preference for obsidian is not constant. Indeed the data indicate that obsidian artifacts increase in number through the Paleoindian and Archaic periods, but decrease significantly during the Early Agricultural Period, before again increasing during the Early Ceramic, Ceramic and Protohistoric periods.

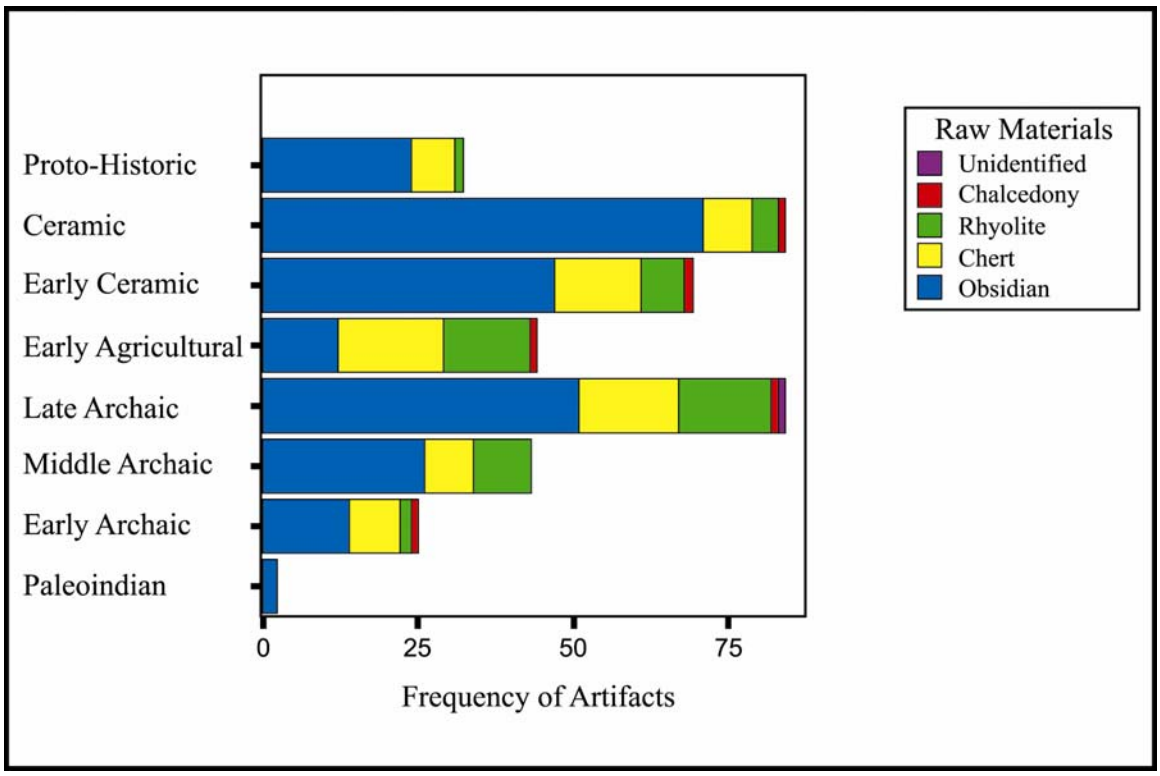

Figure 5.24. Frequency of general raw material types by temporal period

Figure 5.25 allows for an improved perception of the data by illustrating the overall percentages of raw material usage organized by temporal period for the study area. In this figure, a disparity becomes evident between the use of obsidian, and the use of other coarser materials such as rhyolite, chert, and chalcedony. In the lower section of the figure, I have seriated the same distributions in order to better illustrate the differences. The distribution of obsidian over time takes on an hourglass shape, reflecting reduction in use of the material during the Early Agricultural period arranged at the center of the sequence. By contrast, the distributions of the other three materials indicate a peak in the use of chert, rhyolite and chalcedony during the Early Agricultural Period.

I ran chi-square tests of raw material frequencies to test the significance of the tabular data[9]. I first conducted a chi-square test comparing observed distributions of general raw material types throughout all of the temporal periods (Table 30). I compared only the material types obsidian, chert and rhyolite as other categories were only minimally represented within the sample. The chi-square indicates that differences in observed values of general raw material types between temporal periods is highly significant ($\chi^2 = 51.95$, $.001 > p > 0$).

I also compared distributions between the Late Archaic and subsequent Early Agricultural Period (Table 31), as well as between the Early Agricultural and following Early Ceramic Period (Table 32). Again I removed raw material categories that were not well represented within the sample. Chi-squares indicate that differences in observed values of general raw material types between the Late Archaic and Early Agricultural

[9] All chi-square tests for this analysis were generated using the Chi-square Calculator designed by Catherine N. Ball and Jeffrey Connor-Linton of Georgetown University available at http://www.georgetwon.edu/faculty/ballc/webtools/web-chi.html

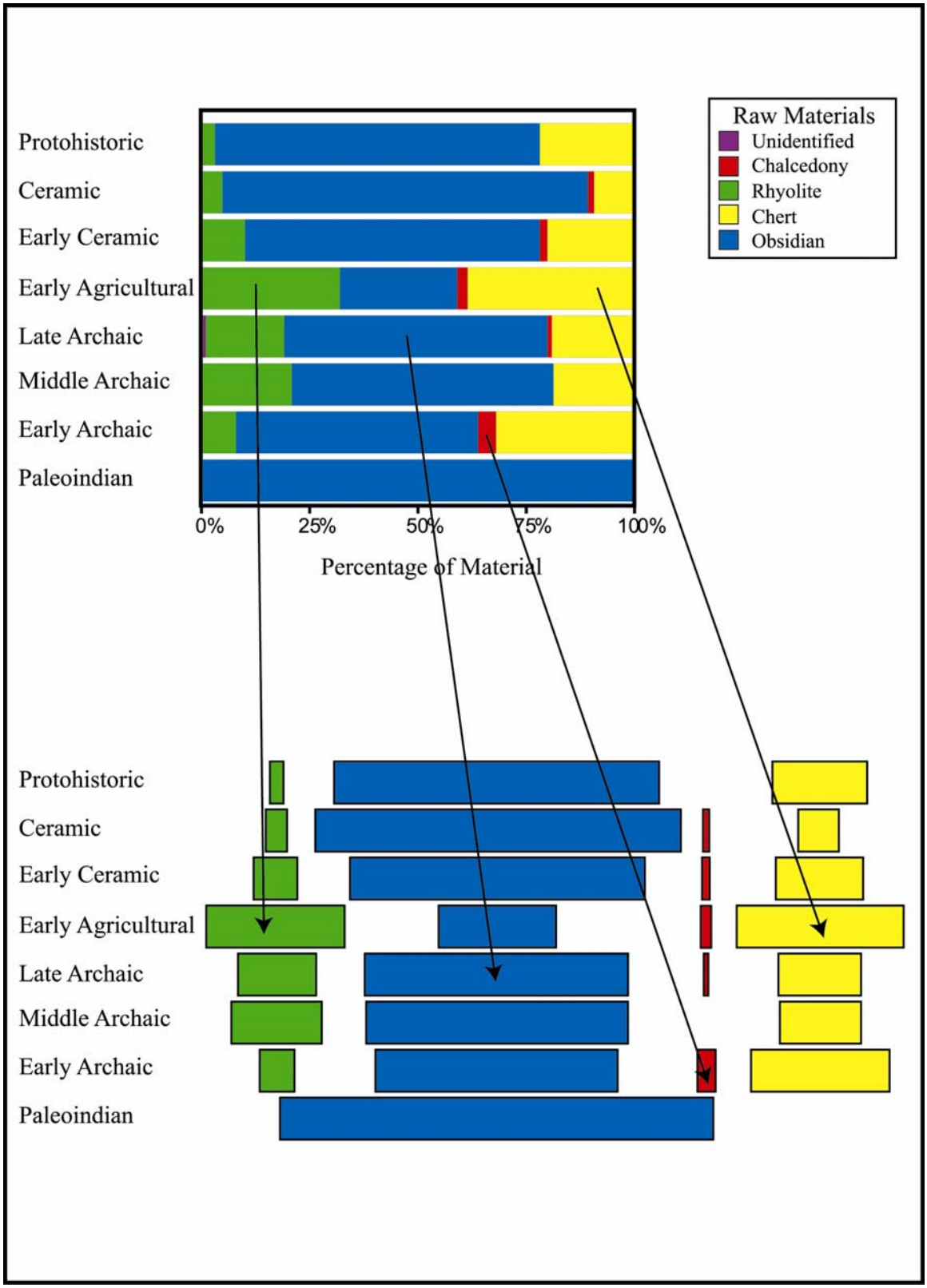

Figure 5.25. General lithic types by temporal period divided by raw material

Table 30. Chi Square Values for Frequencies of General Raw Material Types for all Temporal Periods.

	Obsidian	Chert	Rhyolite	Total
Protohistoric	14	8	2	24
Ceramic	26	8	9	43
Early Ceramic	51	16	15	82
Early Agricultural	12	17	14	43
Late Archaic	47	14	7	68
Middle Archaic	71	8	4	83
Early Archaic	24	7	1	32
Total	245	78	52	375

Table 31. Chi Square Values for Frequencies of General Raw Material Types between the Late Archaic and Early Agricultural Period.

	Obsidian	Chert	Rhyolite	Total
Early Ceramic	51	16	15	82
Early Agricultural	12	17	14	43
Total	63	33	29	125

Table 32. Chi Square Values for Frequencies of General Raw Material Types between the Early Agricultural and Early Ceramic Periods.

	Obsidian	Chert	Rhyolite	Total
Early Agricultural	12	17	14	43
Late Archaic	47	14	7	68
Total	59	31	21	111

Periods ($\chi^2 = 13.34$, $.01 > p > .001$) and the Early Agricultural and Early Ceramic Periods ($\chi^2 = 18.70$, $.001 > p > 0$) are likewise highly significant.

Below, I have further divided the raw materials into specific types as listed in Chapter 3 (Figure 5.26). Again, frequencies of artifacts, divided by raw material types and separated by temporal period indicate a pattern in which the use of some lithic materials peak during the Early Agricultural period, while other materials decrease in frequency during this time. In Figure 5.27 I have once again converted the graph into percentages of types and then rearranged the graph to illustrate the seriation of each material type. The data indicate that utilization of both Partridge Creek and Government Mountain obsidian decrease during the Early Agricultural period (a very slight increase is evident for Presley Wash obsidian). Conversely, percentages of other materials such as Kaibab chert, Red Butte chert, and Rhyolite increase during that period.

Again, I compared distributions between the Late Archaic, Early Agricultural and Early Ceramic Periods (Table 33). I removed the specific raw material types Black Tank obsidian and Perkinsville Jasper as these were not well represented in the sample. Chi-squares indicate that differences in observed values of general raw material types between the three periods are highly significant ($\chi^2 = 37.30$, $.001 > p > 0$).

Table 33. Chi Square Values for Frequencies of Specific Raw Material Types Between the Late Archaic, Early Agricultural and Early Ceramic Periods.

	Gov. Mt.	Part. Creek	Presley Wash	Chalcedony	Kaibab Chert	Rhyolite	Red Butte Chert	Unknown /Other	TTL
Late Archaic	26	17	8	1	9	15	1	7	84
Early Agr.	5	1	5	1	3	14	6	9	44
Early Ceramic	17	20	4	2	5	7	4	4	63
Total	48	38	17	4	17	36	11	20	191

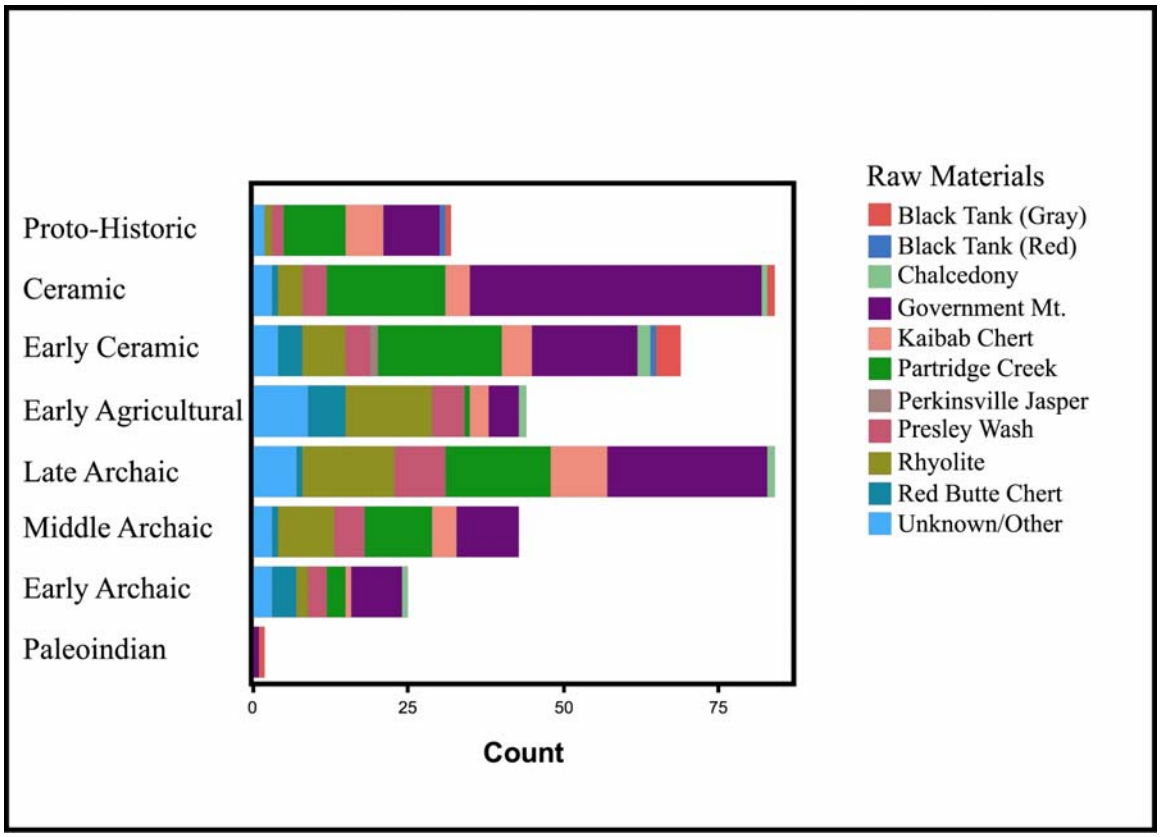

Figure 5.26. Specific raw material types by temporal period

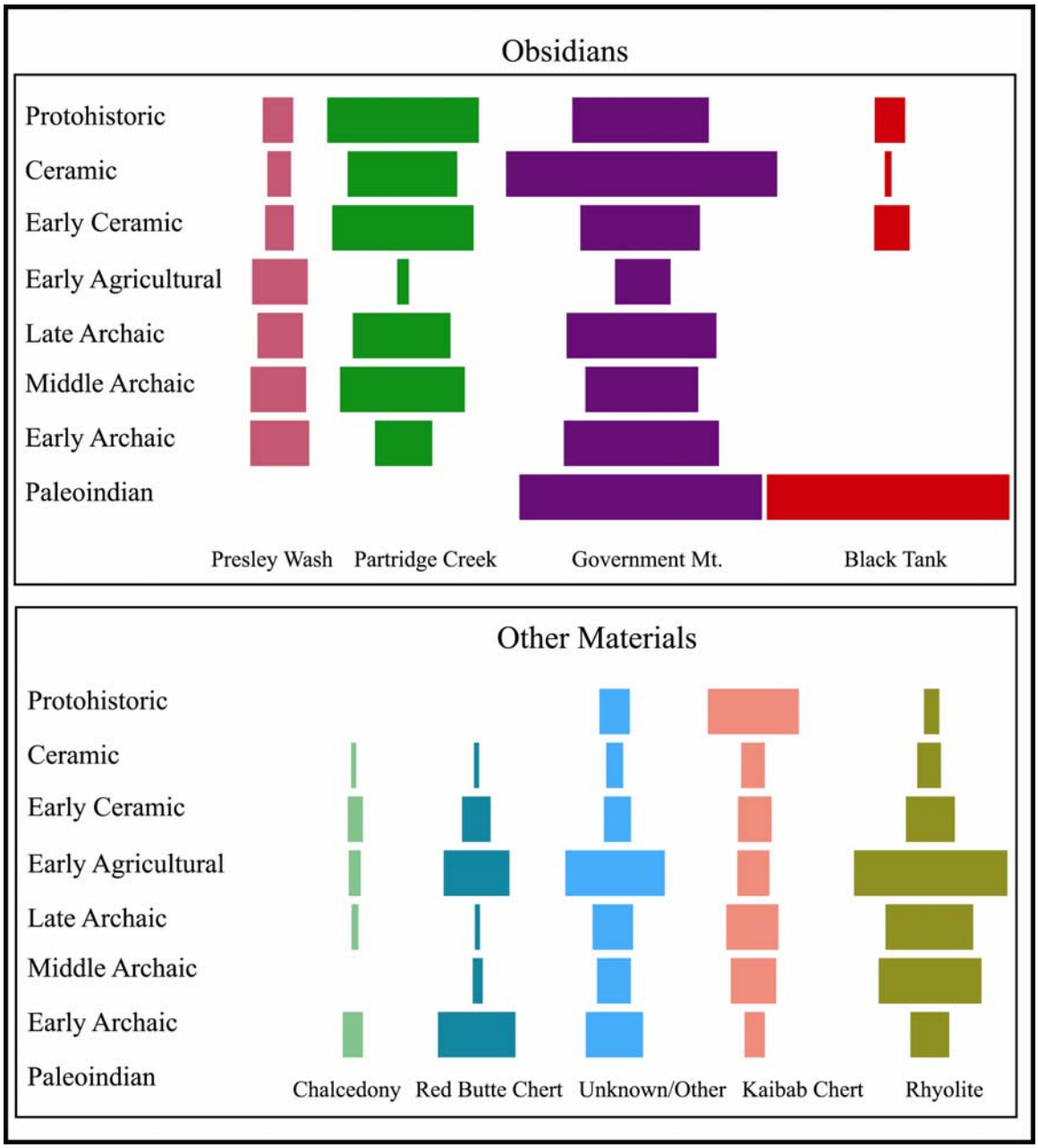

Figure 5.27. Percentages of specific lithic raw material types by temporal period

As stated above, the interpretation presented here remains tentative, due to the uncertainty of visual sourcing and the lack of data regarding the distributions of raw material sources such as rhyolite, and the local cherts. However, significant differences in lithic raw materials are apparent in the data between the Early Agricultural Period and

other periods. Perhaps such differences indicate an increase in the use of localized raw materials by early agriculturalists as has been documented for other areas. For example, Christensen (1987:168) states that at Black Mesa, "Basketmaker II [Early Agricultural] is the only period when there was a significant use of chipped stone materials that were locally available." Such a pattern may represent a model in which increasingly sedentary early agriculturalists used raw materials that were locally available rather than higher quality materials farther away.

In sum, the data provide a valuable insight into lithic procurement and exchange systems in the Southwest. As Lesko (1989:397) concludes, "[n]ow that obsidian source identification in northern Arizona can be reliably assured, it is necessary to develop a broad data base of obsidian artifact distribution...a more extensive program is required to make convincing arguments for determining prehistoric trade and exchange relations." The GIS designed for this study essentially represents such a "data base" that has been populated with the first comprehensive data set for obsidian distributions in the region.

Chapter 6 : Conclusion

This thesis represents the first large-scale study of projectile point distributions for the research area and contributes to an evolving understanding of cultural change through time on the Coconino Plateau. The data presented here build upon the preceramic culture-history initiated primarily by Jennings (1971) that remains poorly understood and underutilized within the research area. Data used for the project encompass a wide geographic extent but derive from one of the smallest units of analysis available for archaeological research, the individual artifact. In that way, this thesis adds a new perspective to the old issue of developing a detailed culture-history contrived from local data for the preceramic periods of the Coconino Plateau.

I have tentatively offered a new scenario of culture-history on the Plateau with the caveat that the ideas presented here require additional data and further testing. The model I have presented is largely inductive in nature, but contributes to an overall framework of the preceramic periods that can be deductively tested. What is needed most are more localized data, specifically chronometric dates from preceramic contexts on the Coconino Plateau. For the current analysis, I have utilized temporal designations for projectile point types from surrounding areas due to the overall shortage of such data on the Plateau. However, the future addition of local chronometric data will allow researchers to refine the model presented here.

The study is not only relevant for researchers in the Flagstaff area, but much of the data is pertinent to investigations within the southwestern United States and beyond. It has not been uncommon for maps showing spatial distributions of projectile points to start and stop at the boundaries of the Kaibab due to an almost total lack of published

data from the area (see for example Justice 2002b:127, 161, 164, 175, 215, 225). In my view, the paucity of preceramic evidence in the study area has perpetuated the notion that the region has been in some way detached from cultural changes seen elsewhere on the Colorado Plateau. The Coconino Plateau may indeed have been a place characterized by occupation hiatuses and/or technological lags, but this idea has never been adequately tested. In contrast the data presented here indicate an overall continuity in technological transition in the region throughout prehistory that appears very much in step with regional cultural changes that took place elsewhere on the Southern Colorado Plateau.

Unquestionably, much further work is needed on the topic. Therefore, it is my hope that the projectile point typology presented here, developed specifically for the research area from local specimens, will prove useful for future research endeavors. If progress is to be made in projectile point analysis on the South Kaibab it is critical that researchers use the same names and type definitions for classifying such artifacts. The typology presented here is polythetic and malleable, so that type definitions and categories can be modified or added as new data become available. Therefore, the 35 type categories presented here represent only a start to discovering the temporally or stylistically meaningful projectile point types in the research area. Again, future data derived from the research area may modify the current typology, particularly the temporal ranges assigned to types derived from data outside of the Plateau.

In addition to developing a method of classification for projectile point types in the region, I have also developed a GIS database to catalog future finds on the Kaibab. In the past, individual projectile point finds have been confined to the pages of hundreds of survey reports so that no one person can easily ascertain the distributions and frequencies

of particular point styles. In contrast, the GIS database has the advantage of keeping all projectile point data from the Kaibab in one location that can easily be queried, manipulated and maintained. My hope is that workers in the area will continue to compile new data into the database so that the project continues to grow as new surveys are conducted. Coupled with the current typology, the GIS database developed for the project offers a valuable tool to researchers in the region. GIS technology is a fairly new application within archaeology, and the potential future addition of thousands of projectile points into this database over time could result in a unique and important academic resource.

In addition to providing data on spatial distributions, I have attempted also to provide an initial data set on lithic raw materials in the region. The current data indicate that lithic raw material usage on the Coconino Plateau was dynamic, possibly changing through time in response to trade, subsistence method, and lithic technology. In particular, lithic data may indicate an increase in the use of local raw materials during the Early Agricultural Period, a pattern that appears consistent with lithic procurement patterns in other areas. Although the data remains somewhat tentative barring the use of improved chemical sourcing methods, it is clear that there are ample opportunities for future work regarding lithic raw materials in the research area.

The most significant contribution of this thesis may be in providing an example of how drastically culture-histories using the archaeological site as the unit of analysis may differ from those utilizing the individual artifact. I have argued that some types of artifacts can become masked at the site level of analysis due to sheer numbers of later artifact types. Moreover, archaeologists are influenced by culture-historical models so

that artifacts that do not fit the model tend to be viewed as anomalous finds and can potentially be ignored. In the introduction to this thesis I discussed the current culture-historical model for the research area and illustrated how the regional site data offer little evidence of occupation during any of the preceramic periods except a large number (n = 968) of lithic scatters possibly dating to the "Archaic" period (Figure 1.1). Again, for reasons explained previously, the graphic depicts only those single-component sites on the South Kaibab that have been assigned dates based on surface assemblages of artifacts.

I now return to that graphic but I have added the artifact data from the current study to the original graph (Figure 6.1). It is immediately apparent from the bar graph that in contrast to the data available at the site level, the artifact data offer considerable evidence of occupation during specific preceramic temporal periods. Yet the projectile points used for the artifact level analysis collectively represent only 425 archaeological sites, while the site level analysis consists of roughly 3,900 sites. The implications of the disparity in temporal data should not be overlooked. Much of the temporally diagnostic data observed on the surface of an archaeological site becomes lost at the site level of analysis. I would argue that the most effective culture-histories will draw from both units of analysis to compensate for this loss.

Finally, I have included one last bar graph that portrays the frequency distributions of the artifact data in a slightly different way (Figure 6.2). The previous graph depicts the projectile point data as if the temporal periods were equivalent in length of time. Therefore, the same number of projectile points exhibited during two temporal periods of varying length appears to be equally represented by the graph. However, it must be recognized that 15 Rosegate projectile points, dating to within a few hundred

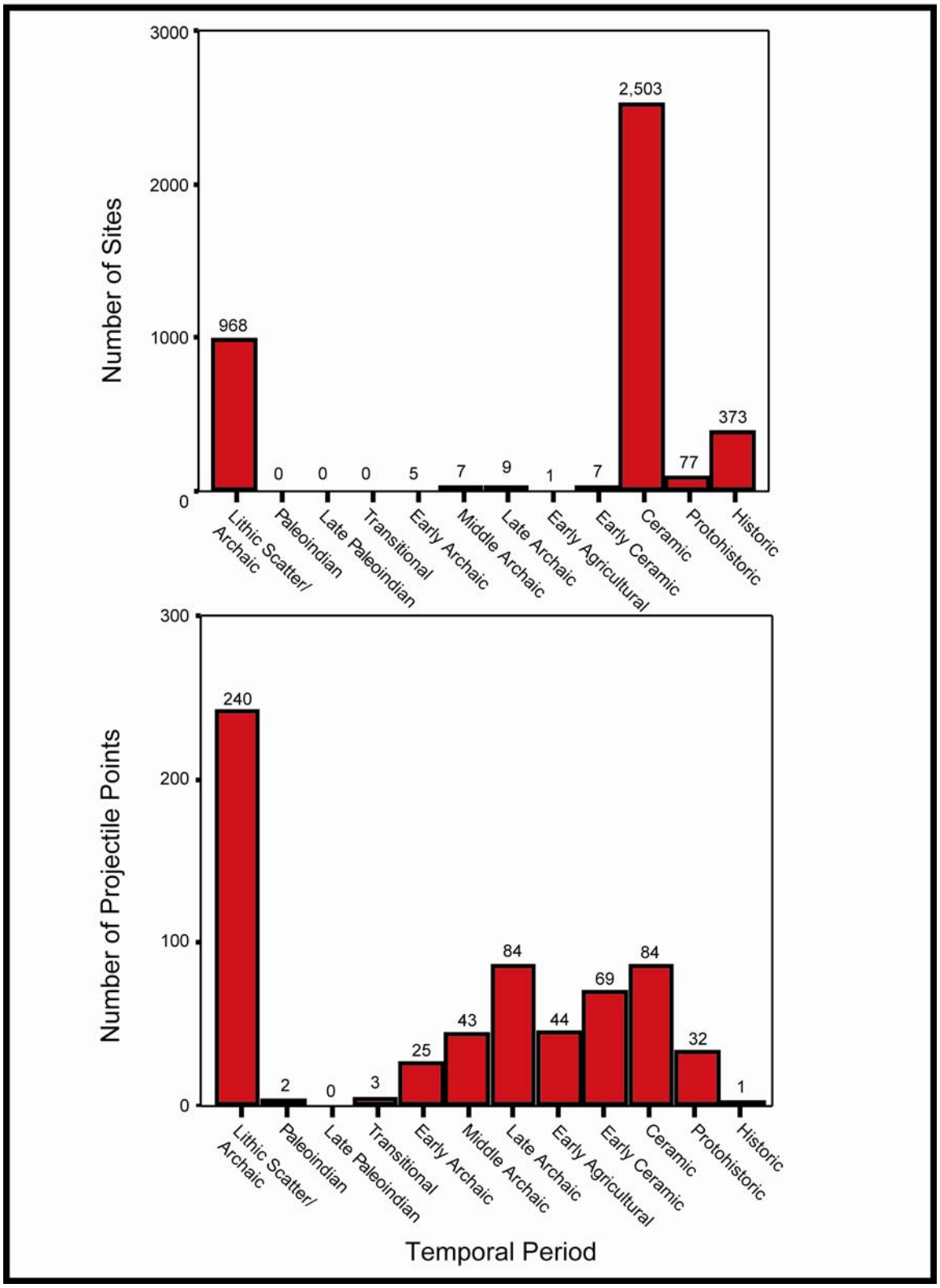

Figure 6.1. Bar graphs depicting distributions of sites and projectile points for each temporal period. Note that Ceramic Period distributions for projectile points are under-represented due to biases within sample as discussed in Chapter 3.

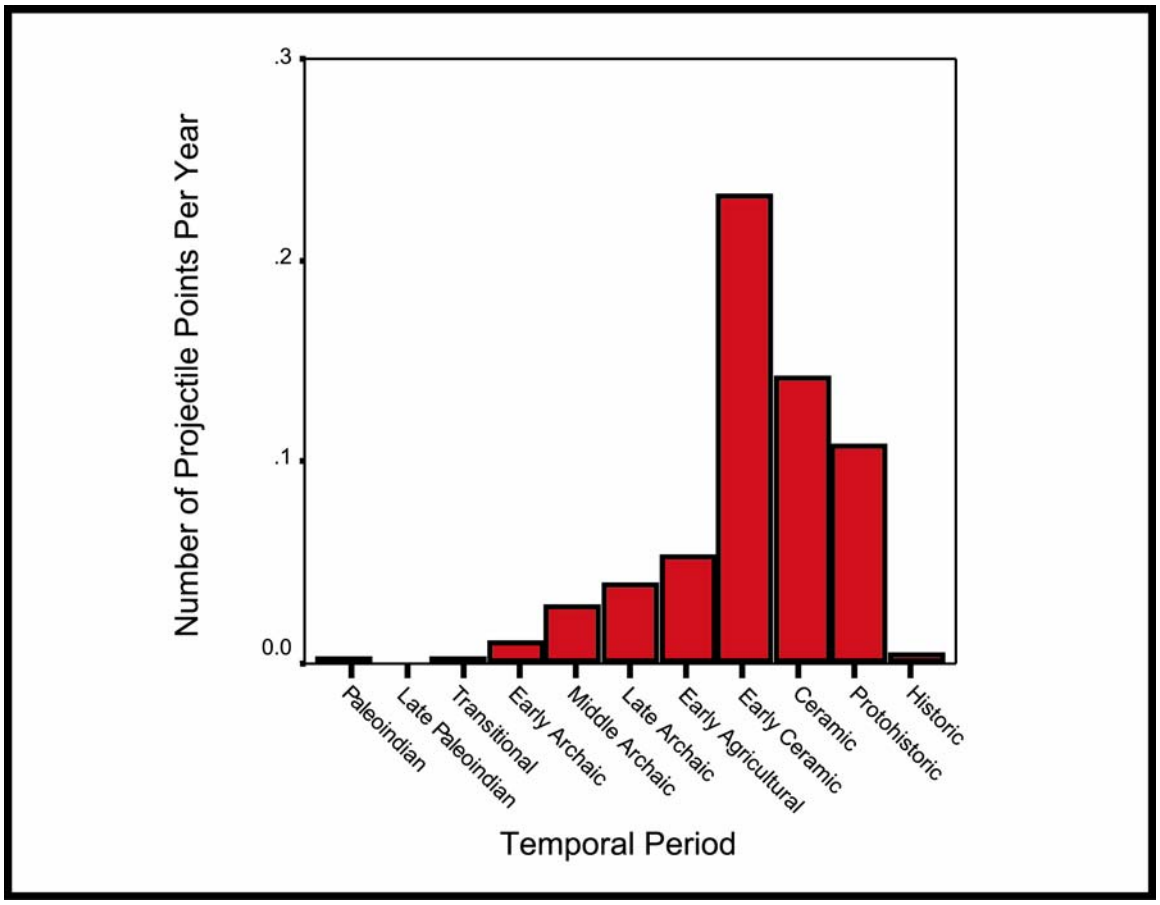

Figure 6.2. Bar graph depicting number of projectile points per year for each temporal period. Note that distributions for the Ceramic Period are under-represented due to biases within sample as discussed in Chapter 3.

years, signify significantly more in terms of production, than 15 Gypsum Cave points potentially spanning a 3,000 year period. Therefore, for the final graph I have adjusted distributions of projectile points to reflect the length of the specific temporal periods in which they occur. I have done this quite simply by dividing the total number of points from a particular period by the total number of years in that period. The result is a rough estimate of how many points occur in the sample compared to each year of each temporal period.

Therefore, the frequency distributions, thus adjusted, indicate a fairly consistent increase in the number of projectile points deposited over time during each temporal period. I am hesitant to make too much of this distribution. However, under a much more refined analysis Wills (1988:67) has used frequencies of projectile points, albeit in concert with radiocarbon dates, to estimate the intensity of occupation during the preceramic period in western New Mexico. If it can be assumed that the frequencies reported here can likewise provide estimates regarding the intensity of occupation for the research area, then the current data indicate a more or less constant rate of growth in occupation intensity on the Coconino Plateau.

This statement has two implications. First, if hiatuses in human occupation of the Coconino Plateau have occurred as has been proposed, one might expect to see an uneven distribution of temporally diagnostic projectile points over time reflecting a decreased intensity of occupation. Instead, even with the conservative classification of projectile points assigned to proposed hiatus periods[10] no decrease in intensity is evident until the Protohistoric Period.[11] Second, the reverse is also true. If human occupation on the Coconino Plateau grew steadily over time with no significant abandonments, then a steady increase in occupation intensity should also be evident. In such a scenario, one might expect that the correct classification of projectile points into temporal periods might yield similar results to those illustrated in Figure 6.2.

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[10] I removed a large number of side-notched projectile points from the sample that might otherwise be classified as San Pedro points, diagnostic of the Early Agricultural Period, citing widespread problems in dating side-notched points in the Southwest. Additionally, I have differentiated between the Bajada, San/Jose, and Armijo points in order to limit the number of points designated to the Middle Archaic Period.
[11] As stated in Chapter 3, large numbers of Ceramic Period Cohonina points were excluded from the sample. However, the frequency of Cohonina points represented in the actual collection is assumed to be many times the number of earlier Rosegate points.

Therefore, in light of the current evidence which does not indicate any hiatus during the preceramic period save that previously discussed for the Folsom Period, I tentatively offer an outline of additional data for the current preceramic culture-history of the Coconino Plateau. This culture-history potentially begins 3,000 years earlier than has previously been proposed with an occupation during the Clovis Period as early as 11,500 B.P. While no Folsom points have yet been identified on the Plateau, some evidence of Late Paleoindian and Transitional Period occupation may also exist. Distributions of artifacts assigned to these periods indicate that human occupation may have centered on the eastern portion of the research area. Perhaps such artifact distributions result from the utilization of the Government Mountain obsidian source located in the center of that area, although lithic raw material types also indicate utilization of Black Tank obsidian and Red Butte chert. None of the six artifacts predating the Early Archaic period derive from sources outside of the Coconino Plateau.

The subsequent Early Archaic Period is well represented in the research area at the artifact level. Perhaps Early Archaic groups utilized the Coconino Plateau seasonally to procure game and lithic raw materials. Temporally diagnostic Early Archaic points located at lithic scatters indicate a spatial distribution similar to the preceding periods, with the exception of two sites located to the north and east of Red Butte. Lithic raw materials of Bajada points[12] still indicate heavy use of the Government Mountain source (40%) although western sources such as Presley Wash (13.3%) and Partridge Creek (13.3%) are also represented.

[12] As discussed in Chapter 3, I suspect the Northern Side-notched points classified for this analysis may actually represent re-notched bifaces dating to later periods than the Early Archaic.

During the following Middle and Late Archaic Periods, no difference in spatial distributions of temporally diagnostic projectile points has yet been discovered. Following Geib (1996:33) and Sorrell (2002:7) it is proposed that Middle Archaic populations may have located sites near the many ephemeral lakes, playas and streams found on the Coconino Plateau. However, a more refined GIS analysis focused on the locations of such features is necessary to support such a position. Spatial distributions for both Middle and Late Archaic artifacts found on aceramic sites indicate a reduced intensity of occupation in the Government Mountain area occupied during previous periods. Conversely, an increase in artifacts dated to both periods is evident within the modern day Pinyon-Juniper forests along the southern and western portions of the project area and north of Red Butte. In addition, lithic raw material types demonstrate an increased reliance on material sources west of the project area. Aceramic sites yielding Middle and Late Archaic Period points reflect an overall drop in elevation of roughly 1,000 ft compared to Early Archaic sites.

While archaeologists have been confounded by a lack of Early Agricultural and Early Ceramic sites on the Coconino Plateau, the current analysis identified temporally diagnostic artifacts from both periods within the project area. Aceramic sites yielding Early Agricultural Period points indicate a concentration of such sites in the area northeast of Red Butte. It should be noted that these sites are distinct from sites in that area yielding points dated to the Middle and Late Archaic Periods. Additionally, lithic raw material types may indicate an increase in the use of local raw materials as observed at contemporary sites in other areas. Recent evidence on Black Mesa and Anderson Mesa have demonstrated the existence of Early Agricultural sites in areas previously

thought to have been devoid of occupation by early farmers. I have proposed here that Early Agricultural sites may likewise exist within the study area, particularly within the Tusayan District of the Kaibab National Forest.

Finally, I have proposed that an Early Ceramic occupation of the project area might similarly be more substantial than previously indicated by site-level analyses. Frequencies of Rosegate projectile points increase sharply over all previous periods and these artifacts appear throughout the South Kaibab. Furthermore, distributions of Lino-Black-on-gray ceramics are likewise fairly widespread and may prove to correlate with Rosegate points through future analysis. Lithic materials indicate the use of otherwise un-utilized or rare material sources compared to other periods and distributions of such materials are significantly different from the previous Early Agricultural Period. Additionally, new evidence of unidentified, and seemingly early brownwares may bolster evidence of an Early Ceramic Period occupation of the research area.

In sum, with the combination of lithic raw material data, projectile point type data, and spatial data, this thesis offers one additional perspective regarding preceramic prehistory on the Coconino Plateau. The artifact-level analysis used here contrasts with other culture-histories that propose population hiatuses or technological lags in the region. Rather, with the exception of Paleoindian Folsom points, all of the periods of cultural change evident in the greater Southwest are represented at the artifact level in the research area. The presence of Paleoindian artifacts pushes back the start-date for human occupation of the area by roughly 3,000 years. Moreover, the presence of Early Agricultural and Early Ceramic artifacts calls into question the idea that the Cohonina were a migrating population of people that represent the first agriculturalists on the

Plateau. The data presented here indicate that people on the Coconino Plateau were active participants in the same regional cultural change that took place throughout the greater Southwest and illustrate the need for much further archaeological investigation of preceramic sites in the research area.

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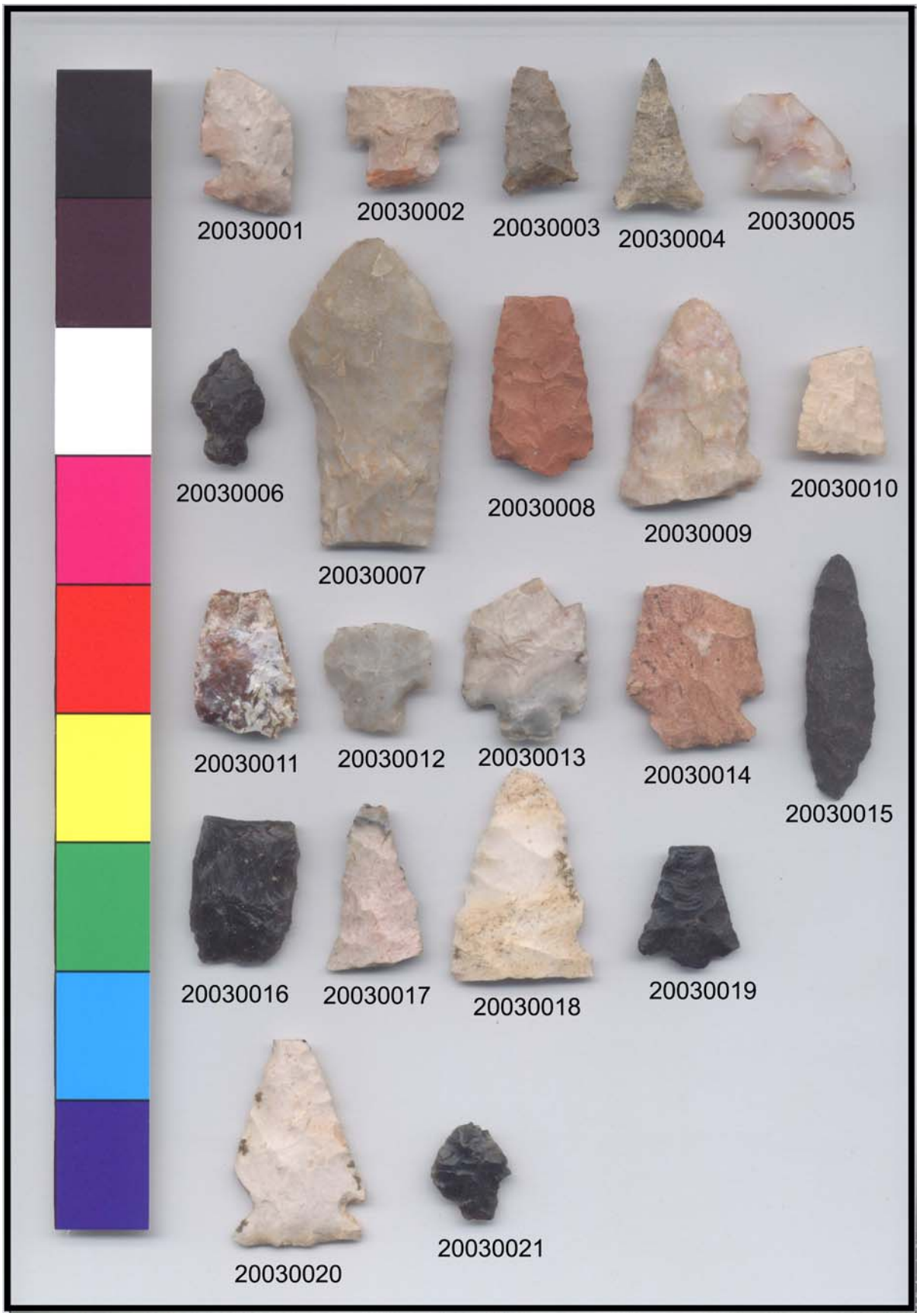
APPENDIX A

Color Plates of 822 Projectile Points from the Kaibab National Forest Collections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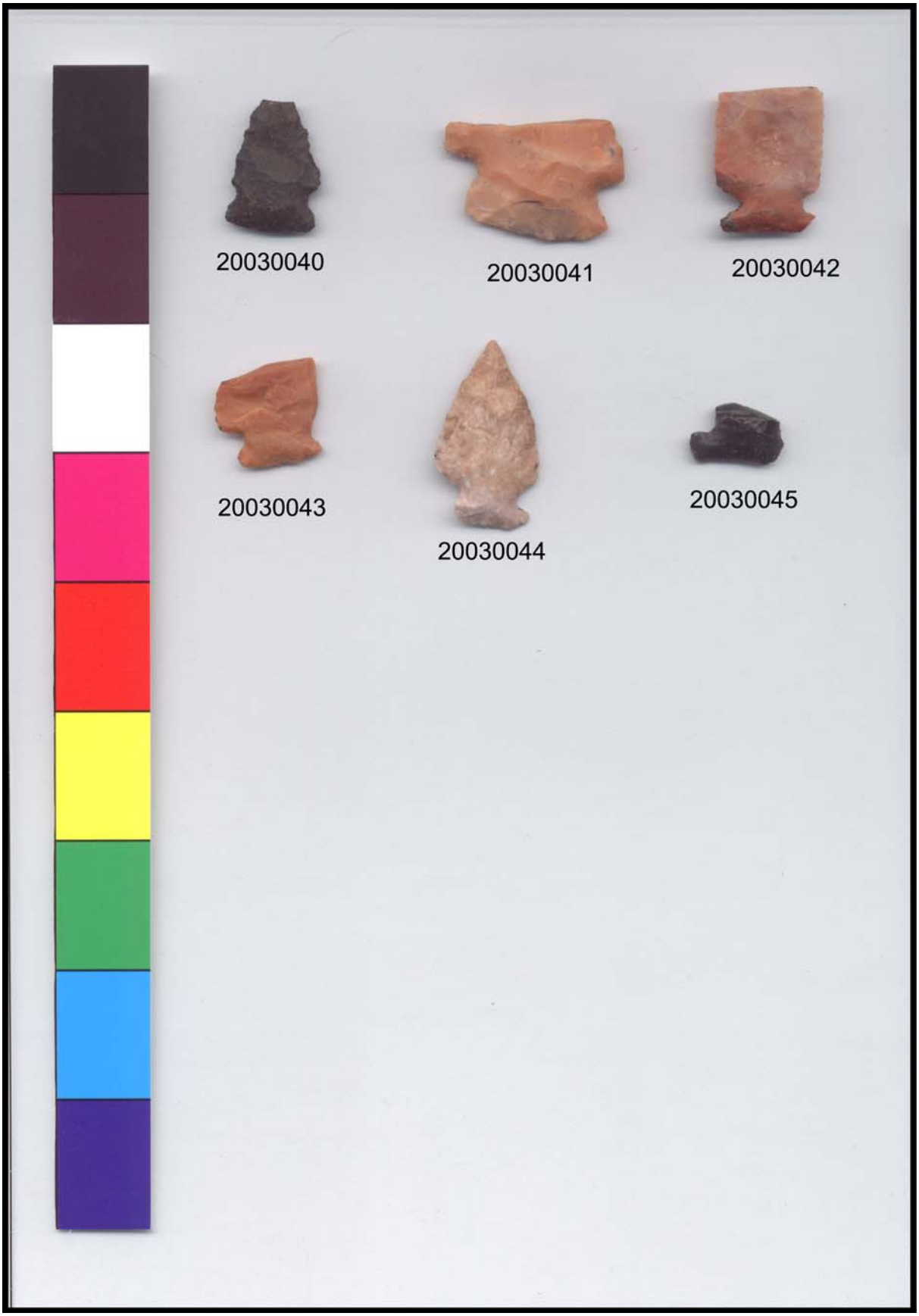
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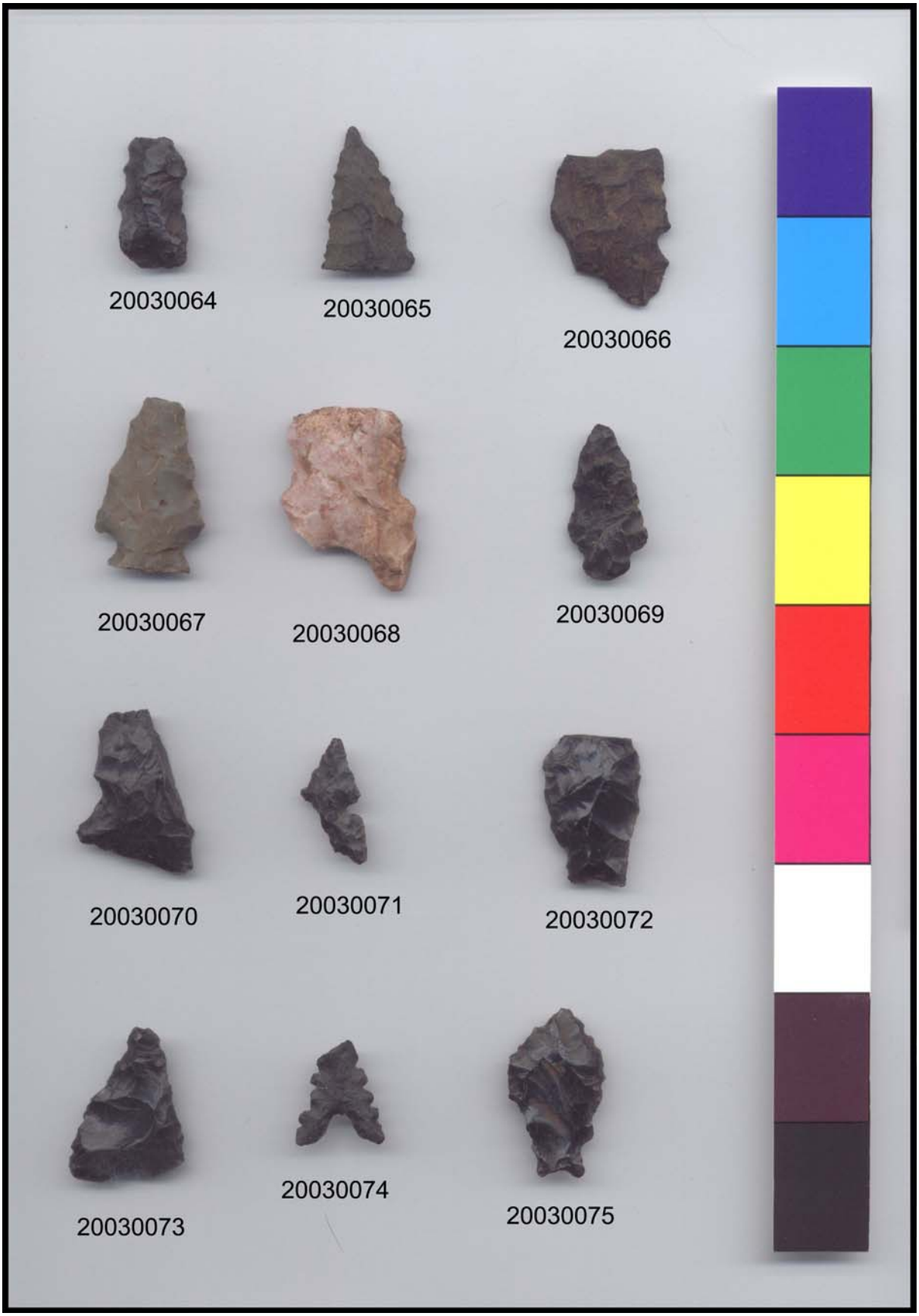
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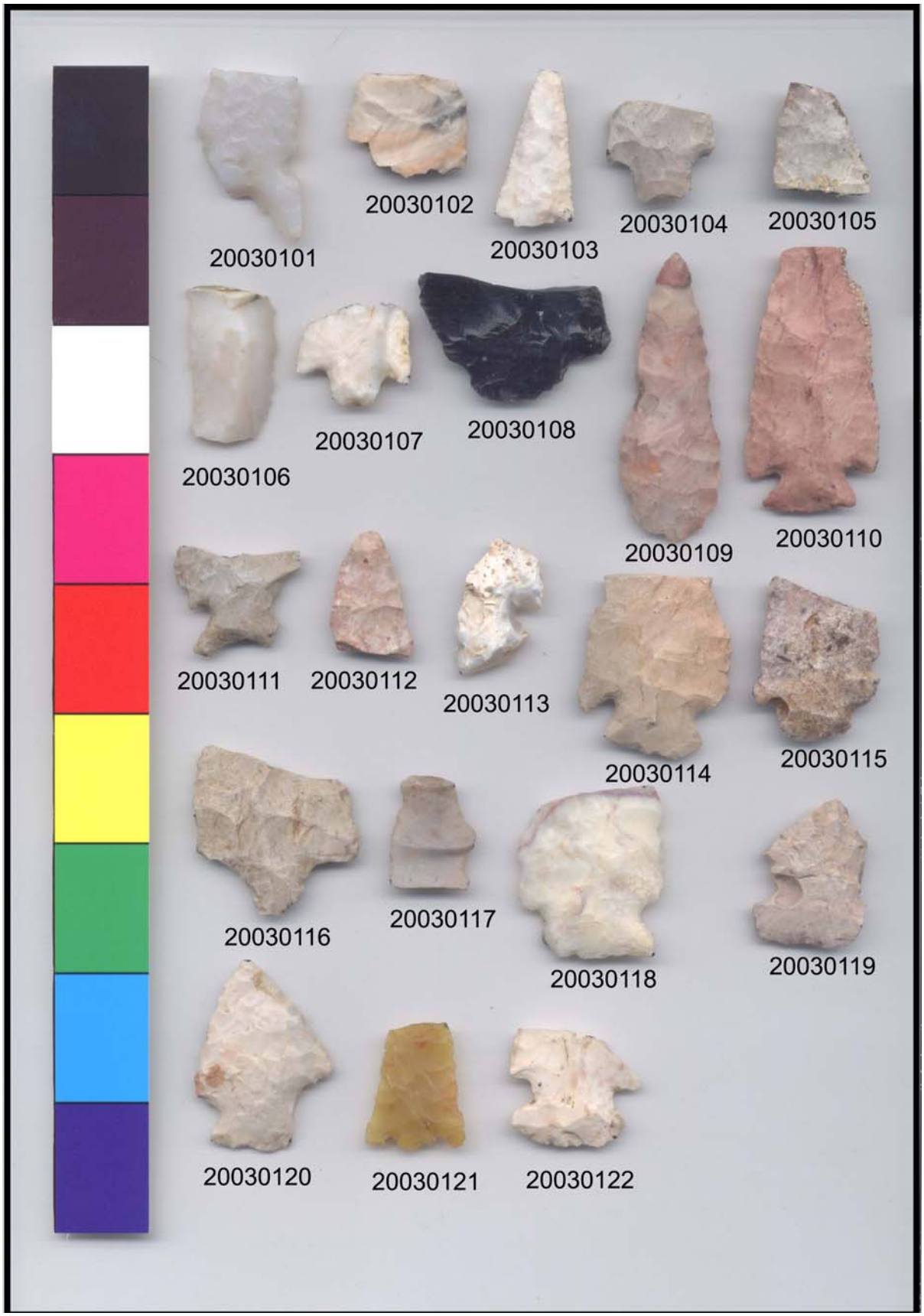
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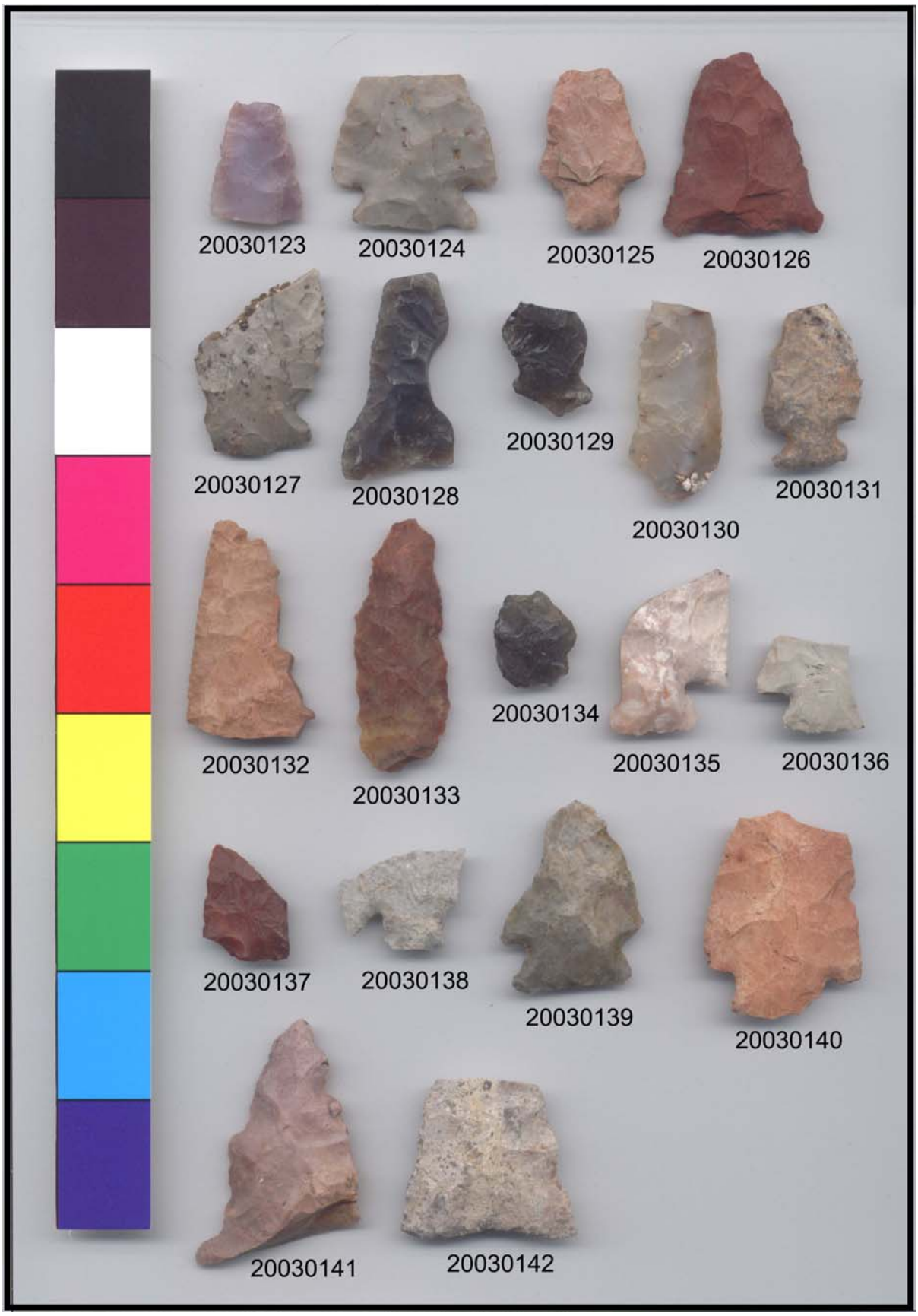
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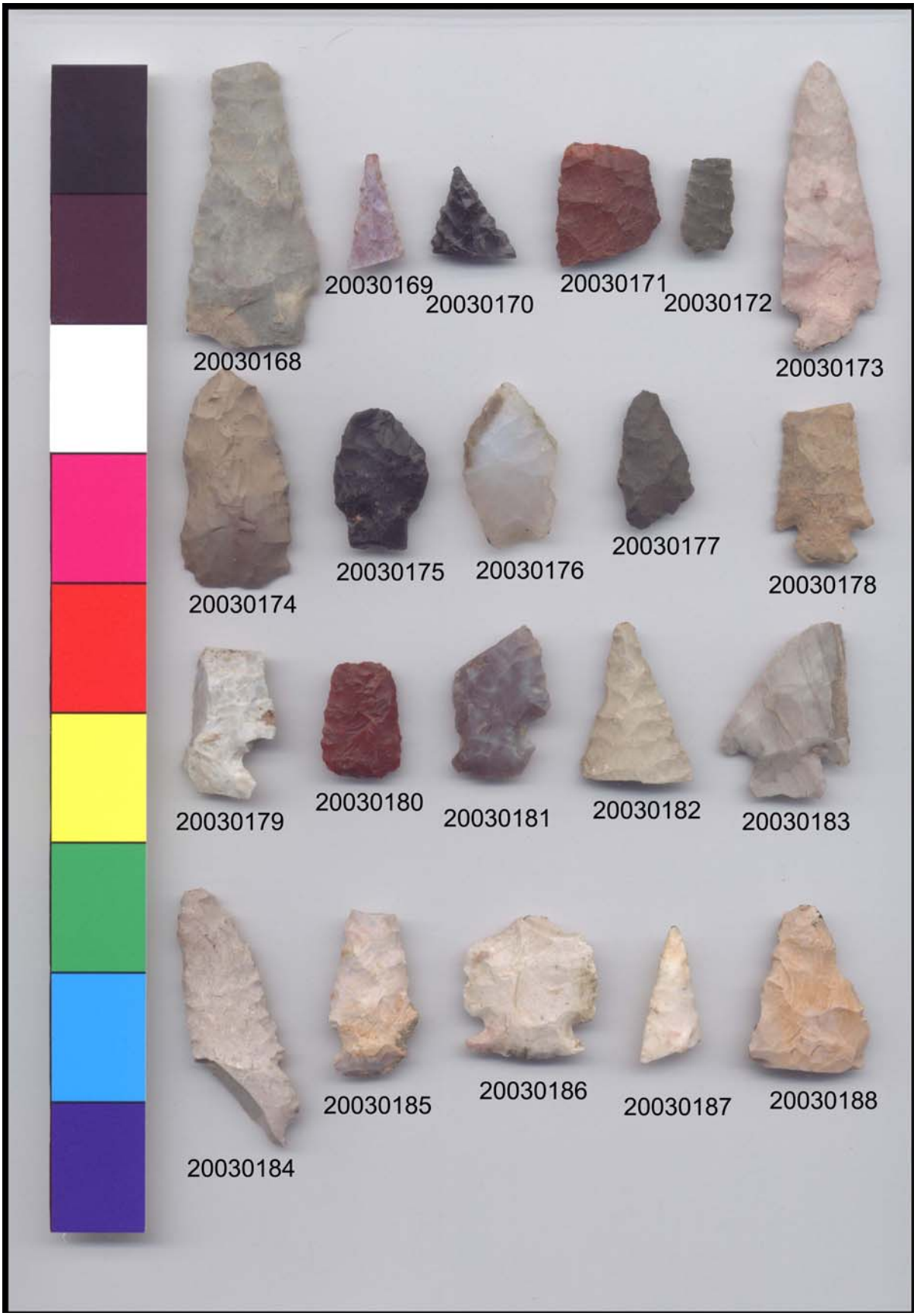
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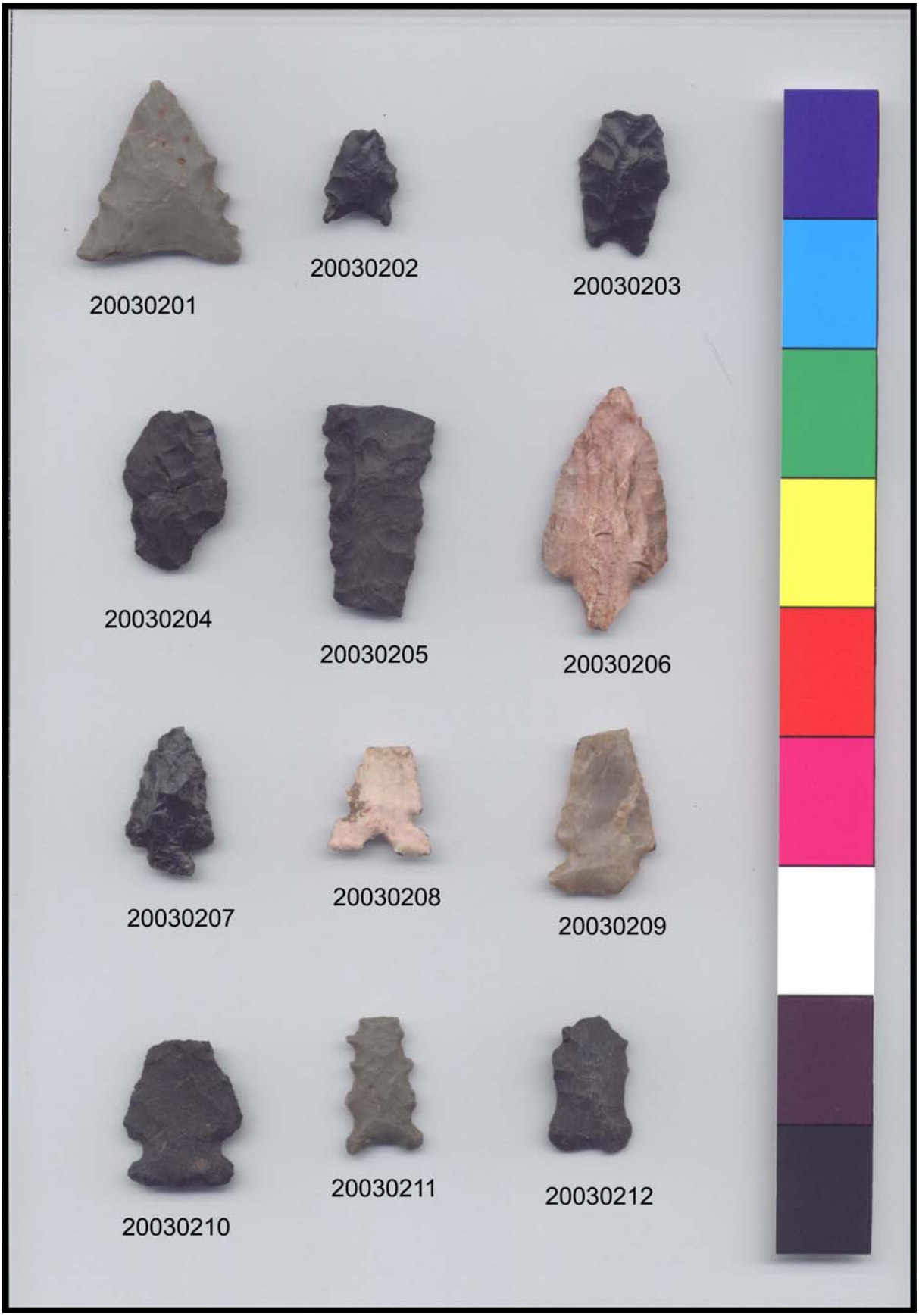
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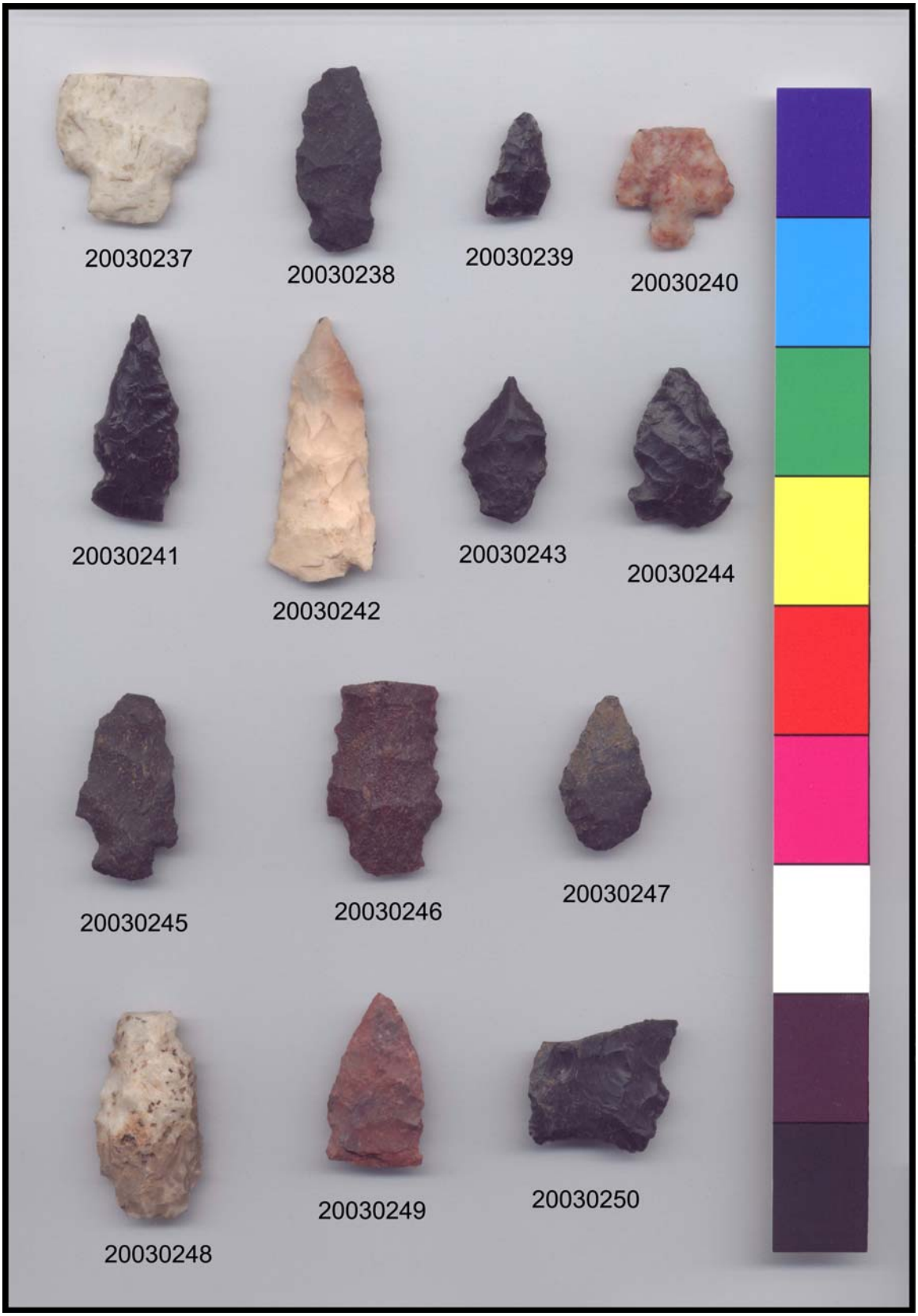
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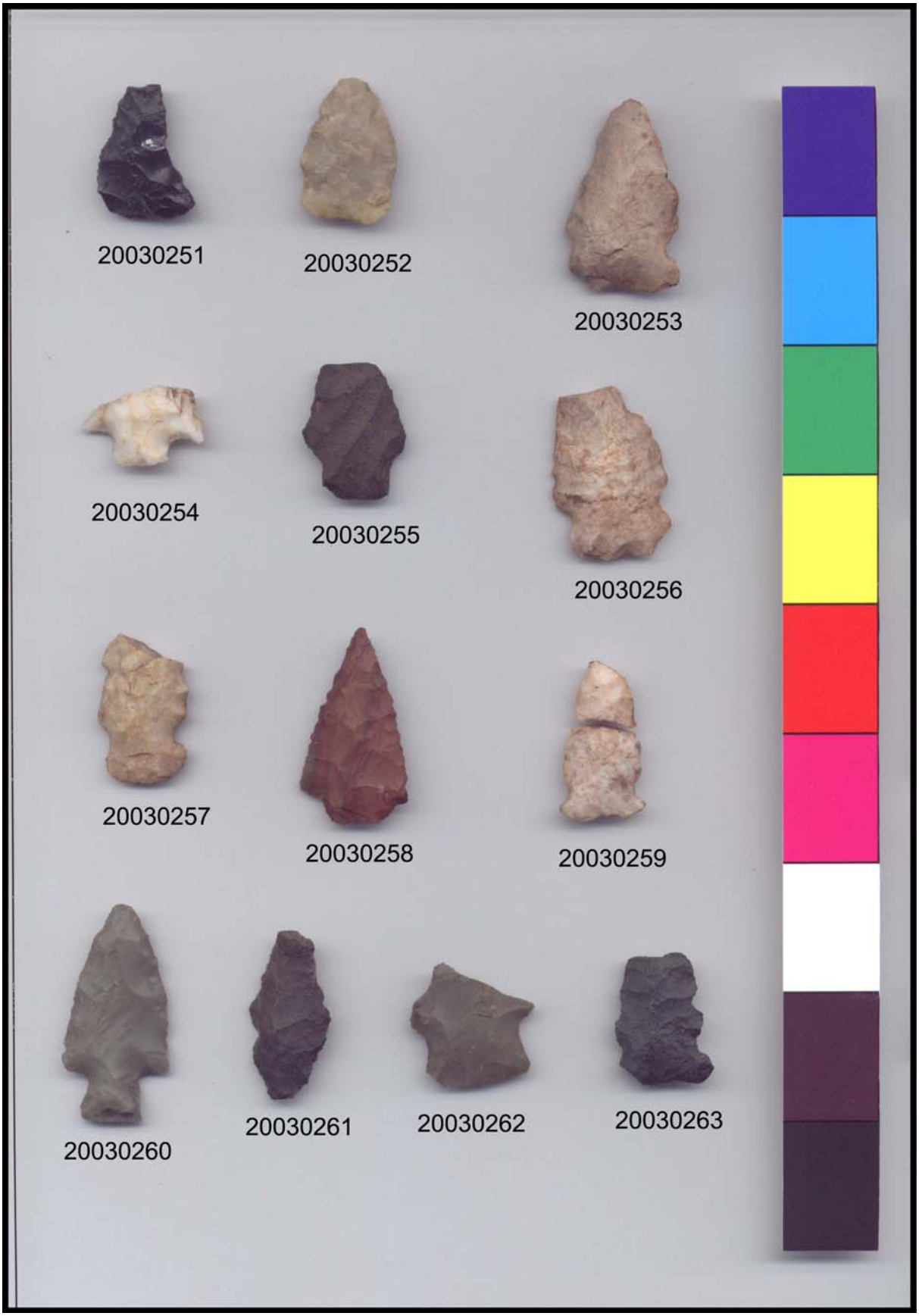
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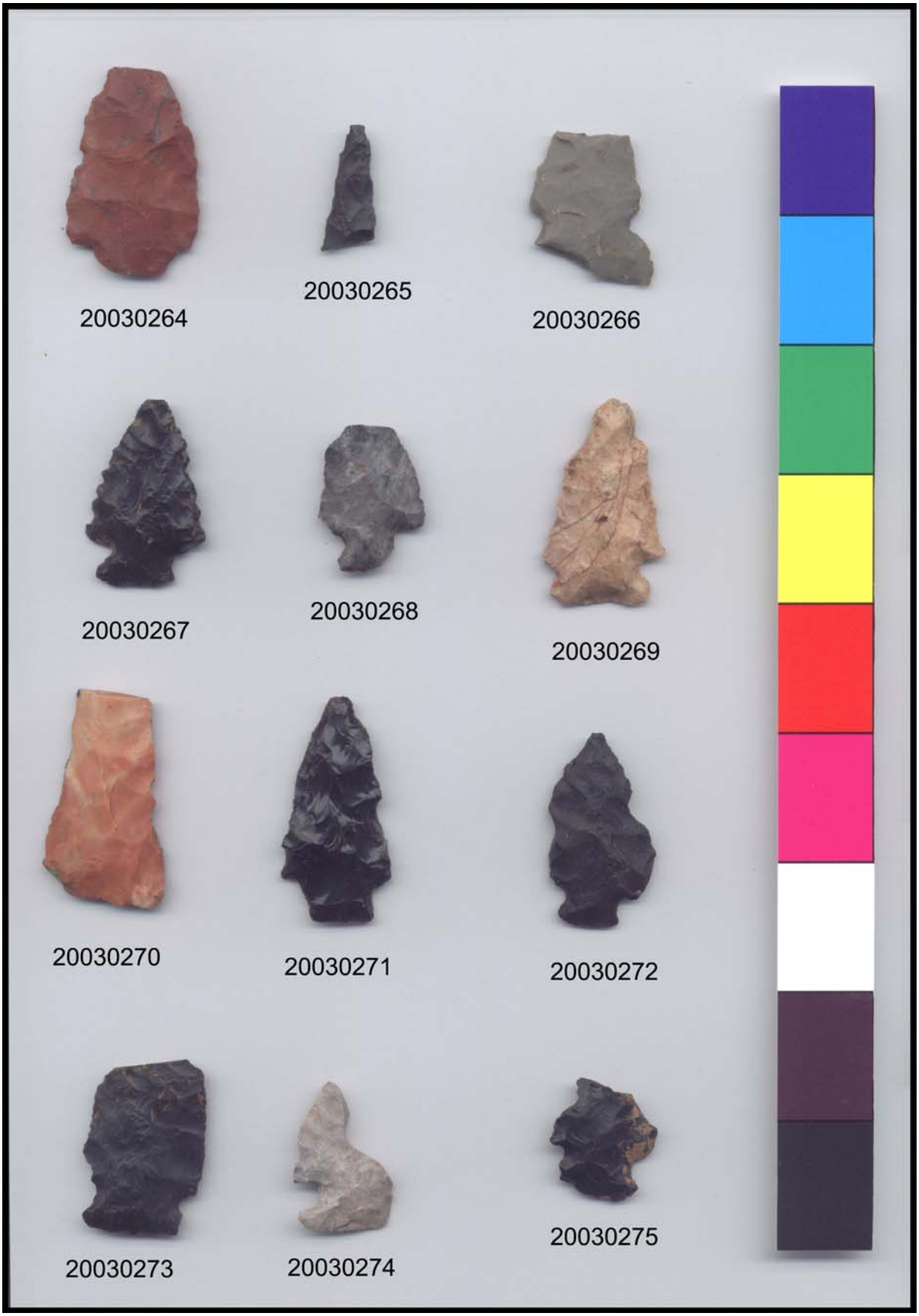
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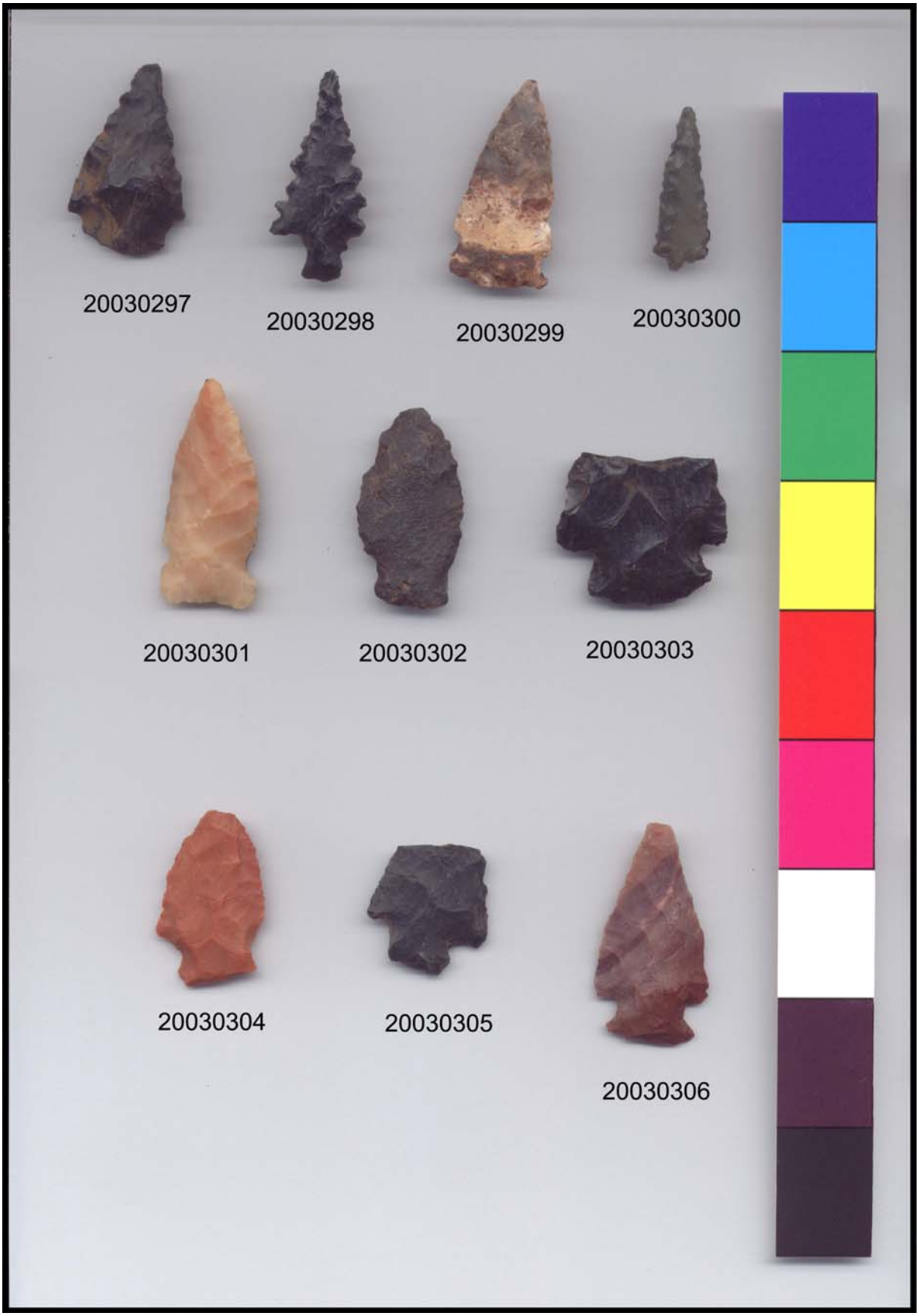
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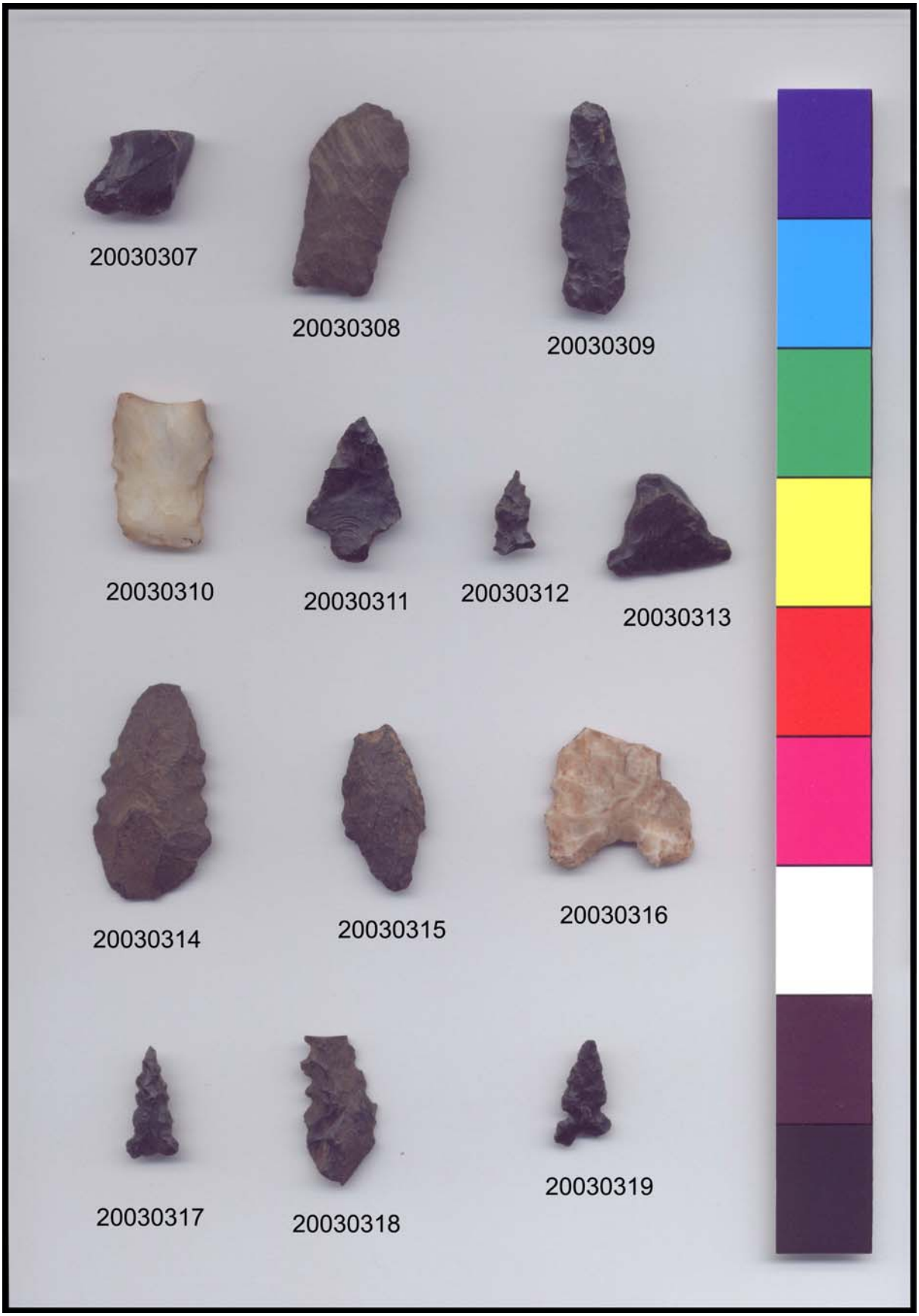
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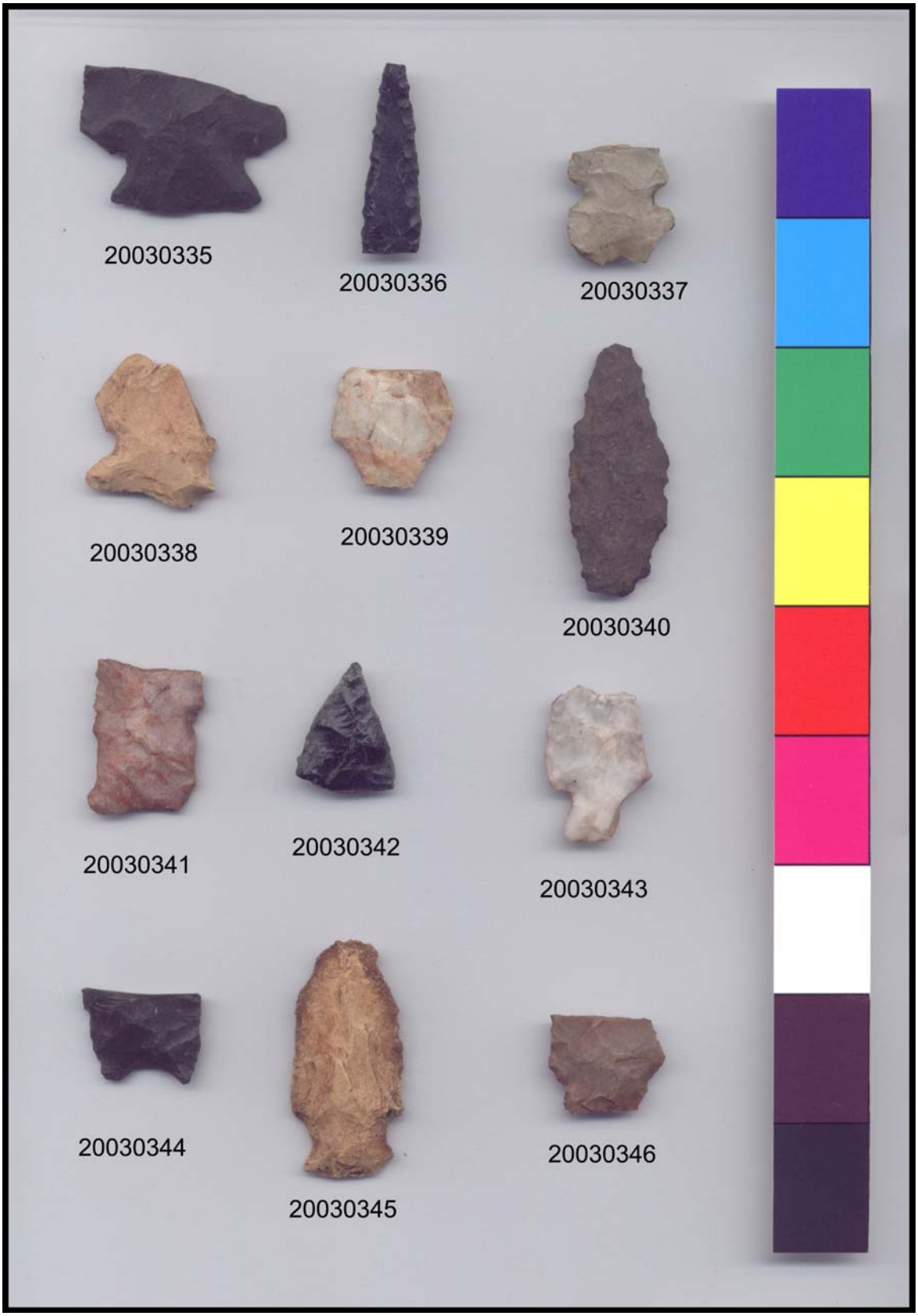
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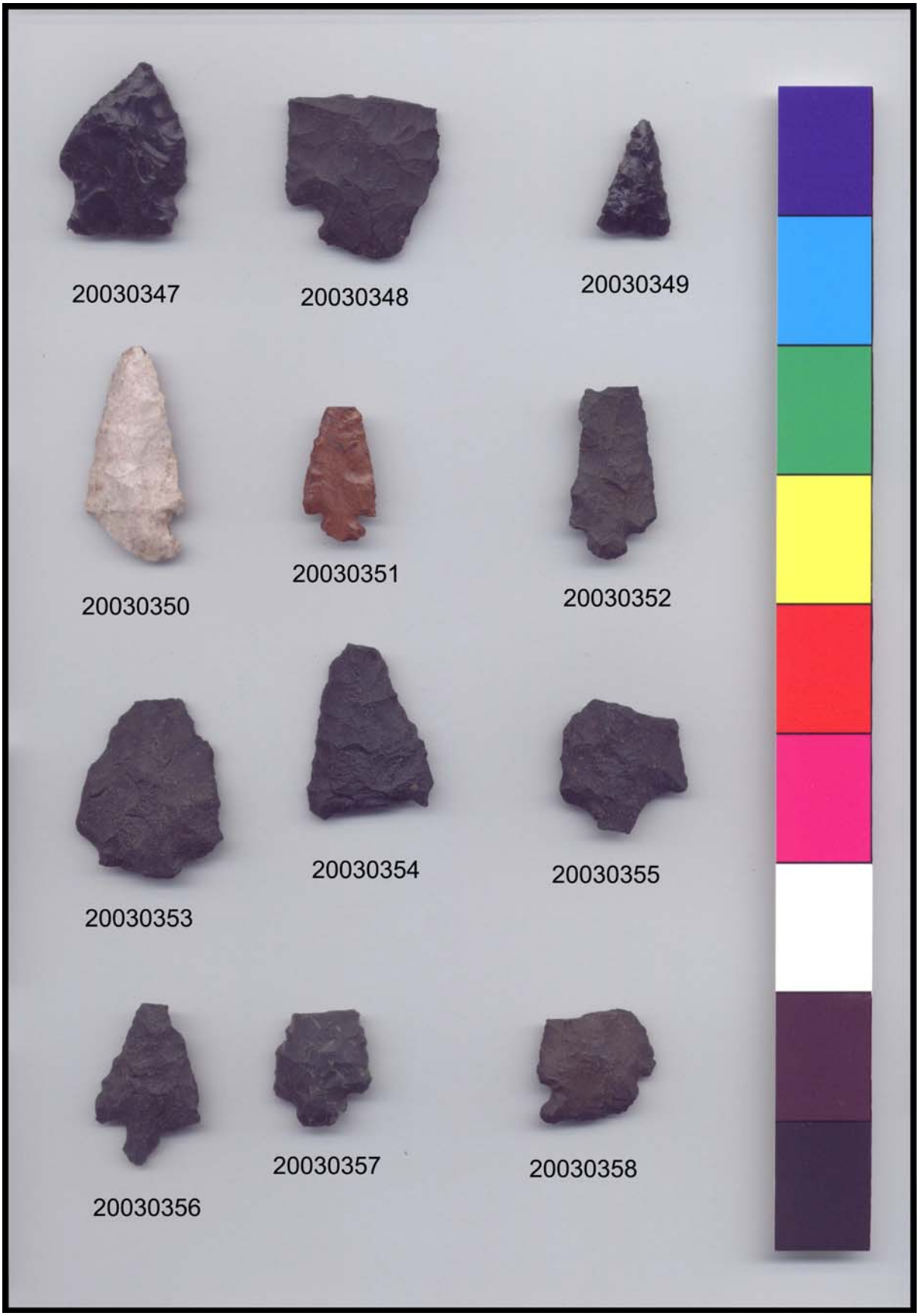
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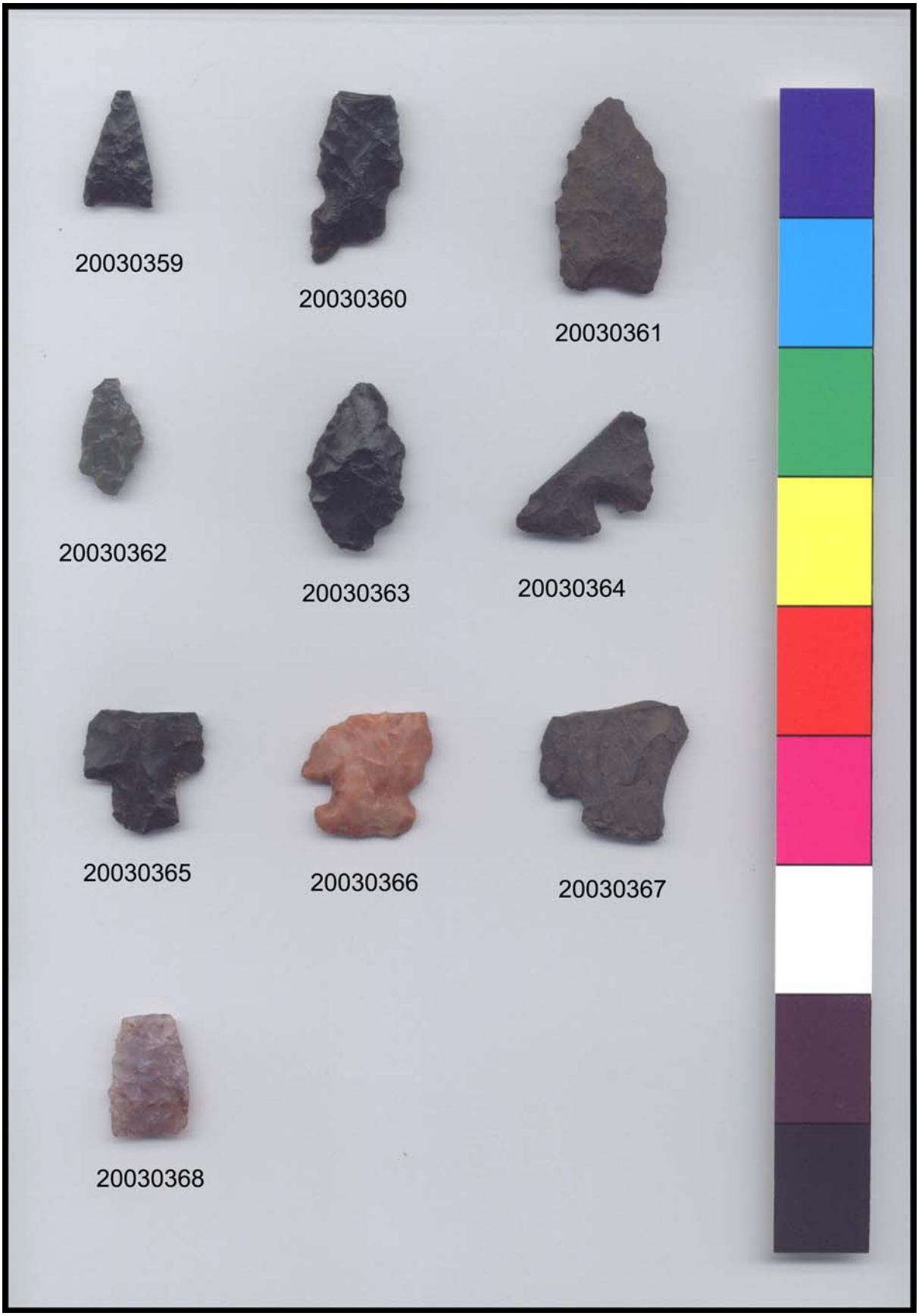
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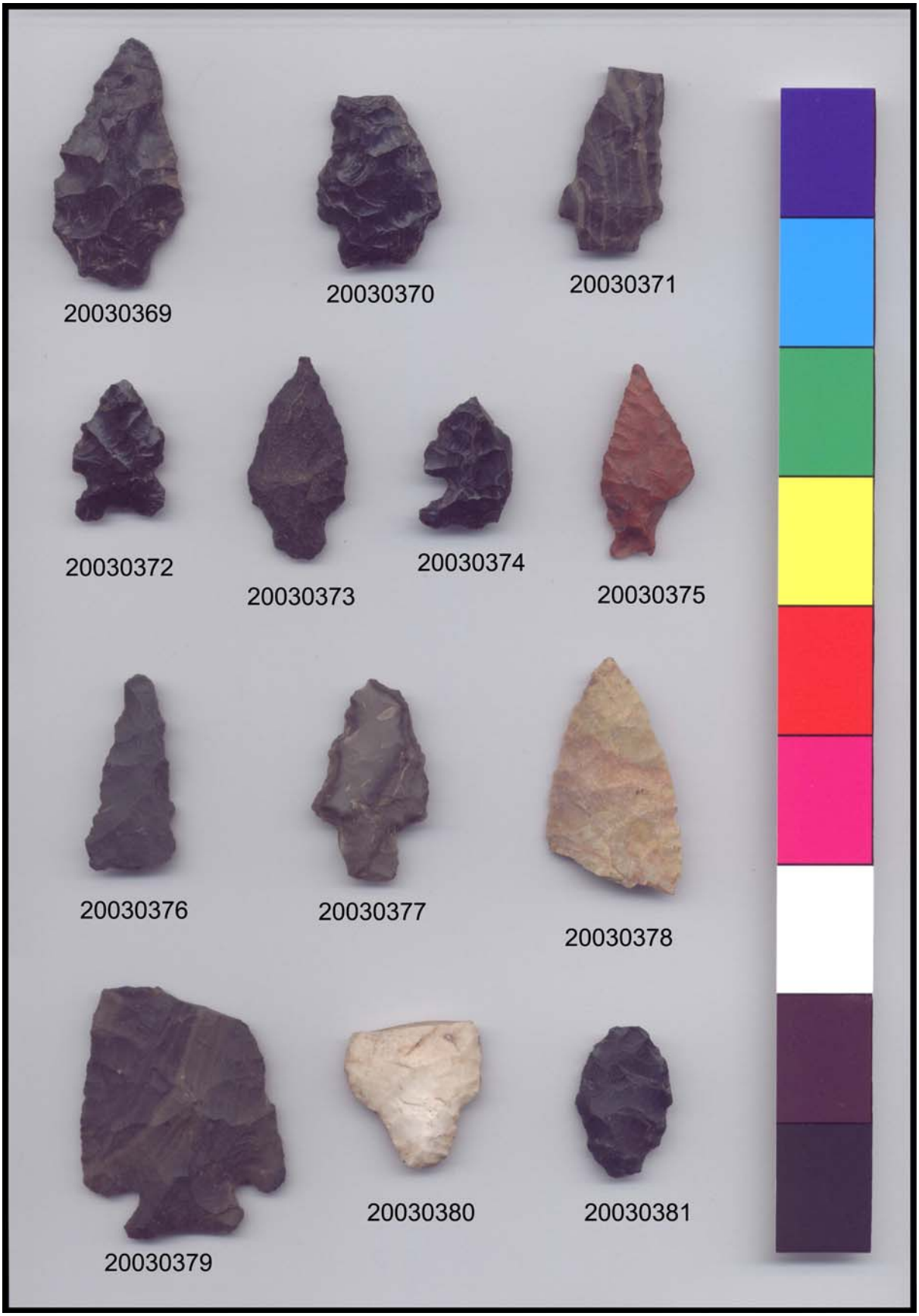
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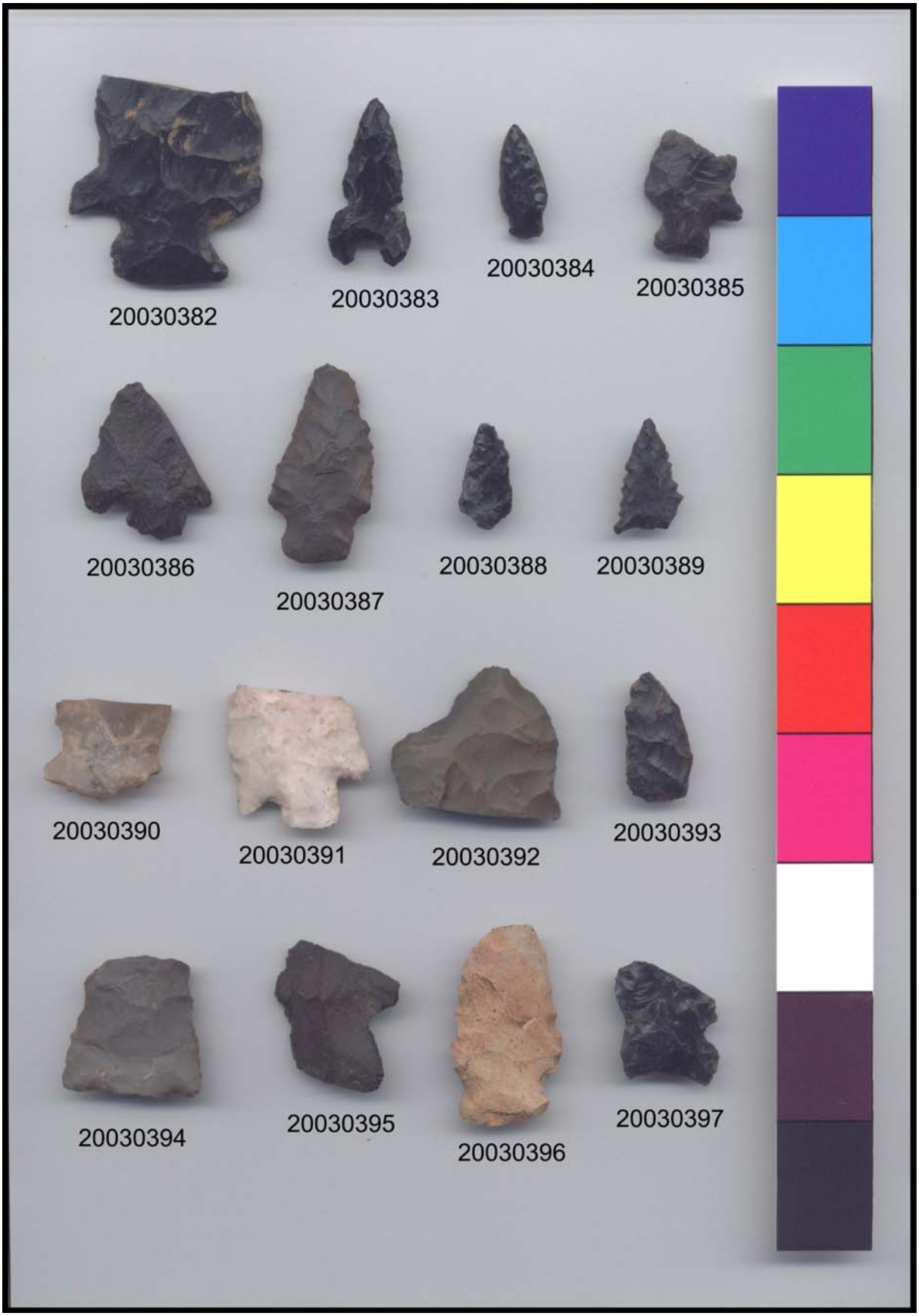
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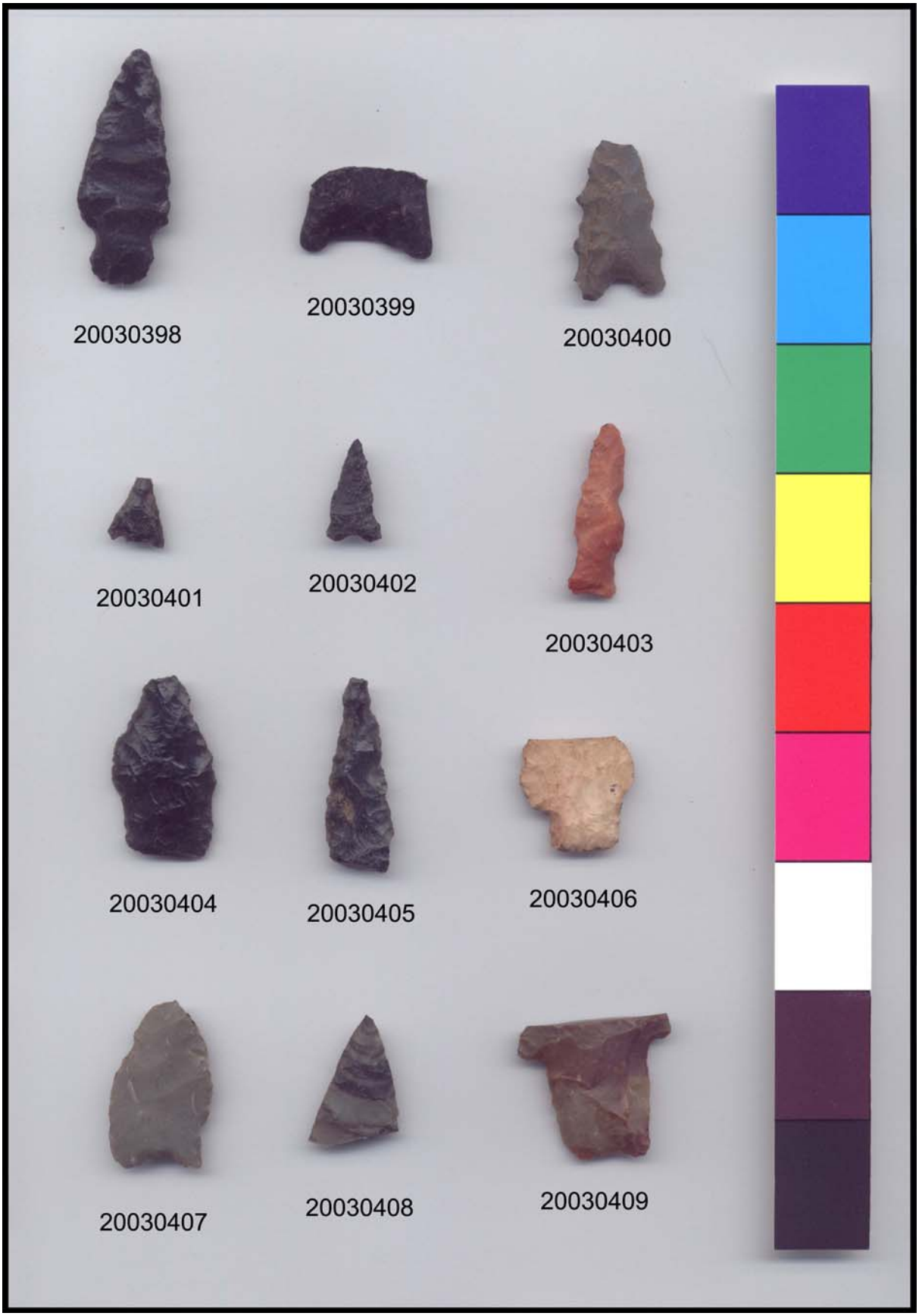
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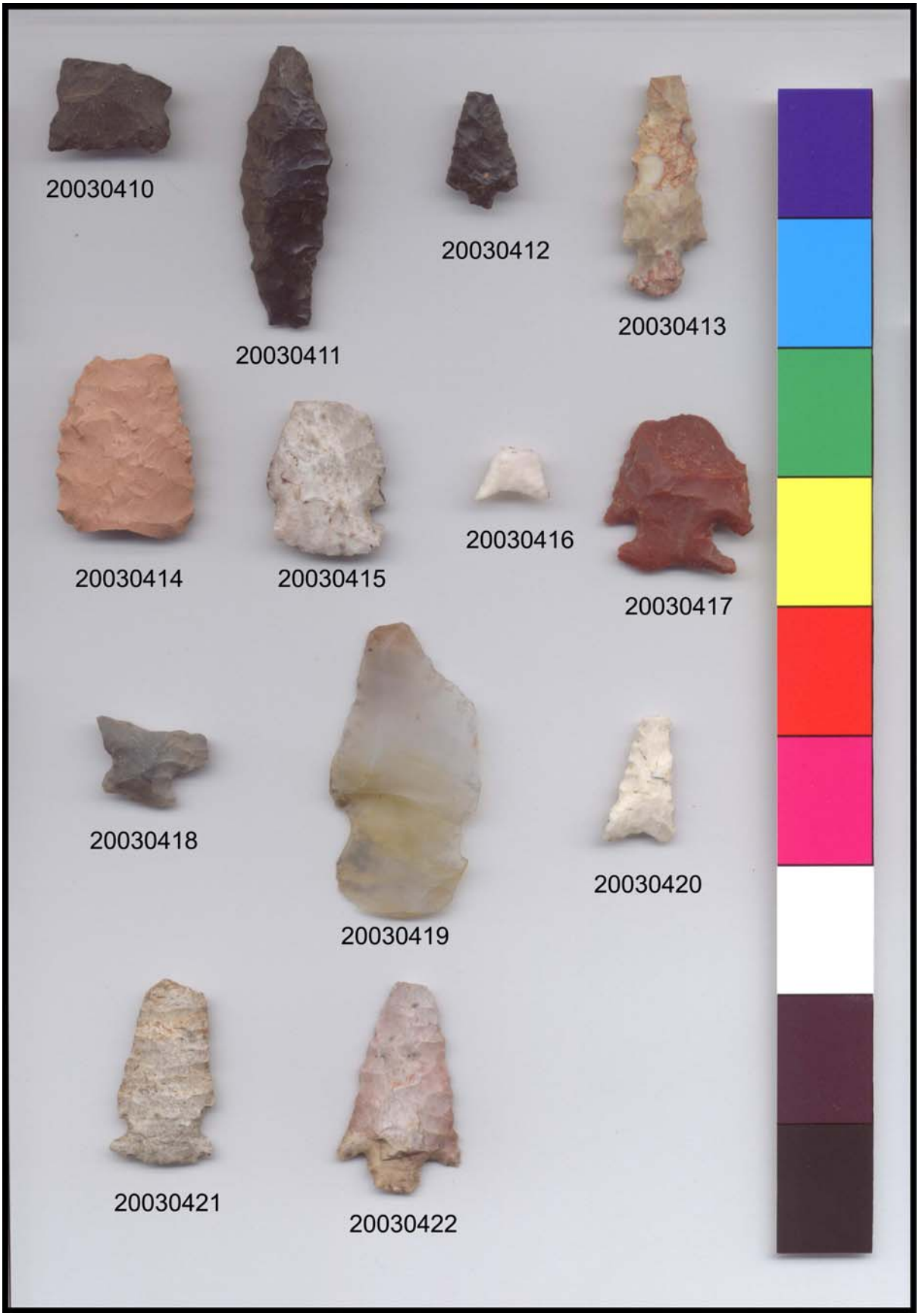
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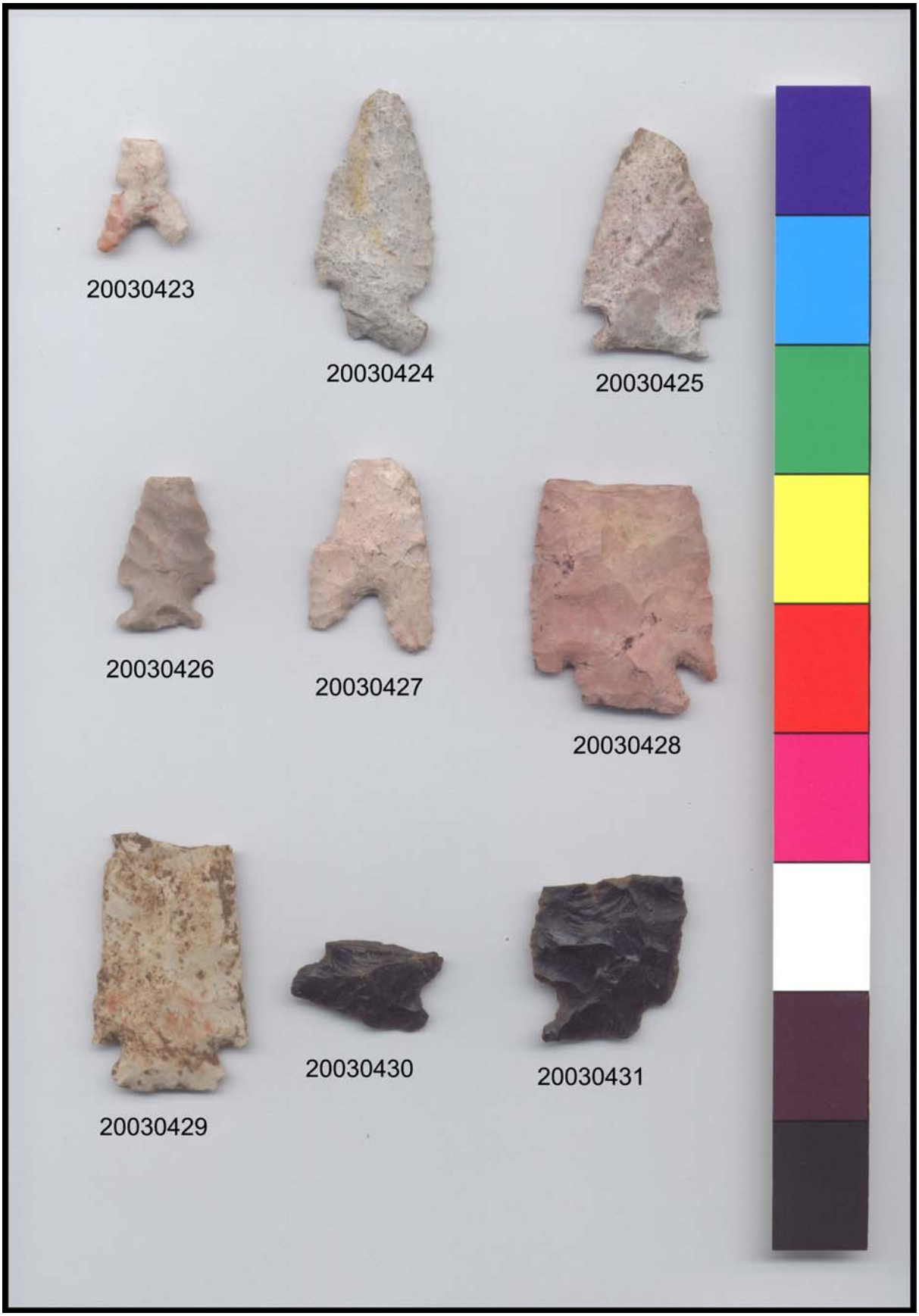
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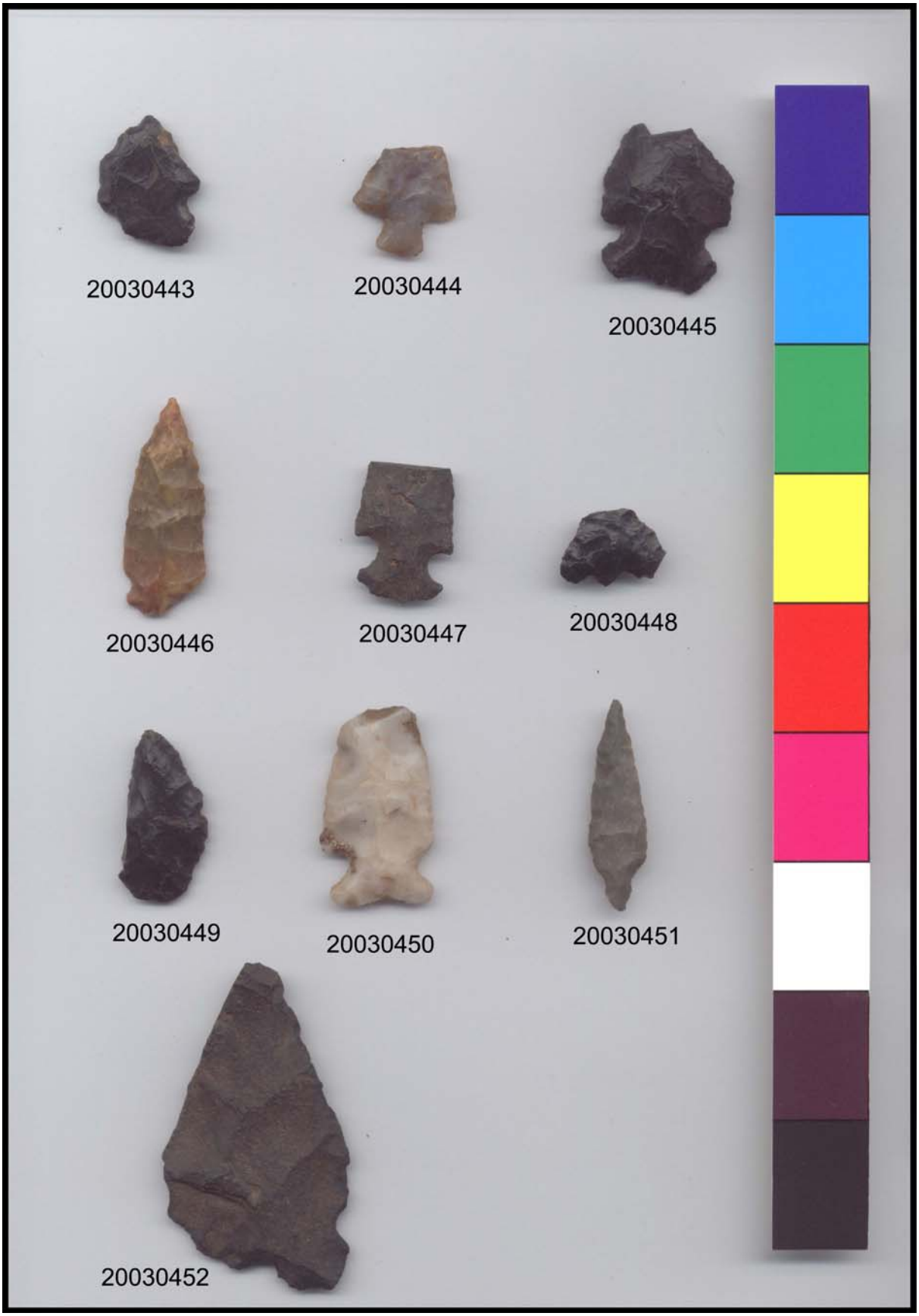
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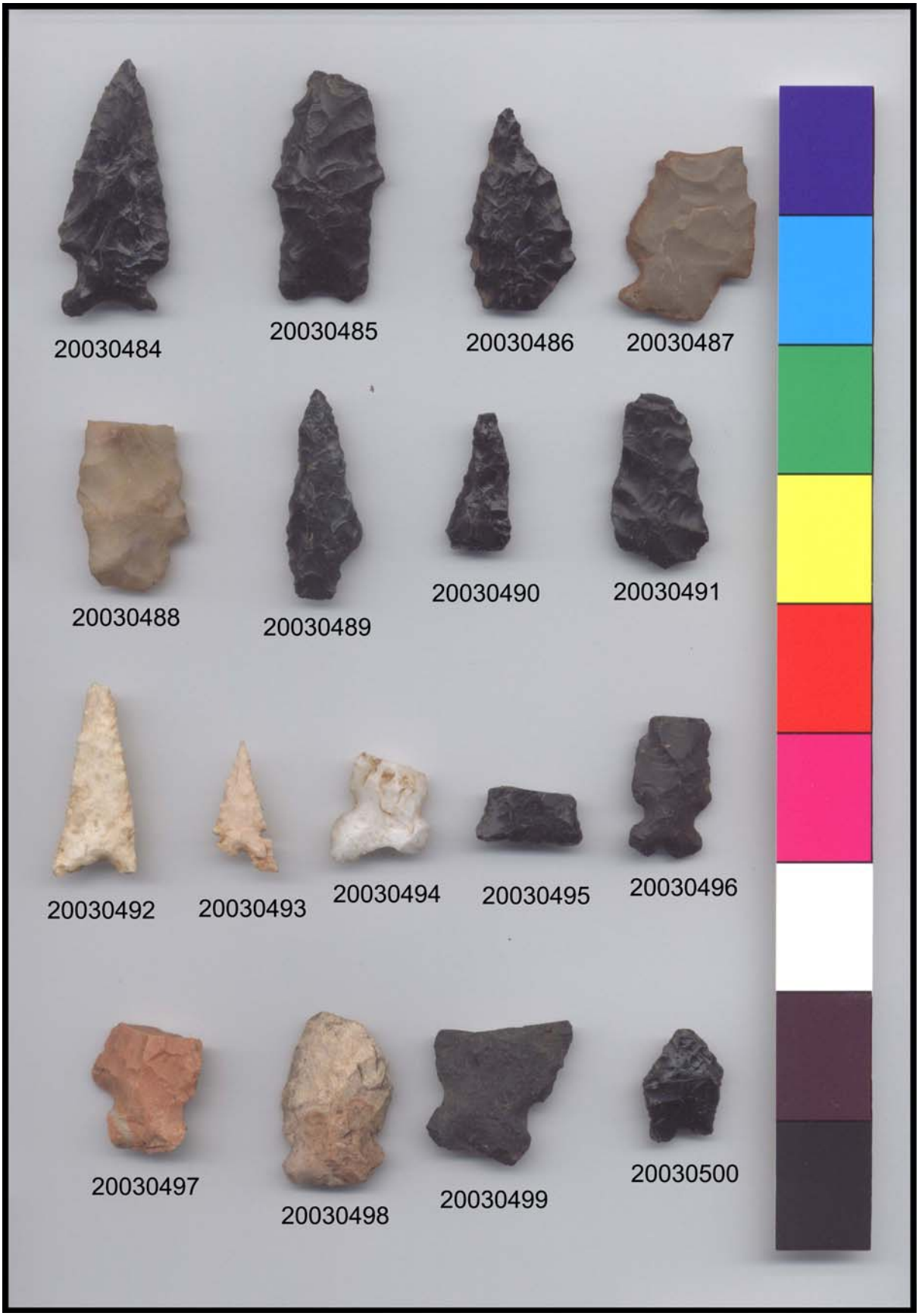
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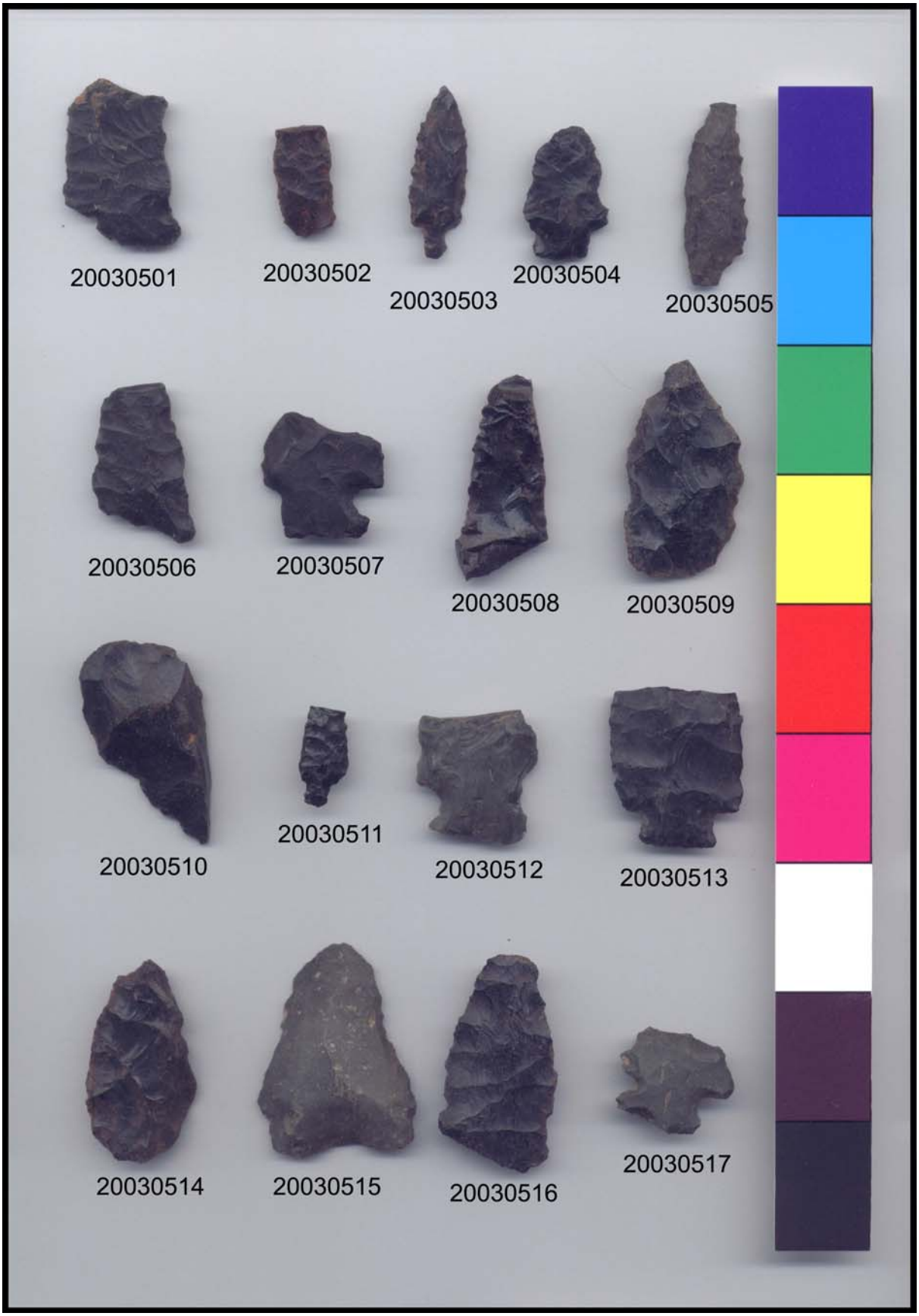
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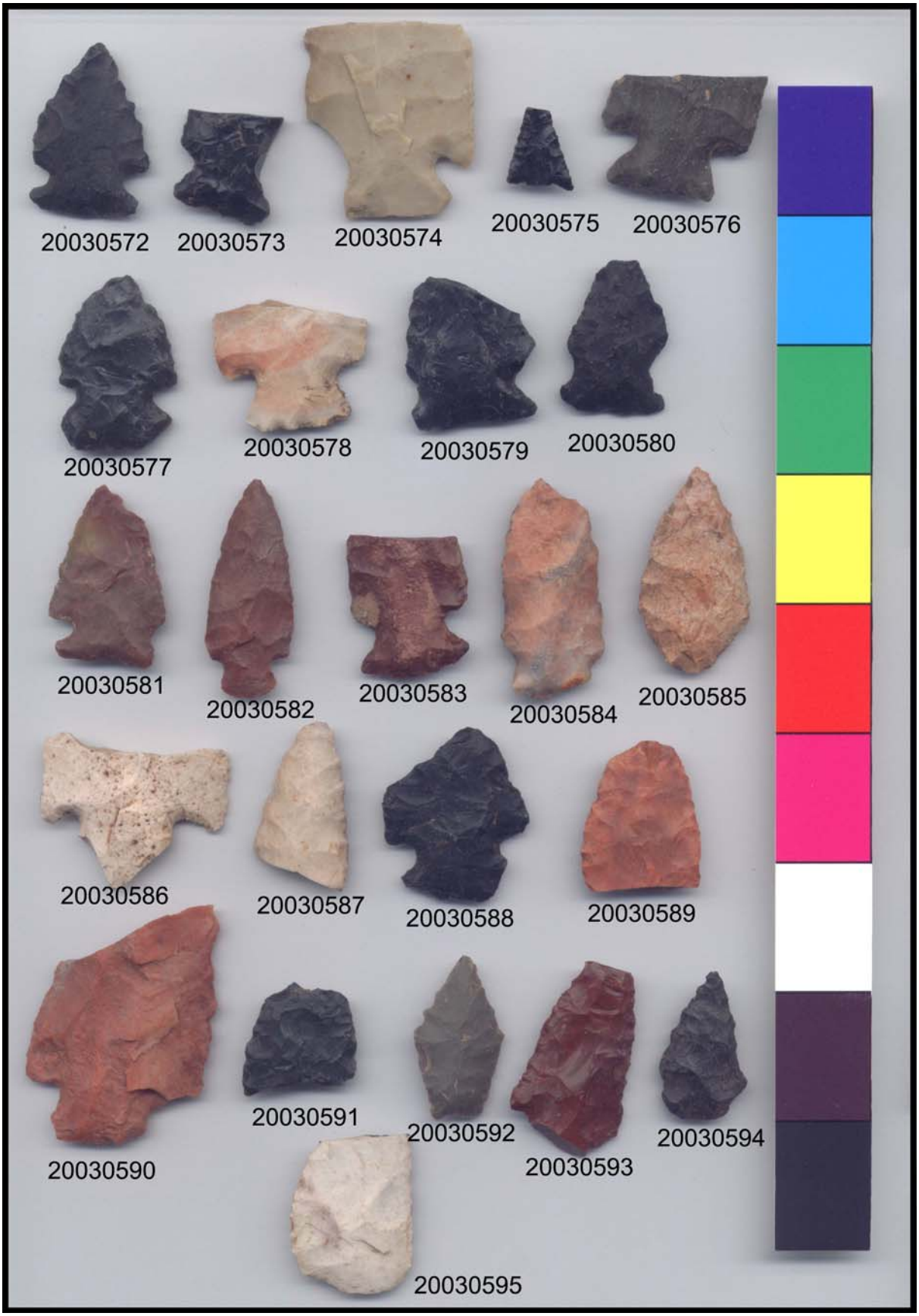
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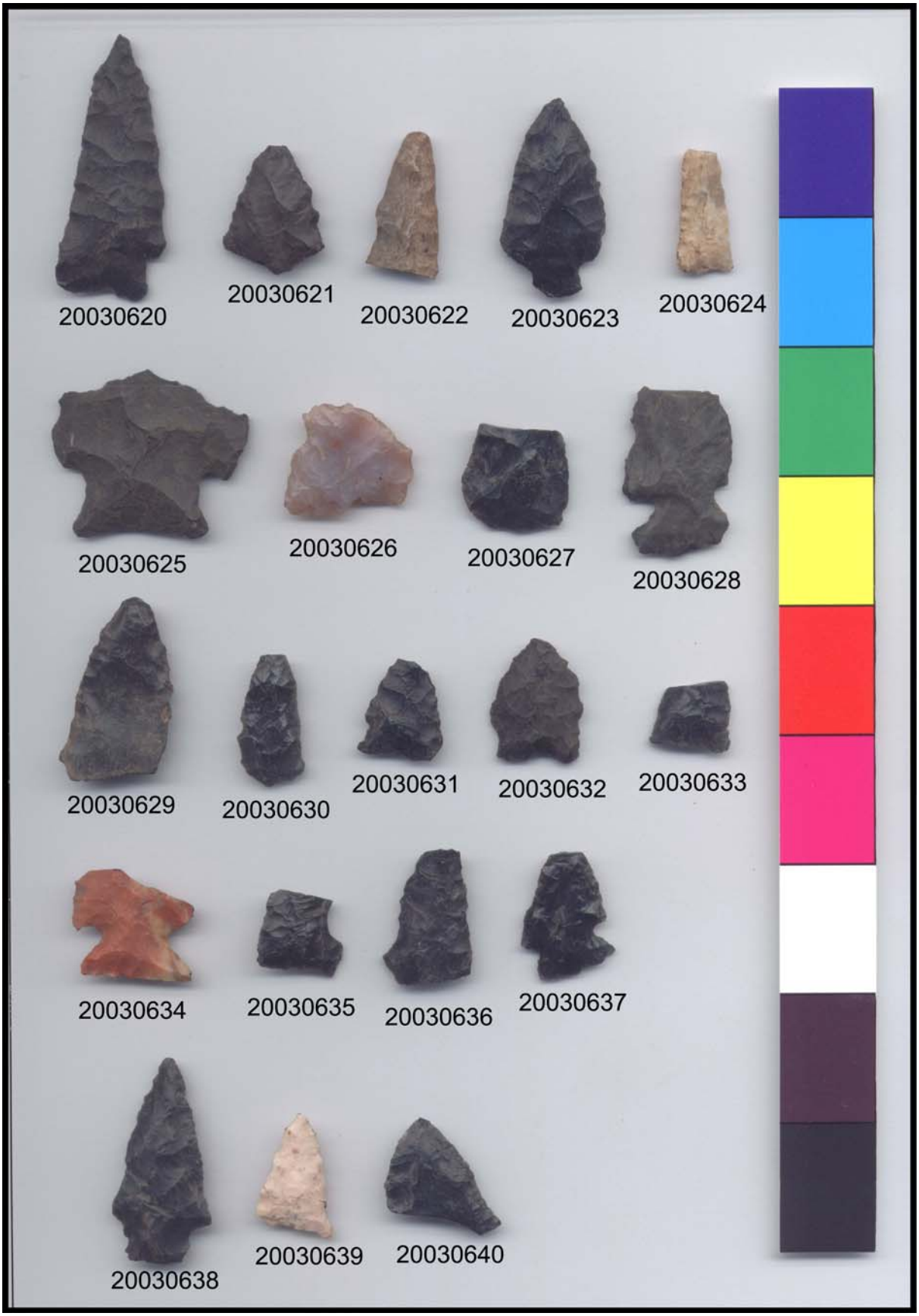
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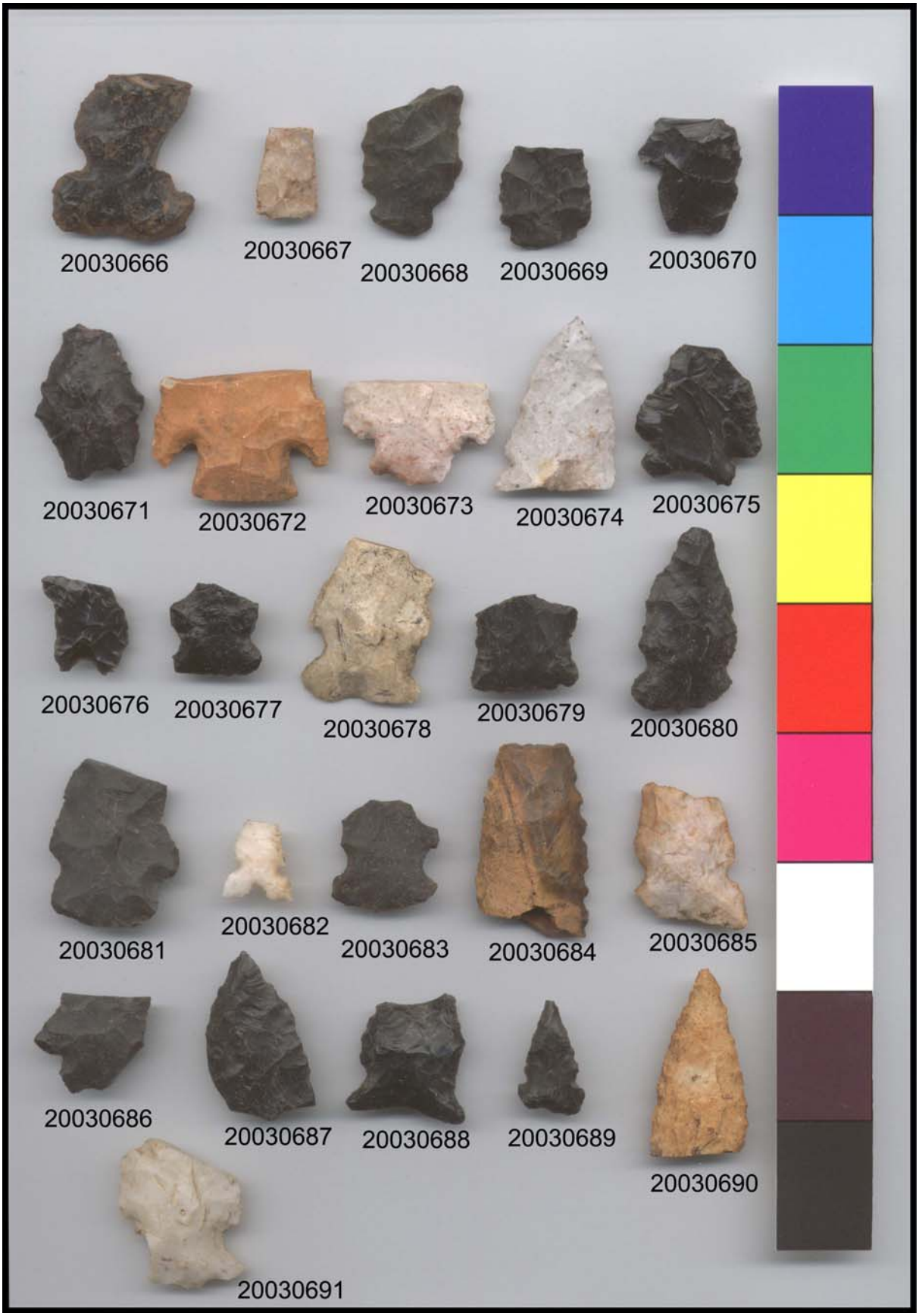
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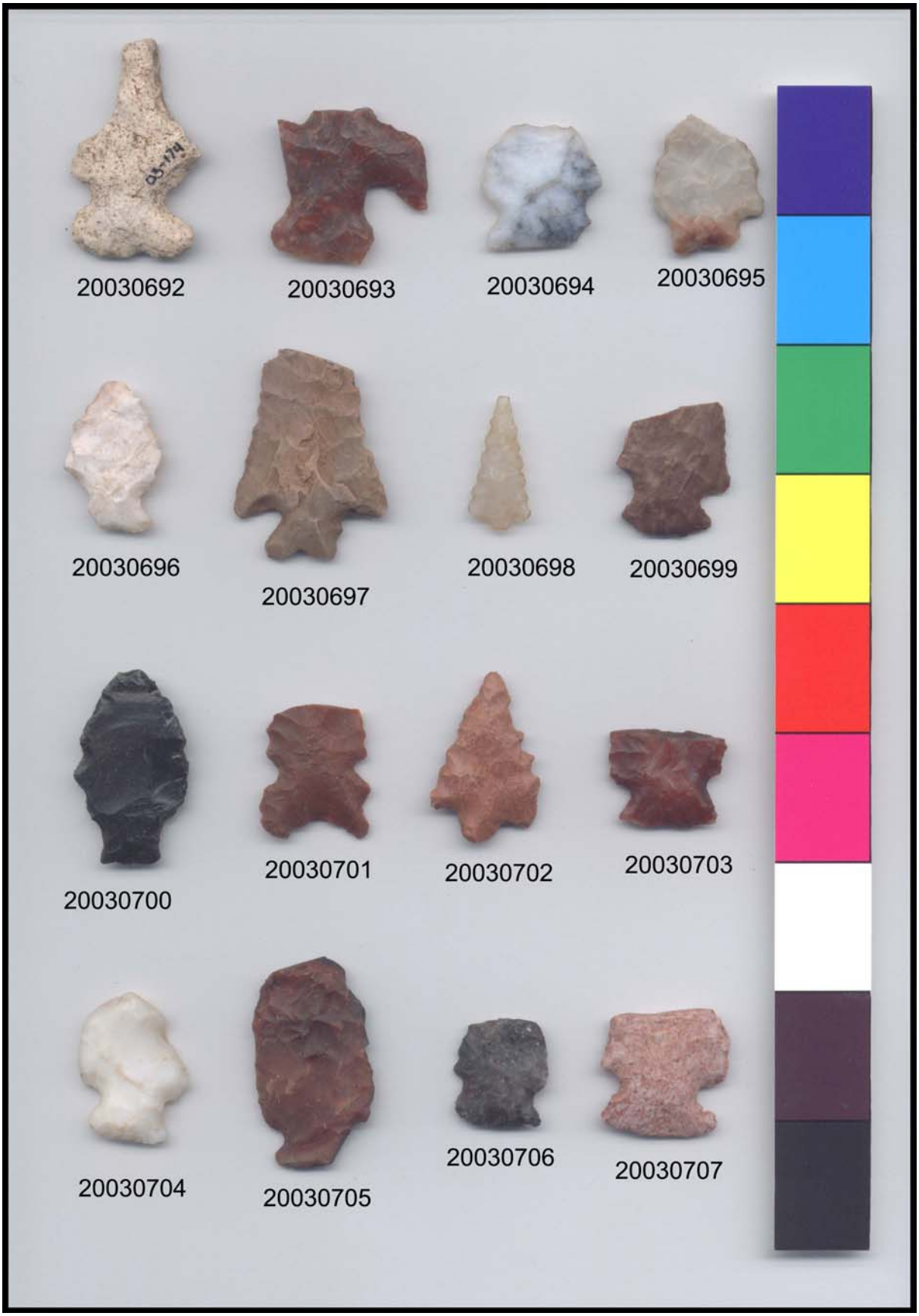
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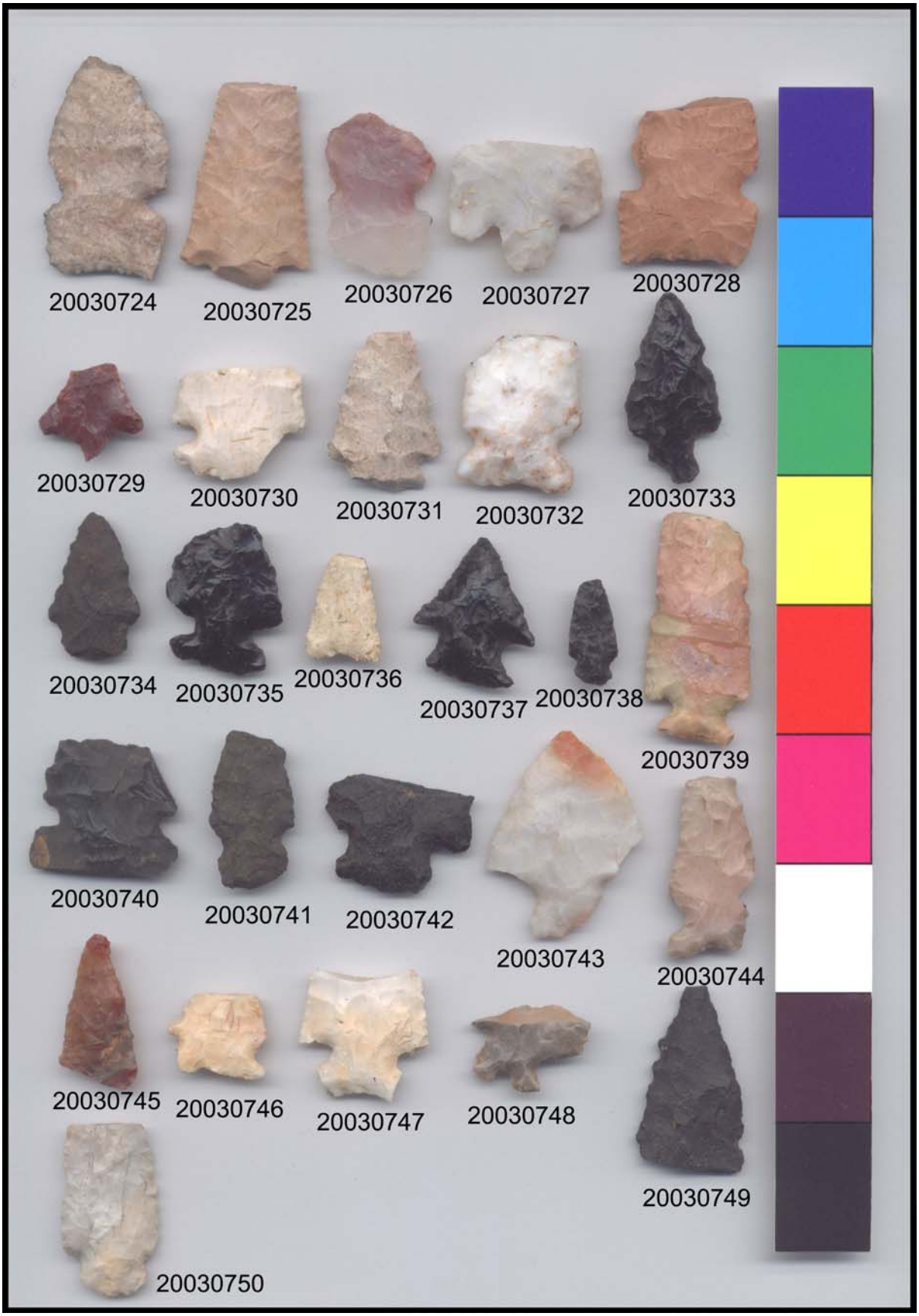
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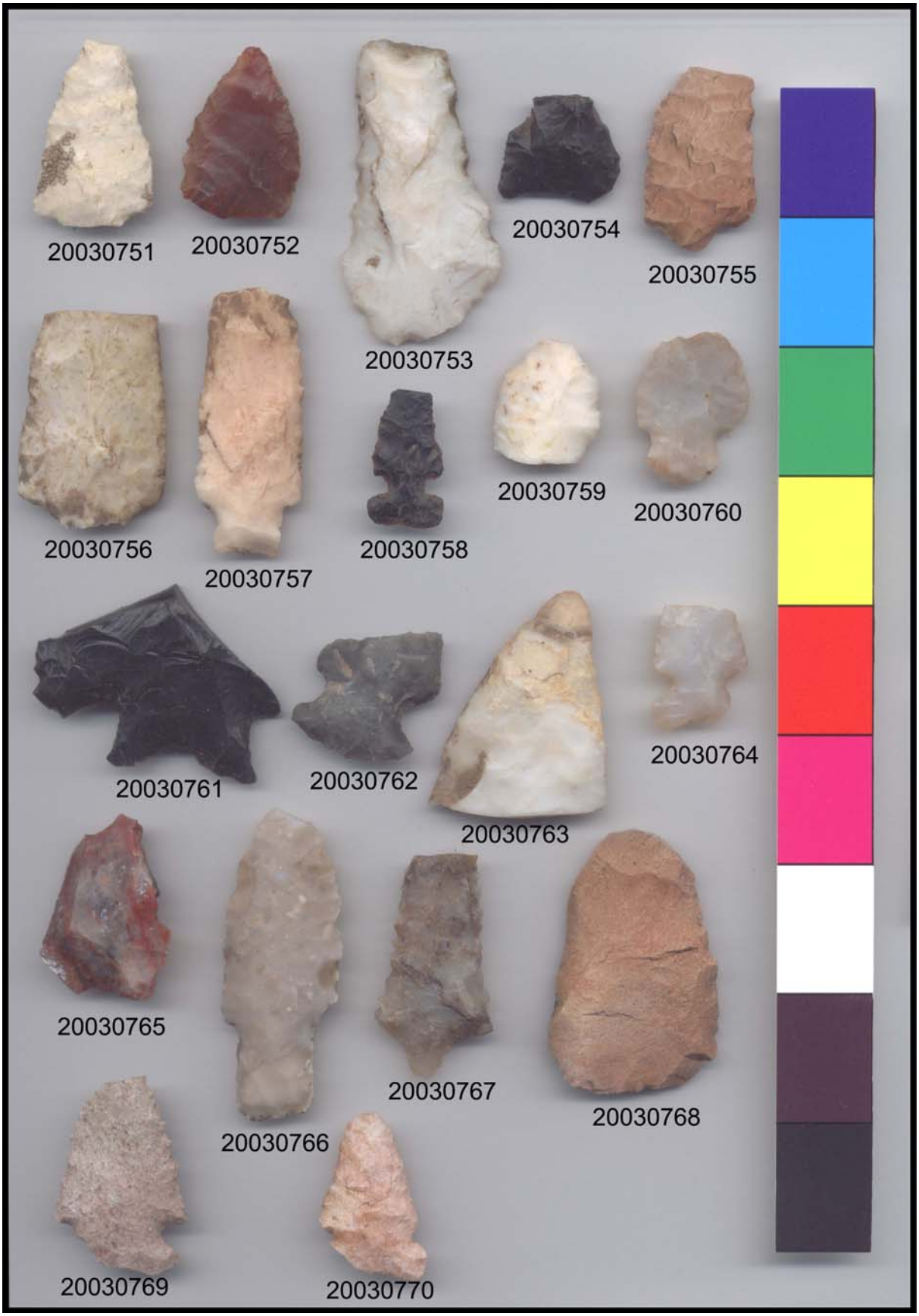
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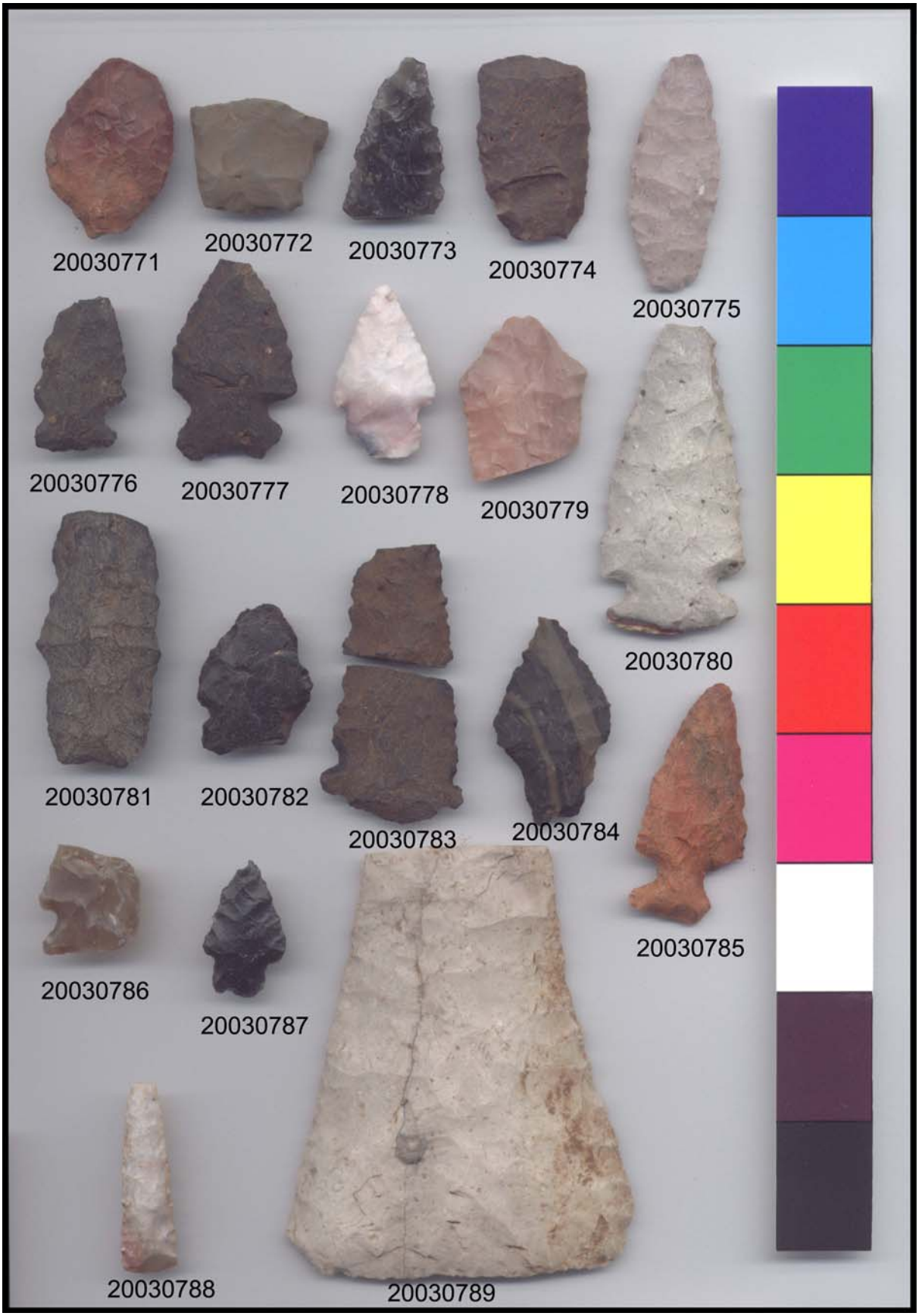
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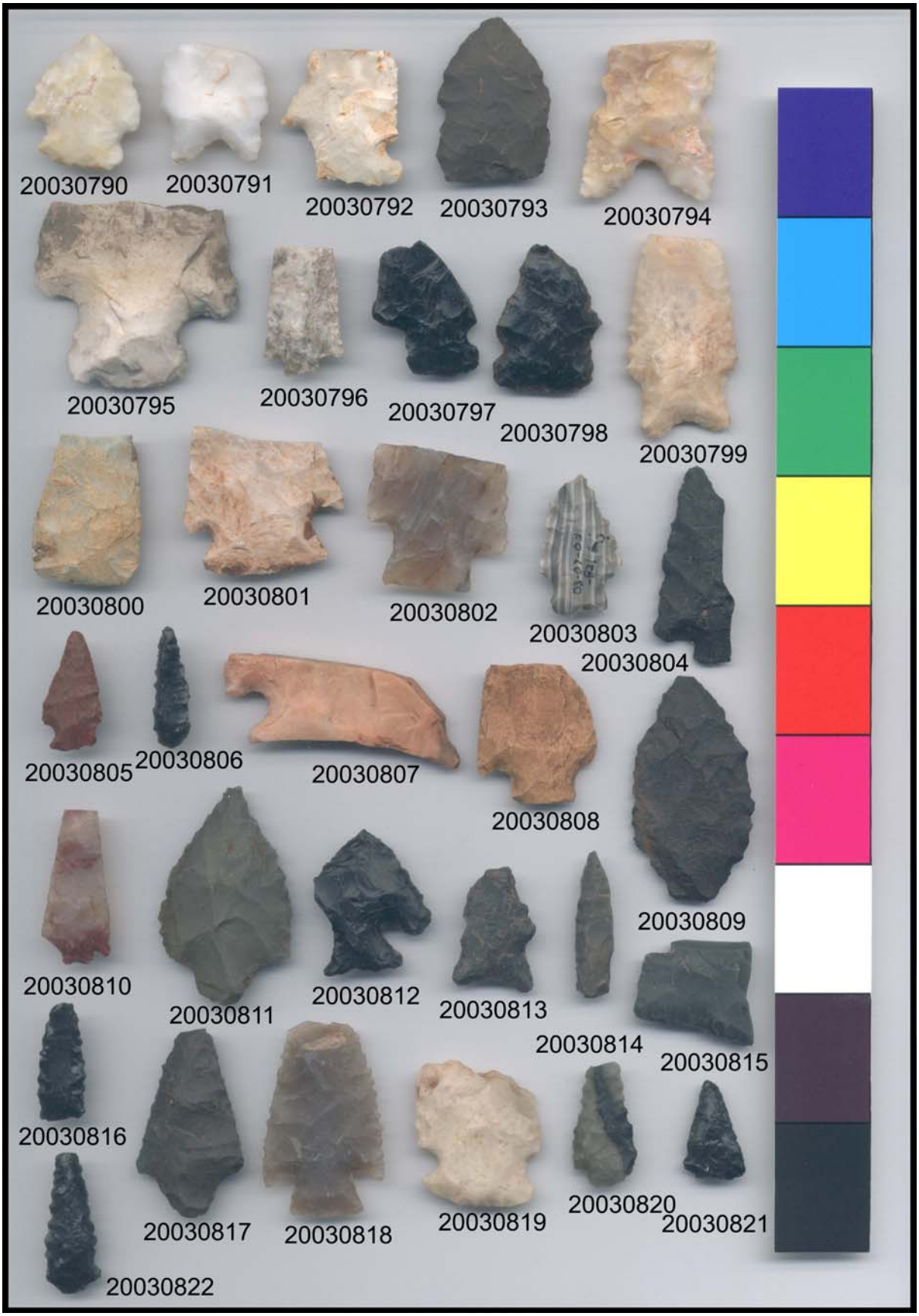
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Appendix B

Attribute Data for Projectile Points in the Sample

Appendix B: Coding Sheet

batch: Batch A = 1, Batch B = 2, Batch C = 3

id: Denotes ID # assigned for the project. All numbers are 4 digits and are preceded by "2003."

fs_site: Denotes 11 digit Forest Service site number.

mlt: Denotes total number of projectile points found on site.

type:	1	Bajada
	2	Clovis
	3	Pinto/San Jose
	4	Gatecliff Split-stemmed
	5	Desert Side-notched, Sierra Variety
	6	Buck Taylor Notched
	7	Elko Corner-notched
	8	San Rafael Side-notched
	9	Northern Side-notched
	10	Gypsum Cave
	11	Rosegate, Variety A
	12	Rosegate, Variety B
	13	Western Basketmaker II
	14	Un-notched Triangular
	15	San Rafael Stemmed
	16	Basketmaker Knife
	17	Indeterminate, Large Stemmed
	18	Cohonina
	19	Elko Eared
	20	Indeterminate, Medium Stemmed
	21	Historic Navajo
	22	Miscellaneous Stone Tools
	23	Kahorsho Serrated
	24	Nawthis Side-notched
	25	Parowan Basal-notched
	26	Cienega
	27	Elko Side-notched
	28	Basal and Side-notched
	29	Sitgreaves Serrated
	30	Chiricahua
	31	Folsom
	32	Armijo
	33	Coconino Stemmed, Variety A
	34	Coconino Stemmed, Variety B
	35	Sudden Side-notched

1000	Unknown

gen: General Raw Material Type

1	Obsidian
2	Chert
3	Rhyolite
4	Chalcedony
5	Metal
6	Unknown/Unidentified

spec: Specific Raw Material Type

1	Black Tank obsidian (mahogany)
2	Government Mountain obsidian
3	Partridge Creek obsidian
4	Presley Wash obsidian
5	RS Hill obsidian
6	Chalcedony
7	Jasper
8	Kaibab Chert
9	Metal
10	Moss Agate
11	Perkinsville Japser
12	Rhyolite
13	Red Butte chert
14	Unidentified/Other
15	Black Tank obsidian (gray)

period:

0	Unknown
1	Paleoindian
2	Early Archaic
3	Middle Archaic
4	Late Archaic
5	Early Agricultural
6	Early Ceramic
7	Ceramic
8	Protohistoric
9	Historic

heat: Denotes presence (1) or absence (2) of heat treatment

cmp: Denotes whether artifact is complete.

c	Complete
it	Incomplete, missing tip
ib	Incomplete, missing base
itb	Incomplete, missing base and tip
its	Incomplete, missing side

rwk: Denotes presence (1) or absence (2) or reworking/refurbishing

blade: Length of blade in millimeters.

stem: Length of stem in millimeters.

total: Total length in millimeters

width: maximum width in millimeters

thick: maximum thickness in millimeters

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
1	22	03070100822	3	5	1	15	8	2	ib	2				9.271	2.642
1	24	03070100822	3	5	1	3	8	2	it	2		9.398		15.037	3.785
1	25	03070100822	3	7	1	3	0	2	ib	1	38.075			19.304	5.385
1	28	03070200693	1	1,000	1	4	0	2	c	2	27.127	15.621	42.164	16.129	6.045
1	30	03070200702	1	27	2	13	0	2	it	2		8.179		19.507	5.232
1	31	03070400461	1	7	2	14	0	1	it	2		4.699		20.142	5.080
1	34	03070200690	1	23	1	3	7	2	ib	2	14.554	5.842	20.955	11.532	4.369
1	38	03070100837	1	3	1	2	3	2	it	2				17.272	6.909
1	39	03070100853	1	6	1	3	8	2	c	2	14.097	5.588	18.745	13.081	2.311
1	40	03070200895	1	27	3	12	0	2	it	1		8.407		15.748	5.283
1	41	03070200894	1	16	2	13	5	2	it	2		13.106		32.309	6.147
1	42	03070400656	3	27	2	13	0	2	it	2		6.502		19.533	3.810
1	43	03070400656	3	27	2	13	0	2	its	2		6.833		19.050	4.191
1	44	03070400656	3	27	2	14	0	2	c	2	26.568	7.976	32.741	18.745	4.623
1	46	03070400500	1	7	2	14	0	1	itb	2		9.931		26.772	4.064
1	47	03070200748	1	6	1	3	8	2	c	2	17.069	8.915	24.079	11.328	2.642
1	48	03070400572	1	1,000	1	4	0	2	c	1	18.237	14.834	31.877	17.374	7.214
1	50	03070100911	1	13	3	12	5	2	itb	1		10.871		26.137	5.182
1	52	03070100916	3	10	1	2	4	2	c	1	13.995	14.783	28.448	17.374	6.147
1	54	03070100916	3	7	1	4	0	2	c	2	34.595	11.278	42.951	20.803	4.166
1	56	03070100916	3	6	2	8	8	2	itb	2		9.754		12.649	2.388
1	58	03070100918	1	16	4	6	5	2	it	2		9.195		29.997	6.604
1	60	03070100921	3	30	2	8	4	2	itb	2		13.335		17.907	4.343
1	61	03070100921	3	30	1	2	4	2	itb	2		12.954		15.392	3.785
1	62	03070100921	3	30	2	8	4	2	itb	2		10.160		16.612	3.607
1	66	03070100832	2	8	3	12	4	2	itb	2		11.786		20.980	5.080
1	68	03070100832	2	8	2	8	4	2	itb	2		21.641		24.765	4.267
1	69	03070100833	1	20	1	2	0	2	c	1	23.063	5.512	27.330	14.046	5.105
1	71	03070100830	1	6	1	3	8	2	ib	2	12.497	10.414	21.565	13.183	2.794
1	74	03070100823	1	5	1	3	8	2	it	2				15.443	2.489
1	76	03070400452	1	3	3	12	3	3	c	2	24.790	8.814	31.115	20.853	5.436
1	78	03070400065	1	7	2	14	0	3	it	2		10.846		27.178	4.521
1	79	03070400069	2	32	1	2	4	2	it	2		9.500		15.291	4.089

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
1	80	03070400069	2	1	1	2	2	2	c	1	21.133	9.550	29.058	16.612	3.556
1	82	03070100859	1	19	1	4	4	2	it	2		8.738		20.599	5.283
1	83	03070100862	1	12	1	3	6	2	c	2	12.954	5.334	17.755	8.484	2.870
1	85	03070400482	1	27	2	14	0	2	its	2		8.611		17.018	5.080
1	189	03070100565	1	13	1	4	5	2	it	2		9.779		27.838	4.724
1	190	03070400105	1	27	1	4	0	2	c	1	25.832	6.553	31.191	18.974	4.089
1	192	03070100403	1	20	1	2	0	2	it	1		7.747		13.818	5.385
1	194	03070100572	1	27	1	4	0	2	it	2		12.268		26.772	5.690
1	199	03070100661	1	12	2	14	6	2	it	2		5.842		10.516	2.819
1	202	03070100726	3	32	1	3	4	2	c	1		6.045		12.675	4.064
1	203	03070100726	3	3	1	3	3	2	c	1	13.919	11.430	24.892	16.078	5.588
1	204	03070100726	3	10	1	2	4	2	c	1	18.847	11.151	28.296	18.898	5.232
1	208	03070100725	1	6	2	8	8	2	it	2		7.493		17.983	3.378
1	209	03070100721	3	27	2	14	0	1	itb	1		8.458		19.380	5.131
1	210	03070100721	3	27	3	12	0	2	it	2		8.585		21.057	4.826
1	211	03070100721	3	29	1	4	7	2	it	2				13.640	3.861
1	212	03070100712	1	3	3	12	3	2	c	1	11.735	15.342	23.927	15.011	5.740
1	214	03070100662	1	27	1	4	0	2	c	1	26.721	10.058	35.509	19.507	5.131
1	216	03070100577	1	32	1	2	4	2	c	1	14.529	9.754	20.549	14.580	3.302
1	217	03070100574	2	27	1	3	0	2	c	1	21.133	8.763	26.822	21.641	3.962
1	218	03070100574	2	10	1	4	4	2	it	2		6.502		20.955	6.731
1	219	03070100723	2	20	1	3	0	2	ib	1	36.093	8.331	42.240	19.177	5.207
1	220	03070100723	2	27	1	2	0	2	itb	2		10.262		24.638	6.274
1	221	03070100711	1	10	1	3	4	2	c	1	20.625	21.082	35.204	15.367	6.985
1	223	03070400403	1	27	1	2	0	2	itb	2		7.950		22.479	5.156
1	224	03070100518	2	4	1	3	4	2	it	2				12.903	5.537
1	225	03070100518	2	19	1	2	4	2	it	1		9.652		21.285	4.420
1	226	03070100523	2	6	1	3	8	2	ib	1	9.017	6.680	15.113	9.398	2.438
1	227	03070100523	2	6	1	2	8	2	itb	2					2.616
1	228	03070100516	1	3	3	12	3	3	c	1	25.019	8.661	30.505	19.964	6.909
1	229	03070100522	2	6	1	3	8	2	it	2		7.468		14.351	3.251
1	230	03070100522	2	14	1	3	7	2	c	2	22.250		22.428	17.729	3.988
1	232	03070100533	1	12	1	3	6	2	c	2	28.626	3.658	32.360	11.278	3.429

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
1	233	03070100537	1	27	1	3	0	2	c	1	15.011	7.061	21.590	15.799	4.826
1	235	03070100534	2	12	2	11	6	2	c	2	17.780	3.429	21.488	12.065	3.327
1	237	03070100534	2	15	2	8	0	2	it	2		8.026		26.137	5.994
1	240	03070100505	1	11	2	14	6	1	it	2		6.655		20.980	5.283
1	242	03070400412	1	7	2	8	0	2	ib	1	45.212			19.329	5.766
1	244	03070100514	1	27	1	2	0	2	c	1	17.018	10.262	27.813	18.542	7.468
1	246	03070100515	3	15	2	14	0	1	it	2		8.865		20.345	6.960
1	247	03070100515	3	10	3	12	4	2	c	1	20.345	10.033	27.203	16.205	5.639
1	250	03070100513	1	9	1	3	2	2	it	2				25.044	5.842
1	254	03070100430	1	11	2	8	6	2	it	2		5.385		22.073	6.401
1	255	03070100435	1	15	3	12	0	2	it	1		6.960		18.212	4.978
1	257	03070100619	1	27	2	14	0	2	it	2		9.677		16.205	6.477
1	261	03070100562	1	1,000	1	4	0	2	c	1	18.263	14.427	29.769	14.859	5.232
1	266	03070400399	1	35	1	4	3	2	itb	2		11.811		22.352	4.369
1	267	03070400365	2	27	1	2	0	2	c	2	27.940	7.417	32.969	21.641	5.258
1	268	03070400365	2	27	2	14	0	2	it	2		6.934		18.847	4.623
1	269	03070400369	1	7	2	8	0	2	c	2	31.293	8.128	36.779	21.590	5.131
1	271	03070400375	3	15	1	3	0	3	c	1	33.122	7.391	39.802	19.482	4.928
1	273	03070400375	3	27	1	3	0	2	it	2		9.373		21.463	4.724
1	274	03070400375	3	13	2	14	5	2	its	2		8.255		17.704	4.267
1	276	03070400368	3	10	1	4	4	2	it	1		7.264		24.333	5.080
1	277	03070400368	3	11	1	4	6	3	it	1		9.398		16.866	4.699
1	280	03070400368	3	20	1	2	0	2	it	2		7.595		15.469	3.886
1	283	03070400362	3	13	1	2	5	2	it	1		8.407		17.628	4.877
1	284	03070400362	3	15	1	3	0	2	it	1		8.788		21.336	5.283
1	285	03070400362	3	7	2	8	0	2	it	2		9.449		24.384	5.182
1	286	03070400366	1	27	2	13	0	2	it	2		7.493		22.606	5.867
1	288	03070200653	2	11	1	3	6	2	it	2		7.747		20.930	7.823
1	289	03070100851	1	10	1	2	4	2	c	1	17.780	9.423	28.499	18.644	6.858
1	291	03070200709	1	15	4	6	0	1	it	2		6.248		24.206	5.436
1	293	03070100892	1	10	1	3	4	2	c	1	21.234	20.396	39.675	21.692	5.410
1	294	03070200653	2	27	1	4	0	2	it	2		9.195		18.136	6.071
1	298	03070400567	4	26	1	2	5	2	c	2		7.899		16.713	4.013

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
1	299	03070400567	4	27	2	14	0	2	c	2	29.997	6.553	11.532	17.882	4.928
1	300	03070400567	4	12	1	15	6	2	ib	2	26.619			9.728	3.683
1	301	03070400567	4	27	2	13	0	2	c	1	31.242	10.617	39.878	17.043	5.994
1	302	03070100948	1	15	3	12	0	2	c	1	25.095	9.119	35.154	18.923	6.502
1	303	03070100975	1	16	1	3	5	2	it	2		10.236		29.997	6.426
1	304	03070400599	1	27	2	13	0	2	c	1		8.306		19.939	5.080
1	305	03070100964	1	11	1	2	6	2	it	2		6.706		21.463	4.775
1	306	03070400570	1	7	2	13	0	2	c	2	31.674	7.518	38.532	20.117	5.588
1	308	03070100760	1	1	1	4	2	2	c	1	14.681	21.336	34.036	17.602	7.874
1	314	03070100771	3	10	3	12	4	2	c	1	17.780	26.162	38.481	21.742	6.020
1	315	03070100771	3	10	1	2	4	2	c	1	19.939	10.338	29.185	14.757	5.080
1	317	03070100779	1	23	1	2	7	2	c	2	19.964		19.406	9.296	3.937
1	319	03070100722	1	6	1	3	8	2	c	2	13.386	6.020	18.974	10.058	2.743
1	320	03070400547	1	21	5	9	9	2	c	2	53.213	7.417	64.668	16.129	1.651
1	323	03070400529	1	35	1	2	3	2	it	2		14.935		22.911	4.851
1	324	03070100952	2	22	2	8	0	2	it	3					
1	325	03070100952	2	10	1	2	4	2	c	1	14.427	14.275	25.222	15.748	5.588
1	326	03070100949	1	10	1	3	4	2	c	1	23.317	9.957	31.394	17.551	6.604
1	328	03070400527	1	27	1	2	0	2	itb	1		7.620		17.983	4.064
1	331	03070400550	2	7	2	13	0	2	c	2	33.680	10.287	42.418	26.772	4.928
1	332	03070400550	2	9	2	8	2	1	it	2		13.462		20.244	4.318
1	334	03070400533	1	7	2	13	0	2	it	2		11.684		26.721	6.020
1	335	03070200771	2	16	3	12	5	2	it	2		10.262		36.043	7.010
1	337	03070200771	2	8	2	14	4	2	itb	2		14.300		19.025	4.013
1	338	03070200766	1	7	2	14	0	2	itbs	2		10.058		22.809	5.283
1	341	03070200762	1	1	2	13	2	2	it	2				19.431	5.791
1	343	03070200756	1	27	2	8	0	2	itb	2		9.322		18.999	4.597
1	344	03070100939	1	1	1	2	2	2	it	2				20.803	5.893
1	345	03070100924	1	27	2	14	0	2	c	2	31.420	9.906	41.605	20.244	6.807
1	346	03070200772	1	15	2	14	0	2	it	1		5.309		20.599	4.775
1	348	03070101012	2	7	3	12	0	2	it	2		8.890		26.873	5.309
1	349	03070101012	2	14	1	3	7	2	c	2	20.828		20.472	13.310	4.115
1	350	03070400605	2	27	2	14	0	2	ib	2	30.328	7.214	37.592	18.136	6.350

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
1	351	03070400605	2	12	1	1	6	2	it	2		5.563		12.954	2.896
1	352	03070101014	5	20	1	5	0	2	it	1	0.000	4.699	0.000	15.392	5.588
1	356	03070101014	5	11	3	12	6	2	itb	2		8.458		18.923	5.182
1	357	03070101014	5	11	1	3	6	2	it	2		5.639		17.628	5.664
1	358	03070101014	5	27	3	12	0	2	it	2		6.731		21.463	5.207
1	359	03070101014	5	14	1	3	7	2	c	2	21.184		20.676	12.192	2.921
1	360	03070200841	1	30	1	3	4	2	itb	2		15.011		16.916	4.851
1	361	03070101047	1	3	3	12	3	2	c	1	21.234	15.392	34.188	19.964	5.969
1	362	03070101010	1	12	1	15	6	2	ib	2	17.145	4.191	20.625	11.786	2.845
1	363	03070101015	2	10	1	2	4	2	c	1	20.701	11.176	29.515	17.577	5.817
1	364	03070101015	2	7	3	12	0	2	its	2		7.417		23.647	3.937
1	365	03070400606	1	15	1	3	0	2	it	1		9.474		21.107	5.359
1	366	03070101017	1	13	2	14	5	1	it	1		9.906		23.063	5.537
1	372	03070100985	1	19	1	2	4	2	c	1	18.694	8.636	25.095	16.662	4.318
1	373	03070100994	2	10	3	12	4	2	c	2	27.584	8.941	35.509	17.551	6.680
1	374	03070100994	2	19	1	3	4	2	its	2		8.915		15.799	4.013
1	377	03070400602	1	15	1	4	0	2	c	1	25.832	10.058	35.484	20.447	4.750
1	379	03070200791	1	16	1	4	5	2	it	2		9.652		35.839	7.290
1	380	03070200810	1	10	2	8	4	2	it	2		10.947		24.435	6.045
1	382	03070100655	2	16	1	2	5	2	itbs	2		11.811		34.188	6.375
1	383	03070100655	2	28	1	2	7	2	c	2	16.789	12.344	29.489	14.478	4.445
1	384	03070100648	2	12	1	3	6	2	c	2	16.637	5.385	20.193	8.407	4.039
1	385	03070100648	2	20	1	2	0	2	it	2		7.137		17.805	5.537
1	387	03070100647	1	20	1	4	0	2	c	1	27.635	10.135	35.001	18.085	4.928
1	388	03070100652	1	12	1	3	6	2	c	2	16.561	2.540	18.593	9.525	3.327
1	389	03070100595	1	23	1	2	7	2	ib	2	21.006		20.295	12.497	3.378
1	391	03070100649	1	7	2	8	0	2	it	2		7.823		24.663	5.563
1	396	03070100481	1	27	2	14	0	2	c	2	26.975	9.398	35.255	19.812	4.750
1	397	03070100452	1	35	1	3	3	3	it	2		11.100		17.780	4.470
1	399	03070200727	2	1	1	2	2	2	it	2				23.317	5.740
1	400	03070200727	2	3	1	4	3	2	it	1				16.815	5.029
1	401	03070400509	1	12	1	2	6	2	itb	2				9.906	2.438
1	402	03070200729	1	23	3	12	7	2	c	2	18.059		18.034	9.601	3.226

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
1	406	03070200741	1	15	2	8	0	2	it	2		8.814		20.218	4.267
1	409	03070200726	1	17	2	13	2	1	it	2		20.371		27.229	7.087
1	411	03070200430	1	1,000	1	2	0	2	c	1	29.718	25.146	49.428	17.374	9.550
1	412	03070200426	1	12	1	2	6	2	c	2	18.313	2.743	20.599	12.675	3.480
1	413	03070200425	1	26	2	8	5	2	it	2		7.772		15.189	5.944
1	431	03070200391	1	27	1	2	0	2	it	2		11.074		26.899	5.715
1	432	03070100794	1	27	1	2	0	2	it	1		10.363		22.936	5.944
1	434	03070100796	2	22	2	8	0	2	it	3					
1	435	03070100796	2	10	1	3	4	2	c	1	20.574	11.100	29.362	15.113	6.502
1	437	03070100799	1	20	1	2	0	2	c	2	27.559	5.817	32.741	15.646	4.877
1	438	03070100802	3	27	1	4	0	2	it	2		9.703		20.777	6.375
1	442	03070100802	3	12	1	3	6	2	itb	2				10.998	2.565
1	443	03070100802	3	27	1	2	0	2	c	1	16.307	7.671	23.292	18.161	4.115
1	444	03070100804	4	11	2	14	6	1	it	1		7.239		18.288	4.674
1	445	03070100804	4	27	1	2	0	2	it	1		11.608		23.165	6.706
1	447	03070100804	4	13	3	12	5	2	it	2		9.703		17.653	5.029
1	448	03070100804	4	22	1	2	0	2	it	2					
1	450	03070100800	1	19	2	8	4	2	it	2		9.906		20.193	5.156
1	453	03070400304	1	12	1	3	6	2	c	2	25.908	5.029	30.074	12.700	4.140
1	454	03070400333	1	7	2	13	0	1	itb	2		7.493		22.962	5.131
1	457	03070400332	1	20	1	2	0	2	it	2		10.312		14.757	4.166
1	458	03070400329	2	7	2	14	0	2	it	2		9.042		27.889	3.937
1	459	03070400329	2	7	1	4	0	2	c	2	41.275	7.595	47.752	24.155	4.597
1	464	03070400310	1	15	1	3	0	2	c	1	30.150	10.389	39.243	21.946	5.639
1	467	03070400334	1	27	3	12	0	2	it	2		8.128		16.078	5.004
1	469	03070100388	1	3	3	12	3	2	c	1	19.507	14.326	32.969	18.034	6.223
1	473	03070100421	1	11	3	12	6	3	it	2		8.484		20.091	4.445
1	483	03070400298	1	27	1	2	0	2	c	1	22.454	6.502	28.245	19.380	5.309
1	484	03070200443	1	19	1	3	4	2	c	1	37.846	10.617	45.669	19.507	5.131
1	485	03070200454	1	1	1	2	2	2	c	1	22.327	19.583	40.310	19.812	7.671
1	487	03070200460	1	27	1	4	0	2	its	2		9.322		22.555	5.791
1	488	03070200463	1	15	4	6	0	2	it	1		8.636		19.888	4.699
1	489	03070400177	1	20	1	3	0	2	c	1	28.778	10.287	36.881	13.487	4.775

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
1	492	03070100296	2	14	2	8	7	2	c	2	33.426		33.858	14.783	3.937
1	493	03070100296	2	6	2	8	8	2	ib	2	16.053	7.874	23.190	11.201	2.642
1	494	03070100297	1	30	2	8	4	2	itb	2		13.056		17.577	4.953
1	497	03070100310	3	27	2	14	0	2	itb	1		11.278		20.142	7.417
1	499	03070100310	3	1,000	3	12	0	2	it	2		10.693		23.520	6.655
1	500	03070100310	3	3	1	3	3	2	c	1	12.243	11.125	19.888	14.376	5.639
1	503	03070100775	1	12	1	2	6	2	c	1	24.994	5.055	30.277	10.541	4.013
1	504	03070100790	1	20	1	2	0	2	is	1	19.025	5.080	23.520	15.291	5.004
1	507	03070100783	1	27	1	2	0	2	its	1		8.484		21.996	5.715
1	511	03070400440	3	12	1	3	6	2	it	2		4.420		8.712	3.581
1	512	03070400440	3	27	1	4	0	1	its	2		10.465		21.565	4.826
1	513	03070400440	3	15	1	5	0	2	it	2		6.858		23.292	5.715
1	517	03070400441	1	27	1	4	0	2	itb	2		8.839		20.726	4.318
1	518	03070100552	2	3	1	3	3	2	c	1	13.462	10.262	21.336	17.374	7.061
1	519	03070100552	2	15	2	8	0	2	it	2		7.214		21.514	5.715
1	523	03070400389	2	27	2	8	0	2	its	2		7.772		18.898	5.486
1	524	03070400389	2	35	2	8	3	2	it	2		9.119		17.780	4.216
1	527	03070100554	1	3	1	3	3	2	c	1	15.494	11.887	24.943	17.120	4.445
1	528	03070100555	1	23	1	2	7	2	c	1	11.354	6.706	16.586	15.545	3.658
1	529	03070100487	1	20	1	3	0	2	c	1	23.927	7.493	29.566	17.272	5.563
1	530	03070200496	1	27	1	2	0	2	it	1		11.811		24.740	6.502
1	532	03070200499	1	11	1	2	6	2	it	2		6.579		21.387	5.486
1	534	03070100488	1	12	1	2	6	2	c	1	16.104	4.369	17.120	12.344	2.743
1	537	03070100805	1	10	1	3	4	2	c	1	16.078	15.189	27.991	16.764	4.953
1	538	03070100808	1	20	1	2	0	2	is	1	18.567	5.969	24.003	16.256	4.470
1	539	03070100806	2	27	1	4	0	2	itb	2		8.839		18.288	4.242
1	541	03070100806	2	19	3	12	4	2	it	2		12.573		22.758	6.401
1	544	03070100809	1	1	1	3	2	3	it	2		16.053		19.101	4.166
1	548	03070100813	1	30	1	2	4	2	it	1		9.398		19.990	4.851
1	549	03070200680	1	27	2	14	0	1	c	1	18.821	7.925	24.384	14.402	5.639
1	550	03070100815	1	19	3	12	4	2	ib	2		10.185		25.121	6.172
1	551	03070200685	4	17	1	2	2	2	it	1		13.919		21.285	6.731
1	553	03070200685	4	32	1	2	4	2	it	2		7.925		15.189	5.182

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
1	555	03070100743	1	10	3	12	4	2	c	1	14.554	20.701	33.782	19.126	6.198
1	556	03070200570	1	19	1	2	4	2	it	2		9.220		23.343	5.791
1	556	03070200685	4	1,000	2	13	0	2	it	2		9.906		18.593	5.080
1	557	03070200566	1	35	2	14	3	2	itb	2		10.566		17.145	3.861
1	558	03070200560	1	24	4	6	7	2	it	2		7.112		12.217	3.708
1	559	03070100750	1	23	1	2	7	2	it	2		6.096		11.024	2.057
1	560	03070200551	1	12	1	15	6	2	ib	2	25.298			14.757	4.242
1	561	03070200548	1	14	1	3	7	2	it	2				14.986	3.759
1	563	03070200643	1	23	1	2	7	2	c	1	16.612	4.318	21.666	10.719	4.445
1	564	03070200626	2	12	1	2	6	2	c	2	19.863	3.835	23.216	10.236	4.724
1	565	03070200626	2	12	1	3	6	2	c	2	22.530	3.531	26.111	11.684	3.708
1	567	03070100755	1	7	3	12	0	3	itb	2				22.631	4.343
1	572	03070400361	1	27	1	2	0	2	c	1	23.825	7.925	30.582	20.549	4.572
1	573	03070400359	2	27	1	2	0	2	its	2		9.881		17.932	5.563
1	574	03070400359	2	16	2	14	5	2	itb	2		10.135		29.972	6.045
1	575	03070400340	1	12	1	3	6	2	itb	2				11.760	2.337
1	576	03070400352	1	7	1	14	0	2	it	2		8.534		27.076	5.385
1	577	03070400354	2	35	1	3	3	2	c	2	21.082	11.252	30.963	20.803	5.334
1	578	03070400354	2	7	2	14	0	2	it	2		9.906		27.051	5.486
1	579	03070400353	1	27	1	2	0	2	it	1		9.119		23.089	5.639
1	580	03070400357	3	27	3	12	0	2	c	1	18.186	9.728	27.178	18.923	5.690
1	581	03070400357	3	27	2	13	0	1	it	2		7.010		20.549	5.029
1	582	03070400357	3	20	2	13	0	2	c	2	31.267	7.468	38.252	15.494	4.674
1	583	03070400336	1	13	2	14	5	1	it	2		10.871		21.209	5.105
1	585	03070400337	3	10	2	14	4	2	c	1	29.845	8.661	36.017	19.837	5.055
1	588	03070400337	3	19	1	2	4	2	it	1		10.566		25.654	5.944
1	590	03070400337	3	16	2	13	5	2	it	2		9.652		32.461	6.198
1	592	03070400347	1	1	1	4	2	2	c	1	17.399	13.360	28.727	16.104	5.207
1	596	03070100501	1	27	2	8	0	2	c	1	30.759	7.493	36.830	19.863	5.969
1	597	03070100497	1	19	4	6	4	2	itb	2		8.661		20.218	6.096
1	601	03070100496	3	15	2	8	0	2	it	2		7.493		20.320	7.671
1	603	03070100496	3	27	2	14	0	2	it	2		9.855		21.666	9.068
1	604	03070100496	3	10	1	3	4	2	c	1	10.135	22.149	29.134	14.529	7.061

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
1	607	03070100411	1	15	2	8	0	2	c	2	20.955	6.731	27.254	23.901	6.502
1	609	03070100490	1	30	1	2	4	2	itb	2		11.862		18.161	4.496
1	611	03070100506	1	20	1	4	0	2	it	1		7.391		16.586	6.172
1	614	03070100507	3	19	1	3	4	2	its	2		9.246		19.787	4.521
1	615	03070100507	3	19	1	2	4	2	itb	1		9.576		22.504	4.369
1	617	03070100507	3	20	1	4	0	2	c	1	28.042	5.842	32.334	18.872	4.191
1	620	03070200594	2	3	3	12	3	2	c	1	39.675	7.874	46.126	18.136	5.867
1	623	03070200625	1	20	1	2	0	2	c	1	29.439	5.842	34.874	18.491	5.232
1	625	03070200202	1	16	3	12	5	2	it	2		12.294		34.747	6.680
1	628	03070200599	1	13	1	4	5	2	it	2		11.049		19.583	4.140
1	632	03070100739	1	3	1	2	3	2	c	1	17.424	8.407	21.996	16.510	4.978
1	634	03070200594	2	7	2	13	0	1	it	2		8.382		21.336	4.470
1	637	03070100734	1	27	1	3	0	2	its	2		6.731		16.358	3.962
1	643	03070100120	1	2	1	2	1	2	it	2				28.067	5.842
1	644	03070100095	1	3	2	8	3	1	it	2				20.066	6.020
1	645	03070100070	1	12	1	14	6	2	c	2	20.218	4.978	24.511	11.684	4.293
1	651	03070200107	1	12	1	3	6	2	c	1	20.015	4.648	23.216	13.767	3.175
1	653	03070200240	1	27	2	8	0	2	it	2		11.608		17.526	6.553
1	655	03070400134	1	27	1	4	0	2	its	2		9.931		19.329	4.623
1	659	03070400062	1	7	2	14	0	2	itb	2				23.571	3.658
1	660	03070400066	1	3	1	2	3	2	it	2				18.136	4.978
1	663	03070400076	2	27	1	4	0	2	it	2		10.033		18.161	3.835
1	664	03070400076	2	10	3	12	4	2	it	3		11.176		16.078	4.369
1	668	03070200385	1	15	1	2	0	2	it	1		6.071		17.983	5.385
1	670	03070100282	2	3	1	3	3	2	it	1				18.085	5.461
1	671	03070100282	2	3	1	2	3	3	c	1	14.681	12.395	27.534	19.406	6.680
1	675	03070100277	3	19	1	3	4	2	it	1		6.020		22.581	3.480
1	676	03070100277	3	4	1	3	4	2	it	2				15.240	5.309
1	677	03070100277	3	27	1	2	0	2	it	2		8.890		16.535	3.404
1	678	03070100274	1	27	2	14	0	2	it	2		11.735		21.590	7.112
1	680	03070200384	1	27	1	2	0	2	c	1	24.028	9.677	32.614	18.567	4.470
1	682	03070100238	1	6	2	8	8	2	it	2		6.020		12.370	2.311
1	683	03070100235	1	27	3	12	0	2	its	2		9.703		19.583	5.740

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
1	685	03070100169	1	35	2	8	3	2	itb	2		11.049		19.761	5.791
1	688	03070100130	2	32	1	2	4	2	it	2				20.980	6.629
1	689	03070100130	2	23	1	2	7	2	c	1	13.056	7.747	20.117	11.786	3.505
1	691	03070100125	1	27	2	8	0	2	itb	1		10.516		21.717	7.239
1	698	03070200483	1	12	4	6	6	1	c	2	22.174	2.261	23.393	10.998	2.896
1	699	03070400275	1	27	2	13	0	1	it	2		8.153		20.218	4.597
1	700	03070400274	1	15	1	3	0	2	c	1	25.019	8.382	34.163	20.015	4.877
1	701	03070400272	1	8	2	13	4	1	it	2		13.106		19.533	4.724
1	733	03070100342	1	11	1	2	6	2	c	2	25.959	8.560	33.503	17.323	5.994
1	734	03070100326	1	34	3	12	0	2	c	2	20.599	6.350	25.883	16.967	6.147
1	736	03070100325	1	14	2	8	7	2	it	2				13.513	2.921
1	738	03070100324	1	12	1	2	6	2	c	2	10.058	4.470	18.618	8.788	2.743
1	740	03070100314	2	9	1	4	2	2	it	1		15.494		26.187	5.994
1	741	03070100314	2	20	3	12	0	3	it	2		10.668		14.910	4.216
1	757	99999999757	1	15	2	8	0	2	it	2		9.042		18.898	6.172
1	758	99999999758	1	24	1	2	7	2	it	2		8.509		13.411	2.896
1	761	99999999761	1	16	1	2	5	2	it	2		10.363		43.967	8.407
1	777	99999999777	1	19	3	12	4	2	c	2	25.095	10.617	35.535	22.301	6.096
1	782	99999999782	1	27	1	2	0	2	ib	1	18.059	7.696	26.924	20.422	4.928
1	784	99999999784	1	10	1	4	4	2	c	1	24.638	12.395	36.627	20.549	5.512
1	785	99999999785	1	13	2	14	5	2	c	2	33.249	9.398	42.113	19.609	6.045
1	786	99999999786	1	7	4	6	0	1	its	1		7.823		17.729	3.480
1	787	99999999787	1	33	1	2	0	2	c	1	18.288	6.604	24.003	14.427	5.436
1	791	03070400164	1	32	2	8	4	2	it	2		7.544		19.075	4.166
1	795	03070400622	2	16	2	8	5	2	it	1		14.859		36.170	7.722
1	796	03070400622	2	25	2	14	7	2	it	2		2.819		14.402	3.099
1	797	03070101065	1	27	1	2	0	2	its	1		8.585		17.831	4.369
1	799	03070400742	1	3	2	14	3	2	it	2		12.852		19.837	6.299
1	801	03070400821	3	7	2	14	0	2	it	2		9.246		28.194	5.232
1	802	03070400821	3	7	2	14	0	1	it	2		10.287		25.273	5.156
1	803	03070400821	3	33	2	14	0	2	c	2	17.983	7.137	24.765	14.605	4.953
1	804	03070200857	1	11	3	12	6	2	is	2	31.166	5.842	34.646		5.766
1	805	03070200856	1	12	2	13	6	2	c	2	17.374	4.064	21.031	10.820	3.302

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
1	809	03070101058	3	10	3	12	4	2	c	1	18.999	23.800	39.751	21.641	5.232
1	810	03070101058	3	25	2	14	7	2	it	2		3.327		11.684	3.912
1	811	03070101058	3	10	1	4	4	2	c	1	31.293	9.906	38.379	23.952	7.772
1	812	03070400745	2	7	1	3	0	2	its	1		9.474		20.218	4.648
1	813	03070400745	2	32	2	14	4	2	its	2		10.846		14.173	4.445
1	817	03070400470	1	10	1	4	4	2	c	2	26.010	8.026	33.147	19.456	5.486
1	818	03070400740	1	7	4	6	0	2	it	2		7.010		21.260	4.115
1	819	03070400378	1	27	2	8	0	2	it	2		9.601		22.555	5.334
2	823	03070201057	2	18	1	2	7								
2	824	03070201057	2	23	1	2	7								
2	825	03070400816	5	12	1	4	6								
2	826	03070400816	5	12	3	12	6								
2	827	03070400816	5	19	1	2	4								
2	828	03070400816	5	27	1	2	0								
2	829	03070400816	5	18	2	14	7								
2	830	03070400823	3	3	1	2	3								
2	831	03070400823	3	3	3	12	3								
2	832	03070400823	3	10	3	12	4								
2	833	03070101189	3	27	1	3	0								
2	834	03070101189	3	27	3	12	0								
2	835	03070101189	3	7	2	8	0								
2	836	03070101192	1	18	1	15	7								
2	837	03070101198	2	7	1	4	0								
2	837	03070101198	2	7	1	4	0								
2	838	03070100382	1	27	3	12	0								
2	839	03070100391	1	27	1	4	0								
2	840	03070101228	1	12	1	3	6								
2	841	03070400007	1	22	2	13	0								
2	842	03070101157	1	27	1	4	0								
2	843	03070400580	1	18	1	2	7								
2	844	03070200054	1	2	1	15	1								
2	845	03070200222	1	18	1	3	7								
2	846	03070400830	1	35	1	2	3								

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
2	847	03070201027	1	12	1	3	6								
2	848	03070201030	1	15	1	4	0								
2	849	03070201054	3	12	1	2	6								
2	850	03070201054	3	12	1	2	6								
2	851	03070201054	3	22	2	14	0								
2	852	03070201056	1	14	1	2	7								
2	853	03070201058	1	13	2	14	5								
2	854	03070201062	1	8	2	8	4								
2	855	03070101241	1	7	3	12	0								
2	856	03070200551	1	27	2	8	0								
2	857	03070400890	1	27	2	8	0								
2	858	03070101141	4	11	1	4	6								
2	859	03070101141	4	16	3	12	5								
2	860	03070101141	4	14	1	4	7								
2	863	03070200914	1	36	1	2	2								
2	864	03070101141	4	18	1	4	7								
2	865	03070101145	1	18	1	3	7								
2	866	03070101147	1	14	1	3	7								
2	867	03070101221	2	11	1	4	6								
2	868	03070101221	2	27	2	14	0								
2	869	03070101173	3	6	1	3	8								
2	870	03070101173	3	6	1	14	8								
2	871	03070101173	3	6	2	14	8								
2	872	03070101174	4	12	2	8	6								
2	873	03070101174	4	27	3	12	0								
2	874	03070101174	4	27	3	12	0								
2	875	03070101174	4	27	1	2	0								
2	876	03070101176	5	16	3	12	5								
2	877	03070101176	5	1	1	3	2								
2	878	03070101176	5	3	1	3	3								
2	879	03070101176	5	7	2	8	0								
2	880	03070101176	5	27	2	8	0								
2	881	03070101203	1	35	1	3	3								

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
2	882	03070101201	1	16	3	12	5								
2	883	03070101217	1	13	3	12	5								
2	884	03070101219	3	14	1	3	7								
2	885	03070101219	3	14	1	3	7								
2	886	03070101219	3	6	1	4	8								
2	887	03070101222	5	11	3	12	6								
2	888	03070101222	5	11	2	8	6								
2	889	03070101222	5	18	3	12	7								
2	890	03070101222	5	14	3	12	7								
1	890	03070100515	3	1,000	3	12	0	2	c	2	27.178	8.890	32.664	18.059	4.597
2	891	03070101222	5	15	3	12	0								
2	892	03070101140	1	30	1	4	4								
2	893	03070201202	1	7	1	3	0								
2	894	03070201172	1	12	1	2	6								
2	895	03070201171	1	18	1	2	7								
2	896	03070201178	1	18	1	2	7								
2	897	03070201176	1	18	1	2	7								
1	898	03070200415	1	11	2	13	6	2	it	2		9.804		15.062	5.842
2	899	03070201210	1	18	1	2	7								
2	900	03070101339	1	18	1	2	7								
2	901	03070201197	1	16	3	12	5								
2	902	03070201207	1	18	1	2	7								
2	903	03070201181	1	6	1	2	8								
2	904	03070201208	1	20	1	2	0								
2	905	03070201209	1	18	1	2	7								
2	906	03070101062	2	12	1	2	6								
2	907	03070101062	2	12	1	2	6								
2	908	03070101060	1	24	1	2	7								
2	909	03070101037	2	20	1	2	0								
2	910	03070101037	2	14	1	2	7								
2	911	03070101081	2	18	1	3	7								
2	912	03070101081	2	20	1	2	0								
2	913	03070101089	1	12	3	12	6								

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
2	914	03070101092	1	18	1	2	7								
2	915	03070101093	1	16	2	14	5								
2	916	03070101094	1	19	1	2	4								
2	917	03070101118	1	11	1	15	6								
2	918	03070101119	1	9	2	14	2								
2	919	03070200935	1	15	1	2	0								
2	920	03070200922	1	27	1	2	0								
2	921	03070200926	1	18	1	2	7								
2	923	03070100584	1	16	3	12	5								
2	924	03070100304	1	14	2	8	7								
2	925	03070400056	2	27	2	13	0								
2	926	03070400056	2	16	2	13	5								
2	927	03070101425	1	9	4	6	2								
2	928	03070101418	1	19	3	12	4								
2	929	03070401009	1	27	2	13	0								
2	930	03070400081	2	13	2	13	5								
2	931	03070400081	2	13	2	13	5								
2	932	03070400137	1	7	2	8	0								
2	933	03070400991	1	15	1	2	0								
2	934	03070400992	1	27	2	14	0								
2	935	03070400064	3	27	3	12	0								
2	936	03070400064	3	13	2	13	5								
2	937	03070400064	3	3	3	12	3								
2	938	03070400997	1	27	1	2	0								
2	939	03070400097	1	16	1	4	5								
2	940	03070400990	3	10	2	14	4								
2	941	03070400990	3	10	2	14	4								
2	942	03070400990	3	6	2	8	8								
2	943	03070401017	2	15	2	8	0								
2	944	03070401017	2	27	1	2	0								
2	945	03070400033	2	13	2	8	5								
2	946	03070400033	2	7	2	14	0								
2	947	03070401006	3	7	2	14	0								

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
2	948	03070401006	3	27	2	8	0								
2	949	03070401006	3	27	1	4	0								
2	950	03070401018	10	20	1	3	0								
2	951	03070401018	10	15	2	8	0								
2	952	03070401018	10	27	3	12	0								
2	953	03070401018	10	27	1	4	0								
2	954	03070401018	10	27	2	8	0								
2	955	03070401018	10	3	2	14	3								
2	956	03070401018	10	3	1	2	3								
2	957	03070401018	10	7	3	2	0								
2	958	03070401018	10	7	1	4	0								
2	959	03070401018	10	7	2	8	0								
2	960	03070101319	2	27	1	2	0								
2	961	03070101319	2	19	3	12	4								
2	962	03070101300	1	23	1	3	7								
2	963	03070401003	1	6	1	4	8								
2	964	03070101322	2	27	2	13	0								
2	965	03070101322	2	18	1	2	7								
2	966	03070101325	1	10	1	2	4								
2	967	03070101285	1	18	1	3	7								
2	968	03070101291	1	20	1	4	0								
2	969	03070101281	1	27	1	2	0								
2	970	03070101294	1	18	1	2	7								
2	971	03070101317	1	27	1	2	0								
2	972	03070101310	2	12	1	3	6								
2	973	03070101310	2	9	3	12	2								
2	974	03070101380	2	14	1	3	7								
2	975	03070101380	2	18	1	2	7								
2	976	03070201402	1	18	1	2	7								
2	977	03070101330	1	35	2	8	3								
2	978	03070101292	1	27	1	4	0								
2	979	03070101296	1	18	1	2	7								
2	980	03070200086	3	27	2	13	0								

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
2	981	03070200086	3	6	1	2	8								
2	982	03070101321	1	14	1	2	7								
2	983	03070201238	1	1	1	2	2								
2	984	03070200397	1	15	1	2	0								
2	985	03070200398	1	15	1	3	0								
2	986	03070200086	3	1	1	2	2								
2	987	03070101386	3	20	1	2	0								
2	988	03070101480	1	33	1	2	0								
2	989	03070101481	1	18	1	2	7								
2	990	03070201235	3	16	1	4	5								
2	991	03070101436	3	34	1	2	0								
2	992	03070101436	3	27	1	2	0								
2	993	03070101436	3	3	1	4	3								
2	994	03070101386	3	18	1	2	7								
2	995	03070101386	3	18	1	2	7								
2	996	03070101438	1	27	1	2	0								
2	997	03070101440	1	15	3	12	0								
2	998	03070101441	1	14	1	4	7								
2	999	03070101443	1	6	1	1	8								
2	1000	03070101444	3	27	1	2	0								
2	1001	03070101444	3	27	3	12	0								
2	1002	03070101444	3	27	2	13	0								
2	1003	03070400913	1	27	2	13	0								
2	1004	03070101456	1	27	3	12	0								
2	1005	03070101453	2	6	1	3	8								
2	1006	03070101453	2	7	1	2	0								
2	1007	03070101447	1	27	2	13	0								
2	1008	03070101450	1	27	1	3	0								
2	1009	03070101448	1	7	2	13	0								
2	1010	03070101451	6	16	3	12	5								
2	1011	03070101451	6	16	2	14	5								
2	1012	03070101451	6	10	3	12	4								
2	1013	03070101451	6	20	1	2	0								

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
2	1014	03070101451	6	20	3	12	0								
2	1015	03070101451	6	27	1	2	0								
2	1016	03070101455	1	27	3	12	0								
2	1017	03070101460	2	27	3	12	0								
2	1018	03070101460	2	27	1	15	0								
2	1019	03070400905	1	18	1	3	7								
2	1020	03070400917	2	19	1	2	4								
2	1021	03070400917	2	18	1	2	7								
2	1022	03070400920	1	7	2	15	0								
2	1023	03070101476	1	18	1	2	7								
2	1024	03070101398	3	6	1	2	8								
2	1025	03070101477	2	7	3	12	0								
2	1026	03070101477	2	18	1	2	7								
2	1027	03070101398	3	18	1	2	7								
2	1028	03070101398	3	12	1	2	6								
2	1029	03070101485	1	18	1	2	7								
2	1030	03070101488	1	3	1	4	3								
2	1031	03070101397	1	20	2	8	0								
2	1032	03070201322	1	11	2	13	6								
2	1033	03070201235	3	3	1	2	3								
2	1034	03070201235	3	19	1	2	4								
2	1035	03070101323	3	14	1	2	7								
2	1036	03070101323	3	18	1	2	7								
2	1037	03070101323	3	18	1	2	7								
2	1038	03070201403	1	18	1	2	7								
2	1039	03070201228	2	18	1	2	7								
2	1040	03070201228	2	18	1	2	7								
2	1041	03070201312	1	18	1	2	7								
2	1042	03070200734	1	16	1	14	5								
2	1043	03070101328	1	27	1	2	0								
2	1044	03070101362	1	20	3	12	0								
2	1045	03070101359	1	18	1	2	7								
2	1046	03070101369	2	22	2	14	0								

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
2	1047	03070101369	2	20	2	8	0								
2	1048	03070101363	4	3	3	12	3								
2	1049	03070101363	4	3	1	3	3								
2	1050	03070101363	4	3	1	3	3								
2	1051	03070101377	2	18	1	2	7								
2	1052	03070101377	2	18	1	3	7								
2	1053	03070101363	4	10	1	2	4								
2	1054	03070101370	1	18	1	2	7								
2	1055	03070101274	3	5	1	2	8								
2	1056	03070101274	3	6	1	2	8								
2	1057	03070101274	3	14	2	13	7								
2	1058	03070200685	4	3	2	13	3								
2	1059	03070100771	3	8	2	8	4								
2	1060	03070100468	1	34	1	2	0								
3	1061	03070101280	2	6	1	2	8								
3	1062	03070101280	2	6	1	2	8								
3	1063	03070101206	6	30	1	2	4								
3	1064	03070101206	6	3	1	4	3								
3	1065	03070101206	6	27	2	14	0								
3	1066	03070101206	6	7	2	8	0								
3	1067	03070101206	6	27	2	8	0								
3	1068	03070101206	6	27	3	12	0								
3	1069	03070201072	1	1	3	12	2								
3	1070	03070201014	1	12	1	2	6								
3	1071	03070201077	1	11	2	13	6								
3	1072	03070201086	1	11	3	12	6								
3	1073	03070201094	1	32	1	2	4								
3	1074	03070101307	1	11	1	3	6								
3	1075	03070101308	2	6	2	8	8								
3	1076	03070101308	2	14	2	8	7								
3	1077	03070101343	1	20	1	2	0								
3	1078	03070101341	1	13	1	2	5								
3	1079	03070101340	1	6	1	2	8								

batch	id	fs_site	mlt	type	gen	spec	period	heat_#	cmp	rwk	blade	stem	total	width	thick
3	1080	03070101345	1	10	1	3	4								
3	1081	03070101346	2	10	1	3	4								
3	1082	03070101346	2	6	3	12	8								
3	1083	03070101348	1	13	3	12	5								
3	1084	03070101352	1	20	3	12	0								
3	1085	03070201282	1	12	1	3	6								
3	1086	03070101344	2	19	1	3	4								
3	1087	03070101344	2	10	3	12	4								
3	1088	03070201306	1	12	1	3	6								
3	1089	03070201250	2	10	2	14	4								
3	1090	03070201250	2	19	6	14	4								
3	1091	03070201294	1	12	2	6	6								
3	1092	03070201142	1	1	2	14	2								
3	1093	03070201283	1	12	1	2	6								
3	1094	03070201292	1	14	1	3	7								
3	1095	03070201340	1	12	1	3	6								
3	1096	03070201309	1	14	1	3	7								
3	1097	03070200001	1	14	1	3	7								
3	1098	03070201314	1	16	3	12	5								
3	1099	03070201337	1	14	3	12	7								
3	1100	03070201339	2	12	1	3	6								
3	1101	03070201339	2	12	2	8	6								
3	1102	03070400886	1	12	2	8	6								
3	1103	03070201123	1	3	1	2	3								
3	1104	03070201127	1	15	3	12	0								
3	1105	03070201133	1	16	3	12	5								
3	1106	03070201136	1	8	1	4	4								
3	1107	03070201078	1	17	2	13	2								
2	1108	03070201117	2	1	2	14	2								
2	1109	03070201117	2	1	2	13	2								

Appendix C

Attribute Data for Archaeological Sites Yielding Projectile Points

Appendix C: Coding Sheet

Note: All attribute data listed below derive from the CRAIS database system maintained by the Kaibab National Forest for archaeological sites.

FS Site #: Denotes 11 digit Forest Service site number.

Date: Denotes date site was recorded.

C: Denotes number of cultural components at site.

Area: Area of site in square meters.

Veg: Predominate vegetation type.

Lithics: Number of lithic artifacts estimated at site.

Groundstone: Number of groundstone artifacts estimated at site.

Ceramics: Number of ceramic artifacts estimated at site.

Sub: Number of subsurface structures observed.

Sur: Number of surface structures observed.

WL: Number of non-room walls observed.

PS: Number of partial shelters observed.

MD: Number of middens observed.

Ht: Number of hearths observed.

CT: Number of storage cists observed.

RP: Number of roasting pits observed.

NR: Number of non-roofed areas observed.

MC: Number of modified caves observed.

DP: Number of large depressions observed.

WS: Number of water/soil controls observed.

NM: Number of non-midden mounds observed.

BG: Number of bedrock grinding loci observed.

QM: Number of quarry/mines observed.

BD: Number of buildings observed.

MF: Number of miscellaneous features observed.

FS Site #	Date	Site Type	C	Culture	Phase/Period	Area	Veg	Landform	Lithics
03070100070	9881	Refuse Scatter	1	Cohonina	MED VALLEY	12495	Pinus	RIDGE	401-800
03070100095	1978	Food Processing Camp	1	Archaic	LITH SCATTER	12000	Pinus	HILL SLOPE	Present
03070100120	1978	Single Unit	1	Cohonina	MED VALLEY	15000	Pinus	LOW RISE	Present
03070100125	1978	Food Processing Camp	2	Unknown	LITH SCATTER	4800	Pinus	LOW RISE	Present
03070100130	1978	Food Processing Camp	1	Archaic	LITH SCATTER	6650	Pinus	HILL SLOPE	Present
03070100169	1979	Food Processing Camp	1	Archaic	LITH SCATTER	500	Pinus	RIDGE	
03070100235	1978	Knapping	1	Unknown	LITH SCATTER	625	Pinus	HILL SLOPE	101-400
03070100238	1978	Refuse Scatter	2	Cohonina		3000	Pinus	HILL SLOPE	51-100
03070100274	1978	Refuse Scatter	1	Unknown	LITH SCATTER	1152	Pinus	HILL SLOPE	Present
03070100277	1978	Knapping	1	Cohonina	HUPMOBILE?	1200	Pinus	ALLUVIAL	51-100
03070100282	1979	Gathering Camp	2	Archaic		3000	Junip	HILL	101-400
03070100297	1979	Refuse Scatter	1		WN	1500	Junip	HILL SLOPE	101-400
03070100304	1991	Food Processing Camp	1	Cohonina	COCO-MEDVALLEY	2500	Pinus	HILL SLOPE	401-800
03070100310	1979	Refuse Scatter	2	Cohonina	- HOPI-LITHIC	9984	Pinus	RIDGE	101-400
03070100314	1979	Refuse Scatter	3	Cohonina	HOPI LITHIC SC	31940	Pinus	RIDGE	101-400
03070100324	1979	Refuse Scatter	1	Cohonina	MED VALLEY	5950	Junip	PLAIN	401-800
03070100325	1979	Refuse Scatter	2	Cohonina	HOPI	1348	Junip	PLAIN	11-25
03070100326	1979	Oven	2	Historic	HOPI	9100	Junip	RIDGE	101-400
03070100342	1979	Refuse Scatter	2	Unknown		5016	Junip	HILL SLOPE	51-100
03070100382	1980	Knapping	2	Unknown	LITH SCATTER	26650	Junip	ALLUVIAL	10001+
03070100388	1980	Knapping	1	Archaic	LITH SCATTER	6222	Junip	ALLUVIAL	801-5000
03070100391	1980	Gathering Camp	1	Unknown	LITH SCATTER	2200	Junip	ALLUVIAL	401-800
03070100403	1980	Knapping	1	Unknown	LITH SCATTER	8000	Pinus	HILL SLOPE	51-100
03070100411	1980	Food Processing Camp	1	Cohonina		40000	Pinus	MOUNTAIN	801-5000
03070100421	1980	Food Processing Camp	2	Unknown	LITH SCATTER	4800	Pinus	TERRACE	401-800
03070100430	1980	Food Processing Camp	1	Unknown	LITH SCATTER	1376	Pinus	UPPER BAJ	51-100
03070100435	1980	Food Processing Camp	1	Unknown	LITH SCATTER	3250	Pinus	UPPER BAJ	101-400
03070100452	1980	Multiple Units	1	Cohonina	MED VALLEY	7000	Pinus	UPPER BAJ	5001-1000
03070100468	1980	Knapping	1	Unknown	LITH SCATTER	1120	Junip	LOWER BAJ	26-50
03070100481	1981	Food Processing Camp	2	Cohonina	MED VALLEY	5920	Pinus	UPPER BAJ	51-100
03070100487	1981	Refuse Scatter	1	Cohonina		875	Pinus	HILL SLOPE	26-50
03070100488	1981	Village (Surface)	1	Cohonina		1250	Pinus	SADDLE	26-50
03070100490	1980	Knapping	1	Unknown	LITH SCATTER	551	Junip	PLAIN	101-400

FS Site #	Date	Site Type	C	Culture	Phase/Period	Area	Veg	Landform	Lithics
03070100496	1980	Refuse Scatter	1	Unknown	LITH SCATTER	1107	Junip	PLAIN	51-100
03070100497	1980	Gathering Camp	1	Unknown	LITH SCATTER	1450	Junip	MESA	51-100
03070100501	1980	Food Processing Camp	1	Cohonina		891	Junip		1-10
03070100505	1980	Refuse Scatter	1	Cohonina		1782	Junip	HILL SLOPE	101-400
03070100506	1980	Knapping	1	Unknown	LITH SCATTER	589	Junip	LOW RISE	101-400
03070100507	1980	Knapping	1	Unknown	LITH SCATTER	4312	Junip	HILL SLOPE	801-5000
03070100513	1980	Food Processing Camp	1	Cohonina	MED VALLEY	525	Junip	HILL SLOPE	11-25
03070100514	1980	Food Processing Camp	1	Historic	HOPI	3172	Pinus	LOW RISE	51-100
03070100515	1980	Food Processing Camp	2	Cohonina	ARCHAIC	2800	Junip	LOW RISE	51-100
03070100516	1980	Multiple Units	2	Historic	ANGLO	1521	Junip	PLAIN	1-10
03070100518	1980	Food Processing Camp	1	Prescott		2940	Pinus	PLAIN	801-5000
03070100522	1981	Refuse Scatter	1	CERBAT		1178	Junip	PLAIN	401-800
03070100523	1981	Food Processing Camp	1	Prescott		702	Junip	PLAIN	26-50
03070100533	1981	Refuse Scatter	1	Prescott		1023	Junip	LOW RISE	26-50
03070100534	1981	Food Processing Camp	1	Cohonina		4884	Junip	HILL SLOPE	101-400
03070100537	1981	Gathering Camp	1	Cohonina		1015	Junip	PLAIN	1-10
03070100552	1981	Refuse Scatter	1	Cohonina		1056	Junip	PLAIN	51-100
03070100554	1981	Refuse Scatter	1	Cohonina		1330	Junip	PLAIN	51-100
03070100555	1981	Refuse Scatter	1	Cohonina		1860	Junip	PLAIN	51-100
03070100562	1981	Multiple Units	1	Cohonina		484	Junip	HILL SLOPE	11-25
03070100565	1981	Refuse Scatter	2	Unknown	LITH SCATTER	10000	Junip	TERRACE	401-800
03070100572	1981	Refuse Scatter	1	Cohonina		16500	Junip	RIDGE	801-5000
03070100574	1981	Refuse Scatter	1	Unknown	LITH SCATTER	2250	Junip	TERRACE	101-400
03070100577	1981	Refuse Scatter	1	Unknown	LITH SCATTER	8100	Junip	TERRACE	5001-1000
03070100584	1981		1	Cohonina	MED VALLEY	0	Pinus	HILL	51-100
03070100595	1995	Surface House	1	Cohonina	COCONINO	840	Pinus	RIDGE	101-400
03070100619	1981	Refuse Scatter	1	Cohonina		1900	Junip	HILL SLOPE	101-400
03070100647	1981	Food Processing Camp	2	Cohonina	SSIN	4400	Pinus	RIDGE	101-400
03070100648	1981	Food Processing Camp	1	Cohonina		3575	Pinus	HILL SLOPE	101-400
03070100649	1981	Gathering Camp	1	Cohonina		1050	Pinus	HILL SLOPE	11-25
03070100652	1981	Refuse Scatter	1	Cohonina		510	Pinus	HILL SLOPE	26-50
03070100655	1981	Multiple Units	1	Cohonina	MED VALLEY	#####	Pinus	PLAIN	401-800
03070100661	1981	Refuse Scatter	1	Southern Sinagua		1600	Pinus	PLAIN	101-400

FS Site #	Date	Site Type	C	Culture	Phase/Period	Area	Veg	Landform	Lithics
03070100662	1981	Refuse Scatter	1	Cohonina		200	Pinus	PLAIN	26-50
03070100711	1981	Single Unit	1	Cohonina		1364	Junip	PLAIN	101-400
03070100712	1981	Refuse Scatter	1	Cohonina		580	Junip	PLAIN	26-50
03070100721	1982	Refuse Scatter	1	Unknown	LITH SCATTER	700	Junip	PLAIN	101-400
03070100722	1982	Refuse Scatter	1	Cohonina	MED VALLEY	150	Junip	PLAIN	51-100
03070100723	1982	Refuse Scatter	2	Cohonina	SSIN	875	Junip	RIDGE	101-400
03070100725	1982	Gathering Camp	1	CERBAT		6400	Junip	PLAIN	51-100
03070100726	1982	Refuse Scatter	1	Cohonina		9990	Junip	BENCH	401-800
03070100734	1982	Hearth	1	Unknown		621	Pinus	RIDGE	51-100
03070100739	1982	Gathering Camp	1	CERBAT		2350	Pinus	RIDGE	801-5000
03070100743	1982	Gathering Camp	1	Unknown		1521	Junip	HILL SLOPE	801-5000
03070100750	1982	Single Unit	1	Cohonina		5110	Pinus	HILL SLOPE	101-400
03070100755	1982	Food Processing Camp	1	Cohonina	MED VALLEY	4032	Pinus	HILL SLOPE	801-5000
03070100760	1982	Food Processing Camp	1	Cohonina	COCONINO	400	Pinus	HILL SLOPE	1-10
03070100771	1982	Food Processing Camp	2	Archaic		2548	Pinus	PLAIN	101-400
03070100775	1982	Refuse Scatter	1	Cohonina	MED VALLEY	0	Pinus	MOUNTAIN	101-400
03070100779	1982	Multiple Units	1	Cohonina	MED VALLEY	1260	Pinus	RIDGE	101-400
03070100783	1982	Refuse Scatter	1	Cohonina		1150	Pinus	HILL SLOPE	26-50
03070100790	1982	Multiple Units	1	Cohonina		2100	Pinus	RIDGE	51-100
03070100794	1982	Refuse Scatter	1	Cohonina	MED VALLEY	4444	Pinus	PLAIN	51-100
03070100796	1982	Refuse Scatter	1	Cohonina		5950	Pinus	PLAIN	101-400
03070100799	1982	Food Processing Camp	1	Cohonina		234	Pinus	HILL SLOPE	26-50
03070100800	1982	Refuse Scatter	1	Cohonina		1470	Pinus	PLAIN	51-100
03070100802	1982	Refuse Scatter	1	Unknown		6480	Pinus	PLAIN	401-800
03070100804	1982	Refuse Scatter	2	Cohonina		13009	Pinus	PLAIN	801-5000
03070100805	1982	Refuse Scatter	1	Cohonina	MED VALLEY	4800	Pinus	PLAIN	26-50
03070100806	1982	Refuse Scatter	1	Unknown		2385	Pinus	PLAIN	101-400
03070100808	1982	Single Unit	1	Cohonina	MED VALLEY	1554	Pinus	PLAIN	51-100
03070100809	1982	Refuse Scatter	1	Cohonina	COCONINO	2250	Pinus	PLAIN	51-100
03070100813	1982	Knapping	1			1089	Pinus	PLAIN	401-800
03070100815	1982	Single Unit	1	Cohonina	MED VALLEY	625	Pinus	PLAIN	26-50
03070100822	1983	Refuse Scatter	1	Southern Sinagua		1760	Pinus	PLAIN	401-800
03070100823	1983	Food Processing Camp	1	CERBAT		468	Pinus	PLAIN	51-100

FS Site #	Date	Site Type	C	Culture	Phase/Period	Area	Veg	Landform	Lithics
03070100830	1983	Refuse Scatter	1	Historic	HOPI	660	Pinus	PLAIN	51-100
03070100832	1983	Oven	2	Cohonina	CERB	1516	Pinus	PLAIN	401-800
03070100833	1983	Single Unit	2	Cohonina		2880	Junip	RIDGE	401-800
03070100837	1983	Refuse Scatter	1	Southern Sin	COHO	8125	Pinus	HILL SLOPE	801-5000
03070100851	1983	Refuse Scatter	1	Archaic		3600	Pinus	PLAIN	101-400
03070100853	1983	Multiple Units	1	Cohonina		1216	Pinus	RIDGE	101-400
03070100859	1983	Refuse Mound	1	Cohonina	MED VALLEY	9000	Junip	HILL SLOPE	5001-1000
03070100862	1983	Refuse Scatter	1	Southern Sinagua		1000	Pinus	RIDGE	26-50
03070100892	1984	Field House(s)	1	Cohonina		800	Junip	EROSIONAL	51-100
03070100911	1984	Food Processing Camp	1	Cohonina	MED VALLEY	21600	Junip	CANYON RI	801-5000
03070100916	1984	Food Processing Camp	2	Cohonina	PRES	3174	Junip	CANYON RI	101-400
03070100918	1984	Refuse Scatter	1	Cohonina		1995	Pinus	PLAIN	51-100
03070100921	1984	Refuse Scatter	1	Unknown	LITH SCATTER	5940	Pinus	RIDGE	801-5000
03070100924	1985	Gathering Camp	1	Cohonina		0	Junip	LOW RISE	51-100
03070100939	1985	Food Processing Camp	1	Cohonina		11500	Pinus	RIDGE	51-100
03070100948	1985	Single Unit	1	Cohonina	MED VALLEY	1089	Pinus	RIDGE	11-25
03070100949	1985	Refuse Scatter	1	Cohonina		2816	Pinus	PLAIN	101-400
03070100952	1985	Refuse Scatter	1	Cohonina	MED VALLEY	2400	Pinus	PLAIN	101-400
03070100964	1985	Multiple Units	1	Cohonina	MED VALLEY	2268	Pinus	PLAIN	401-800
03070100975	1985	Refuse Scatter	1	Cohonina		1400	Pinus	HILL SLOPE	51-100
03070100985	1985	Gathering Camp	1	Unknown	LITH SCATTER	10800	Pinus	LOW RISE	51-100
03070100994	1985	Knapping	2	Cohonina		9440	Junip	LOW RISE	11-25
03070101010	1986	Gathering Camp	1	Cohonina		2800	Junip	HILL SLOPE	51-100
03070101012	1986	Gathering Camp	1	Cohonina		3360	Junip	HILL SLOPE	101-400
03070101014	1986	Food Processing Camp	1	Cohonina		6327	Pinus	EROSIONAL	26-50
03070101015	1986	Gathering Camp	1	Cohonina	MED VALLEY	3685	Junip	HILL SLOPE	26-50
03070101017	1986	Refuse Scatter	1	Cohonina		6000	Pinus	RIDGE	11-25
03070101037	1988	Surface House	1	Cohonina	MED VALLEY	10800	Pinus	RIDGE	101-400
03070101047	1986	Multiple Units	1	Cohonina		1800	Pinus	SADDLE	51-100
03070101058	1987	Food Processing Camp	1	Cohonina	MED VALLEY	2288	Junip	HILL SLOPE	51-100
03070101060	1987		0			0	Pinus		Present
03070101062	1987	Refuse Scatter	1	Cohonina	MED VALLEY	600	Pinus	HILL	11-25
03070101065	1987	Knapping	1	Cohonina	MED VALLEY	3250	Pinus	HILL SLOPE	801-5000

FS Site #	Date	Site Type	C	Culture	Phase/Period	Area	Veg	Landform	Lithics
03070101081	1987	Single Unit	1	Cohonina	COCO-MEDVALLEY	3000	Pinus	HILL SLOPE	101-400
03070101089	1987	Single Unit	1	Cohonina	MED VALLEY	11564	Pinus	HILL SLOPE	801-5000
03070101092	1987	Refuse Scatter	1	Cohonina	COCONINO	10200	Pinus	EROSIONAL	101-400
03070101093	1987	Corral	2	Unknown	SCATTER-HIST	8260	Pinus		401-800
03070101094	1987	Refuse Scatter	1	Archaic	LITH SCATTER	3300	Pinus	ARROYO	51-100
03070101118	1987	Refuse Scatter	1	Cohonina	MED VALLEY	8220	Pinus	RIDGE	101-400
03070101119	1987	Refuse Scatter	1	Cohonina		2646	Pinus	HILL SLOPE	101-400
03070101140	1988	Gathering Camp	1	Cohonina	MED VALLEY	20000	Pinus	HILL SLOPE	401-800
03070101141	1988	Refuse Scatter	1	Cohonina	MED VALLEY	4000	Pinus	HILL SLOPE	101-400
03070101145	1988	Refuse Scatter	1	Cohonina	MED VALLEY	6500	Pinus	HILL SLOPE	51-100
03070101147	1988	Gathering Camp	1	Cohonina	MED VALLEY	300	Pinus	RIDGE	51-100
03070101157	1988	Refuse Scatter	1	Cohonina	COCO/MEDVALLEY	2800	Pinus	HILL SLOPE	26-50
03070101173	1988	Gathering Camp	1	Historic	YAVAPAI	3920	Pinus	HILL SLOPE	101-400
03070101173	1988	Gathering Camp	1	Historic	YAVAPAI	3920	Pinus	HILL SLOPE	101-400
03070101174	1988	Gathering Camp	1	Unknown	LITH SCATTER	8800	Pinus	HILL SLOPE	101-400
03070101176	1988	Food Processing Camp	1	Cohonina	MED VALLEY	9000	Pinus	RIDGE	401-800
03070101189	1988	Refuse Scatter	1	Cohonina	COCO-MEDVALLEY	#####	Junip	RIDGE	5001-1000
03070101192	1988	Refuse Scatter	1	Cohonina	MED VALLEY	1200	Pinus	PLAIN	101-400
03070101198	1988	Refuse Scatter	1	Unknown	LITH SCATTER	500	Pinus	HILL SLOPE	101-400
03070101201	1988	Refuse Scatter	1	Unknown	LITH SCATTER	12000	Pinus	HILL SLOPE	101-400
03070101203	1988	Gathering Camp	1	Historic	YAVAPAI	4250	Junip	ARROYO	101-400
03070101206	1989	Gathering Camp	1	Archaic	LITH SCATTER	1560	Pinus	ARROYO	51-100
03070101217	1988	Pithouses/Surface House	2	Cohonina	MED VALLEY	9000	Pinus	HILL SLOPE	801-5000
03070101219	1988	Refuse Scatter	1	Unknown	LITH SCATTER	500	Pinus	ARROYO	101-400
03070101221	1988	Gathering Camp	1	Cohonina	COCO-MEDVALLEY	1250	Pinus	HILL SLOPE	51-100
03070101222	1988	Single Unit	1	Cohonina	COCO-MEDVALLEY	6336	Pinus	HILL	101-400
03070101228	1988	Gathering Camp	1	Cohonina	COCO-MEDVALLEY	3200	Junip	PLAIN	101-400
03070101241	1989	Knapping	1	Unknown	LITH SCATTER	1560	Junip		26-50
03070101274	1990	Refuse Scatter	2	Cohonina	MEDVAL + YAVA	910	Junip	PLAIN	401-800
03070101280	1990	Knapping	1	Historic	YAVAPAI	8000	Junip	HILL SLOPE	801-5000
03070101281	1990	Pithouses/Surface House	1	Cohonina	MED VALLEY	6400	Pinus	RIDGE	51-100
03070101285	1990	Single Unit	1	Cohonina	MED VALLEY	2000	Pinus	LOW RISE	51-100
03070101291	1990	Multiple Units	1	Cohonina	MED VALLEY	4900	Pinus	RIDGE	101-400

FS Site #	Date	Site Type	C	Culture	Phase/Period	Area	Veg	Landform	Lithics
03070101292	1990	Knapping	1	Archaic	LATE ARCHAIC	2000	Pinus	HILL SLOPE	101-400
03070101294	1990	Multiple Units	1	Cohonina	MED VALLEY	1050	Pinus	RIDGE	11-25
03070101296	1990	Knapping	1		PUEBLO II??	4550	Pinus	EROSIONAL	101-400
03070101300	1990	Single Unit	1	Cohonina	MED VALLEY	2700	Pinus	SADDLE	26-50
03070101307	1990	Refuse Scatter	2	Cohonina	COCO-MEDVALLEY	6600	Pinus	HILL SLOPE	101-400
03070101308	1990	Refuse Scatter	1	Cohonina	COCO-MEDVALLEY	550	Pinus	HILL SLOPE	51-100
03070101310	1990	Multiple Units	1	Cohonina	MED VALLEY	9000	Pinus	RIDGE	101-400
03070101317	1990	Single Unit	1	Cohonina	MED VALLEY	3200	Pinus	SADDLE	26-50
03070101319	1990	Knapping	1	Cohonina	MED VALLEY	43400	Pinus	HILL SLOPE	801-5000
03070101321	1990	Single Unit	1	Cohonina	MED VALLEY	924	Pinus	LOW RISE	51-100
03070101322	1990	Single Unit	1	Cohonina	MED VALLEY	4640	Pinus	PLAIN	101-400
03070101323	1990	Pithouses/Surface House	1	Cohonina	MED VALLE-HULL	11025	Pinus	PLAIN	101-400
03070101325	1990	Knapping	2	Cohonina	MEDVAL + ARCHA	10200	Pinus	HILL SLOPE	801-5000
03070101328	1990	Multiple Units	1	Cohonina	MED VALLEY	2112	Pinus	LOW RISE	101-400
03070101330	1990	Knapping	1	Unknown	LITH SCATTER	1600	Pinus	PLAIN	51-100
03070101339	1991	Food Processing Camp	1	Cohonina	MED VALLEY	2100	Pinus	RIDGE	26-50
03070101340	1990	Food Processing Camp	2	Historic	YAVAPAI	1824	Pinus	HILL SLOPE	401-800
03070101341	1990	Knapping	2	Cohonina	MED VALLEY	1224	Junip	PLAIN	51-100
03070101343	1990	Refuse Scatter	1	Historic	YAVAPAI	900	Pinus	PLAIN	51-100
03070101344	1990	Refuse Scatter	2	Cohonina	COCO&YAVAPAI	4225	Pinus	PLAIN	101-400
03070101345	1990	Refuse Scatter	0		LITH SCATTER	1200	Junip	PLAIN	51-100
03070101346	1990	Refuse Scatter	2	Cohonina	COCO-MEDVALLEY	2200	Pinus	PLAIN	101-400
03070101348	1990	Food Processing Camp	2	Archaic	-PROTOHISTORIC	3000	Pinus	PLAIN	51-100
03070101352	1990	Refuse Scatter	1		LITH SCATTER	10000	Junip	PLAIN	801-5000
03070101359	1990	Multiple Units	1	Cohonina	MED VALLEY	9350	Pinus	HILL	101-400
03070101362	1990	Food Processing Camp	1	Archaic	ARCHAIC LATE	4320	Pinus	HILL SLOPE	101-400
03070101363	1990	Food Processing Camp	1	Archaic	ARCHAIC	11250	Pinus	EROSIONAL	101-400
03070101369	1990	Single Unit	1	Cohonina	MED VALLEY	4200	Pinus	CONSTRICT	11-25
03070101370	1990	Single Unit	1	Cohonina	MED VALLEY	832	Pinus	PLAIN	51-100
03070101377	1990	Multiple Units	1	Cohonina	MED VALLEY	6768	Pinus	RIDGE	101-400
03070101380	1990	Room Block	1	Cohonina	MED VALLEY	2000	Pinus	RIDGE	26-50
03070101397	1991	Multiple Units	1	Cohonina	MED VALLEY	6900	Junip	CANYON RI	401-800
03070101398	1991	Ball Court	1	Cohonina	COCO-MEDVALLEY	10050	Pinus	CANYON RI	51-100

FS Site #	Date	Site Type	C	Culture	Phase/Period	Area	Veg	Landform	Lithics
03070101418	1991	Logging Camp	1	Historic	ANGLO-HISTORIC	2000	Junip	MESA	None Obs
03070101425	1991	Agricultural	1	Cohonina	MEDICINEVALLEY	3000	Pinus	LOW RISE	101-400
03070101436	1991	Knapping	1	Cohonina	COCO-MEDVALLEY	1500	Pinus	LOW RISE	101-400
03070101438	1991	Gathering Camp	1	Cohonina	MED VALLEY	7500	Pinus	RIDGE	101-400
03070101440	1991	Refuse Scatter	1	Cohonina	COCO-MEDVALLEY	3000	Pinus	RIDGE	101-400
03070101441	1991	Knapping	1	Cohonina	MED VALLEY	1600	Pinus	RIDGE	11-25
03070101443	1991	Knapping	2	Cohonina	COCO-MEDVALLEY	3000	Pinus	RIDGE	101-400
03070101444	1991	Knapping	2	Cohonina	COCO-MEDVALLEY	9000	Pinus	LOW RISE	401-800
03070101447	1991	Agricultural	1	Cohonina	MED VALLEY	2200	Pinus	RIDGE	401-800
03070101448	1991	Knapping	1	Cohonina	COCO-MEDVALLEY	2000	Pinus	RIDGE	101-400
03070101450	1991	Knapping	1	Cohonina	COCO-MEDVALLEY	4800	Pinus	RIDGE	51-100
03070101451	1991	Knapping	1	Archaic	LITH SCATTER	2400	Pinus	RIDGE	101-400
03070101453	1991	Knapping	1	Cohonina	MED VALLEY	3250	Pinus	RIDGE	401-800
03070101455	1991	Knapping	1	Unknown	LITH SCATTER	3600	Pinus	RIDGE	101-400
03070101456	1991	Knapping	1	Cohonina	COCO-MEDVALLEY	875	Pinus	RIDGE	51-100
03070101460	1991	Knapping	1	Unknown	LITH SCATTER	1500	Pinus	LOW RISE	51-100
03070101476	1991	Rock Pile	1	Cohonina	MED VALLEY	400	Pinus	CANYON RI	11-25
03070101477	1991	Refuse Scatter	1	Cohonina	MED VALLEY	1200	Pinus	CANYON RI	51-100
03070101480	1991	Knapping	1	Unknown	LITH SCATTER	6400	Pinus	CANYON RI	801-5000
03070101481	1991	Single Unit	1	Cohonina	MED VALLEY	700	Pinus	CANYON RI	51-100
03070101485	1991	Field House(s)	1	Cohonina	MEDICINEVALLEY	0	Junip	ALLUVIAL	51-100
03070101488	1991	Pithouse Village	1	Cohonina	MEDICINEVALLEY	24000	Pinus	LOW RISE	801-5000
03070200001	1976	Rock Art	2	Cohonina	COCO-MED/PAI	2000	Pinus	OPEN CANY	51-100
03070200054	1974	Surface House	1	Historic	ANGLO HISTORIC	0	Pinus	HILL SLOPE	Present
03070200086	1990	Railroad	2	Historic	ANGLO HISTORIC	63960	Pinus	ARROYO	5001-1000
03070200107	1988	Refuse Scatter	1	Cohonina	COCONINO	4200	Pinus	PLAIN	401-800
03070200202	1977	Single Unit	1	Cohonina	MED VALLEY	4000	Pinus	RIDGE	Present
03070200222	1989	Rock Shelter/Cave	1	Cohonina	COCO-MEDVALLEY	1320	Pinus	RIDGE	1-10
03070200240	1989	Pithouse	1	Cohonina	COCO-MEDVALLEY	4200	Pinus	RIDGE	51-100
03070200384	1979	Knapping	1	Cohonina	HUMPMOBILE	8400	Pinus	RIDGE	26-50
03070200385	1979	Knapping	1	Unknown	LITH SCATTER	12100	Pinus	PLAIN	101-400
03070200391	1976	Knapping	1	Archaic	LITH SCATTER	6624	Pinus	HILL SLOPE	101-400
03070200397	1979	Knapping	1	Unknown	LITH SCATTER	2736	Pinus	BENCH	51-100

FS Site #	Date	Site Type	C	Culture	Phase/Period	Area	Veg	Landform	Lithics
03070200398	1979	Knapping	1	Unknown	LITH SCATTER	10800	Pinus	ALLUVIAL	101-400
03070200415	1979	Refuse Scatter	1	Cohonina	COCONINO	4256	Pinus	RIDGE	11-25
03070200425	1979	Refuse Scatter	1	Cohonina	MED VALLEY	8250	Pinus	RIDGE	51-100
03070200426	1979	Subterranean Structure	1	Cohonina	MED VALLEY	18564	Pinus	RIDGE	101-400
03070200430	1979	Subterranean Structure	1	Cohonina		9240	Pinus	RIDGE	101-400
03070200443	1979	Single Unit	1	Cohonina	MED VALLEY	8320	Pinus	HILL SLOPE	101-400
03070200454	1979	Multiple Units	1	Cohonina	MED VALLEY	13000	Pinus	RIDGE	401-800
03070200460	1979	Village (Surface)	1	Cohonina	MED VALLEY	3465	Pinus	HILL	26-50
03070200463	1979	Refuse Scatter	1	CERBAT	COHO SINAGUA	2700	Pinus	PLAIN	26-50
03070200483	1978	Single Unit	1	Cohonina	MED VALLEY	9200	Pinus	PLAIN	Present
03070200496	1980	Knapping	1	Archaic	LITH SCATTER	300	Pinus	ALLUVIAL	26-50
03070200499	1980	Knapping	1	Unknown	LITH SCATTER	288	Pinus	ALLUVIAL	26-50
03070200548	1981	Room Block	1	Cohonina	MED PHASE	0	Pinus	RIDGE	801-5000
03070200551	1981	Refuse Scatter	1	Cohonina	MEDICINE PHASE	12000	Pinus	PLAIN	10001+
03070200560	1981	Room Block	1	Cohonina	MED VALLEY	11150	Pinus	PLAIN	101-400
03070200566	1981	Refuse Scatter	1	Cohonina	COCONINO	1107	Pinus	PLAIN	26-50
03070200570	1981	Single Unit	1	Cohonina	COCONINO	810	Pinus	RIDGE	11-25
03070200594	1982	Refuse Scatter	1	Cohonina	MED VALLEY	1600	Pinus	HILL SLOPE	101-400
03070200599	1982	Gathering Camp	1	Cohonina	MED VALLEY	1575	Pinus	HILL SLOPE	51-100
03070200625	1982	Refuse Scatter	1	Cohonina	MED VALLEY	1155	Pinus	UPPER BAJ	101-400
03070200626	1982	Refuse Scatter	1	Cohonina	COCONINO	1440	Pinus	LOWER BAJ	51-100
03070200643	1982	Refuse Scatter	1	Cohonina	MED VALLEY	1400	Pinus	HILL SLOPE	26-50
03070200653	1982	Pithouse Village	1	Cohonina	MED VALLEY	20000	Pinus	RIDGE	101-400
03070200680	1982	Multiple Units	1	Cohonina		3575	Pinus	PLAIN	101-400
03070200685	1982	Refuse Scatter	1	Unknown		1232	Pinus	PLAIN	101-400
03070200690	1983	Refuse Scatter	1	Cohonina	MED VALLEY	1085	Pinus	PLAIN	101-400
03070200693	1983	Refuse Scatter	1	Cohonina	COCONINO	375	Pinus	ALLUVIAL	51-100
03070200702	1983	Single Unit	2	Cohonina		3000	Pinus	PLAIN	101-400
03070200709	1984	Pithouse	1	Cohonina	MED VALLEY	2800	Pinus	RIDGE	26-50
03070200726	1984	Refuse Scatter	1	Unknown	LITH SCATTER	1800	Pinus	PLAIN	5001-1000
03070200727	1984	Knapping	1	Unknown	LITHSCATTER	1500	Junip	PLAIN	101-400
03070200729	1984	Mound; Nontrash, Nonbu	1	Cohonina	MED VALLEY	4000	Pinus	PLAIN	101-400
03070200734	1984	Surface House	1	Cohonina	MED VALLEY	10925	Pinus	HILL SLOPE	801-5000

FS Site #	Date	Site Type	C	Culture	Phase/Period	Area	Veg	Landform	Lithics
03070200741	1984	Single Unit	1	Cohonina		1800	Pinus	PLAIN	101-400
03070200748	1984	Refuse Scatter	1	Cohonina	MED VALLEY	3900	Pinus	PLAIN	101-400
03070200756	1985	Single Unit	1	Cohonina	MED VALLEY	3000	Pinus	HILL	51-100
03070200762	1985	Gathering Camp	1	Cohonina		1800	Junip	HILL SLOPE	26-50
03070200766	1985	Gathering Camp	1	Cohonina	MED VALLEY	1500	Junip	HILL SLOPE	1-10
03070200771	1985	Food Processing Camp	1	Cohonina	MED VALLEY	15000	Pinus	RIDGE	51-100
03070200772	1985	Refuse Scatter	1	Cohonina	MED VALLEY	1575	Pinus	LOW RISE	101-400
03070200791	1985	Rock Shelter/Cave	2	Cohonina	MED VALLEY	3000	Pinus	RIDGE	11-25
03070200810	1986	Knapping	1	Unknown	LITH SCATTER	0	Pinus	EROSIONAL	26-50
03070200841	1986	Gathering Camp	1	Historic		225	Pinus	RIDGE	None Obs
03070200856	1986	Gathering Camp	1	Cohonina	MED VALLEY	4050	Pinus	PLAIN	1-10
03070200857	1986	Single Unit	1	Cohonina	MED VALLEY	4950	Pinus	RIDGE	26-50
03070200894	1987	Refuse Scatter	1	Cohonina		850	Junip	EROSIONAL	26-50
03070200895	1987	Refuse Scatter	1	Cohonina		1364	Junip	LOW RISE	26-50
03070200914	1987	Refuse Scatter	1	Unknown	LITH SCATTER	2530	Pinus	PLAIN	801-5000
03070200922	1988	Knapping	1	Unknown	LITH SCATTER	2000	Pinus	EROSIONAL	51-100
03070200926	1988	Knapping	1	Unknown	LITH SCATTER	100	Pinus	HILL SLOPE	11-25
03070200935	1988	Knapping	1	Unknown	LITH SCATTER	36000	Pinus	PLAIN	801-5000
03070201014	1989	Gathering Camp	1	Cohonina	NSIN?	1764	Pinus	PLAIN	101-400
03070201027	1989	Refuse Scatter	1	Cohonina	COCO-MEDVALLEY	400	Pinus	PLAIN	51-100
03070201030	1989	Single Unit	1	Cohonina	COCO-MEDVALLEY	2640	Pinus	PLAIN	1-10
03070201054	1989	Knapping	1	Cohonina	COCO-MEDVALLEY	2500	Pinus	LOW RISE	51-100
03070201056	1989	Single Unit	1	Cohonina	COCO-MEDVALLEY	800	Pinus	LOWER BAJ	51-100
03070201057	1989	Food Processing Camp	1	Cohonina	COCO-MEDVALLEY	3300	Pinus	RIDGE	26-50
03070201058	1989	Pithouse	1	Cohonina	MED VALLEY	3500	Pinus	RIDGE	51-100
03070201062	1989	Refuse Scatter	1	Cohonina	MED VALLEY	9500	Pinus	RIDGE	51-100
03070201072	1989	Knapping	1	Unknown	LITH SCATTER	2400	Pinus	PLAIN	26-50
03070201077	1989	Refuse Scatter	2	Cohonina	COCO-MEDVALLEY	8000	Pinus	PLAIN	51-100
03070201078	1989	Refuse Scatter	2	Unknown	LITH SCATTER	#####	Pinus	PLAIN	5001-1000
03070201086	1989	Refuse Scatter	1	Unknown	LITH SCATTER	1500	Pinus	ARROYO	26-50
03070201094	1989	Refuse Scatter	1	Unknown	LITH SCATTER	10400	Pinus	LOW RISE	51-100
03070201117	1990	Cabin(s)	3	Historic	ANGLO HISTORIC	23400	Pinus	PLAIN	801-5000
03070201123	1989	Refuse Scatter	2	Historic	ANGLO+ARCHAIC	11900	Dougla	EROSIONAL	101-400

FS Site #	Date	Site Type	C	Culture	Phase/Period	Area	Veg	Landform	Lithics
03070201127	1989	Refuse Scatter	2	Cohonina	MED VALLEY	800	Pinus	PLAIN	26-50
03070201133	1989	Gathering Camp	3	Cohonina	COCO-MEDVALLEY	0	Junip	CANYON RI	401-800
03070201136	1989	Gathering Camp	1	CERBAT	HAVASUPAI	800	Junip	HILL SLOPE	26-50
03070201142	1990	Knapping	1	Archaic		1300	Pinus	BENCH	51-100
03070201172	1990	Field House(s)	1	Cohonina	MED VALLEY	672	Pinus	UPPER BAJ	11-25
03070201178	1990	Food Processing Camp	1	Cohonina	MED VALLEY	3298	Pinus	RIDGE	101-400
03070201181	1990	Gathering Camp	2	Cohonina	MED VALLEY	3332	Pinus	LOW RISE	101-400
03070201197	1990	Knapping	1	Archaic		1530	Pinus	RIDGE	26-50
03070201202	1990	Refuse Scatter	1	Cohonina	COCO-MEDVALLEY	4256	Pinus	EROSIONAL	1-10
03070201207	1990	Food Processing Camp	1	Cohonina	COCO-MEDVALLEY	1768	Pinus	HILL SLOPE	26-50
03070201208	1990	Multiple Units	1	Cohonina	MED VALLEY	17500	Pinus	RIDGE	51-100
03070201209	1990	Field House(s)	1	Cohonina	COCO-MEDVALLEY	1440	Pinus	HILL SLOPE	11-25
03070201210	1990	Field House(s)	1	Cohonina	MED VALLEY	2640	Pinus	HILL SLOPE	51-100
03070201228	1991	Multiple Units	1	Cohonina	MED VALLEY	7200	Pinus	LOW RISE	801-5000
03070201235	1990	Knapping	1	Archaic	LATE ARCHAIC	9900	Pinus	LOW RISE	801-5000
03070201238	1990	Knapping	1	Archaic	LATE ARCHAIC	2600	Pinus	PLAIN	401-800
03070201250	1990	Knapping	2	Archaic	LITH SCATTER	200	Pinus	BASIN	51-100
03070201282	1990	Pithouse	1	Cohonina	COCO-MEDVALLEY	14000	Pinus	RIDGE	51-100
03070201283	1990	Gathering Camp	1	Cohonina	COCO-MEDVALLEY	2800	Pinus	HILL SLOPE	51-100
03070201292	1990	Rock Shelter/Cave	1	Cohonina	COCONINO	600	Pinus	SCARP/CLI	51-100
03070201294	1990	Multiple Units	1	Cohonina	COCO-MEDVALLEY	2800	Pinus	HILL SLOPE	101-400
03070201306	1990	Agricultural	1	Cohonina	COCO-MEDVALLEY	7650	Pinus	PLAIN	101-400
03070201309	1990	Pithouses/Surface House	1	Cohonina	MED VALLEY	52000	Pinus	RIDGE	801-5000
03070201312	1990	Refuse Scatter	2	Cohonina	COCO-MED-HAVA	14000	Pinus	SADDLE	101-400
03070201314	1990	Refuse Scatter	1	Cohonina	MED VALLEY	9900	Pinus	HILL SLOPE	51-100
03070201322	1990	Knapping	1	Unknown	LITH SCATTER	2250	Pinus	TERRACE	51-100
03070201337	1990	Pithouses/Surface House	1	Cohonina	MED VALLEY	7700	Pinus	RIDGE	401-800
03070201339	1990	Pithouse Village	1	Cohonina	COCO-MEDVALLEY	16800	Pinus	EROSIONAL	10001+
03070201340	1990	Pithouse Village	1	Cohonina	COCO-MEDVALLEY	78000	Pinus	EROSIONAL	10001+
03070201402	1991	Pithouses/Surface House	1	Cohonina	COCO-MEDVALLEY	1000	Pinus	HILL SLOPE	26-50
03070201403	1991	Pithouses/Surface House	1	Cohonina	MED VALLEY	2000	Pinus	EROSIONAL	26-50
03070400007	1972		1			20000			Present
03070400033	1976	Knapping	0			7500			Present

FS Site #	Date	Site Type	C	Culture	Phase/Period	Area	Veg	Landform	Lithics
03070400056	1976	Knapping	0			1600	Pinus		Present
03070400062	1976	Knapping	0			107	Pinus		Present
03070400064	1976	Knapping	0			371	Pinus		Present
03070400065	1976	Knapping	0			432	Pinus		Present
03070400066	1983	Knapping	0			6600			Present
03070400069	1976	Knapping	2			1216	Pinus		401-800
03070400076	1976	Knapping	0			2500	Pinus		Present
03070400081	1975	Knapping	1	Unknown	LITH SCATTER	0	Pinus		Present
03070400097	1976	Knapping	1	Unknown	LITH SCATTER	2500	Pinus	RIDGE	11-25
03070400105	1976	Knapping	1	Unknown	LITH SCATTER	1500	Pinus	HILL SLOPE	Present
03070400134	1977		1	Cohonina	MED VALLEY	8500	Pinus		Present
03070400137	1977	Knapping	1	Archaic	L. ARCHAIC	0	Pinus		Present
03070400164	1978	Refuse Scatter	1	Anasazi		250	Junip	RIDGE	Present
03070400177	1979	Refuse Scatter	1	Cohonina		2520	Pinus	ARROYO	101-400
03070400272	1979	Refuse Scatter	2	Cohonina	MED VALLEY	7350	Pinus	RIDGE	401-800
03070400274	1979	Knapping	1	Archaic	LITH SCATTER	4440	Pinus	RIDGE	1-10
03070400275	1979	Knapping	1	Archaic	LITH SCATTER	960	Pinus	RIDGE	26-50
03070400298	1980	Refuse Scatter	1	Cohonina	MEDICINE VY	4050	Pinus	RIDGE	401-800
03070400304	1980	Knapping	1	Unknown	LITH SCATTER	1598	Pinus	RIDGE	101-400
03070400310	1980	Knapping	1	Cohonina		16800	Pinus	HILL SLOPE	
03070400329	1980	Gathering Camp	1	Cohonina	INA MED VALLEY	4270	Pinus	HILL SLOPE	51-100
03070400332	1980	Refuse Scatter	1	Cohonina		600	Pinus	HILL SLOPE	26-50
03070400333	1980	Knapping	1	Unknown	LITH SCATTER	3025	Pinus	HILL SLOPE	101-400
03070400334	1980	Single Unit	1	Cohonina	INA MED VALLEY	50400	Pinus	HILL	801-5000
03070400336	1980	Food Processing Camp	1	Unknown	LITH SCATTER	2095	Pinus	HILL	101-400
03070400337	1980	Refuse Scatter	1	Cohonina		5250	Pinus	HILL	51-100
03070400340	1980	Refuse Scatter	1	Cohonina	INA MED VALLEY	15400	Pinus	HILL SLOPE	401-800
03070400347	1980	Knapping	1	Unknown	LITH SCATTER	8787	Pinus	HILL SLOPE	801-5000
03070400352	1980	Knapping	2	Cohonina		14994	Pinus	LOW RISE	801-5000
03070400353	1980		1	Unknown	LITH SCATTER	1935	Pinus	HILL SLOPE	51-100
03070400354	1980	Knapping	1	Unknown	LITH SCATTER	4800	Pinus	LOW RISE	5001-1000
03070400357	1980	Refuse Scatter	1	Anasazi		3634	Pinus	RIDGE	401-800
03070400359	1980	Refuse Scatter	1	Unknown	LITH SCATTER	5200	Pinus	HILL SLOPE	401-800

FS Site #	Date	Site Type	C	Culture	Phase/Period	Area	Veg	Landform	Lithics
03070400361	1980	Refuse Scatter	1	Unknown	LITH SCATTER	2604	Pinus	HILL SLOPE	101-400
03070400362	1980	Refuse Scatter	1	Unknown	LITH SCATTER	1210	Pinus	HILL	401-800
03070400365	1980	Refuse Scatter	1	Unknown	LITH SCATTER	4355	Pinus	PLAIN	101-400
03070400366	1980	Refuse Scatter	1	Unknown	LITH SCATTER	825	Pinus	PLAIN	101-400
03070400368	1980	Refuse Scatter	1	Cohonina		16884	Pinus	PLAIN	401-800
03070400369	1980	Refuse Scatter	1	Unknown	LITH SCATTER	2420	Pinus	RIDGE	401-800
03070400375	1980	Refuse Scatter	1	Unknown	LITH SCATTER	1881	Pinus	LOW RISE	801-5000
03070400378	1980	Food Processing Camp	1	Unknown	LITH SCATTER	3402	Pinus	LOW RISE	101-400
03070400389	1980	Gathering Camp	1	Cohonina		10500	Pinus	HILL SLOPE	401-800
03070400399	1980	Knapping	1	Unknown	LITH SCATTER	756	Pinus	HILL SLOPE	101-400
03070400403	1980	Knapping	1	Unknown	LITH SCATTER	1855	Pinus	PLAIN	401-800
03070400412	1980	Multiple Units	1	Anasazi	ZI PI	2000	Pinus	HILL	101-400
03070400440	1982	Knapping	1	Cohonina		8550	Pinus	RIDGE	801-5000
03070400441	1982	Refuse Scatter	1	Unknown	LITH SCATTER	5300	Pinus	PLAIN	101-400
03070400452	1983	Knapping	1	Unknown	LITH SCATTER	4465	Pinus	RIDGE	5001-1000
03070400461	1983	Single Unit	2	Cohonina	MED VALLEY	3910	Pinus	RIDGE	401-800
03070400470	1983	Manufacturing	1	Unknown	LITH SCATTER	#####	Pinus	HILL	5001-1000
03070400482	1984	Refuse Scatter	1	Cohonina	MED VALLEY	9000	Pinus	RIDGE	101-400
03070400500	1984	Field House(s)	1	Anasazi	PI-PII	2400	Pinus	RIDGE	26-50
03070400509	1984	Single Unit	1	Anasazi	PII	2475	Artem	PLAIN	401-800
03070400527	1984	Refuse Scatter	1	Cohonina	COCONINO	1710	Pinus	RIDGE	101-400
03070400529	1984	Wickiup	2	Historic	NAVAJO	3016	Pinus	RIDGE	51-100
03070400533	1984	Knapping	1	Archaic		400	Pinus	ARROYO	401-800
03070400547	1984	Refuse Scatter	1	Cohonina	MED VALLEY	2125	Pinus	PLAIN	5001-1000
03070400550	1984	Refuse Scatter	1	Cohonina	MED VALLEY	7600	Pinus	PLAIN	401-800
03070400567	1984	Refuse Scatter	1	Cohonina	COCNINO	6750	Pinus	RIDGE	801-5000
03070400570	1984	Refuse Scatter	1	Cohonina	MED VALLEY	500	Pinus	EROSIONAL	101-400
03070400572	1984	Knapping	1	Unknown	LITHSCATTER	1500	Pinus	RIDGE	801-5000
03070400580	1985	Gathering Camp	1	Cohonina	MED VALLEY	2200	Pinus	RIDGE	51-100
03070400599	1985	Knapping	1	Unknown	LITH SCATTER	8400	Pinus	RIDGE	801-5000
03070400602	1986	Refuse Scatter	1	Cohonina		10880	Pinus	HILL SLOPE	11-25
03070400605	1986	Refuse Scatter	1	Cohonina	MED VALLEY	1400	Pinus	HILL SLOPE	11-25
03070400606	1986	Gathering Camp	2	Historic	NAVAJO	1575	Pinus	HILL SLOPE	26-50

FS Site #	Date	Site Type	C	Culture	Phase/Period	Area	Veg	Landform	Lithics
03070400622	1986	Gathering Camp	1	Anasazi	PII	2500	Pinus	RIDGE	51-100
03070400656	1986	Knapping	1	Archaic		0	Pinus	RIDGE	26-50
03070400740	1987	Gathering Camp	1	Cohonina	MED VALLEY	8160	Pinus	RIDGE	101-400
03070400745	1987	Knapping	2	Cohonina	MED VALLEY	27000	Pinus	RIDGE	801-5000
03070400816	1988	Refuse Scatter	1	Cohonina	COCONINO	3000	Pinus	LOWER BAJ	101-400
03070400821	1988	Refuse Scatter	2	Cohonina	ARCHAIC	4000	Pinus	RIDGE	401-800
03070400823	1988	Refuse Scatter	1	Cohonina	MED VALLEY	1050	Pinus	FAN	51-100
03070400886	1989	Pueblo	2	Anasazi	COHONINA	10500	Junip	BENCH	51-100
03070400890	1989	Refuse Scatter	1	Cohonina	MED VALLEY	2475	Pinus	BENCH	401-800
03070400905	1990	Refuse Scatter	2	Anasazi	PII/PIII-COHO	4032	Pinus	RIDGE	101-400
03070400913	1990	Knapping	1	Anasazi	PII/PIII	5376	Pinus	RIDGE	51-100
03070400917	1990	Multiple Units	2	Anasazi	PII/PIII-COHO	5941	Pinus	RIDGE	101-400
03070400920	1990	Refuse Scatter	2	Anasazi	PI/PIV	8000	Pinus	EROSIONAL	401-800
03070400990	1991	Knapping	1	Unknown	LITH SCATTER	320	Pinus	RIDGE	101-400
03070400991	1991	Knapping	1	Unknown	LITH SCATTER	23750	Pinus	ARROYO	101-400
03070400992	1991	Knapping	1	Unknown	LITH SCATTER	1400	Pinus	RIDGE	51-100
03070400997	1991	Multiple Units	1	Cohonina	MED VALLEY	4800	Pinus	RIDGE	401-800
03070401003	1991	Rock Shelter/Cave	2	CERBAT	HAVASUPAI	1300	Pinus	SCARP/CLI	101-400
03070401006	1991	Knapping	1	Unknown	LITH SCATTER	7800	Pinus	ARROYO	101-400
03070401009	1991	Knapping	1	Unknown	LITH SCATTER	2160	Pinus	ARROYO	101-400
03070401017	1991	Knapping	1	Unknown	LITH SCATTER	5400	Pinus	ARROYO	101-400
03070401018	1991	Knapping	2	Unknown	SCATTER/HIST	48000	Pinus	FAN	101-400

FS Site #	Groundstone	Ceramics	Sub	Sur	WL	PS	MD	Ht	CT	RP	NR	MC	DP	WS	NM	BG	QM	BD	MF
03070100070	1-10	401-800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100095	Present	Present	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100120	Present	Present	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100125	Present	Present	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100130	Present	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100169			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100235	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100238	None Obs	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100274	Present	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100277	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100282	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100297	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100304	11-25	26-50	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
03070100310	26-50	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100314	11-25	51-100	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070100324	51-100	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100325	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100326	26-50	51-100	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070100342	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100382	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100388	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100391	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100403	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100411	26-50	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070100421	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100430	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100435	11-25	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100452	11-25	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
03070100468	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100481	101-400	26-50	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070100487	None Obs	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100488	1-10	51-100	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100490	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FS Site #	Groundstone	Ceramics	Sub	Sur	WL	PS	MD	Ht	CT	RP	NR	MC	DP	WS	NM	BG	QM	BD	MF
03070100496	11-25	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100497	11-25	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100501	1-10	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100505	11-25	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100506	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100507	11-25	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100513	11-25	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100514	101-400	26-50	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
03070100515	26-50	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070100516	None Obs	26-50	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
03070100518	51-100	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100522	11-25	26-50	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070100523	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100533	11-25	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100534	26-50	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100537	None Obs	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100552	11-25	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100554	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100555	1-10	101-400	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070100562	1-10	51-100	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100565	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100572	1-10	401-800	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
03070100574	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100577	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100584	11-25	26-50	1	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2
03070100595	1-10	101-400	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070100619	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100647	26-50	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100648	1-10	401-800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100649	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100652	None Obs	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100655	26-50	801-5000	0	8	1	0	0	0	0	0	1	0	0	18	0	0	0	0	4
03070100661	1-10	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

FS Site #	Groundstone	Ceramics	Sub	Sur	WL	PS	MD	Ht	CT	RP	NR	MC	DP	WS	NM	BG	QM	BD	MF
03070100662	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100711	1-10	101-400	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100712	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100721	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100722	None Obs	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100723	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100725	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100726	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100734	1-10	None Obs	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070100739	26-50	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100743	26-50	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100750	11-25	101-400	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100755	26-50	26-50	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070100760	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100771	26-50	11-25	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070100775	None Obs	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070100779	11-25	101-400	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100783	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100790	1-10	101-400	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100794	1-10	51-100	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070100796	26-50	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100799	11-25	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100800	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100802	11-25	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100804	26-50	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100805	1-10	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100806	11-25	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100808	1-10	26-50	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100809	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100813	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100815	1-10	1-10	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100822	11-25	801-5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100823	11-25	51-100	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

FS Site #	Groundstone	Ceramics	Sub	Sur	WL	PS	MD	Ht	CT	RP	NR	MC	DP	WS	NM	BG	QM	BD	MF
03070100830	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100832	26-50	101-400	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070100833	1-10	51-100	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070100837	26-50	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100851	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100853	1-10	101-400	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100859	1-10	401-800	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03070100862	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100892	None Obs	51-100	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100911	26-50	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100916	11-25	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
03070100918	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100921	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100924	1-10	1-10	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070100939	1-10	26-50	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100948	1-10	11-25	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100949	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100952	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100964	1-10	401-800	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
03070100975	1-10	51-100	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070100985	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070100994	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101010	11-25	26-50	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101012	11-25	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101014	11-25	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070101015	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101017	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101037	None Obs	401-800	0	5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4
03070101047	1-10	51-100	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
03070101058	11-25	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101060		Present	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101062	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101065	None Obs	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FS Site #	Groundstone	Ceramics	Sub	Sur	WL	PS	MD	Ht	CT	RP	NR	MC	DP	WS	NM	BG	QM	BD	MF
03070101081	11-25	51-100	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101089	51-100	801-5000	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101092	11-25	101-400	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101093	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
03070101094	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101118	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101119	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101140	None Obs	26-50	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101141	11-25	51-100	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101145	26-50	401-800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101147	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101157	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
03070101173	1-10	1-10	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070101173	1-10	1-10	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070101174	1-10	1-10	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070101176	26-50	101-400	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	2
03070101189	101-400	401-800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070101192	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101198	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101201	11-25	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101203	1-10	1-10	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070101206	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101217	26-50	801-5000	1	1	0	0	1	0	0	1	0	0	0	2	0	0	0	0	0
03070101219	1-10	1-10	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0
03070101221	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101222	26-50	51-100	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101228	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101241	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101274	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101280	11-25	Present	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101281	1-10	51-100	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101285	None Obs	51-100	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101291	1-10	401-800	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3

FS Site #	Groundstone	Ceramics	Sub	Sur	WL	PS	MD	Ht	CT	RP	NR	MC	DP	WS	NM	BG	QM	BD	MF
03070101292	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101294	None Obs	11-25	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070101296	None Obs	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101300	1-10	51-100	0	2	0	0	0	0	3	0	0	0	0	10	0	0	0	0	1
03070101307	26-50	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101308	11-25	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101310	1-10	401-800	0	10	0	0	0	0	0	0	0	0	0	7	0	0	0	0	1
03070101317	1-10	401-800	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101319	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101321	1-10	101-400	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
03070101322	1-10	51-100	0	3	0	0	0	0	0	0	0	0	0	2	1	0	0	0	7
03070101323	1-10	101-400	1	7	2	0	0	0	0	0	0	0	1	0	0	2	0	0	2
03070101325	1-10	Present	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101328	1-10	101-400	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070101330	None Obs	None Obs	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070101339	11-25	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
03070101340	26-50	51-100	0	0	3	2	0	0	0	4	0	0	0	0	0	0	0	0	0
03070101341	1-10	1-10	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101343	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101344	26-50	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101345	11-25	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101346	1-10	1-10	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070101348	11-25	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070101352	51-100	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101359	1-10	101-400	0	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101362	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101363	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101369	1-10	1-10	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070101370	1-10	26-50	0	2	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0
03070101377	1-10	101-400	1	36	0	0	0	0	6	0	0	0	0	0	0	1	0	0	19
03070101380	1-10	11-25	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101397	1-10	101-400	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101398	1-10	51-100	0	4	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1

FS Site #	Groundstone	Ceramics	Sub	Sur	WL	PS	MD	Ht	CT	RP	NR	MC	DP	WS	NM	BG	QM	BD	MF
03070101418	1-10	1-10	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
03070101425	11-25	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101436	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101438	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101440	11-25	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101441	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070101443	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
03070101444	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
03070101447	Present	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070101448	11-25	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101450	1-10	26-50	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101451	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101453	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070101455	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101456	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070101460	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101476		Present	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070101477	None Obs	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070101480	1-10	None Obs	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070101481	None Obs	26-50	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070101485	1-10	51-100	0	4	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
03070101488	1-10	801-5000	2	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	3
03070200001		1-10	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
03070200054	None Obs	None Obs	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200086	None Obs	None Obs	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	2
03070200107	1-10	401-800	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200202	None Obs	Present	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200222	None Obs	None Obs	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200240	1-10	11-25	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
03070200384	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200385	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200391	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200397	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FS Site #	Groundstone	Ceramics	Sub	Sur	WL	PS	MD	Ht	CT	RP	NR	MC	DP	WS	NM	BG	QM	BD	MF
03070200398	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200415	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200425	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200426	1-10	401-800	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070200430	11-25	11-25	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200443	1-10	401-800	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200454	11-25	401-800	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
03070200460	None Obs	26-50	0	8	0	0	0	0	2	0	0	1	0	0	0	0	0	0	2
03070200463	None Obs	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200483	Present	Present	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200496	None Obs	None Obs	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
03070200499	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200548	1-10	801-5000	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200551	1-10	10001+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200560	None Obs	101-400	0	2	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0
03070200566	None Obs	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070200570	None Obs	101-400	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200594	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070200599	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200625	None Obs	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200626	None Obs	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200643	None Obs	51-100	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
03070200653	11-25	801-5000	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	3
03070200680	None Obs	101-400	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
03070200685	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200690	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070200693	None Obs	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200702	1-10	101-400	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
03070200709	1-10	101-400	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200726	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200727	None Obs	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200729	1-10	51-100	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
03070200734	1-10	801-5000	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

FS Site #	Groundstone	Ceramics	Sub	Sur	WL	PS	MD	Ht	CT	RP	NR	MC	DP	WS	NM	BG	QM	BD	MF
03070200741	None Obs	101-400	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200748	None Obs	401-800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200756	1-10	401-800	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200762	None Obs	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200766	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200771	11-25	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
03070200772	1-10	401-800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200791	1-10	26-50	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
03070200810	None Obs	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200841	None Obs	None Obs	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
03070200856	None Obs	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200857	None Obs	51-100	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200894	None Obs	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200895	None Obs	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200914	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200922	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200926	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070200935	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201014	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201027	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201030	None Obs	None Obs	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
03070201054	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201056	1-10	51-100	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070201057	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070201058	1-10	1-10	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
03070201062	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201072	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201077	1-10	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201078	None Obs	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201086	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201094	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201117	None Obs	None Obs	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	1	1
03070201123	None Obs	None Obs	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2

FS Site #	Groundstone	Ceramics	Sub	Sur	WL	PS	MD	Ht	CT	RP	NR	MC	DP	WS	NM	BG	QM	BD	MF
03070201127	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201133	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201136	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201142	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201172	None Obs	26-50	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201178	1-10	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201181	None Obs	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201197	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201202	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201207	1-10	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
03070201208	1-10	51-100	0	6	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201209	1-10	26-50	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201210	1-10	51-100	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201228	1-10	801-5000	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070201235	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201238	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201250	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070201282	None Obs	26-50	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
03070201283	None Obs	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201292	11-25	101-400	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
03070201294	Present	801-5000	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201306	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0
03070201309	11-25	801-5000	2	1	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
03070201312	Present	401-800	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201314	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201322	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201337	Present	401-800	3	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
03070201339	1-10	10001+	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201340	51-100	10001+	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201402	Present	401-800	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070201403	None Obs	26-50	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400007	None Obs	Present	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400033	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

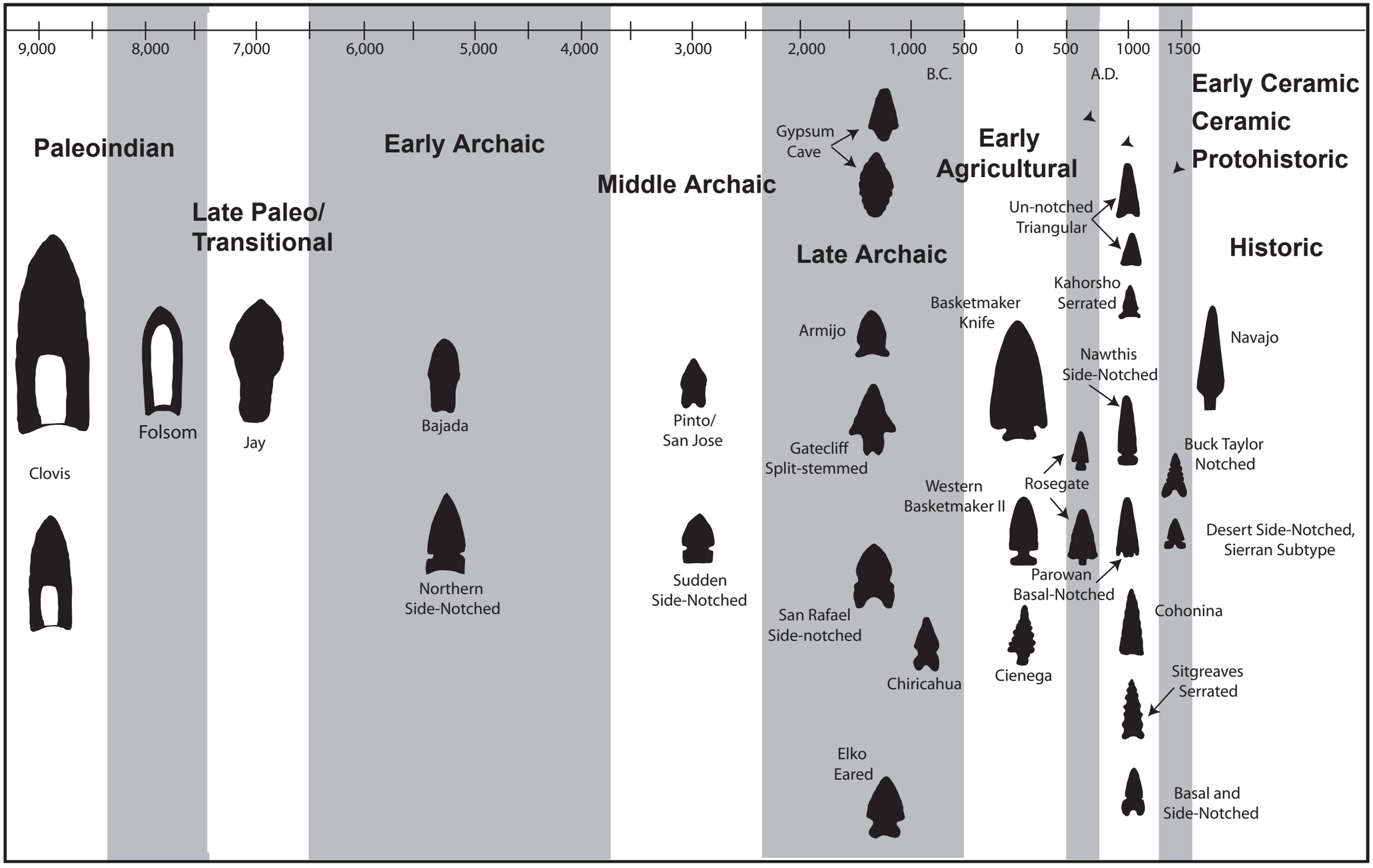
FS Site #	Groundstone	Ceramics	Sub	Sur	WL	PS	MD	Ht	CT	RP	NR	MC	DP	WS	NM	BG	QM	BD	MF
03070400056	Present	Present	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400062			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400064			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400065			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400066			0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
03070400069	11-25		0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
03070400076			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400081	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400097			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400105		None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400134	Present	Present	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070400137	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400164	None Obs	Present	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400177	None Obs	51-100	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400272	None Obs	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070400274	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400275	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400298	1-10	401-800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400304	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400310	None Obs	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400329	None Obs	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070400332	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400333	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400334	1-10	101-400	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400336	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
03070400337	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400340	None Obs	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400347	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400352	None Obs	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400353	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400354	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400357	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400359	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

FS Site #	Groundstone	Ceramics	Sub	Sur	WL	PS	MD	Ht	CT	RP	NR	MC	DP	WS	NM	BG	QM	BD	MF
03070400361	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400362	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400365	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400366	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400368	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400369	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400375	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400378	1-10	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400389	1-10	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400399	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400403	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400412		26-50	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400440	1-10	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400441	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400452	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400461	1-10	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070400470	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400482	1-10	801-5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400500	None Obs	11-25	0	1	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0
03070400509	1-10	401-800	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400527	None Obs	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400529	None Obs	51-100	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
03070400533	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400547	1-10	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400550	None Obs	401-800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400567	1-10	401-800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400570	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400572	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
03070400580	None Obs	101-400	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400599	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400602	None Obs	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400605	None Obs	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070400606	None Obs	1-10	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1

FS Site #	Groundstone	Ceramics	Sub	Sur	WL	PS	MD	Ht	CT	RP	NR	MC	DP	WS	NM	BG	QM	BD	MF
03070400622	1-10	1-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400656	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400740	1-10	401-800	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400745	1-10	26-50	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400816	1-10	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070400821	None Obs	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400823	None Obs	11-25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400886	1-10	101-400	0	5	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0
03070400890	1-10	401-800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070400905	None Obs	101-400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
03070400913	None Obs	26-50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070400917	1-10	51-100	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400920	None Obs	51-100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
03070400990	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400991	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400992	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070400997	None Obs	51-100	2	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
03070401003	1-10	1-10	0	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	1
03070401006	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070401009	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070401017	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03070401018	None Obs	None Obs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix D

Timeline of Projectile Point Types used as Temporal Markers for the Study


9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
500
0
500
1000
1500
B.C.
A.D.
Paleoindian
Late Paleo/
Transitional
Early Archaic
Middle Archaic
Late Archaic
Early
Agricultural
Early Ceramic
Ceramic
Protohistoric
Historic
Clovis
Folsom
Jay
Bajada
Northern
Side-Notched
Pinto/
San Jose
Sudden
Side-Notched
Gypsum
Cave
Armijo
Gatecliff
Split-stemmed
San Rafael
Side-notched
Chiricahua
Elko
Eared
Basketmaker
Knife
Western
Basketmaker II
Rosegate
Parowan
Basal-Notched
Cienega
Un-notched
Triangular
Kahorsho
Serrated
Nawthis
Side-Notched
Cohonina
Sitgreaves
Serrated
Navajo
Buck Taylor
Notched
Desert Side-Notched,
Sierran Subtype
Basal and
Side-Notched