A General Historic Properties Treatment Plan for Archaeological Investigations Associated With FCC Cell Tower Construction Projects on Private Lands in Arizona

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ABSTRACT

Report Title: A General Historic Properties Treatment Plan for Archaeological Investigations Associated with FCC Cell Tower Construction Projects on Private Lands in Arizona

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Agencies: Federal Communications Commission, Arizona State Historic Preservation Office

Project Sponsor: Verizon Wireless (Verizon)

Project Description: Verizon constructs and collocates telecommunications facilities in Arizona. Due to the involvement of the Federal Communications Commission (FCC) in the projects, they are considered federal undertakings subject to Section 106 of the National Historic Preservation Act. The Arizona State Historic Preservation Office (SHPO) reviews FCC-licensed undertakings pursuant to two nationwide programmatic agreements. Some of Verizon's proposed undertakings may be found by the FCC and SHPO to have an adverse effect on historic properties listed in, or eligible for listing in, the National Register of Historic Places (NRHP).

The purpose of this *General Historic Properties Treatment Plan* (General HPTP) is to streamline the resolution of adverse effects to historic properties listed in, or eligible for listing in, the NRHP by Verizon-sponsored undertakings on private lands in Arizona. This streamlined resolution will also include the preparation of a project-specific addendum to the General HPTP. The General HPTP does not apply to state, county, municipal, or Tribal lands including private lands within tribal reservation boundaries, or to lands under federal jurisdiction.

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1. INTRODUCTION

Verizon Wireless (Verizon) constructs and collocates telecommunications facilities in Arizona. Due to the involvement of the Federal Communications Commission (FCC) in the projects, they are considered federal undertakings subject to review under Section 106 of the National Historic Preservation Act (NHPA) [54 United States Code (USC) § 306101] and its implementing regulations at 36 Code of Federal Regulations (CFR) Part 800. The Arizona State Historic Preservation Office (SHPO) reviews FCC-licensed undertakings pursuant to the Nationwide Programmatic Agreement for Review of Effects on Historic Properties for Certain Undertakings Approved by the Federal Communications Commission and to the Nationwide Programmatic Agreement for the Collocation of Wireless Antennas. Some of Verizon's proposed undertakings may be found by the FCC and SHPO to have adverse effects on historic properties listed in, or eligible for listing in, the National Register of Historic Places (NRHP).

The purpose of this *General Historic Properties Treatment Plan* (General HPTP) is to streamline the resolution of adverse effects to historic properties listed in, or eligible for listing in, the NRHP by Verizon-sponsored undertakings on private lands in Arizona. This streamlined resolution will also include the preparation of a project-specific addendum (Addendum Plan) to the General HPTP for each undertaking. The General HPTP does not apply to state, county, municipal, or Tribal lands including private lands within tribal reservation boundaries, or to lands under federal jurisdiction. It is anticipated that the number and location of projects conducted under this plan will roughly correspond to the population distribution across the state, so the majority of undertakings will likely be in the Phoenix and Tucson areas.

The HPTP applies to collocations as well as the construction of new facilities. Collocation refers to an arrangement where telecommunication facilities are installed on second party equipment allowing for interconnection or access to network elements. For example, telecommunication antenna can be installed on a street light owned by a municipality. Whereas collocated towers may not directly result in ground disturbance, they often secondarily result in impacts. Related entities often need to relocate utilities (street lights/traffic signals) and thereby causing ground disturbance with the installation of new equipment, new utility lines, or connections. As a result, ground-disturbing activities associated with collocated towers or equipment shall follow the same protocol for determining adverse effects, and will follow the same project-specific work plans and permitting as new construction projects. An exception would be collocated towers that are categorically excluded from the National Environmental Policy Act (NEPA) and NHPA process.

This General HPTP includes broad-based environmental and cultural contexts; a research design that identifies general research issues, questions, and data needed to address the questions; a discussion of field and laboratory methods and techniques that may be implemented to acquire data for a specific undertaking; a discussion of the treatment of human remains; discussions of permitting, curation, reporting, and consultation requirements; statements on personnel qualifications; a general monitoring and discovery plan that includes provisions and procedures

for evaluating and treating discoveries of unanticipated finds during the course of the undertaking; and a description of what is to be included in a project-specific Addendum Plan.

2. ENVIRONMENTAL CONTEXT

Arizona encompasses a wide range of environmental variation and diversity, including deserts, grass-covered plains, woodland- and shrub-covered hills, and coniferous-forested mountains, and all of these environments were occupied throughout prehistory and history. Broadly, there are three physiographic provinces in Arizona: the Basin and Range Province in the southern and western parts of the state; the southwestern portion of the Colorado Plateau, in the northern part of the state; and the Central Highlands Transition Zone between the other two. These provinces generally correspond with the primary ecoregions defined in the state: the Madrean Archipelago and the Sonoran and Mohave Basin and Range in the southern and western areas; the Arizona/New Mexico Plateau in the northern part of the state; and the Arizona/New Mexico Mountains, which run roughly northwest-southeast across the central portion of the state and separate the higher plateaus from the deserts and grasslands below (Griffith et al. 2014) (Figure 1).

The Madrean Archipelago, located in southeastern Arizona, includes the “sky islands”. It is a region of basins and ranges with local relief typically of 3,000 to 5,000 feet and characterized by exceptional floral and faunal species richness. The Sonoran Basin and Range and Mohave Basin and Range in the southern and western portions of the state are similar in their topography, which is characterized by broad basins and scattered mountains. They differ, however, in that the Sonoran is slightly hotter than the Mohave and contains large areas of paloverde-cactus shrub and saguaros, whereas the Mohave is dominated by creosote shrub. The Arizona/New Mexico Plateau contains numerous lower-level ecoregions with elevations ranging from about 4,000 feet to 8,000 feet; it is characterized varyingly by semi-desert grasslands, semi-desert shrub-steppe, and pinyon-juniper woodlands, among other vegetation communities. The Arizona/New Mexico Mountains ecoregion varies in elevation from about 3,000 feet to over 12,000 feet in the San Francisco Peaks. Accordingly, the vegetation communities vary from semi-desert grasslands and chaparral communities, to pinyon-juniper woodlands, to forests of spruce, fir, and aspen at the highest elevations.

Because the majority of projects done under this plan will likely be in the Phoenix or Tucson Basins, more physiographic detail is provided for those areas. The geology and soils of the state are too varied to provide a meaningful overview, and those components of the natural environment should be addressed on a project-specific basis.

The Phoenix Basin is bounded approximately by the Sierra Estrella on the southwest, the White Tank Mountains on the west, the Hieroglyphic and New River Mountains on the north, and the Superstition Mountains on the east. The principal watercourses in the basin are the Salt and Gila

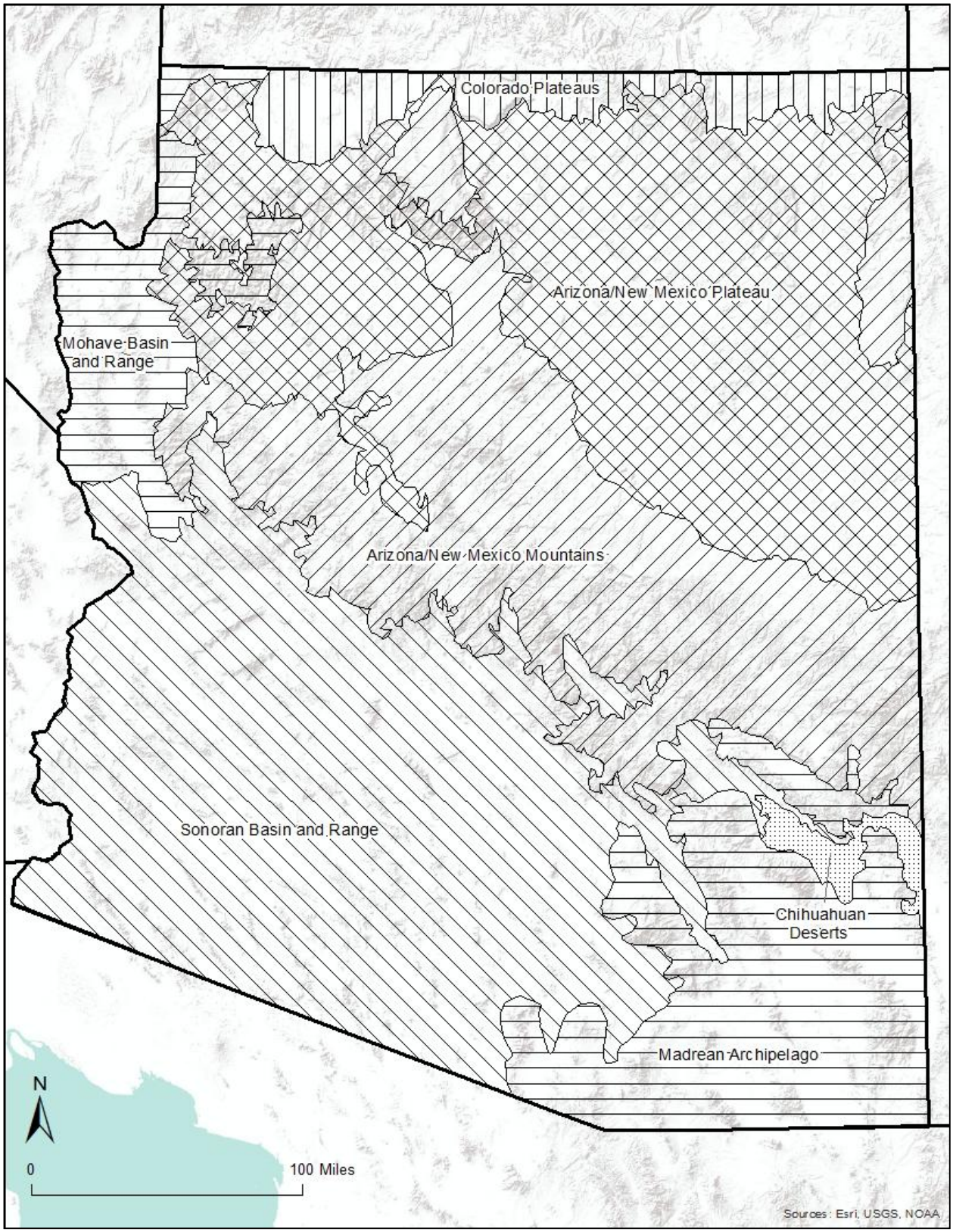

Figure 1. Level III Ecoregions in Arizona (adapted from Griffith et al. 2014).

Rivers; major tributaries to the Salt River include the Verde and Agua Fria Rivers. The central Phoenix Basin is in the Lower Colorado River Subdivision of the Sonoran Desert (Brown and Lowe 1980). Native vegetation in the basin includes creosote, palo verde, mesquite, saguaro cactus, barrel cactus, ocotillo, and various species of cholla and prickly pear (Shreve 1951). The Tucson Basin is bounded by the Santa Catalina Mountains on the north, the Tucson Mountains on the west, the Rincon Mountains on the east, and the Santa Rita mountains on the south. The principal watercourse in the basin is the Santa Cruz River; two of its main tributaries in the basin are the Rillito River and the Cañada del Oro. The Rillito River is created by the confluence of Tanque Verde and Pantano Washes. The Tucson Basin is in the Arizona Uplands Subdivision of the Sonoran Desert (Brown and Lowe 1980). Native vegetation in the basin includes creosote, palo verde, mesquite, saguaro cactus, barrel cactus, ocotillo, and various species of cholla and prickly pear (Shreve 1951).

3. CULTURAL CONTEXT

Undertakings adhering to this plan have the potential to adversely affect historic properties associated with groups or cultures who once lived, or still live, in the state. This cultural context therefore includes discussions of people known through both archaeology and history.

Paleoindian Period

The earliest documented Native American occupation of the Americas is the Paleoindian period, which began at least as early as 13,000 calendar years ago and lasted until around 10,500 years ago (Meltzer 2009). The Paleoindian period was characterized by small, highly mobile bands of people and a hunting-and-gathering way of life adapted to a climate that was generally cooler and wetter than today. Archaeological sites dating to the early part of the Paleoindian period are often associated with the remains of extinct large mammals such as mammoth and bison, which has long been interpreted as reflecting a heavy reliance on hunting big game (Waguespack and Surovell 2003). Early Paeloindian sites are typically identified by the presence of the distinctive fluted spear points of the Clovis and Folsom traditions. The most notable evidence for the Paleoindian period in Arizona comes from the Naco, Lehner, and Murray Springs sites, all located in the upper San Pedro River valley, and all particularly important to the definition and formulation of the Clovis cultural manifestation (Haury 1953; Haury et al. 1959; Haynes and Huckell, eds. 2007). Clovis projectile points have also been recovered from surficial contexts in the Tucson Basin (Hesse 2010) and the Phoenix Basin (North et al. 2005). Evidence of a Paleoindian presence in other parts of the state is for the most part limited to isolated finds of Clovis, Folsom, Agate Basin, Plainview, Cody and Allen projectile points (Haynes 2011; Huckell 2014; Mabry 1998: Figures 3.3 and 3.4).

Archaic Period

Following Huckell (1996), the Archaic period can be defined as the many millennia between the end of the Paleoindian period and the appearance of ceramics, which marks the beginning of the

Formative period. The period is generally characterized as a time of increasing sophistication in hunting and gathering techniques through technological development, of an evolution of more-complex subsistence-settlement systems, and of an increased dependence on plants (Mabry 1998). Although the period has been viewed as relatively stable and conservative from a cultural perspective, numerous labels have been applied to various models, cultures, stages, traditions, complexes, chronologies, and associated projectile points, which hints at considerable variation within the period (Huckell 1996; Mabry 1998). In this General HPTP some of this variation will be discussed under the common framework of Early, Middle, and Late Archaic. In southern Arizona the Late Archaic has essentially been replaced as a concept by the Early Agricultural period, which is discussed in a separate section below.

Early Archaic Period

There is clear, but limited, evidence for an Early Archaic period occupation in Arizona that began at least 8,500 years ago, possibly earlier (Huckell 1996). The Early Archaic was initially formulated as the Sulphur Springs stage of the Cochise Culture from work at stratified sites in southeastern Arizona (Sayles and Antevs 1941; Waters 1986). Ground stone, unifacially retouched scrapers, faunal bone, and fire-cracked rock were all recovered, but projectile points were absent. In northeastern Arizona the period is represented by at least three sites, two of which were in open locations and one in a rockshelter (Huckell 1996; Parry et al. 1994). In the Phoenix area, two Early Archaic period pit structures have been dated to about 7,000 years old, perhaps the earliest structures known in Arizona (Graves et al. 2011). Jay and Bajada points, diagnostic of the same-named phases of the Oshara Tradition (Irwin-Williams 1973), along with Pinto points, which are all diagnostic of the period, have been found in relatively small numbers throughout the state (Mabry 1998).

Middle Archaic Period

The Middle Archaic, which lasted from approximately 5,500 years ago to perhaps 3,500 or 4,000 years ago, is characterized by less regional differentiation as reflected in the wide distribution of the same or similar projectile point types, like San Jose/Pinto, Gypsum, and Elko, which may serve as chronological markers (Huckell 1996). In southern Arizona the Middle Archaic was originally formulated as the Chiricahua stage of the Cochise Culture, again based on work by Sayles and Antevs (1941; Waters 1986). The suite of material culture at those sites included the same inventory of ground stone, but with the addition of basin metates, mortars, pestles, and side-notched, concave-base projectile points that came to be known as Chiricahuas. Middle Archaic sites have been recorded at a number of locales in southern Arizona since then, including at Ventana Cave (Haury 1950); the Tucson Basin (Dart 1986; Gregory 1999; Kaldahl 2001); the Phoenix Basin (Hall and Wegener 2016; Wegener and Hall 2016); near the Picacho Mountains (Bayham et al. 1986) and Santa Cruz Flats (Halbirt and Henderson 1993); in the Santa Rita Mountains (Tagg and Huckell 1984); in the Avra Valley (Downum et al. 1986); and in the Tortolita Mountains (Roth 1988). The Middle Archaic is not as well documented in other parts of the state except by the presence of the projectile points mentioned above (Huckell 1996; Mabry 1998; Sliva

2009). Middle Archaic features include simple, subcircular structure depressions, hearths, rock-filled pits, clusters of fire-cracked rocks, and ground stone caches; human inhumations have also been documented (Huckell 1996).

Late Archaic Period

The Late Archaic period is characterized both by a continuation of the previously established hunting-and-gathering way of life and by a transition to a partial reliance on cultivation accompanied by population growth and the development of more-sedentary settlement patterns. These differences are largely geographic; the latter pattern is particularly well documented in the southern deserts and into the transition zone, where it is known as the Early Agricultural period, while the former pattern is seen to have continued into later prehistory on the Colorado Plateau (Huckell 1996; Mabry 2005a, b, c). By approximately 500 B.C. corn and squash had been introduced to the Plateau, which marks the beginning of the Basketmaker II period, discussed below.

Early Agricultural Period

Intensive use of the Santa Cruz River floodplain in the Early Agricultural period, from about 2100 B.C. to A.D. 50, is indicated by the recent excavation of surprisingly large settlements, which have included evidence for generally increased sedentism, the repeated use of specific locations, and ritual practices, particularly during the San Pedro phase (1200–800 B.C.) and Cienega phase (800 B.C.–A.D. 150) (Diehl, ed. 2005; Mabry 2008a; Mabry, ed. 2008; Sliva, ed. 2005). The evidence for sedentism includes specialized storage pits; a reliance on maize and other tropical cultigens like pepo squash, cotton, tobacco, common bean, and possibly domesticated amaranth; and the production and use of pottery (Mabry, ed. 1998; Mabry 2008a; Mabry and Clark 1994). One of the best examples of Early Agricultural occupation along the Santa Cruz River is Las Capas, a site that has produced some of the earliest and most extensive irrigation networks, as well as some of the earliest dates on maize in the U.S. Southwest (Mabry 2008a; Vint 2015).

In addition to the appearance of new cultigens, new artifact and feature types were also introduced. San Pedro, Empire, Cortaro (Roth and Huckell 1992), Cienega, Tallarin (Sliva 2009), and Western Basketmaker points have all been recovered from Early Agricultural contexts. Ground stone tools including mortars, pestles, metates, lapstones, proto- palettes, bowls, awls, whorls, disks, rods, pipes, and cruciforms (Adams 2005) were all recovered from Las Capas, as were tools of bone and antler (Mabry 2008b:Table 1.2). Fired clay artifacts include small vessels, figurines, pipes, and cornucopia. Features associated with the San Pedro complex include oval to round pit structures; storage structures; various pits for storage, processing and cooking; inhumations and cremations; wells; trash middens; canid burials; and large structures that may have served a communal or ceremonial purpose (Mabry 2008b:9, Table 1.2).

San Pedro phase farmers employed numerous cultivation techniques, including rain-fed farming, dry farming, runoff farming, flood farming, irrigated farming, and water-table farming (Mabry 2005b:Table 5.5). Early Agricultural sites have been recorded in a number of ecological zones. Large sites along the Santa Cruz River have garnered attention deservedly, but other sites have been documented in the upper *bajadas*, and fewer numbers are known from the lower *bajadas* and mountains.

Formative Period

The introduction of ceramic vessels into the archaeological record is typically used to define the beginning of the Formative period (Huckell 1996). Over the centuries of the Formative period populations became greater, denser, and more definable in terms of their geographic extent (Figure 2). The archaeologically visible population distributions are the result of differences in material culture, including architecture, which became more substantial and long-lasting. Over the decades, numerous Formative period groups have been identified or formulated by archaeologists. Some of these groups are no longer in archaeological favor, while others have persisted. The following section provides an overview of Formative period groups about whose existence there is general agreement among archaeologists currently, although the geographic distributions and boundaries shown in Figure 2 should be considered fluid and subject to change.

Hohokam

The cultural expression archaeologists label as Hohokam was the dominant Formative period culture in both the Phoenix and Tucson Basins, and at times extended well beyond those basins (Fish 1989). Each basin is discussed individually through the pre-Classic periods, while the Classic Period is considered from a region-wide perspective.

Phoenix Basin

Pioneer Period

In the Phoenix Basin, Hohokam is seen to emerge at about A.D. 1 or shortly thereafter. The first phase of the Pioneer period, the Red Mountain, is characterized by a complex of characteristics including plain ware pottery, a range of house types, shell bracelets, and inhumations (Garraty 2011; Mabry 2000; Morris 1969). Red Mountain-phase occupations have been documented in the Phoenix Basin and the uplands surrounding it (Hackbarth 2010, 2013). Red Mountain sites in the central Phoenix Basin may be most common at the interface between Salt River terraces and the bajadas above them, close to agricultural fields (Hackbarth 2010, 2013), but the bajadas and upland locales were also exploited (Garraty 2011; Hackbarth 2001; Wegener and Ciolek-Torrello 2011). The Pioneer period, which also includes the Vahki, Estrella, Sweetwater, and Snaketown phases, ended at about A.D. 700 or 750, by which time red-painted decorated ceramics, intrusive exotics, and cremation burials were present (Crown 1991; Doyel 1991). Irrigation technology had

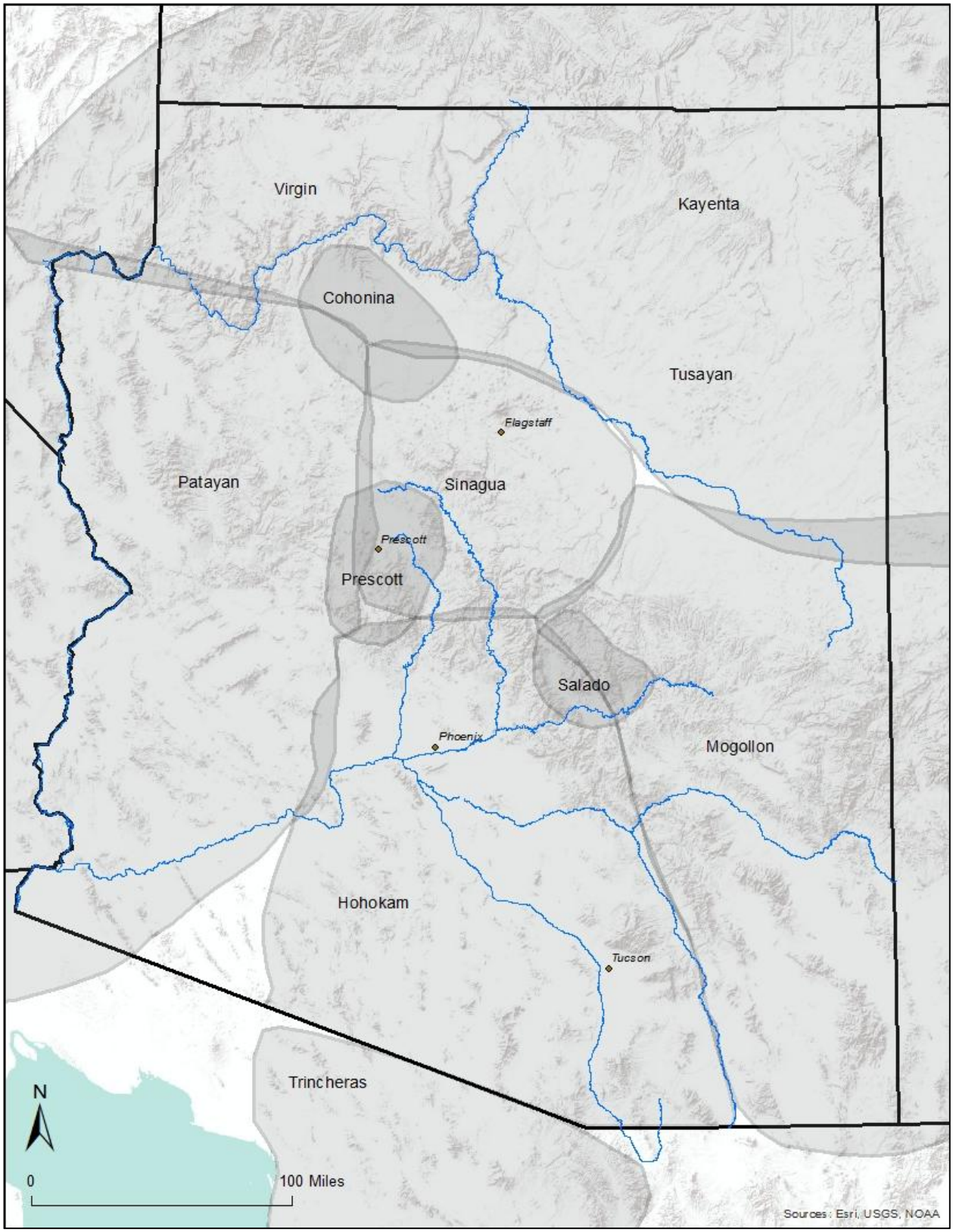

Figure 2. A distribution of Formative period groups in Arizona.

advanced such that large canals were able to convey large quantities of water many kilometers to the upper terraces on both sides of the Salt River (Doyel 1991: Figure 6.5; Howard 1991a; Masse 1991).

Colonial Period

During the subsequent Colonial period (A.D. 700/750—900/950), which consists of the Gila Butte and Santa Cruz phases, existing settlements grew larger, new settlements were founded, and expansion into neighboring river drainages is documented (Crown 1991), perhaps at least in part to maintain regional control over the water used for irrigation in the Phoenix Basin (Masse 1981). Courtyard groups, typically associated with hornos, trash mounds, and cemeteries (Wilcox et al. 1981) and ballcourts were introduced (Wilcox 1991a), and ceramic decoration reached an artistic peak (Haury 1976). Cremation burial continued, and the quantities of exotic goods like turquoise and shell increased (Crown 1991; Haury 1976). Canal systems increased in size, and dry farming continued (Masse 1991; Nicholas and Neitzel 1984).

Sedentary Period

The trends of settlement growth and expansion peaked in the Sedentary period (A.D. 900/950—1100/1150), which consists of just one phase, the Sacaton. Villages continued to be organized as a cluster of courtyard groups and associated features arranged around a plaza (Doyel 1991; Wilcox et al. 1981). Ballcourts were still the primary form of communal architecture, and the majority of known ballcourts were built and used during this time (Wilcox and Sternberg 1983). Existing canal systems were expanded yet more, and new ones were built (Nicholas and Neitzel 1984). Cremation continued to be the dominant burial practice. Ceramic vessel forms were generally larger, and designs on vessels were generally less well executed (Crown 1991).

Tucson Basin

In the Tucson Basin a primary change that marks the end of the Early Agricultural period and the beginning of the Formative period is related to innovations in ceramic technology. Ceramic figurines and “incipient” ceramic vessels were manufactured during the earlier period (Heidke 2005; Heidke and Ferg 2001; Heidke et al. 1998; Mabry, ed. 2008; Stinson 2005), but beginning in the Agua Caliente phase (circa A.D. 50–450/500) ceramic vessels began to take on a more utilitarian role, and seed jars were widely manufactured (Heidke 2005).

Pioneer Period

The Pioneer period in the Tucson Basin consists of two phases: the Tortolita phase (A.D. 450/500–700) and the Snaketown phase (A.D. 700–750), recently refined as the result of work at sites like Valencia Vieja along the Santa Cruz River (Wallace, ed. 2003). Generally, as in the Phoenix Basin, traits include: pottery with red-paint decoration; public architecture in the form of ball courts; villages arranged in house clusters with associated middens, work areas, and

cemeteries; mortuary practices in which cremation and mortuary offerings figure prominently in the differential treatment of the dead; and irrigation systems (Doyel 1980; Wallace et al. 1995).

Colonial Period

In the Tucson Basin, the Colonial period began around A.D. 750 and ended about A.D. 950. It consisted of the Cañada del Oro and Rillito phases, each approximately 100 years in length. In southern Arizona, the Cañada del Oro phase is not as well documented as other phases, but a handful of sites have provided important information, including Hodges Ruin (Kelly et al. 1978), Dakota Wash (Craig 1988), Honey Bee Village (Wallace 2007), Romero Ruin (Elson and Doelle 1987), and Sleeping Snake Village (Ezzo, ed. 2007). All of these sites had at least one ball court (Doelle and Wallace 1991). During the subsequent Rillito phase, there was a fourfold increase in the number of sites in the Tucson Basin (Doelle and Wallace 1991). Ezzo (2007) discusses several of the ball court villages of this phase along the Santa Cruz River, including Los Morteros (Wallace 1995) and Huntington Ruin. The number of primary villages increased throughout the phase and there was an increase in the diversity of pit houses, with both true pit houses and the less-formal “houses in pits.”

Sedentary Period

More recorded prehistoric sites in the Tucson Basin date to the Sedentary period (A.D. 950–1150), composed entirely of the Rincon phase, than to any other prehistoric period (Doelle and Wallace 1991), which has made it the best-understood part of the Hohokam chronology in the area. In general, and as in the Phoenix Basin, the Sedentary period was a time of relative cultural stability and population growth. Small, dispersed sites were located on the bajada (piedmont) slopes and alluvial fans in the basin, while large sites were located along the Santa Cruz River and other major drainages (Whittlesey et al. 1994). As in the Phoenix Basin, courtyard groups were the primary mode of organization within villages, and irrigation systems were expanded during this time. Inhabitants used the bajada slopes for rock-pile agave cultivation (Fish et al. 1985), in addition to other agricultural and wild resource uses. Ceramics of the Sedentary period show a decrease in the quality of painted line decoration, with an overall bolder style; vessels are also thicker and heavier (Wallace 1986).

Classic Period

The Classic period is divided into two phases in each basin: the Soho and Civano in Phoenix, and the Tanque Verde and Tucson in Tucson. In both basins, the Classic period is seen to begin at about A.D. 1150, and the Sedentary-Classic transition is rather abrupt. Innovations in architecture, especially experimentation with adobe construction and aboveground architecture, house groups, or compounds, began to assume a distinct pueblo pattern, although the use of traditional semi-subterranean pithouses persisted (Haury 1928; Wallace et al. 1995). Settlement patterns changed dramatically, which may indicate the emergence of new hierarchical social organizations (Teague 1993) perhaps based on the control of water for irrigation (Doyel 1979). Platform mounds replaced

ballcourts as the dominant form of public architecture, red-painted decorated ceramics became less prevalent while red wares became more so, and inhumations became as common as cremations (Crown 1991). The Classic period saw the abandonment of many small settlements and populations concentrated in fewer, larger aggregated communities, including Pueblo Grande, Mesa Grande, Casa Grande, and University Indian Ruin, to name just a few. As an illustrative example, Pueblo Grande seems to have doubled in population at the beginning of the Classic period, which resulted in a depletion of resources and an over-reliance on domesticated crops, with severe consequences for the health of the population, particularly children (Abbott and Foster 2003; James 2003; Kwiatkowski 2003; Sheridan 2003). A second influx of immigrants to Pueblo Grande in the late Classic period, at around A.D. 1300, speaks to poor living conditions region-wide (Abbott and Foster 2003). Around A.D. 1450, or possibly somewhat later, the terminal Classic period marked the effective demise of complexly integrated Hohokam societies, resulting in the abandonment of most Hohokam sites (Hill et al. 2004).

Trincheras

"Trincheras" is used in multiple ways in the archaeological literature. For example, it may be used to refer to the Formative period Trincheras culture or tradition, which is distinguished by Trincheras Purple-on-red/brown ceramics in much of northwest Sonora (Fish et al. 2007). These ceramics are sometimes found on Hohokam sites in southern Arizona, but the modern international border is also typically used as a border between the Trincheras and Hohokam cultures (Fish et al. 2007; Gallaga and Newell 2004; McGuire and Villalpando 2011).

"Trincheras" is also used to describe a type of site found in southern Arizona. Following Fish et al. (2007), a broad definition for a trincheras site is that it must be located on a hill and contain dry-laid masonry or cobble features. The biggest and best known of these sites in Arizona are Tumamoc Hill, Linda Vista Hill, and Cerro Prieto, all of which are along the Santa Cruz River near Tucson (Downum 1986, 1993, 2007; Fish et al. 1984, 1986; Pailes 2014; Wallace et al. 2007). Trincheras sites were occupied at various times throughout prehistory, from the Late Archaic/Early Agricultural period through to late prehistory. Some sites, including the three mentioned above, contain a great number of masonry features, which include structures, walls, and terraces. Whether or not these sites were built or used for primarily defensive purposes is a question of on-going debate (Downum 2007; Hard and Roney 2007; LeBlanc 1999; Wallace and Doelle 2001).

Ancestral Pueblo

The Ancestral Pueblo occupied the Colorado Plateau, which covers the northern portion of the state. In Arizona, several Ancestral Pueblo groups or branches have been named, including the Kayenta, Tusayan, Virgin, Winslow, Little Colorado, and Cibola. The best-defined of these is the Kayenta and it receives the bulk of the attention in this General HPTP, but their neighbors to the south (Tusayan) and west (Virgin) are also discussed (see Figure 2).

Kayenta and Tusayan

The Kayenta and Tusayan were both western Ancestral Pueblo groups, as opposed to groups further east like Mesa Verde and Chaco (Gumerman and Dean 1989). They lived in the northeast part of the state in an area bounded roughly by the modern state borders to the north and east, by the Colorado and Little Colorado Rivers on the west, and the Little Colorado and Puerco Rivers on the south. At their maximum extents, the Kayenta occupied the northern portion of this area while the Tusayan occupied the south; the division between the two ran roughly just north of the Hopi Mesas (Adams 2013:17). Unlike other Formative groups, the Kayenta and Tusayan can be traced back further in time, overlapping with what is considered Late Archaic or Early Agricultural in other parts of the state.

The sequence begins with the Basketmaker II period (500 B.C.-A.D. 600), when corn and squash, but not beans or pottery, are first seen on the Colorado Plateau, reflecting either an in-situ development or a migration of people from southern Arizona (Matson 1991; Reid and Whittlesey 1997). The Basketmaker II lived in caves and rockshelters, from which well-preserved basketry, textiles, and wooden artifacts have been recovered, but they also established farmsteads or small communities in other settings conducive to agriculture. During the Basketmaker III period (A.D. 600-800) some people continued to live in rockshelters, but most built villages along alluvial floodplains suitable for farming. The villages were composed of pithouses, typically lined with stone slabs. People began to farm beans in addition to corn and squash, and pottery, in the form of a gray-colored plain ware, began to be used for storage (Gumerman and Dean 1989; Reid and Whittlesey 1997).

In contrast to their neighbors to the east, who during the Pueblo I period (A.D. 800-1000) began to build above-ground masonry pueblos, like the massive Pueblo Bonito at Chaco Canyon, the Kayenta and Tusayan continued to live much as they had in the preceding period (Gumerman and Dean 1989; Reid and Whittlesey 1997). Notable differences include the wide distribution of black-on-white pottery types and larger village sizes, and at least a few Tusayan villages had linear arrangements of room blocks. In the Pueblo II period (A.D. 1000-1150) the Kayenta and Tusayan further adopted the use of above-ground masonry rooms and jacals. In the Kayenta region these were often arranged in a U-shaped pattern facing a plaza or kiva, an arrangement referred to as a unit pueblo. These relatively small settlements were built where ever crops could be farmed, resulting in a rather dispersed pattern of settlement (Dean 1996; Gumerman and Dean 1989; Reid and Whittlesey 1997).

The first 100 years of the Pueblo III period (A.D. 1150-1300) are not particularly well known for either group, although the time was marked by population aggregation at fewer sites and a general contraction of territory; the two groups became physically separated (Adams 2013; Dean 1996; Euler 1988; Gumerman and Dean 1989; Reid and Whittlesey 1997). The last 50 years, however, which are known as the Tsegi phase in the Kayenta area, are quite well known due to work at a number of sites in Tsegi Canyon, like Betatkin and Keet Seel (Dean 1996; Gumerman and Dean 1989; Reid and Whittlesey 1997). Both of these large cliff dwellings were built and occupied

between A.D. 1250 and 1300. By 1300 they, like other sites over much of the Four Corners region of the plateau, were abandoned (Dean 1969, 1996). The Pueblo IV period (A.D. 1300-1450) saw Kayenta populations settle in places on the Colorado Plateau like Tusayan villages on the Hopi Mesas (Adams 1981, 1996) and Homol'ovi (Adams 1996, 2004), as well as places even further away like Point of Pines (Haury 1958), Grasshopper (Reid and Whittlesey 1997) the Safford Valley (Neuzil 2008; Woodson 1994, 1999), and the middle San Pedro River valley (Di Peso 1958).

Virgin

In Arizona, the Virgin occupied the portion of the Colorado Plateau now known as the Arizona Strip, west of the area in which the Kayenta resided. The line between the two groups, while not clear, was around the Colorado River or Kanab Creek (Lyneis 1995, 1996). While there was a limited Basketmaker II-III and Pueblo I presence on the plateau, evidenced by the pit houses in which they lived, the Virgin of these times are better documented in Utah and Nevada (Lyneis 1995, 1996; Talbot 1990). The plateau saw an increased Virgin population, albeit with some differences between east and west, in the Pueblo II and III periods (Lyneis 1996).

On the western side of the plateau, by A.D. 1000, residential sites typically consisted of at least one habitation room and associated storerooms or cists arranged in a gently curving arc (Talbot 1990), although caves were used at least temporarily as well (Fisher et al. 2013). This household-sized residential unit was maintained through the Pueblo II period (Lyneis 1996). By around A.D. 1100, on the eastern side of the plateau, architectural layouts of residential units were more linear and rectilinear, perhaps due to an influx of a Kayenta population (Lyneis 1996). Populations remained relatively dispersed until abandonment of the area, which was by about A.D. 1175-1200, at which time the Virgin were perhaps absorbed into the Kayenta or to other groups to the west (Euler 1988; Lyneis 1995, 1996).

Mogollon

In Arizona, Mogollon is the name given to people who lived primarily in the mountainous region of the state bounded approximately on the west by the Verde River, on the east by the border with New Mexico, and on the north by the Little Colorado River. To the south, the border with Mexico can serve to mark the extent of the Mogollon, at least within the state, recognizing that local developments in areas like the Safford and San Simon Basins may not be the same as those in the mountains (Gilman 1997, 2011; Neuzil 2006, 2008).

The Mogollon occupation, as formulated from work in the Forestdale, Point of Pines, and Grasshopper areas, can be divided into three periods: the Early Pit House, the Late Pit House, and the Mogollon Pueblo (Reid 1989; Reid and Whittlesey 1997). The Early Pit House period, from about A.D. 200 to 600, was characterized by small pithouse villages often located on hilltops and ridges, perhaps suggesting a concern for defense (Haury 1988; Haury and Sayles 1947; Reid 1989; Reid and Whittlesey 1997). The pithouses were true pithouses (as opposed to houses in

pits), circular in plan view and excavated up to three or four feet deep. Some villages also had a larger pit house or communal structure, which may have been used for ceremonial activities. A brown plain ware pottery was made during this period but was produced in a limited range of shapes (Reid and Whittlesey 1997).

The Late Pit House period (A.D. 600 to 1150) saw villages moved from the more-defensible locations to valley floors adjacent to cultivable land. Pithouses were generally rectangular, and formal great kivas began to be constructed at larger or focal villages (Reid 1989; Reid and Whittlesey 1997). Toward the end of the period, some ceramics were decorated.

Major changes are seen across the transition from the Late Pit House period to the Mogollon Pueblo period (A.D. 1150-1400), so much so that archaeologists have debated for decades about whether the later developments should be thought of as Mogollon or as something else (Haury 1988; LeBlanc 1986; Reid et al. 1996; Reid and Whittlesey 1997; Riggs 2005). One change was in the ceramic assemblages, which began to include black-on-white and black-on-red vessels. Studying ceramics from Chodistaas, Zedeño (1994) found that many of the vessels had not been produced locally, but rather probably brought to the site by Ancestral Puebloans who were abandoning the Colorado Plateau. This population influx was region-wide and resulted in another change—the construction of above-ground masonry pueblos with contiguous, rectangular rooms organized around plazas or kivas (Reid 1989; Reid and Whittlesey 1997)—which is suggested by the period's name. By about A.D. 1400, however, the mountain pueblos were abandoned.

Sinagua

Sinagua refers to an archaeological culture that has been identified in the Flagstaff area and in the middle Verde Valley, and groups in the two areas have typically been referred to as the Northern and Southern Sinagua.

Northern Sinagua

Materials regarded as Sinagua first appear in the archaeological record at about A.D. 600, although it is possible that earlier ceramic-period occupations exist in the area (Elson, Ort, Anderson, Heidke, Sheppard, and Samples 2011). The Cinder Park phase (A.D. 600-825), however, can serve as the earliest recognizable Sinagua occupation, primarily on the east and south sides of the San Francisco Peaks. The Cinder Park phase is characterized by the presence of Alameda Brown Ware, which was made with the paddle-and-anvil technique also used by the Hohokam; deep timber pit houses; and extended burials (Pilles 1979, 1987; Reid and Whittlesey 1997; Schroeder 1977). Large pithouses may indicate a community-integrating function (Pilles 1979, 1987; Reid and Whittlesey 1997). Settlements were located in park-like settings adjacent to more-fertile land (Pilles 1979, 1987; Reid and Whittlesey 1997).

The subsequent Sunset (A.D. 825-1000), and Rio de Flag phases (A.D. 1000-1085) demonstrate some changes, including population increase, movement into new areas, and minor architectural changes (Pilles 1979, 1987, 1996; Reid and Whittlesey 1997; Schroeder 1977). Many things

changed in the late eleventh century, when Sunset Crater erupted. It is worth mentioning that for decades archaeologists have held that the first eruption happened in A.D. 1064 and that additional eruptions occurred over a period of about 200 years. However, a recent reappraisal of the evidence on which those dates are based, along with consideration of multiple other lines of evidence, suggest that there was just a single eruption and that it happened around A.D. 1085 to 1090 (Elson, Ort, Sheppard, Samples, Anderson, May, and Street 2011).

Earlier archaeologists recognized the material remains of several archaeological cultures in the Sinagua area post-eruption, including Hohokam, Kayenta, Cibola, Chaco, Mogollon, Cohonina, and Prescott (Pilles 1979; Schroeder 1977). The idea was that people from different regions moved to the area in order to take advantage of farmland made more fertile by the eruption. Peter Pilles (1979) has argued that the area would not in fact have been made more agriculturally productive by the eruption and that the seeming evidence of migration can be explained by trade. Reid and Whittlesey (1997) propose that people did move to the area, but in order to gain some sort of ritual power from the volcano as opposed to farming there.

Regardless of the reason or reasons, populations in the area increased and expanded, and pueblos like Elden Ruin, Ridge Ruin, Walnut Canyon, and Wupatki were built during the Elden phase (A.D. 1150-1220). The subsequent Turkey Hill phase (A.D.1220-1300) saw the beginning of the end for the Sinagua, as indicated by the abandonment of some territory and aggregation in a few locales, including the San Francisco Peak and Anderson Mesa. This trend toward abandonment and aggregation continued in the Clear Creek phase (A.D. 1300-1450), with populations coalescing at just a few large pueblo sites like Chavez Pass (Pilles 1987; Reid and Whittlesey 1997). By about A.D. 1450 even those few large sites were abandoned, and the Sinagua are thought to have moved to Homol'ovi and then on to the Hopi Mesas, where their descendants live today (Pilles 1987; Reid and Whittlesey 1997).

Southern Sinagua

The Hackberry phase is the first in which ceramics appear, and also the first associated with the Southern Sinagua culture. The ceramics were imported from the south (Snaketown Red-on-buff, Gila Butte Red-on-buff) and north (Lino Gray, Lino Black-and-gray) and were initially dated by Breternitz (1960) to A.D. 700-800. Subsequent evaluation of those ceramics indicate that a date of A.D. 550-800 is more appropriate (Hall and Elson 2002). Domestic architecture consisted of pithouses, and sites from this phase are more common in upland settings (Pilles 1996).

The Cloverleaf phase, dated to A.D. 800-950, is notable for a strong Hohokam influence on the material culture in the middle Verde Valley, although there is debate as to whether the influence is a result of colonists from the south or an acceptance of certain traits by a local population (Breternitz 1960; Fish and Fish 1977; Pilles 1981a, 1996). The phase marks the first appearance of locally-made ceramics, Verde Brown, but intrusives from both the south (Santa Cruz Red-on-buff) and north (Kana'a Black-on-white, Deadmans Black-on-red) are also present. Smaller, more-compact sites in upland settings were more numerous, but large villages closer to the river, including at Cloverleaf Ranch, were also present (Breternitz 1960; Fish and Fish 1977; Pilles 1981a, 1996).

The Camp Verde phase (A.D. 950 to 1150) saw the continued influence from the Hohokam, in the form of red-on-buff ceramics; southern-style shell ornaments; domestic architectural characteristics; ball courts; and adobe-capped mounds (Breternitz 1960; Fish and Fish 1977; Pilles 1981a). Large villages and evidence of Hohokam influence is lacking, however, in the upper Verde Valley (Fish and Fish 1977; Pilles 1981a). Pilles (1996) noted that sites dating to this period are typically found in the streamside environs of the Verde lowlands, or in the canyons of the Verde uplands.

The Honanki phase (A.D. 1150 to 1300) is notable for the construction of cliff pueblos in the upper Verde, like Honanki and Palatki, and in the lower Verde the earliest room blocks at well-known sites like Tuzigoot and Montezuma Castle (Pilles 1981a). Generally, populations consolidated and perhaps grew, while room size decreased (Fish and Fish 1977; Pilles 1981a). The Hohokam influence in the area disappeared during this time (Fish and Fish 1977; Pilles 1981a), which may have been the result of an influx of people from the Flagstaff area (Pilles 1981a), or due to formation of a "Verde Confederacy" in response to the Hohokam imposing upon the Verde populations for labor (Wilcox 2014; Wilcox et al. 2001, 2007).

The trend toward population consolidation and growth continued into the Tuzigoot phase (A.D. 1300 to 1425) at sites such as Tuzigoot, Montezuma Castle, and the Clear Creek ruins (Fish and Fish 1977). Sites were typically large, multi-storied masonry pueblos, cliff dwellings, and cavates. This period is also characterized by the presence of Jeddito Yellow Ware, further indicating the area's ties to the north. There is no evidence for an occupation of the Verde Valley from approximately 1425 until Spanish contact in the late sixteenth century (Breternitz 1960; Fish and Fish 1977; Hall and Elson 2002; Pilles 1981a, 1996).

Patayan

In this General HPTP, Patayan Culture is the label used to describe the prehistoric inhabitants along the Colorado River and well into western Arizona; in Arizona the distribution is from approximately Yuma to the Grand Canyon, and from Ajo to the Arizona-California border. It should be noted that the Formative period occupations of the areas around Prescott and west of Flagstaff, on the Coconino Plateau, are sometimes considered as upland variants of Patayan. Here, the Prescott Culture and the Cohonina are considered separately and individually.

Compared to some other archaeologically defined cultures, the Patayan is not as well-described or well-known, but work on federal lands in the southwestern part of the state has contributed to a broader understanding (Altschul and Rankin, eds. 2008; Homburg et al., eds. 1993; Tucker 2000). The chronology is divided into three periods, Patayan I, II, and III. Patayan I dates from approximately A.D. 700 to 1000, Patayan II from A.D. 1000 to 1500, and Patayan III from A.D. 1500 into the historic period of the late 1800s or early 1900s; the periods are all primarily defined on the basis of ceramic types, collectively referred to as Lower Colorado buff wares (Waters 1982a, b). Site types associated with the Patayan include sleeping circles, trails, cairns, and intaglios. Large villages with architectural remains are lacking; to the extent they existed they were probably along the Colorado and Gila Rivers and are either deeply buried or have been

destroyed (Cordell 1997; Reid and Whittlesey 1997; Waters 1982a).

Prescott

The Prescott area is located at the interface of several Formative Period archaeological cultures, including the Sinagua, Hohokam, and Patayan (Motsinger et al. 2000; Reid and Whittlesey 1997:7). This fact, combined with a lower level of investigation relative to some other parts of the state, has resulted in a slightly murkier understanding of the period. Here we follow Motsinger et al.'s (2000:Figure 1.2) helpful chronology for the Prescott Culture.

The Early Formative period, which dates from about A.D. 200 to 600, is characterized by shallow pithouses, plain ware ceramics, ground stone, and Cienega-like projectile points (Motsinger et al. 2000), as demonstrated by sites along Big Bug Creek (Punzmann 2000). While the sample is small, this period may represent a transition between more-mobile Archaic Period groups and more-sedentary groups beginning to focus more on crop domestication. The subsequent period of time, the Agua Fria phase (ca. A.D. 600 to 850), is characterized not so much by any particular set of traits native to the area, but rather by an influx of Hohokam groups who likely furthered agricultural pursuits in the region (Punzmann 2000).

The set of traits used to define the poorly understood Prescott phase (ca. A.D. 850 to 1050) include formal, earthen-walled pithouses, Prescott Black-on-gray decorated pottery, and a greater formalization of material culture (Motsinger et al. 2000). Horton's (2000) report on the excavation of two pithouses in Granite Basin would add upright notched stone risers, intrusive pottery types like Wingfield plain and other types from the four corners area, ceramic figurines, formal ground stone artifacts, and jewelry like pendants and rings. The following phase, the Copper Basin phase (ca. A.D. 1000 to 1150) (Jeter 1977) is primarily distinguished by the presence of a single form of architecture, the stone-outlined pithouse (Motsinger et al. 2000). Work at sites near Willow and Watson Lakes led Neily (2008) to define the Prescott phase as extending from A.D. 800 to 1100, separated into early (A.D. 800 to 900) and late (A.D. 900 to 1100) divisions. The early part of the phase Neily (2008) describes is characterized by Colonial-period Hohokam Buff Ware, Pueblo I white ware and red wares, and by a Hohokam-influenced cremation mortuary tradition. The latter part of the phase is marked by a continuation of cremations and Hohokam-style architecture and settlement structure, suggesting either direct occupation or co-residence of Hohokam-affiliated groups (Neily 2008:393).

The Chino phase (ca. A.D. 1100 to 1300) is probably the best documented phase of the Prescott Culture, in no small part because of the presence of above-ground masonry or adobe architecture (Barnett 1973, 1978; Grossman 2000; Spicer and Caywood 1936; Wilcox et al. 2000). Motsinger et al. (2000), however, suggest that a different type of site is more typical of the phase, and they refer to it as a pithouse/pueblo hamlet. These sites are characterized by a single one- or two-room aboveground or semi-subterranean masonry-walled structure located near the center of a grouping of stone-lined pithouses. It also seems that there were habitation sites of this time without any masonry structures. Excavations at the Sundown Site produced an abundance of material culture, including some ceramic types that were not produced until the late 1200s, yet

the only structures were pithouses reminiscent of those constructed by the Hohokam (Higgins et al. 1999). While the pithouses are not necessarily contemporaneous with the late ceramics, the investigators are clear that there were no masonry-walled structures on the site.

Motsinger et al. (2000) proposed a terminal phase for the Prescott Culture: the Willow Creek phase (ca. A.D. 1300 to 1500). This phase was suggested in order to account for the presence of a small population in the area into the 1400s, as indicated by work at the Neural site (Grossman 2000).

Cohonina

The Cohonina are essentially defined by the appearance of San Francisco Mountain Gray Ware on the Coconino Plateau sometime before A.D. 700, and are seen to exist on the plateau to sometime around A.D. 1150 to 1200 (Colton 1958; Bair 1994; Landis 1993; Wegener et al. 2007). At least four different nomenclatures have been proposed to subdivide this span of time into two phases (Bair 1994:Figure 109), but they are all in general agreement that A.D. 900 is the division point, based on the presence of diagnostic and intrusive ceramics. Throughout both phases, domestic architecture was quite variable and included shallow pithouses, ramadas, masonry rooms (at least at the wall bases), and possibly “forts” and “sweat lodges” (Landis 1993; McGregor 1951, 1967); communal or ceremonial structures seem to be lacking (Cartledge 1979). Cohonina sites are generally concentrated in the pinyon woodlands that ring the Coconino Plateau, although sites have also been recorded to the west and off of the plateau. Features like check dams, diversion walls, and cleared garden areas, along with ground stone artifacts, are suggestive of agricultural pursuits, and squash and corn have been identified directly (Landis 1993). Faunal bone recovered from Cohonina sites includes pronghorn, deer, jackrabbit, cottontail rabbit, bighorn, and other smaller mammals (Landis 1993). The commonly cited end date for the Cohonina, around A.D. 1150 to 1200, is based on the disappearance of intrusive, diagnostic ceramics from ceramic assemblages. It is not clear if the lack of diagnostic ceramics is indicative of an abandonment of the plateau, or of a cessation of trading for those ceramics (Bair 1994; Landis 1993). That is, it is possible that ceramic scatters that lack intrusive ceramics may represent a continued Cohonina presence on the plateau.

At around A.D. 1300, Tizon Brown Ware appears on the west side of the plateau, and this ceramic is typically seen as being produced by Pai groups who were probably descendants of the upland Patayan groups (including, perhaps, the Cohonina) and ancestors of the modern Hualapai, Havasupai, and Yavapai (Bair 1994; Landis 1993; Stone 1987; Wegener et al. 2007). Not much is known about the Pai groups in prehistory, but they were occupying the general area when Euroamericans arrived in what is now northwestern Arizona (Pilles 1981b).

Salado

Salado is a term used to describe a cultural manifestation that is centered in the Tonto Basin, but there is no consensus on just what the term should mean, or if it means anything at all (Dean 2000; Lincoln 2000; Reid and Whittlesey 1997). Some see it as a cultural group, others as a

tradition; some have argued that Salado is representative of an ideology or cult, while others see it as essentially Hohokam, albeit with traits blended in from other areas (Crown 1994; Elson 1992; Haury 1976; Wood and McAllister 1980). Delving into the history of these formulations, arguments, and semantic distinctions, while interesting, is beyond the scope of this General HPTP (see Dean, ed. 2000). Here we will focus on the "classic" expression of Salado, which is limited to late prehistory in the Tonto Basin, and briefly discuss the wider distribution of Salado polychrome pottery and the contexts from which it has been recovered.

What archaeologists define as Salado first appeared in the Tonto Basin at the beginning of the Roosevelt phase of the Classic period, at about A.D. 1250 (Dean 2000; Reid and Whittlesey 1997). Prior to that time, sites in the basin typically consisted of small, dispersed settlements that may not have been occupied year-round (Reid and Whittlesey 1997; Wood 2000). At about A.D. 1250, however, a system of large, permanent villages was established. The basic residential unit in the villages was a compound, which consisted of a few above-ground rooms surrounded by a wall. The compounds were loosely arranged around the focal point of the village, which was a platform mound also surrounded by a wall. The subsequent Gila phase, which began about A.D. 1350, saw the abandonment of many of the platform mound villages, the consolidation of the basin's population into large villages with scores or hundreds of rooms, and the construction of cliff dwellings, like those at Tonto National Monument. At some point in the A.D. 1400s, the basin was essentially depopulated.

While the "classic" Salado expression was relatively constrained both spatially and temporally, the ceramics associated with them, particularly Gila and Tonto Polychromes, were distributed widely (Crown 1994, 1995). These ceramics have been recovered from the Phoenix Basin, much of eastern Arizona, western New Mexico, northwestern Chihuahua, and northeastern Sonora (Adams 2000; Doyel 2000; Lekson 2000; Whittlesey et al. 2000). Further, they have been recovered from a variety of site types and contexts, weakening arguments that the ceramics can be seen to represent a particular cultural or ethnic group, a centralized trading system, or a single religious system (Crown 1995; Dean 2000).

Protohistoric

The Protohistoric period in Arizona, considered to be that time of transition between prehistory and history, has been defined in various and sometimes contradictory ways (Gilpin and Phillips 1998). Wilcox and Masse (1981) suggest a start date of around A.D. 1450, a date long considered to signal major demographic changes among the archaeologically recognized cultures of prehistory. Gilpin and Phillips (1998) prefer a start date of A.D. 1519, when Cortez invaded Mexico. Ravesloot and Whittlesey (1987:83) and Officer (1987) prefer to define the period as beginning with the first formal Spanish *entrada*—Coronado's expedition of A.D. 1540 to 1542. Whereas Ravesloot and Whittlesey (1987) see the period as ending with the establishment of the presidio at Tubac in A.D. 1752, Officer (1987) argues that a more appropriate endpoint would be the A.D. 1690s, when the Jesuit Order undertook the conversion of the northern reaches of Pimería Alta, in southern Arizona. This is also a useful date in northern Arizona, given that it marks

the beginning of the Spanish reconquest of the Pueblo country; it is also the approximate date used by the contributors to an important volume on the topic (Wilcox and Masse, eds. 1981). In this General HPTP, the Protohistoric period is considered to last from about A.D. 1500 to 1700, although it is recognized that the time at which native groups entered into Euroamerican history varied by group and place. It is also worth stressing the point that the histories of Native American groups first identified by the Spanish typically persist beyond the terminal Protohistoric.

It is worth pointing out that the number of known protohistoric sites is not great. For example, a search in AZSITE for the word "protohistoric" returns six sites. A search of "Sobaipuri", which is one of the better-documented protohistoric groups relevant for this General HPTP, returns 40 sites. This relative dearth of sites is due to at least three reasons: a demographic decline that began in late prehistory, resulting in a lower population and fewer sites (see, for example, Hill et al. 2004); architecture or other material remains that, in many cases, left only a subtle trace on the landscape; and, related, a protohistoric site component that cannot be discerned from another site component with which it is mingled. To the third point, Doelle (2011) notes tribal consultants were involved in a targeted reassessment of previously recorded sites on the Tonto National Forest that resulted in an increase of recognizable Apache sites or components from 18 to 125.

Gilpin and Phillips (1998:19) helpfully provide a list of 18 native groups known to have been in Arizona at the time the Spanish first arrived: Southern Paiute, Ute, Navajo, Western Apache, Chiricahua Apache, Havasupai, Hualapai, Yavapai, Mohave, Maricopa, Quechan, Cocopah, Hopi, Akimel O'odham, Tohono O'odham, Zuni, Jocome, and Jano; other groups mentioned in their document include the Sobaipuri and Hia C-ed O'odham (Figure 3). These groups occupied various parts of the state, and their subsistence and settlement patterns varied as well (Gilpin and Phillips 1998). An exhaustive summary is not provided here, but the reader is referred to Gilpin and Phillips (1998), the papers in the volume edited by Wilcox and Masse (eds., 1981), and the papers in Adams and Duff (eds., 2004) for more information. Here, the focus will be on examples of the types of sites and features that may be more likely to be affected by projects conducted under this plan, which does not include tribal lands.

Many of the groups, particularly those based along rivers like the San Pedro, Santa Cruz, Gila, Salt, and Colorado, were part-time farmers and so were sedentary at least for part of the year. Groups like the Sobaipuri, O'odham, Mohave, Maricopa, and Cocopa lived in villages or rancherías, and their dwellings were typically rather ephemeral (Gilpin and Phillips 1998; Wells 2006). Other groups, like the Yavapai, Apache, and those of the "Canutillo Complex" were organized into small groups of extended families that were more mobile; while these groups can be discerned from more-sedentary groups, it is difficult to discern them from one another, other groups in the area, or even Archaic period groups (Gilpin and Phillips 1998; Seymour 2004; Whittlesey and Benaron 1997).

Based on previous work, Gilpin and Phillips (1998:Table 3.2) developed a list of 23 types of protohistoric sites. These included Spanish missions, various sorts of habitations, artifact scatters, roasting features, rock art, intaglios, trails, and cairns, and accounted for all of the known sites

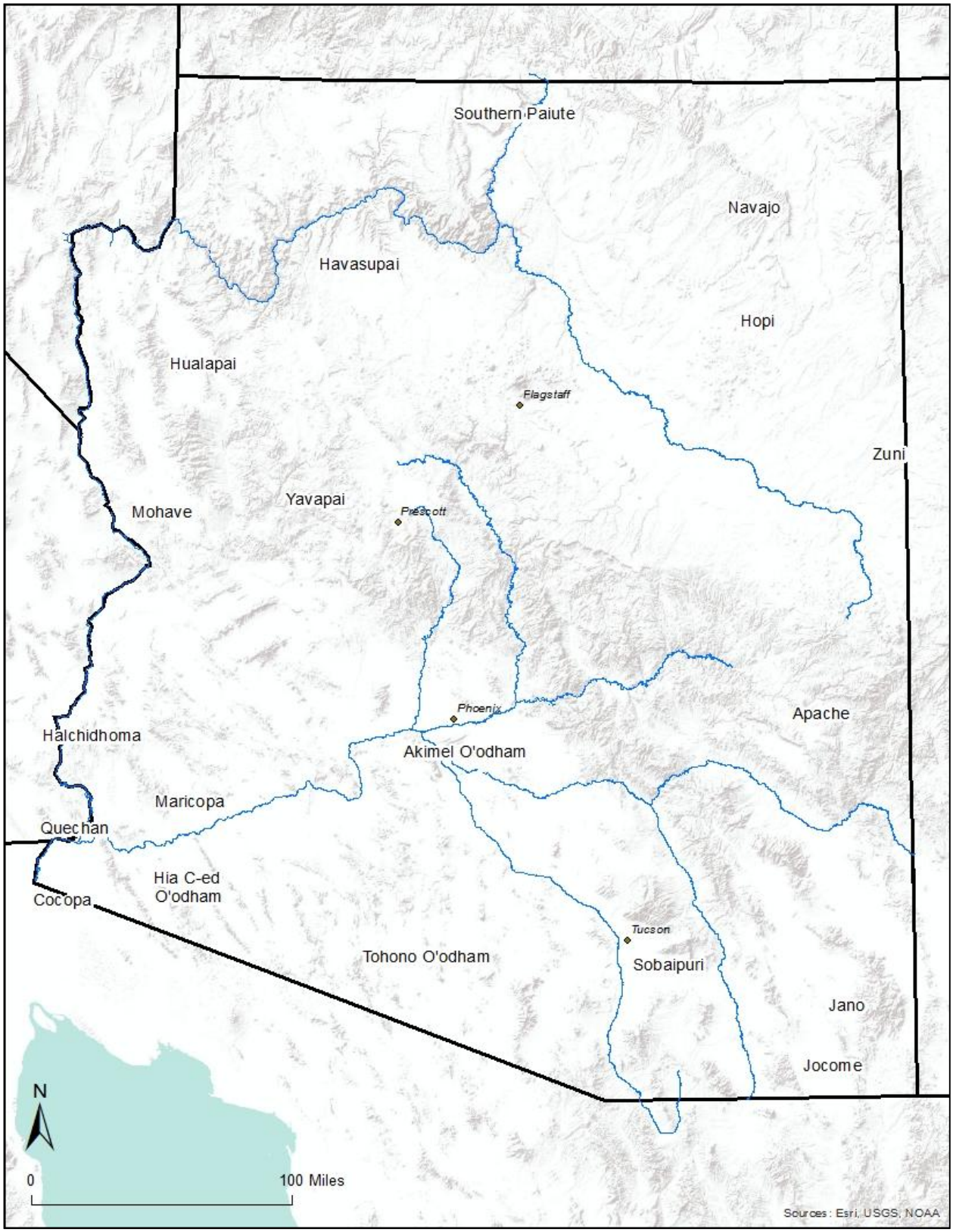

Figure 3. A distribution of Native American groups at Spanish Contact.

that dated to period in question. Gilpin and Phillips (1998:Figure 3.1) also plotted all of the known sites, and one can see that many of them were along rivers. Notable exceptions to this placement are Tohono O'odham sites and Sobaipuri sites; most or all of the Tohono O'odham sites are located on tribal lands and so they and many others are not accounted for in this General HPTP.

Historic Period

Although the following discussion on the historic period emphasizes developments related to the Euroamerican settling of the state, it should be remembered that the Native American presence in the state is not limited to the prehistoric and protohistoric periods. Much of Native American's more recent material history (as opposed to prehistory or protohistory), however, has taken place on numerous reservations throughout the state, which are not included in this General HPTP.

This section provides a brief overview of the Spanish Colonial and Mexican periods in the state, and then turns to the United States period, which is divided into subsections on mining, farming, ranching, the military, homesteading and land grants, and the railroad. The discussion of the Spanish Colonial and Mexican periods is based primarily on the works by Officer (1987) and Sheridan (2012). The United States period also relies heavily on Sheridan (2012), as well as the topic-specific SHPO context studies on gold and silver mining (Keane and Rogge 1992), the military (Collins et al. 1993), homesteading (Stein 1990), roads (Stein 1994), and railroading (Janus 1989). Other sources are cited where appropriate.

Spanish Colonial and Mexican Periods

From an archaeological perspective, the Spanish presence in Arizona is meager. But because it looms large in the collective imagination and provided a foundation for later Euroamerican activities in the state, it merits a brief discussion.

Cabeza de Vaca and his companions, including Esteban, may have entered into Arizona in 1536 during their travels between the gulf coast of Texas and Sonora. A couple years later, Esteban accompanied Fray Marcos de Niza into Arizona and was killed by Zunis. Fray Marcos's report of the country intrigued his countrymen, and Francisco Vásquez de Coronado led an *entrada* into the state in 1540. His failure to find the gold-rich Cíbola resulted in a diminishment of Spanish interest in the region, and Spaniards did not return for forty years. In 1583, Antonio de Espejo led a party across north-central Arizona and found copper and silver deposits near Jerome. In 1598, Juan de Oñate led a larger group in search of those deposits and one of his captains, Marcos Farfán de los Godos, ultimately found them again. But as enthusiastic as he was about the Verde Valley, the area never became part of the Spanish empire. The Spanish were rather more interested in areas of the Colorado Plateau and the Sonoran Desert. In the decades after Esteban's fateful encounter with the Zunis, the Spanish tried repeatedly to establish a presence in the pueblos, but were repeatedly rebuffed.

The Sonoran Desert proved to be a more fertile ground to sow the seeds of “civilization”, although not without great difficulty, due in large part to Apache raiding. Eusebio Francisco Kino helped to establish Jesuit missions at Bac and Guevavi in 1701, but the priests assigned to both settlements became sick shortly thereafter and returned south. Those missions were not staffed by priests again until 1732, and Spanish settlers began to move into what is now southern Arizona. A key development that spurred settlement was the discovery of silver in 1736 on a Basque-owned ranch just southwest of present-day Nogales at a place that was named Arizonac, Basque for “the good oak tree”. Even with the establishment of presidios at Tubac and Tucson, in 1752 and 1776, respectively, the Spanish existence on their northern frontier was precarious and would remain so up to 1821, when Mexico won its independence from Spain.

A settler’s life in the region was no easier during the brief Mexican period. In fact, it was probably more difficult because the Mexican state did not have the ability to maintain institutions that helped to maintain relatively peaceful relations among the various groups in the area. Mexico organized itself into states that often acted independently from another. For example, authorities in Chihuahua negotiated a peace with Chiricahua Apaches, which left them free to raid Sonoran communities, who would then counter attack. This cycle of violence was characteristic of the region for decades. Apache raiding was not, however, the only threat to Mexico’s northern frontier. The United States was expanding to the west. The Treaty of Guadalupe-Hidalgo was ratified in 1848 and parts of Arizona north of the Gila River became part of United States. With the Gadsden Purchase in 1854, Arizona south of the Gila River was also included.

United States

Anglo trappers first entered Arizona in the 1820s, three of whom stopped by Tucson in 1826 to show their passports to Mexican officials. The number of Anglos and other groups, including other Euroamericans and groups like the Chinese (Keane et al. 1992), would increase in the years to come, as mining, farming, and ranching, all of which were initiated during the Spanish Colonial period, became more significant pursuits that required a military presence for protection. Other developments, like the railroad and homesteading, also played a large role in the Euroamerican settling of Arizona.

Mining

The Spanish were not the first to mine in Arizona; Native Americans were mining the deposits that had been “discovered” by Espejo near Jerome, for example. But the Spanish interest in mining, in part fueled by oft-repeated fantastical stories of great wealth, would be both mirrored and exceeded by Anglos. Gold was struck in 1857 along the Gila River about 20 miles upstream from its confluence with the Colorado River, and Arizona’s first boomtown, Gila City, was born; it was largely abandoned by 1864. Beginning in 1863, numerous gold strikes were made in the Prescott area, along the Hassayampa River and Lynx, Weaver, and Big Bug Creeks, as well as near Wickenberg. Soon silver became viewed as the more important mineral because, although it was less valuable, there was more of it. In the late 1870s several large silver strikes were

famously made near Tombstone, which by 1880 had become one of the largest communities in Arizona. Due to several factors, however, the mines were essentially abandoned by 1886. Copper would soon become the most important mineral in Arizona.

Copper began to be mined in the late 1800s at places like Ajo, Clifton and Morenci, Jerome, Globe, Superior, and Bisbee, and by 1910 Arizona was the leading copper producer in the United States. The value of Arizona copper production increased five-fold by 1917, in large part to satisfy military needs during World War I. The copper-mining industry, however, was not exempt from the havoc wreaked by the Great Depression, and in 1933 the value of copper Arizona sold had decrease 94 percent. This boom-and-bust cycle would characterize Arizona's mining industry into the twenty-first century.

Keane and Rogge (1992:Table 2-1) identified three general types of mining-related properties: extraction, processing, and associated habitation and commercial properties. Extraction properties can be divided into those related to exploration, like prospect holes, adits, shafts and claim markers, and those related to development and production, like placer or hard rock mines. Processing properties may include locations or facilities for milling or smelting. Associated properties could include camps and boom towns.

Farming

Like mining, farming had been practiced in Arizona well before the Spanish arrived; prehistoric peoples had been farming for thousands of years. But the Spanish introduced Old World crops, like wheat and peach trees, to both the Hopi and to groups in southern Arizona, and grew crops themselves. Hispanic settlers farmed along the Santa Cruz River, and Mormons tried, with varying degrees of success, to farm along the Little Colorado River.

The Salt River, and its tributaries in the Salt River Valley, however, would be the primary focus of agricultural efforts in Arizona. Historic-period agriculture began in the valley in order to provision the military at Camp McDowell, which gave rise to Phoenix. Beginning in the 1860s, various companies dug ditches, typically pre-existing Hohokam canals, in order to irrigate more and more land. But the Salt River's flow was unpredictable, and floods destroyed irrigation-related improvements repeatedly. It was not until 1911 that Roosevelt Dam was completed, allowing agricultural activities in the Salt River Valley to grow unimpeded.

The outbreak of World War I drove a great demand on cotton, and it became essentially the only crop grown in the valley. Farmers in other places, like near Yuma and in Pinal and Santa Cruz counties, also began to emphasize cotton. But, due to the end of the war and an influx of cotton from Egypt, the cotton boom was short-lived. Other crops like wheat, barley, alfalfa, citrus, melons, and lettuce were reincorporated, although cotton remained Arizona's most important crop.

Property types associated with farming may include the remnants of fields, canals, ditches, wells, windmills, granaries, and farm houses and other associated buildings.

Ranching

Unlike mining and farming, ranching was introduced to the region by the Spanish Colonialists. As early as 1629, Franciscans introduced goats and sheep to the Hopis, and 60 years later Kino provided small herds of cattle and horses to the O'odham. At about this same time, Spanish settlers had also begun to raise cattle in southern Arizona, and the need for beef only increased with the re-establishment of Bac and Guevavi in 1732 and the discovery of silver near Nogales in 1736. Between 1821 and 1843, during the Mexican period, the government awarded 10 private land grants, which were essentially huge ranches, in southern Arizona, primarily along the Santa Cruz and San Pedro rivers and their tributaries.

Once the area became part of the United States, ranchers began operations near places like Prescott, Wickenberg, and Phoenix in order to provide meat and dairy products to miners and associated merchants. The primary cattle consumer, however, was the federal government, who supplied both the military and Native Americans on reservations. The importance of cattle and sheep ranching to the state's economy, and the size of the ranches, increased throughout the state into the late 1800s. Indeed, one ranch in the northern part of the state was the largest in the nation outside of Texas. But drought hit in the 1890s and while all parts of the state were impacted, 50 to 75 percent of the stock in southern Arizona died. In 1934, Congress passed the Taylor Grazing Act, which marked the end of the open range, but also the demise of most small stock raisers.

Property types associated with ranching may include ranch houses and associated buildings and structures, watering facilities and windmills, fences and cattle guards, stockyards, and line camps (Collins n.d.).

Military

The United States military was instrumental in the settling of Arizona and in the development of the state's economy. The initial military forays into the state were to establish routes from New Mexico to California, but these were soon followed by a more permanent presence with the primary aim of subduing or pacifying Native American populations. To this end, Fort Defiance was built in Navajo country in 1851. The 1854 Gadsden Purchase, which brought southern Arizona into the United States, resulted in the construction of Camp Moore, near present-day Patagonia, which was soon abandoned for the nearby Fort Buchanan. Camp Moore was just the first of several camps or forts to be situated in areas amenable to addressing the threat from Native Americans. Fort Defiance, Fort Mohave, Camp Lowell, Fort Bowie, Fort Whipple, and Fort Breckinridge are among the more important of the many installations that were built and occupied for the same reason. Geronimo's surrender in 1886 marked the cessation of hostilities between the United States and Native Americans, and many of the military installations were closed.

This did not, however, signal the end of the military's presence in Arizona. Rather, the military's focus shifted from domestic concerns to international issues. Fort Huachuca, for example, was seen as the lynchpin for defending the United States border against possible Mexican incursion, and also sent units to fight in World War One. World War Two had a much greater impact on the state, as a number of installations like Davis-Monthan, Luke, and Williams Air Force bases were opened. In southwestern Arizona, large expanses of desert were devoted to military use, including the Barry M. Goldwater Air Force Range and the Desert Training Center, California-Arizona Maneuver Area. The military continues to have a significant presence in the state, as does related industry, although these areas currently located on federal land are not covered by this General HPTP.

Collins et al. (1993) provide a list of military-related property types, and while they focus on the U.S. period, some of the times may apply to Spanish Colonial or Mexican period remains as well. Their property types included, but are not limited to: forts, camps, and operational posts; temporary camps; roads and telegraph lines; battle sites; unofficial posts; heliograph stations; air and other bases; prisoner-of-war and internment camps; gunnery ranges; and ground training camps.

Homesteading and Land Grants

The Spanish, Mexican, and United States governments all sought to increase the number of settlers in the state, and all facilitated this by giving land away. The Spanish, and then to a much greater degree the Mexican government, accomplished this by awarding sizeable land grants. The United States granted much smaller homesteads.

In 1789 the Spanish government granted land near Tubac to a man in return for military service; that land would stay in the family until 1938. In 1807 the O'odham of the Tumacácori mission were given title to a strip of land along the Santa Cruz south of Tubac, and in 1812 the site of Arivaca was purchased at public auction. Between 1821 and 1843 the Mexican government awarded 10 grants of large areas all or partially within Arizona. These include the 17,000-acre San Ignacio de la Canoa, the 73,000-acre San Bernardino, the San Rafael de la Zanja, and the San Ignacio del Babocómari, which included more land within the United States than any of the others.

The United States granted land to civilians under the authority of 1862 Homestead Act and three related laws: the Forest Homestead Act of 1906, the Enlarged Homestead Act of 1909, and the Stock Raising Homestead Act of 1916. These laws resulted in the transfer of over 270 million acres from the public domain to private ownership, including nearly 5 million acres in Arizona. The 1862 act allowed for the transfer of up to 160 acres, the 1909 act up to 320, and the 1916 act up to 640. In practice, however, a section of land was not of sufficient size to maintain a successful cattle operation in many parts of the state. Nonetheless, the various acts were instrumental in the settling of Arizona.

Following Stein (1990), property types may include a habitable building or its remains, structures for collection and storing water, outhouse, livestock-related structures, and associated artifacts.

Railroads and Other Linear Infrastructure

The construction of railroads across the state was instrumental in the growth of the extractive industries discussed above and in connecting them to the larger market accessible in growing towns and cities. The Southern Pacific Railroad was constructed across the southern portion of the state, while the Santa Fe's Atlantic and Pacific Railroad was constructed along the northern portion; both followed routes previously mapped by the military and used by emigrants to cross the state.

Construction of the Southern Pacific line in Arizona began in Yuma in 1878, reached Maricopa in April of 1879, and Casa Grande a month later. Construction was halted there for about six months, due to the summer heat and lack of some materials. The tracks reached Tucson in March of 1880, and the New Mexico border in September. Phoenix was linked to the mainline in 1887, and by 1900 there were over 20 stations between Yuma and New Mexico, including Gila Bend, Red Rock, Benson, Willcox, and San Simon.

The Atlantic and Pacific was constructed across the state from east to west, and entered Arizona in the late spring of 1881. Tracks were laid to Flagstaff by August of 1882, and to California a year later. The railroad was a boon to several communities that had been born as railroad towns. Holbrook and Peach Springs, for example, became stock-shipping centers, while Flagstaff and Williams became important points for the timber industry.

By 1920, there were approximately 2,000 miles of track in Arizona, which included at least 46 radial roads in addition to the two mainlines. The railroads then reached essentially all areas of the state, allowing ranchers, farmers, and miners to get their products to the best markets in a timely fashion, and incorporating Arizona into the national economy.

Railroads also brought tourists to Arizona although, beginning in the 1920s, automobiles overtook the railroad as the most common way to get around the state. By 1927, Arizona had nearly 2,000 miles of road in the state system, including north-south and east-west arteries (including Route 66), along which were built gas stations, motels, campgrounds, and other facilities, and along which trash was sometimes dumped. The state system continued to grow, not just to provide access to tourists, but also to accommodate the burgeoning population; by 1960 there were over 620,000 cars and trucks registered in the state.

In addition to railroads and roads, linear resources like underground pipelines and overhead transmission lines were constructed in order to distribute resources to or through the state, and some of these have been recorded as archaeological sites or historic properties.

Traditional Cultural Places

Traditional cultural places (TCPs) are historic properties that are eligible for inclusion in the NRHP based on associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community (Parker and King 1998). TCPs may not contain any material culture or be otherwise distinguishable from their surroundings— for example, they may be mountaintops, lakes, or architecturally unremarkable buildings. Such places would not be revealed by architectural, archaeological, or historical surveys, but rather through ethnographic research. In Arizona, places that have been designated, or considered for designation, as TCPs include the San Francisco Peaks, South Mountain, and the El Tiradito Shrine in Tucson (Lusignan 2009). These few examples hint at the types of places that may be considered TCPs, and indicate that different communities may be involved in designating a TCP.

4. RESEARCH DESIGN

This section includes general contexts and themes, questions based on the contexts and themes, and data requirements for addressing the questions, all of which are provided to guide investigations conducted under this General HPTP. Because the undertakings conducted under this General HPTP will be small in size, and because they may investigate resources that vary widely across time and space, no single theoretical approach is appropriate, and none is provided here. A discussion of field and laboratory methods and techniques that may be implemented to acquire data for archaeological projects is provided in Section 6.

Research Themes

In the following subsections, a number of general historic-period and prehistoric-period research themes are presented, along with research questions that relate to them and data required in order to address the questions. For some projects conducted under this General HPTP, some of the themes and questions may be sufficiently specific and relevant to be included in a project-specific Addendum Plan. In other instances, however, projects may benefit from more specifically formulated themes and questions, or require different ones altogether. The themes presented here rely in part on the context studies that were prepared for SHPO, and they should also be considered when developing project-specific themes. Thematic studies available on the SHPO website may also be relevant for certain undertakings.

Prehistoric Research Themes

Five broad thematic or contextual domains for prehistory are discussed: chronology, agriculture and subsistence, domestic organization, religion and ritual, and social and political organization.

Chronology

Chronology is interrelated with all other research themes. Work at prehistoric sites in Arizona

may provide opportunities to collect various types of datable samples, including charred annual plants (radiocarbon dating), preserved or carbonized wood (dendrochronology), plastered hearths or walls (archaeomagnetic dating), faunal bone (flouride absorption), buried sand deposits (optically stimulated luminescence [OSL]), and ceramics (thermoluminescence dating [TL]). The specific types of samples that may be available will only be determined on a project-specific basis but, ideally, a suite of different samples and sample types will be collected, allowing for the comparison and cross-checking of different types of dates.

Attention should be given in selecting appropriate samples on a project-specific and even sample-specific basis. In the case of radiocarbon dating, for example, the ideal sample is probably a carbonized seed or other annual-plant remain from a well-sealed, *in situ* context. On the other hand, and despite the "old wood" problem (Schiffer 1987), it may be appropriate to collect samples of larger pieces of wood depending on the contexts in which they are found.

Radiocarbon dating is likely to be the most-used dating technique for projects conducted under this General HPTP, but it may not be the only one. Dendrochronological dating depends, of course, on the availability of preserved and viable tree-ring specimens. In southern Arizona, the species of wood used prehistorically for structural members tend to be complacent (i.e., lacking sufficiently distinct growth patterns), but the recovery of datable tree-ring specimens from two Classic period villages led Dean and others (1996) to call for the systematic collection of more tree-ring samples from desert contexts. In the northern parts of the state dendrochronology has been used for decades and to great effect (Breternitz 1966; Towner 2002). Archaeomagnetic dating, which is able to provide dates on well-plastered features like hearths and walls, has a long and successful history of use on Hohokam sites in the Sonoran Desert, where dendrochronology is not as effective (Eighmy and McGuire 1989; Lengyel and Eighmy 2002). Flouride dating has not been used nearly as extensively, but it has been used productively at the Early Agricultural sites of Los Pozos (Schurr and Gregory 2002) and Las Capas (Mabry 2008a) along the Santa Cruz River near Tucson. OSL and TL are techniques that have been used on the Gila Indian River Community (Woodson et al. 2008; Woodson, ed. 2002). OSL also has been used to date canal sediments in the Phoenix Basin, although some of these studies are not yet reported. Treatment Plans and Addenda Plans for the Phoenix area, or elsewhere, should address and incorporate recent local geoarchaeological studies.

Given the relatively small size of undertakings to be conducted under this General HPTP, it is possible that multiple, or even single, samples suitable for absolute dating will not be recovered. It is probably more likely that diagnostic artifacts, including ceramics and projectile points, may be recovered, which also allow a cultural deposit to be situated in time through seriation. Seriation is simply a method used to classify artifacts based on stylistic changes over time; these artifacts are then either ordered relatively according to stratigraphic relationships, or absolutely if they were recovered from contexts with associated absolute dates. Appropriate and relevant artifact identification guides should be consulted, and may include Haury (1976), Heckman et al. (2000), Loendorf and Rice (2004), Lorentzen (1998), Lyndon (2005), Sliva (2009, 2015), and Waters (1982a, b), among others.

Research Questions:

1. When was the project site occupied, and for how long?

2. What temporally diagnostic artifacts were recovered, and what do they say about the occupation of the site?

3. What samples can be dated absolutely, and what do they say about the occupation of the site?

4. Can a relative temporal ordering of project resources be established?

5. How do materials at a site compare to contemporary sites in more distant locations, or to earlier or later sites in nearby locations?

Data Needs:

- Relative stratigraphic dating of site deposits.
- Temporally diagnostic artifacts.
- Radiocarbon dating of annuals from architectural features or food-processing and cooking pits.
- Dendrochronological dating of tree-ring specimens.
- OSL dating of occupation horizons.
- TL dating of ceramics.

Agriculture and Subsistence

The presence of people in Arizona for about 12,000 years is a testament both to the productivity of the landscape and to the knowledge and ingenuity of the inhabitants. The ability to control water, apparently first developed in the Early Agricultural period in southern Arizona, was later mastered by the Hohokam, although groups throughout the state farmed with canals (Woodson and Huckleberry 2002:Figure 5.2). These canal systems left a more visible signature on the landscape with regard to subsistence-related features, but earlier groups also left traces in their quest for subsistence sufficiency. The primary evidence for these groups consists of scatters of flaked stone artifacts, which are notoriously difficult to ascribe a precise function to (Goodyear 1975; Sullivan 1983, 1995). More helpful in building on what is known of pre-irrigation

subsistence would be diagnostic artifacts associated with contexts able to produce macrobotanical or pollen samples.

Sometime around 2100 B.C., people living along the Santa Cruz River, and perhaps other perennial streams in the state, began controlling water and cultivating domesticated crops, most notably maize. Over the centuries, crops were grown with a number of different techniques. Broadly, these techniques were either farming with irrigation or farming without irrigation. The latter category includes such sites as rock piles, check dams, terraces, borders, gardens, and fields (Foster et al. 2002). These modifications to the landscape are often quite visible. Irrigation canals, while for the most part no longer conspicuous today after many decades of development, would have been an impressive alteration of the landscape while operational, especially in the Phoenix Basin. Additionally, field houses—individual structures constructed and inhabited for the purposed of tending fields—may be considered part of the agricultural landscape (Crown 1983; Gregory 1991:163). Often, groups used more than one technique at the same time, so consideration of all water-control features is necessary in reconstructing the prehistoric agricultural landscape.

The Hohokam canals in the Phoenix Basin drew the attention of interested Euroamericans beginning in the late 1800s, but it was not until 1903 that a map of them was first published (Patrick 1903). Dr. Omar A. Turney produced a more detailed map that depicted the locations of many of the canals in the basin (Turney 1929), and Frank Midvale updated that map in 1966, before much of the area was covered by urban and suburban development (Midvale 1966). Jerry Howard revised and refined the map further by incorporating data from aerial photos (Howard 1991b). That data is available as a layer in AZSITE.

Research Questions:

1. How did subsistence change over time?

2. When were specific types of water-control features first used, and for how long?

3. What types of water-control features were used in specific environments or locations, and why?

4. How were water-control features constructed, and of what materials?

5. Can specific types of artifacts or features be associated with specific subsistence activities?

Data Needs:

- Presence of features, whether related to water control or other subsistence activities.

- Information on the prehistoric environmental conditions at the site.

- Artifacts found in association with subsistence-related features, or that have subsistence- related residues on them.

Domestic Organization

One of the most basic ways in which people interact with their environment is to build dwellings and, sometimes, to order the dwellings around one another or other spaces. For the earliest segments of prehistory in Arizona, particularly the Paleoindian, Early Archaic, and Middle Archaic periods, little is known about domestic architecture. What is known about the domestic life of these early times comes from rock shelters like Ventana Cave (Haury 1950; Huckell and Haynes 2003). Beginning in the Late Archaic and Early Agricultural periods, however, the remains of domestic structures are more common. In southern Arizona they are typically shallow, basin-shaped depressions that are circular or oval in plan view and may include informal hearths and large bell- shaped pits (Mabry, ed. 2008; Ravesloot et al., eds., 2010; Vanderpot and Altschul 2007). Formative period domestic structures are much more common. While there was much variation in the morphology of these structures, a typical pre-Classic Hohokam pit house, for example, was “a mud-covered structure of poles, brush, and thatch” (Whittlesey 2000a:3). The shape of these houses in plan view is varied, but almost all have hearths situated just inside the entry. The appearance of domestic structures during the Classic period changed, with regard to both shape and the materials used to construct them. Specifically, they were more often rectangular and above-ground, and more often built of adobe. This general developmental sequence—the construction of more-perishable pithouses followed by more-permanent and substantial above-ground dwellings—characterizes domestic architecture in other parts of the state as well (Cordell 1997).

Sometimes domestic structures were constructed in isolation, but at other times they were situated with reference to other structures. In the Hohokam world, as an example, structures were often organized in courtyard groups or, later, in compounds, both of which were typically associated with other feature types or areas, like trash deposits, burial groups, extramural spaces, or public architecture (Craig and Henderson 2007; Gregory 1991; Wilcox et al. 1981). Similar and typical organizations, like unit pueblos in the northern part of the state, exist for other cultural manifestations as well, albeit with many exceptions.

As individual structures were sometimes organized into larger units like compounds, so too were these sometimes organized into larger entities like villages or communities. But while all of these units of analysis—individual structure, courtyard group, compound, village, and community—are worthy of investigation, it is likely that only the first two will be addressed to any extent during work conducted under this General HPTP.

Research Questions:

1. What features related to domestic activities were documented at the site?

2. Can it be determined how features were built, or how they were abandoned?

3. Morphologically, how similar are the features to features documented at contemporary sites?

4. Can the orientation of structures to one another, or to other features like burials or trash deposits, be ascertained? If so, what do these patterns say about the domestic life of the site inhabitants?

Data Needs:

- Architectural features preserved well enough to discern architectural elements.

- Information on the spatial relationship of features at the site.

Religion and Ritual

There is little doubt that throughout prehistory "ideology, cosmology, and ritual supported and structured many aspects of life," (Whittlesey 2000a:14). As with the other research domains, it is more difficult to ascribe sacred meaning to the landscape for the earlier cultural manifestations in the state, although it is still no easy task for groups in later prehistory. Nevertheless, certain artifact types, feature types (for example, mortuary features; cairns or shrines, sometimes found along prehistoric trails; and geoglyphs or intaglios), and rock art all may be suggestive of ideology.

Artifacts and artifact caches of apparent ritual function have been recovered from Early Agricultural components at sites along the Santa Cruz River (Gregory 2001a, 2001b; Mabry 2005c, 2008c). The artifacts and caches include such items as projectile points, a fossil horse tooth, an unfossilized mammoth or mastodon vertebra, many uncommon lithic artifacts, pipes, cornucopia, tubes, cruciforms, balls, "dice", and a variety of ceramic figurines that may be indicative of ancestor worship.

Both human and animal burials, all with potentially complex ritual associations, have been found at later Formative-period sites throughout the state. Mortuary features could consist of primary or secondary inhumations or cremations, and burials may be found in association with one another. Rock art also likely had ritual or religious significance in its own right (Thiel 1995; Wallace 1983). Cairns or shrines, sometimes associated with trails but also found in other contexts, may have had, or still have, ideological significance (Hayden 1976; Rogers 1966). Indeed, trails themselves may be imbued with ritual significance (Darling and Lewis 2007). Natural features or landforms also had, and still have, cultural or religious importance; such traditional cultural places are discussed in the next section.

Research Questions:

1. Are there features that may be of ritual significance? If so, what are they, and why might they be significant?

2. Are there artifacts that may be of ritual significance? If so, what are they, and from what contexts were they recovered? Are there ethnographic equivalents to establish their significance?

3. Was rock art documented at the site? If so, can it be established that it was created for religious or other reasons?

Data Needs:

- Features that are indicative of a non-domestic, ritual use.

- Artifacts that, because of the context from which they were recovered, their unusualness, or their similarity to more recent artifacts of known function, can be ascribed a ritual significance.

- Rock art.

Social and Political Organization

Following Whittlesey (2000b), this domain includes research issues including social and political organization, cultural affiliation, and trade and exchange. Again, it is difficult to speak to these topics as they concern groups that existed earlier in prehistory, but becomes easier as sedentism and population increased later in prehistory.

One of the more contentious debates in the archaeology of the greater Southwest concerns the degree of social and political complexity in a given period or place. In Arizona, the issue is probably best exemplified in what came to be known as the Chavez Pass-Grasshopper debate, summarized by McGuire (2011). Essentially, one group of researchers saw in their data evidence for a hierarchical social organization (Upham and Plog 1986), while the other saw a more-egalitarian social structure (Reid and Whittlesey 1990), in part based on an analysis of burials (Whittlesey 1978). Despite numerous contributions to the arguments on both sides, the debate was never resolved (Cordell 1997; Kohler 1993), and archaeologists began to explore other approaches to studying leadership and social power (Mills, ed. 2000).

Hohokam archaeologists' views on sociopolitical organization are also varied, although the differing views have generally changed with time rather than with interpretations of contemporaneous data sets (Fish and Fish 1991; Wilcox 1991b). Based on excavations at Los

Muertos, Cushing (1890) saw evidence for a degree of sociopolitical complexity, and that interpretation held sway for many decades. The subsequent and influential use of ethnographic analogs extended to prehistory had the result of interpretations stressing egalitarianism (Gladwin 1930; Haury 1945). Presently, there is a general consensus that, at least in the Classic period, some level of increased social differentiation and hierarchy existed, as seen in the presence of platform mounds, the organization and style of domestic architecture, and specialized artifact types in certain contexts (Fish and Fish 1991; Wilcox 1991b).

It may be that undertakings conducted under this General HPTP are better able to address simpler questions of basic cultural affiliation than more complex questions of sociopolitical organization. An attempt should be made to assess whether recovered or documented material culture is indicative of a defined archaeological culture, as described in Section 3. If so, consideration could be given as to whether the material is typical or not with regard to other nearby findings, which could be accomplished in the context of a heartland/hinterlands model (Sullivan and Bayman 2007; Sullivan and Bayman, eds. 2007) or in the context of trade and exchange.

Archaeological investigations into the trading and exchanging of material goods has played a substantial role in larger discussions of sociopolitical organization. In the Hohokam literature, for example, the presence of nonlocal materials at platform mound sites has been argued to indicate that the procurement, production, and distribution of shell and obsidian goods was controlled by groups of elites (McGuire 1985; Peterson et al. 1997; Stone 2003), while others see evidence for a less controlled, more egalitarian mechanism of down-the-line exchange (Boley 2013). Staying in central Arizona, Abbott (2000) has shown that study of even relatively local artifacts, like ceramics produced at sites along the Middle Gila and Salt Rivers, can result in strong interpretations concerning their movement within the Hohokam world. Similarly, Abbott and his colleagues analyzed plain ware ceramics from sites located in the uplands north of the Phoenix Basin and found evidence for alliances and hostilities at a more-local scale than the regional scale of the Verde Confederacy, which is mentioned above (Abbott 2014; Abbott and Lack 2013; Abbott et al. 2007, 2008).

Research Questions:

1. Do artifacts or features allow assignment to an archaeological culture? If so, is the culture the expected one given the project's location?

2. Can the spatial relationship of features to one another speak to the social organization of site inhabitants?

3. Is there any public architecture on the site? If so, can the relationship of other features on the site be related to it?

4. Were any trade goods (obsidian, shell, nonlocal or local ceramics) recovered from the

site? If so, can they alone or in combination with the contexts from which they were recovered speak to the social and political organization of the site inhabitants?

5. If human burials are present, do their characteristics or associated artifact assemblages indicate differences in wealth or group membership?

Data Needs:

- Artifacts or features indicative of a recognized archaeological culture.
- The presence of public architecture, and the ability to associate other features with them.
- Nonlocal artifacts from contexts that help establish how they came to be deposited as they were.
- Human burials.

Historic-Period Research Themes

The themes, questions, and data needs presented in this section are based on the general historic-period cultural context presented above, which consists of a general overview of the state's history, largely based on the SHPO context studies.

Rural Settlement Landscape

Spanish Colonial and Mexican settlement was focused on presidios and missions; true rural settlement during those periods would have been tenuous due to the requisite of self-sufficiency and to Apache raiding. Rural settlement in Arizona became more common during the U.S. period once the threat of Apache raiding no longer existed, after about 1880, and due to the Homestead Act of 1862 and attendant legislation; it peaked in the 1910s and '20s (Stein 1990:Figure 2). Rural settlement included homesteads on the order of a quarter- or half-section, as well as larger ranches or farms that had bought up individual claims. Archaeological evidence of such settlement, which may include habitations, water-related features, outhouses, remnants of agricultural fields, livestock-related features, or artifacts, can be more informative when combined with archival research (Stein 1990; Thiel 2005).

Research Questions:

1. To what extent was rural settlement in Arizona done under formally recognized claims versus informal use of rural areas?
2. Were homesteads, whether formal or informal, economically self-sufficient?

3. Were homesteaders primarily engaged in farming, ranching, or other activities? Did this vary geographically?

4. Did the size of a formal claim dictate the homesteader's economic activities on the claim?

5. What was family life like on rural settlements? To what extent are women and children "visible" in these areas?

Data Needs:

- Archaeological remains evidencing rural settlement, including features like habitations, privies, water-related features, and farming- or ranching-related features.

- Artifacts from rural settlement locations that provide information about economic activities and indicate differences in age or gender.

- Complementary archival information, including that on the size of a claim and the person who filed the claim.

Townsite and Historic District Landscape

Towns in Arizona came into being for a variety of reasons, including as mining boomtowns, farming communities, and cattle towns that sprouted up along the railroads. Some of these are now ghost towns, while others still exist as historic-period parts of modern towns and cities. Even in instances where much of the above-ground buildings in original townsites have been replaced by modern development, subsurface remains may be plentiful—the Original Phoenix Townsite is a good example of this. The layout and location of the Original Phoenix Townsite is well known, and its subsequent growth over the decades is well documented (Collins 2005; Janus Associates, Inc. n.d.); this knowledge has been supplemented with information gleaned from a number of archaeological investigations. In addition to Phoenix, towns like Mesa, Tempe, Tucson, Flagstaff, and Prescott, among many others, were incorporated in the late 1800s, while numerous other towns were incorporated in the first half of the twentieth century.

Some townsites have been formally listed on the NRHP as historic districts, but this designation is not restricted to the typically commercial core of a town or city. In Tucson, for example, there are approximately 40 listed historic districts, many of which are residential neighborhoods, each of which is unique in terms of the architectural styles it contains, why and how it was developed, the ethnic, cultural, social, or professional groups who lived and worked there, and how they changed over time (e.g. Lister and Lister 1989).

Research Questions:

1. Can it be determined whether a townsite or historic district, or portions thereof, were laid out formally or in a more haphazard manner?

2. Can commercial, residential, social, or other functions be ascribed to a portions of a townsite or historic district, or to specific structures or structural remains within it?

3. What architectural styles are represented by structures in a townsite or historic district?

4. What demographic or spatial changes are evident in a townsite or historic district over time?

5. Do structures, features, or artifacts indicate the presence of specific ethnic or cultural groups, women, or children?

Data Needs:

- Structures or features that are identifiable as to function, or complementary archival information on the same.

- Structures that preserve architectural detail.

- Documentary information on the origin and formation of a townsite or historic district.

- Structures, features, or artifacts that can be associated with specific ethnic or cultural groups, women, or children.

Mining Landscape

Mining has a long and colorful history in the state, beginning in prehistory and continuing through the Spanish Colonial and Mexican periods to the modern day. The earliest mining activities in the U.S. period were simply placer mines on the Colorado and Gila Rivers, and then on creeks near Prescott, which have probably left little archaeological trace. But mines became larger and more substantial with the adoption of changing techniques and technologies and the discovery and exploration of more metals, and more prevalent with an increasing and diverse population and the arrival of the railroad. However, as Keane and Rogge (1992) note, many historic-period mining-related features have been destroyed by subsequent mining activities at the same locations, whether for the same metal originally mined or a different one.

Research Questions:

1. Is a site related to exploration or extraction? What techniques and technologies were employed at the mine?

2. What was being mined at a given location? Did that change over time?

3. How was the mine integrated into the larger economy?

4. Can different ethnic groups, like Native Americans, Cornish, Chinese, or African Americans be identified in the archaeological or mine-specific archival record?

Data Needs:

- Mining-related features, tools, and equipment from exploration or extraction sites.

- Information or evidence of what was being mined, and when.

- The provenance of tools or other supplies found at a mine, and information on how mined ore was delivered to markets.

- Artifacts, features, or other remains that can be associated with specific ethnic or cultural groups.

Ranching Landscape

Like mining, ranching has a history in the state that dates back to the Spanish Colonial period. Ranches in this earlier period, and the subsequent Mexican period, were relatively small and focused on missions in southern Arizona, although the Mexican government authorized several large land grants. It was not until the U.S. period, however, that the pacification of the Apaches and the arrival of the railroad allowed ranching to become a larger and more important economic activity in the state. As Sheridan (2012) has pointed out, individual homesteading claims were not of a sufficient size to raise a profitable herd or flock, so large ranches soon became commonplace throughout the state (Collins n.d.).

Research Questions:

1. Can ranching-related facilities be associated with a smaller ranch of a single homesteading claim, or with a larger ranch of numerous consolidated claims? Can the remains be dated such that changes in ranch size can be determined over time?

2. Do ranching-related features exist such that it can be ascertained whether a ranch focused on cattle, sheep, or both? Are there physiographic patterns to the distribution of such ranches?

3. Can technological changes in features like windmills, barbed wire, and cattle guards be related to larger temporal trends?

4. Can ethnic or cultural groups be identified at a ranch?

Data Needs:

- Ranching-related features that retain technological detail.
- Ranching-related features that can be determined to be animal-specific.
- A complementary archival record that speaks to the size of the ranch and the people who worked on it.

Agricultural and Irrigation Landscape

Irrigation agriculture has a history of many millennia in the state, and it is well documented that historic-period farmers, particularly in the Phoenix Basin, made use of prehistoric canals that diverted water from rivers. But in the historic period irrigation was not limited to the Phoenix Basin, and not all farms were fed by river water. Mormon settlers in northeastern Arizona, for example, irrigated fields along the Little Colorado River and its tributaries, and built towns that still exist today. Farming communities like Coolidge and Eloy were established in large part due to the pumping of groundwater to water fields, which also became more common elsewhere in the state as stream and river levels dropped (Sheridan 2012). Over the course of the historic period, agricultural activities varied widely in terms of who was involved, the size of the farms, and the degree of technical sophistication.

Research Questions:

1. Can agriculture-related features, like canals, head gates, or wells, be dated? Do the types of features present date to approximately the same period?

2. Can identified features inform as to the techniques or technologies that were used to water fields? Can it be documented that this changed over time?

3. Can the size of a farm be determined, and if so, can this be related to demographics and economic considerations of a larger community?

Data Needs:

- Agriculture-related features that can be dated.
- Agriculture-related features that can provide information on the techniques or technologies used to water a specific area.
- Archival research into the size of a farm and the crops grown on a farm.

Transportation, Utilities, and Communication Landscape

Many thousands of miles of historic-period railroad, roads, pipelines, transmission lines, and other linear infrastructure crosscut the state. Historically, railroads are probably the most important of this group given their early role in facilitating endeavors like mining, ranching, and farming, and in connecting those pursuits to markets in Arizona and beyond. Over time, the state's network of roads also played a role in this regard, in addition to opening up much of the state to tourism by automobile. As the need grew to transport natural resources and power to and through parts of the state, so too did the number of transmission lines and other linear resources.

Research Questions:

1. To what extent were different types of historic-period linear infrastructure constructed in the same corridors, and why?
2. Is the linear resource still in use? If so, to what extent has it been maintained or upgraded? If not, why not?
3. Do physical characteristics of the resources speak to the age of the resource, or to its method of construction?
4. Can roadside trash dumps be used to address the nature of the use of the road, or how its use changed over time?
5. Do features associated with roads or railroads, like culverts, bridges, or poles retain historical information of their own?

Data Needs:

- Detailed notes and photographs on the physical characteristics of the linear resource to compare with as-builts and original plans.
- Basic information on nearby communities or facilities with which the resource may be associated.

- Dateable artifacts associated with the linear resource.
- Notes and photographs of features associated with the resource.

Military Landscape

At times, three national militaries occupied portions of the state, and they played a key role in opening up the state for settlers and for allowing and supporting economic pursuits like mining, farming, and ranching. For example, Fort McDowell was supported by the fruits of agricultural pursuits in the Phoenix Basin, although this dynamic worked both ways. From Spanish presidios to U.S. camps, forts, bases, training grounds, and other facilities, a broad array of military-related features and sites are located in Arizona and they were home to a variety of different ethnic or cultural groups and the individuals that composed those groups (Collins et al. 1993).

Research Questions:

1. What structures or features can be identified and dated, and can a function be ascribed?
2. Can national, ethnic, or cultural groups be identified given the types of features or artifacts that are present?
3. What was the nature of the relationship between a military-related feature or site and nearby nonmilitary communities?
4. How did the day-to-day existence of military personnel change over time?

Data Needs:

- Dateable features preserved well enough to determine use or purpose.
- Features, artifacts, or samples that are specific to national, ethnic, or cultural groups.
- Artifacts that reflect the daily lives of military personnel.

5. PERMITTING, BURIAL AGREEMENTS, AND REPOSITORY AGREEMENTS

The Arizona State Museum (ASM) has mandated authority and responsibilities under the Arizona Antiquities Act (AAA), Arizona Revised Statute (A.R.S.) §41-865, which applies to undertakings on private land. AAA permits are not valid or required for undertakings on private land.

ASM administers discoveries of human remains in the state, pursuant to A.R.S. § 41-865 on private lands. An ASM-issued burial agreement should be obtained prior to fieldwork for archaeological projects that have a reasonable expectation of encountering human remains, and this can be determined in consultation with ASM. If human remains are discovered in the absence of a burial agreement, ASM must be contacted immediately. A burial agreement will be developed between ASM and interested Tribes.

Repository agreements must be obtained prior to fieldwork. Repository agreements may be entered into with ASM or another, ASM-approved repository, per 36 C.F.R. Part 79. Collections will be prepared for curation according to the repository's standards and guidelines, including Pueblo Grande Museum's for projects within the City of Phoenix.

Different municipalities may have various permitting and notification protocols, and these protocols will be researched and adheared to during the consultation process and fieldwork. For example, the City of Phoenix may require traffic control plans, utilities permit, or right-of-way permit for work conducted within the city.

6. DATA RECOVERY METHODS

This section discusses types of archaeological testing and data recovery, monitoring, field methods and techniques, and laboratory analyses that may be used during undertakings conducted under this plan, as appropriate. Other methods and techniques may be identified as relevant on an undertaking-specific basis and should be consulted on with SHPO prior to implementation.

Types of Archaeological Testing and Data Recovery

Projects conducted under this General HPTP will employ one or more of the three types of archaeological testing defined in SHPO Guidance Point No. 2, *SHPO Position on the Roles of Archaeological Testing* (revised; SHPO 2018), as necessary and appropriate on a project-specific basis. Testing or data recovery typically will be within the boundaries of recorded archaeological sites or, if within the City of Phoenix, within the buffered boundaries of archaeological sites, consistent with City of Phoenix policy. For some projects on undeveloped land, surface collection of artifacts may be an appropriate component of testing or data recovery. The extent of archaeological testing is generally limited to the size and footprint of a cell tower project's area of potential effects (APE), which are typically small in size.

Identification Testing

It is anticipated that identification testing will most often be conducted in areas that are now obscured or disturbed by relatively recent activities, like asphalt paving or agricultural tilling. The SHPO Guidance Point indicates that this testing should be accomplished by shovel testing or auguring; however, in larger areas, such as within City of Phoenix buffer zones, it will likely

consist of backhoe trenching. Typically only a very small percentage of the given project area that is within a site boundary will be tested. If, through consultation, a specific percentage of the APE is determined to undergo archaeological testing, then the testing percentage will be stated in the Addendum Work Plan.

Eligibility Testing

Eligibility testing is appropriate when a site is known to exist but the existing data, whether from survey or archival records, is insufficient to assess its eligibility to the NRHP. Backhoe trenching will likely be the most commonly used technique, and no more than 1.5% of the site's surface will be tested. The qualified field supervisor will determine whether or not the proposed excavation strategy should be implemented in its entirety or, if sufficient information becomes available to recommend the site eligible, stop before all test excavation is complete

Phase I Testing

Phase I testing will only be conducted as the initial phase of a mitigation treatment that has been deemed appropriate by SHPO and the FCC to resolve an undertaking's adverse effect on a historic property. Its primary goal is to provide information that can be used to focus subsequent data recovery efforts in areas of a site that can address the investigation's research questions. Backhoe trenches are the most common unit of investigation. A representative sample percentage of the site within the project area should be tested, and this is typically greater than that for the other types of testing, but what is considered representative may depend on whether the site has been tested previously. Investigations may conclude at the end of Phase I testing due to a lack of subsurface features or if it is determined that additional important information would not be present at the site.

Phase II Data Recovery

Phase II data recovery is geared toward collecting more information, based on the Phase I results, that can further address the project's research questions. The scope of Phase II data recovery will have to be determined on a project-specific basis, and will be dependent upon factors including the results of Phase I work, the size of the area of investigation, and previous work on the site. Typically, Phase II data recovery will target all or a sample of the features identified during Phase I, depending on the number and type of those features. It also may include the mechanical or manual excavation of horizontal exposures in order to identify additional features.

Field Methods

Data recovery methods, techniques, and procedures will vary depending on the number and types of features that are encountered; a specific plan will be created on a project-specific basis. Regardless of the feature types, no features, except for human remains, will be excavated

outside of the project APE. Horizontal and vertical control will be maintained by establishing a primary datum and supplemental control points as needed. Spatial control will be maintained by use of a handheld Global Positioning System (GPS) unit with sub-meter accuracy or a total station. Features will be mapped by hand through the use of at least two control points. Hand-drawn maps will be digitized and incorporated into a cumulative site map, versions of which will be used in the field and in the final report.

Human Remains

Human remains will be treated with professionalism, respect, and care, and the stipulations of the project's burial agreement will be followed. The excavation of burials will be completed by qualified personnel. Excavations will be conducted strictly with hand tools, preferably of wood or bamboo, and fill associated with human remains will be screened through ⅛-inch mesh. *In situ* artifacts will be point-provenienced. Human remains will be wrapped in muslin, then placed in hand-labeled paper bags, then in hand-labeled cardboard boxes. Unburned osseous material will be protected from sunlight. No soil or other samples will be taken from human burials. Fill in cremation vessels will be kept intact for careful examination and processing in the laboratory. The feature will be documented with scaled plan view and cross-section drawings, a skeletal inventory form, and detailed notes; photographs will not be taken. Funerary objects will never be separated from the human remains with which they were interred, whether in the field, in the lab, during escort between field and lab, or while housed awaiting repatriation.

Domestic Architectural Features

The excavation of a pithouse, room, or other domestic architectural feature will begin either with a rectangular control unit, from 1 m by 1 m to 2 m by 2 m in size, excavated within the boundaries of the structure, or a fraction of the house, typically a quarter or a half depending on house size. The control unit will be excavated by strata if identifiable or in arbitrary 10-cm levels if not. Fill will be screened through ¼-inch mesh, except for 10 cm of floor fill, which will be screened through ⅛-inch mesh. Once the control unit has established the basic stratigraphy, the remainder of the feature will be excavated in appropriate subdivisions in the same fashion. When the floor of the structure has been defined, the structure and its floor assemblage will be mapped in detail. Subfeatures—hearth, postholes, floor pits, etc.—will be excavated and fill will be screened through ¼-inch mesh, with the exception of fill collected for samples. Appropriate flotation, pollen, and other samples will be taken, and the features will be documented with scaled drawings, photographs, and with notes on standard forms.

Pit and Midden Features

Extramural pit features typically will be bisected and one half will be excavated. A profile will be drawn and the remainder of the feature will be excavated in arbitrary 10-cm levels, in natural strata, or as a single unit, depending on the size of the feature and its stratigraphy. Contents of pit features will be screened through ¼-inch mesh, with the exception of fill collected for flotation or

pollen samples. Large features such as trash middens or borrow pits will be sampled with a unit 1 m by 2 m in size. Detailed information on each excavated feature, including a plan view and cross section, will be recorded. Flotation, pollen, and other samples will be judgmentally collected, and features will be documented photographically.

Canals

Canal sediments will be profiled in detail, with a particular focus on changes in grain size and coloration. The presence of specific minerals, potentially reflected in soil coloration in a canal, may provide information on conditions during the use and abandonment of a canal. The canal will be sampled by taking sediments in a vertical column pattern from each identified stratum, or from 10-centimeter intervals if individual strata cannot be identified; ostracod, pollen, or other soil samples will be taken as appropriate. If possible, a trench should be excavated perpendicular to the canal in order to ascertain its orientation. This could both help determine the linear extent of a canal within the APE and its possible relationship to previously documented features beyond the APE. Whenever possible, a qualified geomorphologist or geoarchaeologist will be consulted if canals are identified during monitoring, testing, or data recovery.

Artifacts

Unassociated artifacts observed in trench backdirt will not be collected, unless they are of exceptional cultural or temporal diagnostic significance. Artifacts confidently associated with or manually excavated from features will be collected, with the exception of historic-period artifacts, which will be analyzed in the field. Artifacts not collected will be described and analyzed to the extent practical in the field.

Laboratory Analyses

The following sections outline how different artifact classes and samples recovered from prehistoric and historic-period contexts may be analyzed. Given the variety of material that may be analyzed under this General HPTP, the analyses discussed here should be considered recommendations; not all analyses will be suitable in all instances, and analyses not mentioned here may also be appropriate on a project-specific basis.

Human Remains

All stipulations and conditions of the project's burial agreement will be followed. Human remains must always be treated with sensitivity, respect, and dignity, handled minimally, and only then by specialists. Human remains and associated artifacts should be stored in a secure environment and kept together during documentation. Data collection from human remains and associated funerary objects must be nondestructive. Osteological and dental analyses more detailed than those in the field may be conducted and will focus on such characteristics as age, sex, biological population, disease, and evidence of trauma. Documentation will be conducted by or under the

supervision of experienced bioarchaeological experts.

Ceramics

The first goal of the ceramic analysis should be assignment of ware and type. Beyond that, the analysis of sherds will likely focus on recording morphometric and morphologic attributes. Attributes to be recorded may include the forms of rim sherds, as well as metric attributes such as rim diameter, sherd thickness, and two-dimensional sherd size. Rim sherds could be examined to determine rim form, rim lip finish, and rim diameter. An attempt at determining rim diameter could be made using the curve-fitting method (Egloff 1973; Plog 1985). Microscopic analysis, as well as petrographic analyses of temper or chemical analyses of paste could also be conducted, as could analyses of design motifs and elements, all of which have proved fruitful in addressing various research questions throughout the state (e.g. Abbott 2000; Abbott et al. 2012; Crown 1994; Deaver 2004; Mills and Crown, eds. 1995; Plog 1980; Wallace 1986).

Flaked Stone

Flaked stone assemblages may be analyzed within a framework referred to as the organization of technology, which has dominated flaked stone research for years (Andrefsky 1994; Kelly 1988). Artifacts could be sorted into one of five primary categories: debitage, core, biface, uniface, and hammerstone, the definitions of which are drawn largely from Sliva (1998). Artifacts in each of these types may be coded for basic attributes: maximum dimension, mass, grain, and raw material type. Beyond this, the analyses could become more specifically oriented to recording attributes of the artifact types. Debitage could be coded for attributes such as completeness, presence/absence of dorsal cortex, and whether it macroscopically appears to have been utilized. Cores could be coded for the nature and extent of flake removal, and for use as a tool, if any. Unifaces could be coded for the nature, reach, and extent of their retouch and, like bifaces, could be analyzed as to “intuitive type” (see Sliva 1998). Hammerstones could be examined for the type and extent of the apparent use.

Ground Stone

Following J. Adams (2002), ground stone artifacts should be analyzed within a technological framework that considers both the morphology and associated function of an artifact and the knowledge, ideas, and behavior associated with the design, manufacture, use, and discard of an artifact (see also Adams 2005; Nelson and Lippmeier 1993). Ground stone may be assessed within four typological categories: food processing tools, general processing tools, manufacturing tools, and paraphernalia. Food processing ground stone tools can provide valuable insights into subsistence and diet. For example, slab and basin metates are less efficient than trough metates, which are more efficient in the processing of seeds and maize kernels into flour; these morphological and technological differences may indicate changes over time or through space in the way plant food was processed (J. Adams 2002:121). General processing and manufacturing ground stone tools can also provide information about nonsubsistence-oriented

activities that may have occurred at the site, including craft production, tool manufacture, and architectural maintenance, while paraphernalia may provide insight into ritual or other socio-political human behaviors. Attributes to be recorded may include raw material, artifact type and subtype, portion present, dimensions, morphology, manufacture and design, use, and use wear as well as specific attributes relevant to artifact type and subtype.

Shell

Shell was a key trade item in the prehistoric Southwest. The relative frequency and type of shell artifacts may reveal the extent to which a site participated in trade and exchange networks. Shell artifacts will likely be analyzed descriptively, first recording the species and whether the item is worked or unworked. For worked shell, the analyst will record artifact type, portion, and dimensions, plus the specific attributes relevant to the artifact type. Artifact classification could be based on that developed for the Snaketown shell analysis (Haury 1976), and subsequently built upon by Howard (1987, 1993) and Vokes (1988).

Faunal Remains

Analysis of faunal remains may be used to address questions relating to diet and subsistence strategies and to determine the environmental setting during site occupation. All faunal remains should be analyzed, and the taxonomic unit should be assigned to the finest level possible, ideally species. Element, portion, side, weight, quantity, age, and evidence of pathologies should be recorded.

Variables relating to modification may also be recorded, including evidence of burning, chewing or gnawing, butchering marks, fragmentation indicative of marrow extraction or bone grease production, and shaping to form tools or ornaments. Standard indices such as the number of identified specimens (NISP) and minimum number of individuals (MNI) may be calculated. Other indices indicative of the nature of faunal exploitation, such as the lagomorph index (Dean 2007) may also be calculated. Bone tools may be interpreted along the lines of Griffitts and Waters (2005).

Pollen

The number of pollen samples analyzed will be determined in part on the types of features excavated and the context and quality of the pollen samples taken. Analysis of the samples may follow the methods outlined in at least one recent study (Phillips 2011). Pollen extractions will incorporate Lycopodium grains to estimate pollen concentrations. Samples will be treated with hydrochloric acid (HCL) to reduce carbonates, which will be followed by a swirl-and-decant step to reduce the heavy matrix fraction (Mehringer 1967:136–137). Silicates will be reduced by a hydrofluoric acid treatment. Heavy flotation in zinc bromide will be followed by acetolysis to further reduce organics. The remaining residues will be washed with water and alcohol, stained with saffranin, and suspended in glycerol.

Extracts will likely be mounted and examined at 400x magnification. Percentage calculations will be based on standard 100+ or 200+ grain counts, depending on pollen abundance. Identification should be aided by comparative collections and published keys (Kapp 1969; Moore et al. 1991). Each pollen grain will be identified to the generic level where possible, and otherwise to the family level. Pollen grains degraded beyond recognition will be assigned to the indeterminate category. Pollen concentration values and environmentally diagnostic ratios of pollen taxa may also be calculated.

Macrobotanical Specimens

Macrobotanical samples may be collected both as individual specimens and in bulk soil samples. Samples will be evaluated for their ability to address the research questions. The number of samples to be submitted for analysis should be determined based on the results of data recovery, but those submitted will be representative of the range of excavated deposits. The samples will be subjected to standard laboratory analyses. All macrobotanical samples will be identified through magnification. Comparative collections of modern regional plants may be used if relevant and appropriate. Criteria for the identification of the majority of expected taxa and parts, at least for some areas of the state, have been published by K. Adams (1994, 1997, 2002).

Chronometric Samples

Analyses of radiocarbon and archaeomagnetic samples may be used to provide absolute dates for site occupations. Radiocarbon samples will be processed by an appropriate, competent lab; archaeomagnetic samples will be collected and analyzed by an expert with local experience. Flouride dating, previously and informatively employed on faunal material from at least one site, will be used if deemed appropriate (Schurr and Gregory 2002). The excavation of sediments in canals may also afford the opportunity for optically stimulated luminescence (OSL) dating.

7. PROJECT-SPECIFIC WORK PLAN / ADDENDUM PLAN

For undertakings that have been determined, through consultation, to result in adverse effects to historic properties, and require data recovery, Verizon will prepare a project-specific addendum (Addendum Plan) to this General HPTP. The General HPTP outlines the general research objectives, field methods, laboratory procedures, analyses, administrative and safety protocol, curation, reporting criteria, and consultation protocol that will be used for the project. The Addendum Plan will provide a site-specific work plan to address the proposed archaeological activity as agreed upon among Verizon, SHPO and other consulting parties, as appropriate. The approved outline, below, should be followed, with all relevant components included in the document; any deviations from the General HPTP should be stated. Projects involving monitoring only will follow the monitoring and discovery plan within this General HPTP; it will not be necessary to develop a separate monitoring and discovery plan.

- Title Page
- Abstract (abbreviated)
- Table of Contents
- Introduction
    - Describe the undertaking, its location, and the area of potential effects.
    - Identify the historic property (archaeological site, building, structure) to be affected and describe planned impacts as specifically as possible; include plan sheets with site overlay if necessary.
    - Cite applicable regulations and permitting requirements.
    - Include project location and land jurisdiction map(s).
- Site Description and Research Design
    - Describe the site and summarize the methods and results of all previous research conducted at the site.
    - Describe the applicable research themes and questions to be addressed by current investigation.
    - Reference to the General HPTP where relevant
- Scope of Archaeology Work
    - Type of investigation.
    - Sampling strategy (e.g. trenches, excavation units, etc.)—include description as well as site maps showing planned approach(es).
    - Reference to the General HPTP where relevant.
- Reporting and Consultation Schedule (e.g. local notification protocols, reporting policies, etc.)

The Addendum Plan should be submitted to all consulting parties with a letter requesting review and concurrence. See Section 11.0 for a discussion about the submittal and review process for an Addendum Plan.

8. MONITORING AND DISCOVERY PLAN

Archaeological monitoring may be identified as an appropriate mitigative measure for some projects. Typically, these projects would be characterized by limited vertical and horizontal ground disturbance within the boundary of a recorded archaeological site, or they would be in the vicinity of the plotted locations of prehistoric canals, or in non-site areas that are near to recorded sites. If cultural resources are identified during monitoring, they should be documented, recovered, and interpreted as outlined elsewhere in this document. This section first provides a discussion on archaeological discovery, then focuses on the discovery of human remains during monitoring, on the discovery of canals during monitoring, and on monitoring in non-site areas.

Generally, archaeological monitoring will be performed to ensure that subsurface cultural deposits are identified and recorded, if encountered. The monitor will examine vertical and horizontal exposures created as a result of construction activities, as well as backdirt from the excavations. The monitor will record information about the characteristics of the sediments and stratigraphy, to

the extent possible, on standardized field forms. A digital camera and Global Positioning System (GPS) receiver should be used for documentation and recording as appropriate. The monitor should have the opportunity to communicate in advance with construction personnel about the need for monitoring, the types of cultural resources that may be expected, and the procedures to be followed in the event of a discovery.

Prior to fieldwork, the consultant shall provide SHPO and other consulting parties an aerial image of the area to be monitored during ground-disturbing activities, and the boundary of the archaeological site or projected canal location. If the survey report does not address previous research within the site, a map showing the locations of previous investigations should also be provided, along with a brief discussion of proposed treatment if the expected features are not addressed in the General HPTP. For monitoring projects within the City of Phoenix, the consulting firm must provide notification to the City Archaeologist (602.534.1573) prior to, and upon the completion of, all monitoring.

Archaeological Discoveries

If intact subsurface cultural material is identified during monitoring, ground-disturbing activities within 100 feet of the discovery should cease, giving the archaeological monitor the opportunity to assess the find. Depending on the nature of the discovery, the subsequent course of action will vary.

For the purposes of this document, significant cultural resources are defined as mortuary features, or as one or more identifiable nonmortuary subsurface features that are, either by themselves or in association with other known features, able to contribute important information to prehistory or history. Not all features may be considered significant, and small numbers of artifacts not associated with a feature, unless they are particularly informative or uncommon diagnostic artifacts, are not here considered to be significant cultural resources.

If a significant cultural resource is identified during construction, but additional construction will not harm it further (for example, a feature exposed in the wall of a utility trench), the monitor will record it with drawings, photographs, a GPS unit, and other documentation as appropriate. Once that is complete, construction in the area may resume. If, however, additional ground-disturbing activities will further impact a significant feature, it should be excavated and documented before construction is allowed to resume*, but only after concurrence from SHPO and, in some instances, consultation with ASM, and the FCC (and possibly other consulting parties, e.g., City of Phoenix) is completed*. It is important to note that all human remains, whether in a recognizable mortuary feature or not, are considered significant, and are discussed further below. Data recovery methods are described in Section 9.0.

Human Remains

If human remains are discovered during monitoring, ground-disturbing activities will cease immediately within 100 feet of the discovery. Per the undertaking's burial agreement and per

A.R.S. § 41-865, Verizon will notify the State Repatriation Coordinator at ASM and any Tribes indicated in the burial agreement. SHPO and the FCC will be promptly notified. Other entities, such as the City of Phoenix, or other municipalities with appropriate jurisdiction, also will be notified. The stipulations of the burial agreement will be adhered to and Tribes will be offered the opportunity to visit the burial prior to removal.

Once excavation proceeds, human remains and associated funerary objects will be treated respectfully and professionally at all times, from exposure and removal, to escort and secure off-site housing. The feature will be documented with scaled plan view and cross-section drawings, a skeletal inventory form, and detailed notes; photographs will not be taken. *In situ* artifacts will be point-provenienced and fill will be screened through 1/8-inch hardware cloth. Unburned osseous material will be protected from sunlight, and tools of wood or bamboo will be used. Human remains will be wrapped in muslin, then placed in hand-labeled paper bags, then in hand-labeled cardboard boxes. Human remains and associated funerary objects will be kept together during escort and when housed before repatriation.

Canals

As discussed above, the Hohokam built, maintained, and rebuilt extensive canal systems on both sides of the Salt River in the Phoenix Basin (Masse 1981), and, to a lesser extent, along the middle Gila River and Queen Creek, and in the Tucson Basin. Early Agricultural peoples also built canals in the Tucson Basin, preceding the Hohokam by thousands of years (Mabry 2005a, b, 2008a; Vint 2015). The Hohokam canals in the Phoenix Basin have drawn the attention of interested scholars for over 100 years, and several maps depicting canal locations have been produced (Midvale 1966; Patrick 1903; Turney 1929). Jerry Howard revised and refined Midvale's map by incorporating data from aerial photos (Howard 1991b). That data is available as a layer in AZSITE, and a project's proximity to a canal or canals plotted in AZSITE may dictate archaeological monitoring. Consistent with City of Phoenix policy, archaeological monitoring will be conducted within 50 feet of the projected locations of these canals.

The City of Phoenix has provided guidance for recording information on canals (Montero and Stubing 2004; Montero et al. 2008; Stubing and Turner 2007), which is relevant given that majority of monitoring projects related to canals will likely be in the Phoenix Basin. To summarize that information, canal sediments will be profiled in detail, with a particular focus on changes in grain size and coloration. The presence of specific minerals, potentially reflected in soil coloration in a canal, may provide information on conditions during the use and abandonment of a canal. The canal will be sampled by taking sediments in a vertical column pattern from each identified stratum, or from 10-centimeter intervals if individual strata cannot be identified; ostracod, pollen, or other soil samples will be taken as appropriate. The linear extent of canals within the APE will be traced and mapped, and the possible relationship of such features to previously documented features beyond the APE will be considered.

Non-Site Areas

Occasionally, monitoring may be required in non-site areas, which may include areas that are very close to but outside of the recorded boundary of an archaeological site, and areas that are reasonably expected to have a high likelihood of containing intact subsurface cultural deposits but that are not in or particularly close to a recorded site. Within the City of Phoenix, monitoring within the buffered area around recorded archaeological sites may be appropriate. Archaeological discoveries made in these situations should be dealt with in the same manner as discoveries made in other monitoring contexts, as described above.

Reporting the Results of Archaeological Monitoring

If the monitoring results in negative findings (an absence of subsurface cultural features), within two weeks of the end of fieldwork, the consulting firm shall submit a letter report to SHPO and consulting parties for review and comment for a period of 15 days. The letter shall identify the monitor and the date(s) of monitoring, and describe the nature of activities that were monitored (type of equipment, depth and extent of ground-disturbance), etc.

If the monitoring results in the identification of cultural resources, reporting shall follow Section 11 of this document.

Tribal Monitor

A Tribal monitor may be requested regardless of the finding of project effect. Section 9 (Unanticipated Discoveries) of this document shall be followed in the event of any discovery of cultural resources or human remains during monitoring.

9. UNANTICIPATED DISCOVERIES

Unanticipated discoveries of archaeological materials may be made in the absence of an archaeological monitor during the course of ground-disturbing activities related to construction. Ground-disturbing activities should cease within 100 feet of the discovery and SHPO should be contacted immediately. ASM should be contacted if human remains are present and known to be in an archaeological context; law enforcement should be contacted when there is doubt about the age of human remains.

Human Remains and Mortuary Features

If human remains are discovered during construction, ground-disturbing activities will cease immediately within 100 feet of the discovery. Per A.R.S. § 41-865, the State Repatriation Coordinator at ASM will be contacted. Once an appropriate burial agreement has been put in place and consultation with the appropriate Tribes as identified in the agreement has been completed, treatment of the human remains and runerary objects will proceed in accordance with

the decisions made during the consultation and with the stipulations of the burial agreement. Human remains and mortuary features will be treated and documented as described in Sections 7.0 and 9.0.

If Native American human remains are encountered, the area surrounding the discovery should be secured to prevent theft and/or vandalism. Certain locations, such as metropolitan areas, have a high instance of vandalism and theft, and on-site security shall be arranged in these circumstances to prevent theft or damage to sensitive materials or remains.

Nonmortuary Features and Artifacts

If nonmortuary archaeological deposits or materials are disturbed during ground-disturbing activities, construction should cease immediately within 100 feet of the discovery. SHPO should be contacted immediately. An archaeologist should have the opportunity to visit the location and assess the unanticipated discovery. Depending on the type of discovery, the next steps should follow those outlined in Section 7.0.

10. QUALIFICATIONS OF PERSONNEL

Activities done under this General HPTP that involve the identification, evaluation, analysis, recording, treatment, monitoring, or disposition of historic properties, or that involve the reporting or documentation of such actions in the form of reports, forms, or other records, shall be carried out by, or under the direct supervision of, a person or persons meeting qualifications set forth in the Secretary of the Interior's Professional Qualification Standards (36 C.F.R. Part 61). In addition, consultants carrying out this work will have an ASM qualified Principal Investigator who holds an ASM blanket permit to conduct non-collection surveys within the State of Arizona.

11. REPORT, REVIEW, AND CONSULTATION

When it has been determined through consultation that an undertaking will result in adverse effects to historic properties, Verizon will prepare a project-specific addendum (Addendum Plan) to this General HPTP (see Section 5.0). The draft Addendum Plan will be submitted to SHPO and appropriate consulting parties for review and comment, for a period of thirty (30) calendar days. Verizon will consider all comments and prepare a revised Addendum Plan. The revised plan will be submitted to the signatories and appropriate consulting parties for further review and comment for a period of 15 calendar days. Verizon will make a good faith effort to contact non-responsive parties by phone call and/or email, and may implement the plan if there is no response within five (5) calendar days.

Within two weeks of Phase I testing projects resulting in negative findings (i.e, the absence of subsurface cultural features), Verizon will prepare an end of fieldwork (EOF) report that summarizes the Phase I investigations. The EOF report will also describe the sampling strategy,

field methods, and deviations, if any, from the Addendum Plan. This report will be emailed to the consulting parties, who will have ten (10) calendar days to review and comment on it. Verizon will consider all comments and revise the EOF report accordingly; consulting parties will have another five (5) calendar days to review and comment on the revised report. Once the revised EOF report has been approved by the SHPO, and other consulting parties if appropriate, it will be considered final. Verizon may then authorize construction to proceed.

For Phase I testing projects that encounter cultural resources, Verizon will invite the project-specific consulting parties to an in-field meeting to determine whether Phase II data recovery is warranted. Verizon will then immediately prepare a Preliminary Phase I Report that details the Phase I results, discusses deviations from the Addendum Plan, and summarizes what was agreed upon during the in-field meeting. This report will be emailed to the consulting parties, who will have ten (10) calendar days to review and comment on it. Verizon will consider all comments and revise the Preliminary Phase I Report accordingly; consulting parties will have another five calendar days to review and comment on the revised report. Verizon will attempt to contact nonresponsive consulting parties by telephone or email at the end of this five (5)-day period. If there is still no response, Verizon may then authorize Phase II data recovery to proceed.

At the conclusion of Phase II data recovery, Verizon will invite the project-specific consulting parties to an in-field consultation. Verizon will then prepare a Preliminary Phase II Report that summarizes the results of Phase II investigations as well as what was agreed upon during the in-field consultation. This report will be emailed to the consulting parties, who will have ten (10) calendar days to review and comment on it. If a consulting party disagrees that the agreed-upon investigations were completed, or if major deviations from the Addendum Plan took place during data recovery, Verizon will address these concerns immediately with the consulting parties, and will revise the Preliminary Phase II Report accordingly. The revised report will be emailed to the consulting parties, who will have another five (5) calendar days to review and comment. Once the revised Preliminary Report has been approved, it will be considered final. Verizon may then authorize construction to commence with an archaeological monitor present, and following Section 7.0 of this document.

Once Phase II fieldwork is completed, Verizon will submit a draft technical report within one year. The draft report will describe the archaeological fieldwork, provide the results of appropriate analyses, and discuss how the work addressed the project's research domains and associated questions. The draft technical report will be submitted to the project-specific consulting parties for a thirty (30)-calendar-day review and comment period. Verizon will consider all comments and revise the draft report accordingly; the revised report will be submitted to consulting parties for further review and comment for a period of fifteen (15) calendar days. If a consulting party fails to respond within the review period, Verizon will make a good faith effort to contact the party, and will proceed with revisions or finalizing the report if there is no response within five calendar days. Once the revised technical report has been approved by the signatories to the PA, it will be considered final and distributed to the consulting parties. Project registration and curation requirements will be met.

12. SAFETY PLAN

Prior to commencement of on-site activities, the archaeological consultant will review health and safety needs for each specific project with the project team. Archaeological excavations will be conducted pursuant to Occupational Safety and Health Administration regulations. Field personnel will wear Level D personal protective equipment consisting of hard hats, safety glasses, protection gloves, high visibility vests, and steel-toed boots. It may become necessary to upgrade this level of protection while fieldwork is being conducted in the event that petroleum or chemical constituents are encountered in soils that present an increased risk for personal exposure.

13. CULTURAL SENSITIVITY TRAINING

As practical, Verizon will ensure its archaeological and construction contractors complete cultural sensitivity training offered by the Salt River Pima-Maricopa Indian Community or other, tribal cultural preservation program in Arizona. The training is designed to build acceptance and respect for cultural differences and to help people recognize situations that threaten cultural resources. The training also is important to ensure proper conduct and care of sensitive materials and remains in the field. Training should be renewed every five years.

14. PUBLIC OUTREACH

The public is offered the opportunity to comment on each undertaking as part of the National Environmental Policy Act review with public notices published in local newspapers. The results of archaeological investigations will generally not be shared with the public due to construction schedules, safety protocols, and cultural sensitivity concerns. In particular, the identification and excavation of human burials shall not be publicized. A statement declaring these sensitivity issues should be included in the Addendum Work Plan.

15. PROJECT SUSPENSION/TERMINATION PLAN

In the event that a project is suspended or terminated during archaeological investigations, Verizon will ensure that the consultant has one business day to document all exposed cultural features with written notes and photographs, and record all geospatial data. All human remains will be fully excavated per Section 9.2.1 of the General HPTP. Upon the completion of the required documentation, all open trenches will be backfilled, while any unexcavated features exposed in plan view will be covered with a geotextile before being covered with fill. Verizon will be responsible for completing consultation and should follow stipulations regarding reporting, review, and comment, as outlined above.

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