

Arizona Historical Society



Cultural Resources Overview and Assessment for Buenos Aires National Wildlife Refuge, Borderland Arizona



Prepared for the U.S. Fish and Wildlife Service Southwest Region, 2018



CULTURAL RESOURCES OVERVIEW AND ASSESSMENT FOR
BUENOS AIRES NATIONAL WILDLIFE REFUGE,
BORDERLAND ARIZONA

Prepared for

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EXECUTIVE SUMMARY

In the fall of 2017, EnviroSystems Management, Inc. (EnviroSystems) was contracted by the U.S. Fish and Wildlife Service (FWS), Southwest Region, to develop a Cultural Resource Overview for Buenos Aires National Wildlife Refuge. This particular refuge lies in the Sonoran Desert of southern Arizona and is centered on the bottomlands of the Altar Valley. It is a landscape unique in many ways, but one very specific way is that its southern boundary is the border between Mexico and the United States: this border is arbitrary not only in terms of topography and vegetation, but also in terms of human history. It is only recently, within the last one hundred or so years, that the International Border has divided the people who live on its south side, with the people who live on its north side. That is to say, for most of human history, people have crossed this imaginary line seamlessly as they went about their lives creating meaning for themselves and for their families.

The purpose of a Cultural Resources Overview is detailed in the FWS manual, Natural and Cultural Resources, Part 614 FW 1 (<https://www.fws.gov/policy/614fw1.html>)

D. Cultural Resource Overview. A resource overview is a document prepared for a field office that discusses, among other things:

- (1) Its prehistory and cultural history,
- (2) The nature and extent of known cultural resources,
- (3) Previous research,
- (4) Management objectives,
- (5) Resource management conflicts or issues, and
- (6) How cultural resources program objectives should be met and conflicts resolved.

Likewise, and according to the National Register of Historic Places, an important purpose of a Cultural Resource Overview, which in this case includes comprehensive historic context statements, is to provide a basis for judging the significance of individual objects, properties, and districts and, ultimately, evaluating their eligibility for inclusion on the National Register of Historic Places (see Little and Siebert 2000). To do this, historic contexts by their nature are multidimensional and include a body of thematically, geographically, and temporally linked information whereby specific objects, properties, sites, or districts are understood and their historic meaning, as well as their significance, is made clear.

To this end, the following technical report synthesizes in narrative form current knowledge regarding Native American prehistory, O’odham ethnohistory, and Euroamerican history of Buenos Aires National Wildlife Refuge. This naturally incorporates a body of investigative and synthetic work that covers major temporal and geographic trends that go beyond the small geographic confines of the refuge; for instance, like the meaning and distribution of Hohokam platform mound communities, Tohono O’odham settlement system of wells and fields, and ranching as a lifestyle in southern Arizona and the American Southwest. But these larger trends are exemplified in the cultural record present on the land that composes Buenos Aires. As such, all readily available cultural resource information about the wildlife refuge is incorporated herein, including summaries of previous investigations, both those focused on inventory and those on data recovery, and the properties they have documented. Finally, the National Historic Preservation Act of 1966 (as amended), and in particular Section 106 and Section 110 of that

Act, as well as the National Register of Historic Places and the evaluation and eventual nomination of historic properties to it, is discussed.

Oversight of this project on behalf of the FWS was conducted by Mr. Eric S. Brown, who served as the Contracting Specialist, and Mr. David Siegel, the Southwest Regional Historic Preservation Officer. Mr. Brown took care of all the details regarding federal contract administration and financial obligations. Mr. Siegel served as the Government Technical Representative and was the main point of contact between FWS and EnviroSystems. Mr. Siegel provided initial guidelines for product deliverables, information regarding the whereabouts of cultural resource reports and associated sites cards, contacts with various agency representatives, and important bibliographic information.

Oversight of this project on the part of EnviroSystems was conducted by Ms. Stephanie Treptow, as the Contract Administrator, and Dr. Gregory Haynes, Historic Preservation Specialist and Principal Investigator. Ms. Treptow served to ensure that the Contract conformed to EnviroSystems administrative protocol and she was assisted by Ms. Renee Fay, Financial Controller for the firm. Dr. Haynes, who specializes in the archaeology of the Desert West and with 35 years of historic preservation experience, was the primary author of the report. Ms. Christine Markussen, the GIS/Graphics Division Director at EnviroSystems, manipulated the GIS shapefiles provided by FWS and obtained through AZSITE, to provide up-to-date cultural resource maps. She also was instrumental in developing most of the graphics used in the body of the report.

As primary author, it is my hope that this Cultural Resources Overview is helpful for both archaeologists, historians, and researchers from other disciplines conducting investigations on Buenos Aires. As well, I hope that it proves useful for land managers that have to take into consideration the effects of their undertakings on historic properties significant in understanding the human use of this interesting landscape.

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CHAPTER 1. INTRODUCTION

BUENOS AIRES NATIONAL WILDLIFE REFUGE

Buenos Aires National Wildlife Refuge (Buenos Aires NWR or BANWR) is in southern Arizona just north of the international border with Mexico (*Figure 1*). Established in 1985, the refuge spans a total of 177,464 acres primarily on the floor of the Altar Valley which contains a Sonoran semidesert grassland biome. The land was purchased under the authority of the Endangered Species Act for the reintroduction of the masked bobwhite quail (*Colinus virginianus ridgwayi*) and to restore the natural landscape for native plants and animals that inhabit it. Prior to its purchase by the U.S. Fish & Wildlife Service (FWS), the area had been used as ranchland for livestock operations since the late 1800s when widespread Euroamerican settlement began in southern Arizona. Indeed, the refuge takes its name from one of the earliest ranches established in the Altar Valley, *Buenos Ayres Ranch*, owned and operated by Don Pedro Aguirre. Over 100 years of cattle grazing and related development severely degraded the natural landscape and caused changes in the composition of plant and animal species as well as dramatic erosion over time. Today, the FWS uses several different strategies to cultivate and enhance the land. These strategies include prescribed burning to control invasive plants that outcompete native vegetation; decrease erosion by installing erosion control structures that stabilize the top soil; enhance stock ponds to catch rain water; and remove old cattle fences to promote deer and pronghorn migrations.

Before the settlement of southern Arizona by Euroamericans, the Altar Valley was part of the Tohono O'odham (Desert People) homeland. Related to the Akimel O'odham (River People) to the north, the O'odham inhabited an enormous area of land that incorporated portions of what is today Sonora, Mexico, north to the Phoenix Basin, and from the Gulf of California east to the San Pedro River. These native people lived in autonomous villages in the valleys of northern Sonora and southern Arizona, which may well have included the Altar Valley prior to the 1800s. With the Gadsden Purchase in 1853, the O'odham peoples living in the northern Sonora and southern Arizona were divided. Today, the O'odham in Arizona live in four federally recognized tribes including the Tohono O'odham Nation, who live primarily in a vast area west of Buenos Aires NWR and the Baboquivari Mountains.

The O'odham attest to the fact that the Altar Valley and the lands associated with Buenos Aires NWR have a deep human history that stretch back thousands of years. This is supported by archaeological investigations conducted on refuge lands that have documented archaeological sites affiliated with the prehistoric agricultural society known as the Hohokam (50–1450 CE). There is also evidence that suggests people used the Altar Valley even before the Hohokam, when agriculture was introduced to peoples of the American Southwest around 1500 BCE, and perhaps even earlier when native peoples practiced a mobile foraging lifeway.

The purpose of this technical report is to summarize in narrative form how people throughout time have used the Altar Valley and lands associated with Buenos Aires NWR. It is meant for both the interested lay reader curious about how human events have shaped this unique landscape, as well as the professional seeking to understand how specific cultural resources and historic properties fit into the larger framework of human history. The bulk, therefore, of this introductory chapter presents the

Figure 1. Location of Buenos Aires National Wildlife Refuge in Arizona.

0 2.5 5 Mile



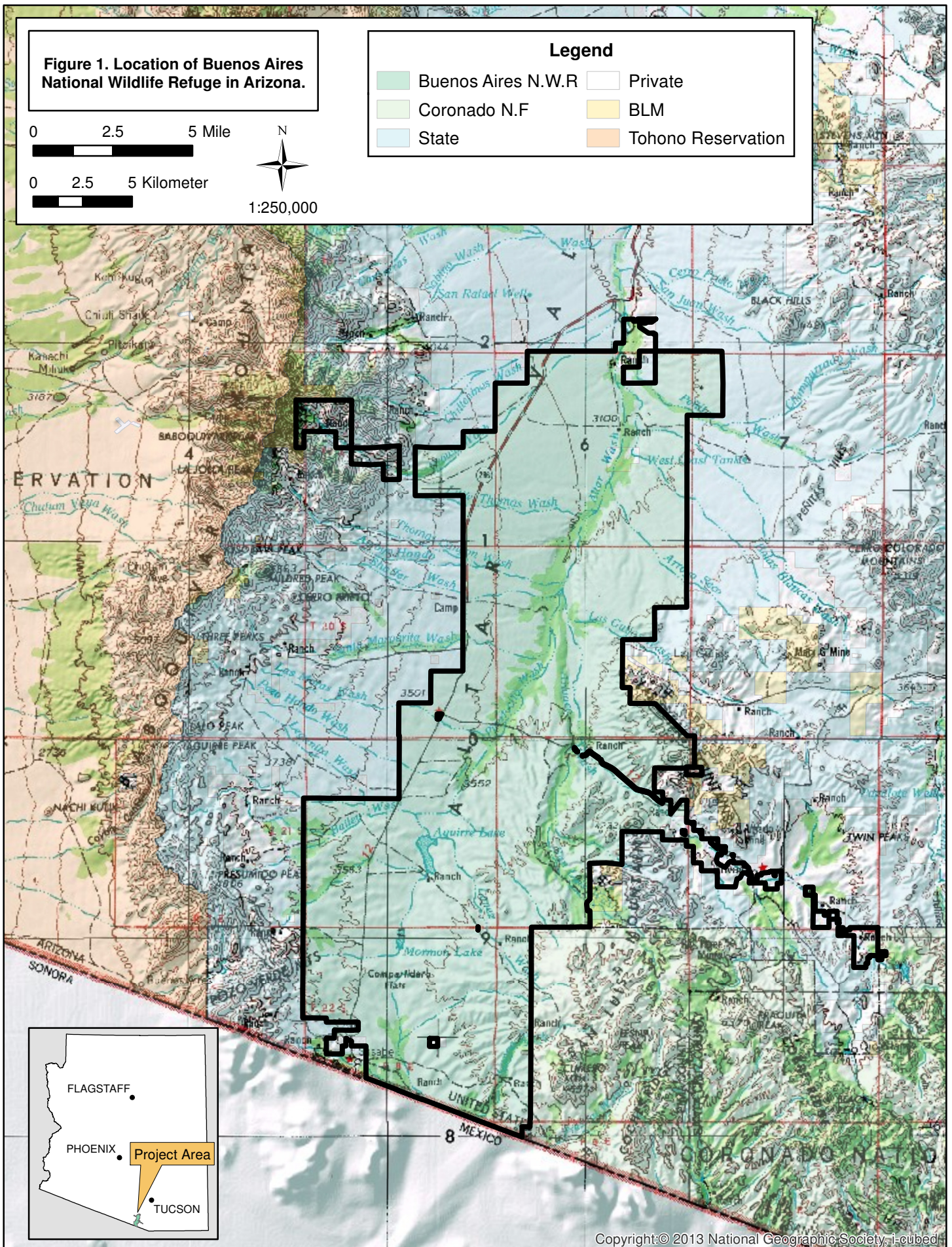
0 2.5 5 Kilometer



1:250,000

Legend

- | | |
|--------------------|--------------------|
| Buenos Aires N.W.R | Private |
| Coronado N.F | BLM |
| State | Tohono Reservation |



natural setting that the prehistoric and historic people called home: topography, climate, geology, and plants and animals. The next chapter (Chapter 2) presents a sketch of what is known about the various prehistoric people who occupied the area from the end of the Pleistocene 13,000 years ago to the advent of Euroamericans into the American Southwest after 1500 CE. This is followed by a portrait of the native people who still call the Altar Valley their homeland, the O'odham (Chapter 3). How Euroamerican people came to settle on the land and their use of it, from exploration to cattle ranching, and finally a landscape set aside from widespread development for habitat restoration, is presented (Chapter 4). A Class I archival review of the kinds of cultural resource investigations that have taken place and the kinds of archaeological sites recorded therein is presented (Chapter 5). The volume concludes with a discussion of important data gaps and future research directions particularly relevant to the cultural landscape and a set of management recommendations for the identification and preservation of the historic properties present within the wildlife refuge (Chapter 6).

THE PHYSIOGRAPHIC SETTING

Buenos Aires NWR lies in the Basin and Range physiographic province, a huge area that includes much of western North America and stretches from northwestern Mexico to Oregon and Idaho, and from the Sierra Nevada Mountains to the Wasatch Range. Because of its geographic expanse, it incorporates several North American deserts including the Great Basin, Mojave, and Sonoran. This province is characterized by alternating narrow, faulted, mountain ranges and flat, arid valleys. This unique topography is a result of tectonic extension of the earth's crust that began sometime around 17 million years ago. The wildlife refuge is an excellent example of this physiographic setting in that it consists of the Altar Valley, an alluvial valley that is roughly 50 miles long, north to south, and 15–20 miles wide east to west (*Figure 2*). It is bound to the east by the San Luis, Las Guijas, and Sierrita mountain masses and on the west primarily by the elongated Baboquivari Mountains (*Figure 3*).

Elevations on the valley floor rise from around 2,500 feet at the north end to around 3,700 feet near the international border, whereas the peaks of the surrounding mountains range from 4,697 feet at the top of Cumero Mountain in the San Luis Mountains to as high as 7,730 feet atop Baboquivari Peak.

Climate

Climate records for Sasabe at the south end of the Altar Valley run from 1959 to 2005 and can be obtained at the following online website: <https://wrcc.dri.edu> (*Figure 4*). These records show that the Altar Valley generally has an average maximum temperature of 79.1° F, whereas the average minimum temperature is 49.3° F. The hottest month of the year is August which has an average maximum high of 94.9° F and the coldest month is January with an average minimum low of 35.5° F. Annual average precipitation is just under 17 inches, with nearly 7 inches of that or 40% coming during the monsoon months of July and August. The driest months of the year are May and June and combined they average less than one-half inch of rain.

Geology

The Altar Valley contains two major geologic associations. The southern end of the valley near the international border is composed of well-drained soils derived from old conglomerates and sandstones that were deposited in the basin between 2 and 16 million years ago (Hendricks 1985:97; <https://data.azgs.az.gov/geologic-map-of-arizona>). Conversely, the northern portion of the valley is composed of well-drained undifferentiated alluvial and eolian soils derived from granite and deposited



Figure 2. The floor of Altar Valley.



Figure 3. Altar Valley and the Baboquivari Mountains.

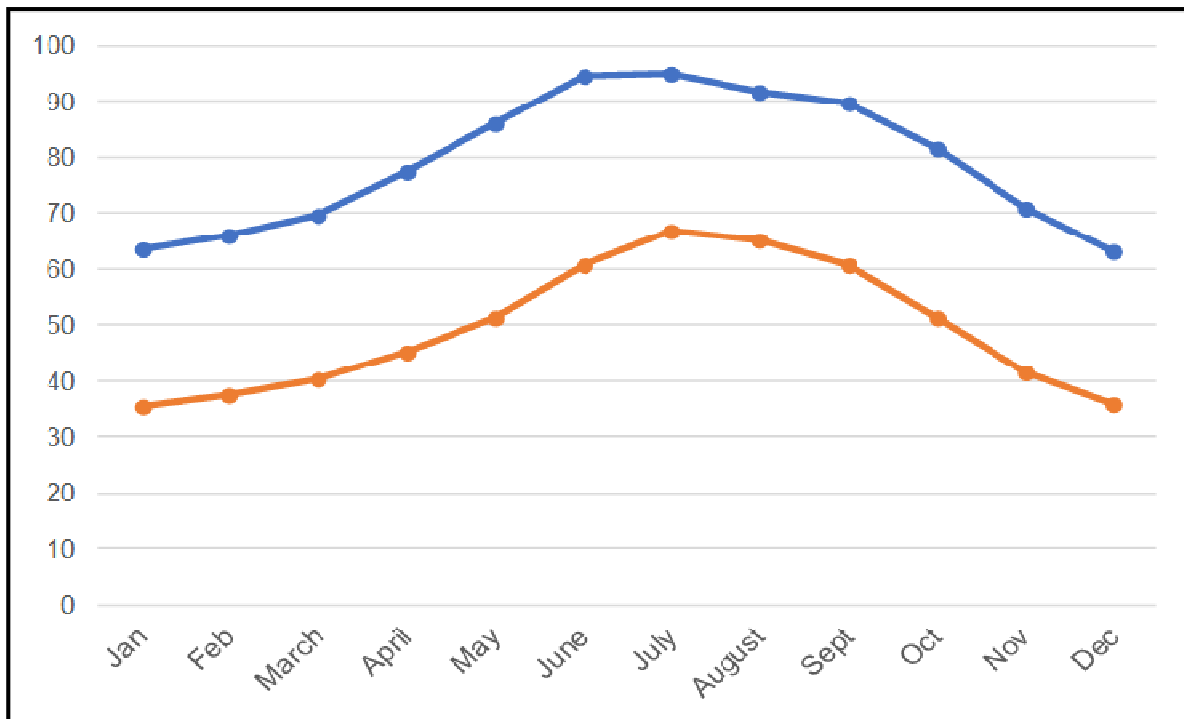


Figure 4. Averaged monthly minimum (orange) and maximum (blue) temperatures for Sasabe, Arizona from 1959 to 2005.

not more than 2 million years ago (Hendricks 1985:112; <https://data.azgs.az.gov/geologic-map-of-arizona>). The source of both Altar Valley alluviums is derived from the mountains that lie on either side of it and these mountains contain bedrock associations that are similar to each other in age and content. For instance, the southernmost portions of the Baboquivari Mountains and San Luis Mountains contain granite that is 50 to 80 million years old (<https://data.azgs.az.gov/geologic-map-of-arizona>). Moving northward, the mountains are composed of non-marine conglomerate and sandstone derived from volcanic lava flows, breccias, and tuffs and are 80 to 170 million years old (<https://data.azgs.az.gov/geologic-map-of-arizona>). These particular rocks are maroon, brown, and purplish-gray in color. One other major geologic unit includes assemblages of igneous rocks that include dark gneissic diorite, medium-grained granodiorite, and light-colored fine-grained granite (<https://data.azgs.az.gov/geologic-map-of-arizona>). Overlying these bedrock units are well-drained shallow residuum soils weathered from the different rock types described above (Hendricks 1985:99).

Biogeography

Buenos Aires National Wildlife Refuge is generally considered part of the Sonoran Desert. However, biogeographically, it resides on the boundary between the Sonoran and Chihuahuan provinces (Brown 1994:Figure 3, 13). Whereas the Sonoran Desert is classified as a tropical-subtropical desert scrubland, the Chihuahuan Desert is a warm-temperate desert scrubland and typical vegetation found in each grade and interfinger into one another in the Altar Valley. Chihuahuan Desert vegetation is generally found in the higher elevation southern portion of the valley and Sonoran Desert vegetation is present in the lower, hotter, northern portion of the valley.

Current vegetation on BANWR's broad valley floor consists of a velvet mesquite (*Prosopis velutina*) shrubland with an understory of non-native Lenmann's lovegrass (*Eragrostis lehmanniana*)

intermixed with various native grasses and forbs. In addition to velvet mesquite, catclaw acacia (*Acacia greggii*), palo verde (*Parkinsonia florida*), and wait-a-minute bush (*Mimosa biuncifera*) are present. A variety of cacti and succulents include the endangered Pima pineapple cactus (*Coryphantha sheeri robustispina*). Portions of the central floodplain are populated by dense stands of tall grasses, including amaranth or pigweed (*Amaranthus* sp.) and sacaton (*Sporobolus airoides*), along with non-native Johnson grass (*Sorghum halepense*). Prior to the introduction of cattle, the valley probably consisted of a wide grassy expanse intermixed with cacti and with mesquite trees along drainages, although little vegetation or range condition data are available before 1970 (Sayer 2002:xii–xiii, xxxiii; Sayre 2007:43).

A Madrean evergreen woodland community is found on all the mountains surrounding the Altar Valley, like the Baboquivaris (Brown 1994:Figure 3, 13). Trees common to this vegetation regime are oak (*Quercus emoryi*, *Quercus gambelii*), Mexican pinyon (*Pinus cembroides*), alligator juniper (*Juniperus deppeana*), and mountain mahogany (*Cercocarpus* sp.). The understory, which depends on the general aspect of the slope, includes sotol (*Dasylirion wheeleri*), bear grass (*Nolina microcarpa*), turpentine bush (*Haplopappus laricifolius*), agave (*Agave schottii*), catclaw (*Acacia greggii*), prickly pear (*Opuntia engelmanni*), and native bunchgrasses. Drainages form riparian ribbons from the valley floor into the mountains with an ensemble of vegetation that includes Arizona sycamore (*Platanus wrightii*), Arizona black walnut (*Juglans major*), willow (*Salix* sp.), and numerous annuals.

Mammals common to the refuge include mule deer (*Odocoileus hemionus*) and Coues white-tail deer (*Odocoileus virginianus*), pronghorn antelope (*Antilocarpa Americana*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), javelina (*Tayassu tajacu*), skunk (*Mephitidae* sp.), jackrabbit (*Lepus californicus*), raccoon (*Procyon lotor*), mountain lion or cougar (*Felis concolor*), and bobcat (*Lynx rufus*). Reptiles include various types of rattlesnakes, desert tortoise (*Gopherus agassizii*), and some Gila monsters (*Heloderma suspectum*). The Mexican gray wolf (*Canis lupus baileyi*) and grizzly bear (*Ursus horribilis*) were also present at one time. Importantly, the threatened and endangered masked bobwhite quail (*Colinus virginianus ridgwayi*), of which its re-introduction was the original purpose of BANWR, at one time also resided in the Altar Valley and was dependent on dense grass to provide cover and habitat (Sayre 2002:13).

CHAPTER 2. Prehistoric Setting

Although federally mandated archaeological investigations have been conducted in the Altar Valley since the 1980s, none of this compliance-based work has ever been synthesized and placed within a context of Pre-Columbian use and occupation. What archaeologists know about the prehistoric inhabitants of the area comes primarily from research conducted in adjacent regions, like the Tucson Basin and along the Santa Cruz Rivers. Over the past several decades, Tucson has mirrored many cities in the American Southwest by an exploding population and rampant expansion. As a result, detailed archaeological research has been conducted at many sites and localities throughout the area and current knowledge about the Pre-Columbian past has increased dramatically. Much the same can be said about the central and western Papaguería, but for a different reason. The U.S. military's need for adequate weapons proving grounds well away from metropolitan areas has led to increased archaeological research in the western deserts of Arizona (i.e., Yuma Proving Ground, Barry M. Goldwater Air Force Range). Accordingly, the list of important bibliographic sources that present the results of various research investigations is simply too large to summarize in a few introductory paragraphs.

CHRONOLOGICAL FRAMEWORKS

Native Americans have lived on the American continent for at least 13,000 years, perhaps even longer. This means that an important part of an archaeologist's task is to determine when a site was occupied and for how long. There are two types of dating techniques that can determine the calendrical age of a site: radiocarbon and tree-ring dating (dendrochronology). In turn, these calendrical or absolute dating methods have allowed specific artifact classes or types to be *cross-dated* through time, like specific projectile point styles and ceramic wares. Through the technique of cross-dating, archaeologists know when specific artifacts were manufactured, and sites can be dated by the presence of these temporally diagnostic artifacts. Determining a site's age allows it to be placed in a temporal or chronological context with other contemporaneous sites.

Paleoenvironmental Framework

Figure 5 presents several related chronological frameworks by which to understand and evaluate prehistoric Native American use of the Altar Valley. The first framework presents a sequence of important paleoenvironmental periods that have occurred since the end of the Pleistocene. This will serve as an important referent for various social developments that took place over time, particularly before the Hohokam tradition. It will become clear that both small-scale and large-scale changes in the earth's climate and, correspondingly, the composition of the physical environment played a dramatic role in how human societies made a living and how they interacted with each other.

To summarize, at the end of the Pleistocene, around 11,000 BCE or 13,000 years ago, large glaciers covered much of the earth's surface and these glaciers were in the process of receding and releasing their water across the globe. In general, the terminal Pleistocene climate was cooler and wetter than it is today. At that time in western North America, there were large lakes and marshes on the valley floors often fed by now-extinct rivers, like Lake Cochise in southeastern Arizona. A salient feature of this period is that biogeographic regions were much larger and contained a relatively homogeneous

Date (BCE / CE)	Paleoenvironmental Chronology	Southern Arizona Chronology	Trincheras Cultural Tradition Chronology	
13000 BCE	Terminal Pleistocene	Paleoamerican Big Game Hunters		
12000				
11000				
10000				
9000				
8000				
7000	Early Holocene	Archaic Mobile Foragers		
6000	Middle Holocene			
5000				
4000				
3000				
2000	Late Holocene			Early Agricultural Farmers-Foragers
1000		Hohokam Cultural Tradition		
0 CE		O'odham	O'odham	
1000				
2000				

Figure 5. Chronological frameworks for southern Arizona.

suite of cool-adapted plants and animals. This was coupled with the belief by paleo-ecologists that the Pleistocene lacked strong annual seasonality, that is, there was not pronounced annual seasons, like winter, spring, summer, and fall. Paleontological studies show that a number of large mammal species, notably mammoth, mastodon, and horse lived in the western Hemisphere, and these megafauna populations required large, uniform habitats to survive.

As climate changed from the terminal Pleistocene into the Early Holocene, it gradually grew warmer and drier and by around 7500 BCE most of the lakes and marshes, and their associated rivers had dried up. The large biogeographic regions that were present during the Pleistocene became dissected into small microenvironments, each one containing unique suites of plants and animals. Coupled with the development of microenvironments across landscapes, the Holocene era exhibits strong annual seasonality: winter, spring, summer, and fall. After the Early Holocene, the Middle Holocene period

was particularly hot and dry, taking place from around 6,000 to 3,000 BCE. Biologists have learned that this period brought about changes in the demography of various plants and animals, forcing cooler/wetter adapted species northward or into higher elevations and forming the so-called *Sky Island* phenomena. Around 5,000 years ago, the hot and arid Middle Holocene period began to ameliorate into what is recognized today as the Late Holocene period. The climate and the corresponding suite of plants and animals on the landscape which we generally recognize today came into existence at this time. The Late Holocene is generally characterized as relatively mild with seasonal alterations in temperature and precipitation. Throughout the course of the following narrative, these environmental periods will be referred to, particularly as they serve to drive changes in the organization of human societies.

Cultural Framework

The second framework presents a prehistoric human chronology for the American Southwest, although the sequence is specific to the Tucson Basin just north of the Altar Valley. This chronology is divided into six major periods that coincide with major adaptations in the way humans were organized and adapted to their environment. The first major period coincides with the Terminal Pleistocene transition where Paleoamerican big game hunters migrated into and expanded across the American continent. The next major period, the Archaic, coincides with a new adaptation whereby mobile foragers moved in small family groups from habitat to habitat to obtain seasonally available resources. Sometime after the Middle Holocene, around 2000 BCE, domesticated plants, like corn, beans and squash, were introduced to Archaic mobile foragers and over time became integrated into their seasonally mobile lifestyle. Through time, these farmer-forager groups became tethered to their crops and adopted ceramic technologies. Finally, by 50 CE, sedentary farming communities developed across the American Southwest and in southern Arizona archaeologists call this group the Hohokam.

PALEOAMERICAN TRADITION (11,500–7500/7000 BCE)

Human populations have occupied the American continent, including the American Southwest, since the end of the Pleistocene, around 11,000 BCE or 13,000 years ago. Archaeological investigations in southeastern Arizona, in particular, have proven important in understanding Paleoamerican adaptations in the Southwest and beyond. For instance, a number of famous Paleoamerican megafauna kill and butchering sites are clustered in the San Pedro Valley east of BANWR, although isolated points have been found on the surface in other areas of southern Arizona (Mabry 1998:43–47). The famous San Pedro Valley sites include, Lehner and Murray Springs, foremost, and Naco and Escapule secondarily; whereas Whitewater Draw, another famous site, is just one basin over to the east in the Sulphur Springs Valley (*Figure 6*).

Although still of some debate, archaeological consensus regarding human entry into the American continent is by a land bridge between Siberia and Alaska (Reid and Whittlesey 1997:24). The Beringian land bridge, as it is called, was created as a result of vast amounts of water locked up into glacial ice sheets that decreased ocean levels throughout the world and exposed land between the two continents. As Reid and Whittlesey (1997:24) state, the first discovery of the New World probably went completely unnoticed as mobile foragers followed the movement of large game from Siberia into Alaska. Since the end of the Pleistocene, this land bridge has been submerged under the Pacific Ocean. Another complementary way that human groups could have entered the New World would have been

Figure 6. Location of Paleoamerican sites in southeast Arizona.

0 2.5 5 Mile



0 2.5 5 Kilometer

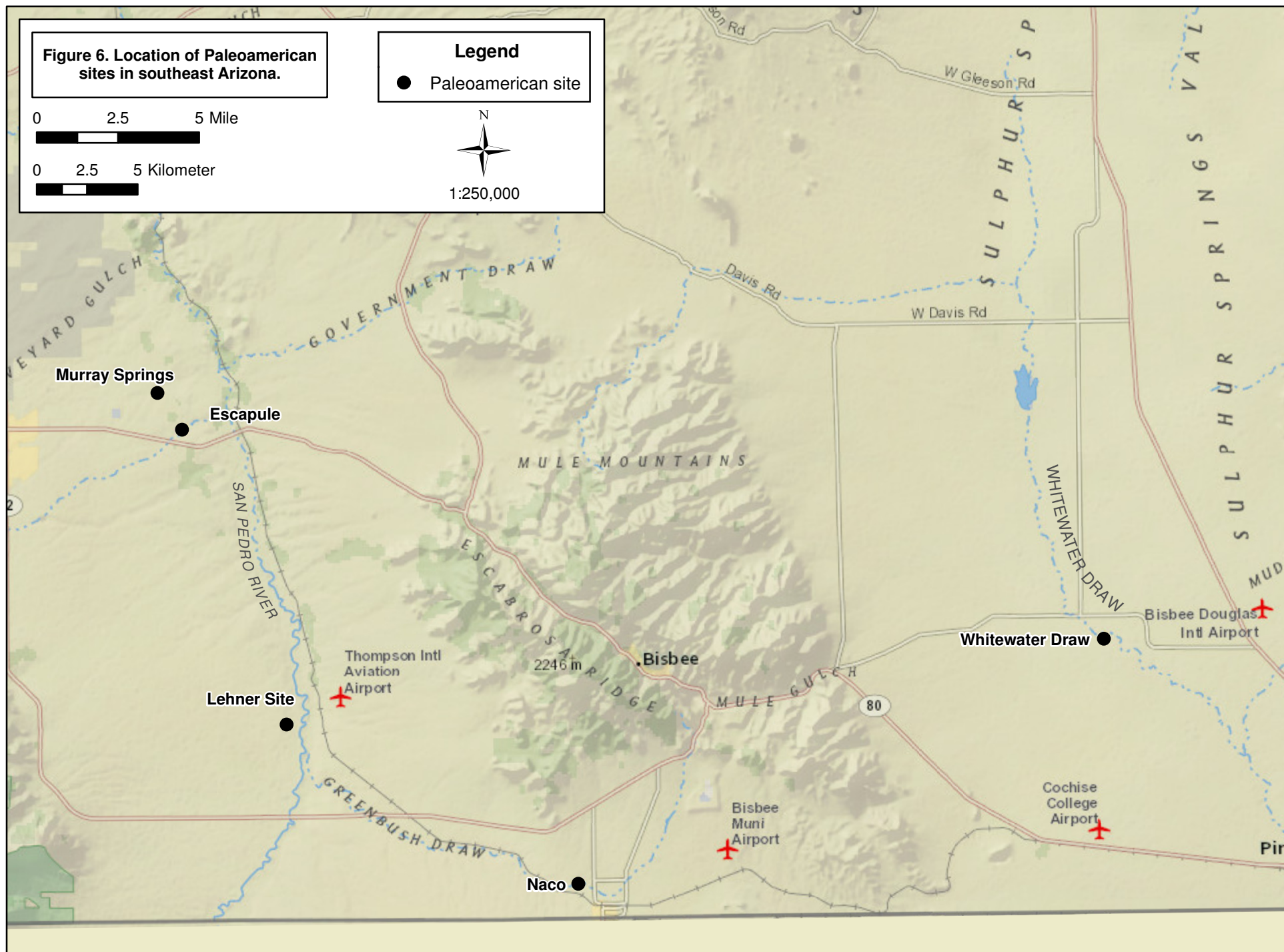


Legend

- Paleoamerican site



1:250,000



by boat along the coast and establishing camps and specialized activity stations along the way. These particular archaeological sites, if they existed, would have long been submerged as ocean levels increased after the Pleistocene.

Debate has raged, however, over the past several decades regarding when the first humans came to America. A number of pre-projectile point stone tool complexes have been posited throughout western North America, the most notable one in the American Southwest is the Malpais Complex as espoused by the late Julian Hayden. Stone assemblages associated with the Malpais Complex consist of choppers and scrapers, along with worked shell, and the stone artifacts are covered in patination or desert varnish, hence their great antiquity (Reid and Whittlesey 1997:27). Work at nearby Ventana Cave in the Castle Mountains west of Tucson, revealed similar artifacts below what was believed to be a Clovis stratigraphic layer (Reid and Whittlesey 1992:27). These pre-projectile point complexes, including the Southwest Malpais Complex, have yet to be recognized by many archaeologists as evidence of the first human occupations of North America. It is likely that the search for evidence of humans that date into the deep Pleistocene will continue into the future.

The first recognizable archaeological manifestations in North America is a stone assemblage that contains distinctive lanceolate spear points, of which the most notable archaeologists call Clovis, named after the place where it was first found, Blackwater Draw near Clovis, New Mexico. The Clovis point is a large stone spear tip that is a lanceolate or leaf-shaped blade with parallel sides and a concave base. Perhaps the most distinctive feature of a Clovis point is that a long, thin flake has been removed from one or both sides from the base to form a flute. These points typically range in size from 7 to 10 cm long, although they can be as short as 2.5 cm and as long as 15 cm and are 2.5 to 5 cm wide. Other artifacts commonly found with Clovis and other Paleoamerican assemblages include flaked stone bifaces which serve a variety of functions, specialized cutting or scraping tools made on flakes or blades, and occasionally finely made bone or ivory tools. The stone tools are always made from high-quality knappable rock and often from geologic sources miles away from an actual site.

The four Paleoamerican sites excavated in the San Pedro Valley are within 15–20 miles of each other and found along tributaries of the San Pedro River. All of them have at least one mammoth skeleton associated with fluted points and other stone tools. The Lehner Site had 13 fluted points, other cutting/scraping tools, several hearths, bones representing 13 mammoths, and various other fauna (G. A. Haynes 2002:62). Whereas the site may represent a place where a number of mammoths were killed over time, it may also be that it represents a single event where an entire herd was taken. Murray Springs has several activity areas within the confines of the archaeologically recognized property (G. A. Haynes 2002:63). One area represents a single mammoth killed on a riverbank and is associated with several fluted points, some other stone tools, and thousands of pieces of debitage. Another area represents a bison kill site associated with Clovis points, some other stone tools, and several thousand pieces of debitage. The last area at Murray Springs is a camp or retooling area with fluted points, other flake stone tools, and debitage reflecting stone tool thinning and sharpening. The other two sites, Naco and Escapule, each contained one mammoth associated with two or more Clovis points (G. A. Haynes 2002:63). Taken together, these sites prove that at least some portion of the San Pedro River Valley was an ideal habitat for mammoths, bison, and other animals sought by Paleoamerican hunters.

Although contemporaneous or slightly later in time, other well-known Paleoamerican spear points from the American Southwest are Folsom and Plainview. Whereas Folsom points have not been found in southern Arizona (Ballenger et al. 2011:Figure 9B, 513), bases of Plainview points have been found in the Tortolita Mountains, the eastern flanks of the Catalina Mountains, the western flanks of the

Picacho Mountains, and on a bajada in the Winchester Mountains (Mabry 1998:47). These places are all north and east of BANWR. Large stemmed points, generally referred to as Western Stemmed points (Bryan 1980), are also considered to be a late Paleoamerican spear point tradition, one that is believed to post-date Clovis, Folsom, and Plainview lanceolates (see Goebel and Keene 2014, Mabry 1998). There are several kinds of stemmed points found in the American Southwest, including the Lake Mojave and Silver Lake points first identified in the Mojave Desert, but the most well-known southwestern stemmed point is the Jay. Western Stemmed points have not been found associated with extinct Pleistocene megafauna, unlike Clovis points. It is also not uncommon, however, to find these various points together at a single site or in the same general locality.

Archaeologists believe that Paleoamerican population levels, along with group sizes, were likely small, with few sites, if any, indicating repeated long-term occupations. Some large-scale habitats, like the San Pedro River Valley, were probably revisited over and over again. The movement of these people from one habitat to another was likely migratory, that is, over the course of one or more years, a family or kin-group would cross multiple biogeographic regions rather than remain limited to a circumscribed home range and annual subsistence round within a single region (G. M. Haynes 2004; Jones et al. 2003). This hypothesis is supported by the geologic source location of stone tools, which are often some distance from the site from which they were found.

It is important to note that no diagnostic Paleoamerican artifacts, namely spear points, have been found on BANWR (see Chapter 5). Work in nearby regions, like the Great Basin, show the placement of Paleoamerican sites to be limited to now extinct lakes, like Pleistocene Lake Cochise or what is now called the Wilcox Playa, marsh-like areas, and rivers, like the San Pedro River. The Altar Valley in Arizona does not contain any of these relict Pleistocene land forms. Despite this, during the terminal Pleistocene, the Altar Wash was likely a perennial water course which drained or captured water from a huge catchment. It very well may have had oxbow-like features that contained marsh-like habitats. Later use of the valley floor by prehistoric Hohokam farmers and historic Euroamerican ranchers may have altered the topography so much that any evidence of such features have been destroyed. Moreover, any Paleoamerican sites that may be present are likely buried within the alluvium that covers the valley floor. There is an old archaeological adage that states: *If you want to find old sites, then you first have to find the old dirt*. That being said, intact Paleoamerican sites are not going to be found on the top of or intermixed in Holocene-age sediments, they will be found in or on top of Pleistocene age substrates.

EARLY & MIDDLE ARCHAIC TRADITIONS (7500/7000–2100 BCE)

Archaeologists use the term *Archaic* to refer to a cultural tradition of mobile foragers who lived in the American Southwest after the Paleoamerican period and the desiccation of pluvial lakes, like Lake Cochise. The cultural relationship between these two traditions, the Paleoamerican and Archaic, remains uncertain and there is debate as to whether there were gradual behavioral changes in resident human populations that corresponded to a changing environment or complete abandonment of the region by Paleoamericans and a later replacement by Archaic people, perhaps from Mexico or the Great Basin. What is clear is that unlike terminal Pleistocene-era Paleoamericans who focused on now-extinct valley floor lacustrine, riverine, and cienaga systems, Archaic populations used a much wider range of topographic positions and, correspondingly, habitats and resources. In other words, archaeological sites and material expressions are found in a wide variety of topographic positions,

from valley floors, to mountain piedmonts and springs, to high elevation mountain ranges. These groups probably used most or all available food resources, such as large and small animals, fish, plant foods, nuts, berries, cactus fruits, even bugs and grubs.

To reiterate, the changes in the way humans lived in the desert Southwest was integrally connected to changes in the environment. Recall that the Pleistocene climate was generally cooler and wetter with habitats being much more uniform and widespread. The hallmark characteristics of Holocene climatic conditions is one that is generally warmer and drier and punctuated by both annual seasonality (i.e., winter, spring, summer fall) and saw-tooth like fluctuations in temperature and precipitation. Overall, environmental change into the Holocene had the net effect of creating a wide range of micro-environments across the landscape, each one a unique habitat with a suite of plants and animals that people could hunt and gather. Archaeologists believe that, through time, populations developed specific human ranges in which their annual subsistence rounds were conducted, much like ethnographically documented mobile foragers (see d'Azevedo 1986, Kelly 1995). With population growth, particularly after the hot Middle Holocene period, these home ranges became increasingly smaller as the overall usable landscape became inhabited by foraging groups.

It is important to note that Early and Middle Archaic adaptations in southern Arizona remain poorly understood. For instance, an intensive survey of approximately 4,000 acres on the bajada of the Sierrita Mountains in the northern Altar Valley found only one site containing a definitive Early Archaic component and six sites with definitive Middle Archaic components (Dart 1989:27). Similarly, a recent synthesis of Paleoamerican and Archaic sites in the Malpai region east of the Altar Valley, an area that covers approximately 40 miles north-south and 75 miles east-west, identified only 18 sites that date from 10,000–1500 BCE (Fish et al. 2006:Figure 3.2, 25). Why this is the case is probably due to a number of factors. One is that many sites that may be attributed to these two cultural traditions do not contain diagnostic artifacts that clearly define them. Another is that later ceramic period prehistoric cultures (Hohokam, Trincheras) were intensive and likely lived in many of the same areas where Early and Middle Archaic sites would have been located, such as springs and river courses on mountain flanks. The same kind of statement applies to historic and modern American ranches and present-day communities. Other factors that may affect the archaeological visibility of these sites are that such investigations may not have been looking in the right places and, additionally, that many of them may be buried and not visible from the surface.

The Archaic period in southeast Arizona is discussed in the context of what was initially called the Cochise Culture and its subdivisions, the Sulphur Springs, Chiricahua, and San Pedro stages. Importantly, the Cochise Culture stages have been correlated with chronological subdivisions of the western Archaic period: Early (7500–5000 BCE), Middle (5000–2000/1500 BCE), and Late (2000/1500 BCE–200 CE) (Reid and Whittlesey 1997:44–46). The last of these stages, the San Pedro or Late Archaic, is now recognized as a time when domesticates were introduced to mobile foraging populations, setting off dramatic long-term changes in Pre-Columbian human societies. Importantly, archaeologists' initial understanding of the human societies that preceded ceramic period farming societies in the American Southwest began at a series of sites buried in the Sulphur Springs Valley of southeast Arizona not too far from BANWR.

First investigated by Byron Cummings in the 1920s, with continued work into the 1930s by E.B. "Ted" Sayles and Ernst Antevs (1941), the earliest of the above stages, the Sulphur Springs stage, was defined by sites along Whitewater Draw near a place called Double Adobe (Figure 6). Initially believed to be associated with the terminal Pleistocene, a number of these sites would later turn out to

be mixed secondary deposits. Later work by geo-archaeologist Michael Waters obtained radiocarbon assays on four *in situ* Sulphur Springs sites in the same area would temporally bracket these early archaeological deposits from 7300 to 6100 BCE (Waters 1986:59).

Artifact assemblages from Sulphur Springs or Early Archaic sites consistently contain hand stones or one-hand manos, and grinding slabs or millingstones, unifacially worked scrapers, and other retouched stone tools, plano-convex scraper cores, choppers, and non-diagnostic biface stage forms. Additionally, the only features that have been found at Early Archaic sites are hearths and roasting features. Although not found at the Whitewater Draw sites, diagnostic projectile points include small or tapered stemmed points, referred to as Bajada or Ventana-Amargosa points in the Southwest, and bifurcate stemmed points, also known as Pinto/San Jose points (Mabry 1998:58–61). The morphology of these point types, not to mention much of the flaked stone assemblage, are similar to those more commonly found in the Mojave Desert and Great Basin regions of the Intermountain West (Huckell 1996:330–331; Mabry 1998:58–61; Roth and DeMaio 2014:125). The number of documented Early Archaic sites in southern Arizona are small and have relatively limited assemblage sizes, suggesting high group mobility focused on resource procurement activities, rather than long-term intensive occupations with a full range of domestic activities. For instance, a recent geospatial examination of 13 Early Archaic sites in the Tucson Basin shows that these sites cluster near springs on upper bajadas and mountains, away from valley floors (Roth and DeMaio 2014:131–132). This finding is consistent with survey conducted by Desert Archaeology on the upper bajada of the Sierrita Mountains, just north of BANWR, where two sites were identified with Early Archaic components (Dart 1989: 27–28, Appendix C). Conversely, work by Waters and Woosley (1990:169) on the floor of the Willcox Basin east of BANWR found not a single Early Archaic site. Of the 68 documented sites on BANWR, there are no sites or site components that contain Early Archaic components. In other words, Jay and Ventana point types, or point types resembling the Western Stemmed Tradition, have not been found. The paucity of Early Archaic sites on valley floor topographic positions may well be due to their archaeological invisibility, as discussed above.

The Chiricahua stage, or what is more commonly referred to as the Middle Archaic period, was also first defined by Sayles and Antevs (1941) in southeast Arizona. These sites included a diverse artifact assemblage with shallow basin milling stones, hand stones, and pestles, choppers, core tools, various types of scrapers, drills, biface stage forms, and side-notched dart points, among other point styles. Over time, the distinctive side-notched point types were called Chiricahua points, and distinctive contracting stem points were called Gypsum Cave. Bifurcated stemmed points, commonly referred to as Pinto/San Jose points, are also identified as a Middle Archaic style, but these may be a more refined point type analogous to the Gatecliff Split Stem in the Great Basin (see Basgall and Hall 2000). In addition, these assemblages can be associated with various features. Roasting pits and hearths have been found, as well as burials, pit structures, and even perhaps surface structures.

When Sayles and Antevs first defined the Chiricahua stage, radiocarbon dating did not yet exist, so the exact age of these sites remained uncertain. Investigations following the advent of radiocarbon in 1949 has allowed archaeologists to determine the chronological parameters of this stage. A review of these radiocarbon assays by Mabry (1998:79) show that, in general, Chiricahua assemblages date from 3500 to 2300 BCE. As others have noted, these dates suggest that there may be a 2,000 to 3,000 year occupational hiatus between the Early Archaic Sulphur Springs stage and the Middle Archaic Chiricahua stage. The timing of this hiatus generally corresponds with the hot and arid Middle Holocene climatic event (Figure 5). Interestingly, it was Ernst Antevs and Ted Sayles who first identified the Middle Holocene as a hot and arid time period. It may well be that during this time

humans either completely abandoned southern Arizona or retreated to better watered regions, like springs and perennial rivers, or into higher elevation mountain ranges.

Recent geospatial examination of 27 Middle Archaic sites in the Tucson Basin shows that these sites also cluster near springs on the upper bajada and mountains as do Early Archaic sites; however, relatively abundant Middle Archaic sites can be found on a variety of valley floor settings, like alluvial riparian areas (Roth and DeMaio 2014:131–132). These findings suggest that Middle Archaic groups expanded their diet to include other viable habitats with different kinds of wild food resources. The abovementioned survey conducted by Desert Archaeology at the base or upper bajadas of the Sierrita Mountains documented six Middle Archaic sites clustered in a one-mile area (Dart 1989:Figure 3.2, 29). Moreover, up to 11 Chiricahua and eight Gypsum Cave style points were identified during this survey in site and non-site contexts. This finding supports the Tucson Basin findings in that upper bajada zones were used by Middle Archaic groups. The three-fold increase in the number of sites or site components from the Early to the Middle Archaic suggests a growing population and/or more intensive occupations in this specific physiographic zone. It is important to keep in mind that deeply buried Middle Archaic components have also been found on the Santa Cruz floodplain at the sites of Las Capas and Los Pozos (Diehl 2005; Gregory 1999).

Only one documented site on BANWR, the Brown Canyon Site (AZ DD:2:58[ASM]), has what may be a Middle Archaic component. This is a large multicomponent aceramic and ceramic period site at the mouth of Brown Canyon where the upper slope of the Altar Valley meets the steep uplift of the Baboquivari Mountains. Along with many other diagnostic artifacts, a single Chiricahua style point has been recorded indicating a potential Middle Archaic occupation. The AZSITE record for this site indicates that it has both surface and subsurface components, suggesting that there may be an in situ Middle Archaic deposit here.

INTRODUCTION OF AGRICULTURE & EARLY FARMERS-FORAGERS (2100 BCE–50 CE)

Recent archaeological research in Mesoamerica has shown that the domestication of various plants in the New World occurred sometime around 4,000 BCE or 6,000 years ago (Merrill et al. 2009:21019). Domesticated species included a number of different kinds of plants, corn or maize (*Zea mays*), varieties of bean (*Phaesolus* spp.), and varieties of squash and pumpkin (*Cucurbita* spp.). Cotton (*Gossypium* sp.) and chiles (*Capsicum* spp.) were also domesticated. The earliest evidence of domesticated crops in the American Southwest comes from five sites in Arizona and New Mexico, including two open-air sites along the Santa Cruz River, Clearwater and Las Capas. At least 15 radiocarbon assays have been obtained on corn macrofossils from these five sites and they all cluster around 2100 BCE (Merrill et al. 2009:21019). The spread of the domesticated plant species and associated agricultural technology presumably occurred in southern Arizona first before getting introduced further north onto the Colorado Plateau. The widespread use of cultigens and a mixed farming-foraging subsistence system, before the appearance of ceramic vessels and full-time sedentary agricultural societies, represent what was once generally called the Late Archaic in the Southwest and, more specifically, the San Pedro stage in southern Arizona (Figure 5). Today, this transition is often referred to by archaeologists as the Early Agriculture Period.

How domesticated plants and the technological conduct of agriculture was transmitted to Southwest people has been debated for some time. For instance, Peter Bellwood and Jane Hill have argued that

agriculture expanded out of Mesoamerica by migrant farmers who spoke a proto Uto-Aztecan language; that is, proto Uto-Aztecan populations were the first sedentary agriculturalists and as their homeland became overpopulated they began *migrating* northwards carrying with them domesticates, the know-how to conduct successful agriculture, and a distinctive language (Bellwood 2005; Hill 2001). Importantly, Hopic and Numic (i.e., Paiute, Shoshone) are Uto-Aztecan languages. This same kind of argument has been offered by Colin Renfrew for the spread of Indo-European languages and domesticates from the Middle East into Europe during the Neolithic Revolution (Renfrew 1987). The alternative, and one that seems to have the most support, is that this transmission occurred by *diffusion* from one group to another (Merrill et al. 2009). This is supported by the fact that it took 2,000 years between the domestication of food crops and their eventual spread to the American Southwest, coupled with the fact that there is no clear material evidence of a migrant Mesoamerican population living in Arizona at 2100 BCE. More nuanced models of diffusion versus migration have also been presented. As Diehl (2005:4) explains,

The question of diffusion versus migration must be answered, at least in the Southwest, on a valley by valley basis. If San Pedro phase farmers migrated from Sonora into southern Arizona and did not migrate further into the Colorado Plateau of Mogollon Rim, the diffusion model and corollary questions may still [need] to be addressed.

The spread of agriculture into mobile foraging populations raises other important questions about how mobile foraging groups become farmers. What was the quickness with which agricultural subsistence activities became incorporated into annual subsistence rounds of Archaic peoples? How did farming affect the size of foraging home ranges and the dispersion of human groups across the landscape? Did agriculture tether people to specific places on the landscape, like fertile floodplains near perennial streams and spring, and how did this affect foraging strategies? How did agriculture affect the overall rise in population levels over time?

On the whole, Early Agriculture sites can contain evidence of substantial settlements and include small, round, or oval semi-subterranean habitation structures, large and small storage pits, burials, and formalized ground stone. In addition, corn is consistently present in micro-botanical pollen samples and macro-botanical plant samples, along with wild plants, and various animal species. Some of these sites even have round oversized structures thought to have been used for community-wide rituals. Several distinctive projectile points styles, and their subtypes, are regularly found associated with Early Agriculture sites: San Pedro, Cienaga, Cortaro, and Empire (Sliva 2015). Thiel and Diehl (2006:3.3) note that marine shell and other non-local raw materials are present at some sites in the Tucson basin, indicating that trade networks with people living in other geographic regions had developed. Based on radiocarbon dates from San Pedro stage sites in the Tucson area, it seems evident that a mixed farming-foraging subsistence system was fully established by 1,500 BCE (Sinensky and Farahani 2018:285). Importantly, artifact and feature assemblages indicate a dramatic increase in the numbers of different types of items, as well as overall technological complexity, when compared to Early Archaic (Sulphur Springs stage) and Middle Archaic (Chiricahua stage) sites.

Abundant work has occurred on Early Agricultural sites over the past several decades in the Santa Cruz River floodplain in the Tucson Basin north of BANWR. The most notable of these sites are Las Capas (AZ AA:12:111[ASM]) and Los Pozos (AZ AA:12:91[ASM]); their overall size and the large amount of work that has taken place there set them apart from all other Early Agricultural sites in the American Southwest (see Diehl 2005). Whereas Las Capas or *The Layers* was first discovered in 1979, it received extensive archaeological investigations from February to April of 1998 as a result of

road improvements along U.S. Interstate 10. The entire site encompasses at least 89 acres, of which only a small portion within the highway right-of-way has been examined. This work revealed hundreds of prehistoric features, including canals, storage pits, hearths, and pit houses. The associated artifact assemblage included fire-cracked rocks, human and dog inhumations, flaked stone tools and manufacturing debris, faunal remains and bone tools, plant remains, ground stone tools, pigments, minerals and shells, and crude pottery. Radiocarbon assays indicate Las Capas was occupied from 1500–400 BCE, but intensively from 1220–730 BCE by forager-farmer groups that ranged in size from 80 to 250 people (Sinensky and Farahani 2018:285). Los Pozos or *The Wells*, contains both Middle Archaic and Late Archaic/Early Agricultural components. Excavations here revealed a suite of deep pits believed to be wells, along with approximately 2,000 prehistoric features that include 254 pit houses, intramural and extramural pits and hearths, human and animal burials, and canals. Radiocarbon assays place the Los Pozos occupation at 400 BCE to 50 CE, post-dating the occupation of Las Capas. What is important about these two sites is that by 1220 BCE relatively large human groups (80–250 people) were living in established agriculturally-based communities along the Santa Cruz River.

The abovementioned survey conducted by Desert Archaeology on the bajadas flanking the Sierrita Mountains identified as many as eight Late Archaic/Early Agriculture sites or components and two isolated San Pedro stage projectile points (Dart 1989:27). In all, 15 Cortaro and six San Pedro projectile points, or points that strongly resembled these types, were found. While the sites associated with the Coyote Mountains Archaeological District are affiliated with the ceramic period Hohokam, at least three projectile points are stylistically consistent with the Late Archaic/Early Agriculture Period (Dart et al. 1990:14). All of the abovementioned sites associated with the Sierrita Mountain survey contain assemblages that are indicative of limited activity resource acquisition and/or processing stations and in physiographic positions very different from the valley floor farming communities of Las Capas and Los Pozos. The inference is that the sites found on the Sierrita Mountains bajada represent foraging sites in a mixed farmer-forager economy.

The Altar Valley is topographically similar to other large valleys in southern Arizona, notably the San Pedro Valley and the Sulphur Springs Valley. It seems entirely feasible that sites affiliated with the Late Archaic/Early Agriculture period may well be present on the wildlife refuge, although they may not be found using Class III surface inventory methods. There are three sites documented on BANWR that have diagnostic projectile points indicative of this time period, AZ DD:2:58(ASM), AZ DD:6:118(ASM), and AZ DD:7:60(ASM). Of particular interest is site AZ DD:7:60(ASM) located on a low, broad ridge separating Puertocito and Arivaca Washes and immediately adjacent to prime agricultural land (Mehalic 2009:28–30). This site is 600 × 300 m in size, contains an abundant and diverse assemblage, including a complete San Pedro point, two roasting features, a rock alignment, and a possible habitation area.

HOHOKAM CULTURAL TRADITION (50–1450 CE)

The Ceramic Period traditionally refers to a time when prehistoric Native Americans practiced an agricultural economy, made distinctive types of pottery, and lived in relatively sedentary communities. The Ceramic Period in southeast Arizona is represented by what archaeologists have long recognized as the *Hohokam* cultural tradition, but is also represented by the contemporaneous *Trincheras* tradition, an archaeological group recognized in southern Arizona but centered in northern Sonora. What we know about the Hohokam is that it appears to have been centered on the Salt-Gila and

Tucson Basins, although not exclusively, as the Coyote Mountains Archaeological District near BANWR makes clear (see Dart et al. 1990). The Trincheras cultural tradition, while associated with northern Sonora, is represented by distinctive pottery types and site types, although recent work indicates that the Hohokam and Trincheras cultures may represent very similar cultural traditions, but in different geographic locations (see Downum et al. 2009, Whittlesey and Ciolek-Torrello 1992). Not surprisingly, because of the expansion of Phoenix and Tucson, a great deal more is known about the Hohokam culture than the Trincheras tradition. The Hohokam tradition is characterized by the introduction of red ware ceramics, red-on-buff or red-on-brown, that has been dated to around 500 CE (Reid and Whittlesey 1997). The Trincheras tradition, correspondingly, is also characterized by a ceramic plain ware and decorated ceramics, including purple-on-red, purple-on-brown, and a polychrome, as well as distinctive hill-top sites with stone terraces and walled habitations that are often referred to as *cerros de trincheras* (Hinton 1995; Downum et al. 2009)

Much of what archaeologists know about the Hohokam is related to modern development throughout the Phoenix and Tucson metropolitan areas, coupled with archaeological resource protection laws (Figure 7). Based in large part from work conducted by Emil Haury at Snaketown (Gladwin et al 1937; Haury 1976), a large Hohokam community along the Gila River, a general developmental sequence or chronology has long been established for this prehistoric culture group.

Because of the size and scale of archaeological sites along the Salt and Gila Rivers of central Arizona, many archaeologists believe that this area was the center of Hohokam culture from which social, religious and political systems spread. This core-periphery concept is similar to the social, religious, and political importance of the ancient Grecian cities of Athens and Sparta to the rest of the Peloponnesian Peninsula between 750 and 400 BCE or the city of Teotihuacan in Mesoamerica between 400 and 750 CE.

Suffice it to say that there are two primary developmental periods recognized for the Hohokam: the Early and the Late Hohokam Sedentary Farming Periods (Figure 8). The Early Hohokam Sedentary Farming Period is divided into what is called the Pioneer and Colonial periods. The earlier Pioneer period is a time when the first ensemble of material traits recognized as the Hohokam tradition are archaeologically represented, whereas the later Colonial period is a time when these material traits become widespread in southern Arizona. The Late Hohokam Sedentary Farming Period is also divided into two periods and these are called the Sedentary and Classic periods. The earlier Sedentary period is a time when dramatic population growth occurred throughout the Hohokam world, coupled with the development of large villages on flood plains, like Snaketown, construction and use of ritual platform mounds and ball courts, and the development of extensive irrigation canal systems. The later Classic period is a time when populations contracted and coalesced into very large communities, like Casa Grande, where family groups lived in walled compounds centered upon oversized, residential, platform mounds. In general, ball courts were no longer used during the Classic period. Needless to say, the exact timing of these large-scale events did not happen synchronously across space. For instance, the exact timing and sequences are somewhat different for the Phoenix Basin, as opposed to the Tucson Basin, and are often called by different developmental phases (Figure 8).

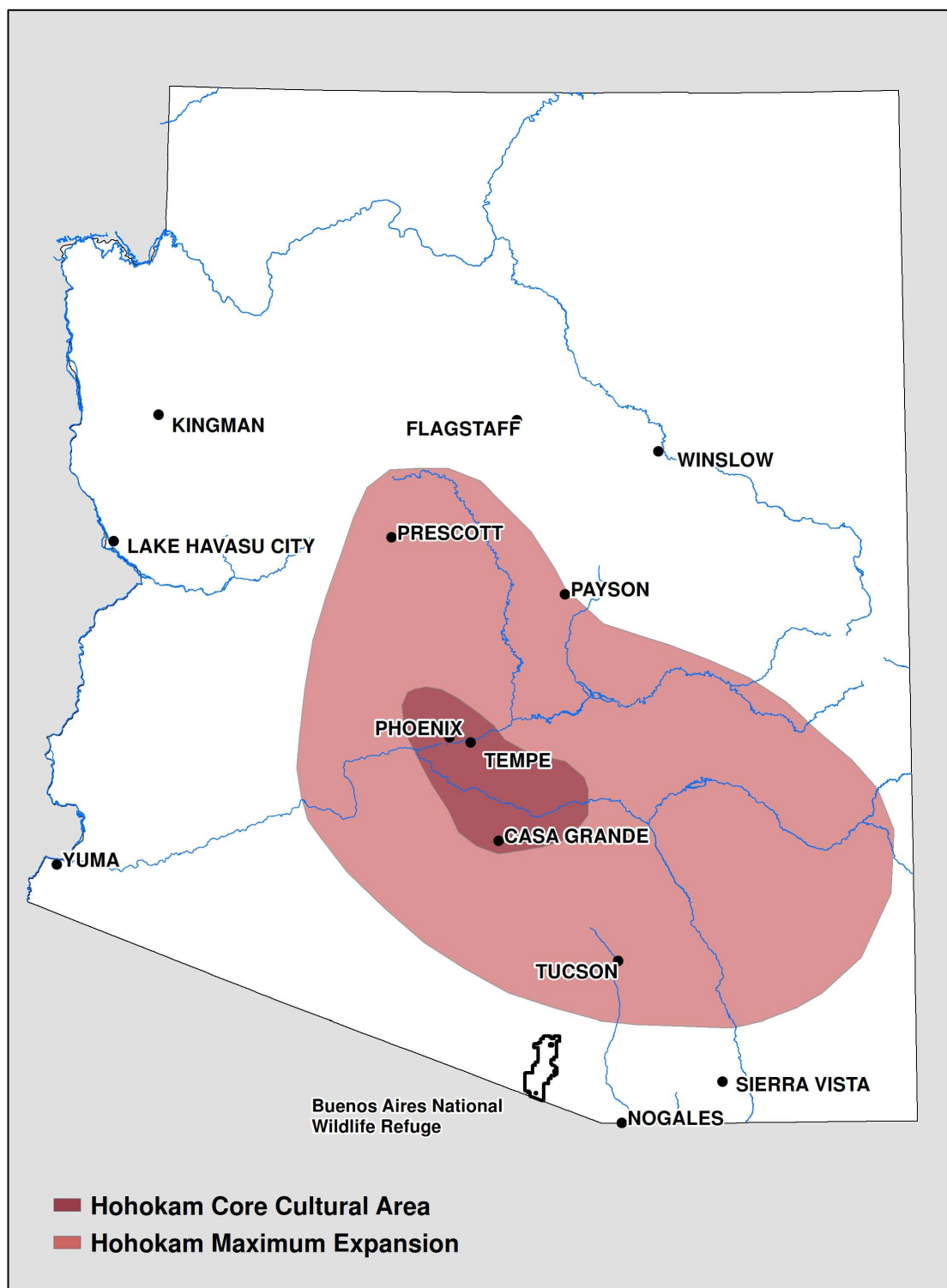


Figure 7. Proposed geographic extent of the Hohokam world.

Date (CE / AD)	Cultural Period	Tucson Basin Chronology	Phoenix Basin Chronology
200	Pioneer Period	Vahki Phase	Red Mountain Phase
300			Vahki Phase
400		Estrella Phase	Estrella Phase
500		Sweetwater Phase	Sweetwater Phase
600		Snaketown Phase	Snaketown Phase
700	Colonial Period	Canada de Oro Phase	Gila Butte Phase
800		Rillito Phase	Santa Cruz Phasse
900	Sedentary Period	Early Rincon	Sacaton Phase
1100		Midde Rincon	
1200	Classic Period	Late Rincon	Soho Phase
1300		Tanque Verde Phase	
1400		Tucson Phase	Civano Phase

Figure 8. Comparative Hohokam chronological frameworks for the Phoenix and Tucson Basins.

Hohokam Material Culture

Hohokam material culture is extensive and producing trait lists that enumerates every artifact and feature type would be an exhaustive exercise. Nonetheless, there are a number of important characteristics by which archaeologists define the Hohokam as a distinct archaeological culture. Foremost, the Hohokam produced a wide array of utilitarian and ceremonial ceramic vessels from three distinctive wares: plain ware (buff, brown, gray), red-slipped ware, and decorated ware (red-on-buff, red-on-gray). There is a bewildering array of ceramic types associated with each of these wares, but the hallmark of the Hohokam are distinctive red-on-buff ceramics in the Salt-Gila River Valleys (e.g., Sacaton Red-on-buff, Casa Grande Red-on-buff) and red-on-brown ceramics in the Tucson Basin (e.g., Tanque Verde Red-on-brown). But vessels were not the only items made from ceramics. The Hohokam also made human and animal figurines, of which the human forms portray a wide variety of ornamentation, like head dresses, facial ornaments, and clothing and body decorations (see Haury 1976). At particularly large sites, like Snaketown and Casa Grande, flaked stone and ground stone equipment indicate formalized sets of tools for specific kinds of tasks. For instance, ground stone implements include mano and metate varieties, mortars and pestles varieties, rubbing and polishing stones, abrading stones, files, reamers, saws, rasps, and hoes, among other types. Stone palettes are also important hallmarks of Hohokam material assemblages; typically rectangular, some

palettes are zoomorphic or anthropomorphic in shape. Ornament are also common, like carved shell bracelets, beads, pendants, nose or ear plugs, and rings.

Along with the plethora of small-scale utilitarian features, like hearths, roasting features, caches, and rock markers, there are also a number of distinctive architectural features. The most notable form of habitation is the rectangular house-in-pit with a short entryway on one long side and post-holes around the perimeter. The typical house-in-pit morphology changed over time but remained a common habitation type at sites throughout the entire chronological sequence. During the latter part of the Classic Period, above ground habitations were built and at large sites these were constructed within the confines of enclosed compounds. Another important architectural feature are large trash mounds, often capped with caliche. These mounds are inferred to represent public architecture that contributed to the topographic relief of villages. Snaketown, for instance, had at least 59 such mounds and together these served to facilitate circulation and ceremonial activities within the spatial confines of the community (Wilcox et al. 1981). Another distinctive architectural feature were ball courts, where a version of the Mesoamerican ball game was played. Ball courts are rectilinear features that contain a central depression or playing field, have distinctive ends, and are bounded on the long sides by smooth flat surfaces, or walls, that face the central field (Ferdon 2009). The geospatial distribution of these ball courts serves to define what has often been termed the Hohokam Regional System during the Sedentary period. Finally, the Hohokam were known for sophisticated and interconnected irrigation systems that irrigated tens of thousands of acres, particularly along the lower Salt and middle Gila Rivers. There were main canals that harvested water from major rivers, lateral canals that brought water to different communities across a basin, distribution canals for specific field systems, and diversion and reservoir structures (see Woodson 2010). Investigations at canals have shown that they can be used over centuries and that they can exhibit signs of renovation.

The Hohokam generally cremated their dead, but inhumations are sometimes found, particularly at Classic Period sites (Thiel et al. 1995:30–31). Cremains were typically placed in a pit, although some have been found in trenches and in urns. At multi-family villages, each kin-group, as defined by spatially oriented houses, had its own cemetery. Moreover, specialized crematory features have been found during excavations. These features were shallow, elongated pits over which a funeral pyre was constructed. They exhibit fire-blackened bottoms and sides and remnants of human ash can be present within them. Funerary goods are common and include ceramic vessels, shell bracelets, shell beads, stone palettes, ornaments, projectile points, whole shells, and other objects. The specialized treatment of the dead indicates that there was a whole set of mortuary rituals that accompanied burial practices.

Hohokam Cultural Tradition through Time

Early Ceramic Period Farmers (50–500 CE)

The populations that inhabited southern Arizona during the Late Archaic/Early Agricultural period, particularly those that inhabited communities like Las Capas and Los Pozos in the Santa Cruz Valley were the ancestors to descendant people known by archaeologists and native O’odham groups as the Hohokam. Before the Hohokam cultural tradition began, a series of developments took place over the course of several hundred years, from 50 to 500 CE, that would include the manufacture of an undecorated plain ware and more formalized habitation features that, taken together, represent greater investments in terms of labor and technical sophistication than that found during the previous 2000 years or so. Moreover, agricultural crops, including agave, became the paramount feature of their subsistence economy and these populations expanded across the floodplains of permanent streams,

laying the foundation for resident populations that would reside in the same geographic areas for the next 1,000 years (a.k.a. Hohokam). These populations were different from their Hohokam descendants in that they did not produce a widespread and distinctive ceramic tradition, lacked spatially organized family and supra-family groups, lacked substantial investment in irrigation agriculture, and did not have a ritual system focused on ballcourts, platform mounds, and cremations (Thiel and Diehl 2006:33; Reid and Whittlesey 1997:88).

Pioneer Period (500–750 CE)

The initial period of the Hohokam cultural tradition is marked by the introduction of a red-slipped ceramic. Somewhat later, a red-on-gray decorated pottery is manufactured in the Salt-Gila River Valleys and a red-on-brown decorated pottery in the Tucson Basin. At least two types of habitation structures are common at this time period. One is a true pit house that was square with four large posts set near each corner and one or two short entryways positioned midway along a wall. Some of these early pit houses could be quite large, measure 7×7 m, and sunk 0.5 m into the earth. The other type of habitation is a rectangular to sub-square house-in-pit with wooden posts variously placed near the walls and with a short entryway set midway along one of the long walls. Even at this early period, the elaborate mortuary practices associated with cremation were already in place. It is also at this time that platform mounds made from community trash and so important in defining circulation and ceremonial space within some of the larger communities in later time periods, are first built at Snaketown (Wilcox et al. 1981:145).

Social organization was focused primarily at the household level. The large majority of habitation sites during the Pioneer period were likely farmsteads. These kinds of sites generally contain a single habitation structure that, presumably, represents a single family, along with small out-buildings or special function features, and positioned near agricultural fields. Larger sites or hamlets were those that contained multiple and contemporaneous habitations where each habitation represented a single family within a larger extended family. When hamlets with multiple structures are found, the houses are often clustered in groups of two to four around a central courtyard and some hamlets may have been loosely grouped together in the same general area to form a dispersed village (Dart 2014:3).

In the Salt and Gila River Valleys, as well as along the Santa Cruz River, irrigation agriculture was being conducted. In desert areas away from major rivers, flood water farming or *ak chin* farming, and other dry farming techniques, was the primary agricultural practice.

According to Dart (2014:3) hamlets and farmsteads are present along the Santa Cruz River in the Tucson Basin. With the exception of single Vahki Red sherd, which denotes the Pioneer period, no evidence of a Pioneer occupation was found during the 1989 inventory on the upper bajada landforms of the Sierrita Mountains in the northern Altar Valley (Dart 1989: 39). In terms of Buenos Aires NWR, the overwhelming majority of documented prehistoric sites on the wildlife refuge, or 54, are affiliated with the Hohokam; unfortunately, none of these sites clearly indicate a Pioneer period occupation.

Colonial Period (750–950 CE)

The Colonial period was a time of expansion for the Hohokam cultural tradition. The traits that came into existence during the Pioneer period become increasingly widespread and elaborated upon in central and southern Arizona. For instance, the first ball courts were constructed during this period, likely distinguishing certain villages in an incipient socio-political system (Wilcox et al. 1981).

Habitation structures, or houses-in-pits, became relatively formalized during the Colonial period. These houses are generally rectangular or oval with a short entryway placed in the center or just off-center along one of the long walls. The floors can be covered by a clay-caliche mixture expressing a light buff color and sometimes the edges are grooved. Well-made clay hearths are common, but so too are informal burned areas, and these are typically positioned near the entryway. Primary post-holes can be found in the corners of structures, along with smaller ones placed around the margins.

There is evidence of population growth and increasing complexity at habitation sites. At Snaketown, Wilcox et al (1981:Table 13, 195) estimate that during the Pioneer period there was a total of 173 habitation structures with about 21 or 22 of those occupied at any given time, whereas during the Colonial period there was a total of 288 houses with 48 occupied at any given time. Coupled with this population increase was that the arrangements of households in hamlets and villages developed an increasingly patterned structure. Households commonly contained a habitation and one or more special-purpose structures, like storage rooms or ramadas. Groups of two to 10 houses, each one representing a single family, were clustered around a central open area or what could be called a courtyard. These so-called *courtyard groups* represent a single related kin-group or extended family. What is particularly interesting is that these kin-groups appeared to remain in existence over multiple generations, as is exhibited in that some houses were abandoned, while new ones were built nearby or on the top of older ones (Reid and Whittlesey 1997:91). Often, these individual courtyard groups had their own cemetery, trash disposal area, and communal cooking facilities, like underground *hornos* or ovens.

It is apparent that socio-political organization above the level of individual courtyard or kin-groups emerged at this time. This is denoted by the introduction of ball courts throughout the Hohokam world. Indeed, over 30 ball courts were constructed during this time period (Wilcox and Sternberg 1983). The use of platform mounds made from community trash, both capped and uncapped, increases and large villages like Snaketown also exhibit central plaza areas by which other communal structures, as well as habitation precincts, are oriented around.

It is during this expansion period that the first habitation sites are present on the upper bajadas around the Sierrita Mountains in the northern Altar Valley (Dart 1989:39). Most of these sites are found within a mile of each other between Fresnel and Sato Washes. During the early part of the Colonial period, 750–850 CE, at least one hamlet develops, and there is evidence that a second hamlet may have started at this time too. By the latter part of the Colonial period, 850–950 CE, there are three hamlets positioned between Fresnel and Sato Washes (Dart 1989:39). As discussed above, at least one of these hamlets, perhaps two, is present through the entire period, suggesting that some of the kin-groups have inter-generational integrity. Without further field investigations, there is no way to tell if any of the Hohokam sites documented in BANWR are affiliated with the Colonial period. Just east of BANWR near Arivaca, Statistical Research conducted excavations at a Colonial period farmstead and found one habitation structure with various internal features, two extramural roasting features, and a trash midden (Whittlesey and Ciolek-Torrello 1992).

Sedentary Period (950–1150 CE)

The Sedentary period is a time when the Hohokam, stretching from the northern margins of the Phoenix Basin to areas south of Tucson, were incorporated into a widespread socio-political, ideological, and economic system, often referred to as the *Hohokam Regional System*. Although not

coincidental, the Hohokam Sedentary period and the regional system associated with it is contemporaneous with the Ancestral Puebloan Chacoan Regional System centered on Chaco Canyon in the San Juan Basin of northwest New Mexico. Since Haury's work at Snaketown, archaeologists have attempted to characterize just what kind of socio-political system integrated, mobilized, and coordinated people to construct massive irrigation canals, communal platform mounds, and ball courts across such a large area. This is because there is little direct archaeological evidence to support some form of institutionalized governing elite. Emil Haury recognized this contradiction but saw no evidence of an elite socio-political group and therefore believed that Hohokam society during the Sedentary period was fundamentally egalitarian (Haury 1976:353). In a recent article, Douglas Craig (2010:71) has summarized alternative leadership models offered by various researchers:

Some researchers have argued that a strong centralized government was required to manage canal systems as large as those built by the Hohokam... Others view the widespread distribution of ballcourts, platform mounds, and other forms of public architecture as evidence for the emergence of a corporate-based political system... Still others point to iconography on pottery, rock art, and ritual artifacts to argue that Hohokam society was a "ritual suzerainty" governed by religious elite.

This particular research domain and related questions will continue to be an important area of inquiry by archaeologists into the future.

Sedentary period houses-in-pits naturally evolved from earlier Colonial period house styles. Small to large oval-shaped houses with rounded ends or rounded corners are common. These houses range in size from 5–8 m in length and 4 m in width, with the largest measuring 10–15 m long and 5 m wide (see Haury 1976, Wilcox et al. 1981). Narrow entryways are usually placed in the middle of one long side and protrude outward from the edge of the wall like an appendage. The interiors are often ringed with post-holes and spaced around 25 cm apart. The standard location of a hearth is midway between the center of the structure and the inner edge of the entry. Floors continue to be lined with a mixture of clay and caliche, giving it a light buff color. Often, there are specially prepared clay lumps on the floor, so-called trivets, believed to hold pots over coal beds. There is some variation in house plans, however. For instance, some can be square and reminiscent of earlier Pioneer period houses; these exhibit short entryways positioned in the center of one wall, a hearth near the entryway, and post holes at each corner.

What has previously been defined as courtyard groups during the Colonial period become the norm during the Sedentary period. To reiterate, these courtyard groups consisted of multiple houses that open onto a common activity area. Each of these groups had their own cooking oven (*hornos*), cemetery, and trash mound. The most common site types across the Hohokam World are farmsteads and hamlets, the former being a single-family residence near agricultural fields, and the latter being a residence for a single courtyard group. The largest sites are villages like Snaketown or the Grewe Site and consist of multiple courtyard groups spatially organized around public architecture. Courtyard groups at the Grewe Site range in size from two households covering a 100 m² area to 21 houses with an area over 600 m² (Craig 2010:78). Analyses by Douglas Craig has revealed that a few of these courtyard groups exhibit exceptional expenditures of labor for their creation and he hypothesizes that these particular family groups may well be the socio-political elite that coordinated, mobilized, and integrated the rest of the population. He believes that wealth and power was concentrated in a small number of aristocratic households or courtyard groups who controlled access to irrigable lands (Craig 2010:72). Presumably, it was also these families that recruited labor, coordinated public architectural construction activities, and led group rituals.

Because so much work has been conducted at Snaketown, we can use this site as a mirror for understanding other village sites throughout the Hohokam World. Snaketown reached its zenith as a central place village during the Sedentary period (Haury 1976; Wilcox et al. 1981). By this time, the site is estimated to be roughly 1000 m in diameter and contain a population of 630 to 1000 people at any given time (Wilcox et al. 1981). Within its confines there is a 300–400 m diameter inner habitation zone denoted by a central plaza, two house concentrations, a well, and what may be a road, all surrounded or circumscribed by eight platform mounds. Away from this inner habitation zone is a much larger outer habitation zone, but which contains both ballcourts. Finally, it may also be that six prehistoric trails lead away from Snaketown northward, whereas the southern perimeter of the community is defined by the Gila River. If we use the population of Snaketown as a very rough and crude estimate, the size of the overall Hohokam population throughout their world during the Sedentary period may be in the order of tens of thousands of people, perhaps even as high as 100,000.

It is also during the Sedentary Period that ballcourts are widespread throughout the Hohokam World, and, indeed, even beyond. Ballcourts in the greater Southwest extend from the large prehistoric community of Casas Grandes in Chihuahua northward to the Ancestral Puebloan site at Wupatki near Flagstaff. The largest known Hohokam ballcourt was at Snaketown and it measured nearly 60 m long and 5 m high and may have been able to hold 500 people along its embankments (Reid and Whittlesey 1997:92). Archaeological investigations have recovered game balls or *pelotas*, as well as figurines believed to represent ball players. The Mesoamerican ball game has cosmological significance and there is every reason to think that it did in the Hohokam World as well (Ferdon 2009; Wilcox and Sternberg 1983). Just as likely, the game was a time of inter-community aggregation, religious cohesion, and a way to distribute goods throughout Hohokam communities, like manufactured turquoise, copper bells, macaws, and other objects.

The conclusion of the Sedentary period marks the end of many long-occupied ancestral communities throughout the Hohokam World, including Snaketown. In addition, most ball courts would no longer be used after the Sedentary period.

It is during the Sedentary period that Hohokam sites become common on the upper bajadas around the Sierrita Mountains in northern Altar Valley (Dart 1989:39). A total of 38 sites that date to this period were recorded during Desert Archaeology's 4,000-acre inventory conducted in 1989. Of these, 12 are hamlets and six of these are clustered within a 1-mile area between Fresnel and Sato Washes. Along with these hamlets, there are also 10 farmsteads, and 16 limited activity sites. Taking these data into consideration, there is on average one Sedentary period hamlet or farmstead every 180 acres or every quarter section. In the Coyote Mountains on the west side of the Altar Valley, 19 of 40 recorded sites contain ceramics that indicate some kind of Sedentary period occupation (Dart et al. 1990: Table 2.2, 15–16). Even though there are 54 Hohokam affiliated sites already recorded on BANWR, none can be conclusively assigned to the Sedentary period.

Classic Period (1150–1450 CE)

The Classic Period saw dramatic changes in the Hohokam cultural tradition. These changes are most notable in household and community architecture, as well as how people distributed themselves across the landscape. In terms of architecture, while houses-in-pits are still built, many habitations consisted of aboveground puddled adobe structures. In fact, even the houses-in-pits exhibit adobe walls, either solid or reinforced by posts or cobbles. Moreover, whereas related families or kin-groups had been organized into courtyard groups during the Colonial and Sedentary periods, during the Classic period

kin-groups lived within walled compounds. Rectangular, flat-topped, pyramidal platform mounds became the primary form of public architecture and these contain structural walls and rooms on their tops. There is general consensus that these oversized platform mounds served as specialized features constructed by a large organized group and that they served village integrative functions (Elson 1998:14). In this way, people became concentrated primarily within what could be described as towns, of which Casa Grande and Pueblo Grande in the Salt-Gila River Valleys are representative, along with the Marana community in the Tucson Basin. These changes are also reflected in burial practices. Although cremation remained common and many of these were placed in urns, burials or inhumations now become a regular feature of the culture. Changes in material assemblages also took place. For instance, stone pallets and clay figurines are not as common, and new ceramic wares develop in the Phoenix Basin (Gila Red) and the Tucson Basin (Tanque Verde Red-on-brown), including polychromes.

The Classic period site of Los Muertos is a good example of how these dispersed towns or communities were organized (Doyel 1991; Haury 1945). Los Muertos is located in the Phoenix Basin between what is now Tempe and Chandler and first documented in 1887–1888 by the Hemenway Expedition. The site is about 1500 m long (east-west) and 600 m wide (north-south), resides along one side of a main irrigation canal, and several lateral ditches bisect through it. There is a central residential area, about 500 m in diameter, with 16 residential compounds, around 20 platform mounds, and at least two reservoirs. All of these features are clustered around a central, oversized platform mound with a building compound on its top. Each of the residential compounds are associated with one large mound or several small ones. In addition, there are two outlying habitation areas with a total of seven residential compounds and eight trash mounds.

Of particular interest here is the Classic period Hohokam community in the Coyote Mountains of northern Altar Valley (Dart et al. 1990). Detailed inventory work has identified a total of 40 Classic period Hohokam sites that is, apparently, the southernmost Hohokam platform mound community yet recorded. This community contained over the course of its 350-year existence 10 walled residential compounds in associated with at least five platform mounds (*Figure 9*). Detailed surface inventory of the district and outlying areas make it relatively clear that at this time the population that once lived in the surrounding area became concentrated within this single community (Dart et al. 1990:70). Whereas the Coyote Mountains lie on the west side of the Altar Valley, the Sierrita Mountains on the east side offer tantalizing evidence that other platform mound communities may also exist. The 4,000-acre inventory conducted on the upper bajada of these mountains identify an explosion of hamlet-sized sites, farmsteads or field houses, and resource procurement sites. In all, 14 hamlets, 15 farmsteads or field houses, and 26 limited activity sites were recorded within a 1.6-square mile area (Dart 1989:37, 39–40). Although the large majority of Hohokam sites recorded in BANWR cannot be affiliated to any time period, two sites have been recorded that appear to date to the Classic Period (AZ DD:7:55[ASM], AZ DD:7:62[ASM]).

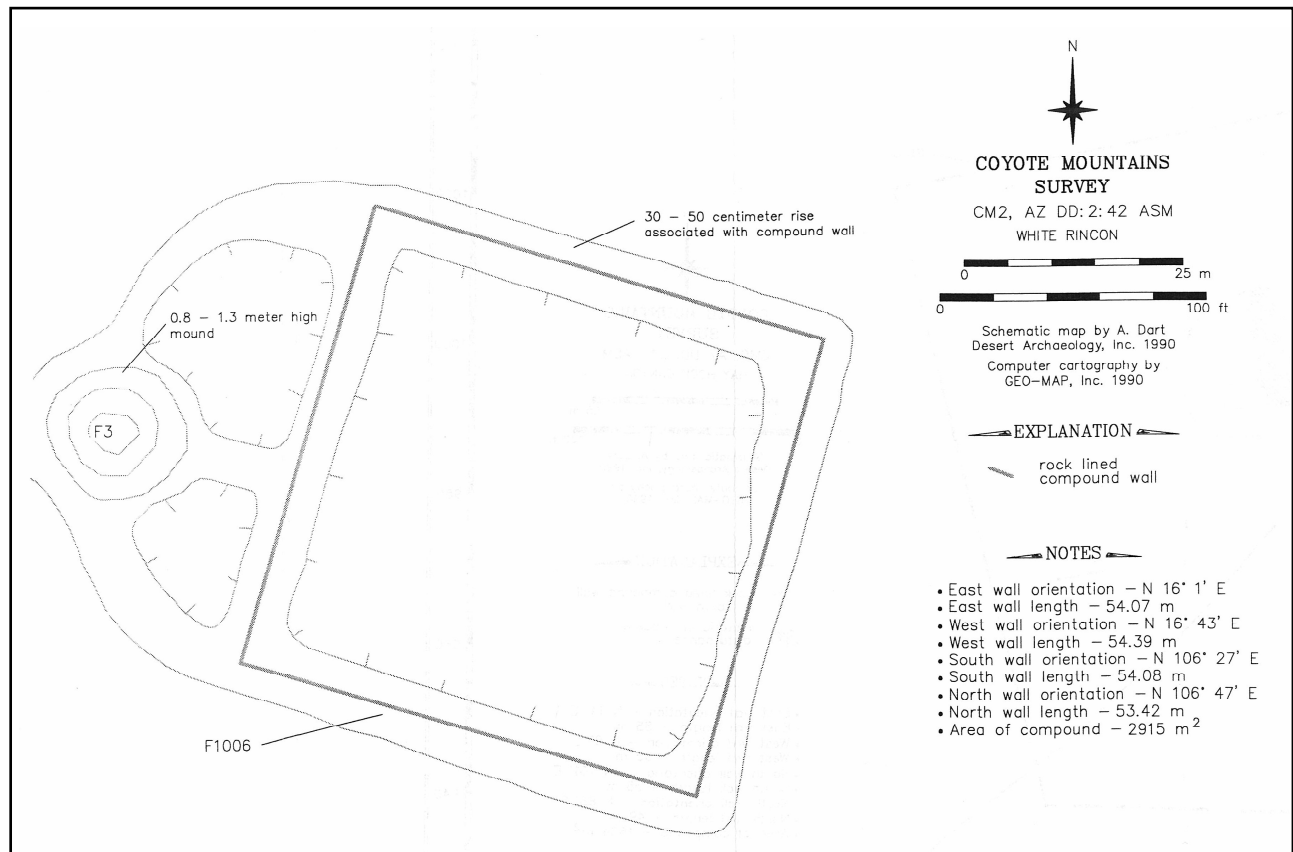


Figure 9. Site DD:2:42(ASM), a Classic Period Hohokam Platform Mound in the Coyote Mountains Archaeological District, northwest of Buenos Aires National Wildlife Refuge (Dart et al. 1990).

Trincheras Cultural Tradition

The Trincheras cultural tradition consists of a well-established ceramic tradition which is often associated with a distinctive site type called *cerros de trincheras*. This tradition is primarily located in northern Sonora, Mexico, along the Rio Magdalena and Rio Altar, but can also be found in southern Arizona (Downum et al. 2009; Hinton 1955; Whittlesey and Ciolek-Torrello 1992). Though some Trincheras affiliated sites may date as early as the Late Archaic/Early Agricultural period, those recognized in southern Arizona are typically associated with Trincheras Ware (purple-on-red, purple-on-brown, polychrome) and are contemporaneous, if not directly associated with Hohokam affiliated sites, particularly those associated with the Hohokam Classic period (Downum et al. 2009). The *cerros de trincheras* site type typically consist of shallow terraces and dry-laid masonry walls built on isolated hills. A number of these sites have been well documented in southern Arizona and include several massive complexes: Tumamoc Hill, Cerro Prieta, and Linda Vista Hill (Figure 10). Carpenter et al. (2008) has developed a revised culture chronology for the Trincheras tradition that includes phases that extend into the historic period. This sequence is subdivided into the Atil/Phase 1 (150–800 CE), Altar/Phase 2 (800–1300 CE), Realito/Phase 3 (1300–1450 CE), Santa Teresa/Phase 4 (1450–1690 CE), and Tohono O’odham/Phase 5 (1690–1940 CE). It is important to include the Trincheras tradition

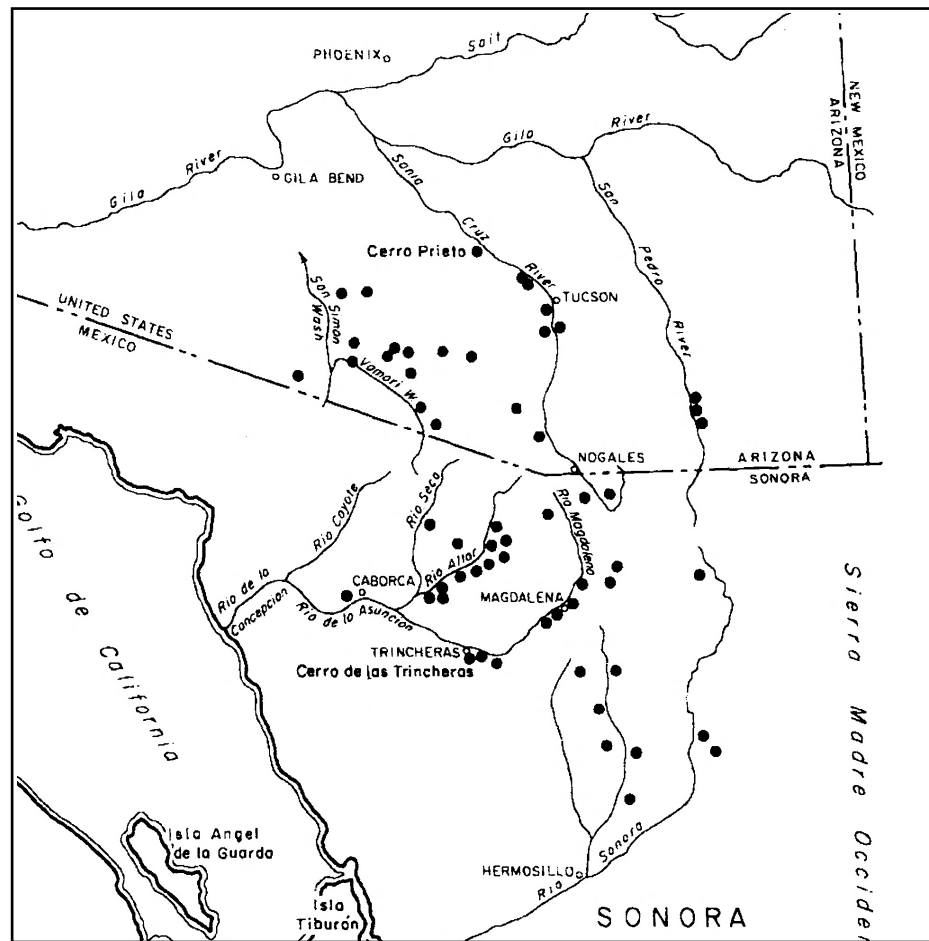


Figure 10. The distribution of *Cerros de Trincheras* or hills with trenches in Sonora and Arizona; note their distribution in proximity to Buenos Aires National Wildlife Refuge (Downum et al 1999).

in a discussion of BANWR because Trincheras Ware ceramics have been found on sites documented on/near the wildlife refuge (see below). Additionally, *cerros de trincheras* have been recorded in the western Papaguería and as far north as the Tucson metropolitan area (see Downum et al. 2009:Figure 1, 263). Based on these findings, the Trincheras cultural tradition may have played a significant role in the overall settlement history of the Altar Valley.

Collapse of the Hohokam and Transition to the Historic Period

During the 1300s, some of the large platform mound communities of the Hohokam Classic period began to be abandoned. This trend would continue until 1450 when these sites would no longer serve as major occupation centers. Notably, archaeologists place the end of the Hohokam cultural tradition at this time. Some archaeologists have suggested that a series of large-scale floods in the mid to late 1300s caused severe infrastructural damage to the large inter-related irrigation systems on which these people relied. One problem with this interpretation is that large Hohokam platform mound communities continue to exist into the fifteenth century. It may be that these floods were an initial driver that would set into motion a series of other events that, taken together, caused the Hohokam collapse. These other events may have included long-term over population, coupled with the salinization of prime agricultural fields following centuries of intensive use.

There does not appear to be any consensus about why the Hohokam abandoned their late prehistoric communities and, moreover, what happened to such a large multi-regional population. What does seem to be clear is that remnant populations became dispersed across the previous Hohokam world living in smaller hamlets and farmsteads, perhaps even in dispersed communities more reminiscent of Snaketown than Los Muertos or Casa Grande (Loendorf and Lewis 2017:133–134; Reid and Whittlesey 1997:108).

CHAPTER 3. ETHNOGRAPHIC SETTING: O'ODHAM

The Altar Valley, including Buenos Aires National Wildlife Refuge, lies at the eastern margin of what was traditionally the Tohono O'odham homeland (*Figure 11*). Once referred to as Papago Indians, a Spanish derivative term meaning *Bean Pima* or *Bean People*, Tohono O'odham is self-referential and means *Desert Pima* or *Desert people* (Fontana 1983a:125, 134; Papago Tribe 1985:3). This particular term, Tohono O'odham or desert people, is in contrast with the names of other related peoples, the Akimel O'odham, which means *River Pima* or *River people*, who live along the Gila and Salt Rivers, and the Hia Ced O'odham or *Sand Papago* (Fontana 1983a; Joseph et al. 1949:69). All three of these groups speak—or spoke—what linguists refer to as Upper Piman, which linguists classify as part of the Tepiman branch of the much larger Uto-Aztecan language family, but each one has slightly different dialects and inhabit different physiographic regions of the Sonoran Desert (Miller 1983). Moreover, Joseph et al. (1949:66) state that there is a relationship between dialects spoken on the Tohono O'odham reservation and the districts that were established there in 1935.

The traditional homeland or range of the three O'odham groups is vast and encompasses lands to the north and south of the international border (*Figure 11*). The greater O'odham territory is bound by the Santa Cruz and San Pedro Rivers to the east, the Lower Colorado River Valley to the west, the Gila River to the north, and the Altar Valley in Sonora, Mexico to the south (Fontana 1983a: *Figure 1*, 126; Papago Tribe 1985: 3–4). The Tohono O'odham people, more specifically, lie in the central Sonoran Desert between the Ajo Range and the Baboquivari Mountains. The Altar Valley lies between the Tohono O'odham and the historically recognized Sobaipuri O'odham, who prior to missionization and widespread Apache depredations practiced irrigation agriculture along the Santa Cruz and San Pedro Rivers east of the wildlife refuge.

Over the years, a great deal has been written about both the Akimel (Pima) and Tohono O'odham (Papago); much less has been written about the Hia Ced O'odham (Sand Papago) because they no longer exist as a distinctive cultural entity. Summaries of the Spanish contact period can be found in Bolton (1984) and Officer (1987). There are a number of general ethnographic summaries about the O'odham, but perhaps the most accessible are Ezell (1983), Fontana (1974, 1983a, 1983b), Underhill (1978), and Russell (1975). Whereas the overviews by Paul Ezell, Bernard Fontana and Ruth Underhill are primarily in the form of narratives, Frank Russell's was published by the Bureau of American Ethnology in the early twentieth century and contain detailed descriptions and line drawings about all manner of O'odham life (i.e., wild plant and animal foods, agriculture practices, trade, artifacts and equipment made from a variety of materials, personal decoration, musical instruments, dancing, festivals, games, etc.). In the 1980s, the Tohono O'odham nation also published their own tribal histories (Papago Tribe 1984, 1985). Detail analyses of O'odham agriculture and subsistence practices can be found in Castetter and Underhill (1935), Castetter and Bell (1942), and Hackenberg (1974, 1983). O'odham religion, rituals, and lore can be found in Bahr (1983, 2001), Saxton and Saxton (1973), and Underhill (1946). The only specific ethnographic discussion regarding the immediate area around Buenos Aires NWR is Wegener et al. (2002), who presents a relatively brief summary of Tohono O'odham history, spiritual beliefs, and subsistence practices as they relate to the Baboquivari Mountains that form the eastern border of their largest reservation and the center of the O'odham universe.

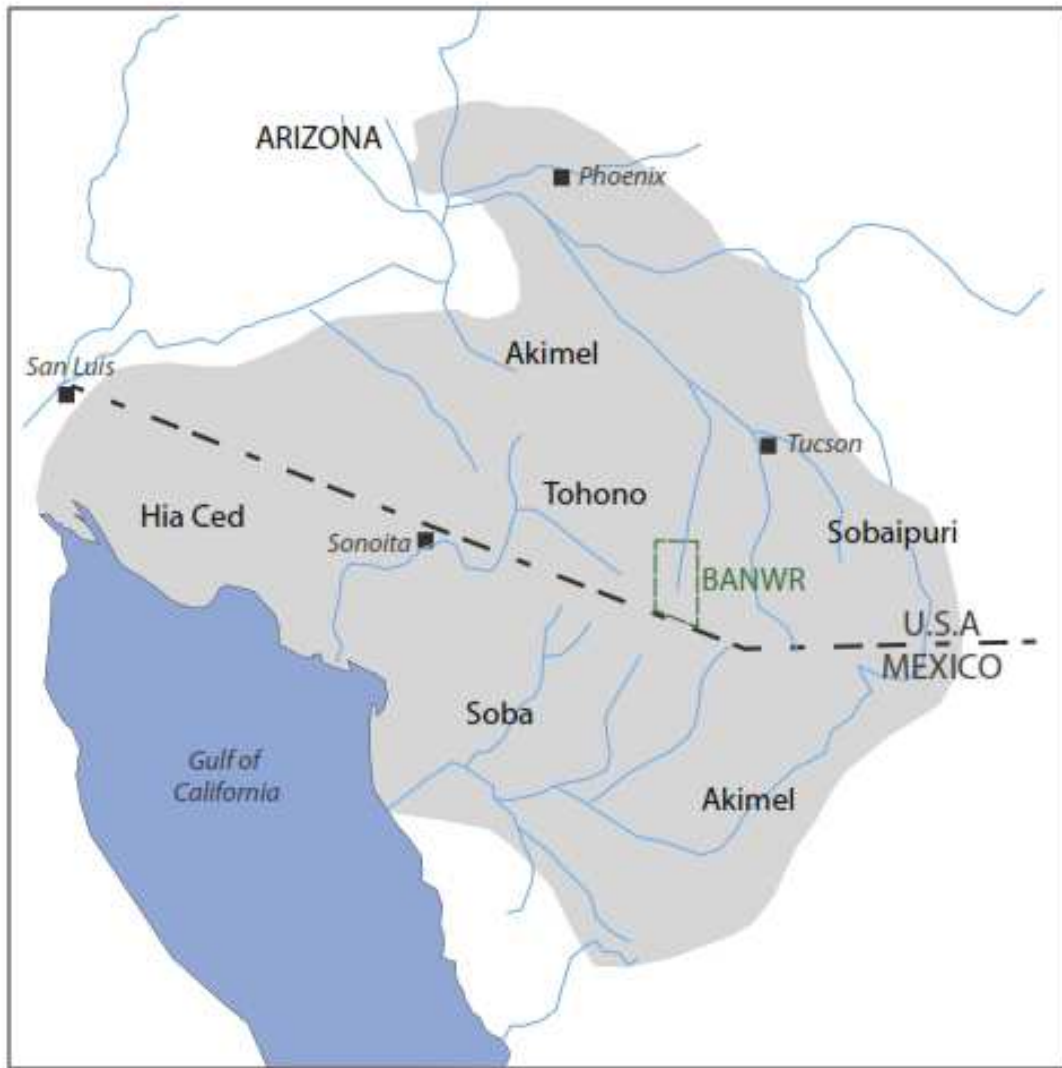


Figure 11. O'odham tribal distributions.

HISTORIC DISTRIBUTIONS, SETTLEMENT & SUBSISTENCE PRACTICES

The cultural geography of the O'odham can be understood or modeled following a gradient from west to east. This gradient is based on precipitation regimes and the amount of rain that falls across their vast homeland, the availability of water sources, the density and diversity of plants and animals, and finally the position of permanent rivers or streams. In practice these groups regularly interacted and intermarried with each other, keeping a series of mutual relations between each other and making any hard and fast distinction in group identity an anthropological abstraction.

Hia Ced O'odham

The Hia Ced O'odham or Sand Papago lived in the far western portion of the Sonoran Desert between the Ajo Mountains and Yuma (Figure 11). This area is extremely dry and receives on average not more than five inches of rainfall annually. Consequently, the Hia Ced O'odham were mobile foragers

and moved widely to visit scattered springs and bedrock water tanks, and to access the Gulf of California. They relied on fish and shellfish from the Gulf, mountain sheep and other game in the mountains, tubers present in dune fields, as well as mesquite and other kinds of cactus fruit. At various times they would barter with their Tohono O'odham relatives and the Colorado River Yumans for agriculture products (Gilpin and Phillips n.d.: 48). Hackenberg (1983:161) speculates that this group may have never exceeded 150 people, although population estimates are difficult to make with any accuracy prior to widespread Euroamerican expansion in the middle 1800s. Mobile foragers throughout the world, like the San of Botswana or the Western Shoshone of Nevada who also live in very arid environments, typically reside in nuclear or extended families that move regularly from habitat to habitat to acquire seasonally available foodstuffs and where the size of face-to-face groups at any given time is dependent upon on the season and on the productivity of a specific habitat (Lee and Devore 1966; Steward 1938).

Tohono O'odham

The Tohono O'odham or Desert People lived in the central and eastern portion of the Sonoran Desert where there were no permanent rivers or streams, but where precipitation was great enough to allow floodwater or dry farming. Their homeland has historically been west of the Baboquivari Mountains, centered on the Vamori Valley, all the way to Ajo and the Growler Ranges, and in the lands that lie immediately north and south of the International Border (Figure 11). Unlike their western relatives, the nomadic Hia Ced O'odham, the Tohono O'odham were semisedentary and primarily lived in two villages or residential bases at different times of the year (Castetter and Bell 1942:41–42; Fontana 1983a:131–133; Gilpin and Phillips n.d.:43–44). During the winter, related families dwelt in the mountain foothills near permanent springs or water holes, whereas in the summer they lived on the valley floors where they practiced floodwater farming. Temporary camps were also used to acquire seasonally available resources, like the saguaro fruit. Tohono O'odham subsistence then is best perceived as a mixed economy where hunting and gathering, agriculture, and trade played important roles.

The winter village or residential base in the mountain foothills afforded Tohono O'odham access to various lower elevation plants, such as cholla and prickly pear, mesquite, and barrel cactus. In the ethnographic literature this is often referred to as the *well village*. Higher up in the mountains, oak, pinyon, and Mormon tea could be obtained. At least two plant foods were obtained from the Baboquivari Mountains west of BANWR, wild chile or chiltepin (*Capsicum* sp.) and acorns (*Quercus emoryi*), as well as several non-food items, such as desert tobacco (*Nicotiana glauca*), coral bean (*Erythrina flabelliformis*), and a form of soap weed (Wegener et al. 2002:42–44). A variety of game are also known to inhabit the Baboquivari Mountains: mule deer, white-tail deer, mountain sheep, coyote, peccary, jackrabbit and cottontail rabbit, ground squirrel, Gambel's quail, and morning dove. Taken together, the winter residences were positioned in an ecotone that offered a wide variety of plant and animal foodstuffs, as well as raw materials for the manufacture of equipment and crafts.

The summer residences were positioned on the valley floors near places where they would undertake floodwater or dry farming during the months of July and August when the monsoon season occurs. This particular village is commonly referred to in the ethnographic literature as the *field village*. The Tohono O'odham generally practice the most common type of floodwater farming, the so-called *ak-chin* method, an O'odham term which refers to the mouth or opening of an arroyo (Hackenberg 1974:73). This is where a field is positioned on an alluvial fan at the mouth of an arroyo so that as floodwaters come down the drainage they are debouched across the fan and at the same time dump

nutrient-rich sediment onto the planted surface (Castetter and Bell 1942:168–169). Earth, rock, and woody debris barriers are typically used to spread the water and during flood events farmers will often dig ad hoc channels to lead the water from plant to plant. Before the summer rains began, people would hike into the upper reaches of a drainage or arroyo and erect temporary rock dams, of which the purpose was to channel runoff into one major waterway where it would enter the valley bottom:

shallow ditches or dykes, or wings, were constructed starting a mile or more from the fields in order to collect the surface run-off for the few acres on which they converged. Low embankments, small brush dikes, and short shallow ditches were used where necessary to control, divert, distribute and retain water. At times, embankments were disposed as levees (Castetter and Bell 1942:168).

Once the monsoon pattern set in, the people would plant their crops and, as Castetter and Bell's (1942:171) informants relate, their crops needed at least two substantial flood events to produce a good yield. Traditionally, they farmed corn, beans, and squash, but wheat was introduced by the Spanish and this crop became increasingly important over time. Interestingly, Castetter and Bell (1942:163) claim that Fresno Canyon, on the west side of the Baboquivari Mountains, was a place where crops were irrigated using water drawn from shallow wells.

There are other recognized floodwater or dry farming methods that could also have been used by the Tohono O'odham. One is the *trinchera* or terrace method where stone dams are built across an ephemeral drainage; floodwaters flowing down the drainage repeatedly deposit their sediment load on the terrace so that, over time, the feature can be planted. The other technique is planting fields on sand dunes positioned over some impermeable stratigraphic layers, like bedrock or caliche; when monsoon rainfall occurs, this water gets captured in the dune field above the impermeable geologic layer.

The saguaro fruit was particularly important for the Tohono O'odham. When the fruit began to ripen in June, winter villages would break up and families would spend several weeks in temporary camps acquiring this resource (Hackenberg 1974:74–75). Details regarding other important wild plants and animals used by the Tohono O'odham can be found in Castetter and Bell (1942:59–62) and Hackenberg (1974:78–93). Another important component of the historic Tohono O'odham economy was trade with their Akimel O'odham relatives, which more than likely had prehistoric antecedents. Hackenberg (1974:74), citing Bryan, gives the following inventory of Tohono O'odham trade items: saguaro seeds, fruit, and syrup; agave cakes, syrup, and baskets made from the leaves; wild gourd seeds; small peppers or chiltepin; acorns; prickly pear syrup; sleeping mats, carrying baskets, and fiber for their manufacture; dried deer, mountain sheep, and cow meat; red, yellow, and buff-colored ochre; salt.

Today, the Tohono O'odham live on three reservations established between 1874 and 1916: the 71,095-acre San Xavier reservation south of Tucson (San Xavier District); the 22,400-acre Gila Bend reservation on the Gila River north of the modern-day town (San Lucy District); and the largest or main Tohono O'odham reservation composed of nine districts, including the nation's capital at Sells. In addition to these reservations, there is also Florence Village established in 1978 near the modern town of Florence (www.tohono-nsn.gov). An important point is that these reservation lands lie within the traditional homeland of the Tohono O'odham and where they were first encountered by the Spanish in the late 1600s, that is, they were never displaced from their homeland by the historic expansion of Euroamericans.

It is difficult to get a sense of what size of population was present in these winter and summer villages and how these villages were internally organized. The descriptions, as summarized above, seem to indicate that these were dispersed communities where related nuclear and/or extended families lived in a general vicinity, rather than being concentrated in nucleated or semi-nucleated villages at a single discrete location. This kind of residential pattern fits with how springs and seeps are present across mountain ranges; such features are found rather sporadically across the face of a range, oftentimes concentrated in major drainages that have large catchments. Castetter and Bell (1942:162) relate that there were 14 such winter or well villages along the western face of the Baboquivari Mountains in the late 1800s and early 1900s. Likewise, floodwater or dry farming is typically an extensive subsistence practice, particularly over time as one area on a landscape will be well-watered one year, whereas another will get abundant rainfall the next. Because of this, a family will have several farming plots each year, so that if one fails due to a lack of precipitation, another one will be productive. Conversely, the best ak-chin farm plots in any given valley may well be concentrated at specific points on a landscape. For instance, there are a number of prehistoric Hohokam sites in BANWR that concentrate along Margarita and Thomas Washes and these were probably positioned to facilitate ak-chin agriculture on the incised arroyos that feed into the primary axial wash (Puertocito Wash) that lay just to the east (see Chapter 5, Figure 20). The above statements correspond well with Joseph et al. (1949:60) who write:

In the old days, when the people migrated at least twice a year between the fields in the valley and the wells in the hills, and new fields were frequently sought, the village was not so much a place as a particular group of people.

Akimel O’odham

The Akimel O’odham or River People lived along the Gila and Santa Cruz Rivers in central Arizona (Figure 11) and often referred to as *Gilenos* in the ethnographic and historic literature. Today, this group resides on two reservations, the Gila River Indian Community, located along the Gila River before it joins with the Lower Salt River, and the Salt River Pima-Maricopa Indian Community east of Phoenix. Like their Tohono O’odham relatives, these people still occupy the same homelands where they were first encountered by the Spanish. Whereas the other O’odham groups historically lived in portions of the Sonoran Desert devoid of permanent rivers or streams, the Akimel O’odham lived in its far eastern portion and in sedentary villages along the abovementioned rivers practicing irrigation agriculture. Indeed, the Gila and Santa Cruz floodplains were the best suited for agriculture in the O’odham world north of the International Border.

The villages of the Akimel O’odham, including the Sobaipuri (see below), were the largest of all the O’odham groups. By around A.D. 1700, they lived in at least seven rancheria-type villages located from the vicinity of Casa Grande to the confluence of the Gila and Salt Rivers: one on the Santa Cruz River west of Picacho Peak; five on the south side of the Gila between Casa Grande and Gila Bend; and one on the north bank of the Gila above its junction with the Salt River (Ezell 1983:150–151). These settlements were largely politically autonomous and economically self-sufficient and Ezell (1983:151) cites that population figures given by the Spanish at around this time range from 2,000 to 3,000 people. By the 1850s, as a result of missionization and Apache aggression, Akimel O’odham villages were located south of the Gila River “forming an inner circle in Casa Blanca district, surrounded by fences, ditches, and irrigated fields that made them difficult to approach undetected... the purpose was to form a defense perimeter” (Hackenberg 1983:169).

According to Castetter and Bell (1942:57), the historic Akimel O'odham households relied on agricultural products for roughly 60% of their food and that this produce was stored in large pottery jars and baskets for consumption throughout the year. The Sobaipuri O'odham at San Xavier del Bac on the Santa Cruz River practiced canal irrigation agriculture when the Spanish arrived in the 1690s; however, as Hackenberg explains (1983:165), the water table was so high along the Gila that the Akimel O'odham simply planted their corns, beans, and squash immediately along it or placed a log across a channel to divert water into their fields. Information obtained by Castetter and Bell (1942:40) from informants seemingly contradict this statement and indicate that early Akimel O'odham agriculture was largely dependent upon canal irrigation. Along with corn, beans, and squash, wheat became a very important crop after Spanish contact.

Despite extensive agricultural production, Akimel O'odham diet was quite mixed and these peoples harvested a wide variety of wild plants, animals, and fish. Mesquite, saguaro fruit, and cholla buds were the primary wild plant foods harvested (Castetter and Bell 1942:63–64). Important game included quail, white-winged dove and mourning dove, and turkey, and they were known to keep eagle, parrot, and hawk in captivity for their feathers (Castetter and Bell 1942:70–71). Because the Akimel O'odham lived along permanent rivers, they regularly acquired chubs, suckers, minnows, and dace (Castetter and Bell 1942:71). Domesticated, cattle would become an increasingly important part of their economy from the time of Spanish missionization in the eighteenth century and into the nineteenth and twentieth centuries.

Historically, another group of River People, the Sobaipuri, were present along the Santa Cruz and San Pedro River valleys east of BANWR (Gilpin and Phillips n.d.; Hackenberg 1974). These people were relatively well documented by Spanish missionaries in the late 1600s and 1700s, particularly by Father Eusebio Francisco Kino who was expanding the Jesuit presence into the Santa Cruz River valley. It was Kino who founded the earliest missions or *misiones cabeceras* (head mission) of San Xavier del Bac in 1692, south of modern Tucson, and San Gabriel de Guevavi in 1701, north of what is today Nogales. By 1750, the settlement of Arivaca, located just east of Buenos Aires NWR, was a small *visita* or settlement that a priest would regularly visit. Later, the Spanish military would establish its first presidio along the Santa Cruz River at Tubac, about halfway between Bac and Guevavi. When Kino first encountered the Sobaipuri in the late 1690s, he found rancherias along both the Santa Cruz and San Pedro Rivers that contained some 920 houses and 4,700 people (Gilpin and Phillips n.d, citing Bolton 1984:377): there were at least four communities on the Santa Cruz River, four on Babocomari Wash, a tributary of the San Pedro River, and 10 on the San Pedro River and along Aravaipa Creek. In the 1760s, as a result of Apache depredations, the Sobaipuris moved from their villages along the San Pedro River to the Santa Cruz Valley to gain protection from the Spanish (Gilpin and Phillips n.d.: 33; Hackenberg 1974:106). Shortly thereafter, the Sobaipuri would cease to exist as a distinct O'odham group because of population decline and because they merged with neighboring Akimel O'odham or the Tohono O'odham populations (Gilpin and Phillips n.d.:33–34; Hackenberg 1974:106).

SOCIAL ORGANIZATION

Historically documented O'odham villages were organized primarily by kinship and lacked a strict social-political hierarchy, that is, there were no hereditary offices or chiefly families. Also, besides clans and moieties that cross-cut affinal and consanguineal ties, there were no formal political organizations that linked two or more villages together or allied groups of villages within a single region. There were historically four major clans and each person determined his or her clan through

their father; in turn, each moiety was composed of families that claimed affiliation with each of the four clans (Saxton and Saxton 1973:371; Underhill 1978:29).

As Bahr (1983:179–181) relates, each individual family had a brush house or enclosure and the structures of related families would be grouped together in a spatially distinct compound that was typically overseen by an elder male (cf. Joseph et al. 1949:50). Each compound would also contain other communal features that everyone would use, like an open-walled ramada, a building for food storage house, a cooking enclosure, a menstrual hut, a corral, and a privy. In the late 1800s, a newly married O’odham couple would reside in the compound of the husband’s father and have access to his agricultural fields, although this rule was not strictly adhered to (Underhill 1939:211–234). Underhill’s work in the 1930s (1939) determined that women who were raised in one group or village would most often marry into the family of a man who lived in another group or village (cf., Joseph et al. 1949:48).

In addition to the various household compounds, each village would contain a single public structure, often a round habitation-like building, with an associated ramada and fireplace, as well as an open area devoid of vegetation that served as a civic plaza (Bahr 1983:178–180; Joseph et al. 1949:63). The public house and the plaza would be situated between the various compounds. The plaza was recognized as a sacred space and used for collective rites in the O’odham ceremonial cycle (see below). Each village was typically named after some geographic feature on the landscape or some legendary event, and villages often had a basket containing important relics that would be displayed during ceremonies.

The public life of each village was directed by a headman. This particular person was a wealthy male who could show, through his wealth, economic productivity and gift-giving generosity to both relatives and non-relatives alike (Bahr 1983:185). The headman played several roles for the village (Bahr 1983; Joseph et al. 1949; Underhill 1978). It was the headman who served as the figurative first among equals. It was the headman that started the fire before nightly meetings, set its agenda, and be its main speaker. It was the headman that would keep each group’s sacred bundle or basket. In addition, a headman would be part of a group of ritual or ceremonial orators during the ceremonial cycle. There were other leaders or offices among O’odham villages, but these were for specialized activities, like hunting, singing, and war, as well as the ditch boss who ensured maintenance of village springs, seeps, and irrigation ditches (Bahr 1983:186; Russell 1975:196).

COSMOLOGY & SHAMANIC PRACTICE

Any summary or overview of a particular culture’s cosmology by someone who is not an initiate is best read and recognized as a partial and incomplete rendition. The purpose here is not to relate a series of esoteric stories or details, nor is it to present a comprehensive understanding of it. Rather, it is to give some idea of O’odham worldview regarding important deities and a supernatural world that is in constant interrelationship with the people themselves and the natural world that surrounds them.

The Baboquivari Mountains and certain places nearby play an important role in O’odham cosmology. Joseph et al. (1949:94), among others, relate that the center of the O’odham universe is the sacred mountain, Baboquivari. It is here that *I’toi* or Elder Brother, the first being and creator of the O’odham, lives. (Fontana 1981:22; Saxton and Saxton 1973:10, 372). It is from a portion of the creation story that the River People or Akimel O’odham choose to live along the river practicing agriculture and the Desert People or Tohono O’odham choose to live below Babquivari with a mixed

subsistence practice. According to Saxton and Saxton (1973:372), *I'toi* or Elder Brother and the Baboquivari Mountains are embedded into the very fabric of their lives, as exemplified in their basket designs (*Figure 12*):

For Elder Brother, Waw Giwulk (Baboquivari) is the “center of the basket”. He sent the clan companions to the edges of the world and back to determine this. His house is pictured as founded on two crosspieces pointing in the four directions with arcs... and lines drawn counterclockwise joining the ends, uniquely combining the crossed and circular patterns characteristic of the O’odham.

After each adventure, Elder Brother returns to the security of the inner recess, Waw Giwulk, the “center of the basket”.

Also, the Baboquivari Mountains and the border town of Pozo Verde are important scenes for the legend of the *Ho’ok*, a witch who liked human flesh and was ultimately defeated by *I'toi* and the O’odham, among other stories (Fontana 1981:26–29; Saxton and Saxton 1973).

Coyote and Buzzard are the first animals created after Elder Brother and they become totems for the two moieties that cross-cut kin-groups in each O’odham village (Saxton and Saxton 1973:10). As mentioned above, all O’odham were historically part of four clans that cross-cut all O’odham kin-groups, and each of these clans were a part of either the Coyote or Buzzard moieties. Some Akimel O’odham call their moieties the Red Ant and White Ant people.



Figure 12. O’odham basket with cosmological design.

Not surprisingly, important food stuffs are tied into the creation stories (see Saxton and Saxton 1973). For instance, the tepary bean was given to a grandfather by his grandson; the grandfather had regularly beaten the child, who fled up into the night sky; after the grandfather showed remorse, the grandson returned and gave his grandfather the tepary bean; the child then told his grandfather that each night he could be seen in the night sky as the milky way or as scattered tepary beans. For the O'odham, it is coyote who first scatters mesquite beans, and it is coyote who first scatters saguaro seeds, it is also Coyote who scatters the stars in the night sky.

Bahr (2001) makes a distinction between creation stories and animal stories associated with ancient times, and orations that are sung for war, rainmaking, harvests, intervillage dances, and thanksgivings. Furthermore, he goes on to add that these ritual orations were sung by a group of specialized singers or ceremonial officials. And these songs or orations were passed down from father to son (Bahr 1983:186). The headman would be expected to be a part of this group, perhaps even the most important. Saxton and Saxton tell how songs and ritual orations are presented (1973:371–372): songs are sung four times, four songs make a set, four sets in a night, and four nights a ceremony. This pattern of four is associated with the four cardinal directions, four clans found in two moieties, and kinship that ascends four generations.

Shamans also play a role in O'odham society and cosmology. Bahr (1983b:186) relates that there were two primary kinds, those that were diviners or shamans who foretold the future and worked magic, and those that were curers or shamans who performed ritualized cures for individuals (cf., Underhill 1978:58–59). People who needed help from shamans to cure some form of illness would require services from both ritual specialists. These two types of shamans would, at times, work sequentially first on diagnosing a person's spiritual illness or problem (the diviner), and then curing the individual (the curer) (Bahr 1983b:186; Underhill 1978:59). Divining shamans did more than just diagnose the spiritual illness of an individual, but performed communal functions, like singing for rain, for successful hunts, or for success at intervillage competitions or games, among other activities. Typical shamanic practices involved calling on spirit helpers, singing, and using specific ritual paraphernalia.

THE PLACE OF ALTAR VALLEY IN THE O'ODHAM WORLD

Throughout much of the ethnographic period, the Altar Valley has lain between two major O'odham population centers: the Tohono O'odham centered in the Vamori Valley west of the Baboquivari Mountains and the Sobaipuri O'odham who were concentrated along the Santa Cruz and San Pedro River Valleys. A review of the above literature gives the distinct impression that Altar Valley has long been an aboriginal no-man's land or frontier that was not permanently occupied or used on a recurrent basis by any O'odham group. Whether this was true before widespread Apache depredations during the 1700 and 1800s cannot be determined by the historic record. Nor can the historic record speak to more sporadic use of the Altar, for instance by small groups exploiting specific resources or by one or several families that may have occasionally lived there practicing a traditional two village settlement and subsistence lifeway.

To what extent O'odham people used the Altar Valley during the historic period can only be answered by archaeological investigations. This will require inventory across the various micro-environments present from the eastern slopes of the Baboquivari Mountains and the western slopes of the San Luis and Las Guijas Mountains where winter villages may be found, to the Puertocito and Altar Wash flood plains where summer villages would be present, as well as those physiographic locations that hold

certain exploitable wild plants and animals. There may also be locations across the valley where certain ceremonial activities were held and that can be identified through some form of material record.

Despite this, it appears that the Altar Valley did serve as a frontier between the Tohono O'odham and other ethnic groups in the historic period. Not only was Father Eusebio Kino and his Spanish missionaries the first to consistently interact with the O'odham, but so too were they the first to document the presence of the Apache in their historically recognized homeland. The Apache were noted for aggressive raiding practices on neighboring ethnic groups and this practice was well-embedded in their cultural tradition. Raids took place against the Sobaipuri, the Tohono O'odham, the Spanish and Mexicans, and later the Americans. In fact, it was because of the Apache that the Sobaipuri would leave the San Pedro River in the mid-1700s and join their kin along the Santa Cruz River, thereby gaining protection from the Spanish. The Altar Valley served as a frontier between the Tohono O'odham and the Apache (Wegener et al. 2002: 18–21). The Altar Valley would later serve as a frontier between the Tohono O'odham and the Spanish. The Spanish primarily inhabited the Santa Cruz River Valley, and their closest settlement was Arivaca which lies between the Las Guijas and San Luis Mountains that border the east side of BANWR. The Pima Revolt of 1751 ended with the O'odham rebels using the Baboquivari Mountains as a natural fortress beyond the western limit of Spanish settlement, that is, with the Altar Valley serving as a frontier between the Spanish-held Santa Cruz River Valley and the Tohono O'odham Vamori Valley (Wegener et al. 2002:18). The Altar Valley may have served as a vacant frontier between the Tohono O'odham and other ethnic groups up until widespread Euroamerican presence throughout much of southern Arizona by the late 1800s.

CHAPTER 4. HISTORIC EUROAMERICAN SETTING

Western Tradition places the beginning of the historic period on the American Continents at A.D. 1492 with the European discovery of the New World. Widespread European inhabitation and use of landscapes throughout the western hemisphere would prove to be incredibly varied in terms of its timing, nature, and intensity. Having said that, there are general trends that are common to the interior of the continents and in places away from major social-political centers, like Mexico City, Santa Fe, and San Francisco. The European exploration of lands now associated with the state of Arizona would start as early as the 1530s and continue for an extended period up to the mid-1800s. This exploration would start with the Spanish and would be continued by later Mexican and Anglo-Americans seeking wealth and suitable travel routes through it. Important bibliographic references for this historic theme include Officer (1987), Sheridan (1995), Stein (1994), and Walker and Bufkin (1986).

The period of exploration after 1700 overlapped to a great extent with sustained European inhabitation of lands in different parts of Arizona. This is particularly true of southern Arizona because of its immediate proximity to Mexico and because of the fertile Santa Cruz and San Pedro River Valleys. This would start with Spanish missionization of various O'odham people which began in the late 1690s (see Chapter 3). Once established Spanish, Mexican, and later Anglo-Americans began to search for and then extract gold and silver, notably in the Las Guijas and San Luis Mountains that compose the eastern extent of the wildlife refuge. Important bibliographic references for mining activity in the region are Kasulaitis (2006), Keane and Rogge (1992), Keith (1974), and Officer (1991).

Following the Gadsden Purchase in 1854 and the subjugation of the Apache by the American military in the 1870s, southern Arizona, including the Altar Valley, would become important livestock ranch lands. Probably the most important evaluation of this period for Buenos Aires NWR is Sayre (2002, 2007), who has written extensively on this topic as it relates to the Altar Valley and the development of the wildlife refuge. Other important work related to ranching and its historic impact include Bahre (1991, 1995), Collins (2002), Leavengood (2006), Sheridan (1995), and Wagoner (1952).

Although land and habitat conservation had been recognized as important by ranchers and the federal government even before World War II, it becomes an increasingly important ideological, behavioral, and political component in the American west, including BANWR. This is true even as once small communities like Phoenix and Tucson begin to enlarge at ever increasing rates with water, roadway, and electrical infrastructure development. The transition of the historic Buenos Aires Ranch and other ranching properties in the Altar Valley into the Buenos Aires National Wildlife Refuge in the 1980s, rather than being gobbled up by land development, is highlighted by Sayre (2002, 2007). As well, ranching and the ranching subculture continues to play an important part of human lifeways in the Altar Valley, as documented by Feldman (2016).

EXPLORATION

When the Spanish began exploring the American Southwest in the sixteenth century, it lay on the northern frontier of New Spain. The Altar Valley of southern Arizona, devoid of a permanent river, was not a natural avenue for human travel into or through the larger geographic region; whereas the

Santa Cruz and San Pedro River Valleys further east were the primary routes for exploration and travel up to the present day.

Presumably the first Spanish to enter Arizona was Alvar Nuñez Cabeza de Vaca and his three companions in 1535 or 1536, but they traveled well east of the Altar Valley through present-day Cochise County. In 1539, Friar Marcos de Niza and one of Cabeza de Vaca's companions, Estevanico, would be sent by the Spanish Viceroy of New Spain, Antonio de Mendoza, to visit the fabled Seven Cities of Cibola, that is, the Zuni Pueblos, although there is some debate whether de Niza made it any further than the San Pedro River. In 1540, Viceroy Mendoza would appoint Francisco Vasquez de Coronado to lead an expedition to the Seven Cities (Zuni) with Friar de Niza as guide. Coronado would organize an army of over 350 Spaniards, 1,300 Native American soldiers, and at least 1,500 animals (Riley 1997:3). Although debated by scholars, Riley (1997:4) believes that the expedition entered southern Arizona by traveling through the San Pedro River Valley, well east of the Altar Valley, then following the Gila River into what is today New Mexico. After Coronado, it would be 150 years later in the 1690s that the Spanish would again exert any substantial presence in the vicinity of the Altar Valley. This was in the form of Catholic Jesuit missionization, and like the Spanish explorers before them, the Jesuits were focused primarily on the Santa Cruz and San Pedro River Valleys, rather than the drier and more remote Altar Valley (see Chapter 3). Much later in 1775, the Franciscan Missionary Fray Francisco Garces traveled up the Santa Cruz River Valley, then headed west towards the Colorado River following the Gila River.

The Altar Valley continued to be on the periphery of formal Euroamerican exploration and travel well into the nineteenth century. This valley and the mountain ranges that border it would become part of Mexico after its independence with Spain in 1821. It would remain so until after the Mexican-American War of 1846–1848, which ended with the Treaty of Guadalupe Hidalgo. However, it was not until 1854 and the Gadsden Purchase that the Altar Valley, along with the rest of the southernmost extent of Arizona, would become part of the United States. Nineteenth century excursions into southern Arizona by Euroamericans would be prompted by monetary gain, the Mexican-American War, and American stage/freight companies looking for good travel routes that could link American populations to the east with California to the west.

The search for monetary gain in the form of beaver pelts and gold and silver deposits fueled later exploration and trail building throughout Arizona. For instance, in 1825 Sylvester Pattie and his son James trapped along the Gila River and included trips into the Santa Cruz and San Pedro River Valleys (Stein 1994:9–10). It may be that at this time gold and silver deposits in the Las Guijas and San Luis Mountains which border BANWR were first exploited by Spanish and Mexican miners (Officer 1991: 5–7; Whittlesey and Ciolek-Torrello 1992:17–18). In addition, placer deposits in the Cerro Colorado Mountains were first mined by the Spanish, and then by Tomas and Ignacio Ortiz in 1802 (Keane and Rogge 1992:41).

In 1846 during the Mexican-American War, Lieutenant Colonel Philip St. George Cooke, of the famed Mormon Battalion, opened a wagon road from New Mexico to California. This road would eventually follow a length of the San Pedro River to the vicinity of present-day Benson, then continue northward along the Santa Cruz River and past the Akimel O'odham villages along the Gila River (Stein 1994:11). A portion of Cooke's wagon road would be followed by an American battalion under the command of Major Lawrence Graham in 1848 who, traveling from Chihuahua, Mexico, moved along the San Pedro River, then down the Santa Cruz River Valley to Tucson (Stein 1994:11). Cooke's

wagon road would eventually become the American Southern Emigrant Route used by California bound miners and other travelers seeking transit through the Southwest.

Other travel routes would also be identified across southern Arizona using the San Pedro and Santa Cruz River Valley corridors. John R. Bartlett in 1851–1852 and William H. Emory in 1854–1855, who were involved in establishing the international boundary after the Gadsden Purchase, would both define travel routes, as well as Lieutenant John G. Parke in 1854–1855, who was conducting a survey for a railroad through the Sonoran Desert (Stein 1994:12). It would be William Emory who provided the earliest known Euroamerican description of Baboquivari Peak in his notes (see Wegener et al. 2002:20). The Route of the San Antonio and San Diego Mail Line, which would later become the famous Butterfield Overland Mail, would also cross through this territory using the Santa Cruz River Valley as a portion of the route. Importantly, a stage line from Tucson to the O’odham town of Quijotoa, in what is now the Tohono O’odham Indian Reservation, cut through the Avra Valley and around the northern end of the Baboquivari Mountains. This stage line was built by Pedro Aguirre & Company, perhaps Pedro Aguirre, Sr.; Pedro Aguirre, Jr., plays a prominent role in Buenos Aires NWR because the refuge is named after Aguirre, Jr.’s ranch in the Altar Valley (Walker and Bufkin 1986:41).

MINING


Although mining operations did not play a big role on the lands that compose Buenos Aires NWR, nonetheless mining was important in places immediately nearby. Before the railroads and technological innovations allowed the extraction of low-grade copper ore, silver and gold were the primary resources to be extracted. In fact, copper was not an important commodity in any of the mining districts that bordered the Altar Valley nor any of the land associated with the wildlife refuge. Most of the mining operations were focused on gold and silver in the San Luis, Las Guijas, and Cerro Colorado Mountains, which border the east side of Altar Valley; the Baboquivari Mountains to the west were also mined to a lesser extent (*Figure 13*). Interestingly, it may be that the oldest gold mining sites in southern Arizona were somewhere near the Guevavai mission in the Santa Cruz River Valley, immediately east of the Las Guijas and San Luis Mountains, as mentioned in Spanish documents that date to the middle of the eighteenth century (Officer 1991: 5–8). The *Rudo Ensayo* [Rude Essay] of 1762, a volume written by the Jesuit Juan Nentvig which describes the landscape of Sonora, Mexico, and southern Arizona, visited gold and several silver mines in the region, including Cerro Colorado (Whittlesey and Ciolek-Torrello 1992:17–18). In the nineteenth century, the development of a ranching industry in the Altar Valley, as well as elsewhere, may have played an important role in sustaining the mining districts that sprung up to work the mines (Wagoner 1952:32). No historic context of BANWR, therefore, would be complete without some discussion of the mining complexes that lay along its boundaries.

Arivaca Mining District

The town of Arivaca proved to be important in mining the mountains east of the Altar Valley. As related by Whittlesey and Ciolek-Torrello (1992:17–18), what was once a Spanish *visita* was an ideal place for a mining center because of its available water, pasture land, and the mineral resources that lay nearby. Reduction works would be built at the townsite, as well as processing operations for the district. The period of greatest activity took place in the 1930s and into the 1940s, but since then there

Figure 13. Mining districts near Buenos Aires National Wildlife Refuge.

Legend

 Mining districts

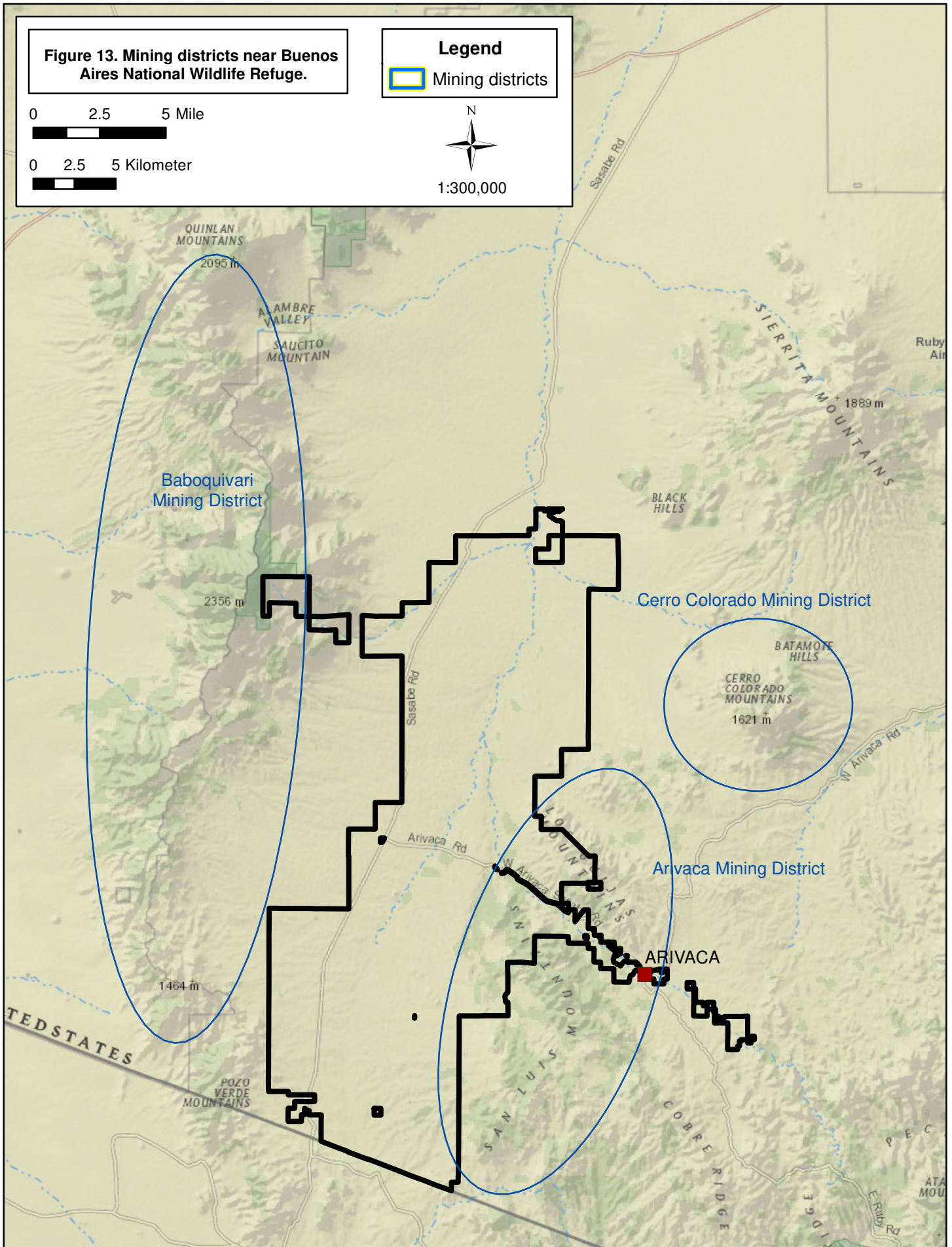
0 2.5 5 Mile



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has been only sporadic mining with little or no production (Keith 1974:14). In 1974, the Arizona Bureau of Geology and Mineral Technology stated that the total number of workings in the district included over 150 small mines and prospects, without any large and sustained operations; moreover, the Bureau stated that the Arivaca District had only limited potential for economically-viable ore (Keith 1974:14).

The Las Guijas Mountains are named after the Spanish word that describes rubble or rock conglomerate that contain gold placer. The most important mines were located just north and west of Arivaca and these include the Los Guijas Mine and Mill (Site AZ DD:7:29[ASM]), the Albatross Mine (Site AZ DD:7:28[ASM]), and the Amado Mine group, among others. According to Keith (1974:13), “Weathering and oxidation have enriched the gold and silver near the surface and erosion produced placer deposits on the lower slopes and in many washes.”

The San Luis Mountains are south and southwest of Arivaca and are named after the early Spanish mine of that name; it is now known as the Oceanic Mine (Site AZ DD:7:19[ASM]). Much of the mining operations in these mountains have occurred along Fragueta Wash, south of Arivaca, or further to the west towards Buenos Aires NWR. Again, gold and silver, produced by weathering and oxidation, are confined to the enriched near-surface zone (Keith 1974:13).

Cerro Colorado Mining District

The Cerro Colorado District lies north of Arivaca and on the southwest flank of the Cerro Colorado Mountains. It contains high-grade silver on the surface and at relatively shallow depths. While first mined by the Spanish, and then by Tomas and Ignacio Ortiz in 1802, the district was rediscovered after the Gadsden Purchase in 1857 by the German engineer Frederick Brunckow. However, it was because of Charles Poston, managing agent for the Sonora Exploring and Mining Company, and with help from Herman Ehrenberg, who would cause it to become a relatively important silver mining area during the nineteenth century. Poston named it the Heintzelman Mine (Site AZ DD:7:11) after Samuel P. Heintzelman, first president of the company and later Union general during the Civil War (Keane and Rogge 1992:41; Keith 1974:20). Since then, the mine has been in operation sporadically and an assessment by the Arizona Bureau of Geology and Mineral Technology stated that, “the possibilities for major economic deposits in the district are unfavorable” (Keith 1974:21).

Baboquivari Mining District

This district covered the length of the Baboquivari Mountains and included the Quinlan Mountains and Kitt Peak. According to the Arizona Bureau of Geology and Mineral Technology, some 50 mines and prospects have been operated since 1900, but few have produced any sizable amount of ore (Keith 1974:15). Like the Arivaca Mining District, most of the deposits are small, surficial or shallow, and occur in sporadic locations throughout the range. This district was removed from the public domain sometime after 1917, following the creation of the Papago or Tohono O’odham reservation by the federal government.

RANCHING

Southern Arizona, more than any other geographic region in the state, has had a long history of ranching. This is because of its proximity to established sociopolitical centers in Sonora, Mexico

between the 1700s and 1800s that fueled Spanish occupations within the more remote frontiers of northern New Spain. Cattle ranching was initially fueled by missionization and then Spanish land grants established cattle ranching in various places, like the San Bernardino Valley in far southeastern Arizona. The commercial American cattle ranching industry of the late nineteenth and twentieth centuries are much later renditions of an earlier lifestyle established when southern Arizona was held by the Spanish.

Ranching as an important economic endeavor began in southern Arizona in the eighteenth century as Jesuit missions and associated Spanish presidios were built along the Santa Cruz and San Pedro Rivers, such as San Xavier del Bac, Guevavai, Tumacacori, and Tubac. Although none of these places had large numbers of Spanish citizens, cattle, along with wheat and other European agricultural products, allowed for the establishment of a permanent O'odham residence at these places and their conversion to Catholicism. During the late 1700s and early 1800s, Spanish-speaking settlers in the area grew, as did the number of farms, mines, and ranches. Collins (2002:E-11) relates that according to Jose de Zuniga, the commander of the Tucson presidio at ca. 1794–1806, there were some 4,000 cattle and 2,600 sheep in the Tucson area, whereas another 1,000 head of cattle were reported at Tubac. In addition, at least 10 land grants were awarded by the Spanish crown and re-affirmed by the Mexican government after Mexican independence from Spain in 1821. Although a number of these land grants were located along the Santa Cruz River and further east, none include the Altar Valley or lands associated with Buenos Aires NWR.

The Spanish were able to expand their presence in what would become southern Arizona or Pimeria Alta in the late 1700s and early 1800s before Mexican independence in 1821. However, the Apache, who integrated raiding as an important part of their transhumant lifestyle, had long been a problem in the northern frontier lands, including Sonora, killing people, destroying property, and acquiring various kinds of livestock. As Collins states (2002:E-17), “Apache warfare against the Mexicans beginning in the 1830s was successful enough in Arizona to effectively separate the Spanish and Mexican cattle industry from the later American period”. That is to say that large-scale ranching endeavors were not common from approximately 1830 until the 1870s when the various Apache bands were subjugated by the American military. During this period, much of the cattle in the area, particularly those on Spanish land grants, became wild and would eventually die (Christiansen 1988; Collins 2002:E-17; Wagoner 1952:27). Later, with the 1849 California gold rush, herds of Texas Longhorn cattle were driven across New Mexico and Arizona into California. Although there were a couple of favored routes, one of these crossed the Sulphur Springs Valley to the San Pedro River, then bore west to the Santa Cruz River and down it to the Gila River, then followed the Gila down to Yuma, and finally across the Mojave Desert (Collins 2002:E-18; Loomis 1962; Wagoner 1952:29–30).

Early American Ranching and the Open Range

The Homestead Act of 1862 proved to be an important impetus for the settlement of lands throughout the western U.S., including those acquired as a result of the Gadsden Purchase. This act provided for the free distribution of 160 acres of land, so long as the claimant or patentee could prove that it was under improvement. Following the development of known travel routes through the territory and the subjugation of the Apache, individuals began to acquire public lands in the southern Arizona territory for cattle ranching. A common theme found in the literature is that, despite its use by the ranching enterprises during the Spanish period, southern Arizona had excellent grasslands for livestock. Quoting Wagoner (1952:39; cf. Sayre 2002: xxxiii, xl–xlii):

Below altitudes of four thousand feet, Indian wheat and other winter annuals thrived, and the so-called six weeks grass furnished summer and fall plants. In the moist valleys, tall sacaton grasses (*muhlenbergia distichophylla*) predominated and provided a protective soil covering which prevented erosion... Many of the older settlers can remember when these flood plains were intact and were characterized by rich grasses.

In order to set up at least a small-scale cattle ranch, a person only needed to patent land that would secure them good water. Once the land with permanent water was acquired, then the surrounding open or free range could be used for cattle foraging or browse without any regulations, that is unless the land was associated with an authenticated Spanish-Mexican land grant or had already been patented. Essentially, with a patented homestead claim in hand, a rancher could control water, as well as several thousand acres of open range land. The obvious problem with this arrangement is that the same open range used by one rancher, could also be used by someone else, with all the potential for conflicts inherent in an unregulated land tenure system.

Whereas one could eke out a subsistence livelihood based on cattle ranching, to become a wealthy rancher required large amounts of land with water and forage. For instance, Walter Vail became sole owner of the Empire Ranch in 1881 with 5,000 cattle and control of a thousand square miles of range land from the Mexican border to the Rincon Mountains (Collins 2002:E20). Another example was the Sierra Bonita Ranch in the Sulphur Springs Valley which was owned by Henry Clay Hooker and who had 5,500 cattle in 1880 (Wagoner 1952:43).

It was at this time that Don Pedro Aguirre, Jr., began to herd cattle near the town of Arivaca (Wagoner 1952:40) (*Figure 14*). Official documents show that he would file an unsuccessful claim in 1877 to 640 acres under the Desert Land Act in that area, but it was rejected because it lay within an authenticated land grant (Wagoner 1952:64). The Desert Land Act of 1875 enlarged the number of acres a given homesteader could claim to 640, which aided ranchers in the acquisition of both water and land. According to Sayre (2002:29–30), by the late 1870s newspapers were reporting that Aguirre had thousands of sheep, as well as cattle, and while his operations were focused around Arivaca, Sayre speculates that his animals likely roamed onto the floor of Altar Valley.

The 1880s proved to be a boom time for the cattle industry, not only in the Arizona territory, but throughout the Southwest and on the Plains. A number of reasons contributed to this cattle ranching boom. First, as discussed above, there was no regulatory land tenure system that allocated specific lands and water rights to users. So long as a rancher or cattleman owned water, they could use the open range at will. Coupled with free land, water, and grass or forage, investors from England and America dropped tens of millions of dollars in western cattle ranches; the land cost nothing, the forage cost nothing, and the cost of water was, basically, minimal (Sayer 2002:31). Between 1880 and 1940, by far the greatest number of recorded cattle in Pima County was between 1887 and 1892, ranging from 83,234 to 121,377 per year (Wagoner 1952: Appendix I, 121–122). By this time, virtually every natural water source in southern Arizona had been claimed and put to use for ranching purposes.

What this created was a land grab where cattlemen would claim every parcel of usable land in the territory running just as much cattle on it as they possibly could. This was done regardless of the carrying capacity of the land, which would be seriously degraded as a result. For instance, the Tucson *Star* would write: “the vast plain of grama grass west of Tucson is being dug out by the roots, thus totally destroying the hope of the grass starting where it has been cut out... unless something is done, the grama grass will soon be a thing of the past in Arizona” (cited in Collins 2002:E-31). But the loss of good grassland was only one significant environmental change in a host of others that would

Figure 14.
RANCHEROS y VAQUEROS
del VALLE de ALTAR

(Don Pedro Aguirre, Jr., founder of the Buenos Ayres Ranch, ca. 1900)



Beatris Aguirre, daughter of Don Pedro

Arizona Roundup, 1899

Don Pedro Aguirre

Figure 14. Rancheros y Vaqueros del Valle de Altar, continued

The Buenos Aires National Wildlife Refuge takes its name from the ranch established by Don Pedro Aguirre in the 1870s. *The Buenos Ayres Ranch*, as it was known throughout its colorful history, was one of among several noted ranching operations established by frontier families in the Altar Valley, and throughout much of southern Arizona, in the decades following the Gadsden Purchase.

Though ranching in southern Arizona dates to Spanish colonial times, many early *rancheros* had abandoned their operations when Mexico, unable to prevent Indian hostilities, took control of the region in 1821. With the 1853 Gadsden Purchase, the territory became a possession of the United States. The arrival of American troops made the region once again safe for pioneer stockmen. The Altar Valley, a rich but largely dry grassland extending well into Sonora, in time became the headquarters for a number of famous outfits with names that recall the romance of yesteryear: La Osa, Robles, Rancho Palo Alto, Aros, Santa Margarita, and the Buenos Ayres.

Don Pedro Aguirre typified the rugged businessman, sons and daughters of the leading families of Sonora and Chihuahua, who came to Arizona to renew the cattle industry. These ranchers ran herds of as many as 20,000 head and more and controlled enormous tracts of land. Some also kept large herds of mares to produce horses and mules for sale to the U.S. and Mexico cavalries. Because of their position and status in southern Arizona society, an ancient Spanish tradition of respect was frequently observed by addressing these prominent landowners as “Don.” The *vaqueros* (cowboys) who worked on the ranches were expert horseman and wise in the ways of cattle. Together, the *rancheros* and *vaqueros* of southern Arizona upheld the lifeway and custom of a centuries-old tradition of livestock raising, with roots reaching back to the great haciendas of Mexico and Spain.

In 1911, the Buenos Ayres Ranch was sold. The ranch grew in size as it changed hands several times in succeeding decades. It was finally established as a National Wildlife Refuge in 1985. Today, little remains of the original ranch headquarters established by Don Pedro near the site where his brother, Don Epifanio Aguirre, was ambushed and killed by Apaches in 1870. Little too remains of the stage stop, La Posta de Aguirre, which was established on the stage line that once ran from Tucson and Altar, Sonora. The Pozo Nuevo schoolhouse, immortalized in the writings of “Sister” Eulalia Bourne, is preserved here. And some remains of old Sasabe can be found on the southern boundary of the Refuge. Across the grassy plains to Baboquivari peak, a quiet presence embraces the open range as before. And everywhere the memories of a bygone era are stirred by the kind words, *los buenos aires*, of the Altar Valley.

significantly alter the landscape. The loss of grass across valley floors caused erosion and soil loss which, in turn, caused the development of large, entrenched, channelized arroyos (Bahre 1995:246). This is well illustrated in the Altar Valley, where the axial drainages are deep and wide channels, whereas it is speculated that they were once shallow and broad where after a precipitation event an ever-changing pattern of low-flow water would wash over the land in sheets. The development of channelized arroyos occurred after 1886 and took place not only in the Altar Valley, but in the larger more abundant watersheds of the Santa Cruz and San Pedro River valleys, as well as in the San Simon Valley (Sayre 2002:45–46). With the loss of widespread grass to hold the soil in place and the entrenchment of streams, mesquite and other woody shrubs would eventually spread across the landscape where they had once primarily lined the major drainage. And these changes are still present in the landscapes of southern Arizona, including the Altar Valley, to this very day.

Thus, widespread environmental degradation coupled with several years of intense drought between 1891–1893 brought the cattle boom period to an end. In his history of Arizona, Thomas Sheridan states that 50–75% of all cattle in southern Arizona died as a result of the drought of 1893; for instance, the number of cattle in Pima County in 1892 was 116,604 but declined to 49,500 in 1893 (Sheridan 1995:141–142). A similar decline occurred in Cochise County, as well. And because of these things, it would be the ranchers and the livestock industry that realized a change in grazing and land tenure had to take place in order to sustain their businesses into the future. For extended discussions of how early American cattle grazing caused these environmental changes see in particular Bahre (1991), Sayre (2002), and Wagoner (1952).

Impact of the Southern Pacific Railroad on the Ranching Industry

The Southern Pacific Railroad (SP), which crossed southern Arizona from Yuma to San Simon, was begun in 1878 and completed in the fall of 1880. The SP would ultimately connect with the Santa Fe Railroad in Deming, New Mexico, by the spring of 1881 completing the nation's second transcontinental link, then shortly thereafter with the Texas & Pacific Railroad in El Paso (Janus Associates Inc. 1989). The Arizona Territory, as it was then, did not have the means or the ability to construct the SP on its own, but once the railroad was completed, it became part of a nationwide freight and transportation system that led the way toward the economic development of the territory.

Before the railroad, social, political, and economic relationship between southern Arizona had primarily been north-south, that is with Sonora, Mexico; whereas with the completion of the SP and other railroads at around the same time, this orientation forever changed to one oriented east-west with Anglo-American populations further east in Texas and the Mississippi Valley, and to the west in California. This does not mean that Spanish-Mexican populations were no longer important, indeed, they would continue to play determinative roles in this part of the world throughout American history. This is best illustrated by the business empire established by Pedro Aguirre, Jr. in the Altar Valley, first with a freight line between Tucson and Altar, Mexico, then with the development of the Buenos Aires Ranch in the Altar Valley of Arizona.

The impact of the railroad cannot be underestimated for ranchers in southern Arizona. Before the SP, cattle production in the form of meat, beyond that meant for subsistence, went to local markets, namely travelers, miners and mining districts, as well as the American military, whereas afterwards live cattle would be supplied to a national market (see Collins 2002: E-14, E-30). Moreover, it also meant that the kinds of cattle changed from Spanish-derived *criollo* and Texas Longhorn cattle to

other better tasting European varieties like Shorthorn and Herford breeds (Collins 2002:E-30; Wagoner 1952:49–50). These changes proved to be important in transforming the livestock industry of the nineteenth century that was an endeavor that had more in common with Spanish Colonial times, to that of the twentieth century and one driven by national and international markets and technological expertise.

American Ranching in the Twentieth Century

A number of important developments came together at the end of the nineteenth century to form the basis of what is recognized today as the modern cattle industry. Two of these characteristics had come to initial fruition before the end of the nineteenth century: the development of a reliable transcontinental railroad network that could move cattle from the remote frontier of Arizona to large markets in other states (see above); and the expansion of cattle ranching into areas that did not have abundant surface water, like the Altar Valley. This latter was accomplished by careful placement of stock ponds or *charcos*, although on their own these water harvesting features were not perennial, and more importantly wells drilled into the aquifer to supply permanent water. The other two important characteristics that came about in the twentieth century and were a direct result of environmental degradation and fluctuations in a market-oriented industry. First, formal land tenure regulations would be established by the federal government over time that resulted in the designation of rangelands as grazing districts, coupled with the use of fee-based permits or leases to use public land. This was coupled by a growing scientific or empirically-based industry that relied on technical specialists to determine carry capacities, best practices for sustaining cattle on any given rangeland, and breeding. Taken together, these factors would spawn the dominant kind of ranch in the twentieth century, the large-scale ranch integrated into national and international politics and market-based economies and that would exist in partnership with public agencies.

Another important characteristic of the twentieth century livestock industry is that it was geared towards the production of calves and yearlings for fattening elsewhere in the country (Collins 2002:E63; Wagoner 1952:45). The mild winters that characterize southern Arizona proved conducive to calving over other more inclement regions and the relatively sparse nature of the browse and forage in the twentieth century made livestock fattening for slaughter less appealing.

With the widespread use of lands by Euroamericans throughout the western U.S., the idea that open land should be held in-perpetuity for the public good, rather than selling the land and its resources for development by individuals or private companies, was becoming an accepted idea. This was embodied within the General Public Lands Reform Act or General Revision Act of 1891 that first “introduced the concept that the federal government should remain a permanent landowner” (Collins 2002:E-58). Whereas the General Land Office or GLO had been crucial in demarcating the land for private acquisition, other federal land management agencies came into being to oversee different aspects of land management. The Bureau of Reclamation was authorized to control land for the construction of irrigation projects (e.g., Roosevelt Dam, Hoover Dam); the Forest Service was managing forest reserves for habitat, watershed, and renewable resources; and the National Park Service was created to protect places of great scenic beauty and historic significance. Inevitably, even the mission of the GLO changed to include oversight of range and mineral leases, land exchanges, in addition to land sales (Collins 2002:E-44). Later, in 1946, the Truman administration would consolidate what was known as the U.S. Grazing Service and the GLO into the Bureau of Land Management (www.blm.gov/history/timeline). Through the use of the Taylor Grazing Act of 1934 (see below), game preserves were created, including the Kofa Mountains and Cabeza Prieta in southwest Arizona,

and would ultimately spawn the creation of the U.S. Fish & Wildlife Service in 1940, a tangible recognition that ecological conservation and restoration is an important land management goal supported in large part by the American public (Collins 2002:E-62).

Having seen the devastation of the open range by overstocking, many ranchers believed that some limits had to be placed on grazing lands. The Forest Service became the first land management agency to put into place such regulations, coupled with grazing fees and permits on the land it was charged to oversee. This would evolve during the first decade of the 1900s under the leadership of Gifford Pinchot; after 1907 a certain percentage of the revenues generated from grazing fees would be annually distributed to the state or territory, then in turn to the county, in which a Forest Reserve was located (Wagoner 1952:76). These fees would increase with time and not without complaints by cattlemen and their industry associations. Despite the early efforts by the Forest Service, it would not be until 1934 and the passage of the Taylor Grazing Act before substantial regulation of unappropriated grazing lands would be nationally codified, along with the acquisition of derived revenues for rangeland management. Quoting Wagoner (1952:69):

grazing districts were to be established. Permits to graze livestock thereon would be issued to stock owners (preference to contiguous owners of land or water rights) entitled to participate in the use of the range, upon the payment of annually reasonable fees based upon carry capacity. Permits were granted up to ten years, renewal begin subject to the discretion of the Secretary of the Interior.

One result of the Taylor Grazing Act was to create grazing districts so that rangeland leases could be managed at a local level. This was aided by the Roosevelt Administration in 1934 when it withdrew all public domain land from nonmineral entry or patent, which then allowed the Department of the Interior to classify certain lands suitable for grazing (Collins 2002:E-59).

The Forest Service, in concert with the development of grazing districts and permit fees, was also instrumental in developing a scientific approach to range management. The Forest Service developed an Experimental Station in 1915, after initial rangeland experiments conducted in the Santa Rita Forest Reserve seemed to prove that native vegetation could be restored when protected for a period of time (Wagoner 1952:79). This station would become known as the Southwestern Forest and Range Experiment Station in Tucson. The purpose of these experiments was to determine carrying capacity of various lands, how to best preserve browse and forage, and inhibit noxious or poisonous weeds that could outcompete good forage and kill livestock. In addition, the Smith-Lever Act of 1914 created agricultural extension programs or stations, jointly funded by various levels of government and associated with land-grant universities, that were developed to aid in the scientific management of rangelands (Sayre 2002:83). The University of Arizona Agricultural Extension Station or UAAES is an example of this particular development. Moreover, responding to the dramatic problems posed by the Great Depression and the Dust Bowl, the federal government created the Soil Erosion Service, which was the precursor to the Soil Conservation Service and the National Resources Conservation Service (Sayre 2002:83).

Because the fortunes of the livestock industry in southern Arizona were governed as much by climatic fluctuations, as by national and international market volatility, changes in the land tenure system and an increasingly scientific approach to carrying capacity, aided in leveling out instability in the livestock business over the long term. These changes helped the livestock industry throughout the U.S., which had gone from a relatively simple endeavor in the nineteenth century, to one that was a complex business with high production costs and capital investment in the twentieth century. For

instance, grazing fees became instituted based on the number of livestock within a given range, rather than by the number of acres, because different rangeland had different carrying capacities (Wagoner 1952:77). Many state and federal programs sought to aid the livestock industry by promoting range improvement projects (Range Conservation Program, Civilian Conservation Corps) as well as relief during times of drought, and financial organizations were developed to give credit or loans to ranchers (Arizona Livestock Production Credit Association). Minimizing risk, however, was the goal of these programs, but all the innovations put together could not be determine success in southern Arizona because of its lack of water, its periodic droughts, its fluctuating browse and forage conditions, and fickle markets.

Twentieth Century Ranching in the Altar Valley

The livestock industry in the Altar Valley during the early to middle twentieth century largely mirrors the industry as a whole throughout the state. The smaller ranches that were present in the valley during the nineteenth century would be gobbled up into larger ranch holdings and these would be consolidated into formal business organizations. Public lands, both federal and state, would be divided into parcels and leased to the large ranch holders for controlled use (see Sayre 2007:41). Specialized range management practices and water management improvement projects were instituted throughout most of the twentieth century. And the dramatic alterations to the landscape that had started in the 1880s and 1890s would continue to transform the physiography of the Altar Valley. The most dramatic and far reaching of these transformations were the entrenchment of the primary and secondary washes that greatly inhibited sheetwash flow across the landscape (e.g., Altar Wash, Arivaca Wash), the loss of native perennial grasses to weedy annual grasses, and the expansion of mesquite across the valley floor at the expense of forage and browse.

Pedro Aguirre, Jr., owner/creator of the original Buenos Ayres Ranch, passed away in 1907 and his property would eventually be sold to William Coberly a couple of years later. At the time of this sale, Coberly was in the process of amassing thousands of rangeland acres in the Altar Valley. He had previously acquired several ranches in the southern part of the valley, including the La Osa and Palo Alto, which he would organize into the La Osa Cattle Company (Sayre 2002:56). Although these acquisitions allowed Coberly to control much of the southern portion of Altar Valley, it would not be until he sold them to a man named Jack Kinney that a truly large-scale, capitalist-driven, twentieth century ranch was formed.

Jack Kinney was not from Arizona. He had been involved in various aspects of the cattle industry in both Texas and Montana before moving to the state in 1913. It was Kinney who acquired Coberly's land-holdings and eventually reorganized it all into the Las Osa Live Stock and Loan Company around 1915 (Sayre 2002:56). Through historic circumstance, a good portion of the land in the Altar Valley became State Trust Land, rather than lands held in-perpetuity by federal land management agencies, and through various means Kinney was able to acquire leases for large blocks of state land; together Kinney's livestock company controlled 20,000 acres of deeded land, 130,000 acres of state leases, and 60,000 acres of public domain land (Sayre 2002:67–68). This company did not produce livestock for slaughter and butchering, rather they were for producing calves that were fattened other places in the U.S. Kinney apparently constructed earthen water tanks every 2 miles across his lands in the Altar Valley and would file over 300 separate water rights for over 200 tanks (Sayre 2002:72).

In 1926, after a severe drought and falling assets, Kinney would sell much of his ranching interests in the valley, including Buenos Aires Ranch, to Fred and Roy Gill. The purchase price was \$75,000 and

the Gills would own these ranch properties from 1926 to 1959. In acquiring the land, the Gills were able to take advantage of current scientific research and twentieth century technological advancements. Accordingly, many of their water and erosion control improvements were accomplished in concert with federal agencies, like the Soil Conservation Service. Like Kinney before him, the Altar Valley was used as a place to feed young cattle before moving them elsewhere and selling them (Sayre 2002:88). According to Sayre (2002:88), “By the 1940s Fred Gill and Sons was one of the largest owners of cattle in the United States, supplying some sixty thousand head per year to the armed forces during World War II”. The Gills would eventually replace draft animals with modern tractors and bulldozers and by the 1940s initiated major water improvement projects. For instance, they modernized surface water tanks, greatly improved Aguirre Lake, and created spreader dams to recreate sheetwash flooding across the valley floor (Sayre 2002:89–90). These improvements were often geared to ensure that water could be properly channeled into these water harvesting devices, as well as to protect them from catastrophic flood events. Like Kinney before them, the goal of these improvements was to ensure reliable and evenly distributed water sources across all ranch lands so that livestock could be shifted from one parcel to another, in order to protect the rangeland from overgrazing (Sayre 2007:42).

The Gills had originally bought the La Osa Ranch from Jack Kinney as part of the 1926 acquisitions. They would sell its headquarters and the land immediately around it the next year (1927) to Arthur Hardgrave who, rather than using it as a livestock-producing facility, made it into a guest or dude ranch (Sayre 2002:75). The La Osa Ranch website, in contradiction, states that the ranch was sold to Louisa Wetherill in 1925, was open to guests by 1926, and had eastern investment backing by the 1930s (www.ranchodelaosa.com, accessed November 20, 2018). The guest or dude ranch can be defined as a type of twentieth and twenty-first century ranching facility that is oriented toward tourism and providing specialized vacations for visitors. Although ownership of this property may have changed hands since the 1920s and 30s, it remains a guest ranch up to the present day. The transition of the La Osa Ranch from a working livestock ranch into a guest dude ranch was a harbinger of larger socio-political and economic shifts that would transform the American West after World War II.

THE MODERN ERA: RANCHING, CONSERVATION & DEVELOPMENT

Cattle and the livestock remain an important part of Arizona’s modern economy. In the 2002 Multiple Property Documentation Form, *Cattle Ranching in Arizona, 1940–1950*, William Collins presents a number of statistics relevant to this industry. It is important to remember that these statistics were developed in 1992, so as of 2018 they are 26 years old. Despite this, they are quite telling for the time period following World War II and the rise of the Phoenix and Tucson metropolitan areas. Of all the land in Arizona, approximately 72.7 million acres, about 40% of that, or 29.65 million acres, are classified as pastureland or rangeland. The economic value of all livestock and poultry in 1992 was estimated to be around 616 million dollars, of which 94.2% or approximately 580 million was related to cattle. Taking the entire agricultural sector of the state into consideration, cattle represented 38% of the 1.5 billion dollars of agriculturally-related products sold.

The Buenos Aires Ranch and surrounding properties would transfer hands several times in the ensuing decades before being purchased in 1985 by the U.S. Fish & Wildlife Service. The last owners of the Buenos Aires Ranch were Wayne Pruett, Peter Wray, and Pablo Brenner, who had acquired the ranch land in 1972 and incorporated it into the Victorio Land and Cattle Company (Leavengood 2006:19).

This company would continue important programs that had already been established to control mesquite and improve the production of grasses. In a recapitulation of history, Pablo Brenner, the final owner of the 166,000-acre ranch, was a Mexican citizen, highlighting the fact that southern Arizona remains complexly interrelated with Mexico, despite that it has been part of the U.S. since 1854.

The FWS bought the lands held by the Victorio Land and Cattle Company in the Altar Valley for the sole purpose of re-establishing the masked bobwhite quail (*Colinus ridgwayi*) (Figure 15) (Sayre 2002; Leavengood 2006). This particular species is endemic to northern Sonora, Mexico and southern Arizona, notably the Altar Valley which is located at the northern extreme of its range. It relies on large and abundant grasses as habitat and for protection. Livestock grazing in the Altar Valley during the late 1800s largely destroyed its habitat and the quail has not been naturally occurring in the area ever since.

In the 1930s, J. Stokley Ligon, a biologist for the U.S. Biological Survey (later the FWS) became interested in the masked bobwhite quail. Fearing the eventual demise of the species, he would capture these birds in Mexico, releasing some of them in Arizona and New Mexico, and keeping others as brooding stock on an experimental farm near Carlsbad, New Mexico (Leavengood 2006:24). Later, the FWS would initiate a propagation program at the Patuxent Wildlife Research Center at Laurel, Maryland, and with the cooperation of Wayne Pruett of the Victorio Land and Cattle Company, began to release them in the Altar Valley (Leavengood 2006:25). Although these releases ultimately proved unsuccessful, the eradication of mesquite and widespread grasslands on the floor of the Altar Valley made for suitable quail habitat. Ultimately, “Through efforts of the National Audubon Society and the Nature Conservancy, plus strong support from Arizona congressman Morris Udall”, the Reagan



Figure 15. Masked bobwhite quail (*Colinus ridgwayi*).

Administration's Secretary of the Interior, Donald Hodel, approved the purchase of most of the land that would comprise the present-day refuge for \$8.9 million (Leavengood 2006:25–26). A number of other small properties have been added to the wildlife refuge since that time, notably 1,641 acres along Arivaca Creek and 1,907 acres in Brown Canyon.

Buenos Aires National Wildlife Refuge is a federal landholding that today is meant for the conservation of natural habitat and ecosystems beyond just the masked bobwhite quail. According to Sayre (2002:152), it is the largest ungrazed grassland in Arizona, even though much of this grass is Lehman's Lovegrass (*Eragrostis lehmanniana*), a native to South Africa and introduced to the American Southwest in the 1930s for range restoration purposes (www.fs.fed.us/database/feis/plants/graminoid/erabel). Moreover, the Altar Valley as a whole is about a half million acres that contains a wealth of natural values that is largely rural and unfragmented by modern development, even as the Tucson metropolitan area encroaches on the valley's northern perimeter and the ever-present potential for ranchers to sell all or parts of their land for real estate profit.

HISTORICALLY SIGNIFICANT PLACES

Aguirre Lake (Site AZ DD:6:13[ASM]). Located on the floor of the Altar Valley on Buenos Aires National Wildlife Refuge, Aguirre Lake is in Section 22 of Township 21, Range 8 East. It was originally constructed by Don Pedro Aguirre, Jr., around 1883 when he began to ranch livestock in the valley. Perhaps the first of his water harvesting endeavors, it is a relatively large reservoir positioned at the confluence of Lopez and Compartido Washes (*Figure 16*). According to Sayre (2002:33): "The reservoir, which came to be known as Aguirre Lake, lies in lower alluvium just below the pediment zone. There it captured the runoff from the pediment's shallow soils. Because the bottomlands were nearly flat, even a low dam could back up water over a considerable area". By 1903, the *Tucson Post* reported that the lake was three-quarters of a mile long and one-half mile wide. It was significantly altered in the 1950s when the Gill family owned it. The lake is large enough to be depicted on USGS topographic quadrangles and it is present on a 2010 *DeLorme Atlas & Gazateer* (Plate No. 65).

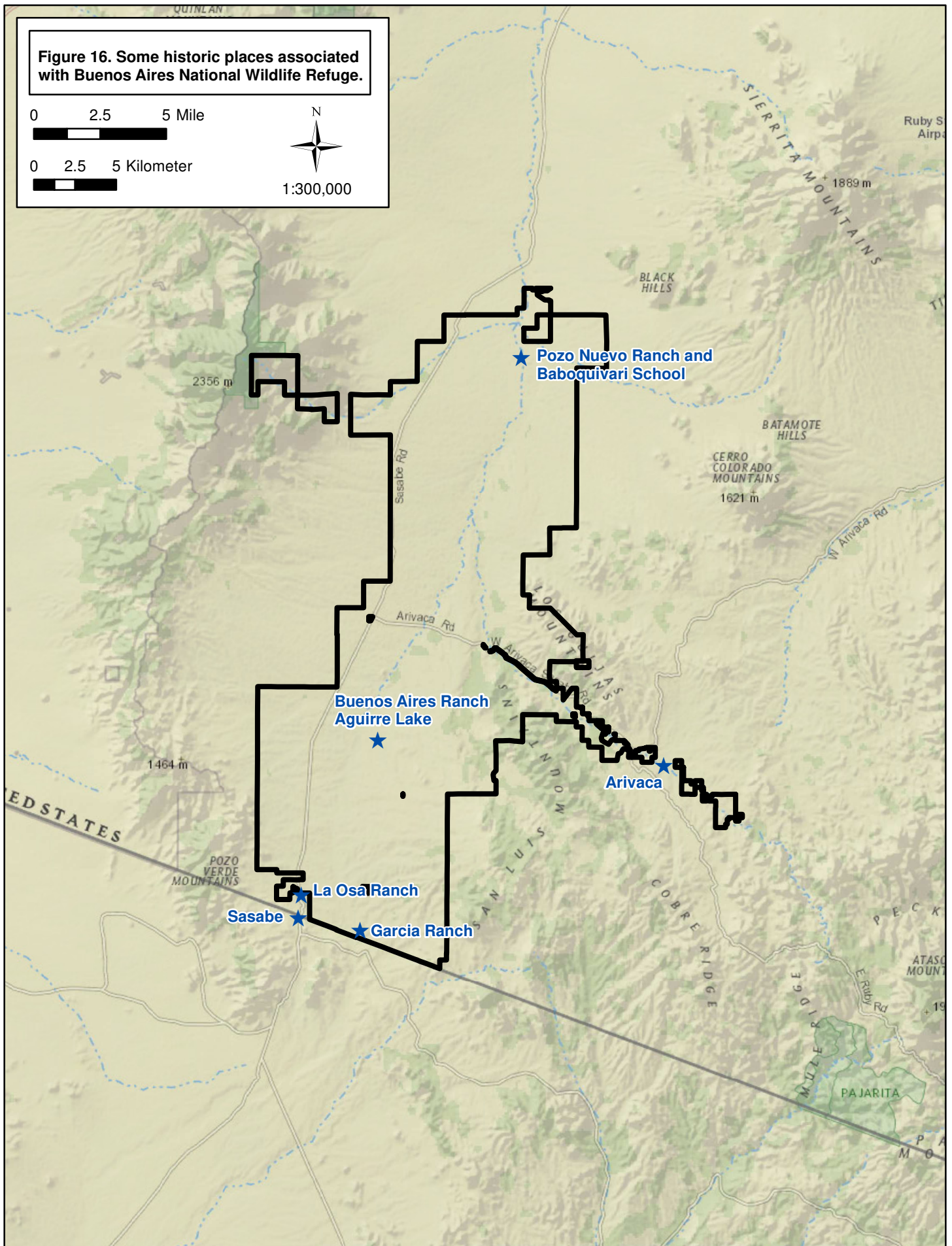
Arivaca. This is a small town on the east side of the Buenos Aires NWR between the Las Guijas Mountains to the north and the San Luis Mountains to the south (*Figure 16*). It lies on State Route 289, which connects the town to Interstate 19 in the Santa Cruz Valley (to the east) and State Route 286 in the Altar Valley (to the west). Although probably preceded by an older O'odham village, during the 1700s it became a *visita* or subordinate community to the Spanish mission Los Santos Angeles de Guevavi. During the Pima revolt of 1751 it was the site of a battle between the Pimas (O'odham) and the Spanish. Because of abundant water and pastures, and its proximity to mineral resources in the Las Guijas and San Luis Mountains, it was a Spanish mining center. It was later acquired as a Mexican land grant awarded in 1833 to Tomas and Ignacio Ortiz. After the Gadsden Purchase, it would become the center of the Arivaca Mining District between 1876–1881 (see above). Arivaca is an O'odham word meaning 'little reeds' or 'little fence water'.

Figure 16. Some historic places associated with Buenos Aires National Wildlife Refuge.

0 2.5 5 Mile



0 2.5 5 Kilometer



Buenos Aires Ranch. The namesake of Buenos Aires NWR, this was the first ranch in the Altar Valley and established by Don Pedro Aguirre, Jr., as early as 1859 (Figure 16). It was in that year that Aguirre established a stage stop on the Tucson to Altar Road at the mouth of Presumido Canyon. He would name it Buenos Ayres because of the steady winds present there. An 1888 GLO for Township 21 South and Range 8 East depicts the ranch complex with two building with the call out, *Buenos Ayres Ranch*. After Aguirre's death in 1907, the estate sold the ranch to William Coberly who began spelling it as Buenos Aires Ranch. The ranch would have various owners throughout the early and middle twentieth century. The Buenos Aires NWR was established there in 1985 by Secretary of the Interior Donald Hodel and the ranch buildings would become the visitor and administrative headquarters of the modern refuge.

Garcia Ranch (Site AZ DD:10:15[ASM]). Garcia or Gustavo Ranch is bisected by the international border and lies two miles southeast of Sasabe (Figure 16). The ranch is not depicted on an 1888 GLO survey plat, but it is on a 1950s USGS topographic map. Artifacts recovered during data recovery efforts in 2009 indicate that its initial occupation occurred in the late 1800s or early 1900s (Gage 2009). Moreover, a late nineteenth century stage line depicted on the 1888 GLO survey plat shows the line terminating at what would have been the Garcia Ranch and BLM land patents indicate that a Teofilo Aros was homesteading the area by 1906. It would appear the Garcia or Gustavo Ranch was a stage stop and port of entry in the late nineteenth century, perhaps prior to its use as a ranch. Data recovery efforts on the U.S. side of the border identified a complex of features including an adobe structure, a cobble foundation, and a cistern or privy, among other things (Gage 2009).

La Osa Ranch or Rancho de la Osa. Located adjacent to refuge's southwest boundary, this historic ranch is just northwest of Sasabe (Figure 16). The original La Osa landholding was one of the early ranches in the Altar Valley, although it is not depicted in the 1888 GLO survey plat for Township 22 South, Range 8 East. It may have been started by the De La Osa family, prominent in Santa Cruz County and in Sonora, Mexico. The ranch would be acquired by a Colonel William Sturges perhaps as early as 1885, then sold it to William Coberly in 1902. Coberly would also buy the Buenos Ayres Ranch from Aguirre's estate in 1909, consolidating control of most of the ranchlands in southern Altar Valley and organizing them all into the La Osa Cattle Company. The La Osa holdings would be sold to Jack Kinney sometime around 1915, who then reorganized them into the La Osa Live Stock and Loan Company. By the late 1920s, the property had changed hands and had become a guest or dude ranch, as it remains to this day. According to the online website, US Presidents, Pancho Villa, and Margaret Mitchell stayed there (www.ranchodelaosa.com). La Osa is a Spanish word meaning bear.

Baboquivari School House at Pozo Nuevo Ranch. Pozo Nuevo Ranch, on which stands the first Baboquivari School House, was one of the early ranches in the Altar Valley and was started as early as 1885. The ranch and the school house are located on the Buenos Aires NWR near its northern extent, not far east from SR 286 (Figure 16). The school house was the first of three Baboquivari Schools built to educate children of ranch families that lived in the valley (Bourne 1968) (Figure 17). This particular building was used at the least between the years of 1935 and 1937. According to an online website, there were three Baboquivari Schools built in different locations, but all within 25 miles of each other (www.cowpuncher.library.arizona.edu). Citing the first issue of the *Little Cowpuncher*, a newsletter published in October 1935 and written by the students at the first Baboquivari school at Pozo Nuevo Ranch:



Figure 17. Baboquivari School House at Pozo Nuevo Ranch.

The student body consisted of the nine Aros children, who lived on the ranch, and ten others who were bussed in from long distances. Only a few of them knew how to read before Eulalia Bourne [see below] arrived. Bill Ronstadt, owner of the nearby Delicias Ranch, and Pascual Hernandez, the bus driver, were the only members of the school board. However, in the fall of 1937, because their noise and activity were disturbing the horses and cattle, the school had to find a new location.

The Little Cowpuncher, Volume V, Number 2, dated October–November 1937, is titled: *Last Days at Pozo Nuevo* (www.cowpuncher.library.arizona.edu/newspaper/211). Underneath the title there is an extended reference or citation:

Written, Illustrated, and Mimeographed
By the Ranch Children of Baboquivari School
Sasabe Star Route – Tucson, Arizona
Edited and Published by Eulalai Bourne

In addition, this particular newsletter contains a hand drawing of the school. The drawing is by Edward Hernandez, Jr., and depicts a number of important features: well house, cistern, school house with windows and a door, a distinctive roof on the school house, a flagpole, and a number of trees that surround the building.

Sasabe. This is a town at the south end of the Altar Valley on State Route 286, just north of the international border (Figure 16). The word is likely O'odham in origin and may mean the head of a valley; correspondingly, the area was initially referred to as Sasabi Flat or what is now the northern end or head of Altar Valley. Over time a number of small communities with various names have been founded in the immediate area, including La Osa, but the location of modern Sasabe originated as a ranch owned by Carlos Escalante, who named the village San Fernando after his uncle Don Fernando Serrano, Sr. The name would eventually be changed to Sasabe, following an older border town by that name in Sonora, now El Sasabe, and to avoid confusion with San Fernando, California.

HISTORICALLY SIGNIFICANT PEOPLE

Don Pedro Aguirre, Jr. Aguirre is historically significant because he established the first ranch in the Altar Valley which he named Buenos Ayres Ranch (*Figure 18*). He was of Spanish descent and part of the upper class in northern Sonora and the southern Arizona territory. According to Leavengood (2006:1), he was born on June 21, 1835 after Mexico had gained its independence from Spain. His father started a stage and freight line through the Altar Valley, and Aguirre, Jr., continued this tradition by opening a stop called *La Posta de Aguirre* along the Tucson to Altar Road. Along with opening a stage stop and building a ranch, other business ventures included mining and real estate. He would also fund the construction of the first school house in Arivaca. Over the course of his life, he would be a representative on the Pima County Board of Supervisors and build a school house in Arivaca. Don Aguirre died in Tucson on February 21, 1907 (Leavengood 2006:11).

Gill Family. Fred Gill, father to Roy Gill and two other sons, purchased several ranches in the Altar Valley from Jack Kinney in 1926. Fred Gill came from California and had a background in ranching. He would buy several ranches in the Altar Valley, one for each of his sons, and Buenos Aires became the property of Roy Gill. In the 1930s, the family would expand their holdings by purchasing other ranches, including the Garcia or Gustavo Ranch along the international border. The Gill's livestock empire is an excellent example of twentieth century ranching industry with access to about 100,000 acres, much of it leased from governmental agencies, and who ran between 2,500 to 6,800 head. They would eventually buy tractors and bulldozers and in the 1940s began largescale water improvements. These improvements including the development of reliable water sources and earthen tanks, renovation of Aguirre Lake, and spreader dams to assist with erosion control and irrigation. It is likely that many of these features are still present across the wildlife refuge. Roy Gill is particularly well known for his love of quarter horses and quarter horse racing. Roy Gill would sell the Buenos Aires Ranch in 1959 to H. Clifford Dobson.

Jack Kinney. Typifying the large-scale cattlemen who came to southern Arizona in the years before statehood, Jack Kinney would buy the La Osa Ranch in 1915, which included the Buenos Aires Ranch, and organize it all into the La Osa Live Stock and Loan Company. Kinney was born in Dixon, Illinois, in 1872 and eventually came to Arizona in 1913, and served in the financial infrastructure that supported market-driven ranching in southern Arizona. He would become active in the Arizona Republican party and serve as a county supervisor from 1928 to 1932.



Figure 18. Don Pedro Aguirre, Jr.

Eulalia Bourne. Known euphemistically as *Sister* Eulalia Bourne, this historic woman was best known as a bilingual school teacher in southern Arizona. Born Eulalia Collins in 1892, she married a prospector named William S. Bourne and moved to Arizona sometime between 1911 and 1914. During her life she also lived with or was married to Ernest John Dougherty, Roy Pennawell, and perhaps Jack Ryland. She obtained an Arizona teaching certificate in 1914 and taught in Helvetia, a mining community in the Santa Rita Mountains. Later, Bourne attended the University of Arizona and would receive an AB degree in 1930. By that fall, she was teaching at Carlink Ranch in the San Pedro River Valley. She would go on to teach at other southern Arizona schools, including the Baboquivari School at Pozo Nuevo Ranch in the Altar Valley (see above). Under her instruction, the students at these schools produced a mimeographed newspaper entitled *Little Cowpuncher*. She owned homesteads and acquired cattle, first at Pepper Sauce Canyon, then in the foothills of the Galiuro Mountains. She retired from teaching in 1957, authored several books, and through the years received a number of special recognition awards. She died on her ranch on May 1, 1984.

CHAPTER 5. CULTURAL RESOURCE INVESTIGATIONS ON BUENOS AIRES NATIONAL WILDLIFE REFUGE

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

A comprehensive archival review was conducted to enumerate the kinds of archaeological investigations that have taken place on Buenos Aires, both in terms of inventory and data recovery, and to summarize these findings. An initial electronic transfer of information and electronic documents took place between EnviroSystems Management's Principal Investigator, Greg Haynes, and the US Fish and Wildlife Service Southwest Region Historic Preservation Officer, David Seigel. This was supplemented by reviewing Arizona State Museum's on-line cultural resources database AZSITE, which proved to be the primary source of baseline information regarding the kinds and quantities of investigations, and in the acquisition of readily available site forms. Finally, for recent and relatively extensive inventory work in and immediately adjacent to BANWR, of which most have not yet been entered into AZSITE, technical reports were obtained by contacting either the appropriate agency (i.e., Coronado National Forest) or the private consulting firms which completed the investigation (i.e., Center for Desert Archaeology, Environmental Planning Group, Northland Research, SWCA). As a result of this review, 21 archaeological investigations have been conducted on BANWR, of which 19 are inventory or survey projects and two are data recovery projects (*Table 1, Figures 19–20*). There have also been four other inventory projects undertaken immediately adjacent to the wildlife refuge and these have been included in Table 1 and depicted on Figures 19–20 as well.

The *Arizona Reporting Standards for Cultural Resources*, developed by the Arizona State Historic Preservation Office (SHPO), the Arizona State Museum (ASM), and the Arizona State Land Department (ASLD), defines what an intensive cultural resources survey means for work in the state: *Management objectives determine the survey intensity, but an intensive survey (100%) usually is required. The intensive survey will locate all surface-visible sites* (Arizona Reporting Standards for Cultural Resources 2009: 6). In addition to this general statement, a more exact methodology for pedestrian inventory or survey is defined (Arizona Reporting Standards for Cultural Resources 2009:7):

Appropriate survey methods selected for a specific survey are based on factors such as the size of the area, the type and number of anticipated cultural resources, vegetation cover, the extent of ground disturbance, and agency management objectives... For surveys on unobstructed open land, conduct the survey on foot in transects at a maximum spacing of 20 meters apart.

This reflects the Arizona State Historic Preservation Act of 1982, as defined in the 2001 implementing guidelines issued by the State Historic Preservation Office. These state guidelines that:

A systematic, detailed pedestrian examination of an area [should be] designed to identify all potentially eligible historic properties and to gather sufficient data about these properties to make a determination of eligibility for the Arizona Register of Historic Places or the National Register of Historic Places (Guidelines for the [Arizona] State Historic Preservation Act 2001:21).

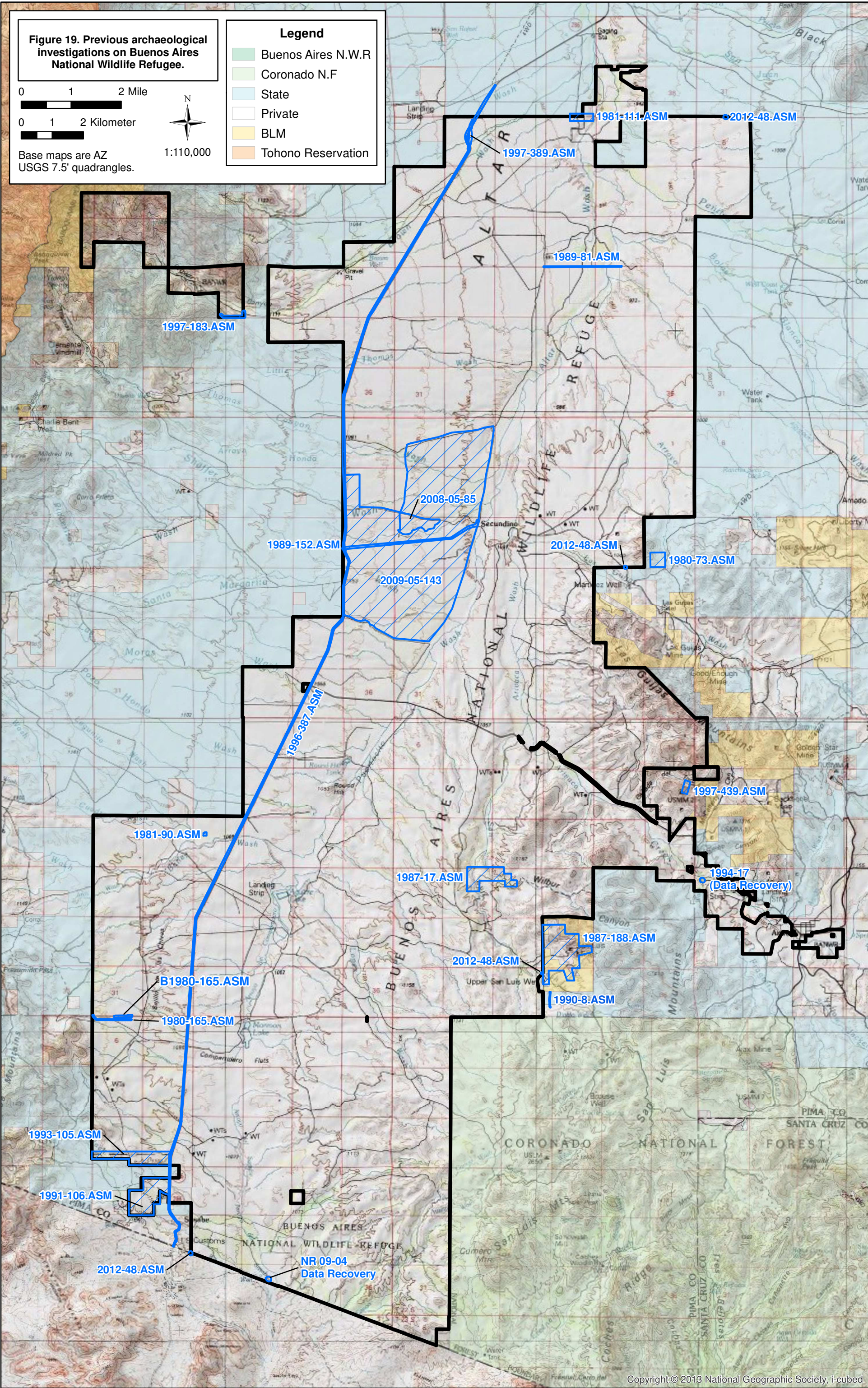
As stated above, 19 inventory projects have been conducted on BANWR, of which seven were conducted in the 1980s, five in the 1990s, three in the 2000s, and four between 2010 and 2018. Eleven of these inventory projects were linear surveys for utility lines or related actions ($n = 8$), State Route

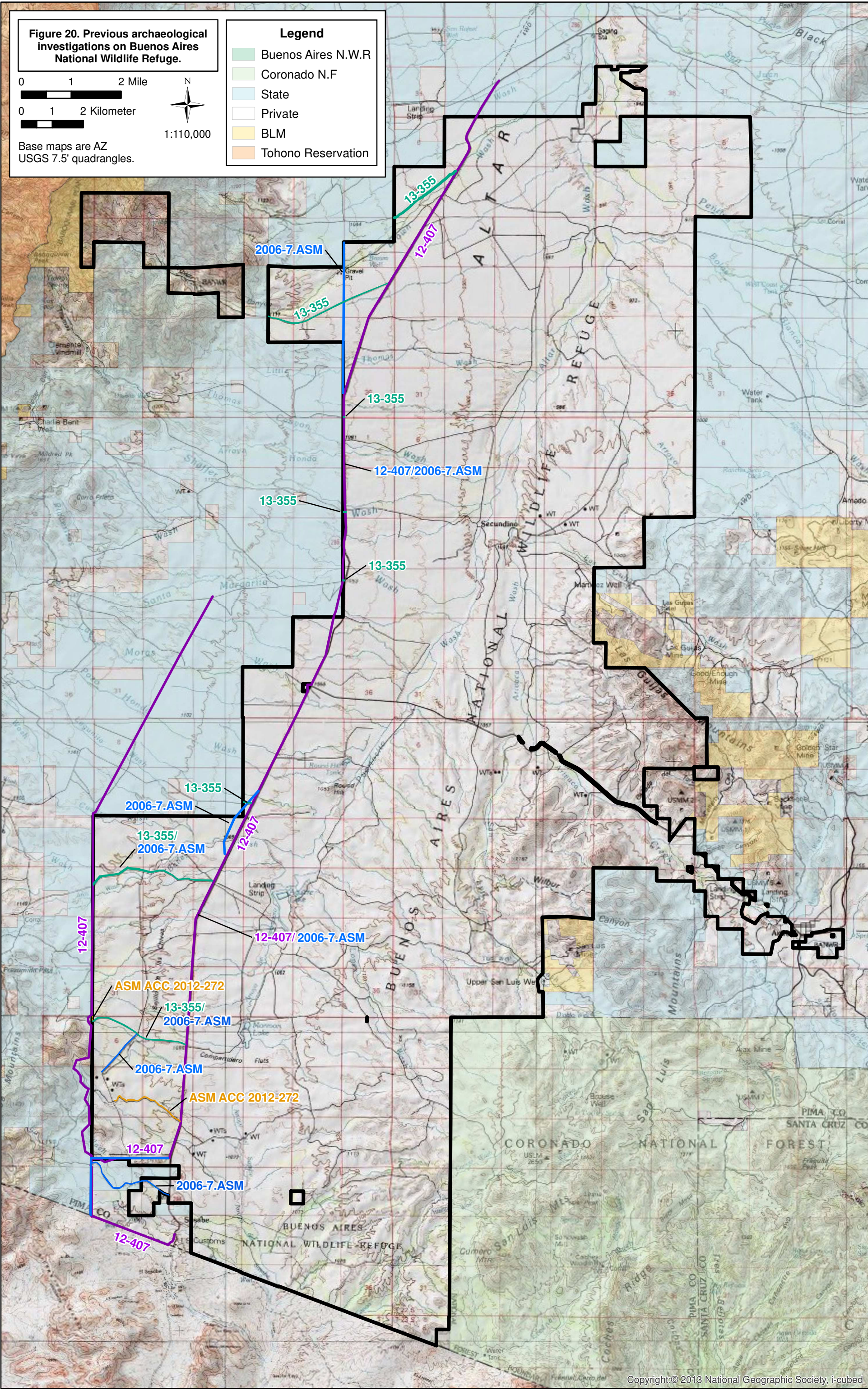
Table 1. Previous Archaeological Investigations on Buenos Aires National Wildlife Refuge

Reference*	Report Title (Report No.)	Acres in BANWR	ASM Sites
Lange, R. C. (1980) ASM	State Land Survey -- John Avram Mineral Lease (ASM No. 1980-73)	<i>Borders BANWR</i>	AZ DD:7:12
R. Ervin (1980) ASM	TRICO [Electric Cooperative] Survey near Sasabe Letter Report (ASM No. 1980-165)	13.2	AZ DD:6:19
Unknown author (1980) BLM	Unknown Report Title for Trico Electric Cooperative (B1980-165.BLM)	12.6	None
R. C. Lange (1981) ASM	Report of an Archaeological Survey for Arizona Department of Transportation Job No. 5-315-906 for Granite Construction Company (ASM No. 1981-90)	27.5	None
J. Mayberry (1981) ASM	Archaeological Survey of Proposed Trico Electric Cooperative Powerline, Altar Valley, Pima County, Arizona (ASM No. 1981-111)	1.2	AZ DD:3:37
J. Madsen (1989) ASM	Avril L. Jackson Mining Lease Letter Report (ASM No. 1987-17)	120	AZ DD:7:15** AZ DD:7:16**
J. Bayman (1987) ASM	An Archaeological Survey of the Oceanic Mining Claim, Pima County, Arizona (ASM No. 1987-188)	<i>Borders BANWR</i>	AZ DD:7:18
S. M. Troncone (1989) SRI	Ripley Survey Road Right-of-way (ASM PRF No. 1989-81)	1.8	None
M. L. Heuett (1989) ASM	A Class III Archaeological Survey of a Transmission Line Corridor, Buenos Aires National Wildlife Refuge, Northeast of Sasabe, in Pima County, Arizona (ASM No. 1989-152)	7.3	None
K. Rozen (1990) ASM	Letter Report from Rozen to Alexander, March 7, 1990 (ASM No. 1990-8)	<i>Borders BANWR</i>	AZ DD:7:25
D. Swartz (1991) CDA	An Archaeological Survey of 300 acres on the Buenos Aires National Wildlife Refuge (ASM No. 1991-106)	300	AZ DD:10:8
J. Bayman (1993) SRI	An Archaeological Survey of 200 Acres on the Sasabe Exchange for the Buenos Aires National Wildlife Refuge (ASM No. 1993-105)	200	AZ DD:6:31 through AZ DD:6:35 AZ DD:10:10
B. Stone (1996) ARS	A Cultural Resources Survey of a 43.48 Mile Long Segment of Arizona Department of Transportation Right-of-way for State Route 286, between Sasabe and Three Points, Southeastern Pima County, Arizona (ASM No. 1996-387)	~ 300	AZ DD:10:10
H. D. Wallace (1997) CDA	An Archaeological Survey of a Portion of Brown Canyon, Baboquivari Mountains, Pima County, Arizona (CDA Letter Report No. 97-133; ASM No. 1997-183)	8 (+ 35 <i>recon acres</i>)	AZ DD:2:58
Madsen, J. H. (1997) ASM	The Albatross Patented Claim (ASM No. 1997-439)	<i>Borders BANWR</i>	AZ DD:7:28

Reference*	Report Title (Report No.)	Acres in BANWR	ASM Sites
B. Stone (1997) ARS	Cultural Resources Survey for a Proposed Realignment of State Route 286 between Mileposts 23.64 and 24.29, Approximately 25 Miles North of Sasabe, Southeastern Pima County, Arizona (ASM No. 1997-389)	6.2	AZ DD:10:10
S. Wilcox, A. Sewequaptewa, and K. Dobschuetz (2007) EPG	A Cultural Resource Survey for the El Paso Corporation Sasabe Lateral Pipeline Project from Sasabe to Three Points, Pima County, Arizona (Environment Planning Group Cultural Resources Technical Paper No. 2006-21; ASM No. 2006-7)	487	AZ DD:6:19 AZ DD:6:31 AZ DD:6:39 AZ DD:6:54 through AZ DD:6:63 AZ DD:10:8
W. B. Gillespie (2008) Coronado	Cultural Resources Inventory for the Proposed Masked Bobwhite Habitat Restoration Project, Central Buenos Aires National Wildlife Refuge, 2008 (Coronado National Forest Heritage Report No. 2008-05-85) NOT IN AZSITE	132	None
D. Mehalic (2009) Coronado	The 2009 Cultural Resources Inventory for the Masked Bobwhite Habitat Restoration Project, Central Buenos Aires National Wildlife Refuge, Pima County, Arizona (Coronado National Forest Heritage Report No. 2009-05-143) NOT IN AZSITE	5,261	AZ DD:7:41 through AZ DD:7:63
D. R. Hart & D. A. Barnes (2012) GSRC	Cultural Resources Survey for the Installation of Cattle Guard Crossings in Southern Pima County, U.S. Customs and Border Protection, U.S. Border Patrol, Pima County, Arizona (ASM No 2012-48)	> 1	None
Hesse et al. 2012 SWCA	Archaeological Survey for El Paso Natural Gas Company's Sasabe Lateral Project, Pima County, Arizona (SWCA Report No. 12-407) NOT IN AZSITE <i>Site Density: 816 / 22 = 1 site per 37.1 acres</i>	816	AZ DD:3:148 AZ DD:3:156 AZ DD:6:19 AZ DD:6:31 AZ DD:6:39 AZ DD:6:54 AZ DD:6:56 through AZ DD:6:63 AZ DD:6:76 through AZ DD:6:79 AZ DD:6:81 AZ DD:7:66 AZ DD:10:8 AZ DD:10:10

Reference*	Report Title (Report No.)	Acres in BANWR	ASM Sites
West et al. (2013) SWCA	Archaeological Survey for Sierrita Gas Pipeline LLC's Sierrita Pipeline Project, Pima County, Arizona, Addendum 3—Additional Roads Survey on Buenos Aires National Wildlife Refuge (SWCA Report No. 13-355; ASM Records No. ASM ACC 2012-272) NOT IN AZSITE	11	AZ DD:6:118 AZ DD:6:123 AZ DD:6:124
J. S. Hesse & I. S. Hesse (2014) SWCA	Archaeological Survey of Sierrita Pipeline Project Access Roads on BANWR— Post-Construction Survey (SWCA Report No. 13-355) NOT IN AZSITE	185	AZ DD:2:68 AZ DD:3:156 AZ DD:3:180 AZ DD:3:181 AZ DD:6:19 AZ DD:6:56 <i>through</i> AZ DD:6:59 AZ DD:6:81 AZ DD:6:118 AZ DD:6:134 AZ DD:7:66 AZ DD:10:8
Non-project Sites	Sites depicted in AZSITE that are not associated with any project	NA	AZ DD:3:55 AZ DD:3:126 AZ DD:6:13 AZ DD:7:2 AZ DD:7:10 AZ DD:10:6 AZ DD:10:7 AZ DD:10:8
Data Recovery Reports			
J. H. Thiel et al. (1995) CDA	Archaeological Excavations at the Arivaca Wash Cemetery, AZ DD:7:26(ASM), Buenos Aires National Wildlife Refuge (Center for Desert Archaeology Technical Report No. 1994-17)	> 2	AZ DD:7:26
G. Gage (2009) Northland Research	Results of Data Recovery Operations, Ethnographic Research Monitoring, and a Damage Assessment at Garcia Ranch, also known as Gustavo Ranch (AZ DD:10:15[ASM]), A Historic Ranch on the US-Mexico Border near Sasabe, Pima County, Arizona (Northland Research Technical Report No. 09-04)	~ 5	AZ DD:10:15





268 (n = 2), or other roads (n = 1). Three others were inventory projects for small point-specific parcels, including an ADOT gravel pit (n = 1), a small survey in Brown Canyon (n = 1), and the placement of cattle guards around the perimeter of the wildlife refuge (n = 1). Finally, five other inventory projects consisted of large parcels or polygons that were for mining leases (n = 1), habitat restoration (n = 2), and land exchanges to enlarge the refuge (n = 2). The four investigations that immediately border the wildlife refuge all occur immediately to the east in the San Luis and Los Guijas mountain ranges and concern mining claims (n = 3) or related activities (n = 1).

As a result of the 19 inventory projects, a total of 7,891 acres or 4.4% of Buenos Aires NWR's 177,464 acres has undergone intensive pedestrian survey of some kind for cultural resources. Current intensive cultural resources pedestrian survey, as defined above, came into effect in 2009. This indicates that that only five of the 19 inventory projects have been conducted to the current state standard and these projects surveyed 6,274 acres or 3.5% of BANWR. Regardless of whether a specific survey project meets current intensive inventory standards, taken together, these 19 projects have documented in some way 62 cultural resources or historic properties, whereas nine other resources have been documented resulting from some other kind of discovery process (e.g., inadvertent discovery, international border activity).

One project is particularly instructive for estimative site density across the entire 177,464 acres encompassed by the refuge. The El Paso Natural Gas Company's Sasabe Lateral Pipeline (SWCA Report No. 12-407) was a linear survey paralleling SR 268 along the refuge's western periphery. It was conducted in 2012 by SWCA, so it was undertaken by archaeologists who met the State of Arizona professional guidelines and conducted according to modern protocol. The estimated number of acres surveyed for this project in the wildlife refuge was 816 and 22 sites were documented in the process. Site density for this project was, therefore, 1 cultural resources site every 37.1 acres. Because this particular project crossed the entire refuge lengthwise, from north to south, this value can be used as a proxy to estimate what might be the average site density throughout BANWR. If this density is used to estimate the total number of sites on the wildlife refuge, then 4,783 sites on BANWR ($177,464 / 37.1 = 4,783$).

Besides the 19 inventories, two other investigations entailed data recovery efforts, which included comprehensive archival reviews and subsurface excavations. The first data recovery project involved the excavation and removal of human inhumations at what is now called the Arivaca Cemetery (AZ DD:7:26[ASM]). This site was discovered in 1994 by a visitor who was hiking in a tributary of Arivaca Wash and identified the skeletal material eroding out of a wash bank. Subsequently, the Fish and Wildlife Service contacted the Center for Desert Archaeology and requested that they undertake data recovery efforts to recover the remains (Thiel et al. 1995). The other site to receive data recovery is the Garcia or Gustavo Ranch (AZ DD:10:15[ASM]), located on the U.S.-Mexico Border. In the mid-2000s, this site underwent data recovery by Northland Research to support enhanced border security (Gage 2009). As a result, the documented site includes only that portion lying north of the international border on BANWR. Both of the abovementioned sites are discussed in more detail below.

DOCUMENTED CULTURAL RESOURCES

The Arizona State Historic Preservation Act of 1982, as defined in the 2001 implementing guidelines issued by the State Historic Preservation Office, defines cultural resources and historic properties/historic resources (*Guidelines for the [Arizona] State Historic Preservation Act* 2001:21):

Cultural Resources – Structures, properties, and objects from the past that constitute both our national and local heritage, including historic buildings and prehistoric and historic archaeological remains.

Historic Property (also Historic Resource) – District, site building, structure, or object significant in Arizona's history, architecture, engineering, archaeology or culture at the national, state, or local level that are listed on or eligible for the Arizona Register of Historic Places... or the National Register of Historic Places.

Moreover, the rules implementing the Arizona Antiquities Act define an archaeological site to mean *any area with material remains of past Indian or non-Indian life or activities that are of archaeological interest, including without limitation, historic or prehistoric ruins, burial grounds, and inscriptions made by human agency* (Rules Implementing A.R.S §15-1631 and §41-841, et seq., The Arizona Antiquities Act – General, Revision 5/00: 1). In general, these are cultural resources that are at least 50 years of age, although this does not always have to be the case (*Arizona Reporting Standards for Cultural Resources* 2009:7).

With these definitions in mind, there are 71 cultural resource sites currently documented on BANWR (Table 2, Figure 21). In terms of general affiliation, 57 sites or 80.4% are prehistoric Native American, four (5.6%) are ethnohistoric Tohono O'odham, five (7.0%) are historic Euroamerican or Mexican-American, four (5.6%) are multicomponent and contain more than one cultural tradition or affiliation, and for one (1.4%) site a cultural affiliation cannot be determined. This enumeration does not include the towns, ranches, roads, and other well-known places on the wildlife refuge or as depicted on historic maps (e.g., GLO plats), which have not been officially documented with readily available information.

Prehistoric Resources

In terms of prehistoric sites or resources, 54 are affiliated solely with the Hohokam Cultural Tradition (Figure 21, Table 2). The majority of Hohokam affiliated sites or 36 are recorded as artifact scatters. These kinds of sites represent single-event activity stations, repeatedly-used localities, and special function sites. Three other artifact scatters are so large and dense that they likely contain subsurface pit-houses, but these features have no visible surface expression. There are also a number of other artifact scatters that contain non-architectural features including seven with various kinds of rock features, of which two have fire-related hearths or roasting features. Three other sites have surface architecture and these are either habitation sites or agriculturally-related field houses. Finally, three Hohokam sites are documented with trash or platform mounds, and these particular sites likely contain habitations and, based on the prehistoric context (Chapter 2), may well have served intra-village communal functions. The only other single component prehistoric sites include an unaffiliated toolstone quarry, an unaffiliated flaked stone scatter, and a Late Archaic/Early Agricultural habitation.

All four sites with multiple affiliations present on BANWR contain prehistoric Hohokam cultural components in conjunction with either Archaic or Tohono O'odham affiliated components. One of these is the Brown Canyon Site, so-called because it resides on the eastern flanks of the Baboquivari Mountains on the floor of Brown Canyon (AZ DD:2:58[ASM]). This site contains a large and

Table 2. Documented Archaeological Sites on Buenos Aires National Wildlife Refuge

ASM Site No.	Description	Affiliation / Dates	NRHP Eligibility*
AZ DD:2:58(ASM)	Multicomponent Brown Canyon Site Middle-Late Archaic artifact scatter & Hohokam habitation/trash mound	Archaic / 3500 B.C.E–C.E. 50 Hohokam / A.D. 1150–1450	Eligible
AZ DD:2:68(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 650–1450	Eligible
AZ DD:3:37(ASM)	Large prehistoric artifact scatter w/ 3 loci (probable habitation)	Hohokam / A.D. 50–1450	Unevaluated
AZ DD:3:55(ASM)	Prehistoric temporary habitation	Hohokam / A.D. 50–1450	Unevaluated
AZ DD:3:126(ASM)	Large prehistoric habitation	Hohokam / A.D. 50–1450	Unevaluated
AZ DD:3:156(ASM)	Historic utility line (<i>not displayed on map</i>)	Euroamerican / 1900–1962	Not eligible (SHPO concurrence)
AZ DD:3:180(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 650–1450	Eligible
AZ DD:3:181(ASM)	Prehistoric artifact scatter w/ 3 rock features	Hohokam / A.D. 650–1450	Eligible
AZ DD:6:13(ASM)	Aguirre Lake	Euroamerican / pre-1950	Unevaluated
AZ DD:6:19(ASM)	Prehistoric artifact scatter w/ rock ring & 2 trash mounds (probably habitation)	Hohokam / A.D. 650–1450	Eligible (SHPO concurrence)
AZ DD:6:31(ASM)	Large prehistoric artifact scatter (probable habitation)	Hohokam / A.D. 50–1450	Eligible (SHPO concurrence)
AZ DD:6:32(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Unknown
AZ DD:6:33(ASM)	Roasting feature	Unknown Native American	Unknown
AZ DD:6:34(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Unknown
AZ DD:6:35(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Unknown
AZ DD:6:39(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 650–1450	Not eligible
AZ DD:6:54(ASM)	Prehistoric artifact scatter w/ 7 rock features	Hohokam or Trincheras A.D. 650–1450	Eligible
AZ DD:6:55(ASM)	Multicomponent prehistoric & ethnohistoric artifact scatter	Hohokam- Tohono O'odham A.D. 800–1700	Eligible
AZ DD:6:56(ASM)	Prehistoric artifact scatter w/ rock feature & ground stone cluster	Hohokam / A.D. 650–1450	Eligible (SHPO concurrence)
AZ DD:6:57(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 650–1450	Eligible (SHPO concurrence)
AZ DD:6:58(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 650–1450	Eligible (SHPO concurrence)
AZ DD:6:59(ASM)	Ethnohistoric artifact scatter	Tohono O'odham / A.D. 1700–1950	Eligible (SHPO concurrence)
AZ DD:6:60(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 650–1450	Eligible
AZ DD:6:61(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 650–1450	Eligible
AZ DD:6:62(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 650–1450	Eligible
AZ DD:6:63(ASM)	Prehistoric artifact scatter w/ rock cluster & trash mound	Hohokam / A.D. 650–1450	Eligible
AZ DD:6:76(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 650–1450	Eligible
AZ DD:6:77(ASM)	Large prehistoric artifact	Hohokam / A.D. 650–1450	Eligible
AZ DD:6:78(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 650–1450	Eligible
AZ DD:6:79(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 650–1450	Not eligible
AZ DD:6:81(ASM)	Prehistoric artifact scatter w/ trash mound	Hohokam / A.D. 650–1450	Eligible
AZ DD:6:118(ASM)	Multicomponent prehistoric artifact scatter w/ 7 rock features	Archaic-Hohokam 1200 B.C.–A.D. 1450	Eligible
AZ DD:6:123(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible

ASM Site No.	Description	Affiliation / Dates	NRHP Eligibility*
AZ DD:6:124(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:6:134(ASM)	Prehistoric artifact scatter w/ 3 rock features	Hohokam / A.D. 650–1450	Eligible
AZ DD:7:2(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Unevaluated
AZ DD:7:10(ASM)	Prehistoric habitation	Hohokam / A.D. 50–1450	Unevaluated
AZ DD:7:15(ASM)	Prehistoric rhyolitic schist quarry	Unknown Native American	Unevaluated
AZ DD:7:16(ASM)	Ethnohistoric artifact scatter	Tohono O'odham / A.D. 1500–1950	Unevaluated
AZ DD:7:18(ASM)	Ethnohistoric habitation w/ 3 mining pits	Tohono O'odham / A.D. 1500–1900	Eligible (SHPO concurrence)
AZ DD:7:25(ASM)	Prehistoric artifact scatter w/ rock features	Hohokam / A.D. 50–1450	Unevaluated
AZ DD:7:26(ASM)	Arivaca Cemetery	Tohono O'odham / A.D. 1450–1800	Eligible (SHPO concurrence)
AZ DD:7:41(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:42(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:43(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:44(ASM)	Prehistoric flaked stone scatter	Unknown Native American	Eligible
AZ DD:7:45(ASM)	Multicomponent prehistoric artifact scatter	Archaic-Hohokam / pre-1450	Eligible
AZ DD:7:46(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:47(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:48(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:49(ASM)	Prehistoric artifact scatter w/ 2 rock features	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:50(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:51(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:52(ASM)	Prehistoric artifact scatter w/ roasting feature	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:53(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:54(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:55(ASM)	Prehistoric habitation	Hohokam / A.D. 1150–1300	Eligible
AZ DD:7:56(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:57(ASM)	Prehistoric artifact scatter w/ roasting pit	Hohokam / A.D. 1150–1450	Eligible
AZ DD:7:58(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 1150–1450	Eligible
AZ DD:7:59(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:60(ASM)	Large prehistoric artifact scatter w/ 2 roasting pits, 1 rock alignment, & possible pit house area	Early Agricultural 1500 B.C.–A.D. 50	Eligible
AZ DD:7:61(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:62(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 1150–1450	Eligible
AZ DD:7:63(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Eligible
AZ DD:7:66(ASM)	Historic SR 286 road camp (artifact scatter w/ 9 features)	Euroamerican / 1900–1950	Not eligible (SHPO concurrence)
AZ DD:10:6(ASM)	Prehistoric artifact scatter w/ rock feature	Hohokam / A.D. 50–1450	Unevaluated (SHPO concurrence)
AZ DD:10:7(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 50–1450	Unevaluated (SHPO concurrence)
AZ DD:10:8(ASM)	Prehistoric artifact scatter	Hohokam / A.D. 650–1450	Eligible (SHPO concurrence)
AZ DD:10:10(ASM)	Historic road w/ associated features (State Route 286)	Euroamerican / 1900–1950	Eligible (SHPO concurrence)
AZ DD:10:15(ASM)	Garcia/Gustavo Ranch	Mexican-American / 1880s – post-1950s	Eligible

ASM Site No.	Description	Affiliation / Dates	NRHP Eligibility*
Borders BANWR			
AZ DD:7:19(ASM)	Historic habitation (San Luis Mine)	Euroamerican A.D. 1880s–1910s	Eligible (<i>SHPO concurrence</i>)
AZ DD:7:28(ASM)	Albatross Mine	Euroamerican A.D. 1930s–1940s	Unknown
AZ DD:7:29(ASM)	Las Guijas Mill	Euroamerican A.D. 1900–1950	Eligible
AZ DD:10:3(ASM)	Historic Rancho de la Osa	Mexican-American A.D. 1800s–present	Unknown
AZ DD:10:4(ASM)	Sasabe Town Site	Mexican-American A.D. 1500–present	Unknown

extensive artifact scatter with temporally diagnostic projectile points from the Middle and Late Archaic/Early Agriculture Periods, and artifacts associated with the Hohokam Classic Period. Importantly, there is a trash mound associated with the Hohokam component. Another site is on the east side of the Pozo Verde Mountains north of Sasabe (AZ DD:6:55[ASM]). It is a large and dense prehistoric scatter that contains ceramics that indicate Hohokam and the Tohono O’odham traditions. Its large size, coupled with artifact density and typological diversity, strongly suggests that it is a habitation.

The two other multicomponent sites are relatively small by comparison. One of these smaller sites is on the floodplain of Puertocito Wash on the west side of the Altar Valley (AZ DD:7:45[ASM]). This site contains a relatively extensive flaked and ground stone assemblage that is strongly suggestive of an Archaic or Early Agriculture occupation. At least three plain brownware sherds are also present, indicating the potential for an overlaying Hohokam food processing station. The last site is located below the Pozo Verde Mountains near Sasabe (AZ DD:6:118[ASM]). Despite its relatively small size, it contains a dense assemblage including abundant Hohokam ceramics, abundant flaked and ground stone artifacts, and sparse fire-cracked rock. In addition, there are seven features including a possible field house, two rock rings, bedrock grinding features, and fire-cracked rock concentrations. The presence of a San Pedro projectile point indicates that an initial occupation dates to the Late Archaic/Early Agriculture period, overlain by a much more intensive Hohokam occupation.

Ethnohistoric Tohono O’odham Resources

Four sites or resources have been recorded on the wildlife refuge affiliated with the ethnohistoric Tohono O’odham, that is, they are believed to contain only Tohono O’odham components (Figure 21, Table 2). Inferring an ethnohistoric affiliation can be difficult since these kinds of sites typically contain both Native American artifacts and acquired Euroamerican artifacts, if not other acquired traits (i.e., architectural and non-architectural features).

One of these sites is a habitation that lies on the refuge’s eastern border at the base of the San Luis Mountains (AZ DD:7:18[ASM]). This site was initially recorded in 1987 by the University of Arizona and consists of at least two cobble and adobe structures associated with *manure-tempered* pottery, purple glass, and other historic debris. Three mining prospects are also encompassed within the boundary.

Another site is the Arivaca Cemetery, a Tohono O’odham burial ground or locality (AZ DD:7:26[ASM]). This particular site is also on the east side of the refuge and found in 1994 when a

visitor walking up a tributary of Arivaca Wash observed human skeletal remains eroding out of a wash bank. Ultimately the Center for Desert Archaeology conducted data recovery and found five Tohono O'odham burials (Thiel et al. 1995). Of these, three were adult males, one was an adult female, and one was a teenaged male, and all were placed in pits. Radiocarbon dates from two features that contained charred seeds place the probable period of use from as early as A.D. 1450 up to the 1800s.

Two other sites appear to be temporary camps, of which both contain Tohono O'odham ceramics in direct association with Euroamerican artifacts. One of these has a relatively large spatial extent, but most of the artifacts are present within a small 20 × 10-m concentration (AZ DD:6:59[ASM]). Native American artifacts include abundant ethnohistoric plainware and red ware sherds with a dark organic paste, coupled with flaked stone and a marine shell fragment. Euroamerican artifacts include brown glass, aqua glass, olive glass, white glazed and yellow/buff glazed earthenware, crown caps, a tobacco tin, and miscellaneous metal. The other is a small artifact scatter consists of a dispersal of Tohono O'odham ceramics (Sells Red Ware) and Euroamerican ironstone, hole-in-top milk cans, purple glass, and green glass (AZ DD:7:16[ASM]). For the latter site, the hole-in-top milk cans coupled with purple glass suggests that the artifacts were discarded sometime in the 1910s or 1920s.

There is also one site with a Tohono O'odham affiliated component that is present with a Hohokam component (AZ DD:6:55[ASM]). This site is a large scatter on the east side of the Pozo Verde Mountains north of Sasabe. As previously stated, the size of the scatter and its density strongly suggests it was used as a habitation (see above).

Historic Euroamerican Resources

There are only five historic Euroamerican cultural resources officially recorded on BANWR (Figure 21, Table 2). Two of these sites are related to historic ranching activities. The earliest of these is Aguirre Lake (AZ DD:6:13[ASM]) located on the floor of Altar Valley. This lake was initially constructed in 1886 as a water supply for cattle by Don Pedro Aguirre, the first homesteader in the valley (Sayre 2002). It was Don Pedro who established Buenos Ayres Ranch in the 1870s, the namesake of the national wildlife refuge. The other site (AZ DD:10:15[ASM]) is the Garcia or Gustavo Ranch, located on the U.S.-Mexico Border, east of Sasabe. In the mid-2000s, this site underwent data recovery by Northland Research in support of enhanced border security (Gage 2009). As a result, the site only includes that portion north of the international border on refuge land. This site is a complex of 23 features that includes an adobe structure and a concrete-lined cistern, among other things. The recorded portion dates to the 1950s, but archival work conducted by Northland Research suggests it represents only a very recent component; the site may have also served as an early port of entry and stage stop (Gage 2009:70).

The other three sites are all related to late historic Euroamerican infrastructure in one way or another. One of these is a now-abandoned utility line that was at least 21 miles long and appears to have run south from Three Points into the Altar Valley (AZ DD:3:156[ASM]). Its purpose was to provide telephone and/or telegraph service to ranches in the valley (Hesse et al. 2012:149). Another is State Route 286 (AZ DD:10:10[ASM]), both abandoned and in-use alignments. The highway bears north-south down the west side of the Altar Valley and its southern terminus is the U.S.-Mexico border. Whereas portions of the road are as old as the 1920s, it was incorporated into the State Highway Systems in 1955 as SR 286 or the Sasabe to Robles Junction Highway (Hesse et al. 2012:232). The only other historic Euroamerican site recorded on the wildlife refuge is a road camp associated with SR 286 (AZ DD:7:66[ASM]), as depicted as such on various 1940s- and 1950s-era maps (Hesse et al.

2012:225). It consists of a dense artifact scatter, a concrete foundation, an earthen platform and foundation, what may be a privy, and several other features.

Thematically Relevant Resources Adjacent to Buenos Aires National Wildlife Refuge

In addition to the above historic resources, there are five sites documented immediately adjacent to the refuge that reflect themes and events important in understanding the historic use of southern Arizona: mining, ranching, and transportation (Figure 21, Table 2). Three of these are mining or mining-related sites in the San Luis and Las Guijas Mountains, an area that saw extensive mining activity in the late 1800s into the early and middle 1900s. One site is a habitation with an extensive artifact assemblage just east of BANWR (AZ DD:7:19[ASM]). It is on an alluvial bajada immediately below the San Luis Mine and was likely associated with early American mining activities in the area. The Albatross Mine (AZ DD:7:28[ASM]) is a patented claim at the southern end of the Las Guijas Mountains overlooking the Canada del Toro drainage. This site consists of a tunnel and shaft, a mine pulley, a house foundation, and a dug-out feature. The last site is the abandoned remnants of an ore processing mill used for the Las Guijas mines (AZ DD:7:29[ASM]). This site is depicted on a variety of maps, including a 2004 *Arizona Atlas & Gazetteer*.

Two other sites are related to the development of Sasabe, an important community vicinity that lies just adjacent to the southwest corner of the wildlife refuge and serves as an international port of entry. Rancho de la Osa (AZ DD:10:3[ASM]) is located west of Sasabe and was an important Mexican-American ranch. The site was poorly documented in 1961 but states that it was part of the 1812 Ortiz Brothers Spanish land grant and bought by cattle baron William Sturgis in the late 1800s after the Gadsden Purchase. It became a guest ranch in 1921 and continues in operation as such to the present day. The townsite of Sasabe also has an AZSITE form (AZ DD:10:3[ASM]) and, like Rancho de la Osa, this form was completed in the 1960s. Still used as a port of entry, the Sasabe inspection station is listed on the National Register of Historic Places under the Multiple Property Documentation Form, U.S. Border Inspection Stations (NRHP MPDF No. 64501205).

RESOURCES DEPICTED ON GENERAL LAND OFFICE SURVEY PLATS

General Land Office (GLO) survey plats offer an important way to determine the presence of cultural resources within specific township and ranges. Buenos Aires NWR covers most of five township and ranges (T19S, R9E; T20S, R9E; T21S, R9E; T21S, R8E, T22S, R8E) and small portions of eight others (T18S, R9E; T19S, R7E; T19S, R8E; T19S, R10E; T20S, R8E; T21S, R10E; T22S, R9E; T23S, R8E). Of these 13 township and ranges, 10 have GLO survey plats available from the Bureau of Land Management's GLO website (www.glorerecords.blm.gov). Of the available plats, nine date to 1888, whereas two others, including a partial resurvey of T21S and R9E, date to 1910.

Table 3 enumerates the kinds of cultural resources depicted on the historic plats for Buenos Aires and immediately adjacent areas. What is striking is the abundance and variety of resources found on them. Resource types include houses, ranch complexes, fences, windmills, water harvesting and other related features, corrals, windmills, trails, and roads and road complexes, among others. Importantly, many of these houses or ranch complexes are named. For instance, the Buenos Ayres Ranch in T21S, R9E, and the Garcia House and corral in T22S, R8E are depicted; the Espinosa House and the Taylor House complex in T19S, R9E; Sacundino House and Martinez House in T20S, R9E; the M.R. Wise House in T21S, R8E; Mrs. Wilbur's House and corral, the Suares building, St. Louis Ranch House, P.R. Tully

Table 3. Historic Properties Depicted on General Land Office Survey Plats

Township & Range (Year)	Historic Property Description	Section(s)
T19S, R8E (1888)	Road complex	13, 21–27, 36
T19S, R9E (1888)	Espinosa House	3
	Post & wire fence of A. Hemme (appears to enclose ranch land)	2, 3, 10, 11, 14, 15, 22, 23, 27, 28, 33, 34
	Trail	12
	Charco	22, 23
	Taylor House & agriculture land	27
	Road complex	<i>throughout</i>
T19S, R10E (1888)	Old Trail	7
T20S, R8E (1888)	Road “to Arivaca”	24, 25
	Road “from Altar to Tucson”	36
T20S, R9E (1888)	Sacundino House, agriculture land & brush fence, and charco	8, 17
	“Large pile of stones”	16
	Martinez House (two buildings depicted)	24
	Road complex	<i>throughout</i>
T21S, R8E (1888)	M.R. Wise House	23
	Large charco adjacent to M.R. Wise House	22
	Buenos Ayres Ranch (2 buildings)	27
	Charco	36
	Road complex	<i>throughout</i>
T21S, R9E (1888)	Mrs. Wilbur’s House & corral (2 buildings, 1 corral)	11
	“Suarez” building	13
	Huacheta Springs & Pump	19
	St Louis Ranch House	20
	P.R. Tully House	28
	“House”	33
	Ramon Carrillo Home, corral, & old ditch	34
	Manuel Otero House & well	35
	Road complex	<i>throughout</i>
T21S, R9E (1910) partial resurvey	Wright House	13
	R. Paul House	13
	Unidentified structure	13
	Corral	13
	Well	24
	Adobe	24

Township & Range (Year)	Historic Property Description	Section(s)
	Roads to Arivaca & Buenos Ayres	13, 24
T21S, R10E (1910)	Arivaca Mill & Pumphouse, 2 shacks, unidentified house, Miguel Eguirrola House, Wm. Earle House, 2 fencelines, 2 trails, road complex (Buenos Ayres-Arivaca)	19
	Unidentified house, F. Moreno House, multiple fencelines, USMM No. 5, road complex	20
	Arivaca, 3 unidentified houses, mill, well, N.W. Bernard House, corral, brush fence, multiple fencelines, field, road complex	28
	Dr. Ball House, well, unidentified house, fenceline, road complex	29
	Road, trail	30
T22S, R8E (1888)	Bueno Vista Ranch House	7
	Windmill	7
	Nicholas Garcia House & corral	15 & 22, 16 & 21
	Road complex	throughout
T22S, R9E (1910)	Stone wall	6
	Road complex	throughout (Sections 6, 7, 18, 19, 30, 31)

House, Ramon Carrillo Home and complex, and the Manuel Otero House in T21S, R9E; the Wright House and R. Paul House in T21S, R9E; the Arivaca Mill and Pumphouse complex, F. Moreno House, the townsite of Arivaca, and the Dr. Ball House in T21S, R10E; and, lastly, the Buena Vista Ranch House in T22S, R8E. Roads to various places are depicted criss-crossing through these plats; indeed, most exhibit complex road networks through various portions of them. For instance, the roads *to Arivaca* and *from Altar to Tucson* are depicted in T20S, R8E; the *Road to Arivaca and Buenos Ayres* is depicted in T21S, R9E and T21S, R10E; and road complexes are depicted in portions of seven GLOs (T19S, R8E; T20S, R9E; T21S, R8E; T21S, R9E; T21S, R10E; T22S, R8E; T22S, R9E). The former roads may well depict the Aguirre brothers early stage route through the valley. Other miscellaneous features include a large pile of stones, charcos, the Huacheta springs & pump, an unidentified structure and an unidentified adobe, and a stone wall.

What is important is that the Altar Valley was home to a relatively large number of homesteads and ranches by the 1880s. Some of the depicted resources have names that are Spanish in origin, whereas others are English. Moreover, various ranching related features are present in the area, in particular those associated with water harvesting. Finally, by the 1880s there was an extensive trail and road system that connected these people to each other and to various communities further away, like Arivaca and Tucson.

NATIONAL REGISTER OF HISTORIC PLACES

All federal agencies are mandated to evaluate cultural resources under their authority to the National Register of Historic Places (NRHP). There is an incredibly diverse array of cultural resources and historic properties throughout the United States. These are typically codified as either prehistoric or

historic archaeological sites, architectural buildings and structures, or districts that may incorporate one or more of these resource types. Moreover, individual objects can be evaluated for NRHP inclusion (e.g., Abraham Lincoln's iconic stove-pipe hat), as well as near-historic resources that are important in understanding the broad patterns of U.S. history (e.g., Cold War facilities). The purpose of the NRHP is to document:

the appearance and importance of districts, sites, buildings, structures, and objects significant in our prehistory and history. These properties represent the major patterns of our shared local, state, and national experience (USDI 1995:i).

As such, the NRHP serves as the nation's inventory of historic places and the repository of documentation for cultural resources that are deemed significant as a part of our national heritage.

Criteria

To be considered eligible for the NRHP, a cultural resource must possess the requisite quality of integrity (see below) as well as meet particular significance criteria identified in 36 CFR 60.4 (USDI 1995:2):

The quality of significance to American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, material, workmanship, feeling, and association, and:

- (A) That are associated with events that have made a significant contribution to the broad patterns of our history; or
- (B) That are associated with the lives of persons significant in our past; or
- (C) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (D) That has yielded, or may be likely to yield, information important in prehistory or history.

Prehistoric sites most often qualify for National Register consideration under Criterion D. In other words, sites that have the potential to address research themes and related questions identified as important to the understanding and interpretation of prehistory (in most cases at a local and/or state level) would be considered eligible for the NRHP. It is more difficult to justify the significance of prehistoric sites under Criteria A and B, because there is no way to know if the site was associated with an important prehistoric event or events (Criterion A), and for obvious reasons with a significant prehistoric individual (Criterion B). Furthermore, Criterion C usually applies to the built environment, not intentionally discarded debris like prehistoric artifacts; however, Native American rock art sites may be eligible under this criterion for their artistic values. Historic sites typically qualify for the NRHP under any of the four significance criteria.

Integrity

In addition to the above criteria, a site must possess enough integrity to convey its historic importance or significance (USDI 1995:44). Integrity is usually evaluated in terms of seven different aspects or characteristics: location, design, setting, materials, workmanship, feeling, and association. Evaluating integrity can often be subjective, but it must be based on a property's physical

manifestation at the time of its nomination and these relate to its historic significance. Determining which aspect or aspects of integrity are important requires knowing about a property's thematic importance, its geographic place, and its chronological importance. Definitions of each of the abovementioned seven aspects of integrity are as follows (USDI 1995:44–45):

- Location: is the place where the cultural resource was constructed, used, or where an historic event occurred;
- Design: is the combination of elements that create the form, plan, space, structure, and style of a cultural resource;
- Setting: is the physical environment of a cultural resource;
- Materials: are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration;
- Workmanship: is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory;
- Feeling: is a property's expression of the aesthetic or historic sense of a particular period of time;
- Association: is the direct link between an important historic event or person and a historic property.

How Resources Get Listed on the National Register of Historic Places

In order for any given resource to be placed or rather *listed* on the National Register, there are a number of processual steps that must be accomplished. First, the resource, whether that be an object, a historic property with built features, or an archaeological site, must be documented in some fashion. In Arizona, this typically means recording the resource using an Arizona State Museum site card or form, and this must be done in a manner consistent with the State Historic Preservation Office standards. Moreover, if a public agency oversees the land on which the resource is located, the documentation must also be in compliance with that particular agency's standards, in this case, the U.S. Fish & Wildlife Service.

Next, the property must be evaluated for its eligibility to the NRHP under the four abovementioned criteria. Its integrity must also be determined using the seven aspects that have just been defined. While this information is placed on a resource site card or form, the evaluation is typically done within the body of a larger technical report that presents the results of a larger undertaking. However, a property may be evaluated individually in a separate Determination of Eligibility or DOE report. Regardless, the reason or reasons why a property is evaluated as either *Eligible* or *Not Eligible* is presented in detail and this is coupled with an evaluation of resource integrity.

This report is then presented to the agency which oversees the land on which a property resides, again, in this case it would be the U.S. Fish & Wildlife Service. A review of the report, and the reasoning behind a given resources NRHP evaluation, is made by an agency Historic Preservation Officer (HPO), for Buenos Aires NWR, this reviewer would be the Southwest Region Historic Preservation Officer. The HPO then makes an official determination about whether a resource is eligible, not eligible, or if it remains unevaluated to the National Register, and then seeks concurrence from the SHPO. If, at this point, a resource is determined eligible to the National Register with concurrence from the SHPO, it can then be nominated to the NRHP.

The nomination of an object, individual property, or district can be accomplished by anyone. However, the nomination must be processed on an official National Park Service Form that can be obtained online at the following website address: www.nps.gov/subjects/nationalregister/index.html. In addition, there are a number of downloadable National Park Service Bulletins that provide assistance and guidance in the completion of the nomination form. Importantly, there are three major types of nominations, one for individual properties, one for districts that incorporate multiple properties, and one for thematically similar properties that are non-contiguous.

Once a nomination form is complete, it is sent to the appropriate HPO, again, at Buenos Aires this would be the Southwest Region HPO. The agency HPO then ensures that the form has been completed appropriately before sending it to the State Historic Preservation Officer or SHPO for approval. Once the SHPO approves the nomination, the agency HPO then submits the nomination to the Keeper of the National Register of Historic Places for review and approval. It is important to keep in mind that review of any nomination is an iterative process, that is, if any of the above historic preservation officer believes that a nomination is incomplete, it is returned to the author for further work and emendation. Once approved by the Keeper, the resource then becomes listed on the National Register of Historic Places and the approved documentation becomes the official record of its specific importance to the nation. To date, there are no resources on Buenos Aires National Wildlife Refuge listed on the NRHP; however, based on this Cultural Resources Overview, there are many that deserve to be.

CHAPTER 6.

Research Summary & Management Recommendations

DATA GAPS & FUTURE RESEARCH DIRECTIONS

The archaeological record that has been documented, to date, at Buenos Aires NWR is one that is primarily prehistoric in affiliation. Even more so, it is one that reflects the latest prehistoric cultural tradition, the Hohokam. Only a small number of sites hint at the presence of Archaic mobile foragers, groups experimenting with an agricultural lifestyle before the Hohokam, and O'odham. The historic record is one that is abundant but known mostly through the written record. With several exceptions, notably Aguirre Lake, Garcia Ranch, and the precursor to SR 286, little archaeological or architectural documentation is readily available for the ranches, ranching facilities, trails, roads, and mines that are the physical manifestations of historic Euroamerican activities. Based on the previous chapters, a number of research agendas can be offered for the wildlife refuge: (1) Archaic, Early Agriculture, and other prehistoric sites that cannot be affiliated with the Hohokam; (2) Santa Margarita Wash and Thomas Wash Hohokam sites; (3) Hohokam platform mounds; (4) Tohono O'odham use of Altar Valley; and (5) a historic resources/built environment inventory and documentation. It is important to recognize that the five proposed domains by no means exhaust the research and data collection potential of the archaeological and historic record at BANWR, rather they are offered as themes that serve as the very beginnings of orienting compliance (NHPA Section 106) and research (NHPA Section 110) projects.

Archaic, Early Agriculture, and Unaffiliated Prehistoric Sites

To reiterate, most of the archaeological record documented on the national wildlife refuge is affiliated with the Hohokam Tradition. However, there are a small number of sites that hint at the presence of Late Archaic/Early Agriculture populations, as well as other kinds of resources used more sporadically by prehistoric and ethnohistoric groups. General questions relevant to them all are: What are these resources?; Where are they located?; What are their specific cultural and temporal affiliations?; What do they tell us about Native American life over deep time? Essentially, this research agenda seeks to fill in data gaps about archaeological resources on the wildlife refuge that are generally less visible than the more well studied Hohokam.

There are at least two sites believed to be Late Archaic/Early Agricultural base camps or habitations and both are positioned in unique topographic positions on the landscape. One is located in Brown Canyon on the west side of the Baboquivari Mountains (AZ DD:2:58[ASM]) and the other is in the middle of Altar Valley (AZ DD:7:60[ASM]) near the conjunction of Altar, Puertocito, Las Guijas, and Shaffer Washes. Two other unaffiliated sites, one along Puertocito Wash (AZ DD:7:45[ASM]) and the other along the margin of the Pozo Verde Mountains (AZ DD:6:118[ASM]), are highly suggestive of a Late Archaic/Early Agricultural limited activity occupation, that is, sites that are used in some way for resource exploitation or processing.

Comprehensive inventory and comparative analyses of these four sites should be accomplished. This work should include detailed documentation of all features and, if possible, subsurface tests to determine the presence of subsurface deposits and the possibility of information-rich ecological data.

The artifact assemblages should either be sampled or completely analyzed in the field. The results of this descriptive work will produce a better profile of what these hard to identify sites look like in this part of Arizona and to help archaeologists conducting inventory better recognize them. Importantly, these sites can now be placed in a much better behavioral context as a result of findings at the Late Archaic/Early Agricultural communities of Las Capas and Los Pozos found along the Santa Cruz River near Tucson (see Chapter 2).

The abovementioned sites highlight another important data gap in the BANWR archaeological record. There is little if any evidence of populations that pre-date around 1500 BCE, in particular, Paleoamericans and Early to Middle Archaic people. A famous dictum in archaeology is that ‘absence of evidence is not evidence of absence’. The most important research goal, at this point, would simply be to determine if this absence of evidence is really the case. Did these early mobile foraging peoples avoid the Altar Valley? Did they simply pass through it on their way to better habitats where important familial relationships and mating networks were present? This may well be the case for Paleoamericans where research throughout the Desert West has shown that archaeological sites generally tend to be located along lakes, marshes, and permanent streams. The same may not be true for Early and Middle Archaic people who experienced changing environmental conditions, including the desiccation of water sources and the arid middle Holocene, and were experimenting with mobility strategies and subsistence practices (i.e., annual rounds, wide-spectrum foraging).

Other resources and anecdotal cultural resource evidence obtained by wildlife refuge staff suggest that other aboriginal land-use practices took place on BANWR. For instance, Site AZ DD:7:15[ASM] is a prehistoric rhyolitic schist quarry on the western edge or foothills of the San Luis Mountains. This kind of a site indicates that in some places on the refuge toolstone was available as an abiotic resource. Although use of toolstone quarries is variable and dependent on a wide variety of factors, like flaked stone quality, package size, group mobility, proximity to habitats, etc., it begs the question if there are other such resources on the refuge, as well as their specific characteristics and distributions across the landscape.

Another important resource that has been documented only on an anecdotal basis is rock art. No resources of this kind have been officially documented and made readily available through AZSITE. Over the years, however, refuge personnel have occasionally obtained cultural resource information while conducting other work. This is true for rock art. What appears to be a very large site, the so-called Garcia Petroglyph Site, is located in the somewhat rugged terrain on the southeastern portion of the wildlife refuge west of the San Luis Mountains. These data show that this particular site is around 400–500 m in diameter. Other similar data suggests that there is at least one other rock art site in the same geographic area. Importantly, rock art resources that are the size of the Garcia Petroglyph Site are almost always used over a long period of time, generally from the Archaic and through the Formative Period. Oftentimes, they are also used by ethnohistoric people who have ancestral ties to the landscape and are fully aware of their presence. Because rock art requires a specific rock for use as an adequate medium, and because Buenos Aires is primarily located on the floor of a broad alluvial valley, rock art sites should not be very common.

Santa Margarita Wash and Thomas Wash Hohokam Sites

In 2009, archaeological survey was conducted in a 5,261-acre parcel on the floor of Altar Valley west of the valley’s two axial channels, Puertocito Wash and Altar Wash (see Chapter 5, Table 1 and Figure 23). The inventory parcel included land immediately adjacent to Santa Margarita and Thomas Washes,

both of which are fed by the watershed of the Baboquivari Mountains and debouch into the two abovementioned axial drainages.

A large number of Hohokam affiliated sites are present in the vicinity of Santa Margarita and Thomas Washes and lie west of the bluffs that overlook the larger Puertocito and Altar drainage system (see Chapter 5, Table 2, Figure 25). Unfortunately, inventory work did not make specific chronological determinations for the phase or phases for which each site corresponds. It may be that the largest sites were used over multiple phases, whereas smaller sites represent short-term fieldhouses or limited activity stations used only during a single phase.

Regardless, these sites have a number of important characteristics ideal for research. First, they are two cultural resource clusters or concentrations positioned in similar physiographic positions; presumably, the concentrations represent the same kinds of behavioral phenomena. Second, it is unclear why these concentrations are positioned in this topographic position, whether that be to access *ak chin* farm land, as previously described for the ethnohistoric Tohono O'odham, or for some other function. Third, because the chronology is poor, it is not clear whether each concentration represents some form of community at some specific point in time or rather represent long-term and repeated use of the landscape by a limited number of people? Fourth, if these concentrations represent two separate communities composed of discrete kin-groups, how did they interact with each other and, in addition, were they tied to larger villages somewhere else in the Hohokam world?

Hohokam Platform Mounds

It is clear from the prehistoric setting (Chapter 2) that Hohokam trash or platform mounds played an important role in the civic life of communities from early on. This is because at relatively large residential sites the Hohokam began to purposefully deposit their trash in specific locations and, over time, these trash deposits were capped and used as small-scale topographic nodes where civic activities took place. Sedentary Period use of capped trash mounds is exemplified by the ones at the center of Snaketown. Later, during the Classic Period, these are enlarged and can contain residential suites, presumably for elite kin-groups. Pueblo Grande along the Salt River exemplifies this kind of feature. It is also clear that there was an important functional evolution regarding these features, from the simple segregation of trash on large habitation sites, to important civic features, to residences that were at the center of Hohokam semi-aggregated communities. Of the 54 Hohokam archaeological sites documented on BANWR, four contain trash or platform mounds (AZ DD:2:58[ASM], AZ DD:6:19[ASM], AZ DD:63[ASM], AZ DD:6:81[ASM]).

There are a number of interrelated research questions that can be raised about these features and the Hohokam communities that called the Altar Valley home. These questions focus on their chronological, morphological, and functional development over time. At a minimum, the sites need to be more precisely dated and this can be accomplished by ceramic seriation; ideally, the features themselves should be dated in this same fashion. Coupled with the question of chronology is whether construction sequences can be discerned for each feature. This kind of work is normally accomplished by examining one or more excavated profiles. Taken together, both these endeavors conducted in concert could determine their ages, construction and development, and morphological characteristics. Larger questions relate to whether the BANWR mounds fit standard developmental and morphological patterns or particular ranges of variability or if they represent some variant or anomaly. The BANWR mounds' geospatial position in the periphery of the Hohokam World suggests that they may have significantly greater variation than those found along the Salt and Gila Rivers.

It is also important to evaluate each feature's spatial provenance, both in terms of its intrasite relationships, and in terms of its relationship to contemporaneous sites nearby. In other words, were these features used only by people at a specific site or were they also used by people living at nearby habitations?

Tohono O'odham Use of the Altar Valley

Whereas the ethnographic literature contains a good deal of information about O'odham use of the Baboquivari Mountains and the Santa Cruz River Valleys, there is practically no information about their use of Altar Valley. If anything, the impression elicited from this material is that Altar Valley served as a friendly and permeable frontier between the semi-sedentary Tohono O'odham, who practiced floodwater farming, and the sedentary Sobaipuri O'odham who practiced irrigation farming. Later, during the period of Apache depredation, ca. 1690 to 1870, the Altar Valley appears to have served as a frontier no-man's land between the Tohono O'odham and the Apache (see Wegener 2002, Gilpin and Phillips n.d.). The Altar Valley as a frontier between ethnographic peoples is currently supported by the kinds of resources recorded on Buenos Aires which only hint at O'odham use. With the exception of one habitation site on the margins of the San Luis Mountains (AZ DD:7:18[ASM]) and an informal cemetery in Arivaca Wash (AZ DD:7:26[ASM]), the presence of the Tohono O'odham are distinguished by a small number of artifact scatters that are identified by their distinctive pottery.

The problem is that this characterization may not be true. The prehistoric record shows that the Hohokam used Altar Valley relatively extensively, perhaps as a place for *ak-chin* farming. It may also have been a place where the Tohono O'odham practiced their semi-sedentary lifestyle as highlighted in the previous chapter. The springs and permanent streams that emit from the west side of the Baboquivari Mountains may well have been a good place for their winter residences (their *well* or *post* residences), whereas the valley floor near the major axial drainages of Puertocito and Altar Washes may have been used for summer farming residences (their *farm* residences). Buenos Aires could very well hold an important early record of Tohono O'odham settlement and subsistence practices and one that may extend back in time to their prehistoric antecedents.

Historic Properties Inventory and Built Environment Documentation

Narrative histories of the Altar Valley and lands associated with Buenos Aires NWR have been developed but only a few of the cultural resources that are physical manifestations of the Euroamerican historical record have been documented. Having said that, one important research direction would be to initiate a comprehensive inventory of historic-period properties on the wildlife refuge. The information provided in the two previous chapters would be an appropriate starting point from which to begin such an inventory (see Chapters 4–5). Knowing the kinds of resources that are present on refuge land would allow managers (and others) to understand what historic themes these properties are related to, the kinds of data each may contain, and what kinds of research questions each one may be able to address.

An inventory of this kind should include basic descriptive information using ASM site cards or Arizona SHPO architectural documentation forms. There also needs to be an assessment of each property's overall condition and integrity, so that recommendations about long-term preservation can

be offered. Preservation recommendations are important to help guide management decision-making. These kinds of recommendations typically indicate the following categories for use: in-situ preservation, monitoring, maintenance/repair, public interpretation, recreation, and/or research. Importantly, an inventory of this type should evaluate each property's eligibility for NRHP inclusion, thereby allowing future work to be focused on priority assets, rather than spending time, money, and energy on those that hold little historic significance. Initiating such an inventory would fill in a very big data gap in the wildlife refuge's cultural resources program.

Some of this work has already begun. For instance, a project is currently being organized with the National Park Service's Historic Preservation Training Center to partially restore and stabilize the Baboquivari School House at Pozo Nuevo Ranch (personal communication: David Siegel, 10-16-2018). Also, an historic evaluation of El Cazador, an old ranch building, will be conducted in the near future under Section 106 of the National Historic Preservation Act (see below) (personal communication: David Siegel, 11-26-2018).

MANAGEMENT RECOMMENDATIONS & CONCLUDING REMARKS

The purpose of this cultural resources overview is to contextualize the kinds of archaeological and historic properties present on Buenos Aires National Wildlife Refuge. Another purpose is to summarize the kinds of investigations that have taken place therein, whether that be inventory, data recovery, architectural documentation, or otherwise, and the results of that work as it pertains to the archaeological and historic properties record. The goal is to understand the kinds of resources present on the wildlife refuge and how they are connected to and exemplify in some fashion important geographic, thematic, and temporal events in human history. Accordingly, the overview identifies the kinds of research domains that are relevant to these resources and the kinds of data they are likely to hold. In that way, properties that are documented in the future can be appropriately placed within this larger framework and streamline their evaluation for National Register inclusion.

If cultural resources are found that lay outside of expected geographic, thematic, or temporal events, they can be recognized as either unique or anomalous, or representing phenomena associated with other important themes and/or temporal events. As an example, there is no narrative or documentary evidence that sixteenth century Spanish explored the Altar Valley in any significant way, that is, like Coronado's expedition; however, the finding of in situ sixteenth or seventeenth century Spanish artifacts would contraindicate these expectations and open up a whole new line of historic and archaeological inquiry.

The mission of national wildlife refuges is to protect and preserves America's lands and ecosystems, along with the fish, wildlife, and plants that live within them. Their main function, therefore, is not the documentation, protection, and promotion of cultural resources that lie within the confines of a refuge. Despite this, the U.S. Fish and Wildlife Service like all federal land management agencies are mandated to do just that under the National Historic Preservation Act of 1966 or NHPA (as amended). The most important sections of this Act as it pertains to managing cultural resources are Sections 106 and 110.

Section 106 of the National Historic Preservation Act

Section 106 of the NHPA directs the head of any federal agency having direct or indirect jurisdiction over a proposed federal or federally-assisted undertaking to take into account the effects of that undertaking on cultural resources (i.e., district, site, building, structure, or object). In particular, this pertains specifically to those resources that are listed, or eligible for listing, on the National Register. The agency must complete Section 106 review before the expenditure of funds is approved or before the issuance of federal authorization for the undertaking. Federal agencies have the statutory obligation to fulfill the requirements of Section 106.

Practically speaking, how this works is that before any given undertaking, the federal agency will conduct an inventory of all cultural resources within a specified area of potential effect (APE) and identify those resources that are listed or are eligible for listing on the National Register of Historic Places. This inventory can be conducted internally by the federal agency or the agency can contract with a private firm that employs specialists who meet the Secretary of the Interior Standards for such work. A report is then produced that summarizes how the inventory was conducted, its results in terms of the numbers and kinds of resources identified and makes recommendations about which of those resources are eligible to the NRHP. At the same time, project-specific management and protection measures for NRHP-eligible resources are stipulated. Once this has been accomplished, the agency must then get concurrence on these findings from the State Historic Preservation Officer before the undertaking can proceed. Today, most cultural resources found on public lands are documented as a result of the Section 106 process.

Section 110 of the National Historic Preservation Act

Section 110 of the NHPA directs the heads of all federal agencies to assume responsibility for the preservation of cultural resources that are owned or controlled by them. Where possible, these resources should be used in ways that further the mission of the agency. Also, each federal agency shall establish a preservation program for the identification, evaluation, and nomination of resources under their charge to the NRHP, and for their protection. There are other portions of Section 110 of the NHPA but for all intents and purposes it establishes historic preservation programs as a part of land management agencies like the U.S. Fish & Wildlife Service.

It is through Section 110 that many federal preservation programs undertake activities not mandated by regulatory compliance as stipulated in Section 106. For instance, the development of this cultural resources overview is authorized by this section of the Act. Specialized historic preservation education programs, like archaeological field schools, also fall under the authority of this section. The nomination of important districts, sites, structures, buildings, or objects to the National Register are usually undertaken as part of a preservation program's Section 110 obligation. This is to say that the activities undertaken under Section 110 are not necessarily accomplished by regulatory compliance, but rather are accomplished to promote historic preservation of important cultural resources as an end in itself.

Management Recommendations

This technical report has sought to summarize all readily available information about cultural resources and historic properties on Buenos Aires National Wildlife Refuge but there has been no discussion of its cultural resources and preservation program. That being said, there is no active

heritage program on-site at the refuge. In an ideal world there would be a part-time or full-time archaeologist dedicated to developing such a program and managing the refuge's heritage resources. However, given the relatively small size of the refuge at roughly 117,500 acres or 183.5 square miles, this seems impractical. For instance, USDA Forest Service ranger districts that encompass land masses many times greater than BANWR are fortunate to be overseen by a single person and oftentimes one cultural resources specialist will oversee two districts. But there are more wildlife refuges in southern Arizona than just Buenos Aires and as development and recreation continues to increase in the area, there may come a time when it makes economic and managerial sense for the Fish & Wildlife Service to have a *zone archaeologist* duty-stationed at one of these refuges that would manage several of them in the general area. This person would participate in interdisciplinary teams that develop and oversee undertakings, direct Section 106 compliance efforts, conduct Section 106 work on small-scale projects, while creating cultural resources inventory needs assessments for the larger ones, as well as promoting Section 110 preservation activities.

This review has also presented in summary form the properties formally documented and available through Arizona State Museum's on-line cultural resources database AZSITE. Based on this information, it appears that the overall level of baseline archaeological documentation for sites and other properties is relatively low or at least uneven. This is highlighted by two salient characteristics. One is the number of cultural resources anecdotally recorded by resource staff at the refuge but not formally documented by specialists. The other is the fact that there are abundant Hohokam affiliated prehistoric sites, but the temporal affiliation is only known in the most general sense. An important recommendation, therefore, is that the refuge seek to enhance its baseline documentation of archaeological sites following modern recordation protocols like those established by ASM/SHPO and other federal land management agencies that hold much larger land masses (i.e., Bureau of Land Management, Forest Service, National Park Service).

One way to do this at small cost and effort is to seek university-based archaeological and historic investigations on its properties. Winter and spring field schools offered by any of the community college or university institutions in the state could readily revisit previously recorded archaeological sites and bring them up to current documentation standards. Since many of these sites were recorded before the 1990s and 2000s, they need to be revisited as to assess their condition and evaluate them in terms of NRHP inclusion. In addition, such field schools could document the anecdotally recorded resources known to be present on the refuge. Of course, there could also be more site-specific and intensive work completed, like testing archaeological deposits or the partial excavation of sites. To ease the monetary burden, these programs might be accomplished at sites that are likely to be impacted by a development or undertaking. Moreover, programs that focus on architectural history could do the same kinds of things with the historic built environment. These kinds of activities do not necessarily have to be limited to institutions of higher education. State supported or regionally recognized organizations, like the American Rock Art Research Association, could be invited to record, for instance, the abovementioned Garcia Petroglyph Site or other known rock art sites that have limited or no formal recording. In terms of resource protection, the refuge should seek to involve the Arizona Site Stewardship Program whereby the public is given a role in monitoring important archaeological and historic sites over time (see www.azstateparks.com/arizona-site-stewards-volunteer-program/).

It is clear that important cultural resources are present on the refuge, but that information does not seem to be available to the public. There are several ways that this could be remedied. One would be to include more information on the refuge website about these resources, their meanings, and

preservation activities. Right now, this website presents information limited to Pedro Aguirre, Jr. and the historic cattle industry. A more enhanced series of web pages could include information about any number of interesting topics. For instance, there could be a webpage that discusses the Hohokam and includes immediately relevant information about the Santa Margarita and Thomas Wash ‘community clusters’ and the presence of civic platform mounds at a number of sites on the refuge. Another topic would be to present information about the role of Altar Valley with regards to the various tribal groups in the historic period, that it may have served as a frontier between them in the 1700s and 1800s, but this may not have been true in the 1500s and 1600s. Another way to promote public interest and enhance their knowledge about the refuge’s history is to develop interpretive signs and panels showcasing particular resources like Aguirre Lake or highlighting important subjects like the Baboquivari Mountains, the Tohono O’odham settlement system, or the mining districts in the Las Guijas and San Luis Mountains. A step further would be to develop interpretive historic trails or travel routes through the refuge that highlights it as a Native American and Euroamerican landscape. None of these suggestions are particularly labor intensive and, for the most part, involve only one-time small to moderate expenditures of time and capital.

Beyond these recommendations, the refuge should seek to prioritize its heritage assets and determine which ones should be nominated to the National Register of Historic Places. The Baboquivari School House at Pozo Nuevo is a good example of a building that should be nominated. With increased documentation, the Santa Margarita and Thomas Wash Hohokam ‘communities’ could be nominated as a district. It is probable that the Buenos Aires Ranch, as well as other similar historic ranches and their associated features, still contain enough information whereby they all may fall under a multiple property listing, like William Collins’ *Cattle Ranching in Arizona, 1540–1950* (2002). Of course, nominating properties to the NRHP requires the highest standard of documentation that properties across American can achieve, but nonetheless Section 110 of the NHPA directs federal agencies to do just that.

Concluding Remarks

The purpose of this volume has been to summarize in narrative form how people throughout time used the Altar Valley and the lands associated with Buenos Aires National Wildlife Refuge. Historic contexts and cultural resource overviews are by their nature multidimensional and include a body of thematically, geographically, and temporally linked information whereby archaeological sites and historic properties are understood and their historic meaning, as well as their significance, is made clear. This naturally incorporates a body of smaller-scale investigative and larger-scale synthetic work that covers major temporal and geographic trends that go beyond the geographic confines of the refuge, but these larger trends are exemplified in the cultural resources present on the land that composes Buenos Aires. As such, this particular volume is meant for both the interested lay reader curious about how human events have shaped this unique landscape, as well as the professional seeking to understand how specific cultural resources and historic properties fit into the larger framework of human history.

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