Quitobaquito
Organ Pipe Cactus National Monument

FINAL

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Cultural Landscape Report

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TABLE OF CONTENTS

Part Two

LIST OF FIGURES

CHAPTER 1

CHAPTER 2

LIST OF TABLES

EXECUTIVE SUMMARY

REPORT ORGANIZATION

This Cultural Landscape Report is organized according to guidance set forth in Page et. al. (1998), *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques.* The report introduction provides a summary of the project, scope of work, a landscape description including the boundaries of the project site, research methodology and key findings. Part One focuses on documentation of the project site including a historical overview of Quitobaquito, a summary of landscape existing conditions and an evaluation of the role that current landscape features play in the site's significance. Part Two of the report provides an overview of prior National Park Service (NPS) and Organ Pipe Cactus National Monument (ORPI) guidance documents as they impact policy and management of the Quitobaquito landscape. Part Two includes general and specific treatment recommendations for the cultural landscape.

PROJECT HISTORY

Staff from the NPS contacted the University of Arizona (UA) Heritage Conservation program, which partners with the NPS through its Cooperative Ecosystem Studies Units (CESU) program, in the spring of 2020 about a project to prepare a Cultural Landscape Report for Quitobaquito. A Cultural Landscape Inventory (2011) had been previously prepared by another park partner. Beginning in September 2020 and ending in February 2024, the UA Principal Investigator and Landscape Architecture graduate student conducted historical research and field work to document the landscape and prepare recommendations. Field work was conducted in March and November of 2021, March and November of 2022, and April of 2023. Monthly remote meetings were held with NPS staff at ORPI and the Intermountain Regional Office in Santa Fe. A meeting to discuss the project with tribal partners was held in July 2022. Tribal partners will review the final draft report in the fall of 2023. NPS staff provided written comments on three report drafts and will review the final draft in the fall of 2023. The final report will be presented to the NPS in February 2024.

STUDY AREA

Quitobaquito is located in the southwestern corner of Organ Pipe Cactus National Monument along the US/Mexico border. The landscape, as defined in this report, includes natural features, wildlife, plants, archeology sites and human constructed features. The landscape contains an O'odham cemetery and sites and features of traditional, cultural use and importance. Due to its proximity to the border, the area has been impacted by Department of Homeland Security operations. Quitobaquito contains several active springs, manmade drainage channels, an earthen dam, and a large spring fed pond. The site is open to park visitors who use several planned and social trails to, around and above the pond. A road leads to a parking lot near the pond.

BACKGROUND

As one of only a few sources of perennial water in the region, Quitobaquito has long been a destination and stop for travelers. Archeological evidence indicates human presence near Quitobaquito between 8,000-10,000 BCE. Indigenous people, Spanish missionaries, explorers, and Mexican and European settlers have lived and visited the Quitobaquito landscape over the millenia. Quitobaquito came under federal management when Organ Pipe Cactus National Moment was created in 1937. The last Hia C'ed O'odham family to live at Quitobaquito left in 1957 under pressure from the NPS. The natural landscape has been extensively modified by people including the creation of irrigation canals from the springs, the construction of a dam to create the pond, the planting of a fruit tree orchard and agricultural fields, the building of dwellings, corrals and commercial operations. Remants of traditional trails, including trails used by the O'odham to collect salt from the Gulf of California, are found in the landscape. After the NPS began to actively manage the Quitobaquito landscape, above ground evidence of human occupation, other than the dam and drainage channels form the springs was intentionally dismantled. Today, the pond and surrounding area contain several endangered species. The landscape continues to be an important place for the O'odham people.

PROJECT OBJECTIVES

The purpose of this project was to complete a Cultural Landscape Report (CLR) for Quitobaquito. The CLR provides a synopsis of landscape features and provides a set of landscape treatment options that will assist the NPS in managing the Quitobaquito landscape to retain its historic integrity into the future. Any management actions will require the usual National Environmental Protection Act and National Historic Preservation Act reviews as this document is not part of those processes.

KEY FINDINGS

The Quitobaquito cultural landscape district is eligible for listing on the National Register of Historic Places under Criterion A as a place of occupation and visitation for thousands of years with human presence at the springs dating to at least 9000 BCE. Quitobaquito is also eligible under Criteria D (Potential to Yield Information) due to its importance in archeology and ethnography. Landscape features such as the springs, irrigation channels, pond, dam, remnant orchard, cemetery, and archeological sites contribute to the significance of the landscape. While many historical features such as adobe structures, fencing, and grinding stones were removed by the NPS in the 1960s, Quitobaquito contains the history, stories, traditions, and ancestors of the O'odham people and should be considered for future listing as a traditional cultural place. It is recommended that management of the site balance protection of endangered species, wilderness values, recreational opportunities, and cultural traditions.

CHAPTER 1: INTRODUCTION

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Project Summary

The National Park Service (NPS) completes many projects each year through partnerships with educational institutions in its Cooperative Ecosystem Studies Units (CESU) program. The NPS Regional Office in Santa Fe contacted the Heritage Conservation program at the University of Arizona, Tucson, to engage University staff and students in the creation of a Cultural Landscape Report (CLR) for Quitobaquito. The project, which began in September 2020 and ended in February 2024, involved the research and review of primary and secondary sources of information about Quitobaquito, Organ Pipe Cactus National Monument (ORPI), and the larger region. Six visits to Quitobaquito and ORPI were undertaken to conduct field work. Field work involved taking measurements, recording GPS coordinates of notable features, inventorying and photographing plants and built and natural features, and meeting in person with NPS staff. The project team (NPS staff and UA faculty and graduate student) met virtually each month throughout the project to report on new developments and progress in the preparation of the CLR. Several rough drafts of each report section were submitted for review to NPS staff and revisions were completed as a result. The final report reflects the work of the UA team with feedback from the NPS, its tribal partners and the State Historic Preservation Office.

Scope of Work

This Cultural Landscape Report (CLR) examines Quitobaquito within the defined boundaries of a cultural landscape. The report documents the development and use of the Quitobaquito landscape from pre-contact to the present day and analyzes existing landscape features which contribute to the significance of the landscape. The CLR provides treatment recommendations for the cultural landscape to maintain its integrity and significance and to meet the management objectives of the National Park Service.

As stated in A Guide to Cultural Landscape Reports, the report should be “a flexible document, the scope of which is determined by the needs of park management, type of landscape, budget, and staffing requirements” (Page 1998, 82). This CLR:

- Describes the physical evolution of the cultural landscape and provides a baseline of information for the development of a treatment approach.
- Documents the existing conditions of the landscape including identification of character defining features.
- Creates treatment strategies for the preservation and rehabilitation of the cultural landscape of Quitobaquito.

Research for the CLR included a review of primary and secondary sources of information about Quitobaquito, Organ Pipe Cactus National Monument, and the *Papaguería*. Field work was undertaken on numerous occasions to document the landscape features and conditions. The

CLR builds on previous landscape inventories conducted for a Cultural Landscapes Inventory for Quitobaquito (2011 and 2002).

Landscape Overview

Quitobaquito is a cultural landscape and the name, as it is used here, refers to the entirety of that landscape: the spring-fed pond formed by a manmade dam, the natural springs, and the larger landscape within the boundaries defined in the report. Quitobaquito is located in the far southwest quadrant of Organ Pipe Cactus National Monument (ORPI) along the US-Mexico border (Figure 1-1). The Monument is located within the Basin and Range physiographic province in the Sonoran Desert ecosystem, one of the most arid regions in the United States. Rainfall averages about 9 inches in ORPI (Ferguson et al. 2019) with huge variability from year to year. Rainfall is typically bimodal with gentle winter rains and heavy summer monsoon storms. Recorded temperatures have ranged from a low of 14° as high as 116° F (Bryan et al. 1983). Since 1949, the average temperature in ORPI has increased by 2 degrees across all seasons and overnight lows and daily highs (Reistad, acc 2021). The biodiversity of the Sonoran Desert is rich with 350 species of birds, 20 amphibians, 100 reptiles, 20 fish and 2,000 native plants (Nabhan 2000). The Monument was created by executive order by President Franklin Delano Roosevelt in 1937 and was designated a Biosphere Reserve by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1976.

Figure 1-1 Quitobaquito context map

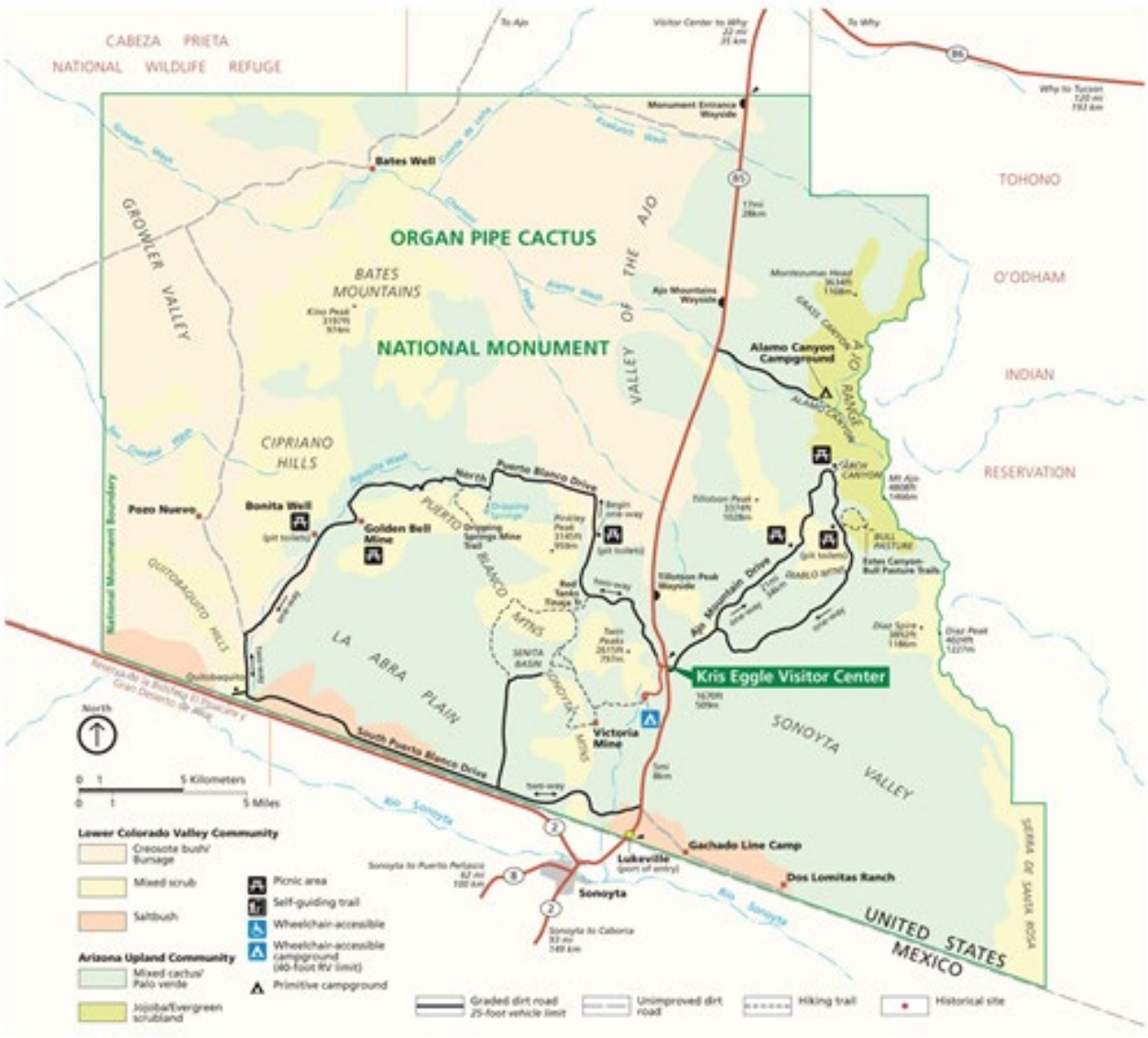

Figure 1-2 Organ Pipe Cactus National Monument

Quitobaquito is located about 12.5 miles northwest of Lukeville, Arizona in Pima County, 118 miles southwest from Tucson, Arizona and 75 miles northeast of Puerto Peñasco, Sonora, Mexico. The Quitobaquito Hills lie to the northwest. At its eastern end is the La Abra Plain, a broad, approximately 100-square mile alluvial fan that originates from the Puerto Blanco Mountains to the north. The landscape lies within the northern part of the Rio Sonoyta Watershed, with its drainages flowing south to the Rio Sonoyta River in Mexico (Figure 1-2).

Hydrologic studies indicate the presence of six springs in the area. According to Zamora et al. (2020), the water source likely originates from a couple of different sources, one locally through groundwater recharge as well as regionally, from the Sonoyta River aquifer by way of a proposed fault system. Water emerges at Quitobaquito through a series of fissures in the rock.

The flow from two springs was redirected by the National Park Service (NPS) to feed the pond. Three additional intermittent springs can be found in the vicinity but do not contribute flow to the pond. In a natural state, the springs would support a *cienega* or marsh.

The site has been a destination for indigenous inhabitants, settlers, and travelers for thousands of years as it is one of only a few perennial water sources in the area. The earliest evidence of human use or habitation at Quitobaquito springs dates to the Archaic period beginning around 9000 BCE (Ferguson 2019; Rankin 1995). Archaeologist Adrianne G. Rankin's surveys suggest indigenous people have lived and traveled through the area that is now ORPI since the first human presence in the Sonoran Desert, 12,000 years ago. Quitobaquito has also served as a crossroads for Spanish, Mexican, and Anglo-Europeans since at least Father Eusebio Francisco Kino's visit in 1698.

Quitobaquito can be considered a Traditional Cultural Property due to its long and ongoing association with the cultural practices, traditions, beliefs, and lifeways of the indigenous people of the Sonoran Desert, specifically the O'odham and their ancestors. Indigenous people have sought the resources of the Quitobaquito oasis for subsistence and to carry out traditional cultural and religious practices for millennia. The site continues to hold importance to the O'odham people for ritual and ceremonial purposes.

Federal management of the Quitobaquito area began with the designation of a 60-foot strip of land for public activities related to securing the international border in 1907, now referred to as the "Roosevelt Reservation" (RR). In 1923, President Coolidge established Quitobaquito pond and the surrounding quarter acre as a federal water reserve. In 1935, Chief of Southwestern Monuments, Frank Pinkley, was directed by the NPS to conduct a survey of the area to draw boundaries for the creation of a new national monument. On April 13, 1937, ORPI was created through Executive Order by President Franklin D. Roosevelt. Human habitation ended at the site in 1957 when Jim Orozco[1], the last remaining Sand Papago (Hia C'ed O'odham) was paid by the federal government to vacate his property (Orsi 2017).

Site Boundaries

Determining the unit boundaries of Quitobaquito as a cultural landscape is a challenging endeavor because one must include all the diverse elements of this remarkably unique desert oasis and consider how people experienced this place over thousands of years. The O'odham people still visit Quitobaquito to gather plants, visit their cemetery, conduct ceremonies, and pray (Orsi 2017). The landscape boundary contains natural features such as the springs, rock outcroppings, edible and medicinal plants, and viewsheds. It also contains a diversity of cultural

[1] Historical documents use the spelling "Orosco" for the family name. However, the family's descendants prefer the spelling "Orozco" (Anderson, Bell, and Stewart, 1982). Document titles and photos that were originally labeled with the spelling Orosco were preserved but other mentions use the Orozco spelling.

features. These include archeological sites such as gravesites, paths and trails, trail markers; and constructed features such as the pond, dam, irrigation ditches and agricultural fields. While features such as archeological sites are easier to define, the spatial distribution of vital plants gathered for food and medicine is dynamic and more difficult to encapsulate within a border.

The Quitobaquito cultural landscape was historically connected to the land south of what is now the US/Mexico border. Quitobaquito is linked hydrologically to the watershed of the Rio Sonoyta in Mexico; and the people, animals and water once moved freely between the river and the springs (Zamora et al. 2020). At present, the historical memory of a connected bi-national landscape has largely been lost. Natural and cultural features have not been intentionally preserved on the Mexican side of the border. Mexico Federal Highway 2 cuts through the traditional landscape. While many natural and cultural features remain on the U.S. side of the border, the United States constructed a 30' tall border wall between the two nations adjacent to the cultural landscape, and a dirt road for border control activities runs along the north side of the wall. The border wall, border road, and Mexican highway impact both the visual quality and connectivity of the site and artificially divide the northern portion of the Quitobaquito cultural landscape from the land to the south. For purposes of this cultural landscape report, the southern boundary of the Quitobaquito cultural landscape site follows the international border; however, it does not reflect the true traditional cultural landscape extent.

This CLR defines the Quitobaquito landscape as generally bounded to the east at Aguajita wash adjacent the designated Wilderness boundary, to the north by Quitobaquito Hills, and is truncated to the south by the international border between the United States and Mexico. It includes contributing features associated with precontact and historic use. The site area is larger than what was described in the 2002 Cultural Landscape Inventory (CLI), which received NPS Superintendent but not SHPO concurrence, leaving it in an incomplete status. The expanded boundary includes archeological sites near Aguajita wash as well as the cemetery on the slopes of Quitobaquito Hills. The cemetery was classified as part of the discontiguous areas in the CLI but is included as part of the one contiguous area in this CLR. The rationale for doing this is twofold. Firstly, these sites appear to be connected to the overall Quitobaquito landscape by contributing features such as plant resources and viewsheds as well as by archeological sites. Secondly, the areas in between the springs and the cemetery would have been part of the lived experience of Quitobaquito and not separate from it. The boundary also includes trail segments associated with the historical practice of the O'odham salt pilgrimage and O'odham route to Bates Well. These trail segments are linear archeological sites that make up larger travel corridors. The travel corridors extend outside the boundary of this cultural landscape. For the purposes of this CLR, the trail corridor contributes to the Quitobaquito Cultural Landscape as the springs were a primary reason for the trail terminus location. Trail segments outside of the boundary can be considered adjacent lands that contribute to the significance of Quitobaquito.

The boundary begins to the southeast just east of Aquajita wash at the international border at 31.93870 degrees latitude and -113.0139 degrees longitude; it follows Aquajita wash to the north-northwest for approximately 2,430 feet where it crosses to the west of North Puerto Blanco Drive at 31.94707 degrees latitude and -113.01169 degrees longitude. From here, the boundary continues parallel to the road on the west side for approximately 2,663 feet at 31.95249 degrees latitude and -113.01166 degrees longitude where it begins to curve to the west. From this point, it climbs to the top of a ridgeline of Quitobaquito Hills for approximately 720 feet 31.95306 degrees latitude and -113.01429 degrees longitude. The boundary continues along this ridge above Burro Spring, trending to the west-southwest for approximately 2,700 feet at 31.95063 degrees latitude and -113.02252 degrees longitude. From this point the boundary descends the ridgeline, curving to the south-southwest and arrives at a wash in approximately 690 feet at 31.94940 degrees latitude and -113.02380 degrees longitude. At this point, the boundary traverses the slope on the west side of the wash trending south and slightly west until entering the main wash in approximately 1,600 feet at 31.94575 degrees latitude and -113.02661 degrees longitude. From here the boundary heads south for approximately 690 feet where it reaches the U.S. Mexico border at 31.944185 degrees latitude and -113.02776 degrees longitude. The boundary follows the international border until it reaches the starting point at 31.93870 degrees latitude and -113.0139 degrees longitude.

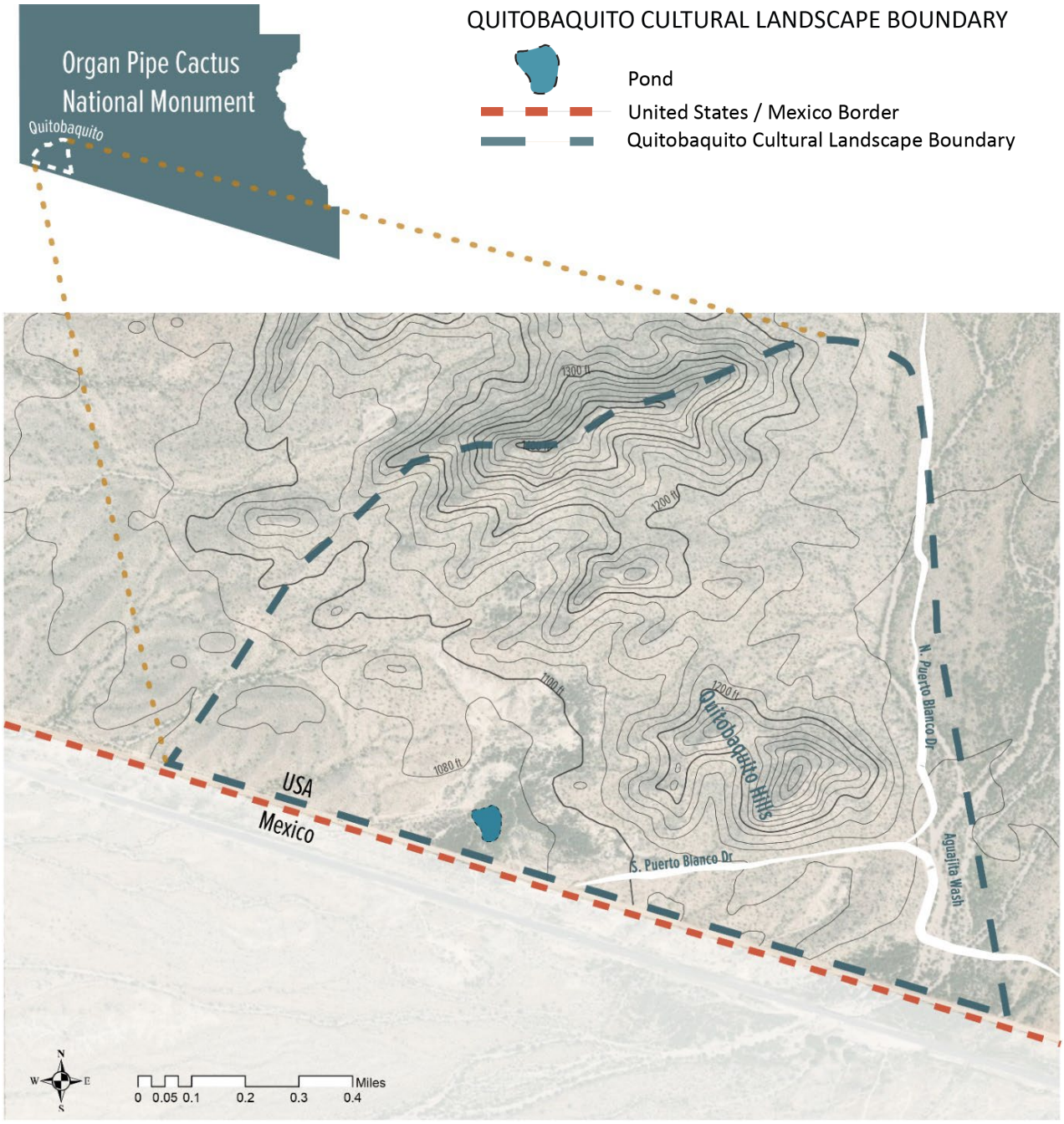

Figure 1-3 Quitobaquito site boundary map

Methodology

The CLR was created in accordance with A Guide to Cultural Landscape Reports: Contents, Process, and Technologies (Page 1998). Historical research was conducted with materials obtained from the ORPI files, the Western Archeology and Conservation Center (WACC) in Tucson, Arizona, materials available through other federal agencies such as US Fish and Wildlife Service and published materials available through the University of Arizona Libraries and online

sources. Additional information was obtained directly from conversations with NPS staff in the Resource Management office.

Field work was conducted by the two authors on numerous occasions during the project. Field work involved conducting an inventory and photographic record of features, identifying condition issues, and taking measurements when needed. NPS staff accompanied the team on several occasions.

Treatment recommendations were developed by reviewing existing management documents for Quitobaquito and the park as a whole and reviewing treatment strategies as defined in the A Guide to Cultural Landscape Reports. A virtual meeting was held in July 2022 with tribal individuals, including one employee of the Tohono O'odham Nation (TON) Tribal Historic Preservation Office and a TON member also representing the Hia C'ed Hemajkam LLC to elicit perspectives on future management of the landscape. In addition, another TON member, and Hia C'ed O'odham elder provided comments in writing to the team.

Key Findings

The Quitobaquito cultural landscape is eligible for inclusion on the National Register of Historic Places as a district under Criterion A as a place of occupation and visitation for thousands of years with human presence at the springs dating to at least 9000 BCE. Quitobaquito is also eligible under Criteria D (Potential to Yield Information) due to its importance in archeology and ethnography. Landscape features such as the springs, irrigation channels, pond, dam, remnant orchard, cemetery, and archeological sites contribute to the significance of the landscape. While many historical features such as adobe structures, fencing, and grinding stones were removed by the NPS in the 1960s, Quitobaquito contains the history, stories, traditions, and ancestors of the O'odham people and should be considered a traditional cultural place. During the early years under federal administration, Quitobaquito was managed primarily for its natural resource values to the exclusion of its important cultural and historical values. Preservation is the recommended treatment strategy going forward irrespective of prior approaches to the treatment of the landscape. It is recommended that management of the site balance protection of endangered species, wilderness values, recreational opportunities, and cultural traditions. A coordinated approach to management of Quitobaquito is required to reach this important balance.

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CHAPTER 2- LANDSCAPE HISTORY

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Introduction

Quitobaquito has been a destination for temporary and permanent settlement and a stopover for travelers for thousands of years due to a reliable source of water in an otherwise parched environment. The springs that feed the constructed pond are fed by groundwater under the La Abra Plain to the east (Orsi 2017). In addition to the two main springs, three intermittent springs are found near the Quitobaquito pond but do not flow into it. People have spent time, traveled through, or used the resources of Quitobaquito since at least 8,000 to 10,000 BCE (Rankin 1995). Quitobaquito habitation continued through the 1950s until the last resident, Jim Orozco, left the Monument in 1957. The federal administration of Quitobaquito began in 1937. The following is a brief summary of the use and occupation of the area.

Prehistoric and Protohistoric Period

Archeological surveys conducted in ORPI have identified material culture traditions from the southwestern Archaic (9500 BCE-150 CE), Hohokam, Patayan, and Trincheras ceramic period cultures (300-1400 CE), Protohistoric groups (1450-1700 CE), and the O'odham people (Hia C'ed O'odham and Tohono O'odham) in the historic period (1700-1960 CE when the Orozco family left Quitobaquito) (Rankin 1995). Figure 2-1 illustrates the distribution of major prehistoric cultural traditions in the ORPI region during the ceramic period. Surveys conducted in and around Quitobaquito and nearby Aguajita Wash region (ORPI 1977B, 1977C, 1977D, 1978A, 1979B, 1979C, 1980B, 1985A, 1988A, 1990E, 1991D) resulted in the identification of precontact and historic cultural resources.

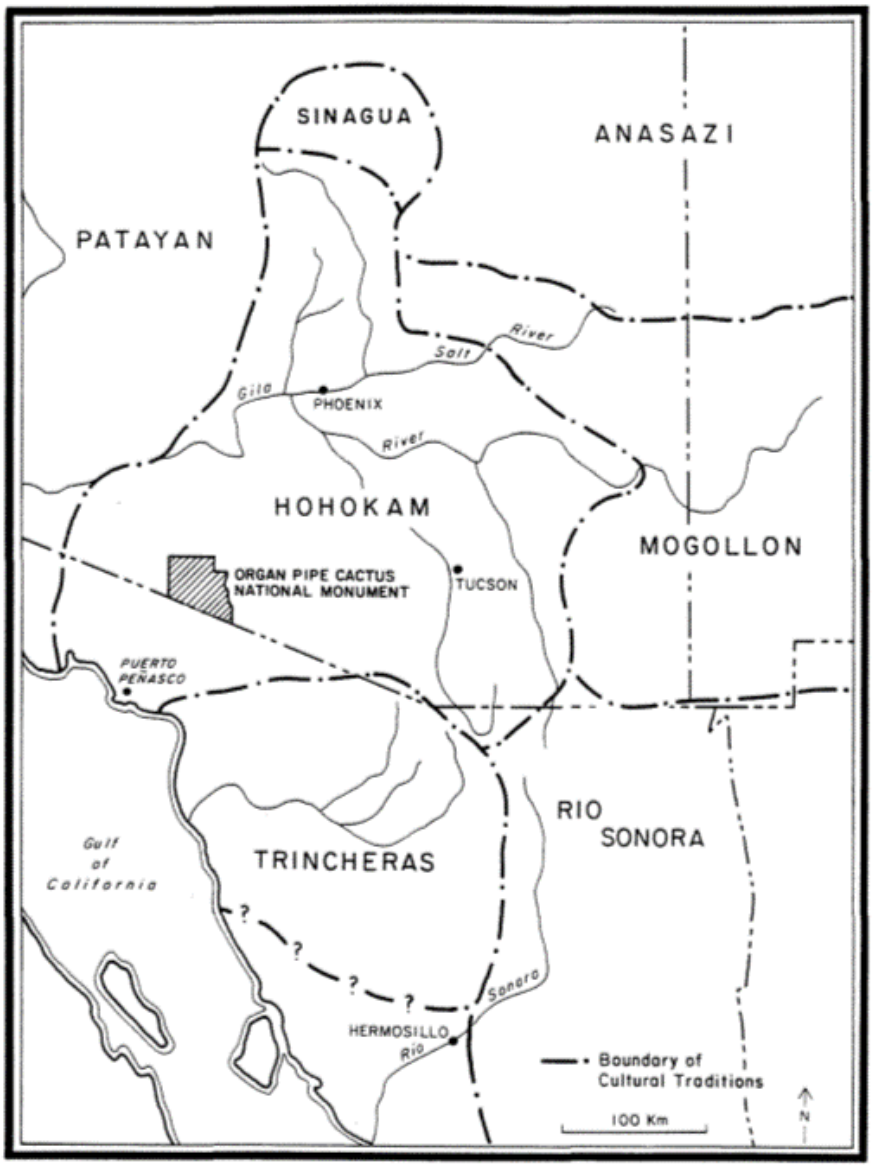

Figure 2-1 Distribution of Major Prehistoric Cultural Traditions in Arizona and Northern Sonora, Mexico (Reprinted from Rankin 1995)

Paleoindian Tradition

As reported by Rankin (1995), San Dieguito I period artifacts were apparently identified by archaeologist Julian Hayden near an extinct spring in the vicinity of Quitobaquito and may place human presence there between 8,000 to 10,000 BCE. However, "the San Dieguito I phase may have been contemporaneous with the better recognized and better-known Clovis tradition" which dates from 13,600-12,800 years ago (Ferguson 2019, 7). Clovis sites have been found to the east and south of ORPI, and Clovis points have been collected in the Cabeza Prieta National Wildlife Refuge and Barry M. Goldwater Range to the west. The climate of the Sonoran Desert during this time period supported oak, pine and juniper woodlands and associated large

mammals. As the climate changed at the end of the era, subsistence activities shifted to hunting smaller animals and foraging desert plants (Ferguson 2019).

Archaic Tradition

The Archaic tradition spans the period from about 9000 BCE to approximately 150-200 CE. The post-Pleistocene period saw the emergence of new settlement patterns, trade systems and greater dependence on plants for food (Ferguson 2019). Evidence exists that crops were cultivated, including maize, squash, beans, and gourds, with the assistance of irrigation canals in the Late Archaic period around 2100 BCE in the Tucson area and in northern Sonora (Carpenter, Sánchez, and Villalpando 2005, Diehl 2005; Mabry 2005; Merrill et al. 2009). Evidence of use throughout ORPI during all Archaic periods has been documented in the form of archeological sites consisting of surface artifact scatters and features include “sleeping circles or cleared areas, rock rings, and roasting pits.” (Rankin 1995, 1).

Ceramic Period

The Early Ceramic period begins about 200 CE. Evidence of three, archeologically defined Ceramic period cultural traditions have been found in ORPI, that of the Patayan, the Hohokam, and the Trincheras. Across the Southwest region this period is characterized by larger settlements with pit houses, canal-based agriculture, and the use of pottery (Rankin 1995; Ferguson 2019).

The Patayan tradition is an archeologically defined material culture that manifests for over a thousand years over a large geographic distribution. Early Patayan material culture dates to around 700 CE and progresses well into the historic era. Patayan sites and artifacts are found in western Arizona, southern California, southern Nevada, and Baja California (Ferguson 2019). The distribution of Patayan material culture overlaps with the historic distribution of the Yuman language indicating a connection between the ancestral Patayan material culture and Yuman-speaking people (Archaeology Southwest 2021). Researchers believe that Patayan communities created both seasonal encampments in upland environments and permanent, long-term settlements along major waterways such as the Colorado and Gila Rivers (Archaeology Southwest 2021). Sleeping circles outlined with stone cobbles, roasting pits, trails and associated shrines, and intaglios are defining features of the Patayan culture. No exclusively Patayan sites have yet been discovered in ORPI, although Patayan ceramics have been identified within archeological sites across the Monument (Rankin 1995).

The Hohokam and Patayan communities were likely socially and economically highly connected as evidenced by pottery distribution and similarities in petroglyph iconography; especially north of ORPI in the Gila Bend area (Archaeology Southwest 2021). “By AD 1000, Patayan groups had begun to reside next to or even integrate into existing Hohokam communities in the Gila Bend and Phoenix Basins. At contact, the lower Gila was a multicultural landscape in which riverside

villages were inhabited by Cocomaricopa and Opa (historic Patayan groups) and O'odham (descendent Hohokam)" (Archaeology Southwest 2021).

The Hohokam developed a recognizable material cultural identity in the Southwest from 450 to 1450 CE (Fish and Fish 2007). The Hohokam culture in Arizona is characterized as a regional system with the core area in the Salt-Gila Basin and outlying communities across southern Arizona. Hohokam subareas in the Tucson Basin, Upper Santa Cruz, San Pedro, Safford, Tonto Basin, Upper Verde, Agua Fria, Gila Bend, and lower Sonoran Desert had an economic relationship with the core area of the Salt-Gila Basin as evidenced through the distribution of ceramics (Rankin 1995). Hohokam ceramics were identified in all areas surveyed within ORPI by Rankin (1995) and her team. In the Salt and Gila River areas, Hohokam settlements were large with complex social and political systems (USDOI, NPS Hohokam Culture). Hohokam settlements were often organized around monumental architecture, first ball courts, followed by platform mounds, where the rituals and beliefs of the community were enacted (Fish and Fish 2007). A prominent feature of the Hohokam cultural tradition is this expansive network of irrigation canals. Water was used to irrigate a variety of crops including beans, squash, corn, tobacco, agave, corn, and edible grasses. The Hohokam also gathered fruits, buds and seeds from trees, shrubs and cacti and hunted rabbits, other small animals, deer, and bighorn sheep (Ferguson 2019, Fish and Fish 2007).

Ceramic period sites within ORPI are different than those in central and other parts of southern Arizona, although they frequently contain Hohokam ceramics and were likely occupied by people representing this material culture. These sites seem to represent seasonal subsistence patterns which may have included *ak-chin* (floodplain) farming on alluvial plains during the summer rains and winter settlements located near perennial water sources in mountain foothills and canyons during the winter (Rankin 1995). Rankin notes that there is evidence that some settlements, such as at *Kuakatch* in ORPI, may have been occupied year-round. Fish and Fish (2007) note that Hohokam settlements in the area are often filled with shell fragments and shell powder from cutting and polishing shells collected from the Sea of Cortez. Hohokam communities throughout Arizona utilized shells for various products, including jewelry and traded these goods throughout the Southwest. These communities were likely nodes in a wider network that included the transport and trade of shell. Trails located through ORPI are the physical manifestation of this ancient network and were used "for trade and ritual activities since time immemorial" (Ferguson 2019, 1).

Trincheras material culture was largely contemporaneous with Hohokam culture and was located primarily in northern Mexico in the Altar and Magdalena River valleys with sites extending into southern Arizona (Arizona State Museum). The Trincheras material culture tradition as ascertained from sherds found in southern Arizona indicate a date range from 800-1100 CE (Johnson 1963). Trincheras ceramics have been identified in Classic period Hohokam

sites within ORPI but not much is known about the local relationship between Trincheras and Hohokam culture (Rankin 1995; O'Donovan 2002).

Historic and Modern Periods

While Coronado's expedition in 1540 CE into the American Southwest is seen as the beginning of the historic period in the region, local cultures likely had little contact with Europeans until the arrival of Father Eusebia Francisco Kino, a Jesuit missionary, in the late 17th century (Altschul and Rankin 2008; Rankin 1995; Zepeda 1985). The Spanish used the term Pimas and Papagos for two distinct cultural groups they encountered and named the area of southwestern Arizona the *Papaguería* after the Papagos. The *Papaguería* includes the area west of the Santa Cruz River and east of the Colorado River, north of the Gulf of California and south of the Gila River (Orsi 2017).

The O'odham people were documented by the Spanish as occupying the *Papagueria* region at least since the 17th and 18th century (Rankin 1995). Five groups of O'odham were described during this period. The Akimel O'odham or River People (Pima) lived along the Gila, San Pedro, and Santa Cruz Rivers to the east and north of ORPI. They lived in small villages near rivers and farmed the flood plains and riparian areas. To the east were the Sobaipuri O'odham who lived in the San Pedro valley. The Sobaipuri relocated to Santa Maria Soamca and the Tucson area by the end of the 18th century due to hostilities with the Apaches (Ferguson 2019). The Hia C'ed O'odham or Sand People (Sand Papago) inhabited the western-most portion of the *Papaguería* and were historically migratory, seasonally revisiting temporary camps while hunting and gathering within their home territory. The area between the Sobapuri and the Hia Ce'd was occupied by the Tohono O'odham or Desert People (Papago) who alternated village locations seasonally (Ferguson 2019). The area that is now ORPI was used primarily by the Hia C'ed O'odham and Tohono O'odham (Rankin 1995). Spanish expeditions in the 17th century, including that of Father Eusebia Francisco Kino, identified O'odham living along the *Camino del Diablo* west of Quitobaquito (Nabhan et al. 1982; Ferguson 2019). Figure 2-2 illustrates the geographic distribution of these groups.

Similarities in the oral traditions of the O'odham indicate a common origin story and illustrate potential points of convergence with the Hohokam culture (Bahr 2007). According to Gumerman (2007), "Although Spaniards encountered only village farmers in seventeenth-century southern Arizona, the historical continuity between their descendants in the region today, the O'odham, and the more complexly organized Hohokam cannot be denied" (146). Today the O'odham self-identify as descendants of the Hohokam culture and continue to engage in similar customs and rituals.

Figure 2-2 Traditional O'odham lands
(Reprinted with permission from Native Land Digital)

Hia C'ed O'odham

The Hia C'ed O'odham people were traditionally engaged in semi-nomadic hunting and gathering. Rankin (1995) reports that their area of occupation stretched from the Bates and Growler Mountains west to the Colorado River, south to the Gulf of California and north to the Gila River, and that they ranged over a wide territory throughout the western *Papagueri*a. Their original territory was centered on the Sierra Pinacate in northern Sonora. Seasonally occupied camps and villages were established and repeatedly occupied at reliable water sources such as springs and *tinajas* (natural rock tanks) including at Quitobaquito (*A'al Waippia*) (Ferguson 2019). In addition to *'A'al Waippia*, Hia C'ed O'odham villages included Sonoyta and *Wak* (Quitovac) in Mexico, *Moik Wahia* (Ajo), Wellton, Arizona, *Juni Ka:ck* (Bates Well) and Dome, Arizona. On the northwest side of Quitobaquito is a large mountain called *Winum Do'ag* (The Desolate Mountain) where an old village was located (Bell et al. 2017). Several of the elder Hia

C'ed O'odham interviewed by Bell in "We Are from the Sand: Fillman Bell's Interviews of Hia-Ced" (Bell et al. 2017) identified Dome or the Dome Valley as the place where the "Sand Indians" came from.

Residents of the *rancheria* of '*A'al Waippia* at Quitobaquito self-identified as the Hia C'ed O'odham by the mid- to late-1800s. Fillman Bell et al. (1980) report in their oral history collection that the Hia C'ed O'odham inhabited Quitobaquito from at least the late 19th until the mid-20th century although the O'odham have stated that they have always been the guardians of Quitobaquito (Lauren Kingston, personal comm.). It is thought that the Hia C'ed O'odham were driven from their primary *rancheria* in the Sierra Pinacate around 1850 due to illness, lack of access to water, and agitation by the Mexican military and that they shifted their population to the Quitobaquito area at that time (Dobyns 1954, Anderson et al. 1982). An Indian Agent, Charles Poston, reported the presence of "250 Sand Papagos" at Quitobaquito in 1863 (Bell et al. 2017).

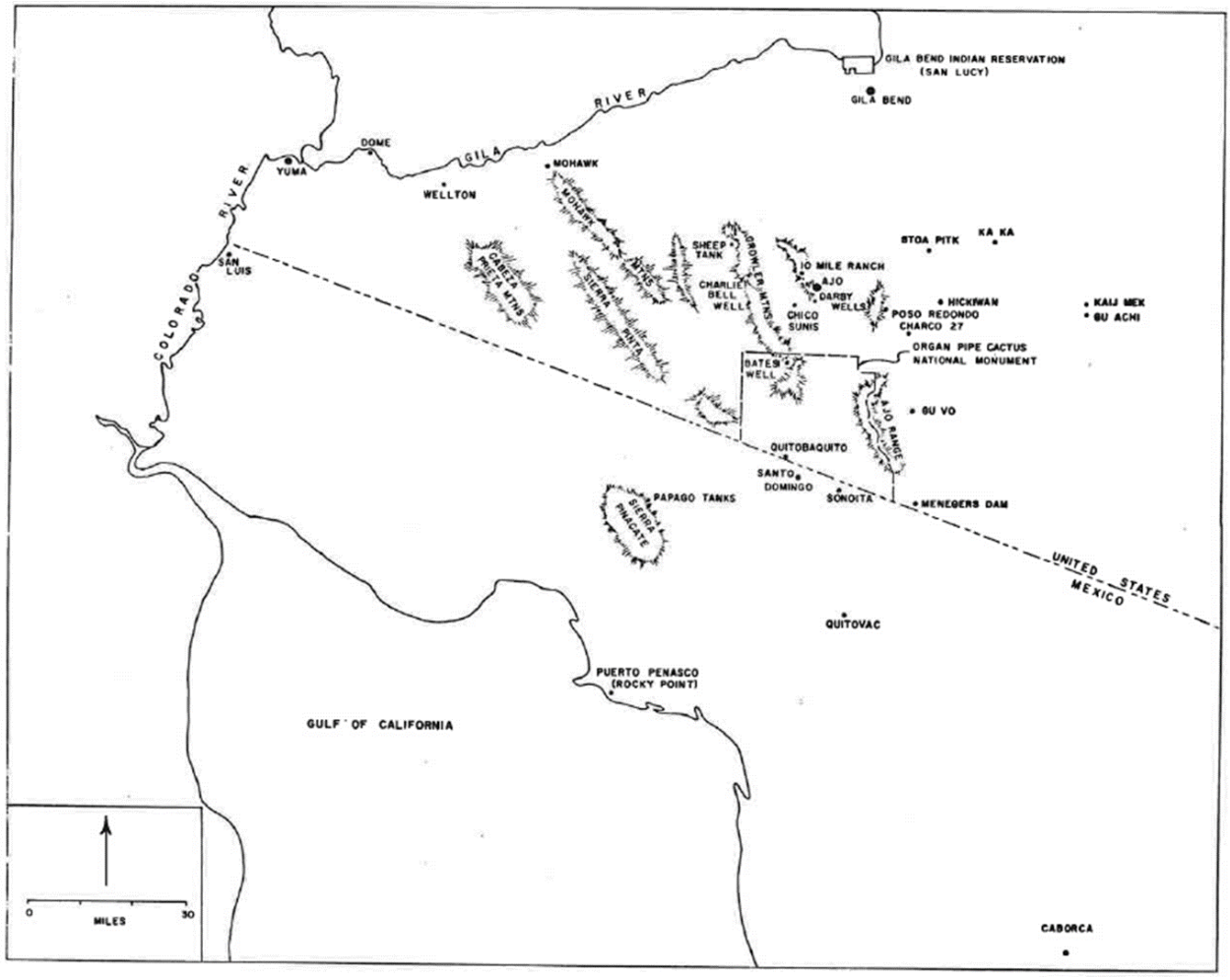

Figure 2-3 Sand Papago territory and surroundings (reprinted from Bell, Anderson, and Stewart 1980)

Quitobaquito appears to have been on the eastern edge of the Hia C'ed O'odham territory and events of the 18th and 19th centuries influenced their movement in and out of the area. These events included Mexican-American conflict, struggles between ethnic and political groups over control of the Western *Papaguería*, Anglo exploration and settlement, mining activities and disease. According to Bell, "Quitobaquito was probably never a major Sand Papago settlement, but it became one of their last refuges" (Bell 1980, 8).

Hia C'ed O'odham had been recorded as living at Quitobaquito since 1855. The first individual known to be living there was Juan José (or José Juan) Garcia and his two sons in the period between 1860-1890. The reason they left is unclear and it appears they relocated to Bates Well. Juan José was ultimately buried at the Quitobaquito cemetery and was the patriarch of one of the two families associated with the cemetery. The second family with lineage associated with the cemetery at Quitobaquito was that of Luis Orozco who began living near Quitobaquito in 1887. Luis' son, José Juan Orozco, lived there until his death in 1945. José Juan's son, Jim, was the last inhabitant of Quitobaquito and left in 1957 after the government purchased his water right and requested his relocation (Bell, 1980).

Luis Ortega, his wife, and other Hia C'ed O'odham resided at Quitobaquito between 1885-1889. Mexican outlaw Cipriano Ortega's threats drove them into Mexico where they camped about one quarter mile from Quitobaquito. Once Ortega left Quitobaquito, many Hia C'ed O'odham returned to the springs. An 1896 boundary survey reported "Sand Papago" living near the springs and a report by anthropologist W.J. McGee in 1900 observed two adobe houses and six "native huts" near the pond (Bell 1980).

In 1907, the Carnegie expedition reported three men of Anglo-European descent, Thomas Childs, Jr, Rube Daniels, and John Merrill, living at Quitobaquito with their O'odham wives. Tom Childs married Martha Garcia, the granddaughter of José Juan Garcia. Rube Daniels married Viviana Orozco, also a granddaughter of José Juan Garcia. John Merrill married Thomas Garcia's daughter, Maria. A map drawn up in 1913 entitled, "Proposed Quitobaquito Indian Reservation" shows multiple dwellings at the springs and in 1914-1915, approximately 25 people from four O'odham families living at Quitobaquito growing alfalfa (Bell 1980).

By 1920, most Hia C'ed O'odham had left Quitobaquito to find work (Orsi 2017). Only José Juan Orozco's family remained. By 1950, the Orozco family had constructed a one room adobe building, a double room adobe house, a saguaro rib house, a grinding mill, two corrals, and 3200' of ditches to move water from the springs to the pond, to the residence and to agricultural fields in Mexico. They tended thirty pomegranate trees, nine of which were in Mexico, eight fig trees, melons and corn, and cottonwood trees (Orsi 2017). The Orozco family cultivated as many as 80 acres and grazed cattle in the vicinity of Quitobaquito. They were informed in 1941 by the ORPI Superintendent, William Supernaugh, as well as agents from the Sells Papago Agency that they would not be allowed to construct additional buildings, hunt animals, or gather wood without permission, activities in which the family engaged for decades.

In 1945, José Juan Orozco died and was buried at the Quitobaquito cemetery and his son, Jim, took over the property. In 1948, a border fence with a gate was constructed which divided Orozco's cultivated fields. In 1957, Orozco was asked by the NPS to vacate his property at Quitobaquito and was paid $13,000 for his 160-acres of land and water rights, ending his family's occupation there (Orsi 2017).

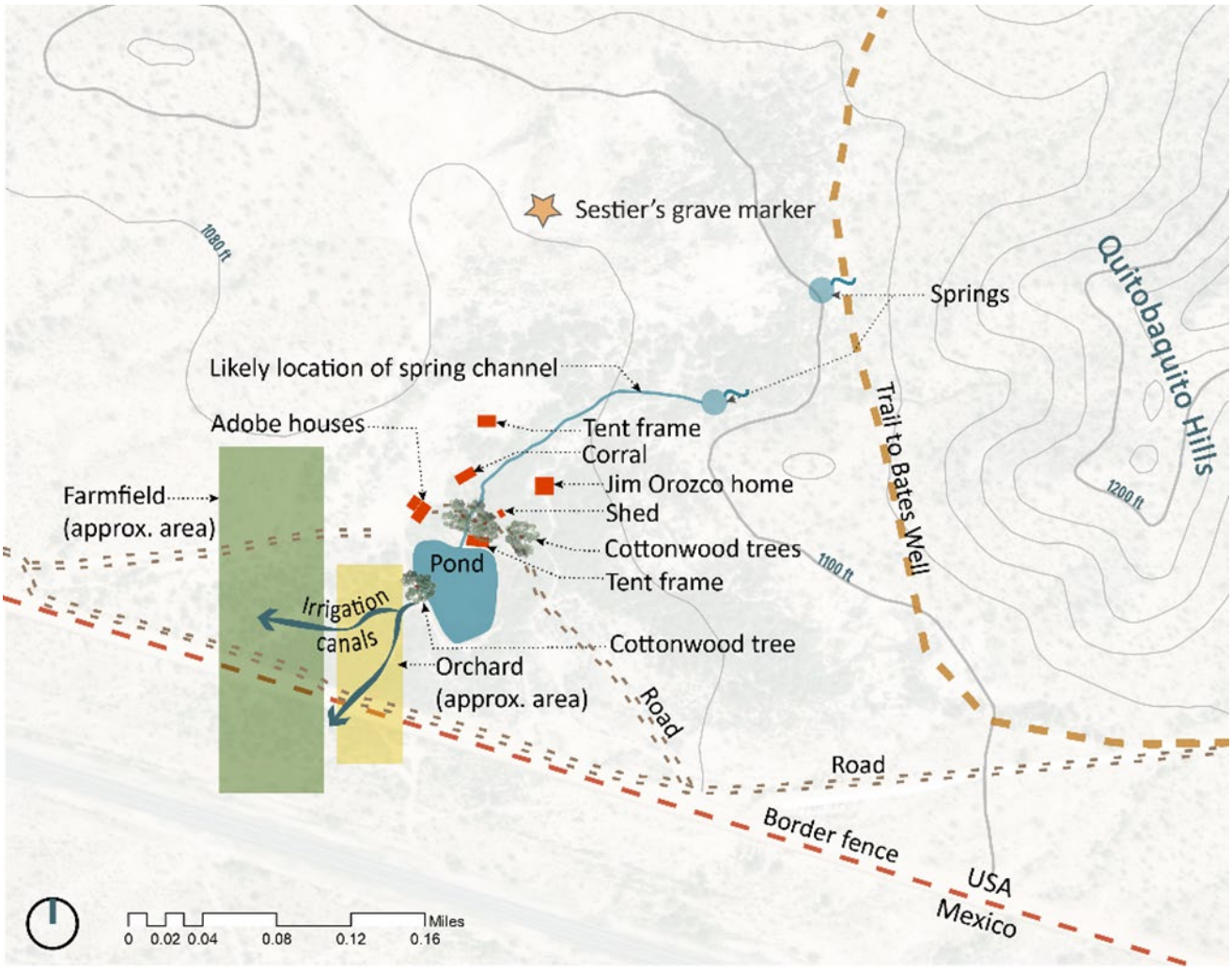

Figure 2-4 Orozco family period circa 1915-1957 (same as Figure 3-6)

Archival photographs show the Orozco homestead and other dwellings in the early to mid-20th century and illustrate the degradation of the adobe structures after the occupation at Quitobaquito ended. Figure 2-6, taken in 1939, shows several intact buildings. Figure 2-7, date unknown, shows the same buildings in a degraded condition with the same three trees thriving. The NPS 1959 long-range development plan included the removal of buildings, new fencing to keep the cattle out of the pond and removal of "unsightly debris left there by the family of Indians" (Orsi 2017, 92) The NPS removed the remaining structures in 1962 as part of their program to return the site to a naturalistic state (Orsi 2017).

Figure 2-5 Identified as the “House of Jose Juan Orosco at Quitobaquito” (date and photographer unk). Possibly tent dwellings constructed by the U.S. Border Patrol to monitor hoof-and-mouth disease in Mexican cattle in mid-1940s.

Figure 2-6 “House of Juan Orosco, the Sand Papago, Quitobaquito” (1939). Natt Dodge, photographer

Figure 2-7 “Old adobe house at Quitobaquito” (date and photographer unk)

Figure 2-8 Ruins of José Juan Orozco pithouse at Quitobaquito (1967). Bill Brown, photographer

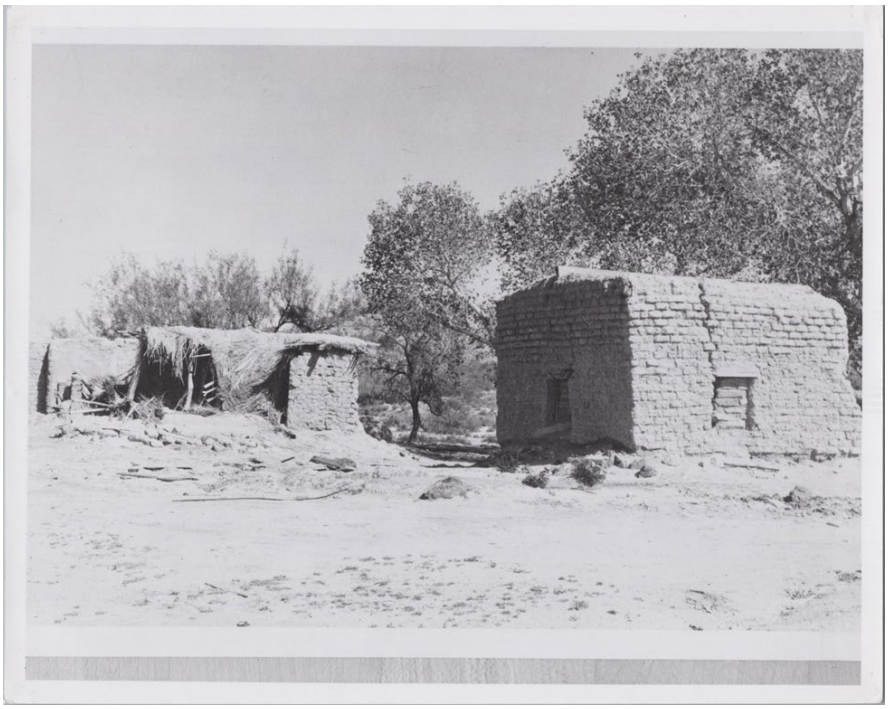

Figure 2-9 “Old adobe houses at Quitobaquito” (1957). Moulton B. Smith, photographer

Figure 2-10 “Quitobaquito before construction.
View looking north from west side at pond showing old buildings and barren area.”
(date unk). William Supernaugh, photographer

Figure 2-11 “Quitobaquito look north from west side of the pond”
(photo date is 1950 but may be inaccurate based on other documentation, likely 1960-1962).
William Supernaugh, photographer

Traditional subsistence practices of the Hia C'ed O'odham included the use of a wide range of resources. Nabhan et al. (1989) reports that Hia C'ed O'odham foraged, hunted, traded, and engaged in floodwater farming. Foraged food sources included roots, honey, mesquite beans, locusts, lizards, crabs, clams, fish, shellfish, and fruit from cholla, saguaro, organ pipe, mesquite, and ironwood trees. Seeds from Indian wheat and greens from evening primrose and lamb's quarters were also consumed (Ferguson 2019). Alonzo Puffer, a Hia C'ed O'odham man interviewed by Fillman Bell shared, "We gathered all kinds of food from the desert because this was my grandmother's way of life. There was plenty of rain in those days, and the desert yielded lots of food. It was beautiful. All kinds of vegetation that are edible. All kinds of desert spinach. All of us gathered these vegetables. The women dried it; it was stored. Whenever they needed greens, they cooked the dried vegetables. It was like fresh picked" (Bell et al. 2017, 554). The Hia C'ed O'odham farmed seasonally and utilized reliable water such as the springs at Quitobaquito and other locations, and along the Sonoyta River to irrigate crops. At Quitobaquito, canals led from the pond to fields south of the pond which now lie on the Mexican side of the border (Rankin 1995). In Fillman Bell's interview with Vacila Luna in 1979 (Bell et al. 2017), Luna said that Quitobaquito was planted with wheat, squash and green chiles. Others reported seeing corn and a pear tree. The Hia C'ed O'odham also hunted big horn sheep, squirrels, javelina, jack rabbits, badgers, birds, and collected eggs (Nabhan 1989).

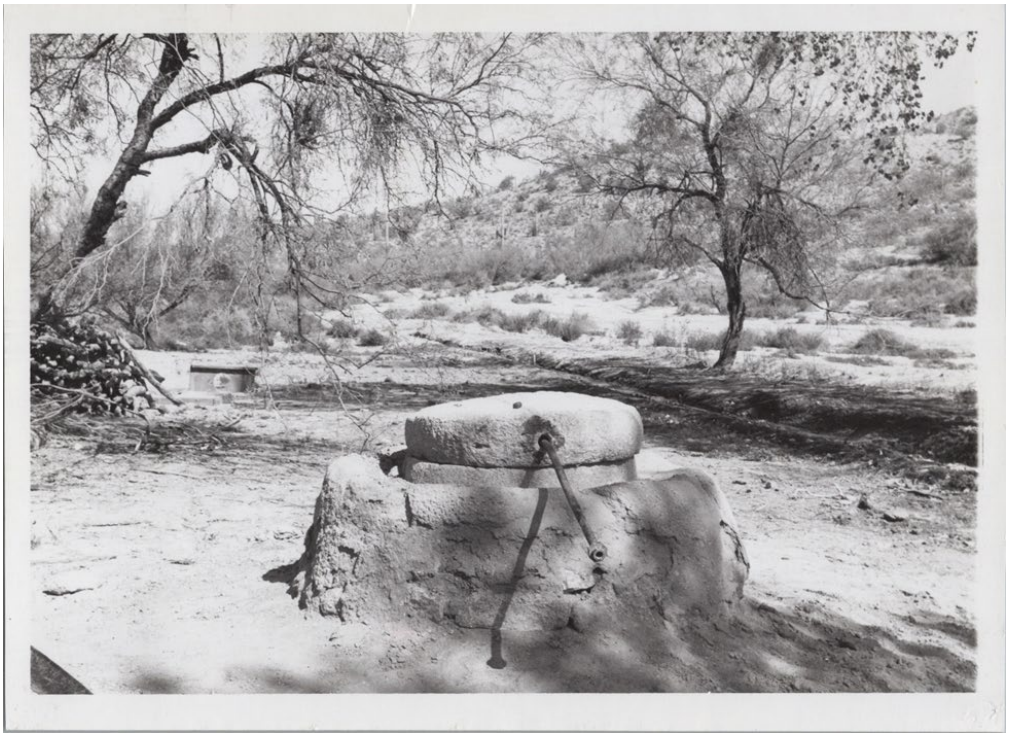

Figure 2-12 Stone grinder at Quitobaquito (1954). Moulton B. Smith, photographer

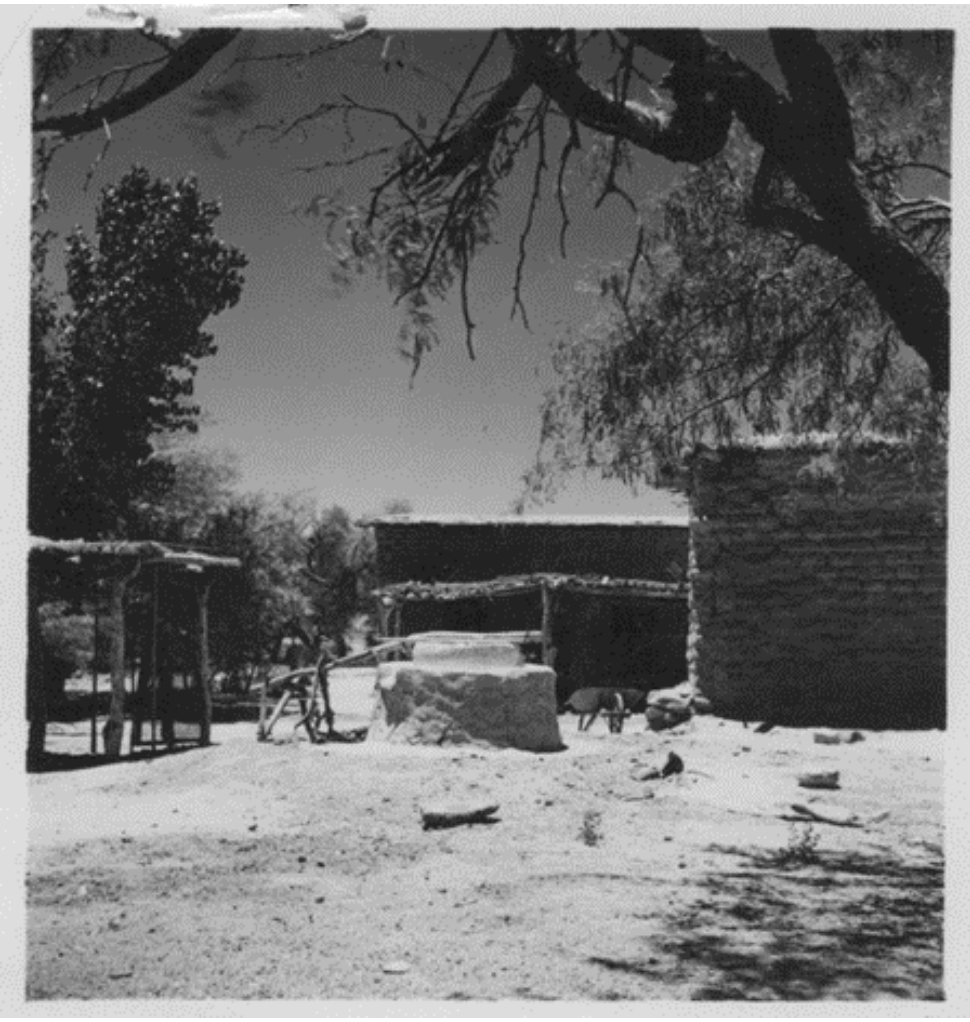

Figure 2-13 Quitobaquito mill with stone grinder in center (date and photographer unk)

There are different styles of dwellings recorded in the archeological and ethnographic record. Traditional Hia C'ed O'odham dwellings were made by piling boulders several courses high around a small, cleared area with grasses placed against the boulder walls to break the wind (Rankin 1995). Traditional grass huts and a few adobe houses built by Mexicans existed at Quitobaquito around the turn of the 20th century (Celaya et al. 2007). Betty Melvin (Childs) described the jacal construction of Indian dwellings in an interview with Fillman Bell in 1979 (Bell et al. 2017) as "houses made out of saguaro cactus ribs and mesquite wood covered with greasewood and mesquite wood covered with greasewood and other kind of brush. On top of the brush, mud is splashed on" (563). Martha Childs Celaya (Bell et al. 2017) described traditional shelters built in a circle with the ocotillo stalks standing upright. The top was covered with wild pigskin and mud was used to plaster the hut. The ocotillo was bent from the opposite sides and tied with wild pig leather strips. When illness befell a village, the community would burn the structures and rebuild someplace else. Temporary shelters were created when people were traveling. People would dig a hole in the ground and cover it with ocotillo because it prevented animals and snakes from entering the shelter (Bell et al. 2017).

The Hia C'ed O'odham moved often, either seasonally to hunt, to gather foods, to work, to visit relatives, or to engage in ceremonies and events. Hia C'ed O'odham traditionally freely crossed the US border to collect fish and shells at the Gulf of California or to visit relatives (Dobyns 1954). Traveling from village to village or harvest site to hunting site was a common activity for Hia Ce'd O'odham of all ages. They often traveled on foot and sometimes on horseback. When harvests were completed in August, the Hia C'ed O'odham would gather at *A'al Waippia* (Quitobaquito) and walk to *Wak* (Quitovac, Mexico) to participate in the rain dance ceremony, bringing a fetish that was kept in an oblong basket. The elder medicine men would perform the dances (Bell et al. 2017, 537). On occasion, women traveled to a mountain between Sonoyta and *'A'al Waippia* to gather century plants (agaves). They dug a hole, built a fire, placed the plants in the hole and covered them to let them bake. When the plants were cooked and cooled, they walked back to Quitobaquito. It was common for relatives to visit each other for extended stays between villages. According to one oral history, "Our people traveled between these two villages, *Juni Ka:ck* (Bates Well) and *'A'al Waippia*, for many years" (Molly Jim Orozco in Bell et al. 2017, 558)

A story shared by Alonzo Puffer with Fillman Bell et al. (2017) gives a glimpse into the nomadic nature of the Hia C'ed O'odham and the widespread landscape that constituted their home: "*'A'al Waippia* was our main village because there was lots of water. Water was plentiful in *'A'al Waippia*. My grandfather (Thomas Garcia), his father before him, and all the old men made a canal, because the water was always seeping out of the mountain, trickling into the canal the old people made. They made a shallow dam to catch the water." (Bell et al. 2017, 555) After a man named *S-wi:s Wo:dakam* came to stay at *'A'al Waippia*, the old people decided to leave and moved to *Juni Ka:ck* (Bates Well). After a short stay, they moved to Chico Suni's (in what is now Cabeza Prieta Wildlife Refuge) where they dug a well. Once they reached water they decided to stay for a while. When Chico Suni came and settled there, the old people decided to leave and moved to Darby Well (just south of Ajo on land now managed by the Bureau of Land Management) where they dug another well until they reached water. "Here is where the Sand Indians remained till all the old people died." (Bell et al. 2017, 555).

In Alonzo Puffer's telling, when an old woman died at Darby Well, the family transported her back to Quitobaquito for burial. He shared that there are many graves at Bates Well and *Moik Wahia* (Ajo) as well as at Quitobaquito (Bell et al. 2017). Oral histories as told by Hia C'ed O'odham elders and collected by Fillman Bell (Bell et al. 2017) indicate that many people were buried at the Quitobaquito cemetery that did not live there at the time of their death but lived there at an earlier time or had ties to the community.

The cemetery at Quitobaquito holds the remains of at least two families that had lived at Quitobaquito, the Garcías and the Orozcos. The thirty-four graves located at the cemetery reflect family relationships. The families were joined by the marriage of José Juan Orozco and

Thelinie (or Terini) García, in the second generation of each family at Quitobaquito. The Garcías and the Orozcos identified as *S-o' obmakam,* also known as *'0'otkol Ha-ko' adam* (Sand Lizard Crunchers), a dialect within the Sand Papago or *Areñeno* territory (Anderson et al. 1982). Tohono O'odham linquist Ofelia Zepeda explained that O'odham names are descriptive of dietary characteristics or cultural attributes that distinguish the Hia C'ed O'odham from other groups (Zepeda 1985). José Juan García, who was buried at the cemetery, was the patriarch of one of the families and was described by Lumholz (1971) to be at least 100 years old in 1909 or 1910 when he died. The second family line to live and bury their family members at Quitobaquito was that of Luis Orozco who resided there beginning in 1887. José Orozco, Luis' son, was buried at the cemetery in 1945, the last person to be buried there (Orsi 2017). The western slope contains 29 graves associated with the Orozco and García families. The lower and eastern slopes contain the graves of Wialos Velasco, a medicine man, his wife, Savel Orozco, and his relatives.

In 1977, NPS staff met with thirty-five descendants to consult on a plan to protect and restore the graves. The project involved the collection of oral histories and ethnographic research as well as a physical assessment of the site (Orsi 2017). Most graves were oriented in an east-west direction and were covered with branches, cactus ribs, wooden poles, and lumber. Rocks and dirt covered the graves. Objects including food, utensils and cans were found at the grave sites, and may have been offerings by visitors, possibly on All Soul's Day or simply discarded materials. While the age of the graves is uncertain, objects found at the cemetery date from about 1890 into the 1930s and it is estimated that the cemetery was in use from about 1900 until 1945 (Anderson et al. 1982). Hia C'ed O'odham descendants of those that lived or are buried at Quitobaquito continue to visit the cemetery and to conduct traditional religious and cultural ceremonies and rituals.

While the Tohono O'odham are a federally recognized tribe, the Hia C'ed O'odham are not, despite that they "have a unique origin, historical land-tenure pattern, traditional stewardship of natural and cultural resources, and a discrete cultural belief system" (Ferguson 2019; Eiler and Doyel 2008). Many of today's Hia C'ed O'odham are members of the Tohono O'odham Nation.

Tohono O'odham

Tohono O'odham use of the Organ Pipe area is well documented. Spanish military personnel, Catholic missionaries, federal government surveyors and agents, geographers and anthropologists have noted Tohono O'odham use of the area east of Bates and Growler Mountains, west to Tucson, south into northern Sonora, Mexico and north to south of the Gila River (Fontana 1983; Hackenberg 1974). While the Tohono O'odham have used the land in what is now ORPI; the remains of exclusive, permanent villages have not yet been identified.

Ferguson (2019) notes that oral histories have mentioned that people who spoke the Tohono O'odham dialect may have resided at Quitobaquito at times.

The Tohono O'odham moved throughout the area that is now ORPI, hunting, gathering cactus fruit and practicing *temporale* farming (Rankin 1995). They set up winter camps near reliable sources of water like springs. They moved to summer camps where the floodwaters from arroyos provided opportunities to capture the summer monsoon rains (Rankin 1995). Water to irrigate crops was diverted by use of brush dams or canals. Summer locations were flexible, dependent on changes to the hydrology year-to-year. The Tohono O'odham also established cactus camps during the saguaro and organ pipe fruit harvesting season. Throughout the year, they harvested cholla and prickly pear cactus fruit and mesquite and palo verde beans as dietary staples (Rankin 1995). Other plants, namely yucca and devil's claw, were collected and used to create baskets (Rankin 1995). Tohono O'odham constructed houses from mesquite saplings, ocotillo stalks, saguaro ribs and grasses. These were circular with flat roofs covered by dirt and the kitchens were often without roofs. Ramadas were built with mesquite, ocotillo, and saguaro ribs. Mexican-style home construction influenced the Tohono O'odham and adobe was used by the turn of the century (Rankin 1995).

The ORPI area was also a place of movement and connection for the Tohono O'odham and the Hia C'ed O'odham (Lumholz 1971; Greene 1977; Ferguson et al. 2019). A network of trails extending as far north as the Gila River and as far south as the Gulf of California and likely represents thousands of years of travel. Several trails begin or end at Quitobaquito, likely due to the existence of a reliable source of water for travelers. Artifacts found along the trails indicate usage from at least 9000 BCE (Rankin 1995). Trails connected villages and were used to hunt and gather food. Trails were also used to enable trade between communities and for spiritual and ritual purposes. The Tohono O'odham have used the trails to carry out salt pilgrimages to the Gulf of California since at least 1850 (Hayden 1967). Lumholtz (1971) wrote about the salt pilgrimages to the Gulf of California in 1912. Several men from one or more villages would begin their journey in the spring after the winter tides had receded on the Gulf shores, exposing the salt which they would then collect and bring back to their village. The pilgrimage also serves as an important rite of passage for young men and an opportunity to "pay spiritual respect to the land and sea" (Ferguson et al. 2019, 14). The traditional salt pilgrimage is an important practical and religious custom that has been recently resurrected by the Tohono O'odham (Ferguson et al. 2019)

<u>Spanish Explorers, Missionaries and Anglo-American Settlers</u>

By the time the Spanish passed through the Sonoran Desert in the mid-16th century, the Hohokam millennium was over (by 1450 CE) but the remnants of their villages remained in the form of large earthen architecture and extensive irrigation canals (Fish and Fish 2007). The first known Spanish traveler through the region was Alvar Nuñez Cabeza de Vaca whose ship ran

aground off the coast of Texas after the crew escaped a counterattack by Florida's natives. A member of that party was a man named Esteban, an African who was likely from Morocco. Cabeza de Vaca, Esteban and a few remaining crew members wandered through Texas, into New Mexico and through the Sonoran Desert until they ended up in Mexico City in 1536, having traveled eight years and 3,500 miles (Herrick 2019).

Francisco Vazquez de Coronado's expedition passed through the area in 1540-1542 introducing the first cattle to the region (Orsi 2017) although a Jesuit missionary from Spain, Father Eusebio Kino, is acknowledged as having brought the first gifts of livestock to the local tribes (Jeffery and Pinto 2009). Father Kino documented his travels through Mexico and Arizona beginning in late 17th century. His expeditions visited Quitobaquito and Father Kino wrote about a small group of people (whom he called the Papagos) living among the marshes at the springs and growing squash (Orsi 2017). Kino's excursions and those of subsequent missionaries had a lasting impact on the region. He established missions in northern Sonora and into Arizona, traveling as far north as the area southwest of present-day Tucson with the establishment of San Xavier del Bac. Franciscan missionary Francisco Garces stayed at Quitobaquito for a time in 1770 and Father Barnardo de Urrea counted 75 "native American Christians" living at Quitobaquito in 1775 (US Department of Interior CLI 2011).

The discovery of silver and copper in the mid-18th century lured Spanish settlers to the region. The *Camino del Diablo* (Devil's Road) was a rugged, inhospitable route between New Mexico, Chihuahua, Sonora, and California used by explorers and travelers. The trail passed near to Quitobaquito which may have been a stopping place due to its reliable water source. While archeological evidence indicates the use of the *Camino del Diablo* by travelers during the Spanish and Mexican periods (1698-1848) and during the California Gold Rush (1840's-1850's), evidence has not yet been found to connect these travelers directly to Quitobaquito (Orsi 2017). A stretch of the Sonoyta River which runs almost to Quitobaquito likely had perennial surface water which may have given little incentive to travelers to make their way to Quitobaquito except to contact the O'odham community living there.

Spanish rule in Southern Arizona ended in 1821 with the establishment of the Republic of Mexico. With the Gadsden Purchase of 1853, a period of boundary surveying and mapping began. In 1854, the US government and the Southern Pacific Railroads noted the presence of inhabitants at Quitobaquito while surveying the border and rail route (Hoy 1970). It was in 1860 when the first person of European descent settled at Quitobaquito. Andrew Noworthy Dorsey established a store, grain mill and mining claim, and constructed an earthen dam (Hoy 1970; Orsi 2017; CLI 2011). He built irrigation channels to water fig and pomegranate trees and crops. It is unknown whether Dorsey improved on existing irrigation channels created by Hia C'ed O'odham or whether he created them anew. Reports from the 1855 Boundary Commission expedition mentioned a *cienega* but did not indicate the presence of constructed irrigation

channels (Orsi 2017). In 1894, another boundary survey crew reported the existence of a shallow, constructed lake at Quitobaquito with irrigated fields falling on the Mexican side of the border. The two reports taken together indicate that a dam to create the pond was likely constructed between 1855 and 1894.

Two men of European descent, Albert Steinfeld and J.C. Waterman, opened a mill and store in Quitobaquito in the 1870s but left within the decade (US Department of Interior CLI 1998_2002). The Lopez family moved in and raised goats near the springs until the late 1800s. Another settler at Quitobaquito from outside the area was Emanuel Garcia "M.G." Levy, or Mikul Levy (Orsi 2017). He migrated from Texas and set up a store in either 1888 or 1894 (reports differ) and procured mining claims. In 1896 and 1909, M.G. Levy with Tom Childs and John Merrill recorded mining claims at Quitobaquito (Rankin, n.d. Appendix, 4). Levy appears to have left for a time and returned by 1900. Most of the supplies for his successful store were brought by mule train from Caborca, Sonora. Levy hired French immigrant, Lorenzo Sestier, to manage his store in his absence (Orsi 2017). Sestier died in 1900 and a gravestone marker sits on a small knoll overlooking the pond at Quitobaquito. It appears that Levy left Quitobaquito around 1905 and moved to Ajo to continue his business as a shopkeeper and a miner (Orsi 2017).

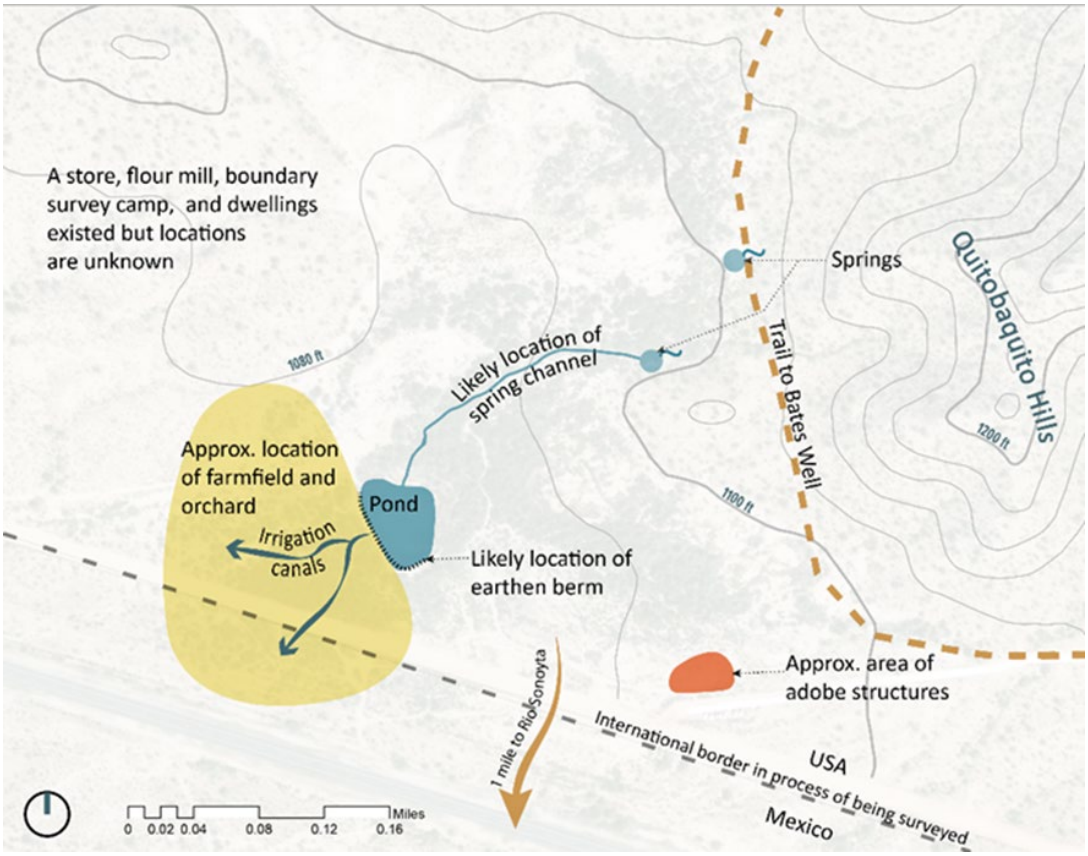

Figure 2-14 Early Euro-Mexican Settlement period circa 1860-1900
(same as figure 3-5)

Tom Childs, who married Martha Garcia, a Hia C'ed O'odham woman, lived at Quitobaquito until about 1910. Interracial marriage was illegal in Arizona, so the couple wed in Sonoyta, Mexico (Orsi 2017). Between 1903-1905, Childs rebuilt the earthen dam and irrigation ditches constructed by Dorsey and raised crops including watermelon.

The Gray family played a significant role in developing large scale ranching in the area of ORPI in the 1920s (Jeffery and Pinto 2009). Robert Louis Gray, Sr. purchased land south of Ajo in 1917 and began grazing his cattle in the Ajo Mountains, along the international border and near Quitobaquito by 1923. Bob Gray controlled all the watering sites east of Quitobaquito springs and north of the Rio Sonoyta at the international border which gave the family control over the cattle range in the ORPI area without owning any land (Jeffery and Pinto 2009). The family opposed creation of the Monument due to fear that their grazing rights would be removed. The family was ultimately granted an annual grazing permit to continue running cattle within the Monument until the 1970s.

Federal Involvement and Management

Upon completion of the Gadsden Purchase in 1853 which transferred the land below the Gila River in Arizona and New Mexico from Mexico to the United States, a period of extensive surveying along the border began. In 1854-1855, a boundary survey led by Andrew B. Gray for the Texas Western Railroad Company noted the presence of "an Indian town where the Gobernador of the Papagos resides. There are also a few Mexican families" (Bennett and Kunzmann 1989, 14). A survey conducted in 1855 by Lt. Nathaniel Michler for the United States and F. Jimenez for Mexico as a result of the Gadsden Purchase noted the existence of five springs that ran for most of the year and the raising of cattle (Bennett and Kunzmann 1989; Orsi 2017)). The Michler survey placed the international boundary just south of Quitobaquito. The first superintendent of Indian Affairs in Arizona, Tom Poston, documented 250 families living at Quitobaquito in 1863 (Rankin 1995). A resurvey of the US/Mexico border at Quitobaquito in 1894 noted the presence of two Mexican families living there (Orsi 2017) and the boundary survey in 1896 reported six "native huts" and a small community of "Sand Papago" at Quitobaquito (Rankin 1995).

Chinese workers began migrating to the United States in the 1850s to work in mining, agriculture, railroad construction, and factories. Opposition to Chinese labor and immigration grew in some sectors of the United States which resulted in the passage of the Chinese Exclusion Act of 1882 (US Dept of State). To evade the Act, many Chinese immigrants entered the US from Mexico through southern Arizona; one migration route ran through ORPI (Orsi 2017). To thwart entry into the US by Chinese immigrants, a US government hired Jefferson Davis Milton to establish a customs and immigration station at Quitobaquito in 1887 (Organ Pipe Cactus National Monument). The US Border Patrol was established in 1925 to stop Chinese and European immigrants from crossing illegally into the US.

Federal removal of the land that now encompasses ORPI from the public domain began in 1907 when President Theodore Roosevelt withdrew a strip of land sixty feet wide immediately north of the border for use by customs personnel (Orsi 2017). This area is now known as the Roosevelt Reservation. After Congress authorized a survey of water sources in 1916 (Orsi 2017), President Calvin Coolidge withdrew an additional 40 acres around Quitobaquito springs as a public water reserve in 1923 (Bennett and Kunzmann 1989). The year 1916 also saw the establishment of the National Park Service under the Organic Act.

The idea for a national monument to protect desert vegetation, particularly the organ pipe cactus, began in 1931 with discussions between the Grand Canyon National Park naturalist, Edwin McKee, the Desert Botanical Laboratory, and the Pima County Board of Supervisors (Orsi 2017). Review of several sites by the National Park Service identified the area west of the Ajo Mountains between Ajo and Sonoyta as a suitable location. The proposed monument received support from Arizona Congresswoman Isabella Greenway, the University of Arizona, and Tucson Natural History Society (Orsi 2017). Frank Pinkley, chief of the Southwestern Monuments under the NPS, conducted a survey to identify the Monument boundaries in 1935 (Orsi 2017). It was in 1937 that President Franklin Delano Roosevelt set aside 330,000 acres to create Organ Pipe Cactus National Monument (Jeffery and Pinto 2009).

The first master plan created for ORPI identified areas for public education and interpretation specifically focused on the archeology, biology, geology, history, and “Papago” culture (Orsi 2017). In 1939, the first survey of water supplies and forage in the Monument was conducted by the NPS wildlife technician, Andrew Nichol, who remarked that human activity, including grazing, had reduced wildlife at Quitobaquito (Orsi 2017). Opposition to the creation of the Monument was voiced by the Louis Gray family who had grazed cattle within the boundaries of ORPI for 17 years. Gray filed a request to graze his herds within the boundaries in 1937, soon after establishment of the park (Orsi 2017). The family was given permission to continue to graze under an annual permit agreement until 1968 (Jeffery and Pinto 2009). Under pressure from Arizona Senator Carl Hayden and in opposition to the opinions of conservationists and scientists, legislation was passed in 1941 to permit unrestricted mining activities in the newly created National Monument (Orsi 2017; Greene 1977). The mining law was repealed in 1976 (Public Law 94-429).

The Tohono O’odham Nation (formerly the Papago Reservation) was established to the east and northeast of ORPI in 1917 under the authority of the Indian Appropriations Act of 1851. The international border between the US and Mexico divided the traditional Tohono O’odham lands and imposed obstacles and restrictions on accessing traditional lands from one side of the border to the other. Tribal leadership supported the creation of ORPI as long as the Tohono O’odham would be allowed their historic use of the lands (Orsi 2017). The O’odham people

requested through the Office of Indian Affairs that a formal statement be made that granted them the right to collect cactus fruit within the Monument. The Presidential Proclamation establishing the Monument states that "…administration of the monument shall be subject to: (1) Right of the Indians of the Papago Reservation to pick the fruits of the organ pipe cactus and other cacti, under such regulations as may be prescribed by the Secretary of the Interior;" (Proclamation No. 2232). Though permission was granted, the O'odham's traditional use of the land was restricted by many of the laws meant to protect the resources contained within ORPI's boundaries. The Indian Affairs Commissioner requested that the Tohono O'odham be allowed to graze livestock within ORPI and they were given permission in 1940 to graze cattle only in the southeastern portion (Orsi 2017).

With the creation of the National Park Service in 1916, management of monuments and national parks under its purview focused on new objectives, "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (National Park Service, Organic Act). The traditional usage of the Quitobaquito area by Jose Juan Orozco and his family in the mid-20th century did not coincide with NPS's long term goals for natural resource conservation. In 1938, Orozco's request to graze 100 head of cattle was granted. However, in 1941 ORPI Superintendent Supernaugh and agents from the Sells Papago Agency informed Jose Juan Orozco that he would not be allowed to construct any more buildings, to hunt animals, or gather wood within the Monument without permission. A barbed wire international border fence was constructed in 1947 along the US/Mexico border dividing the Orozco fields. The Orozco family had grazed their cattle freely on both sides of the border until this time (Bennett and Kunzmann 1989). In 1957, the government requested that Jose Orozco vacate his property and paid him $13,000 for his 160 acres of land and water rights. The family left Quitobaquito, ending human occupation there.

In 1949, the U.S. Bureau of Animal Industry set up a station at Quitobaquito to try to contain hoof-and-mouth disease which was spreading north from Mexico. In addition to constructing two tent-frame structures north of the pond, they built concrete spillways at the two springs and installed a thousand feet of pipe to bring water to the tent structures. They moved out in 1952 after the disease was no longer a threat (Orsi 2017). In 1961, grazing was still allowed in the Monument and Quitobaquito was fenced to keep cattle away from the pond which had experienced degradation of the vegetation.

Between 1957 and 1962, the NPS began to remove structures and scrape the landscape around Quitobaquito (CLI 2011). According to Orsi (2017), a 1959 development plan addressed removal of the remains of the Orozco family's occupation at Quitobaquito. In 1962, the NPS demolished three buildings, fences, debris, and agricultural fields. Areas where structures and other materials were removed were left barren, and plants that prefer disturbed soils such as from

Chenopodiaceae family colonized the bulldozed areas. In the process of bulldozing the Quitobaquito area, important prehistoric and historic era archeological sites were destroyed (CLI 2011). The NPS also dredged the pond, strengthened the dam, and realigned ditches from the springs. Earthen ditches to the pond were replaced with underground pipes (CLI 2011). The emphasis in the 1960s was to restore the ecology to what was considered an original state while acknowledging that the dam and canals were all constructed features. While the original state of Quitobaquito was a spring-fed *cienega,* the dammed pond had become an important feature in the landscape and reliably supported a community of desert pupfish (*Cyprinodon macularius*) and Sonoyta mud turtles *(Kinosternon sonoriense longifemorale*). In 1969, the pupfish were temporarily relocated, the pond was drained to kill invasive fish, then refilled and the pupfish were reintroduced. The new, deeper pond was not optimal for the pupfish, so NPS staff constructed a shelf along one part of the pond to provide a warmer habitat.

2-15 Quitobaquito pond deepened by the NPS (Jan. 1962). Warren Steenbergh, Photographer

2-16 Parking lot constructed in the early 1960s next to the pond (1968). Richard Begeman, Photographer

As a result of the planning conducted during the Mission 66 initiative to provide more visitor services in the national parks, “improvements” were made at Quitobaquito in 1974 which included the construction of a pit toilet, interpretive exhibits, and expansion of the parking area (CLI 2011). A nature trail was built around the pond. Also in 1974, the parking lot was removed and relocated to the east due to impacts from visitors. The new parking lot construction created further impacts by disturbing the historic integrity of a large archeological site (Rankin 1995; Bennett and Kunzmann 1989). The next year, 1975, saw the removal of cattle fencing after grazing was eliminated from the Monument. In 1989, ORPI worked with the Arizona-Sonora Desert Museum to create meandering concrete-lined water channels to replace the water pipe system from the springs to the pond to improve its appearance and to enhance habitat for pupfish and mud turtles (CLI 2011).

To develop a science driven approach to natural resource management at Quitobaquito, the NPS formed a joint research team with the University of Arizona in 1973. In 1974, monthly monitoring of the spring flow into the pond was begun. An Interim Management Plan was prepared for Quitobaquito in 1975 and approved in 1979. The Plan acknowledged that the site could not be left to return to its original ecological state as that would require removal of the

man-made structures supporting the habitat for the desert pupfish. It also recognized that interpretation of the site's history was difficult given the removal of all historic structures. The approach was to treat Quitobaquito as a managed landscape by revegetating with native species and maintaining the dam, pond, and channels from the springs to maintain the water flow to the pond (Orsi 2017).

Maintaining the water levels in the pond at Quitobaquito to support endangered aquatic species has been a focus of NPS management since the 1970s. While water levels had stayed relatively stable apart from seasonal fluctuations, the onset of an extended drought beginning in the 1990s caused the water level to drop below the opening of the outflow pipe located on the southern end of the pond. Emergency measures to stabilize the water supply and maintain the water level were begun in 2005. Water levels in 2007 dropped below critical habitat conditions for the Quitobaquito pupfish and Sonoyta mud turtles and these species were temporarily relocated to holding facilities to repair a leak in the berm. Other suspected causes for the reduction in the water level were the drought and lower levels of spring discharge into the pond (Orsi 2017).

Later interventions to stabilize water levels included inserting an impermeable diaphragm wall into the berm (2008), patching the southeast corner with bentonite clay (2009), and removing the large leaning cottonwood tree located on the berm which was contributing to leaks in the pond (2016). With water levels in 2021 at 23" below the outflow pipe, the NPS engaged in a project in 2022 to repair the pond liner, create better habitat for the pupfish and mud turtles, and revegetate the pond banks. The overall size of the pond was slightly reduced, and shallow ledges were created for pupfish habitat. Design of the pond remediation strategy was prepared by Natural Channel Designs in conjunction with park natural resources staff in 2021 with installation of the new pond design completed in 2022. The plan includes two sediment ponds that also function as a temporary pupfish refuge, and a new section of concrete channel which runs between the two sediment ponds. In 2023, the contractor is investigating the loss of water from the stream at the intersection of the new diversion channel and the pond and will engage in repairs as necessary.

The United Nations declared ORPI as a Biosphere Reserve in 1976. This designation encourages the involvement of local communities and stakeholders in the planning and management of the Reserve to support biodiversity, cultural diversity, sustainable economic development and research, monitoring, and education. In 1978, Congress established 312,600 acres (97% of ORPI) as designated wilderness after attempts to change it to a national park in the prior decade had failed (National Parks and Recreation Act, Pub. Law No. 95-625). The Wilderness Act requires that designated Wilderness minimize human disturbances to maintain resources in as undeveloped of a state as possible. Most of the Quitobaquito area is located within this

designated Wilderness. This created and continues to create a dilemma for NPS's management of a site that has been highly impacted by human activity for a long time.

An Interim Management Plan for Quitobaquito in 1979 recognized that the area was important for ecological, historical, and recreational reasons (Orsi 2017). The document concluded that the NPS would need to actively manage the site to ensure a balance between these three values. Recommendations from the plan were not universally supported and the plan was never implemented. A General Management Plan (GMP) for the whole park was completed in 1997. The GMP recommended moving the parking lot at Quitobaquito to minimize disturbance, to redirect the nature trail away from historic resources and to manage Quitobaquito as a wilderness zone within the Monument (Orsi 2017).

Richard Brown, historian, and Wilton Hoy, ORPI Ranger, prepared a study in 1967 identifying 18 sites of historical significance within ORPI. Quitobaquito was listed as the most important historic site due to its long association with people from pre-contact cultures to Spanish exploration to historic period Native American use. The authors recognized the important role that water played in the landscape – a magnet to draw and keep people in a place. Despite their report and an internal effort to collect archeological artifacts in 1974 before construction of a parking lot at Quitobaquito, park construction plowed up and destroyed part of an important archeological site (Orsi 2017).

A 1976 archeological survey conducted in advance of the construction of a nature trail at Quitobaquito resulted in a decision to delay the project until such time as a comprehensive survey could be conducted at the springs. Lynn S. Teague from the Arizona State Museum conducted a systematic archeological survey at Quitobaquito in 1977. The survey identified occupation in the area from at least 8,000 BCE (Orsi 2017). Teague reported that Quitobaquito was the northernmost extent of the "Sand Papago" culture and the only site present in the US. One of the sites surveyed by Teague and her team was a Hia C'ed O'odham cemetery. Thirty-four graves dating to the beginning of the 20th century were identified. The condition of the grave sites was poor, impacted by weather, animals, and vandalism. Descendants of those buried in the cemetery expressed concern about the lack of respect shown their ancestors because of the condition of the graves. NPS staff met with them to develop a plan to protect and restore the grave sites, establishing a new partnership between the Native American tribes in the area and the Monument. In 1980 after the development of an impact assessment, clearances from the Arizona State Historic Preservation Office (AZ SHPO) and continued tribal consultation, NPS stabilized and covered the graves to prevent further deterioration and vandalism (Orsi 2017). Oral histories with descendants were conducted by Fillman C. Bell and linguist Ofelia Zepeda (Bell et. al 1980; Zepeda 1985).

Attempts to list Quitobaquito on the National Register of Historic Places (NRHP) have been unsuccessful to date. In 1977, NRHP nominations were drafted by historian Jerome Greene for southwestern sites, including one for Quitobaquito. In 1979, the keeper of the NR approved

four sites which did not include Quitobaquito. The NPS Western Regional Office contacted AZ SHPO for comment on the submitted Quitobaquito nomination but it is not clear what became of the request (Orsi 2017).

Archaeologist Adrianne Rankin, with the Western Archaeological and Conservation Center (WACC) in Tucson, and her team conducted an extensive archeological survey of ORPI, covering 7,675 acres between 1989 and 1991. Rankin's report identified nine sites in the vicinity of Quitobaquito, all of which were deemed eligible for the NRHP. In 1993, Rankin completed a more extensive survey which covered 250 acres at Quitobaquito (Orsi 2017). Based on this research, the park submitted a NRHP nomination for Quitobaquito as "a historic district with archeological components in 1991" (Orsi 2017, 123). AZ SHPO did not support the proposed historic district nomination due to a loss of integrity of the historic-period resources.

The NPS Western Regional Office submitted a revised NRHP nomination in 1994 to AZ SHPO which claimed significance for "illustrating the change over time among people and the environment as each adapted to the other in and in turn caused changes to the other" (Orsi 2017, 119). AZ SHPO endorsed this nomination. However, it is unclear if the nomination was ever submitted and consequently the nomination did not receive approval and Quitobaquito is not currently listed on the NRHP (Orsi 2017).

In 2011, another NRHP nomination was prepared by the University of New Mexico with input from the NPS. This nomination proposed the listing of the Quitobaquito Historic District under criteria A for its association with historic trade routes and its settlement by Native American, Hispanic, and Euro-American cultures and D for the archeological features which illustrate historic cultural patterns and water usage in the Sonoran Desert. The proposed period of significance in the nomination was 1698 to 1957. It is not clear, based on ORPI records, if the draft nomination was accepted by the monument or finalized, and it was not submitted to AZ SHPO.

ORPI partnered with the University of Arizona to conduct a Class II pedestrian survey of O'odham trails within ORPI (Ferguson et. al 2019). The extensive study involved a literature review, geospatial analysis, and cultural resources survey. Four linear sites, representing trail corridors, were recommended eligible for the NRHP: ORPI00291, ORPI00294, ORPI00295, and ORPI00298. Two trail corridor NRHP nominations relevant to the Quitobaquito cultural landscape are the Bates Well to Quitobaquito Corridor (ORPI00291) and the Quitobaquito Corridor (ORPI00298) prepared by Hanson et al. (2020) as a result of the project.

Landscape Chronology

The following table identifies key dates, event description, and event type to chronicle the history of use, occupation, and development of the Quitobaquito cultural landscape.

Table 2-1 Landscape chronology

Event Type	Dates	Description
Use and Occupation	9500-9000 BCE	Late Paleoindian period culture at extinct springs at Quitobaquito was based on analysis of stone tools found at the site. This was the earliest evidence of occupation at Quitobaquito.
Use and Occupation	8500 BCE-300 CE	Evidence of cultural use at Quitobaquito was documented from the Archaic Period.
Natural Systems	8000 BCE	Sonoran Desert vegetation was established in the area.
Use and Occupation	300 CE – 1450 CE	Hohokam, Patayan and Trincheras ceramics were present in archeological sites within the Quitobaquito area. Quitobaquito served as a nexus for trading, hunting, and gathering; based on the presence of roasting pits, shell, ceramics representing different contemporary cultures, and a diversity of lithic artifacts within the sites that make up the area (National Register 1994).
Use and Occupation	1698 CE	Father Kino, Spanish missionary, documented indigenous occupation at Quitobaquito.
Use and Occupation	1770	Franciscan missionary Francisco Garces stayed at Quitobaquito.
Use and Occupation	1775	Barnardo de Urrea from the Presidio of Saint Gertrude of Altar in Sonora counted 75 “native American Christians” living at Quitobaquito (de Urrea 1775).
Government & Activities	1821	The Republic of Mexico was established, and Spanish rule ends in Southern Arizona.
Use and Occupation	1840	El Camino del Diablo, or Devil’s Highway, located west of Quitobaquito was heavily used by surveyors, gold seekers and smugglers during this period (Greene 1977).
Government & Activities	1853	The Gadsden Purchase was finalized; the US acquired the land below the Gila River in Arizona and New Mexico.
Natural Systems	1853	Desert pupfish (*Cyprinodon macularius*) was first identified by Spencer F. Baird and Charles Girard.

Government & Activities	1854 – 1855	A boundary survey marked the international border between US and Mexico. Surveyors noted the presence of five flowing springs at Quitobaquito.
Government & Activities	1854	A railroad crew surveyed Quitobaquito while surveying the route for Southern Pacific Railroad (Hoy 1970).
Use and Occupation	1855	An international survey crew documented the Hia C'ed O'odham people living at Quitobaquito (Greene 1977).
Use & Occupation Constructed Feature	1860	The first documented settler of European descent, Andrew Noworthy Dorsey, settled at Quitobaquito and established a store, grain mill and mining claim. The first historic period modification of Quitobaquito Springs into a pond is credited to Dorsey who also built a dam and irrigation ditches and planted crops including fig and pomegranate trees.
Use and Occupation	1863	Tom Post, the first superintendent of Indian Affairs in Arizona, reported that 250 Sand Papago families were living in the vicinity of Quitobaquito.
Use and Occupation	1870	Papago residents left the site by this date, some settling on the Mexican side of the border about ¼ mile from Quitobaquito. Relocation was due to threats from Cipriano Ortega because the Papago did not disclose the location of a nearby mine (Greene 1977).
Use and Occupation	1870	A mill and store were opened by Steinfeld and Watermen at Quitobaquito. The Lopez family settled here and raised goats.
Use and Occupation	mid-to-late 1800s	The Juan Jose Garcia family and the Valesco family were reported to be living at Quitobaquito.
Use and Occupation	1885-1889	Luis Ortega and his wife were residing at Quitobaquito while other Papagos were camping there (Bell 2017).
Use and Occupation	1887	The Luis Orozco (Sand Papago) family settled at Quitobaquito by this date and raised crops and cattle but likely had been settled there prior to 1887.
Government & Activities	1887	A US Customs and Immigration station was established at Quitobaquito to prevent smuggling of Chinese from Mexico into the US.

Use and Occupation	1888	Mikul Levy established a store near Quitobaquito (Greene 1977).
Government & Activities Use and Occupation	1892	A resurvey of US/Mexico border noted presence of two Mexican families living in the settlement of Quitobaquito.
Use and Occupation	1894	A.N. Dorsey built a mill at Quitobaquito.
Government & Activities	1894	Mining claims were recorded at the southern end of Quitobaquito Hills near international border.
Use and Occupation	1896	A boundary survey reported the presence of six dwellings and a small community of Sand Papago living at Quitobaquito.
Use and Occupation Exploration	1900	A National Geographic expedition noted two adobe houses and half a dozen Sand Papago huts at Quitobaquito.
Use and Occupation	1900	Jose Lorenzo Sestier died at Quitobaquito and his grave marker becomes an extant feature in the landscape.
Constructed Feature Agriculture	1903-1904	Thomas Childs, Jr. rebuilt irrigation ditches and raised crops including watermelon.
Government & Activities	1907	A Presidential Proclamation (May 23, 1907) set aside a 60’ wide strip of land along the international boundary for highway use.
Natural Systems Agriculture	1907	The scientific expedition of Hornaday and MacDougal observed several small springs north of the boundary line irrigating a small agricultural field on the south side of the border line. They also reported that a stagnant pond was present (Rankin 1995, 67-68).
Use and Occupation	1907	Jose Orozco and his family moved back to Quitobaquito in the fall.
Natural Systems Constructed Feature	1910	Naturalist Carl Lumholtz observed that a tiny stream was fed by springs and with heavy rainfall, this stream connected with the Sonoita River. A moderate size dam was present.

Use and Occupation	1913	A map entitled “Proposed Quitobaquito Indian Reservation” indicated dwellings at Quitobaquito.
Use and Occupation Constructed Feature Agriculture	1914-1915	Engineer Herbert V Clotts surveyed the area and reported three running springs, 25 people in four families and four houses at Quitobaquito (on the US side). He also noted a reservoir, 8 acres of fields, most of which lay in Mexico, cattle, and horses.
Use and Occupation	1914-15	Approximately 25 people from four Sand Papago families were reported living at Quitobaquito, growing alfalfa (Bell 2017).
Government & Activities	1917	The Tohono O’odham Nation (initially called the Papago Indian Reservation) was established.
Natural Systems Use and Occupation Government & Activity	1917-1918	Geologist Kirk Bryan reported two main springs which showed evidence of excavation to increase and concentrate the flow. He noted that the community which was usually inhabited by Papagos was abandoned because of activity associated with the Mexican revolution and raids by Pancho Villa and others. Military troops briefly camped at Quitobaquito.
Use and Occupation	1920	Robert Louis Gray extended his cattle grazing range up to Quitobaquito.
Government & Activities	1923	Executive Order (November 21, 1923) reserved 40 acres of Quitobaquito as a public water reserve No. 88 (Bennett and Kunzmann 1989).
Government & Activities	1925	The US Border Patrol was established to stop Chinese and European immigrants from crossing into the United States.
Government & Activities	1937	Organ Pipe Cactus National Monument was established by President Franklin Delano Roosevelt. The new Monument included Quitobaquito Springs. Mining was disallowed in the monument, but rogue operations continued for decades.
Government & Activities Use and Occupation	1941	ORPI Superintendent Supernaugh, three officials of the Sells Papago Agency, and a forester from Phoenix informed Jose Juan Orozco that he was not allowed to construct any more buildings, shoot animals, or gather native wood without permission.

Use and Occupation	1946	Jose Juan Orozco died and was buried at Quitobaquito O'odham cemetery and his son, Jim Orozco takes over the property.
Government & Activities	1948	A fence with a gate is constructed along the US/Mexico border, dividing the Orozco agricultural fields.
Government & Activities	1949	The US Bureau of Animal Industry set up headquarters at Quitobaquito to stop the spread of Hoof-and-Mouth disease from Mexico to the US.
Government & Activities	1951	Paul Ezell conducted the first professional archeological survey of Quitobaquito, designating it with Arizona State Site number Sonora B:4:1 (ASM) (Orsi, 2017).
Government & Activities Use and Occupation	1957	Jim Orozco was paid $13,000 for 160 acres of land and water rights and the family leaves the area, ending the period of residential occupation at Quitobaquito.
Government & Activities Constructed Feature	1962	Three buildings, fences and an accumulation of cans and other debris were removed by NPS from the Quitobaquito area. NPS also removed silt (4,164 yards) from the pond, strengthened the dam, and realigned the ditches from the springs.
Government & Activities Constructed Feature	1960's	NPS installed a concrete brace to support the leaning cottonwood tree that had been compromised by the dredging of the pond.
Natural Systems Constructed Feature	1969	The pond at Quitobaquito was drained, the pupfish were temporarily relocated, and the remaining non-native, invasive fish killed. The pond was left to dry for 30 days, refilled with water and the pupfish reintroduced.
Government & Activities	1974	NPS constructed new pit toilets in the mesquite bosque along the south side of Quitobaquito and expanded the parking area. Interpretive exhibits were installed (Bennett and Kunzmann 1989).
Government & Activities	1974	The parking lot was removed and relocated farther from the pond. Bulldozers tore down the site of a former Hia C'ed O'odham encampment impacting the integrity of the archeological site.

Government Water	1974	The NPS began monthly monitoring of the flow from Quitobaquito Springs.
Government & Activities	1975	Cattle grazing was excluded from ORPI and all fencing was removed from Quitobaquito.
Government & Activities	1976	ORPI was established as a Biosphere Reserve by the United Nations.
Government & Activities	1976	Gauges were installed at the springs by USGS and NPS to monitor flow.
Government & Activities	1977	95% of ORPI was designated as wilderness by Congress. Quitobaquito was included in this designation.
Government & Activities Use and Occupation	1977	Lynn S. Teague from the Arizona State Museum led the first systematic archeological survey of Quitobaquito. The survey revealed continuous human presence at Quitobaquito from roughly 8,000 BCE.
Government & Activities Use and Occupation	1977	NPS staff and descendants of the Quitobaquito inhabitants met to explore options to restore grave sites that had been vandalized.
Government & Activities	1977	The NRHP nomination for Quitobaquito was drafted by historian Jerome Greene. The nomination was not approved. The fate of the nomination is unclear.
Government & Activities	1978	Congress declared 312,600 acres of ORPI as wilderness, including Quitobaquito.
Government & Activities	1979	NPS “Interim Management Plan for Quitobaquito Oasis” was completed (Orsi 2017).
Government & Activities	1980	A survey of Quitobaquito archeological sites and an ethnographic study which included the Quitobaquito cemetery was completed (Chambers 1980).
Government & Activities	1980	NPS covered gravesites with wire mesh and stones to prevent further vandalism and natural deterioration.
Use and Occupation	1981	Dr. Ofelia Zepeda collected oral histories with Hia Ce’d O’odham.

Government & Activities	1982-83	A Cooperative National Park Resources Study Unit (CPSU) study of Sonoran Desert mud turtle confirmed the Quitobaquito population was declining.
Natural Systems	1984	Improved hydroelectric power access increased the capacity of Mexican farmers to pump water from the aquifer in the Sonoyta Valley.
Government & Activities	1986	The Desert pupfish *(Cyprinodon macularis)* was federally listed as an endangered species.
Natural Systems	1987	The Quitobaquito desert pupfish (*Cyprinodon macularius eremus*) was formally recognized as a distinct subspecies of desert pupfish (Miller and Fuiman 1987).
Constructed Feature	1989	A concrete channel was constructed to bring water from the springs to the pond to improve habitat for Sonoran mud turtles, pupfish, and aquatic plants.
Government & Activities	1989	The Western Archeological and Conservation Center (WACC) began a large-scale systematic archeological survey at Organ Pipe led by Adrianne Rankin.
Government & Activities	1993	Adrianne Rankin conducted an additional archeological survey of 250 acres surrounding Quitobaquito pond and spring.
Government & Activities	1994	AZ SHPO concurred on a determination of eligibility (DOE) of Quitobaquito (prepared by Lawrence Van Horn) on August 18, 1994.
Government & Activities	1995	A Final General Management Plan (GMP), Developmental Concept Plans and an Environmental Impact Statement (EIS) was developed. NPS decided that it will not make decisions about Quitobaquito without consultation with the O'odham.
Natural Systems	2000	Mitochondrial DNA from the subspecies of desert pupfish at Quitobaquito (*Cyprinodon macularis eremus)* was determined to be a distinct species, *Cyprinodon eremus* (Echelle et al. 2000).
Government & Activities	2002	ORPI Park Ranger Kris Eggle was killed while on duty.

Government & Activities	2003	ORPI closed many areas to the public, including Quitobaquito, because of concern of transborder violence. These closures remained until 2014.
Natural Systems	2005	Water levels in the pond reached a historic low of 11.5 inches below outflow pipe on southern end of lagoon.
Natural Systems	2007	The water level in the pond reached a new low of 23.25 inches below the outflow pipe.
Constructed Feature	2008	NPS placed an impermeable diaphragm wall into the earthen berm that Dorsey constructed in the 1860's to prevent leaking.
Government & Activities	2008	A National Register nomination for Quitobaquito was rejected by AZ SHPO.
Constructed Feature	2009	ORPI patched the southeastern portion of the pond with bentonite clay to prevent leaking.
Government & Activities	2010	NPS attempted to treat the leaning cottonwood growing in the berm which was highly suspected of syphoning water from the pond. Resource managers drilled holes in the tree and filled them with bentonite clay in an attempt to stabilize the tree. They removed bullrushes from the pond and decaying tree roots that were threatening the berm's integrity.
Government & Activities	2011	The Intermountain CLI Coordinator revised the 2002 CLI to reflect updated conditions. DOEs for the district were submitted to AZ SHPO for concurrence on the updated CLI (CLI 2011).
Government & Activities	2014	Quitobaquito reopened to the public after years of closure due to the threat of transborder violence.
Agriculture Government & Activities	2015	Jesus Garcia from the Arizona-Sonora Desert Museum's Kino Heritage Fruit Tree Project took cuttings of the last remaining pomegranate tree at Quitobaquito.
Government & Activities Natural Systems	2016	NPS removed the leaning cottonwood tree which had been dying and was siphoning water from the pond, imperiling the berm, fish, and turtles. Cuttings were taken before it was removed, although none survived to be transplanted

Government & Activities	2016	36 CFR 2.6 was enacted, which allowed NPS to negotiate and enter into agreements with federally recognized tribes for the gathering of plants or plant parts from a NPS unit.
Government & Activities	2014-2017	University of Arizona Archeologist T.J. Ferguson led an intensive study of the historic salt trails that run through ORPI, including the Quitobaquito area.
Government & Activities	2019-2021	Construction of the border wall at Quitobaquito began, located 197 ft from the springs.
Government & Activities Government & Activities	2021	Water in the pond fell 23” below the outtake pipe. A design to remediate the situation by making the pond shallower and creating a ledge for the pupfish was developed by Natural Channel Design.
Government & Activities	2022	Resource management staff salvaged plants adjacent to the pond for use in restoration of the pond. Pupfish and mud turtles were placed in holding ponds.
Government & Activities	2022	The pond redesign, dredging, and pond liner replacement was implemented. Pupfish and mud turtles were returned to the pond.
Use and Occupation	2023	The O’odham people continue to visit Quitobaquito to gather plants for food and medicine as well as to conduct ceremonies and pray in sacred areas.

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CHAPTER 3 – LANDSCAPE EXISTING CONDITIONS

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Introduction

As a riparian zone in a Sonoran Desert environment, Quitobaquito Springs has been an important natural resource for thousands of years. It has been a source of water, a place to gather plants for food and medicine, as well as a reliable place to hunt wildlife. For people who settled here, it provided fresh water for early agricultural systems by the Indigenous and multi-cultural communities that occupied Quitobaquito. A variety of natural features including topography, the presence of water in the desert, and habitat zones that attract many species (some extremely rare), make up the unique natural character of Quitobaquito.

Of all the natural systems and features of Quitobaquito, water is perhaps the most distinctive. Many of the landscape characteristics are tied to the presence of water. The seeps and springs provide habitat for unique and federally endangered species such as the Quitobaquito pupfish and Sonoyta mud turtle. Constructed water features (the pond, spring channel, and irrigation canals) utilize the water from these natural water sources. Other landscape characteristics such as spatial organization, circulation, land use, and cultural traditions are deeply connected to water.

Natural Systems and Features

Water

Alluvial plains spotted with green vegetation reveal a place sculpted by water. There is, however, little continual presence of water within ORPI; washes (floodplains) are dry except during infrequent large rainfall events when these drainages quickly fill and then drain just as fast. *Tinajas* (rock basins) capture and store some of this rainwater, for days, weeks or months. Aguajita Wash, located at the eastern edge of Quitobaquito, drains excess stormwater south of the international border to Rio Sonoyta. This river used to run perennially; in recent times, however, it is mostly dry except for a few patches where it continues to flow year-round. On the U.S. side of the border, a U-shaped basin at the foot of Quitobaquito Hills holds groundwater which emerges as a rare and welcome group of springs. This desert oasis and associated plants and animals are the most important natural features of Quitobaquito.

The existence of a reliable water source is a central defining factor in the movement and settlement of Indigenous people in the Western *Papaguería*. Quitobaquito, whose O'odham name *'A'al Waippia* means "many little wells," is the second largest spring-fed oasis in the Sonoran Desert (Bradenfels 2011). According to Rankin et al. (2008), Quitobaquito, which consisted of 26 springs at one time, is one of the most important archeological sites in the Western *Papagueria*. The presence of springs is due to the geology of the area which creates many small seeps and several larger springs due to fissures or fractures in the rock. In the historic period, the Quitobaquito area contained five or more springs which fed a *cienega* or marsh oasis, but today only two of the springs are active year-round. After the construction of a dam in the late 1800s, the oasis became a pond with varying average depths. In its current state, Quitobaquito pond is .63 acres and up to 10 feet deep.

Surveys of the Quitobaquito area by Rankin (1995) and others indicate long term use and occupation of the area near the springs. The survival of the community depended on knowing the location of water sources, including springs, *tinajas* and perennial river water. Water was often harnessed in the form of dams, canals, reservoirs, and wells for a myriad of uses. Evidence of the use of Quitobaquito springs for irrigation of crops dates to at least the mid to late 1800s but likely pre-dated this period. Farmers diverted water from the *cienega* into irrigation canals where the water fed the orchard and agricultural fields (Rankin et al. 2008). Interventions beginning in 1860 created a dam and a pond which controls the flow of water to the south. The NPS has managed this configuration while adding additional water controlling features.

Naturally occurring water is considered sacred and healing by many Southwestern tribes including the Hopi, Zuni, Yavapai, and O'odham (Rankin et al. 2008). Rankin et al. report that the location and power of springs is closely guarded by traditional medicine practitioners. Natural waters are considered to have power to heal the mind, body, and soul. Many origin accounts, including that of the O'odham, involve water. For many Indigenous cultures, life is seen as beginning in a water body or in the underworld and emerging through springs (Rankin et al. 2008). The Hia C'ed O'odham recount how the earth was covered by water before it was parted by the Earth Doctor (Benedict et al. 2001). *I'itoi,* or Elder Brother, and Buzzard lowered the mountains around Pinacate to bring water from the peaks for human use (Rankin et al. 2008). O'odham oral traditions also recount the connection between water and significant events (Rankin et al. 2008).

The springs were also a way point for many non-Indigenous people including European missionaries and explorers, possibly travelers along the Camino del Diablo, scientific teams, and government officials. Father Eusebio Kino was the first European to document Quitobaquito in 1698 (Orsi 2017). Spanish settlers traveled the *Camino del Diablo* (Devil's Highway), a route between New Mexico, Sonora, Chihuahua, and California beginning in 1770s. People seeking their fortunes during the California Gold Rush of the late 1840s and 1850s also traveled the Devil's Highway (Orsi 2017). As the Camino is a short distance from Quitobaquito, it is possible that travelers stopped there while enroute but evidence of this has not been documented. After the Gadsden Purchase of 1853, international boundary survey teams visited or camped at Quitobaquito remarking on their "fine springs" (Orsi 37). Others who visited or stayed at Quitobaquito include scientists, customs service personnel and agricultural agents. Euro-Americans settled for periods of time at Quitobaquito including Andrew Dorsey who arrived around 1860 and is credited with constructing the earthen dam, Emanual Garcia Levy who opened a store in the late 1880s and Tom Childs who married into the Hia C'ed O'odham Community (Orsi 2017).

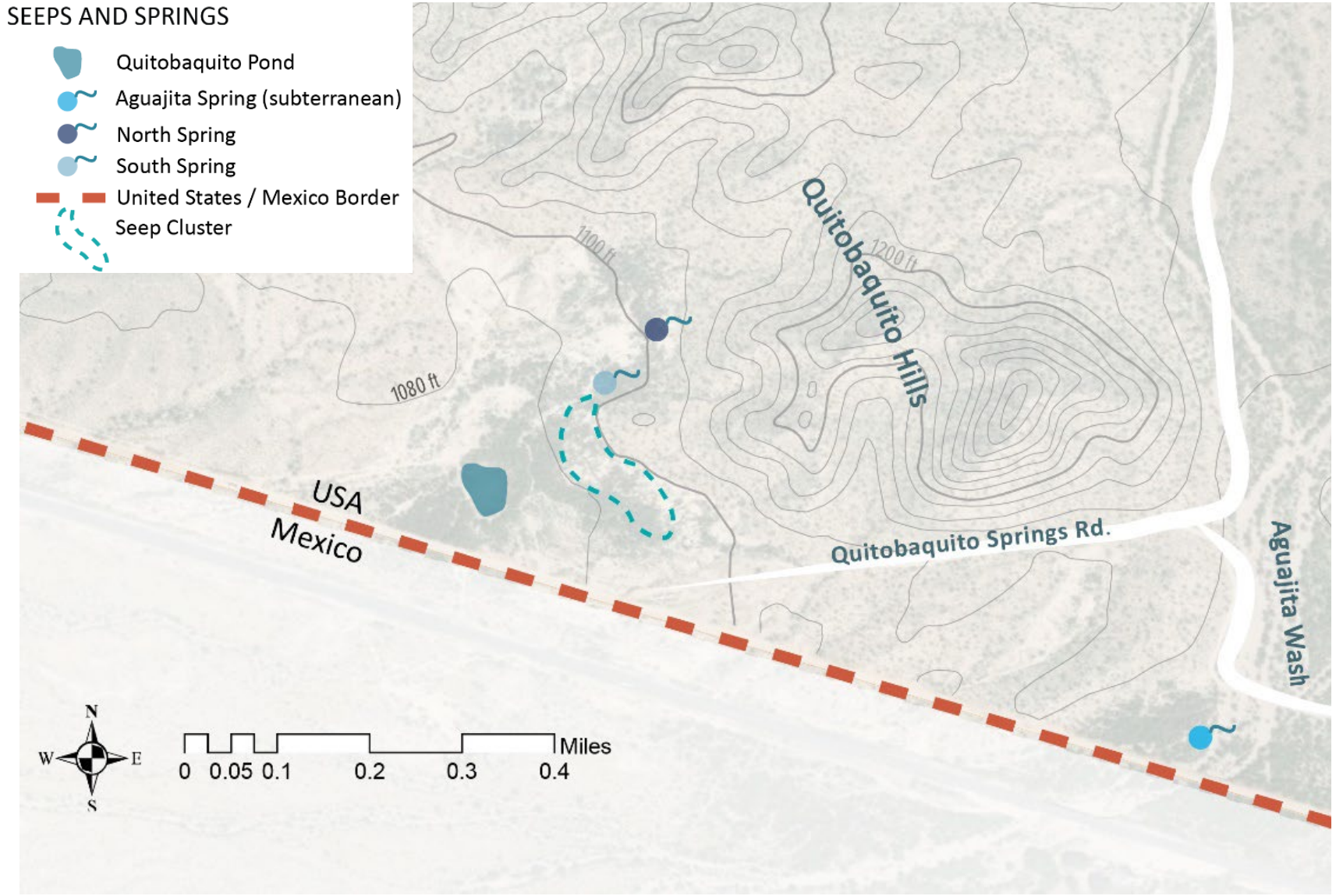

Figure 3-1 Seeps and Springs

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Figure 3-2 Seep flow with patches of yerba mansa (Nov. 2021). Teresa DeKoker, photographer

Wildlife

ORPI is home to approximately 64 mammal species, five amphibian species, 43 species of reptiles, and one fish species (US DOI General Management Plan 1997). Many of the animal species at ORPI inhabit Quitobaquito because of the diversity of habitats and the presence of water. The springs and pond at Quitobaquito attract a large number of bird species; 210 bird species have been recorded there since 1939, including four species that are federally listed species of concern (Gary Nabhan, personal comm., January 22, 2022.), Quitobaquito provides rare marsh/aquatic habitat in the Sonoran Desert for water obligate birds and provides important stop-over habitat for migratory waterfowl and mammals including Underwood's Mastiff Bat (*Eumops underwoodi*). Endangered species that find a home at Quitobaquito include the Sonoyta Mud Turtle (*Kinosternon sonoriense longifemorale*), and the Quitobaquito pupfish (*Cyprinodon eremus*). Other species of concern at Quitobaquito include the Southwestern willow fly catcher (*Empidonax traillii extimus*), Howarth's white (*Ascia howarthi*) and the Quitobaquito Spring Snail (*Tryonia quitobaquitae*), a species which will be listed under the Endangered Species Act no later than November 2023. The Quitobaquito spring snail, the Sonoyta mud turtle and the Quitobaquito pupfish are endemic to the Quitobaquito area.

Little was known about the Quitobaquito pupfish before the 1960s other than their population in the pond decreased at a rapid rate. The species had first been identified as desert pupfish, *Cyprinodon macularis* in 1853 (they were later found to be distinct species from *C. macularis*). To address their decline, NPS temporarily removed the pupfish, drained the pond, and dredged

the bottom to remove accumulated silt and plant material. However, these changes proved not favorable for the fish, as the pond was now too deep and cold. To address this, ORPI installed a bench at one end of the pond, creating a warmer shallow breeding area. ORPI noticed a second wave of decline in the late 1960s. Visitors had been encouraged to visit the pond, which they did. Unfortunately, the proximity of the parking lot at that time made it easy for people to release their pet fish, turtles, and ducks. The Golden Shiner, an introduced bait fish, had begun outcompeting the pupfish (Orsi 2017). ORPI staff did a second round of temporarily removing the pupfish and draining the pond. However, this time they also poisoned the pond to kill the exotic animal species that had displaced the pupfish and threatened their existence.

In the 1970s the first systematic scientific studies and monitoring of the pupfish began at Quitobaquito. The Cooperative National Park Resources Studies Unit (CPSU/UA) was the first to study Quitobaquito's pupfish. In 1975, ORPI began annually monitoring pupfish populations. Numbers fell rapidly from 7,295 in 1975-1,800 individuals in 1981 (Orsi 2017). In 1976, ORPI also spearheaded a study of the area's hydrogeology and installed gauges to monitor spring flow.

Regular monitoring showed that pupfish populations at Quitobaquito continued to decline in the 1980s, and in 1986, it was listed as endangered by the U.S. Fish and Wildlife Service (USFWS). Subsequently, the pupfish at Quitobaquito were formally recognized as a subspecies of desert pupfish (Miller and Fuiman 1987), the Quitobaquito desert pupfish, (*Cyprinodon macularius eremus*) (Miller and Fuiman 1987) and further mitochondrial DNA studies determined that it was a distinct species. (Echelle et al. 2000) In the literature, while the pupfish was classified as a subspecies it was known as *Cyprinodon macularus eremus*; once it was determined its own species it became *Cyprinodon eremus*.

C. eremus and its habitat are closely monitored by ORPI resource managers and the USFWS. Although it is protected within the designated wilderness of ORPI, its survival is still threatened by such things as: introduced species, habitat changes, pollution from nearby agricultural fields (Miller and Fuirman 1987) and critically low pond water levels. To ensure their survival, the Quitobaquito pupfish have been brought to various refugia within the last decade and a half. These assurance populations are located in adjacent areas such as Cabeza Prieta National Wildlife Refuge, the visitor center pond at ORPI as well as five locations in Sonora, Mexico (Rijk Morawe, phone conversation, July 6, 2021). Populations continue to fluctuate from season to season. The pond liner replacement, carried out in 2022 is intended to reduce habitat threats, such as low water levels, as well as to protect critical habitat for the Sonoyta mud turtle.

The history of NPS's management of Quitobaquito indicates the importance of both addressing specific species goals as outlined in the Endangered Species Act while also managing the ecosystem. During the pond draining and dredging to improve pupfish habitat in 1962, and again in 1969, Sonoyta mud turtles (*Kinosternon sonoriense longifemorale*) were left to fend for themselves. A CPSU/UA study in 1982-1983 showed that the Sonoyta mud turtle's population was down to only 50-100 individuals. This study led to a 1986 recommendation that ORPI

restore mud turtle habitat, which it did in 1989 with the help of the Arizona-Sonora Desert Museum. Islands were created in the spring channel and in the pond to enhance critical habitat. Despite the NPS's efforts to protect the mud turtle (its population increased to around 150 after habitat restoration), survival of *S. sonoriense* remained in peril, and in 2017, it was also listed by the USFWS as an endangered species. Like the pupfish, the mud turtles still face threats even though they are closely monitored and protected. The Arizona-Sonora Desert Museum has a captive breeding program for the turtles as assurance against extinction and educates the public about them. Meanwhile, wild populations at Quitobaquito continue to fluctuate. The 2022 pond restoration project created habitat for the Sonoyta mud turtle, as well as for other critical species at Quitobaquito, and is a good example of the NPS managing species by addressing the ecosystem.

A study of arthropod fauna by Kingsley, Bailowitz and Smith (1987), concluded that Quitobaquito is most likely the only U.S. breeding habitat for the rare butterfly, the Giant White (*Ascia howarthi*) which is dependent upon the desert caper tree (*Atamisquea emarginata*) a rare plant whose only known location in the U.S. is ORPI. Since a few of this small population of *A. emarginata* were removed during the construction of the U.S./Mexico border wall in 2021, it is possible that the population of *A. howarthi* was also affected.

Figure 3-3 "Turtle Island" Sonoyta mud turtle habitat improvements (1990). photographer unk

A study of invertebrate species at Quitobaquito identified 124 distinct taxa with 65 of these uniquely found at Quitobaquito (Hollien et al 2022). No seasonal variation in species richness was observed at Quitobaquito, likely due to the heterogeneity of habits found there.

Spatial Organization

Quitobaquito Pond forms the nexus of activity of the cultural landscape with springs to the north and east, remnants of historic agriculture such as irrigation canals to the south and southwest, and a parking area and trailhead to the southwest. In the historic period, agricultural fields extended south of the international border into Mexico. Historic residential areas would have been on the north, east and west sides of the pond, although nothing remains of these structures today. Historic cemeteries are located in the hills to the west, further away from the springs. Numerous archeological sites are spread throughout the landscape with clusters circling the springs, Aguajita Wash, and along segments of the salt trails.

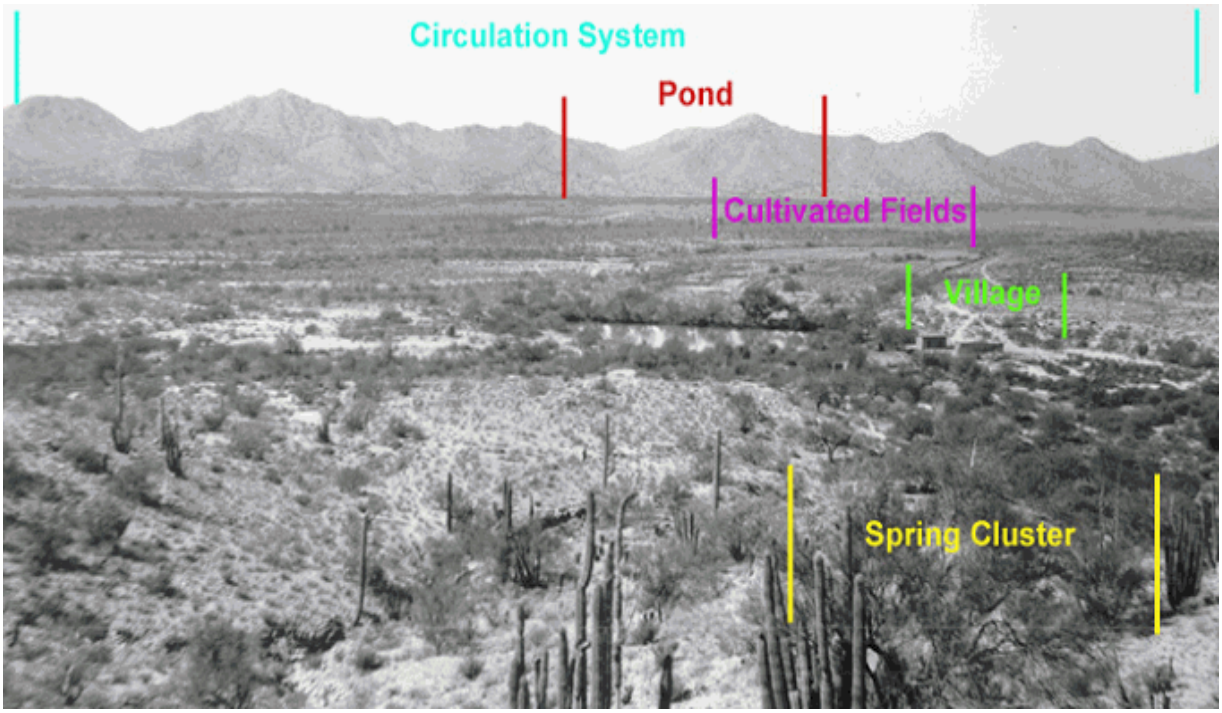

Figure 3-4 Historical spatial organization of Quitobaquito looking south (1917). Kirk Bryan, photographer. (Cultural Landscapes Inventory 1998)

The following maps depict the spatial organization from distinct historic periods. Some elements are conjecture due to limiting information, especially during the early Euro-Mexican period (Figure 3-5). The defining features from this period are the earthen dam which created the pond, agricultural fields, and the trail to Bates well. One section of this trail became the Pozo Nuevo road. Other circulation patterns probably existed but the locations are unknown.

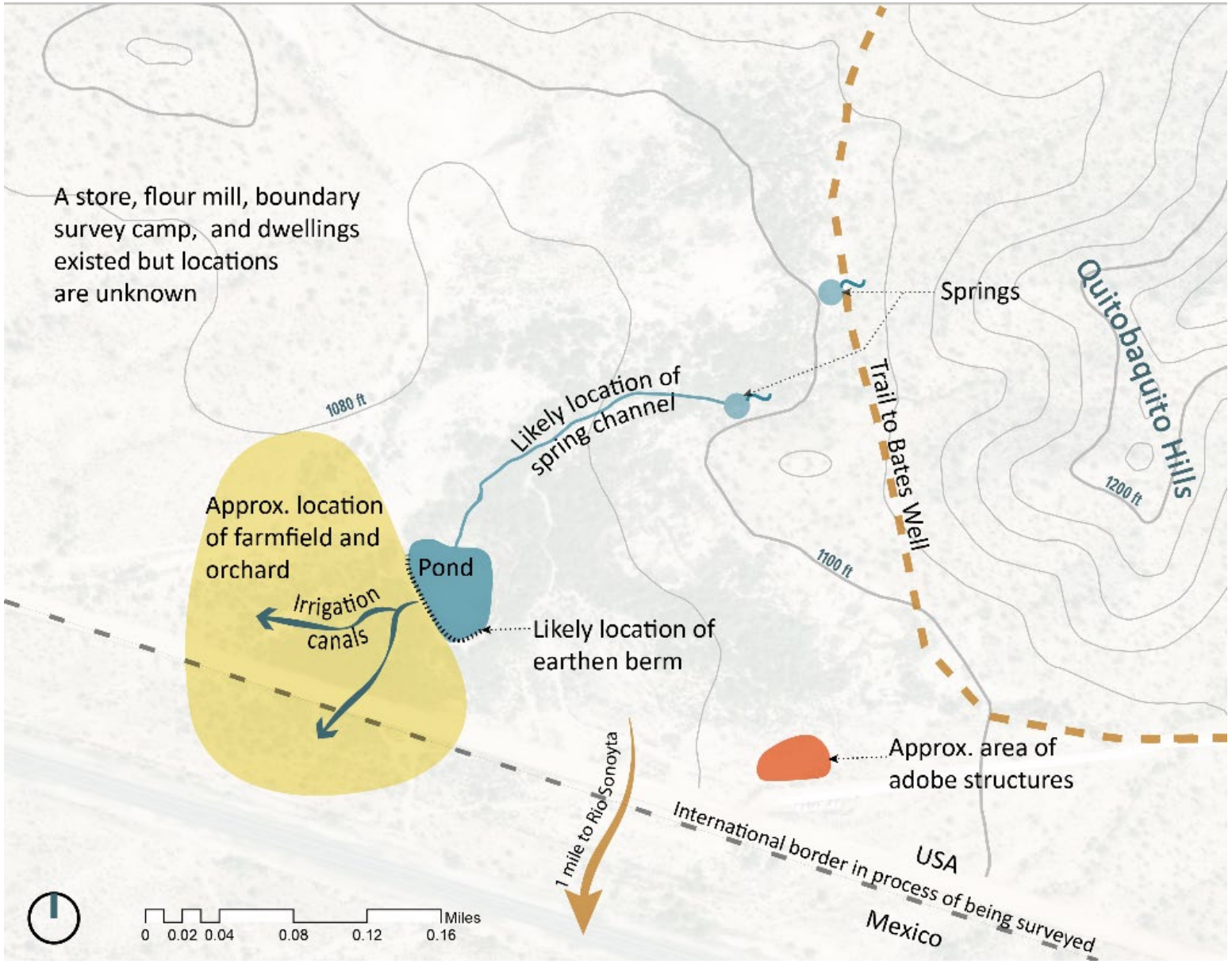

Figure 3-5 Early Euro-Mexican Settlement period circa 1860-1900

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During the Orozco family period, Quitobaquito was defined by the homestead which was centered around the pond and spring channel (Figure 3-6). Cottonwood and orchard trees were planted and remained until recent history. One of these cottonwood trees has survived to the present day.

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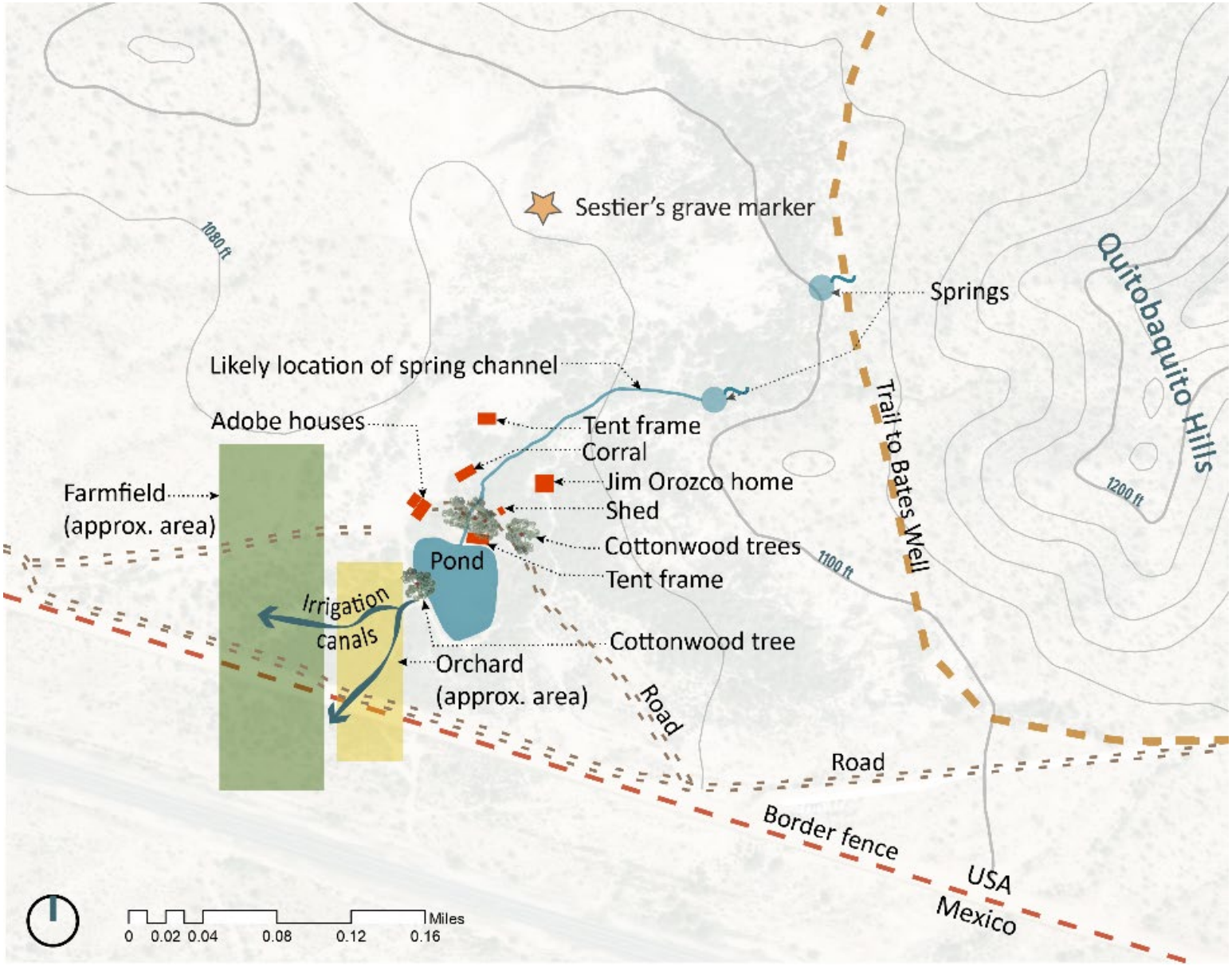

Figure 3-6 Orozco family period circa 1915-1957

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During the National Park Service period, all remaining historic period structures were razed, water from the springs to the pond was conveyed via underground pipe, and visitor amenities such as a parking lot, pit toilets, and an informational kiosk were added. Trees planted during the Orozco period remained including some pomegranate and fig trees, and the cottonwood trees, one of which was then leaning heavily into the pond.

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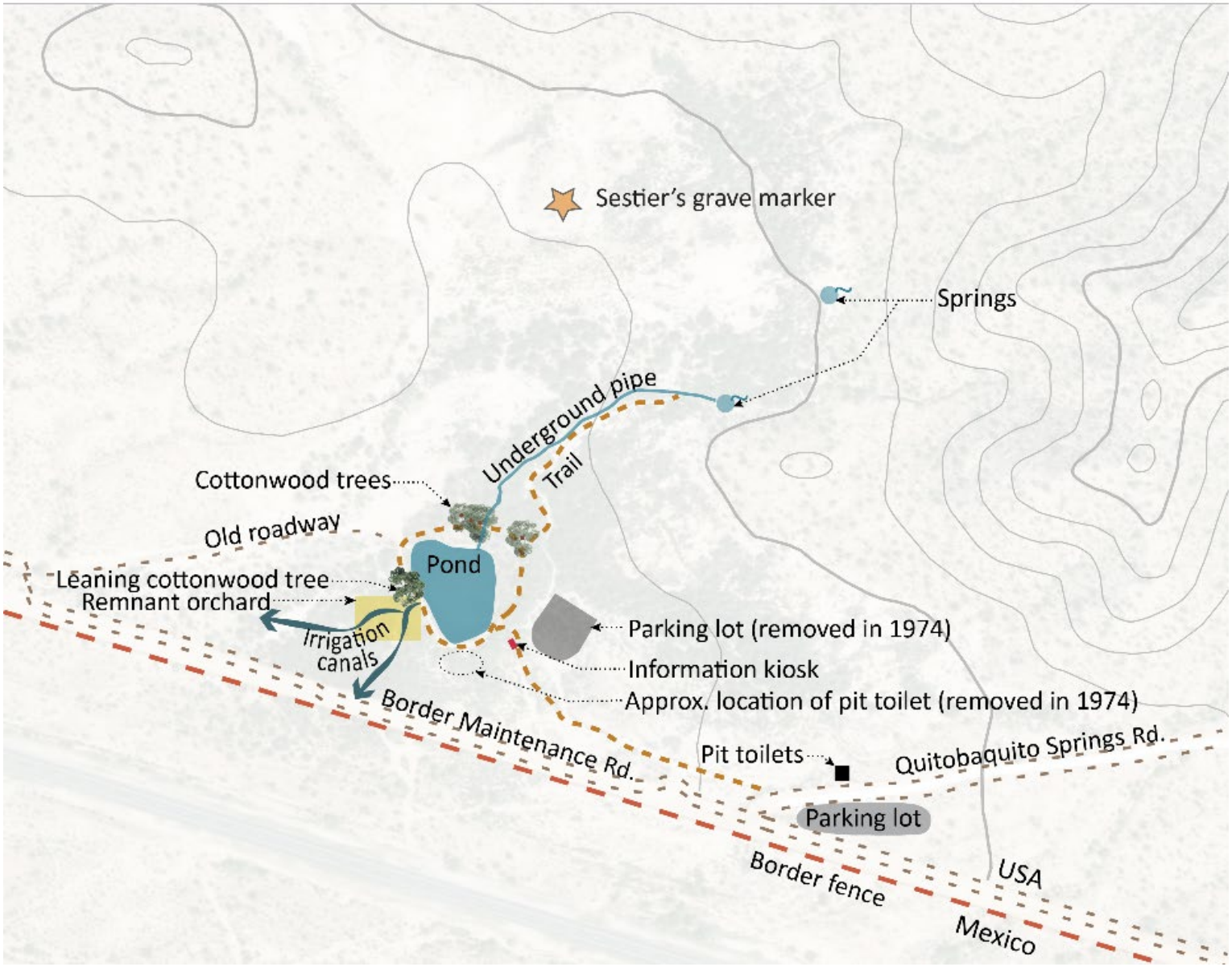

Figure 3-7 National Park Service Period Circa 1966-1980

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Land Use

Indigenous groups have hunted and gathered plants and animals at Quitobaquito for thousands of years. The O'odham people and their ancestors utilized many species of plants at Quitobaquito for food, fiber, shelter, medicine, basketry, tools, and ceremony. Native succulents including saguaro, agave, yucca, cholla and prickly pear were consumed by the Hia C'ed O'odham and Tohono O'odham throughout the Western *Papagueria* (Altschul and Rankin 2008, 189).

Agriculture has been practiced in the Sonoran Desert for millennia in places with perennial water or where seasonal rains produce high surface runoff. Quitobaquito springs has been a reliable water source and with interventions such as ditches and canals can be harnessed to produce crops year-round. Although the area has been well surveyed, subsurface testing and/or excavation would be required to find confirmation of prehistoric agricultural activities at Quitobaquito. Records of historic period agricultural activities within the landscapes are, however, abundant.

Hia C'ed O'odham had been living at Quitobaquito since 1855, according to the historical record, but it is unclear the extent to which they were engaged in agricultural activities. Juan José Garcia and his sons lived at Quitobaquito during the 1860-1890 period but whether they planted and tended crops is unknown. In 1860, Andrew Dorsey settled at Quitobaquito and constructed a dam and canals to irrigate fig and pomegranate trees and other crops. Bennett and Kunzmann (1989) speculate that the community that lived at the springs likely practiced subsistence agriculture before Dorsey's arrival. By 1887, the Louis Orozco family, who identified as Sand Papago, were settled at Quitobaquito and raised crops and cattle. The family may have been living at the springs prior to 1887. Upgrades to the irrigation ditches were undertaken in 1903-1904 by Thomas Childs who raised watermelons. The Hornaday and MacDougal scientific expedition of 1907 reported the presence of a stagnant pond, several small springs, and irrigated fields on the south side of the border. A 1915 report by Herbert V. Clotts who surveyed the "Nomadic Papago Country" included observations of Indigenous agriculture and cattle raising (Clotts, 1915). He reported 25 people living at Quitobaquito with eight acres of agricultural fields, mostly on the Mexican side of the border.

After a brief time away from Quitobaquito, the Orozco family returned in 1907 and maintained a small homestead until Jim Orozco moved from ORPI in 1957. José Juan Orozco, son of Louis, raised corn, figs, melons, and pomegranates at Quitobaquito (Greene 1977). He also ran 100 head of cattle at one point. His operations spanned the international border with most of the fields in Mexico. The orchard was located southwest of the pond on the US side. Orozco also constructed a mill to grind corn into meal (Greene 1977). In 1941, José Juan was notified by the federal government that he would not be allowed to construct any additional buildings, shoot animals, or gather wood. At that point, his homestead included two corrals, 2,000 ft of ditches, 22 pomegranate trees (nine of which were in Mexico) and eight fig trees (Hoy 1970). At one

point, it was reported that José Juan had 80 acres under cultivation. The era of agriculture at Quitobaquito ended in 1957 when Jim Orozco moved from the site.

Cultural Traditions

The Quitobaquito cultural landscape has been a place of hunting and gathering, use and settlement by the O'odham and their ancestors for thousands of years. The landscape includes evidence of use for transportation, rituals, pilgrimages, and subsistence practices of hunting and gathering. The practice of cactus fruit harvesting has been and continues to be important to the O'odham. Harvesting of saguaro fruit is a particularly important regional practice. Saguaro fruit is considered valuable because it is sweet and nutritious and can be dried and rehydrated later (Ferguson 2019). The fruit from the organ pipe cactus was also collected by the Hia C'ed O'odham (Ferguson 2019).

The historic Hia' C'ed O'odham cemetery is located northwest of the Quitobaquito pond about .35 miles and within the boundaries of the Quitobaquito cultural landscape. The cemetery, which contains 34 graves from the 1900-1945 period, continues to be a sacred place to the O'odham and a representation of the history of family connections to the site. Visitation to ancestors' graves has been practiced for at least 90 years (Underhill 1946; Anderson et al. 1982) and demonstrates continued use of the area by descendants of the people who were buried at Quitobaquito. The cemetery is a recorded archeological site with the Arizona State Museum (SON B:04:006 (ASM)).

Deterioration of the grave sites led the NPS in 1980 to work in collaboration with the Hia C'ed O'odham people and archaeologists to map the location and orientation of the graves and stabilize the site. Wooden structures that had been placed over the graves had collapsed and were replaced with metal grates covered with rocks (Anderson et al. 1982). Fillman Bell (1980) and others conducted oral history interviews to name the individuals buried at the Quitobaquito cemetery, to create a genealogy for the community, and to recount lifeways and burial practices.

The traditional death ceremony of the O'odham is a sacred ritual, focused on safeguarding the deceased's spirit until it reaches its final destination. The burial ground is considered a holy place and is sanctified by a medicine man. Relatives leave food and other offerings at the gravesites, often on All Soul's Day. The cemetery survey in 1980 noted the presence of food containers, corn meal, eating and cooking utensils, clothing, tools, pottery, and wreaths with cardboard frames, including one from All Soul's Day in 1979. Other burial locations occur in the vicinity but are managed as archeological sites (Rankin 1995).

Cluster Arrangement

Human activity during the historic period was clustered around the pond (Figure 3-8). The small village consisting of homes and ranches and a small store was clustered on the east and north sides of the pond beginning in the 1860s and ending with the razing of the Orozco homestead in 1962. Agriculture was clustered south and west of the pond behind the earthen dam and extended into Mexico. A parking lot was built in 1962 to the southeast of the pond but was removed 12 years later in 1974.

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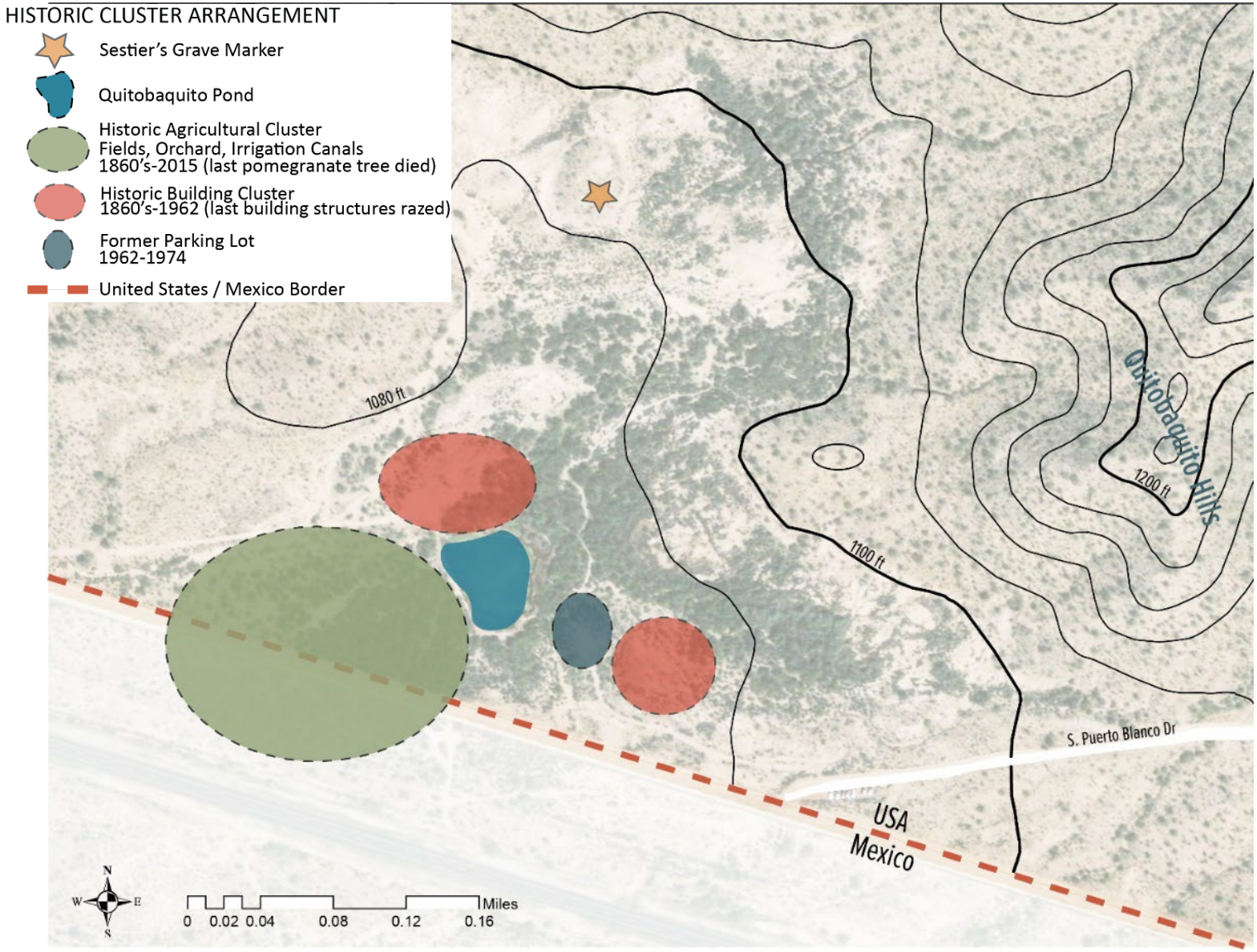

Figure 3-8 Historic Cluster Arrangement

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Circulation

Quitobaquito is linked to the Gulf of Mexico, California, New Mexico, numerous locations in the Western *Papaguería* and to northern destinations via a series of ancient and historic trails and roads. These travel routes connected people to villages, camps, and natural resources: fresh water, fish, plants, animals, shells, and salt (Ferguson et al. 2019). Travel along these routes, which generally followed long-established trail systems, occurred primarily by foot, but pack animals, wagons, and motorized vehicles were later used (Hilton and Ferguson 2019).

Father Kino's expedition to Quitobaquito in 1698 followed native trail systems. Quitobaquito may have been a stop along the infamous *Camino del Diablo*, a route Spaniards began to use in the late 1700's to travel between settlements in New Mexico, Chihuahua, Sonora, and California. The specific location of Quitobaquito, north of the Sonoyta River and a long one-day's walk to Sonoyta or Bates Well, placed it near many local and long-distance trails. These ancient trails continue to serve important cultural traditions and are considered sacred to the O'odham people (Ferguson et al. 2019).

Trail networks in ORPI centered around two nodes of activity: Quitobaquito (or *Al' Waipia*) and Bates Well (or *Juñi Kaachk*). Quitobaquito has served as an important node along these travel routes, providing critical water and food resources for precontact peoples and later the O'odham. According to Rankin (1995), the longest trail (AZ Z:13:119, ASM) and one of the most important in ORPI, begins near Bates Well and terminates at Quitobaquito. Artifacts found through archeological surveys along this trail date back as far as 8500 BCE (Hilton and Ferguson 2019). These trail segments were likely used by the Ceramic period cultures to collect shells from the Gulf of California and were used historically and through the early twentieth century by the O'odham to collect salt from the salt flats along the Gulf of California (Rankin 1995; Hilton and Ferguson 2019).

Salt pilgrimages were an important ceremonial journey conducted by the O'odham. These pilgrimages originated from O'odham villages and lead to salt flats located on the Gulf of California in Sonora, Mexico. The pilgrimage, conducted on foot and following cultural and traditional protocols, is considered a spiritually powerful ceremony for young men and a way to help them transition to adulthood. After a 60- to 80-year hiatus in the tradition, the salt pilgrimage was revived in 2011. However, O'odham people continued to travel to the Gulf to collect salt using horses, wagons, or vehicles during the decades the formal practice was on hold (Hopkins 2019). The present pilgrimage faces new challenges of access to the land and to the original trails followed by O'odham ancestors as well as concerns about safety and border crossing. Within ORPI, both the Bates Well to Quitobaquito Trail Corridor and the Quitobaquito Trail Corridor are associated with historic salt pilgrimages (Hanson et al. 2020).

Rock cairns (small stacks of rocks) were and continue to be used to mark travel routes, to direct the traveler, to commemorate an event, identify a place, recognize a spirit, or to inform future

generations about the past (Jansson 2019). They can be as small as one to several cobbles, or as large as 10 cobbles stacked two courses high. In the 20th century, people used other common items to mark trails such as wooden boxes, cans, or rags tied to trees. Rock cairns have been recorded as a component of the Quitobaquito Trail Corridor (ORPI 00298) and the Bates Well to Quitobaquito Trail Corridor (ORPI 00291) (Hanson 2020).

Shrines, while less common, may be found along major travel routes. These differ from rock cairns in that shrines include offerings by the people who visit or pass the shrine. The offerings may include shells, rocks, ceramics, and stone tools and, in contemporary times, "cassette tapes, full beer bottles, bits of old saddles, and even ritual dance regalia." (Jansson 2019, 70). Some cairns may function as shrines to commemorate an event or a sacred place or spirit (Vanderpot and Altschul 2008). One O'odham shrine has been recorded (SON B:04:005(ASM)) in the Quitobaquito vicinity.

Upon the creation of ORPI, free movement through the landscape was curtailed. Historically, local travel by the O'odham between places like Bates Well, Quitobaquito, Quitovac, and Sonoyta was common as people visited relatives in these villages or walked south to attend important events such as the Rain Dance or to participate in the traditional salt pilgrimages (Hilton and Ferguson 2019). When the last O'odham resident living in ORPI left in 1957, local travel connected to Quitobaquito ceased. With the establishment of ORPI and the recent construction of a border wall, travel along the north/south route has been altered.

Two important travel routes, which have been recommended eligible for the NRHP, (Hanson et al. 2020) connect Quitobaquito to the north and to the south. The Bates Well to Quitobaquito Trail Corridor (ORPI00291) follows Growler Wash to the northeast from Quitobaquito ending at historic Bates Well, which has been a reliable source of water. The Quitobaquito Trail Corridor (ORPI00298) is located east of Quitobaquito with one branch leading south into Sonora, Mexico. Archeological sites have been recorded along both travel corridors. Hanson et al. (2020) argue that the material culture associated with these trails indicates long-term use dating to the Early Archaic period (ca. 9000 BCE).

Today, circulation in and out of Quitobaquito mainly comes from the east and northeast along Puerto Blanco Road. U.S. Border Patrol agents also utilize the border infrastructure road that runs along the north side of the border wall and occasionally use roads that ORPI has intentionally closed off, such as the one to the west of the pond. The parking lot is located southeast of the pond, adjacent Puerto Blanco Road, immediately north of the border wall. The original parking lot was located directly east of the pond.

There are three distinct foot paths at Quitobaquito (Figure 3-9). The entrance trail from the parking lot to the pond, the pond trail which circumnavigates the pond, and the spring trail that

leads to South Spring. The entrance trail leads from the parking lot to the pond. It ranges from 3-7’ wide and is composed of native soil. Most of the trail is lined with varying sizes of rocks. The trail around the pond includes the berm on the south and east sides of the pond that are part of this path. The berm is approximately 25’ wide, and the trail ranges from 7-13’ wide. It is composed of native soil. A smaller trail leads from the pond to the springs and is used by NPS to monitor spring flow. It ranges from 18-48” and is composed of native soil. Recent trail works added wooden water bars to mitigate erosion (Figure 3-13). There is one area of user created social trails above South Spring which has caused some erosion (Figure 3-14).

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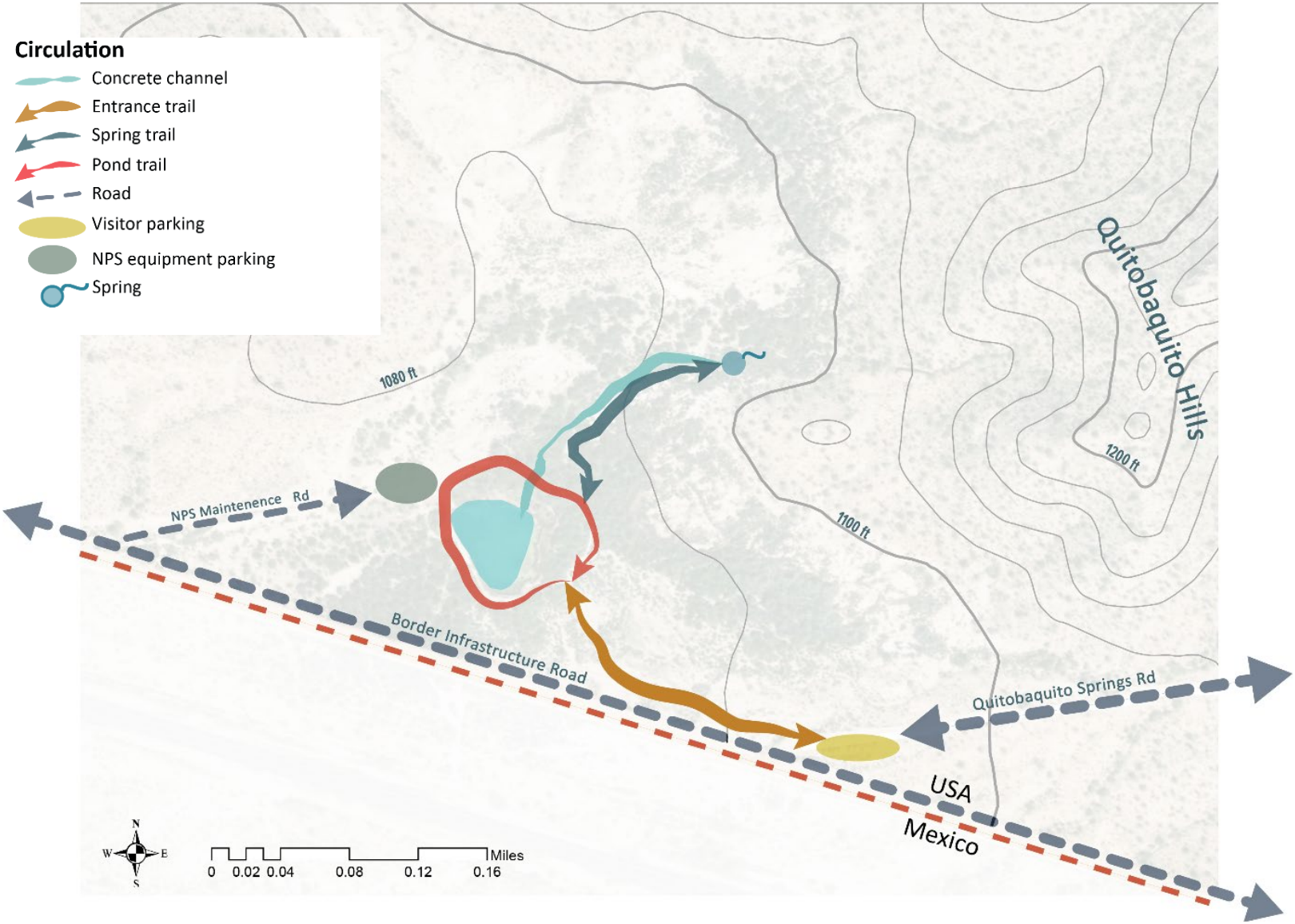

Figure 3-9 Quitobaquito area contemporary circulation and parking map

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Figure 3-10 Quitobaquito entrance trailhead (Nov. 2021). Teresa DeKoker, photographer

Figure 3-11 Quitobaquito entrance trail near parking lot (Nov. 2021). Teresa DeKoker, photographer

Figure 3-12 Pond trail around north side of pond (Nov. 2021). Teresa DeKoker, photographer

Figure 3-13 Spring trail (April 2023). Teresa DeKoker, photographer

Figure 3-14 Visitor created social trail above South Spring (April 2023). Teresa DeKoker, photographer

Topography

The topography of Quitobaquito, along with subsurface geology and precipitation, create the conditions that make this area culturally and ecologically unique. The springs occur at the base of the Quitobaquito Hills, which rise 500' above the flatlands below and run five miles long and up to two miles wide. The geology of the northern part of the range consists of mostly of intrusive igneous rocks and gneiss. Granite and quartz diorite make up the bedrock of the southern end of the hills where Quitobaquito is located. The slopes of these hills, known as *bajadas*, contained the raw materials for stone tool making (Vanderpot and Altshul 2008).

The La Abra Plain, along the eastern end of the site is a 100 square mile alluvial basin that is formed from eroded sediments from the Puerto Blanco and Sonoyta Mountains that lie to the north. For millions of years, wind and water have carried sediments from these mountains and deposited them, forming a plain of sediments 1,000 feet deep. The deep alluvial soil that had accumulated in the valley bottom, along with the presence of water at Quitobaquito, enabled people to grow food. The historic agricultural fields extended south from the springs and into what is now Mexico. Additionally, these valleys of accumulated alluvium were reliable sources of clay that was used for making ceramic vessels. These topographic conditions created an environment that was suitable for human use and attractive to wildlife.

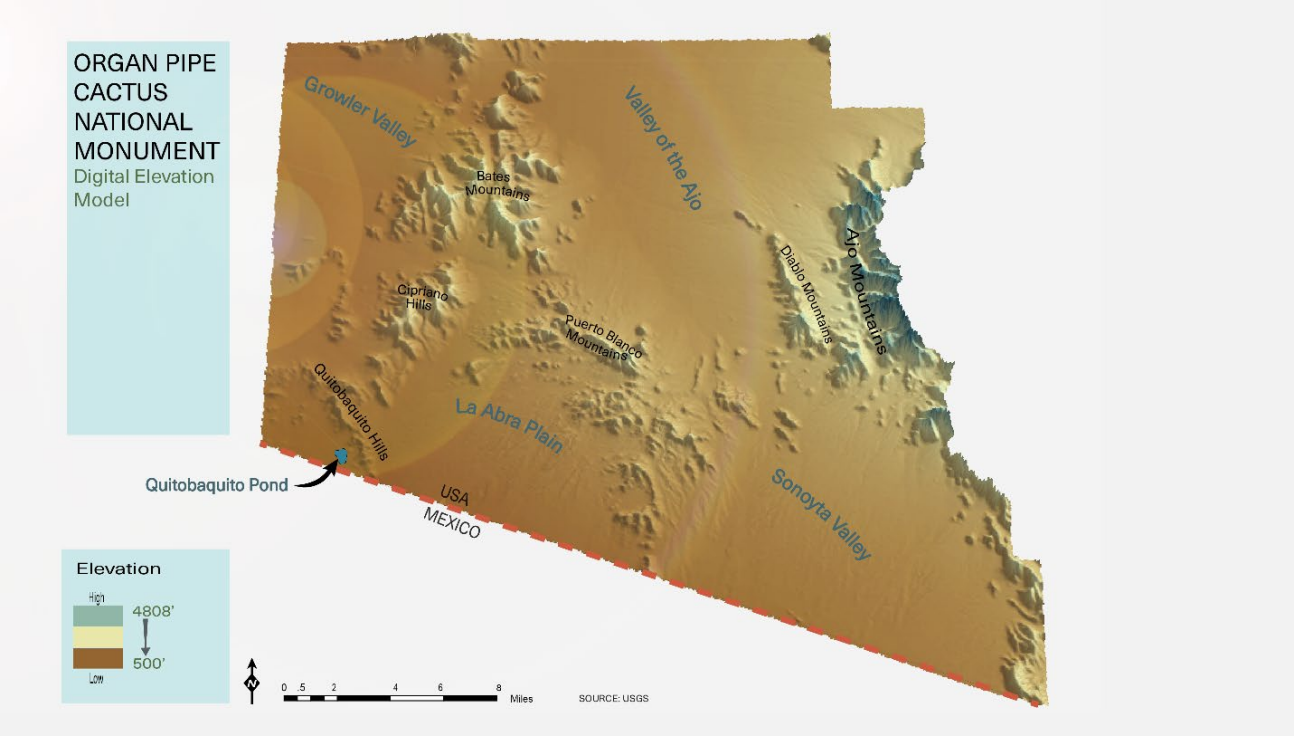

Figure 3-15 Digital Elevation Model of Organ Pipe Cactus National Monument

Vegetation

Early visitors to Quitobaquito would have seen quite different plant communities than what exists today. Archeological evidence suggests that around 10,000 BCE, this area would have been a pine-juniper forest, and around 9,500 BCE it would have transitioned to a yucca-juniper woodland and grasslands. This change in plant communities was a result of a hotter, drier climate that would eventually transition into the Sonoran Desert that we see today.

The amount and seasonality of rainfall is one of the most significant physical conditions defining the boundaries of the Sonoran Desert (Shreve & Wiggins 1964). The Sonoran Desert is wet compared to other North American deserts, with a bi-seasonal rainfall pattern. Mild winters see storm fronts from the Pacific Ocean that bring gentle rains. From July to mid-September, moist tropical air can bring turbulent storms and monsoon rains which are more localized, frequent, and wetter. Of the plants that exist here, half have tropical origins with life cycles that are adapted to this brief, yet potent, summer rain schedule (Shreve & Wiggins 1964). Two visually dominant life forms, columnar cacti, and leguminous trees, distinguish this desert from neighboring deserts.

ORPI lies within the Arizona Upland and Lower Colorado Valley subdivisions of the Sonoran Desert. The Arizona Upland subdivision is particularly high in species diversity and richness and includes numerous species of cacti, shrubs, and grasses (Shreve and Wiggins 1964). The Lower Colorado Valley subdivision is warmer and drier and has fewer plant species overall, however, it supports more late winter annuals than the Arizona Upland subdivision (Shreve & Wiggins

1964). The positionality of ORPI at the intersection of two subdivisions contributes to its biodiversity. Some of these habitats also support several endangered species. Even though Quitobaquito only receives 5 inches of rain per year on average, its unique and varied landform types create novel habitats for diverse plant communities (Felger et al. 1992). These habitats include rocky slopes, wetlands and pond, washes (floodplains), alkaline flats (seasonally wet areas adjacent springs) and remnant agricultural fields that now take the form of a mesquite bosque (CLI 2011). Some of these habitats also support several endangered species.

There are over 643 plant species in ORPI, 271 of which can be found at Quitobaquito (Felger and Broyles 2007, 209). Notable species such as organ pipe cactus (*Stenocereus thurberi*), Saguaro cactus, (*Carnegiea gigantea*), screwbean mesquite (*Prosopis pubescens*), desert caper (*Atamisquea emarginata*), and yerba mansa (*Anemopsis californica*).

Figure 3-16 Traveling spikerush growing around a seep (Nov. 2021). Teresa DeKoker, photographer

The seeps, springs, and the pond at Quitobaquito support open water, marsh and riparian habitats that are rare within the Sonoran Desert. The lush vegetation surrounding the springs and pond are a stark contrast to the desert scrub in the surrounding area. Although the vegetation communities are similar in the wetlands around the pond from those around the seeps and springs, they are different enough to be separated as distinct habitats. Common

species around the pond include velvet mesquite (*Prosopis velutina*), screwbean mesquite (*Prosopis pubescens)*, Goodding's willow (*Salix gooddingii)*, wolfberry (*Lycium fremontii)*, arrowweed (*Pluchea sericea)*, seep willow (*Baccharis salicifolia)*, bulrush (*Schoenoplectus americanus)*, and desert broom (*Baccharis sarothroides).* One cottonwood tree (*Populus fremontii*) remains of those that were planted along the pond's perimeter prior to NPS management of Quitobaquito. The remaining cottonwood will likely be removed in 2023 for safety reasons. Tamarisk (*Tamarix chinensis*), a non-native and highly invasive species, was first recorded at the pond in 1985 (Felger et. al. 1992). NPS actively removes invasive species from the pond including bulrush and tamarisk as well as woody species such as Gooding's willow that have the potential to compromise the earthen berm and pond liner (Jeanne Taylor, personal communication, March 9, 2022).

Plant communities around the seeps and springs have different plant compositions than those around the pond due to the presence of shallow water and wet soils surrounding them. The common species at the wetlands around the seeps and springs include wolfberry (*Lycium fremontii)*, traveling spikerush (*Eleocharis rostellata)*, alkali goldenbush (*Isocoma acradenia)*, velvet mesquite (*Prosopis velutina)*, saltgrass (*Distichlis spicata)*, graythorn (*Ziziphus obtusifolia)*, arrowweed (*Pluchea sericea)*, and catchfly prairie gentian (*Eustoma exaltatum*). Notable differences in plant species include the presence of yerba mansa (*Anemopsis californica*), the greater abundance of traveling spikerush and an absence of seep willow at the seeps and springs. Both areas around the pond and springs have an abundance of invasive Bermuda grass.

Mesquite *bosques* (mesquite woodlands) are riparian areas located where there is a relatively shallow water table. At Quitobaquito, the mesquite *bosque* is in the floodplain of Aguajita wash and surrounds the pond. Common species in these areas include: *Prosopis velutina*, *Prosopis pubescen*s, *Lycium* spp., and *Senegalia greggii* (catclaw acacia).

Rocky slopes of the Quitobaquito Hills make up a substantial portion of the landscape. Variations in slope, soil depth, and drainage patterns are the primary factors contributing to plant community compositions on these rocky, shallow soils. Common species found in this habitat are: organ pipe cactus (*Stenocereus thurberi*), saguaro (*Carnegiea gigantea)*, Engelmann's hedgehog cactus (*Echinocereus engelmannii*), Emory's barrel cactus (*Ferocactus emoryi*), brittlebush (*Encelia farinosa*), triangle-leaf bursage (*Ambrosia deltoidei*), white bursage (*Ambrosia Dumosa*), creosote bush (*Larrea tridentata*), desert limberbush (*Jatropha cuneata*), foothills palo verde (*Parkinsonia microphylla*), and ironwood (*Olneya tesota*).

Alkaline flats have seasonally wet soils and can be found near the larger springs at Quitobaquito. Common species in this habitat are: saltgrass (*Distichlis spicata*), alkali sacaton (*Sporobolis airoides*), arroweed (*Pluchea sericea*), saltbush (*Atriplex* spp.), white ratany (*Krameria grayi*), and alkali goldenbush (*Isocoma aradenia*).

Figure 3-17 Rocky slopes with organ pipe cactus and creosote bush (Nov. 2021). Teresa DeKoker, photographer

Figure 3-18 Alkaline flats (Nov. 2021). Teresa DeKoker, photographer

Washes form the drainages from the mountains, hills, and alluvial fans around Quitobaquito. Aguajita wash, along with its many side channels, drains the La Abra Plain and forms the eastern boundary of the Quitobaquito cultural landscape. These washes are particularly rich in biodiversity and can have a high density and diversity of annual plants depending on seasonal rains. The southern end of the wash adjacent the Mexico border supports one of the only populations of desert caper (*Atamesquea emarginata*), in the United States. The other population is located at the pond, where there are several individuals. Aguajita wash is also the only location of smoketree (*Psorothamnus spinosus*) in ORPI. Common species in the washes at Quitobaquito include blue palo verde (*Parkinsonia florida*), ironwood (*Olneya tesota*), and velvet mesquite (*Prosopis velutina*).

Old agricultural fields and orchards are in the flatlands below and to the west of the dam and extend south of the border. Sections of the irrigation system exist below the pond where stumps from the planted figs and pomegranates can still be found along the canal. The old fields immediately adjacent to the pond have been converted to a mesquite bosque. Further from the pond, the old fields are regenerating with a mix of species. Common species in this habitat include: cholla (*Cylindropuntia* spp.), velvet mesquite, narrowleaf saltbush (*Atriplex linearis*), wolfberry (*Lycium* spp.), triangle-leaf bursage (*Ambrosia deltoidei*), and graythorn (*Ziziphus obtusifolia*).

Other disturbed areas include the site of the old homestead on the northwest side of the pond, the site of the old parking lot and store on the east side of the pond, the area adjacent to the entrance trail to the pond (once a road to the old parking lot), as well as the roadside and area disturbed by the border wall. The area where the old homestead once stood is used as a staging area by NPS and is occasionally used by border patrol. The ground is bare of vegetation since it is travelled upon by vehicles and sometimes heavy equipment. The area around the old parking lot, store, and entrance path has converted to a saltbush shrubland dominated by desert saltbush (*Atriplex polycarpa*), narrowleaf saltbush (*Atriplex linearis*), and seepweed (*Suaeda nigra*). Other common species in this community are *Cylindropuntia fulgida* (chainfruit cholla), buckhorn cholla (*Cylindropuntia acanthocarpa*), and spectacle fruit (*Wislizenia refracta*). Buffelgrass (*Cenchrus ciliaris*), a non-native perennial bunchgrass, occurs in this area but is actively removed by NPS (Jeanne Taylor, personal communication, March 9, 2022).

Cryptobiotic soil crusts form a thin layer of biological material across the soil surface in areas of the Quitobaquito cultural landscape. These crusts are communities of non-vascular organisms including lichens, mosses, algae, and cyanobacteria which take many years to form. These crusts play a vital role in arid soils: they retain soil moisture and slow evaporation rates, help maintain soil temperature, retard wind and water erosion, and enhance seedling establishment. Although they take many years to form, they are easy to destroy. Foot traffic breaks these crusts and leaves the exposed soil vulnerable to dehydration and erosion (GMP 1995). For this reason, off-trail walking including social trails at Quitobaquito threaten these biotic communities.

Over 200 species of plants are known to have been used by Indigenous groups at Quitobaquito (the Hia C-ed O'odham, the Tohono O'odham, and their predecessors). Plants were used for food, medicine, fiber, shelter, tools, basketry, and ceremony.

Ethnobotanical records and paleobotanical remains from archeological surveys in the region indicate that tree legumes (including mesquite, ironwood, and palo verde), cacti (including saguaro, cholla, and prickly pear), agave and yucca were among the most utilized food plants (CLI 2011). To make these plants edible, they were first cooked (boiled, roasted, baked). Seeds from grasses and other small plants were also processed in this way. Pit cooking was the most common method of food preparation for the O'odham and their predecessors, the Hohokam (Altschul and Rankin 2008, 189).

Figure 3-19 Screwbean mesquite at Quitobaquito (Nov. 2021). Teresa DeKoker, photographer

Figure 3-20 Yerba mansa, an important medicial plant growing near springs (Nov. 2021). Teresa DeKoker, photographer

One of the most important plants for the O'odham is the saguaro (*Carnegiea gigantea*), which is deeply connected to culture and identity. The flowers, fruits, seeds, thorns, burls (boots), and ribs are used for a variety of purposes including food, fiber, tools, trade, structures, and ceremony. Saguaro fruit (*bahidaj*) harvesting is a centuries old practice representing an intimate connection to traditional lands (Toupal, Stoffle, and Dobyns 2006). Saguaro camps are linked to families, with specific groves connected to family groups and passed from generation to generation (Toupal, Stoffle, and Dobyns 2006). The fruits are made into jams, eaten fresh, or fermented into wine for the *Navai't* and *Vikita* harvest ceremonies. The O'odham believe that it is their responsibility to care for the saguaro, and that part of this care is to conduct the harvest and ceremonies that accompany it (Toupal, Stoffle, and Dobyns 2006).

Other cacti, including cholla (*Cylindropuntia* spp.), organ pipe cactus (*Stenocereus therberi*), and prickly pear (*Opuntia* spp.) are important and highly nutritious food sources for the O'odham (Crosswhite 1981). Cacti are an excellent source of carbohydrates and minerals. The fruits of the organ pipe cactus provide carbohydrates. Cholla flower buds are especially rich sources of calcium. Harvesting parties gather in April and May to pick cholla buds in large quantities. Once collected, the buds are brought back to a central location where they are roasted in a pit using mesquite wood. The dried buds are then preserved for use throughout the year (Altschul and Rankin 2008). Both the pads and the fruits of the prickly pear cactus (*Opuntia* spp.) are used for

food. The young pads are harvested in late spring and summer and then cooked and eaten as vegetables. The fruits are harvested in the summer and eaten fresh or boiled and made into syrup or marmalade (Altschul and Rankin 2008).

Legumes such as mesquite (*Prosopis* spp.), palo verde (*Parkinsonia* spp.) and ironwood (*Olneya tesota*) were all staple foods for the O'odham. Mesquite was (and still is) especially useful as a food, medicine, and wood for fire and building material (Altschul and Rankin 2008). Legumes are a highly nutritious food source; the seeds and pods that were used (and still are to a lesser extent) are rich sources of proteins and carbohydrates. Mesquite pods and beans were harvested in the summer and early fall and used throughout the winter. The pods and seeds were first either sun dried or fire-parched and then pounding in a mortar to make flour. Palo verde, and acacia species were also used as foods in this way, although these were less utilized. The processing of these other woody legumes differed in that the seeds and pods were not as sticky so they could be processed with a metate (Altschul and Rankin 2008).

Seeds of wild grasses and annual forbs were important foods for Indigenous peoples of the Southwestern Arizona, contributing essential fatty acids, micronutrients, proteins, and carbohydrates to their diets. Grass seeds from sacaton (*Sporobolis airodes*) were likely utilized as a grain. Seeds from annual plants such as carelessweed (*Amaranthus palmeri),* tansy mustard (*Descurainia pinnata*), and chia (*Salvia columbariae*) were highly prized. Seeds of carelessweed were parched and ground into a flour. The leaves were also used. They were rolled into a ball and baked on hot rocks or coals and stored for later consumption. It appears that tansy mustard may have been cultivated by the Hohokam since large amounts of the seeds have been found at Hohokam sites. Chia was highly cherished; its nutritious oily seeds were parched and ground into flour. The flour was brought on journeys and eaten for energy and to reduce thirst. It was mixed with water to make a drink called *pinole.* A thicker version of pinole was also made, with just enough water to make it into a cake which was then baked (Altschul and Rankin 2008, 197). Plants in the amaranth family (*Amaranthaceae*) such as saltbush (Atriplex spp.), and netleaf goosefoot (*Chenopodiastrum murale*) were eaten in a similar manner where they were parched, ground, and made into atole (Altschul and Rankin 2008, 197).

Quitobaquito has a centuries-long agricultural and horticultural history; its fertility owing to the deep alluvial soils and the perennial presence of water. Written and oral histories document the following crops that have been grown on site: cane sorghum, cantaloupes, green chilies, figs, pomegranate, pear, peach, watermelon, green chilies, watercress, wheat, barley, tepary beans, pumpkins, squash, maize, onions, alfalfa, grapes, black-eyed peas, and red pinto beans (Felger et. Al 1992). The majority of these crops were grown in the historic period; crops have not been planted since NPS took possession of the area in 1957.

Although annual crops ceased to exist at Quitobaquito after 1957, orchard species persisted, albeit not very well. Fig and pomegranate trees continued to grow where they had been planted along an irrigation channel stemming from the outflow of the pond. They survived

without maintenance for decades; the last fig tree died in the 1990s and the final struggling pomegranate died in 2016. Gary Nabhan, ethnoecologist, and Wendy Hodson from the Desert Botanical Garden took cuttings from both the figs and pomegranates in the 1980s (Jesus Garcia, personal communication, December 15, 2021). These cuttings were grown at the Desert Botanical Gardens (DBG) as well as at the Arizona-Sonora Desert Museum in to preserve their genetic heritage. Additionally, Jesus Garcia from the Arizona-Sonora Desert Museum took cuttings of the last pomegranate before it died, which were grown at Mission Gardens in Tucson. Both species are still being grown at these nurseries, with the majority produced at Mission Gardens and distributed to visitors there. (Jesus Garcia, personal communication, December 15, 2021). Although the orchard and fields are gone, remnants of the irrigation ditches, lined with the stumps of fig and pomegranate trees, can still be seen. The Orozco family planted cottonwood trees (*Populus fremontii*) along the perimeter of the pond and at the homestead. As of April 2023, only one of these trees remained alive along the north side of the pond. Felger et al. (1992) states, “These trees, all of which are pistillate, were probably planted from cuttings taken from nearby Sonoyta, where the trees are common.” Since these trees are both female, continuation of this species at Quitobaquito will have to occur vegetatively, such as by cuttings. Since these trees are now reaching the end of their life cycle, ORPI resource management plans to take cuttings of these trees in 2023 (Rijk Morawe, personal communication, Jan 6, 2022).

Ranching, specifically overgrazing during drought periods, and human disturbance have had a significant impact on plant communities at Quitobaquito since the late 1800s (CLI 2011). Velvet mesquite (*Prosopis velutina*), disseminated by cattle (Bahre 1993), developed dense stands on the south side of the pond. Cholla cactus (*Cylindropuntia spp.*) has extended down from the hillsides and is now abundantly growing in the former corral site. Plants that are susceptible to impact by cattle have been replaced by opportunistic species such saltgrass (*Distichlis spicata*), triangle leaf bursage (*Ambrosia deltoidea*), bulrush (*Schoenoplectus americanus*), marsh fleabane (*Pluchea odorata*), and seepweed (*Suaeda nigra*). Although these plants were able to take advantage of disturbed conditions that cattle created, the populations of species, such as bulrush and mesquite, were kept at bay by the activities of cattle.

Now that the cattle are no longer present, the NPS regularly clears out some of the bulrushes from the pond and spring channels to maintain habitat conditions for pupfish and turtles (Orsi 2017). Non-native and invasive species have also come in with human impacts and cattle grazing including Bermuda grass (*Cynodon dactylon*), fountain grass (*Pennisetum setaceum*) red brome (*Bromus rubens*), buffelgrass (*Cenchrus ciliaris*), wild Sahara mustard (*Brassica tournefortii*), and salt cedar (*Tamarix ramosissima*). ORPI resource management has removed all the salt cedar due to its highly invasive nature. Since this species exists nearby along the Rio Sonoyta, it is likely to continue to establish itself in ORPI. Thus, ORPI resource management staff actively monitors the Quitobaquito area for this the species and removes it when found (Rijk Morawe, personal communication, Jan 6, 2022). Because of the continuous human impact at Quitobaquito, over half of all the non-native species in Organ Pipe can be found here.

The “cleanup” and pond filling at Quitobaquito by the NPS in the 1960s created even more disturbance on site. The draining and reforming of the pond likely resulted in the loss of some aquatic plant species in the process (CLI 2011). The marsh habitat that existed in the area between the springs and the pond was eliminated when water began to be transported via underground pipes in 1966. Some marsh habitat was restored when spring water was transported on the surface again in the 1980’s, however, the water was more channelized (with less marsh habitat) than it was in its pre-1960’s state. When NPS razed the buildings in 1962, it left the soil bare. This bare soil became colonized by opportunistic species of Amaranth family. Seepweed *(Sueda nigra)*, an opportunistic plant with a high tolerance for saline soils, began colonizing the former site of the Orozco homestead in the 1980s and was very much in the same state in the early 2000s (CLI 2011). This site is now used as a staging area for the NPS, which has left it bare of vegetation. Although the former parking lot site was scarified and a few species of plants such as cholla saltbush were used in revegetation, this area has had a slow recovery and has attracted weedy species (CLI 2011).

Figure 3-21 Remnant irrigation ditch with neglected pomegranate tree (2010). C. Mardorf, photographer

Figure 3-22 Pomegranate tree along irrigation ditch. Date unk, photographer unk.

Figure 3-23 Remnant irrigation ditch with dead pomegranate tree stumps (Nov. 2021). Teresa DeKoker, photographer

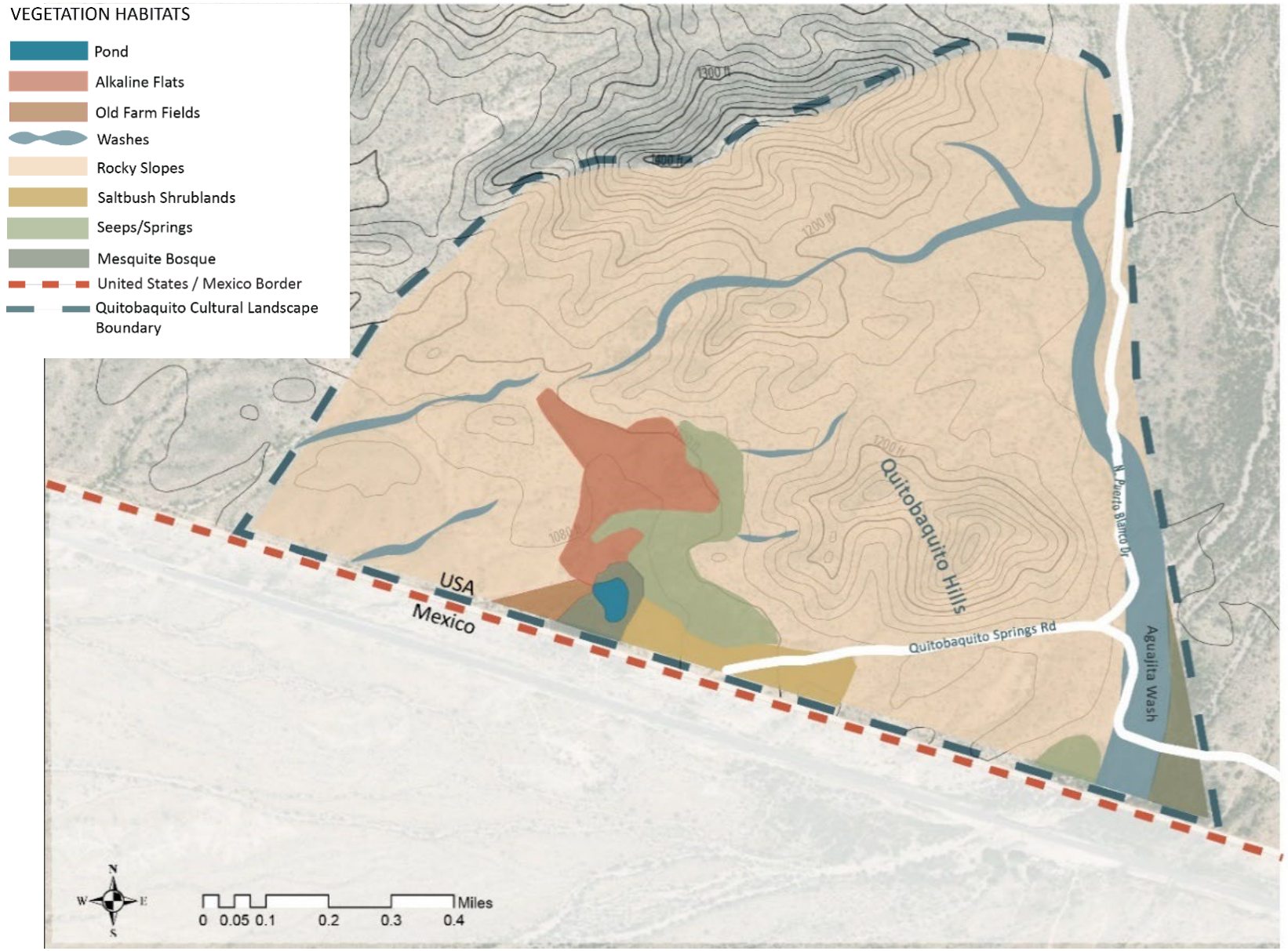

Figure 3-24 Vegetation habitats map

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Table 3-1 presents significant and conspicuous plants at Quitobaquito and their habitats, traditional ethonobotanical uses, and status. It also lists non-native and potentially invasive species.

Table 3-1 Characteristic and significant plants, their habitats, status, and O'odham traditional uses at Quitobaquito

Plant Family	Plant Family Common Name	Scientific Name	Common Name	O'odham Name	Habitat P=pond S=seeps/ springs R=rocky slopes M=mesquite bosque A=alkaline flats W=washes O=old fields D=disturbed areas	Status R=rare I=Invasive N=non-native	Traditional Uses	Notes
PTERIDOPHYTA (Ferns and Fern Allies)								
Pteridaceae	Maidenhair Fern Family	*Notholaena standleyi*	star cloak fern		A			
MAGNOLIDS (Terrestrial flowering plants, often scented from ethereal oils; cotyledons 2, floral parts generally spirally arranged in 3s.)								
Aristolochiaceae	Birthwort Family	*Aristolochia watsonii*	Watson's dutchman's pipe		W			
Saururaceae	Lizard-tail Family	*Anemopsis californica*	yerba mansa		S		medicine	
EUDICOTS (Flowering plants, cotyledons 2, floral parts generally in 4s or 5s)								
Acanthaceae	Acanthus Family	*Carlowrightia arizonica*	Arizona wrightwort		W			
Amaranthaceae	Amaranth Family	*Amaranthus palmeri*	pigweed, quelite de las aguas		W, O		Food/ beverage	
Amaranthaceae	Amaranth Family	*Atriplex linearis*	narrowleaf saltbush		A, O, D		Food	
Amaranthaceae	Amaranth Family	*Atriplex lentiformis*	big saltbush		A		Food	Formerly present, not seen in 2012 (Felger et al. 1992)
Amaranthaceae	Amaranth Family	*Atriplex polycarpa*	desert saltbush		R, A, W, O, M, D		Food	
Amaranthaceae	Amaranth Family	*Chenopodium murale*	net-leaf goosefoot		A, W, O, D	N	Food	
Amaranthaceae	Amaranth Family	*Nitrophila occidentalis*	alkali weed		W, A		Leaves smoked	
Amaranthaceae	Amaranth Family	*Sueada nigra*	seepweed		W, A			
Apocynaceae	Dogbane Family	*Funastrum hartwegii*	climbing milkweed		W, O			

Plant Family	**Plant Family Common Name**	**Scientific Name**	**Common Name**	**O'odham Name**	**Habitat** P=pond S=seeps/ springs R=rocky slopes M=mesquite bosque A=alkaline flats W=washes O=old fields D=disturbed areas	**Status** R=rare I=Invasive N=non-native	**Traditional Uses**	**Notes**
Asteraceae	Aster Family (or Sunflower Family)	*Ambrosia ambrosioides*	canyon ragweed	ñuñuvĭ jej	W		medicine	
Asteraceae	Aster Family (or Sunflower Family)	*Ambrosia confertiflora*	weakleaf bur ragweed	mo'ostalk	O			
Asteraceae	Aster Family (or Sunflower Family)	*Ambrosia deltoidea*	triangle-leaf bursage	tadtshagi	R, W, O			
Asteraceae	Aster Family (or Sunflower Family)	*Ambrosia dumosa*	burrobush	va:gita	R			
Asteraceae	Aster Family (or Sunflower Family)	*Ambrosia salsola*	burrobrush	'i:wadhod	W		Roofing materials for ramadas	
Asteraceae	Aster Family (or Sunflower Family)	*Baccharis salicifolia*	seep willow	susk	0, P			
Asteraceae	Aster Family (or Sunflower Family)	*Baccharis sarothroides*	desert broom	Su:sk wakck	0		Roofing for ramadas, decorations for altars and wreaths	
Asteraceae	Aster Family (or Sunflower Family)	*Bebbia juncea*	sweetbush	hauk'u's	W			
Asteraceae	Aster Family (or Sunflower Family)	*Eclipta prostrata*	false daisy		S	N		
Asteraceae	Aster Family (or Sunflower Family)	*Encelia farinosa*	brittlebush	tohaws	R, O		Chewing gum, violin resin	
Asteraceae	Aster Family (or Sunflower Family)	*Hymenoclea monogyra*	singlewhorl burrobrush	'i:vadhod	W, S			
Asteraceae	Aster Family (or Sunflower Family)	*Hymenothrix wislizenii*	Trans-Pecos thimblehead		W, O			

Plant Family	**Plant Family Common Name**	**Scientific Name**	**Common Name**	**O'odham Name**	**Habitat** P=pond S=seeps/ springs R=rocky slopes M=mesquite bosque A=alkaline flats W=washes O=old fields D=disturbed areas	**Status** R=rare I=Invasive N=non-native	**Traditional Uses**	**Notes**
Asteraceae	Aster Family (or Sunflower Family)	*Isocoma acradenia*	alkali goldenbush		W, S, A		Food/beverage	
Asteraceae	Aster Family (or Sunflower Family)	*Leucosyris arida*	arid tansy-aster		A, W, O			
Asteraceae	Aster Family (or Sunflower Family)	*Leucosyris carnosa*	shrubby alkali aster		W, O			
Asteraceae	Aster Family (or Sunflower Family)	*Pluchea sericea*	arrowweed	'u'us kokomadk, komagĭ'u'us	P, W, S, A		food	
Asteraceae	Aster Family (or Sunflower Family)	*Porophyllum gracile*	slender poreleaf		O		Round-house construction, arrows for hunting bighorn sheep	
Asteraceae	Aster Family (or Sunflower Family)	*Stephanomeria pauciflora*	desert-straw		P, O		Food/ beverage, Fence/house construction (stem ribs)	
Asteraceae	Aster Family (or Sunflower Family)	*Thymophylla concinna*	dogweed	ban mansani:ya	A			
Asteraceae	Aster Family (or Sunflower Family)	*Trixis californica var. californica*	California threefold		W, R, A		medicine	
Boraginaceae	Borage Family	*Heliotropium curassavicum var. aculatum*	alkali heliotrope					
Brassicaceae	Mustard Family	*Brassica tournefortii*	Sahara mustard		R, W, O, D	N,I		
Brassicaceae	Mustard Family	*Descurainia pinnata*	western tansy mustard		W, A, R		Food, dye, medicine (seeds)	
Brassicaceae	Mustard Family	*Lyrocarpa coulteri*	Coulter's lyrepod		W, O		Food	

Plant Family	**Plant Family Common Name**	**Scientific Name**	**Common Name**	**O'odham Name**	**Habitat** P=pond S=seeps/ springs R=rocky slopes M=mesquite bosque A=alkaline flats W=washes O=old fields D=disturbed areas	**Status** R=rare I=Invasive N=non-native	**Traditional Uses**	**Notes**
Cactaceae	Cactus Family	*Carnegiea gigantea*	saguaro	ha:san	R, W, O		Food/ beverage, Ceremony, structural materials, tools	
Cactaceae	Cactus Family	*Cylindropuntia acanthocarpa*	buckhorn cholla	hanam	A, O, D		Food	
Cactaceae	Cactus Family	*Cylindropuntia bigelovii*	teddybear cholla	hadtshadtk am	R			
Cactaceae	Cactus Family	*Cylindropuntia fulgida*	chain-fruit cholla	to:ta hanam	A, O, D, R		Food	
Cactaceae	Cactus Family	*Cylindropuntia leptocaulis*	Christmas cactus	aj wipinoi	W, R		Food	
Cactaceae	Cactus Family	*Echinocereus engelmannii*	strawberry hedgehog cactus, Engelmann's hedgehog cactus	I:swigĭ	R, O			
Cactaceae	Cactus Family	*Ferocactus cylindraceus*	desert barrel cactus, California barrel cactus	jiawuli	R		Food/ beverage	
Cactaceae	Cactus Family	*Ferocactus emoryi*	Emory's barrel cactus, strawberry barrel	jiawuli	R			
Cactaceae	Cactus Family	*Mammillaria grahamii*	Arizona fishhook cactus	ha-i:swigĭ	R, O			
Cactaceae	Cactus Family	*Mammillaria thornberi*	Thornber fishhook cactus		R, O, A			
Cactaceae	Cactus Family	*Opuntia engelmannii var. engelmanii*	Engelmann prickly pear	naw	R, O		Food/ beverage	
Cactaceae	Cactus Family	*Stenocereus thurberi*	organ pipe cactus	cucuis	R, A		Food	

Plant Family	**Plant Family Common Name**	**Scientific Name**	**Common Name**	**O'odham Name**	**Habitat** P=pond S=seeps/ springs R=rocky slopes M=mesquite bosque A=alkaline flats W=washes O=old fields D=disturbed areas	**Status** R=rare I=Invasive N=non-native	**Traditional Uses**	**Notes**
Capparaceae	Caper Family	*Atamisquea emarginata*	desert caper, vomitbush		W, M	R		
Cleomaceae	Cleome Family	*Wislizenia refracta ssp. refracta*	spectacle fruit		D, A, W			
Euphorbiaceae	Spurge Family	*Acalypha californica*	California copperleaf		W, R			
Euphorbiaceae	Spurge Family	*Argythamnia lanceolata*	narrowleaf silverbush		R			
Euphorbiaceae	Spurge Family	*Euphorbia polycarpa*	desert spurge		R, W		medicine	
Euphorbiaceae	Spurge Family	*Jatropha cinerea*	ashy limberbush		R		Red dye	
Euphorbiaceae	Spurge Family	*Jatropha cuneata*	desert limberbush		W, O, R			
Fabaceae	Legume Family	*Calliandra eriophylla*	fairy duster	cu:wĭ wuipo	R			
Fabaceae	Legume Family	*Olneya tesota*	ironwood	ho:idkam	R, W			
Fabaceae	Legume Family	*Parkinsonia florida*	blue paloverde	ko:okmad	W			
Fabaceae	Legume Family	*Parkinsonia microphylla*	foothills paloverde	kuk ce:hedagĭ	W, O, R		Food (seeds) fuel (wood)	
Fabaceae	Legume Family	*Phaseolus filiformis*	desert bean	ban bavĭ	W		Food	
Fabaceae	Legume Family	*Prosopis pubescens*	screwbean mesquite	kujel	O, M		Food/ Beverage Fuel Construction	
Fabaceae	Legume Family	*Prosopis velutina*	velvet mesquite	kui	W, M, S		Food/ Beverage Fuel Construction	
Fabaceae	Legume Family	*Psorothamnus spinosus*	smoketree		W, O		Food (seeds) fuel (wood), black dye (sap), house and corral construction	

Plant Family	**Plant Family Common Name**	**Scientific Name**	**Common Name**	**O'odham Name**	**Habitat** P=pond S=seeps/ springs R=rocky slopes M=mesquite bosque A=alkaline flats W=washes O=old fields D=disturbed areas	**Status** R=rare I=Invasive N=non-native	**Traditional Uses**	**Notes**
							(trunks and large limbs)	
Fabaceae	Legume Family	*Seneglia greggii*	catclaw acacia	'u:pad	M, W		Food, medicine, Construction of bows, cradleboard frames and used as a crosspiece in saguaro fruit harvesting poles	
Fouqueriaceae	Ocotillo Family	*Fouquieria splendens*	ocotillo	melhog	R		Food/ beverage (flowers), fences and housebuilding (stems)	
Gentianaceae	Gentian Family	*Zeltnera arizonica*	Arizona centaury		P, S			
Gentianaceae	Gentian Family	*Eustoma exaltatum*	catchfly prairie gentian		P, S			
Krameriaceae	Ratany Family	*Krameria grayi*	white ratany	echo	A			
Lamiaceae	Mint Family	*Condea albida*	desert lavender	wiopal	W, R			
Lamiaceae	Mint Family	*Salvia columbariae*	chia		W			
Loasaceae	Stickleaf Family	*Petalonyx thurberi*	Thurber's sandpaper plant		W, O		Ceremony (flowers)	
Malvaceae	Mallow Family	*Hibiscus denudatus*	rock hibiscus		R, O		medicine	
Malvaceae	Mallow Family	*Sphaeralcea emoryi*	Emory's globemallow		W, O, M		Food/ beverage	
Martyniaceae	Devil's Claw Family	*Proboscidea althaeifolia*	devil's claw	ban I'hug	W		The claws of the opened seed pod are used for baskets.	

Plant Family	**Plant Family Common Name**	**Scientific Name**	**Common Name**	**O'odham Name**	**Habitat** P=pond S=seeps/ springs R=rocky slopes M=mesquite bosque A=alkaline flats W=washes O=old fields D=disturbed areas	**Status** R=rare I=Invasive N=non-native	**Traditional Uses**	**Notes**
Orobanchaceae	Broomrape Family	*Orobanche cooperi*	desert broomrape		O		Food/beverage	
Plantaginaceae	Plantain Family	*Penstemon parryi*	desert penstemon	hewel hiosig	W			
Plantaginaceae	Plantain Family	*Veronica peregrina*	necklace-weed		P		Foundation material for baskets	Formerly bordered the pond at Quitobaquito (Felger et al. 1992)
Rhamnaceae	Buckthorn Family	*Condalia globosa*	snakewood		W, O			
Rhamnaceae	Buckthorn Family	*Ziziphus obtusifolia*	lotebush, graythorn	u:spad	P, S, M			
Salicaceae	Willow Family	*Salix gooddingii*	Goodding's willow		P		Chewing gum	
Solanaceae	Nightshade (or Potato Family)	*Calibrachoa parviflora*	seaside petunia		A			Half a dozen plants were found in 1988 on moist soil but these plants were not present the following year. (Felger et al. 1992)
Solanaceae	Nightshade (or Potato Family)	*Datura discolor*	desert datura	toloache	W, D		ceremony	
Solanaceae	Nightshade (or Potato Family)	*Lycium andersonii*	desert wolfberry	s-toa kuavulĭ	R, M		Wall and roofing in round house construction, medicine (leaves and branches), sticks used to curl hair	
Solanaceae	Nightshade (or Potato Family)	*Lycium fremontii*	Fremont wolfberry	kuavulĭ	R, M, W, S		Food	
Solanaceae	Nightshade (or Potato Family)	*Lycium macrodon*	desert wolfberry	s-cuk kuavulĭ	M, W, O		Food	

Plant Family	**Plant Family Common Name**	**Scientific Name**	**Common Name**	**O'odham Name**	**Habitat** P=pond S=seeps/ springs R=rocky slopes M=mesquite bosque A=alkaline flats W=washes O=old fields D=disturbed areas	**Status** R=rare I=Invasive N=non-native	**Traditional Uses**	**Notes**
Solanaceae	Nightshade (or Potato Family)	*Lycium parishii*	parish wolfberry		O, M			
Solanaceae	Nightshade (or Potato Family)	*Nicotiana obtusifolia*	coyote tobacco	ban wiwga	R, W			
MONOCOTS (Flowering plants, 1 cotyledon, leaf veins generally parallel, floral parts generally in 3s)								
Zygophyllaceae	Caltrop Family	*Larrea tridentata*	creosote bush	segai	R		Reddish dye for fabric and basketry, tanning agent for deer hides, medicine, used to make arrows for small game hunting, roofing and the cover sides of traditional grass houses.	
Cyperaceae	Sedge Family	*Cyperus squarrosus*	dwarf sedge, bearded flatsedge		P			Reported from 1980 as abundant in moist soil near the pond but it has not been documented since this time (Felger et al. 1992). No herbarium vouchers from ORPI have been located.
Cyperaceae	Sedge Family	*Eleocharis flavescens* var. *flavescens*	yellow spikerush		P, S			This plant reported as once abundant in moist soil near the pond and springs at Quitobaquito and locally infrequent after the late 1980's.

Plant Family	**Plant Family Common Name**	**Scientific Name**	**Common Name**	**O'odham Name**	**Habitat** P=pond S=seeps/ springs R=rocky slopes M=mesquite bosque A=alkaline flats W=washes O=old fields D=disturbed areas	**Status** R=rare I=Invasive N=non-native	**Traditional Uses**	**Notes**
Cyperaceae	Sedge Family	*Eleocharis rostellata*	traveling spikerush		P, S			
Juncaceae	Rush Family	*Schoenoplectus americanus*	bulrush	Va:k	P, W, S		Medicine, food/ beverage	
Juncaceae	Rush Family	*Juncus mexicanus*	Mexican rush		P, S		Medicine, basketmaking	
Poaceae	Grass Family	*Juncus cooperi*	Cooper's rush		P, S			
Poaceae	Grass Family	*Bromus rubens*	foxtail brome		W, D	I, N		
Poaceae	Grass Family	*Cynodon dactylon var. dactylon*	Bermuda grass		O, A, P, D	I, N		
Poaceae	Grass Family	*Distichlis spicata*	saltgrass		A, O, S, P			
Poaceae	Grass Family	*Cenchrus ciliaris*	buffelgrass		R, D, W	I, N	Food (seeds) Fuel (wood)	
Poaceae	Grass Family	*Sporobolus airoides*	alkali sacaton		O, A			
Potamogetonaceae	Pondweed Family	*Zannichellia palustris*	horned pondweed		P			
Typhaceae	Cattail	*Typha domingensis*	southern cattail		P			Growing in a pool in the in-flow stream near the pond

(Altschul and Rankin 2008, 197; Felger et. al 1992; Felger, Rutman, Malusa & Van Devender 2013; Nabhan, Hodgson and Fellows 1989: 508-533)

Views and Vistas

Rugged mountain ranges frame spectacular columnar cacti growing along the broad alluvial plains that make up this basin and range landscape. Looking north from the pond, the view is unobstructed by roads and boundaries. It is a view that people have witnessed for centuries. Riparian vegetation surrounding the pond provides a completely different view from the expansive arid landscape. Surrounded by tall trees, rushes, and dense shrubs, it is green and intimate. Vegetation has grown over the historic farm fields, orchard, and building sites that were razed in the 1960s. The orchard is only discernable from the stumps that line remnant irrigation ditches from the pond and it is now filled in with mesquite trees and tall shrubs. To the south, the view has been broken by the 30' tall border wall and accompanying commercial

post lights which interrupts the cohesiveness of the cultural landscape. The border wall completely blocks views of the historic agricultural area and partially impacts views of the mountain ranges to the south. In addition, traffic on Mexico Highway 2 along the border creates visual blight inconsistent with the traditional cultural landscape.

Figure 3-25 View near Quitobaquito (date and photographer unknown)

Figure 3-26 View of Quitobaquito landscape facing east from hills north of pond (Nov. 2021). Teresa DeKoker, photographer

Figure 3-27 Agricultural fields from Mexico looking north at Quitobaquito (1950). W.R. Supernaugh, Dunn and Burton, photographers

Figure 3-28 Agricultural fields and structures looking south into Mexico (1917). Kirk Bryan, photographer

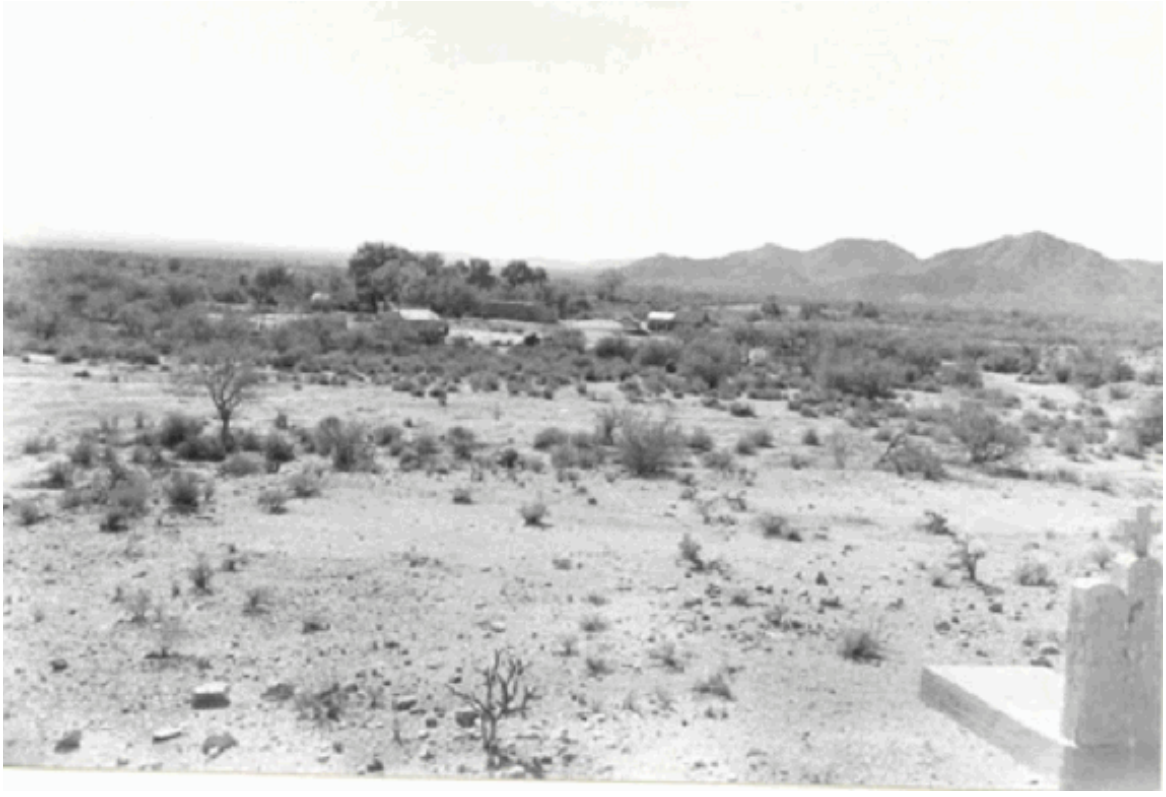

Figure 3-29 View of Quitobaquito looking south from Sestier's grave marker (1950).
W.R. Supernaugh, photographer

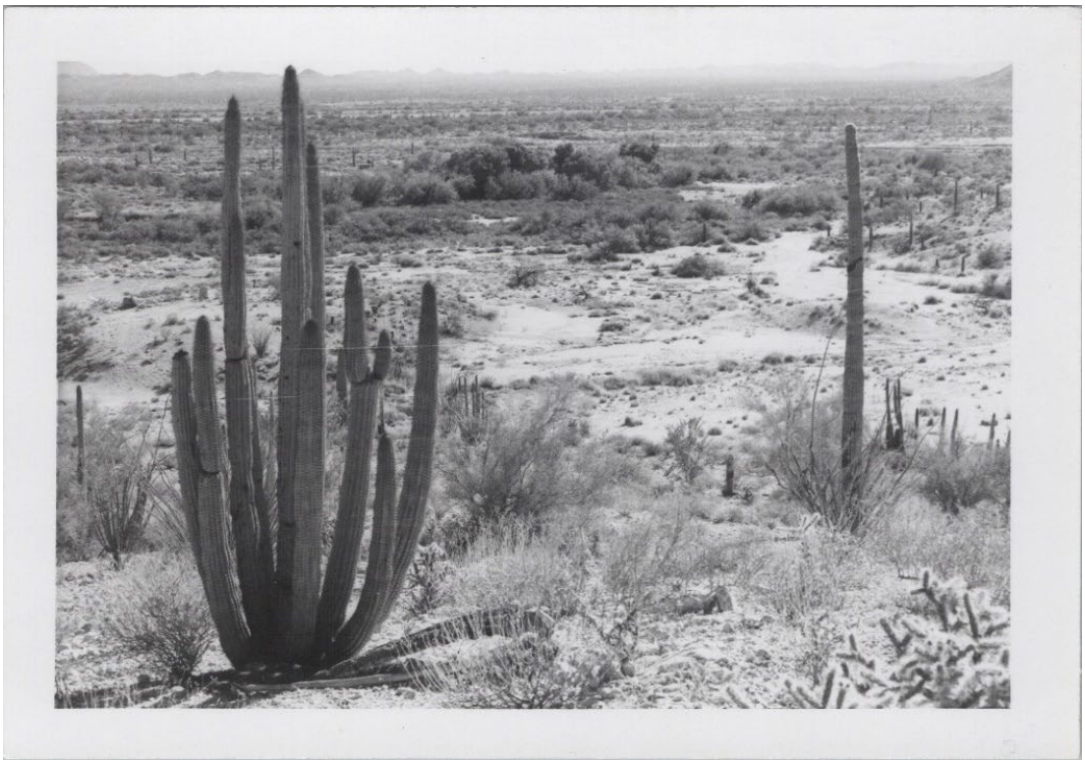

Figure 3-30 View of Quitobaquito looking south from hills north of Sestier's grave marker. (date and photographer unknown, post 1962 razing of buildings)

Figure 3-31 View of Quitobaquito looking south from Sestier's grave marker (1982); photographer unknown

Figure 3-32 View of Quitobaquito looking south from Sestier's grave marker (2010). C. Mardorf, photographer

Figure 3-33 View of Quitobaquito looking south from Sestier's grave marker (Nov. 2021). Teresa DeKoker, photographer

Figure 3-34 View looking south across the international border (2010). C. Mardorf, photographer

Figure 3-35 View looking south across the international border from parking area (Nov. 2021). Teresa DeKoker, photographer

Constructed Water Features

The current state of the Quitobaquito riparian zone is a product of human manipulation over the last two centuries. Early accounts identify it as a *cienega,* a Spanish word for marsh or wetland. The first accounts of a pond in the Quitobaquito area are after the 1860s, when the frontiersman Andrew Dorsey settled there and built several structures on site, including an earthen dam on the south and west sides of the riparian zone and irrigation ditches below the dam to provide water for fruit trees and agricultural crops. Primary and lateral canals were constructed from the pond to irrigate orchards and cultivated fields including those in Mexico. Later Anglo settlers including Thomas Childs rebuilt the canals and replanted fruit trees and other crops after Dorsey had abandoned his homestead.

According to Rankin et al. (2008), Hia C'ed O'odham diverted water from the *cienega* into irrigation canals to water crops. It is probable that Dorsey reconstructed and rebuilt water diversion channels that had been constructed earlier by peoples including the O'odham or the pre-contact Hohokam. Oral histories collected by Bell et al. (1980) recount the use of canals and a dam by Native Americans prior to the arrival of Dorsey. Without further archeological excavations, it is impossible to date the first constructed water diversion features at Quitobaquito. Human control over scarce resources such as water in the desert are key features of settlement and movement of indigenous peoples in the Western *Papaguería*.

Earth works within the wetland created the pond conditions that are still seen today. The pond made possible new ecological conditions that subsequent people, and particular plants and animals such as the endemic Quitobaquito pupfish, have come to rely upon. (Orsi 2017, 102) The pond and dam have been maintained by its human caretakers ever since.

Once the last human residents left the Quitobaquito area in 1957, ORPI made decisions about the current and future form and function of the oasis. NPS management decided to remove the most obvious constructed features from the Orozco homestead while maintaining the dam and pond as a visitor attraction.

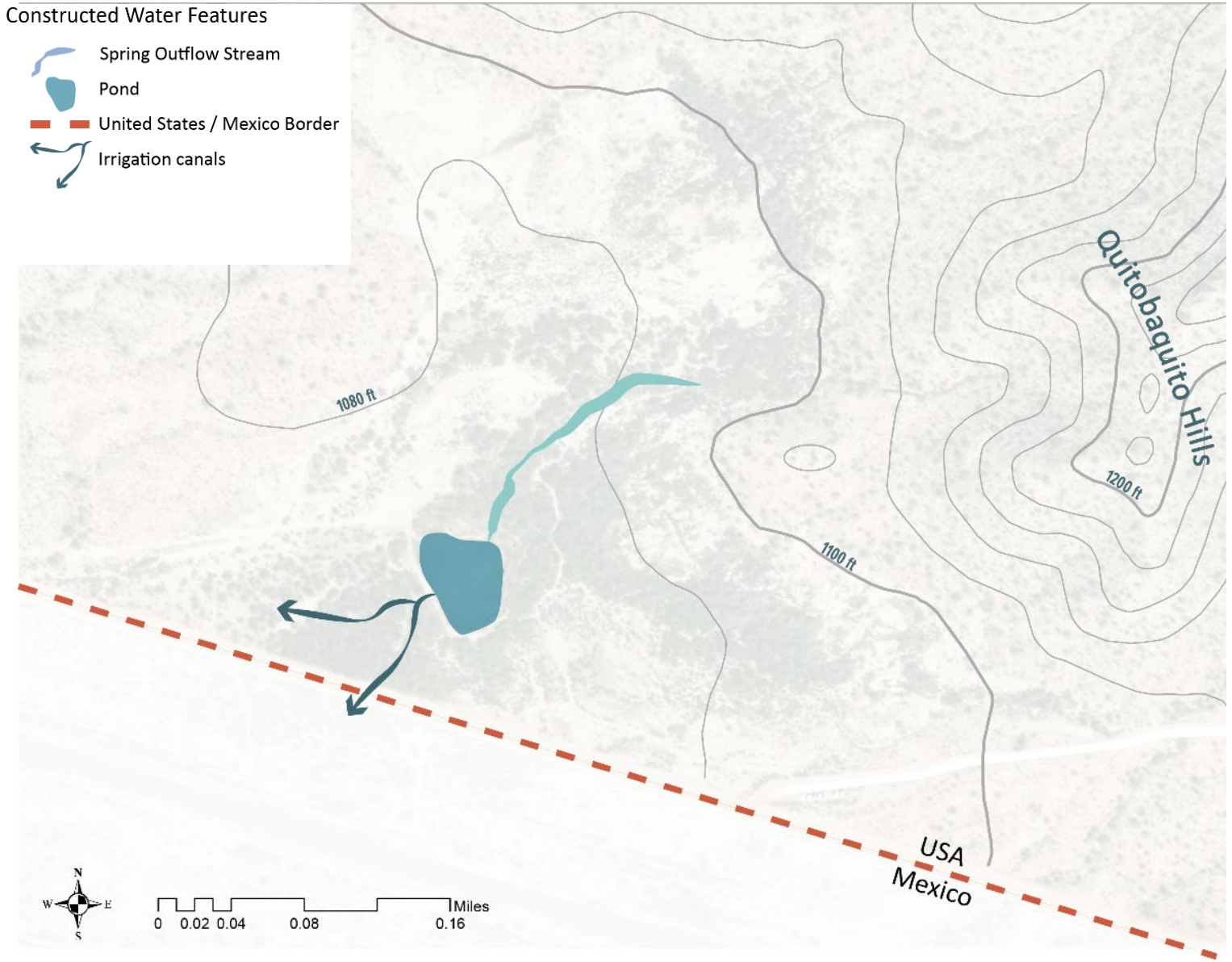

Figure 3-36 Constructed water features

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Figure 3-37 Quitobaquito pond facing northwest. Photo taken before deepening in 1962. (date and photographer unknown)

The 1860-era dam has been repaired and modified over the years but is part of the historic agricultural system at Quitobaquito. The historic irrigation canals that provided water to the orchard and agricultural fields to the south are not maintained thus are overgrown by vegetation. The archeological site number Son B:4:027(ASM) encompasses the historic agricultural system consisting of multiple components and features, including of 4,275 feet of irrigation canals, extending approximately 720 feet in Mexico. Component 1 includes canals on the east-northeast side of the pond leading from the springs to the pond. Component 2 consists of the dam, the canals that originate at the dam on the west side of the pond and supply water to fields and the orchard, as well as the orchard and agricultural fields (US Department of Interior CLI 2011).

NPS modifications to the pond occurred in 1962 and included dredging, deepening, and enlarging the berm. The new conditions (steep sides, greater depth, and cooler water) of the pond proved to be unfavorable habitat for the endemic (currently federally endangered) Quitobaquito pupfish (*Cyprinodon eremus*) as well as for the rare (also currently federally endangered) Sonoyta mud turtle (*Kinosternon sonoriense longifemorale*) (Orsi 2017). In response, ORPI created a shallow shelf on the east end of the pond to restore favorable habitat for these species. This dredging also negatively impacted the iconic leaning cottonwood that was on the southwest part of the dam (US Department of Interior CLI 2011). To keep the large tree from collapsing, the NPS installed a concrete brace. The cottonwood tree was removed fifty years later after creating a leak in the pond. Other alterations

Figure 3-38 Concrete-lined spring outflow stream channel (Nov. 2022). Teresa DeKoker, photographer

in the 1960s included an overflow pipe and concrete spillway. In 1974 a buried plastic pipe was installed to deliver water from the springs to the pond. In 1989, ORPI worked with the Arizona-Sonora Desert Museum on its current water delivery method, comprised of a 700’ long meandering concrete channel with rock overhangs and islands to enhance pupfish and mud

turtle habitat and to create a more natural appearance (US Department of Interior CLI 2011) (Figure 3-39).

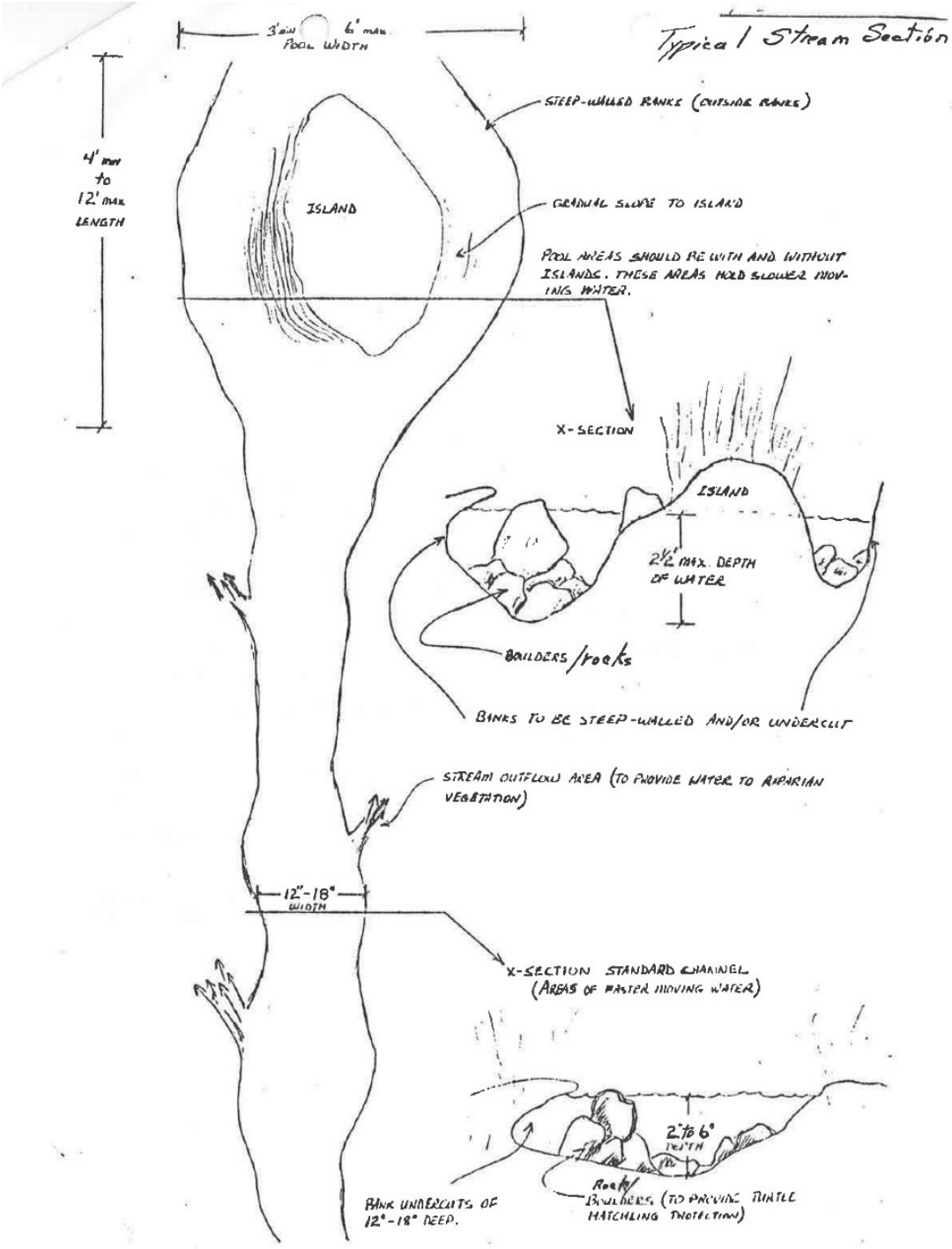

Figure 3-39 Arizona-Sonora Desert Museum channel plan drawing (1989)

Figure 3-40 Concrete-lined channel with small island to enhance Mud Turtle Habitat (Nov. 2021). Teresa DeKoker, photographer

Figure 3-41 Quitobaquito pupfish in spring channel (Nov.2021). Teresa DeKoker, photographer

The 1962 alterations created a pond that averaged between 25” to 40” deep with a surface area of around 27,000 square feet. Apart from seasonal fluctuations of between 2-4”, these averages held firm up until the early 1990s with the onset of an extended drought (which has continued to the present day) (Emergency Actions 2008). For the first time since the 1960s, the water level dropped to a point where it no longer flowed through the outflow pipe at the southern end of the pond (Emergency Actions 2008). Beginning in 2005, resource management personnel began taking measures to stabilize the water supply such as renovations to the northeast spring, repairing the stream channel and managing emergent plant material. An unprecedented decrease in water level occurred between July 11, 2007, and October 22, 2007. By late 2007, the pond levels dropped to critical conditions for the Quitobaquito pupfish and the Sonoyta mud turtle with the pond averaging 4.5” deep and 70% if its average surface area (Emergency Actions 2008). Quitobaquito pupfish and the Sonoyta mud turtles were taken to temporary holding facilities at Cabeza Prieta National Wildlife Refuge, the Arizona-Sonora Desert Museum, the Phoenix Zoo and ORPI headquarters while the berm was evaluated and repaired. Evaluation of the drastic water loss pointed to a more nuanced set of circumstances to the problem. Drought and subsequent lessening of spring discharge were at play. There were, however, additional losses coming from the pond itself, above the normal annual fluctuations from evaporation and plant transpiration. A leak in Andrew Dorsey’s berm was highly suspected (Orsi 2017).

In April 2008, NPS inserted an impermeable diaphragm wall into the berm and in 2009, the southeast corner was patched with bentonite clay to prevent leaking. NPS began to suspect that the unhealthy, leaning cottonwood located on the berm was siphoning water from the pond. To stabilize the tree and fix the leak, resource managers drilled holes in the tree and filled them with bentonite clay. Tree roots were removed from the berm to protect its structural integrity and bulrushes in the pond were removed. Although these measures had some effect with the water rising pond levels 16’’ (from the lowest level, recorded in April 2008 of –28 ‘’ to -12” below the outflow pipe) (Orsi 2017), it was apparent that there was still a problem. When ORPI trucked in water in March 2009 and filled the pond, the water level quickly fell back to -12” below the outflow pipe. There was clearly a leak at this level of the pond.

Since there were no obvious areas of saturation adjacent the pond at the 12” level, resource managers continued to suspect the leaning cottonwood which had been planted on the northwestern edge of the berm around the turn of the last century. It had been gradually tilting until the trunk eventually dipped into the pond. It was suspected that the dipping trunk was a conduit from the pond to the berm. The tree had started to die in 2003 and its base was beginning to rot. When ORPI staff patched the tree in 2010, they noticed two basketball-sized holes in its base, solid evidence that this was a source of a substantial leak. This, along with the potential for the dying tree to collapse and damage the berm, leading to water loss that would threaten endangered species such as the pupfish and mud turtles, led to NPS’s decision to remove the cottonwood (Orsi 2017). In June 2016, after documentation, compliance measures, and consultation with the Tohono O’odham Nation (the tree was both a natural and cultural

resource) and the AZ SHPO, the tree was finally removed. Before the tree died, cuttings were taken to preserve its genetic heritage. The cuttings were grown out in ORPI's nursery but unfortunately died two years later. NPS plans to take cuttings in 2022 of the remaining cottonwood trees which are likely related to the leaning cottonwood (Rijk Morawe, personal communication, December 14, 2021). By the fall of 2016, pond levels had risen to -8" below the outflow pipe.

Although the cottonwood removal helped the water levels substantially, the trend of dropping pond levels has continued. As summarized above, since 2008, NPS has had to make several major repairs to address leaks in the berm. During each repair, new layers of bentonite clay were added to seal the pond (Rijk Morawe, email message, June 30, 2021). To compound the problem, drought conditions and above average temperatures have continued, with extremes such as the rainfall average of only 1" at ORPI in 2020 (down from the 6" average). Additionally, a 2020 University of Arizona study (using environmental isotopes and water chemistry to distinguish sources of water) indicated that the Sonoyta River in Mexico may supply the springs at Quitobaquito by way of flow along a fault system. Based on this information, groundwater extraction and lowering of water levels in the Sonoyta River aquifer could also diminish the spring flow at Quitobaquito (Zamora et al. 2020). The NPS is currently working with USGS to further understand the geohydrology of the Quitobaquito area, which may provide more insights concerning the source waters of the springs.

Finally, despite much international protest from hydrologists, ecologists, and the O'odham people, the construction of the Trump Administration's 30' tall border wall, only 200' from Quitobaquito, was completed in 2021. Hydrologists point out that the use of dynamite on Monument Hill, groundwater pumping for concrete and dust control, and the increase in truck and heavy machinery traffic along park roads could have contributed to the decline of spring flow at Quitobaquito (Nabhan 2020) although at this time there is no definitive evidence that this was the case. In July 2021, the water level in the pond dipped back down to -23" below the outflow pipe and the spring outflow, according to the USGS transducer, was down to 8.7 gpm, from 25 gpm in the early 1990's (Rijk Morawe, personal communication, June 30, 2021). The declining water levels in the pond continued a thirty-year trend of falling water levels. In 2021, the International Sonoran Desert Association received donated funds of approximately $100,000 to assist ORPI to stabilize the pond system. NPS has provided funding to cover the remaining cost of the project, which is likely close to $500,000.

The pond restoration, as originally planned, would have been informed by the treatment recommendations of this CLR; however, the severity of the decreasing water levels meant the timing of the restoration had to be expedited. The pond restoration was completed in May 2022 and involved building a redesigned pond with a geomembrane liner and sediment traps on the north end (Figure 3-45). The new design created a smaller pond (from .8 acres to .63 acres) to account for the lower average spring flows and has various depths to account for seasonal fluctuations (Natural Channel Design, March 2023; Rijk Morawe, personal communication, July 6, 2021) (Figure 3-46). The refuge/sediment pond areas total 0.05 acres.

Two benches approximately 3’ wide were constructed to provide habitat. One bench is 6” deep while the other is 2.5’ deep. A 20’ long, 4” wide outlet pipe was constructed to discharge excess spring water. The maximum depth of the reconstructed pond is 9.5.’

3-42 Quitobaquito pond facing north (1950); W.R. Supernaugh, photographer.

Figure 3-43 Quitobaquito pond facing northwest (Nov. 2021). Teresa DeKoker, photographer

Figure 3-44 Quitobaquito pond facing northwest post pond restoration (Nov. 2022). Teresa DeKoker, photographer

Figure 3-45 Sediment trap created during 2022 pond restoration (Nov. 2022). Teresa DeKoker, photographer

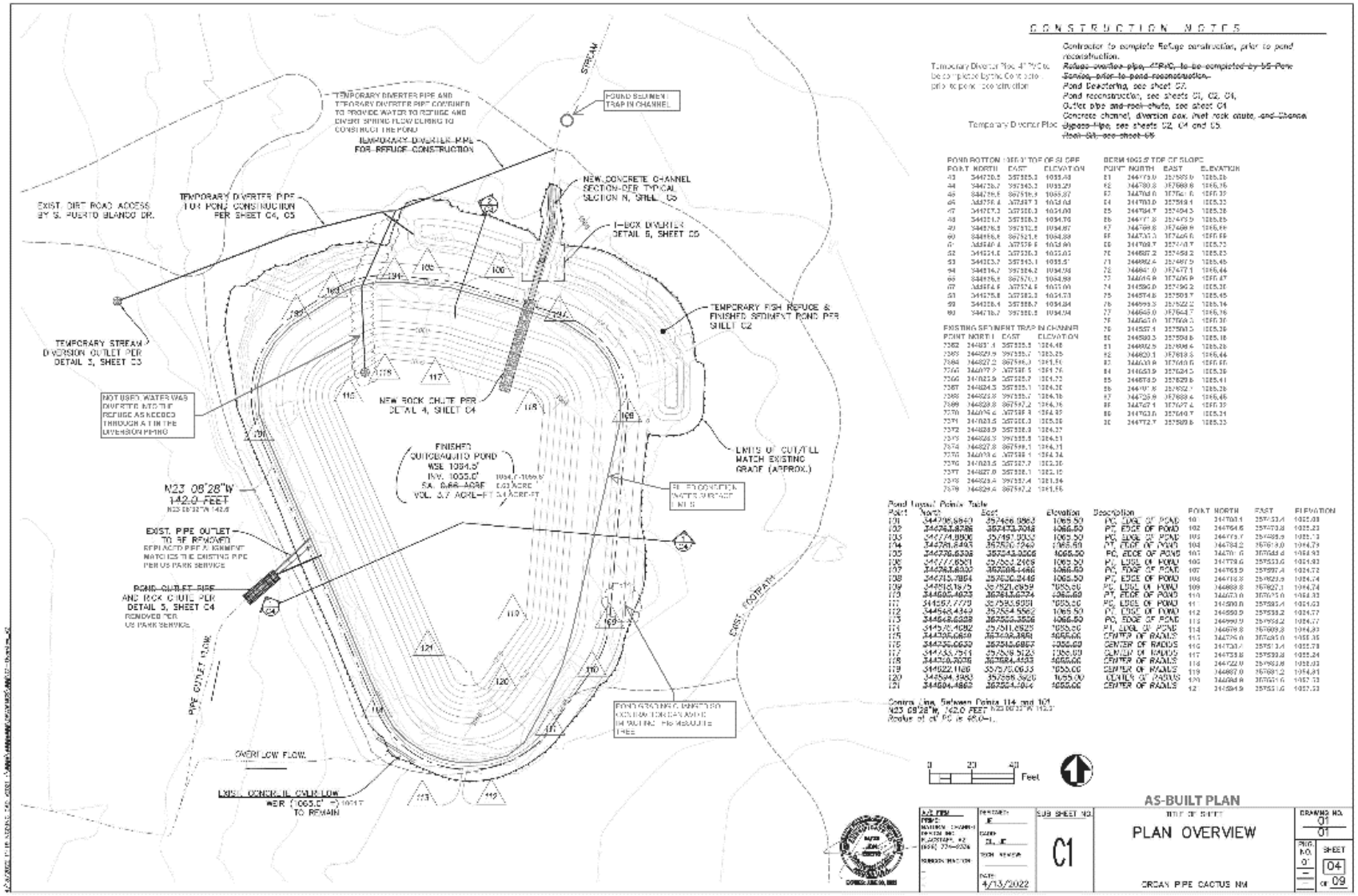

Figure 3-46 Pond redesign as-built plan

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Figure 3-47 View facing south to leaning cottonwood (date and photographer unknown)

Figure 3-48 View facing south, cottonwood tree removed, border wall placed (Nov. 2021). Teresa DeKoker, photographer

Figure 3-49 Berm on west end of pond facing north to site of former leaning cottonwood (Nov. 2021). Teresa DeKoker, photographer

Figure 3-50 Berm on west end of pond facing north with outflow pipe post restoration (Nov. 2022). Teresa DeKoker, photographer

Figure 3-51 Drainage ditch placed with border wall construction in 2020, facing west (Nov. 2021) Teresa DeKoker, photographer

Figure 3-52 Drainage ditch with tamarisk growing, facing west (Nov. 2022). Teresa DeKoker, photographer

Small-Scale Features

Several small-scale features lie within the Quitobaquito site boundary. The monument to Jose Lorenzo Sestier, a shopkeeper in Mikul Levy's store, lies approximately 150 feet northwest of the pond. This historical feature dating from 1900 is made up of a concrete grave marker and cover. The marker is also plastered. The marker inscription reads "Q en P.D. Jose Lorenzo Sestier Born Breast France Died Quitobaquito, Ariz. Feb. 9,1900 Age 74."

Several traditional tribal commemorative sites and shrines marked by stones are also on site. Prior to the pond liner project in 2022, non-historic small-scale features on site included wood benches, a picnic table, and a water control apparatus, and two metal signs at the trailhead. One sign reads "Quitobaquito" and the other warns visitors of drug smugglers. The water control apparatus and metal signs remained in place after the pond restoration; however, the benches were removed and replaced in new locations and the picnic table was relocated.

Figure 3-53 Bench on northwest side of pond which was removed for restoration in 2022 and placed in a new location (Nov. 2021). Teresa DeKoker, photographer

Figure 3-54 Bench on south side of the pond which was removed during 2022 restoration. New benches with concrete footers were placed in new locations (Nov. 2021). Teresa DeKoker, photographer)

Figure 3-55 Picnic table on northwest side of the pond which was moved to a new location following pond restoration in 2022. (Nov. 2021). Teresa DeKoker, photographer

Figure 3-56 Water control gage monitored by the USGS (Nov. 2021); Teresa DeKoker, photographer.

Archeology

Within the Quitobaquito cultural landscape there are many archeological sites, many of which represent occupations of multiple time periods and or continuous use. The AZ SHPO concurred in 1994 that twenty sites were eligible for listing on the NRHP for the period circa 9000 BCE to 1944 CE (DOI National Register Nomination, 1994; CLI 2011). Rankin (1995) reports that archeological surveys conducted in and around Quitobaquito and Aguajita Wash (ORPI 1977B, 1977C, 1977D, 1978A, 1979B, 1979C, 1980B, 1985A, 1988A, 1990E, 1991D), have resulting in the identification of prehistoric and historic cultural resources.

Archeological sites with definite pre-contact components included within the Quitobaquito boundary are Son B:04:01:09(ASM), Son B:04:011(ASM), Son B:04:13-14(ASM), Son B:04:16(ASM), Son B:04:19-26(ASM), and Son B:04:28-32(ASM). Additional subsurface testing and excavations may yield additional information about commerce and trade, agricultural practices, settlement, and migration patterns during the periods of occupation and use.

Historic Buildings and Structures

When ORPI was established in 1937, Quitobaquito was the residence, working ranch, and farm of the Orozco family. They had constructed several structures that were on site when NPS required them to leave in 1957. These structures consisted of a single room adobe building, a double-room adobe house, a saguaro rib house, a grinding mill, two livestock corrals with mesquite wood fencing, a corrugated metal shed, and 3200' of irrigation canals. Other historic structures on-site in 1957 included Andrew Dorsey's 1860s earthen dam and foundation of his store, and Sestier's grave marker.

NPS's 1959 long-range development plan included the removal of the remaining buildings to fit into their program of returning the site to a naturalistic state (Orsi 2017). These buildings, along with the remaining foundation from Andrew Dorsey's 1860s store, were all razed by NPS in 1962 (prior to the National Historic Preservation Act). The only remaining historic structures at Quitobaquito are sections of the Orozco family's irrigation canals, the dam, and Sestier's grave marker.

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CHAPTER 4 – LANDSCAPE ANALYSIS AND EVALUATION

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Introduction

The Statement of Significance for Quitobaquito is based on previous work presented in the NPS Cultural Landscapes Inventories (2011), the 1994 National Register Nomination for the Quitobaquito Springs Historic District, and 2020 National Register Nominations for two trail corridors: the Quitobaquito Trail Corridor (ORPI 00298) and the Bates Well to Quitobaquito Corridor (ORPI 00291).

In 1994, a NRHP nomination for the Quitobaquito springs archeological district was completed and received concurrence from the Arizona State Historic Preservation Officer (AZ SHPO). AZ SHPO concurred that the twenty sites with archeological components at Quitobaquito were eligible for listing in the areas of archeology, exploration/settlement, ethnic heritage, transportation, and agriculture for the period 9000 BCE to 1944 CE. The 2011 Cultural Landscape Inventory (CLI) determined that Quitobaquito is significant under Criterion A and D for the period 9500 BCE to 1957 CE in the areas of agriculture, commerce, exploration/settlement, transportation, and ethnic heritage for its association with historic trade routes and Native American, Hispanic, and Euro-American culture. The CLI also recognized the site as significant for prehistoric-aboriginal, historic-aboriginal, and historic non-aboriginal archeology. Two National Register nominations prepared by Hanson and team (2020) identified two trail segments which intersect the Quitobaquito area as eligible for listing under Criterion A in the area of transportation (roads and trails) and Native American Ethnic Heritage of the O'odham peoples and their traditional salt pilgrimage. The team also proposed eligibility under Criterion D due to the potential to yield information in all subcategories of archeology (prehistoric, historic-aboriginal, and historic non-aboriginal).

Significance

The Quitobaquito cultural landscape is eligible for inclusion on the NRHP under Criterion A as a place of occupation and visitation for thousands of years with human presence at the springs dating to at least 9000 BCE. From pre-contact to modern times, the springs have been a central defining feature of Quitobaquito and are a cornerstone of the cultural landscape. Indigenous peoples have used the resources of Quitobaquito for subsistence and for religious and cultural activities for millennia. Quitobaquito has been an important stop for travelers and migrants due to the availability of perennial water and remnants of pre-contact and historic trail segments begin and end at Quitobaquito (Hanson, et al. 2020). Europeans and Euro-Americans have visited or resided at Quitobaquito since the first European, Father Eusebio Kino, documented the springs in 1698 (Orsi 2017). The pre-contact and historic period use of Quitobaquito for subsistence, cultural traditions and travel speaks to its importance in Broad Patterns of History (Criterion A). Quitobaquito is also significant under Criteria A (Broad Patterns of History) of the NRHP as a Traditional Cultural Property for its importance in the ongoing cultural and religious traditions of the O'odham peoples. The period of significance is 9000 BCE to the present.

Quitobaquito is also eligible for inclusion on the NRHP under Criteria D (Potential to Yield Information) due to its importance in archeology and ethnography. The site is associated with pre-contact cultures (Prehistoric Paleo-Indian, Archaic, Prehistoric Ceramic, and Protohistoric Hohokam) and an early Hia C'ed O'odham village and has a high potential to yield significant information. Information which may be uncovered in the future includes prehistoric and historic period use and location of irrigation channels, agricultural activities, habitation practices, travel patterns, trade, burial sites, shrines, and ritual activities. Most archeological sites are believed to be in good condition although several known sites have been impacted by NPS and DHS construction activities. Overall, archeological sites within the Quitobaquito area retain integrity.

Period of Significance

A period of significance from time immemorial to the present day encompasses the known period of activity within the Quitobaquito cultural landscape. The O'odham people believe that significance begins at time immemorial. Artifacts found at an inactive spring at Quitobaquito may date to the San Dieguito I culture (10,000 BCE) and projectile points dating to the Early, Middle, and Late Archaic period (9000 BCE to 150-200 CE) were found along trails and passes in the Quitobatuito Hills. (Ferguson 2019; Rankin 1995) The period continues to the present day due to the continued importance and use of the landscape by the O'odham people.

Analysis of Contributing Landscape Features

The natural environment has enabled long term use and habitation of the Quitobaquito area in an otherwise arid environment. Without the reliable source of water provided by Quitobaquito springs, humans would have simply traveled through the area rather than settled, hunted, and farmed there. Landscape features, discussed here, contribute to the significance of the landscape, and embody a prominent or distinct quality or characteristic present in a cultural landscape (Page 1998).

<u>Natural Systems and Features</u>

Water

Water is the central feature of the Quitobaquito cultural landscape. Without the springs and, later, the pond, it is unlikely that the intensity of use and occupation of the area would have occurred. The presence of a reliable water source is a central defining feature in the movement and settlement of Indigenous people in the Western *Papaguería*. Quitobaquito consisted of 26 springs at one time and in the historic period contained five or more springs which fed a *cienega* or marsh oasis (Rankin et al. 2008). Today only two of the springs are active year-round. Archeological surveys have documented long term use and occupation of the landscape around the springs by Indigenous people (Rankin 1995). The Quitobaquito springs and seeps are contributing features in the cultural landscape.

Wildlife

The presence of perennial water in an arid landscape attracts and supports a myriad of wildlife. In addition to farming practiced during the historic period, O'odham settlers and those who passed through Quitobaquito relied on wildlife that frequented the springs as a source of food, hunting larger game and collecting smaller animals like lizards. Because Quitobaquito is a rare aquatic habitat in the Sonoran Desert, two hundred and ten species of birds, including four federally listed species of concern, have been recorded at the springs and pond at Quitobaquito (Gary Nabhan, personal comm., January 22, 2022.). Endangered and endemic species recorded at the Quitobaquito springs and pond include Sonoyta Mud Turtle (*Kinosternon sonoriense longifemorale*), and the Quitobaquito pupfish (*Cyprinodon eremus*). Other species of concern at Quitobaquito include the Southwestern willow fly catcher (*Empidonax traillii extimus*), Howarth's white (*Ascia howarthi*) and the Quitobaquito Spring Snail (*Tryonia quitobaquitae*), an endemic species that is a candidate for protection under the Endangered Species Act. Quitobaquito is likely the only breeding habitat for a rare butterfly, the Giant White (*Ascia howarthi*), which is dependent upon the desert caper tree (*Atamisquea emarginata*) a rare plant whose only location in the U.S. is ORPI (Kingsley, Bailowitz and Smith 1987). Endangered and rare wildlife species contribute to the ecological richness and importance of the Quitobaquito springs and pond.

Spatial Organization

The pond and springs compose the central hub of the Quitobaquito cultural landscape. The present-day walking path around the pond and from the parking area to the pond are important to the visitor experience and for NPS monitoring and maintenance. The old parking area and historic period building sites display disturbances in the vegetation and soil and create open spaces in the landscape. Access through the desert from the pond to the O'odham cemetery is unimpeded, although there is no path or visitor access. While the much of the historic period agricultural fields are no longer accessible as they lie south of the international border, the dense mesquite *bosque* with remnant pomegranate trees to the southwest of the pond defines the uppermost area of the previously irrigated agricultural area. The relationship of the pond, springs, channels and *bosque* and cemetery contribute to the significance of the landscape.

Land Use

Land use within and adjacent to the Quitobaquito landscape has changed over the millennia. From precontact times until federal management began in 1937, people have used the springs, seeps, cienega or pond, vegetation and wildlife for subsistence, community gathering and religious ceremonies, activities which continue today. People traveled through the landscape in a variety of ways: on foot, using trails, with livestock, on horseback, and later, during the historic period, using roads. Historic period agricultural use included construction of irrigation

channels and planting of fields and an orchard. A mesquite bosque has taken over the orchard, although some of the irrigation channels are still in evidence. Farming and ranching were practiced at Quitobaquito until park policy forbid these activities. Since the last resident at Quitobaquito left in 1957, the NPS has managed the landscape primarily for its natural resource values, and more recently, for its historic and cultural resource values. Agriculture is still practiced in the floodplain of the Rio Sonoyta on the Mexican side of the border, although not directly south of Quitobaquito. Mexican Highway Two, located just south of the border has increased the vehicle traffic in the area significantly. The border wall infrastructure road on the north side of the border sees a fair amount of traffic by the US. Customs and Border Patrol and other vehicles associated with DHS management of the infrastructure and activities thereby impacting the experience of the landscape. The O'odham continue to visit the cemetery and to conduct ceremonies at the pond and spring, and these uses of the land that contribute to its significance. The 2011 NRHP draft nomination form states that "Patterns associated with the settlement of Quitobaquito demonstrating the development of cultivated agriculture and vernacular engineering are also demonstrated at Quitobaquito as seen in the remnants of the historic orchard and trees, canal system and dam" (8:16). Agriculture traditions are an important component of the cultural landscape of Quitobaquito. The remnants of agricultural land use, namely the irrigation canals and orchard, contribute to the significance of the cultural landscape.

Cultural Traditions

The Quitobaquito cultural landscape has been a place of hunting and gathering, use and settlement by the O'odham and their predecessors for thousands of years. The landscape includes evidence of use for transportation, rituals, pilgrimages, and subsistence practices of hunting and gathering. The practice of cactus fruit harvesting in other areas of the park has been and continues to be important to the O'odham. The pond, springs, native vegetation, trails, and cemetery are important parts of the cultural history of Quitobaquito and represent long term use of the area. Cultural traditions of the O'odham are an integral part of the cultural landscape and contribute to its significance.

The historic Hia C'ed O'odham cemetery is a sacred place and has been a destination for the O'odham for at least 90 years (Underhill 1946; Anderson et al. 1982). The cemetery illustrates continued use of the area by descendants of the people who were buried at Quitobaquito. The O'odham are engaged in ongoing consultation with the NPS over care and management of the cemetery. The 2011 Quitobaquito Cultural Landscape Inventory identifies cemetery visitation as a contributing cultural tradition. The cemetery is a recorded archeological site with the Arizona State Museum archeological site database(SON B:04:006 (ASM)). At least one shrine near Quitobaquito remains in use by the O'odham (Quitobaquito TCP Nomination, 52).

The cultural traditions of the O'odham are manifested in the landscape and evident through the presence of the cemetery, shrines, and trails. Vegetation, wildlife, and water, discussed in other sections, are also essential tangible components of cultural traditions.

Cluster Arrangements

The buildings and structures that once defined the homestead cluster arrangement are no longer present. The grouping of the agricultural area (orchard and fields) and the pond remains. The orientation of the agricultural area to the pond and springs illustrates the use of natural hydrology for subsistence, but this speaks more to the spatial organization than to a cluster arrangement. Due to the lack of extent buildings and structures, cluster arrangement does not contribute to the significance of the landscape.

Circulation

Circulation in the Quitobaquito landscape has centered around the pond and springs with social trails throughout the area. A walking path encircles the pond. Travel routes to the north and south have been identified and two of these trail corridors (ORPI00291 and ORPI00298), along with their associated features, are eligible for listing on the National Register of Historic Places under Criterion A for their association with historic transportation and with the cultural traditions of the O'odham peoples. Both corridors hold great potential to yield information about precontact and historic cultures (Criterion D) (Hanson et al. 2020).

Access to Quitobaquito is via Quitobaquito Spring Road which lies to the east. A parking lot is located southeast of the pond along Quitobaquito Spring Road. An official visitor trail leads from the parking area to the pond perimeter trail and to the springs. An NPS maintenance trail follows the channel above the pond to the springs. A border infrastructure road runs along the north side of the border wall, south of the pond. An earlier parking lot was located directly east of the pond but has been revegetated. There is some evidence of the location of the old road to the removed parking lot but vegetation is slowing obscuring the route.

The two historic trails eligible for listing on the NRHP contribute to the long history of the landscape. The pond perimeter path is an important feature which allows visitors to directly access the pond and it is likely that a walking path has long encircled the pond, making it a contributing feature of the cultural landscape. Other features, such as the parking lot and trail from the parking lot, are more recent constructions and part of the visitor infrastructure. The border infrastructure road impacts the views and viewsheds to and from the cultural landscape.

Topography

The topography of the Quitobaquito cultural landscape is mostly intact with the exception of the area along the southern boundary that has been impacted by border wall construction and border patrol activities. The natural topography of the landscape is an environment in which

water is easily directed from the springs to form a pond for human and livestock use. The surrounding hills afforded the O'odham and their ancestors extensive views to the south, east and west providing more fruitful hunting and defense. The topography is mostly intact except areas that have been impacted by the border wall and contributes to the cultural landscape.

Vegetation

The flora of Quitobaquito is an integral part of the cultural landscape and the Hia C'ed O'odham, Tohono O'odham and their predecessors have used the local plants for food, medicine, fiber, shelter, tools, basketry and for ceremonial purposes. Based on ethnobotanical records and paleobotanical remains from archeological sites, the most utilized native resources in the Sonoran Desert include tree legumes (mesquite, ironwood, and palo verde), cacti (saguaro, cholla, and prickly pear), and agave and yucca (Rankin 1995). These commonly used plants are still found in the landscape. Cultivated plants such as figs, pomegranates, cantaloupe, chilies, wheat, squash, and others were irrigated by pond water during the historic period of agricultural production but no longer exist in the landscape. Historically planted fig and pomegranate trees continued to grow until the last fig tree died in the 1990s and last pomegranate in the 2010s due to a lack of water and maintenance. Invasive species such as Bermuda grass and buffelgrass continue to pose a management challenge for the NPS. The native plants found at Quitobaquito are essential contributing elements to the function, aesthetics, culture, and history of the landscape.

Buildings and Structures

All buildings previously located within the landscape were removed by the NPS in the 1950s-1960s and are no longer extant; therefore, they no longer contribute to the significance of the site. The remaining structures including earthen canals, the dam, irrigation canals and Sestier's grave marker were constructed during the historic period and do contribute to the cultural landscape. The remnant spaces occupied by these buildings hold important archeological evidence of past patterns of habitation, agriculture, and cultural traditions. For this reason, these areas have the potential to be eligible under Criterion D, Potential to Yield Information, as archaeological sites with subsurface cultural deposits and could contribute to the area as archaeological sites.

Views and Vistas

The expansive views from the hills within the Quitobaquito cultural landscape have provided the O'odham with a visual connection to their traditional lands. The views from the Quitobaquito pond to the north to of the Quitobaquito Hills and due west and east are generally intact and have integrity. The views to the south have been heavily impacted by border activities including construction of the border wall which prevents a visual connection with the areas of the cultural landscape that were visually connected during the period of significance. The border road on the north side of the border and Mexico Highway 2 on the

south side of the border also impact the visual field and increase noise. Border wall construction activities have disturbed vegetation and natural drainage patterns along the southern boundary of Quitobaquito. For these reasons, the views south from the landscape do not have integrity.

Vistas contained within the Quitobaquito cultural landscape focus primarily on the pond. Removal of the cottonwood tree in 2016 changed the appearance of the pond but was necessary due to its impact on the integrity of the dam, pond, and water levels. Changes in vegetation over time have also impacted the pond vistas. Invasive species such as Bermuda grass (*Cynodon dactylon*), red brome (*Bromus rubens*), Lehmann lovegrass (*Eragrostis lehmanniana*), buffelgrass (*Pennisetum ciliare*), wild turnip (*Brassica tournefortii*), salt cedar (*Tamarix ramosissima*), and fountain grass *(Pennisetum setaceum*) have the potential to be an impact if not managed within the pond viewscape. While the salt cedar has been removed by the NPS, it may re-establish itself as it is found nearby in Rio Sonoyta. Removal of invasive species and re-establishment of native plants may improve the integrity of the plant communities around the pond. The cottonwood trees which had been planted along the north bank have mostly disappeared, save for one tree which may be removed in 2023. The view of the pond has changed considerably since the removal of the leaning tree and the death of the other Cottonwoods.

Constructed Water Features

The original dam that created the pond has been repaired and modified over the years both as part of the agricultural irrigation system and by the NPS to maintain water levels in the pond Installation of a pond liner and subsequent alterations during the period of NPS management have been necessary to respond to lower water flows, to repair leaks and to create a more suitable habitat for the endangered species in the pond. Despite the modifications, the dam is a contributing feature of the landscape, as it enabled long-term occupation by the Orozco family and other Hia C'ed O'odham, Tohono O'odham, Anglo-Americans, Mexicans, and immigrants in the historic period.

Irrigation canals from the pond to the agricultural fields and orchard have been impacted by several iterations of border infrastructure and ongoing activities as well as natural forces like erosion. Intact irrigation canals from the pond to the orchard do contribute to its significance as a homestead with subsistence agricultural practices. Concrete channels installed by the NPS in the 1980s to control the flow of water from the springs to the pond are non-contributing.

Small-Scale Features

Small scale features such as benches and signage were installed by the NPS in more recent times and do not contribute to the significance of the cultural landscape. Sestier's grave marker does contribute to the significance of the landscape.

Archeological Sites

The many surveyed and recorded archeological sites indicate that the area within the boundaries of the Quitobaquito cultural landscape has the potential to yield information about a wide range of practices and culture revolving around three research themes: prehistoric commerce and trade, settlement and migration, and early prehistoric agriculture (CLI 2011). The 1994 National Register nomination and AZ SHPO concurrence deemed twenty sites within the Quitobaquito historic district to be significant from the period 9000 BCE to 1944 CE for archeology (prehistoric, historic-aboriginal, historic-non-aboriginal), exploration and settlement, ethnic heritage (European, Hispanic, and Native American) and Agriculture. The sites are affiliated with Paleo-Indian (likely, but unconfirmed), Archaic, Hohokam, Hia C'ed O'odham, Tohono O'odham, Historic Mexican and Euro-American cultures. The area has been occupied so long that most of the sites represent multiple periods of occupations and cultures. , Although the NPS has now managed the site for over 50 years, NPS developments have not been recorded as historic features or archaeological sites. This will be an emergent issue within the next twenty years of management. Modern activities, including NPS management between 1937-1972 and border infrastructure development that has over the years escalated in scope and scale, has resulted in the disturbance of known and unknown archeological sites. Despite disturbances, the entire Quitobaquito cultural landscape has the potential to yield information should new surveys and excavations occur.

Conclusion

Quitobaquito is a traditional cultural landscape important to the O'odham people. It is a place where their ancestors lived, visited, gathered, hunted, farmed, ranched, were buried, and engaged in spiritual and religious practices. It is a place of connection – to the water, to ancestors, to traditional foods, and to places beyond. The resources of Quitobaquito continue to serve contemporary O'odham people who gather plants at the springs as part of long held spiritual and subsistence practices. Gravesites within the vicinity of Quitobaquito represent sacred connections to O'odham ancestors and are visited and cared for by descendants at the present time.

Quitobaquito represents broad patterns of history from 9000 BCE to the present time and includes many sites that may yield information about the past through further study. The plants, animals, water sources, trails, and views of the surrounding desert are all important contributors to the landscape significance. Despite impacts from NPS, Border Patrol, and visitor activities, the landscape as a whole retains integrity to convey its connection to its traditional cultural uses.

CHAPTER 5 – TREATMENT

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INTRODUCTION

The treatment approach proposed in this report is based on an analysis of Quitobaquito cultural landscape characteristics, existing conditions, the history and significance of the site, and the goals and policies of the National Park Service (NPS) and associated tribal communities. Environmental issues such as water availability for endangered species, projected temperature and precipitation patterns under changing climactic conditions, and public use of the site are considered as well.

This section of the report begins with a review and discussion of Quitobaquito and Organ Pipe Cactus National Monument (ORPI) management and guidance documents followed by a summary of the Secretary of the Interior Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes (1996). A treatment philosophy and general treatment guidelines for the Quitobaquito cultural landscape are presented. The section concludes with specific treatment recommendations for the landscape.

NPS AND ORPI POLICY GUIDANCE

Interim Management Plan for Quitobaquito (1983)

The earliest guidance document reviewed was the Interim Management Plan for Quitobaquito (IMPQ) completed in 1983. The IMPQ elucidates the fundamental dilemma in managing the Quitobaquito landscape under prior NPS policies: should Quitobaquito be managed for its historical or biological resources? Distinct NPS policies had been written for natural, historical, and recreational values but clearly "Quitobaquito is neither exclusively a historical nor a biological resource. It is both simultaneously" (IMPQ, 26). To manage Quitobaquito as a traditional historical area would impact the natural resources of the site. To manage Quitobaquito solely based on its natural resources would impact historic and recreational values. To resolve this conflict, the IMPQ proposed the creation of a Quitobaquito Management Area with management objectives that are distinct from other parts of ORPI. The IMPQ recognizes that at the time when the NPS acquired and began to manage the Quitobaquito area, the historic values of the site were not appreciated or understood, and no law or policies were in place to prevent the destruction of historic resources. Natural resource and aesthetic values took precedence.

The recommended theme presented in the IMPQ is "Appreciation of life as it can be found at a waterhole sanctuary in the Sonoran Desert" (IMPQ, 30). "At Quitobaquito we would no longer attempt to manage toward achieving naturalness, but to achieve the appearance of naturalness" (IMPQ, 30). The proposed IMPQ goals in order of priority are to:

1. *To ensure the continued well-being of the rare and/or endemic wildlife.*
2. *To encourage ecological stability by suitable means, especially by species diversity.*
3. *To provide a setting suitable for appreciation of Sonoran Desert life (including man in his historical setting).*

4. *To interpret the resource non-intrusively at a level suitable for a public whose ecological sophistication is growing.*
5. *To permit suitable scientific investigation to evaluate resource management or to generate information about the biota.* (IMPQ, 31)

The proposed management objectives from the IMPQ for Quitobaquito are to:

1. *Preserve intact those portions of the area not altered by man.*
2. *Restore or hold safe from further use roads and trails not required for management use.*
3. *Maintain suitable habitat for the life forms unique to Quitobaquito Pond.*
4. *Maintain suitable habitat for the resident and migratory native species associated with riparian ecosystems management unit.*
5. *Manage the resource in such a manner that degradation of the historical components is not accelerated either by management or visitor activities.*
6. *Provide a setting to allow the use of the area by park visitors for wildlife and vegetation observation, but with the realization that visitor use and activities may have to be limited in order to accomplish the first five items on this list. The number of visitors and/or the types of visitor use may have to be restricted. Such restrictions are to be passive in nature wherever possible.*
7. *Provide adequate interpretive programs, literature, public contact and signing to explain the Quitobaquito resources and resource management.*
8. *Restore Williams Spring, as far as possible, to its natural condition had European man not altered it.*
9. *Provide for preservation and protection of the Papago cemetery in perpetuity and guarantee unhindered access to it by the Papago families whose dead are interred there.* (IMPQ, 28-29)

The report states that two different types of management are required for this unique site. "Most of the QMA (Quitobaquito Management Area) can be treated in the traditional manner. Non-impacted areas can be managed in the usual way" (IMPQ, 29). It is recommended that exotic species be eradicated, and roads, tanks and other evidence of prior human activity be removed. The Tohono O'odham cemetery would be an exception to this approach and would be made available to the families of the descendants buried there. However, the preservation of artificial systems such as the pond and the irrigation ditch system should be managed as historic structures, not removed to support wilderness values.

Organ Pipe Water Resources Management Plan (1992)

The purpose of the Water Resources Management Plan (WRMP) of 1992 was to describe the water resources of ORPI, discuss issues surrounding these resources, and propose management actions to address these water management issues. It is meant as a supplement to the monument's draft General Management Plan (GMP) (the final draft would not be completed until 1997), as well as a supplement to the Natural and Cultural Resources Management Plan (RMP). Project statements from this plan were incorporated into the GMP.

The GMP identifies the global significance of ORPI as a pristine Sonoran Desert ecosystem for which it was designated a Biosphere Reserve by the United Nations Education, Scientific and Cultural Organization (UNESCO). The WRMP highlights the significant water resources at ORPI as an integral part of this pristine Sonoran Desert ecosystem. The unique water resources in the monument contribute to its high biodiversity and thus to its significance as part of a worldwide network of Biosphere Reserves.

The WRMP maintains that the only way for the important water resources to be preserved is if the "unnatural stresses from both within and outside the boundaries are reduced and kept at a minimum" (WRMP, 5). Identified stressors included factors associated with human development such as water and air pollution, overuse of groundwater from outside of ORPI, physical impacts from human and vehicular traffic, and the introduction of exotic species. Since ORPI is a protected area, the WRMP concludes that these stressors are most likely to come from outside the monument's borders. This document contends that the most imminent threat to ORPI's water resources is overuse of groundwater in the Sonoyta Valley in Mexico due to agricultural use and development.

The specific water resources identified at ORPI include surface water (seeps, springs, ephemeral washes, and tinajas), and groundwater which supply the seeps, springs, and pond with year-round surface water. Surface water is essential for wildlife and is especially important due to the presence of water-dependent endangered species such as the Quitobaquito pupfish and Sonoyta mud turtle. In addition to supplying water to seeps and springs and the pond, maintaining groundwater levels is essential for important plant resources such as mesquite and the rare desert caper tree whose only location in the United States is at Quitobaquito.

The WRMP identifies six management objectives to protect the water resources within ORPI. These objectives are:

1. *To protect the natural water cycle processes from disturbance to preserve the ecosystems that are dependent on natural water levels, flow, and quality.*
2. *To maintain or restore the quality of water resources through resource management actions and through cooperation with local communities and peoples and regional, state, federal, and international agencies.*
3. *To contribute to the scientific base for water resources management and perform and/or coordinate water resources research.*
4. *To promote public awareness of the water resources of Organ Pipe Cactus National Monument and an understanding of current and potential human impacts upon these resources on an aquifer-affected regional basis.*
5. *To promote water conservation through direct NPS action and through cooperation with local communities and with regional, state, federal, and international agencies. To provide for visitor safety by evaluating flash flood hazards, locating new facilities out of*

> *hazardous areas, and relocating existing facilities if flood hazards cannot be mitigated.* (WRMP, 6-7)

The WRMP summarizes laws and regulations, international agreements, and enabling legislation such as wilderness legislation and major state and federal water resources legislation that apply to the water resources at ORPI. Due to the monument's status as a UNESCO Biosphere Reserve, its designation as a wilderness area within an NPS managed national monument, and its location bordering the Tohono O'odham Nation and Mexico, these agreements, laws, and regulations are vast.

The following is a list of the identified water resources issues and proposed management actions from the WRMP.

1. Address water rights issues by using an interdisciplinary team to conduct literature and field research on water resource attributes to qualify and support water rights claims. This is identified as the highest management priority so that ORPI can identify its water resource attributes to effectively participate in state water rights adjudications.
2. Conduct studies to document land subsistence and groundwater depletion and encourage the Mexican government to reduce groundwater overdraft to address the alteration of natural flow regimes and groundwater levels.
3. Inventory and monitor water resources, analyze existing literature on regional aquifers, monitor water quality to identify pollution threats from Kuakatch and Cuerda de Lena Washes, and determine the geohydrology of Quitobaquito Springs to address the lack of basic information to understand monument resources and related threats. Elements of each of these studies would set a baseline for understanding and monitoring water resources and would include a design for a permanent monitoring network.
4. Address the degradation of water quality and resources by conducting literature and field surveys to determine the chemical analysis of mine tailings from problem mine sites and establish native vegetation, construct earthen dikes, and install rock and brush structures in incised channels to address historic ranch sites where anthropogenic erosion is evident.
5. Conduct a flood hazard analysis and monitor riparian ecosystems through field surveys and aerial mapping of selected riparian for floodplain management and wetlands protection.
6. Conserve water; digitize and analyze available water resource data from Mexico, Tohono O'odham lands, and the Quitobaquito habitat area; monitor precipitation chemistry; and monitor wastewater systems to make sure they are in compliance with state regulations to address other water resources issues.

In addition to these management actions, the WRMP takes a broad view approach, considering resources and patterns of the greater ecosystem and how they play into the management of water resources in ORPI.

Organ Pipe Cactus National Monument General Management Plan (1997)

In 1997, an Organ Pipe Cactus National Monument General Management Plan (GMP) was finalized. The purpose of the plan was to provide a comprehensive management framework to manage the resources of the park under the NPS legal requirements to "propose, develop, make public, and execute such a plan" (GMP 1997, 3). The objective of the plan was to carry out the principles of the Man and the Biosphere program by adopting a regional perspective for conservation, visitor services, wilderness values and resource protection. The Plan identified several ongoing management issues within the park including a steady growth in visitation, impacts on the park from the surrounding landscape, and resource degradation. The following goals and desired futures were identified through public input, consultation with the Tohono O'odham Nation and input from NPS staff as well as existing mandates. The New Proposed Action Alternative, the NPS's preferred alternative, sets out the following actions for ORPI:

- *Seek redesignation of the monument as Sonoran Desert National Park.*
- *Work with the State of Arizona, and others, to ensure continued commerce while enhancing resource protection and conservation practices along the portion of State Route 85 within the monument.*
- *Use a cost-effective development strategy that utilizes existing facilities with some additions of tent camping, visitor services. maintenance, and other operational needs, and establishes partnerships to share in establishing new facilities to provide for visitor contact, employee seasonal housing and some offices.*
- *Re-align the trail network at Quitobaquito Springs area to enhance habitat protection*
- *Increase the amount of wilderness and improve protection of wilderness values through development of an inter-agency Wilderness Management Plan and an overall reduction in the amount of social trails.*
- *Stabilize and apply preservation and use treatments for historic properties.*
- *Establish a government-to-government agreement with the Tohono O'odham Nation about lands which are sacred to them, ensure adequate and accurate communication, and increase O'odham involvement in interpretive programs.*
- *Reduce the impact of adjacent facilities and use on wilderness by seeking a class I airshed designation and by relocating and burying power line* (GMP, 2).

Quitobaquito is identified as a Management Area Subzone. The plan examines unique issues at Quitobaquito and proposes specific policies for land use and management, natural and cultural resources, and visitor use and facilities. Management policies and actions are to:

- Preserve Quitobaquito's wilderness values in accordance with the regulations of the Wilderness Act by relocating the parking lot to Puerto Blanco Road and converting the old access road to a handicap-accessible trail.
- Create a well-defined and improved trail system to Quitobaquito to reduce visitor trampling and improve pupfish habitat.

- Develop a study to determine if limits to use would help protect the endangered species at Quitobaquito.

The GMP reiterates the need to manage Quitobaquito in its wilderness context and to protect endangered species and their habitats as well as planning and designing for visitors so that impacts on the site are limited.

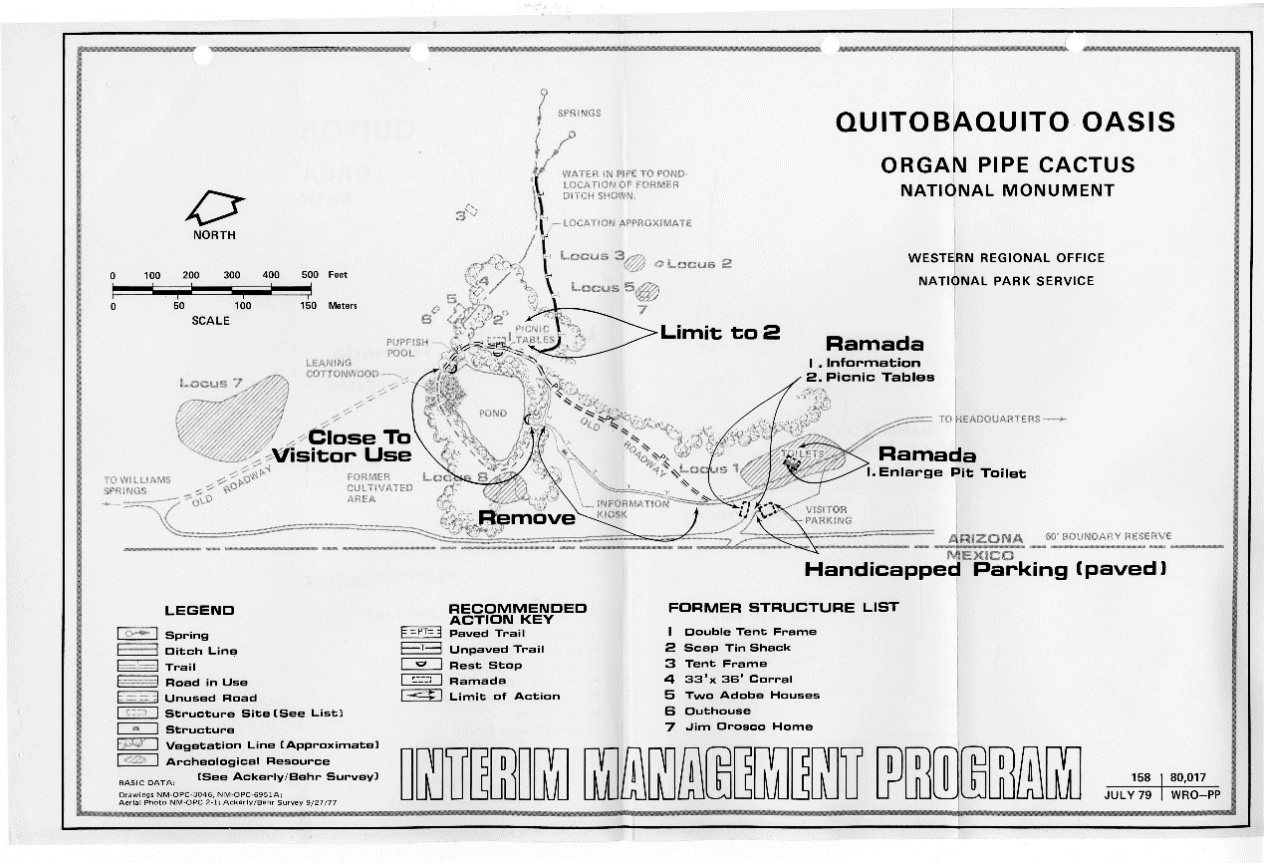

Figure 5-1 Quitobaquito Oasis Interim Management Plan map (1979)

Organ Pipe Cactus National Monument Foundation Document (2016)

The 2016 Park Foundation Document includes four statements which identify the reasons why Organ Pipe Cactus National Monument is a designated unit of the National Park System. These are:

1. *Organ Pipe Cactus National Monument is a vast Sonoran Desert designated wilderness area that protects wilderness values, such as opportunities to experience solitude and primitive recreation, expansive vistas, and dark night skies.*
2. *Distinct summer and winter rainy seasons and rare freezes contribute to the stature and diversity of Sonoran Desert natural communities at Organ Pipe Cactus National Monument. This environment supports a rich assemblage of tropical desert endemic species, including a number of endangered species and the largest protected concentration of organ pipe, senita, and saguaro cactus in the United States.*

3. *The monument has been continuously studied since the early 1940s, serving an international role in research, conservation, and education, and has been recognized by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as a globally important biosphere reserve that is representative of the natural Sonoran Desert ecosystem.*
4. *For more than 15,000 years, Organ Pipe Cactus National Monument has been a place of trade, travel, and convergence, as evidenced through prehistoric and historic sites such as Quitobaquito Springs and other culturally significant features and is still being used today* (USDOI 2016, 5).

The Document identifies the fundamental resources and values (FRV) that warrant primary consideration during planning and management of ORPI and which are essential to maintaining the significance listed above. Without a protection of these FRV, the park's significance or reason for designation will be undermined. The fundamental resources and values are:

- *Columnar Cacti, including the Organ Pipe Cactus. Organ Pipe Cactus National Monument exhibits an extraordinary collection of rich tropical flora, Pleistocene relict woodlands, and animals that have specially adapted to the conditions of the Sonoran Desert, including 26 species of cactus and three species of columnar cactus—the organ pipe, saguaro, and senita. The columnar cacti are iconic of the Sonoran Desert and serve as indicators of overall ecosystem health.*
- *Wilderness. Ninety-five percent of Organ Pipe Cactus National Monument is designated wilderness, cooperatively managed with monument partners to protect the wilderness character of the landscape. The largely undeveloped and primitive landscape is a natural haven for flora and fauna of the Sonoran Desert. Though the monument welcomes thousands of visitors a year, it is not difficult for visitors to experience remote solitude, primitive recreation, expansive vistas, and natural night skies in this immersive wilderness landscape.*
- *Quitobaquito. Quitobaquito, the location of several springs and seeps, is a unique desert oasis that has provided a constant source of water for desert travelers and residents for more than 15,000 years. Prehistoric Paleo-Indian, Archaic, and Hohokam groups, as well as Papago, Spanish, Mexican, and Anglo groups all interacted with the environment, and in some cases, with each other. A former village, camp, and agricultural site, human habitation ended at Quitobaquito in 1957, though ongoing use of this tribal cultural place still continues by traditionally associated tribes and groups. This oasis is also an ecological singularity, where water and high moisture contrast with the surrounding arid desert. As such, Quitobaquito is home to a diverse range of plants and animals, including many rare and endangered species such as the Quitobaquito pupfish, Sonoyta mud turtle, and Quitobaquito tryonia.*
- *Continuum of Human History. Organ Pipe Cactus National Monument's diverse range of cultural resources document thousands of years of human presence and adaptation to the arid Southwestern environment. Among the monument's important cultural resources are prehistoric American Indian sites; traces of the Salt Trail and El Camino del*

Diablo; place names for early Spanish explorers and missions; and 19th and 20th century homesteads and mining sites. For contemporary people, including American Indians and European American descendants of explorers and pioneers, many of the monument's cultural sites, objects, landscapes, and natural resources remain important touchstones that contribute to group identity and heritage.

- *Science and Research. The long and highly active legacy of scientific study and scholarly research at Organ Pipe Cactus National Monument illuminates the area's natural and cultural history, including the stories of American Indians and pioneers, and their interaction with the natural environment. The monument's designation as a UNESCO International Biosphere Reserve further demonstrates the special diversity of the monument's Sonoran Desert ecosystem, and its importance for continued scientific research and education* (USDOI 2016, 6).

The Foundation document discusses the important resources and values and current conditions, trends, threats, and opportunities. Quitobaquito is valued for its long history of occupation and use as well as the plants and animals found there. Quitobaquito also falls within the designated wilderness area which is also one of the important resources and values that define ORPI.

The document considers the Quitobaquito cultural landscape as degraded due to past management and neglect. The Quitobaquito pupfish and Sonoyta mud turtle populations are considered to be stable and flora and fauna in the cultural landscape is determined to be in good condition. Visible changes seen at Quitobaquito are the loss of heritage trees, the removal of historic structures, changes in plant communities including the aging and loss of cottonwood trees and soil erosion. Trends that have been deemed problematic in the Foundation document include increased visitation to Quitobaquito due to expansion of access without a corresponding increase in facilities for visitors. At the time the Foundation document was written, loss of water from the pond from leaks in the pond liner and due to breaches in the earthen dam were problematic despite the reconstruction of the retaining berm in 2006. Noise and potential contamination from hazardous materials spills from increased traffic on Mexico Highway 2 is also a trend of concern. Specific threats to Quitobaquito include:

- *The significance of the Quitobaquito site is not well understood by visitors, which may affect how they treat or care for the site when they visit (related to littering, social trails, soil erosion, and improper disposal of human waste).*
- *This area has long been used as a staging area for cross-border activity, including associated impacts related to trampling of natural and cultural resources, littering, and potential impacts to visitor experience.*
- *Water quality in this region is highly variable and is susceptible to contamination from human activities and atmospheric deposition of chemicals. To date, there have been no large deviations from baseline water quality measures at Quitobaquito Pond, but even small fluctuations could pose a threat to the threatened and endangered wildlife that*

depends upon this area, especially if climate change comes with reduced rainfall in the region that recharges the springs.
- *Evapotranspiration is an additional factor that decreases water levels, in addition to leaking water from the earthen dam and pond bottom.*
- *A hazardous material spill from traffic on nearby Mexico Highway 2 could, depending on the nature of the spill, greatly impact the ecological integrity of Quitobaquito and Quitobaquito Springs.*
- *Due to an accumulation of vegetation in the area and an increase in dead wood, fire is a regular threat at the site.*
- *Introduction and proliferation of invasive plants and animals could greatly impact the ecological integrity of the site, including the threatened and endangered species* (USDOI 2016, 20).

Opportunities for Quitobaquito are identified in the document:

- *Create a more robust visitor experience at the site, through an increase in visitor services and interpretation of the natural and cultural resources of Quitobaquito.*
- *Investigate working with traditionally associated tribes and groups to restore the tribally important site.*
- *Continue working with the Desert Botanical Garden in Phoenix, Arizona, to propagate cuttings of the original figs and pomegranates from the cultural landscape and reintroduce those cuttings to the landscape in order to restore the orchards.*
- *The monument should continue propagating efforts already initiated as well—these have been mostly for the cottonwood and willow trees but could be expanded to other species. The monument's nursery should be utilized to its fullest potential.*
- *Continue work on the fire management plan and implement fuel reduction strategies* (USDOI 2016, 20).

The identified Data and/or GIS needs for Quitobaquito outlined in the Foundation Document are:

- *GIS mapping of cultural resources at Quitobaquito.*
- *Archeological surveys.*
- *Archeological overview and assessment.*
- *Ethnographic overview and assessment.*
- *Cultural landscape inventories.*
- *Groundwater assessment* (USDOI 2016, 20).

Lastly, several areas were identified as requiring additional planning. These planning needs are:

- *Resource management and restoration plan for Quitobaquito Springs and site.*
- *Comprehensive interpretive plan.*
- *Cultural landscape reports.*

- *Cultural resource management plan.*
- *Wayside plan.*
- *Planning for adaptation to climate change* (USDOI 2016, 20).

The management and policy guidance provided by these four documents presents a consistent summary of the challenges and goals for Quitobaquito. Determining the best way to manage a complicated, multi-layered, historic, and culturally rich wilderness area with one of the only sources of perennial water in the region presents many dilemmas including how to prioritize some values of Quitobaquito over others. To date, the focus has been primarily on the natural environment and protection of water, plant and wildlife resources from visitor impacts and impacts from surrounding land use, at times, to the detriment of the site's cultural history. Tribal consultation over the years has highlighted the importance and necessity of protecting cultural resources and sites and acknowledging the long history of use and occupation at Quitobaquito. The proposed treatment plan seeks to address the multiple values of the Quitobaquito cultural landscape.

TREATMENT AND DESIGN RECOMMENDATIONS

Introduction

A key component of a Cultural Landscape Report is the preparation of a set of treatment recommendations for the landscape. The treatment section proposes strategies for long-term management of the cultural landscape based on its significance, existing conditions, and use. The treatment plan specifies the required actions to preserve the landscape and provides a road map for management by National Park Service staff.

Treatment Philosophy

Secretary of the Interior's Standards for the Treatment of Historic Properties recognize four types of treatment (Page et al. 1998 82):

Preservation: the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Includes initial stabilization work, where necessary, as well as ongoing preservation maintenance and repair of historic materials and features.

Rehabilitation: the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.

Restoration: the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by removing features from other periods in its history and reconstruction of missing features from the restoration period.

Reconstruction: the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time, and in its historic location.

Recommended Treatment Approach

The recommended approach for Quitobaquito is **preservation**. The treatment approach as recommended here is future focused and does not reflect prior treatment activities. The preservation strategy is recommended because the site is within a designated wilderness area and is consistent with the stated NPS goals for water and wildlife protection and the site's history and cultural values. According to Page (1998), the standards for preservation are:

1. A property will be used as it was historically or be given a new use that maximizes the retention of distinctive materials, features, spaces, and relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be Undertaken.

2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Work needed to stabilize, consolidate, and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection, and properly documented for future research.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color, and texture.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken. (88)

OVERALL TREATMENT RECOMMENDATIONS

The overall approach to the Quitobaquito cultural landscape is to preserve and maintain the landscape to preserve its wilderness, ecosystem and cultural values while allowing visitor access and interpretation. Overall treatment recommendations consistent with the Secretary of the Interior standards for preservation are presented here. The subsequent section includes specific treatment recommendations for sub-areas within the cultural landscape. Many recommendations found in this report are currently being addressed and others are standard NPS management practices.

General

- All landscape modifications should be done in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes: Preservation (1996).
- Consider the landscape as a whole rather than planning solely for its individual components to ensure that modifications to one feature do not negatively impact another.
- Prepare an updated management plan for the Quitobaquito cultural landscape that addresses essential habitat, viewsheds, pedestrian circulation, cultural and natural resource protection and interpretation, water monitoring, and placement of small-scale features.
- All changes to the landscape should be carefully documented and monitored.
- New construction projects should disturb as little of the landscape as possible.
- Areas impacted by modern human use and construction, outside of general management and traditional use, should be revegetated and original hydrology patterns reestablished as feasible and as soon as is practical.
- Continue to study the natural and cultural systems of Quitobaquito.
- Consult with experts in ecology, fish and wildlife management, landscape architecture, archeology, and hydrology before, during and after construction projects.
- Ensure that any new features are designed to fit with the landscape, be minimally intrusive and are consistent with wilderness designation.
- Continue ongoing consultation with the Tohono O'odham and associated tribes and make no major changes to the landscape without tribal consultation.
- Develop opportunities for visitors to explore and learn about the history and ecology of the Quitobaquito landscape while limiting impacts on natural, cultural, and scenic values.
- Provide adequate visitor interpretive programs, literature, public contact, and appropriate signage to explain the natural and cultural history and rules for use of Quitobaquito.
- Regularly convene NPS staff representing different areas of park management to better coordinate and manage the wide range of Quitobaquito resources, values, and activities.

Land Use

- Continue to request that US Customs and Border Patrol vehicles use existing roads only and document and monitor off-road use in the area.
- Prepare a contingency plan in the case of spills or air pollutant release of hazardous materials from vehicles on Mexico Highway 2.

Circulation

- Establish and post regulations for visitor access in the Quitobaquito landscape.
- Provide regular enforcement of such regulations designed to protect the historical and natural features of the site.
- Increase regular patrols by park law enforcement staff to enforce regulations and reduce misuse by the public.
- Formalize trail system planning and discourage the formation of social trails that could impact resources.
- Consider creating additional formal trails to points of interest for visitors when consistent with wilderness designation.
- Direct visitors to formal trails and reduce impacts on resources from social trails through signage.
- Direct visitor vehicle access to Quitobaquito Road and the Quitobaquito parking area only.
- Limit use of the parking area northwest of the pond to essential NPS activities only.

Natural Systems

- Monitor the status of endangered wildlife species populations and populations of conservation concern.
- Maintain suitable habitat for rare, endangered, and migratory species who inhabit the pond area.
- Monitor spring outflow and pond surface water levels.
- Evaluate subsurface hydrology to understand and predict spring production.
- Continue to remove non-native, invasive species such as tamarisk and buffelgrass.
- Repair damage to hydrology from construction activities.
- Create or maintain NPS participation in work groups and recovery teams.

Vegetation

- Remove and manage invasive species.
- Continue to conduct vegetation surveys and monitoring.
- Revegetate the pond area after pond construction and maintenance activities.
- Use only species that are indigenous to the area for revegetation projects.
- Use salvaged plants and those from the NPS nursery whenever possible.
- Develop a plan to manage native vegetation in the pond, spring, and channel.

- Manage and remove dead and downed woody vegetation that could contribute to wildfire risk.

Cultural Traditions

- Continue formal consultation and informal communications with the O'odham and other associated tribes on preservation, use and management of the cultural landscape.
- Interpret the cultural traditions of the O'odham in partnership with representatives of the associated tribes.

Topography

- Remediate drainage issues created by construction of the international border wall.

Views and Vistas

- Design visitor features to take advantage of views.
- Interpret historic viewshed for visitors.

Constructed Water Features

- Monitor and maintain the integrity of the pond liner and the dam.
- Ensure that constructed water features are compatible with existing features and the surrounding natural landscape.

Small-Scale Features

- Ensure that small scale features do not conflict with wilderness values.
- Place most small-scale features in high impact and previously disturbed areas.
- Limit signage and small-scale features in the wilderness area.

Archeological Sites

- Protect historic and cultural resources from human-caused impacts and impacts from natural process, including regular education/outreach/enforcement of regulations.
- Continue to monitor impacts to archaeological sites.
- Continue ongoing consultation with the Tohono O'odham and associated tribes.

Information Sharing with Tribal Stakeholders

In July 2022, ORPI held a meeting that was attended by representatives of the federally recognized Tohono O'odham Nation, as well as a representative of the Hia-Ced Hemajakam LLC., to discuss concerns and recommendations for the future of Quitobaquito. All 11 Native American tribes that ORPI regularly consults with were invited to attend, as well as representatives from the two groups of non-federally recognized Hia C'ed O'odham. The intent was to garner input from the tribes for the treatment recommendations in the Cultural Landscape Report. NPS staff and the University of Arizona consultants prepared six clarifying questions to guide the discussion. The questions were sent out in advance to the tribes. These questions were:

1. How would you describe your feelings about the current state of the Quitobaquito Landscape?
2. How do you think the landscape should look and function?
3. What are your hopes for the future of the landscape?
4. How would you like to use the landscape? Are there any features that should be included in the landscape?
5. Are there plants that you would like to see present in the landscape, and where?
6. How can the monument better communicate the story and importance of Quitobaquito to Native people?

ORPI's affiliated tribes were invited to the meeting. Eleven people attended the meeting including NPS staff, UA consultants, and representatives of the Tohono O'odham Nation and the Hia-Ced Hemajakam LLC. One elder of the Hia Ce'd O'odham community sent written comments. The meeting started with an explanation of the Cultural Landscape Report followed by an open dialogue about questions, concerns, recommendations, and responses to the clarifying questions regarding Quitobaquito. Table 5-1 summarizes these responses and includes those received in written form.

Table 5-1 Comments from meeting with tribal representatives

Concerns and Recommendations	Representative Group or Individual
Endangered species: Is it possible to inform visitation policies on biological opinion to protect endangered species?	Hia-Ced Hemajakam LLC.
Viewshed: Family memories are of Quitobaquito as a lusher environment than today. The view of the border wall is in stark contrast with family memories. Is it possible to screen the wall with vegetation?	Hia-Ced Hemajakam LLC.
Cultural Interpretation: Would like to see a cultural interpretation displayed (artistic interpretive signage and brochures in English, Spanish, and O'odham) including the O'odham name for Quitobaquito (*A'al Vaipia*). The park used to have "Indian Days" where they could set up booths and sell pottery and crafts at the visitor center. The importance of providing information directly to visitors was emphasized.	Hia-Ced Hemajakam LLC. Hia-Ced O'odham Elder
Cultural Resource Damage: Concerns over possible visitor damage to the cemetery and reburial sites	Hia-Ced Hemajakam LLC.

Pond: Concerns about the new pond liner and ORPI's decisions around management of the pond.	Hia-Ced Hemajakam LLC.
Ramada: Would like to see a traditional ramada with benches and educational center on site history, culture, and ecology.	Hia-Ced O'odham Elder
Paths and Roads: The circulation of paths and roads is different than in the past and there is concern that everything has changed.	Hia-Ced O'odham Elder
Springs: Concerns about why some springs have dried up.	Tohono O'odham Nation
Access to ceremonial areas: Would like free access to cemetery, reburial sites, ceremonial area.	Hia-Ced O'odham Elder
Access to plant resources: Would like to have free access to collect medicinal plants, and harvest desert foods during harvesting cycles.	Hia-Ced O'odham Elder
Access to Entryway: Would like free access to entryway for Salt Pilgrimage Runners, Spiritual Runners to/from the Sea of Cortez including overnight camping.	Hia-Ced O'odham Elder
Vegetation: There used to be more arrow weed (*Pluchea sericea*) by the pond. What happened to these plants?	Tohono O'odham Nation
Medicinal Plants: would like to see medicinal plants replanted and carefully managed	Hia-Ced O'odham Elder
Border Wall: Would like to see the NPS advocate for the removal of the wall. It has completely changed the landscape. There is concern about the lights being turned on and how this would affect wildlife and disturb the site. Would like the lights to be removed.	Hia-Ced Hemajakam LLC. Hia-Ced O'odham Elder
Border Wall Gates: Can a new gate be installed at Quitobaquito? This was requested before the wall was built but it never happened. How can the existing flood gates be opened?	Tohono O'odham Nation Hia-Ced O'odham Elder
Co-management of ORPI: Would it be possible to manage ORPI in a similar way to the way Canyon de Chelly is managed?	Hia-Ced Hemajakam LLC.
Farm and Orchard: These are still an important part of the landscape history and would like to see this preserved. Would like	Hia-Ced Hemajakam LLC. Hia-Ced O'odham Elder

to see the replanting of traditional trees such as pomegranates.	
Bathroom: Build bathroom facilities	Hia-Ced O'odham Elder

In addition to the recommendations above, general recommendations for the management and inclusion of O'odham people were proposed by a Hia-Ced O'odham elder. The written recommendations are summarized below:

1. Develop a Memorandum of Understanding with the Tohono O'odham Nation for use of the Quitobaquito area.
2. Engage in ongoing consultations with affiliated tribes in the development of proposals and implementation of activities to preserve the Quitobaquito cultural landscape.
3. Communicate the history and culture of Quitobaquito and surrounding area, including areas of cultural sensitivity, sacred sites, and burial grounds, to NPS and contract employees prior to work being done in the area.
4. Include O'odham historians to inform plant repopulation and reseeding their medicinal and other culturally important plants.
5. Employ O'odham people for preservation and maintenance activities if available and willing.
6. Conduct regular Cultural Sensitivity and Bias Training for the NPS and invite participation from Department of Homeland Security law enforcement to avoid conflicts and misconceptions around traditional uses of Quitobaquito.

SPECIFIC TREATMENT RECOMMENDATIONS

Because of the diversity of uses and thus a diversity in treatment recommendations in the Quitobaquito Cultural Landscape, we have divided the landscape into sub-zones. Figure 5-2 illustrates the entire cultural landscape while Figure 5-3 shows the concentration of zones near the pond and omits the outlying zones such as Aguajita Spring, and parts of the road, wilderness, and historic trail system. The cemetery has intentionally been left off the map due to cultural sensitivity.

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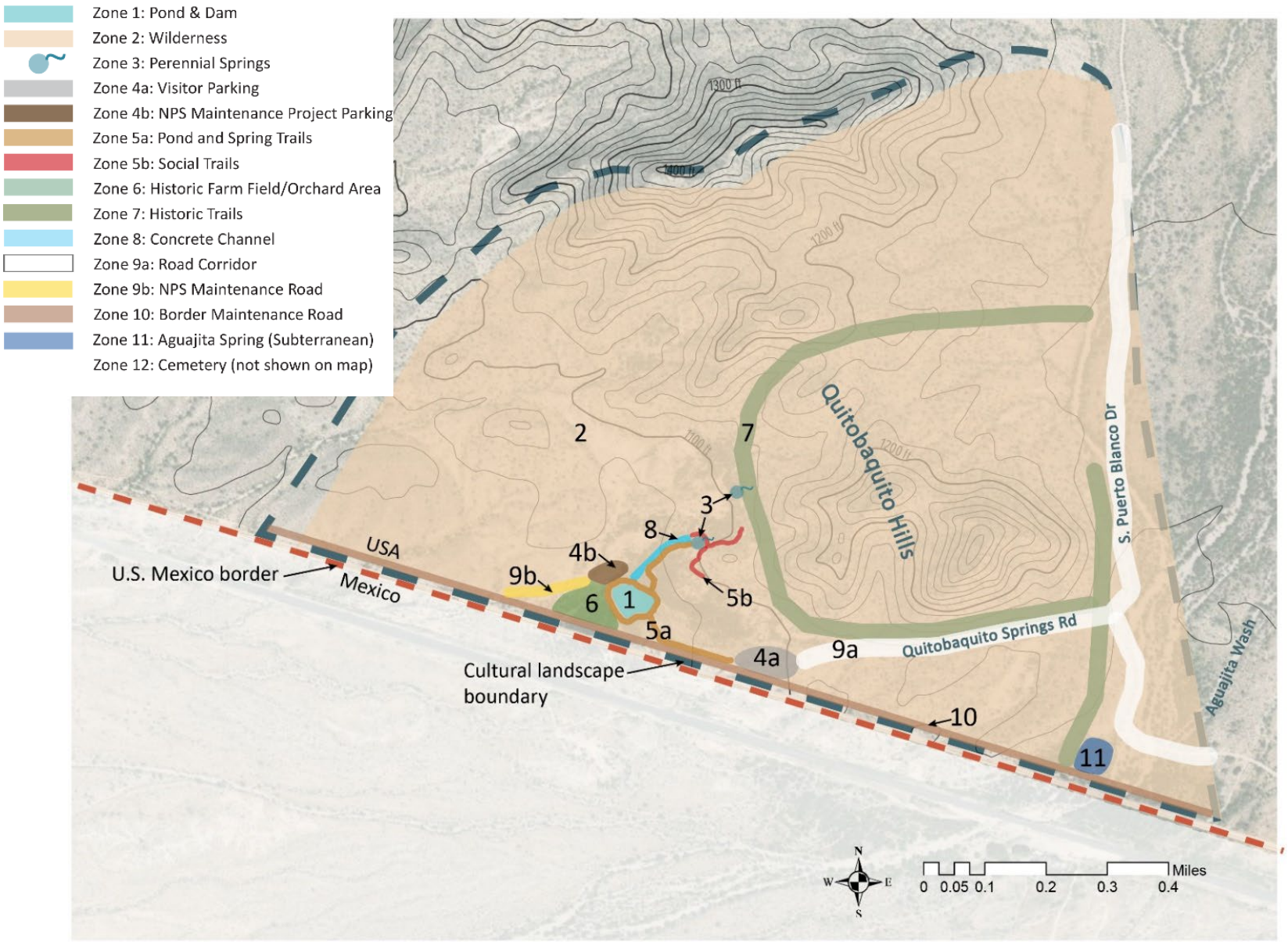

Figure 5-2 Quitobaquito management zones

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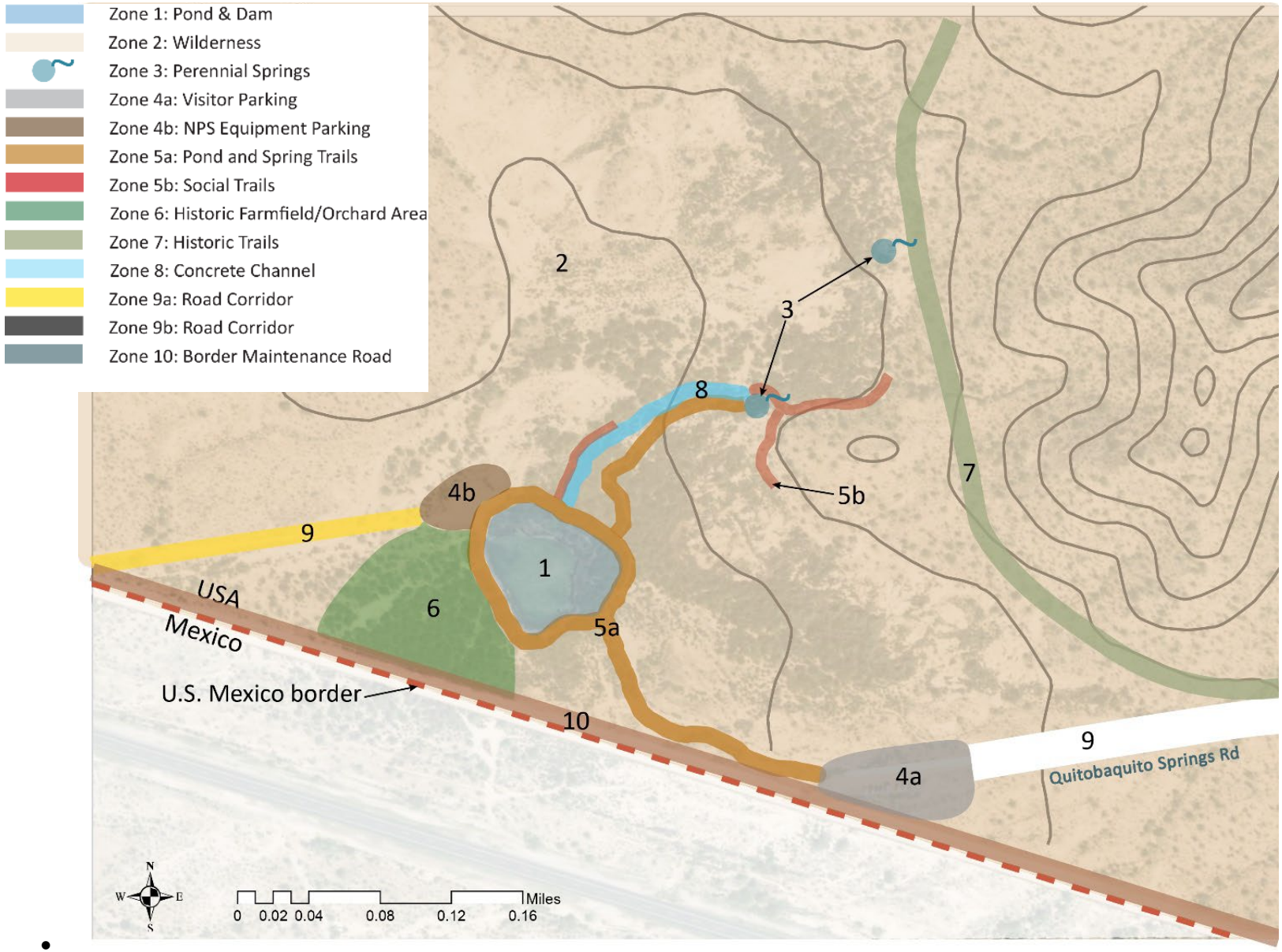

- Figure 5-3 Management zones near pond

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Zone 1: Pond and Dam

The pond is a central feature of the Quitobaquito Cultural Landscape. Along with providing important habitat for many species including the endangered, endemic pupfish and mud turtles, it is the feature that brings most visitors to this part of ORPI. The earthen dam is inseparable from the pond because without it, there would be no pond. As such, their treatment is also inseparable. Pond reconstruction in the Spring of 2022 involved replacement of the clay pond liner with a high-density polyethylene (HDPE) pond liner and included the addition of two smaller pools located on the north side of the pond (Figures 5-4, 5-5 and 5-6). The purpose of these smaller pools is 1) to capture sediment when rainfall is heavy and surface water flow carries sediment downslope towards the pond; 2) 2) to serve as refuge ponds for fish and turtles during the pond liner replacement project and if the pond habitat were to become unsuitable in the future; and 3) to increase water availability for all wildlife on site.

Treatment recommendations for the pond and dam include:

- Continue monitoring water levels.
- Protect and monitor population health of federal endangered species and species of conservation concern.
- Preserve and maintain the earthen dam.
- Continue removal of noxious weeds such as buffelgrass and tamarisk.
- Ensure that the new bench seating around pond blends with the landscape and is reviewed for compliance with the Wilderness Act. The benches near the Twin Peaks Campground at ORPI are a good example of seating that would be appropriate to Quitobaquito. Additionally, benches should be placed to optimize views (Figure 5-7).
- Maintain new pond liner as necessary to maintain water levels to ensure survivability of endangered species.
- Revegetate pond edge with plants that were salvaged before reconstruction in 2022, and then continue to manage vegetation.
- Diversify pond plantings to include seepage loving plants and important ethnobotanical species that were historically at the pond. Utilize seeds/plants from as close to on site as possible (Table 5-2).
- Propagate cuttings of last remaining cottonwood tree for future cottonwood placement in their historic locations (where possible).
- Consider planting female cottonwood trees from local sources.
- Work with a landscape architect to create a way for visitors to view the pond from several points while minimizing impacts.

Figure 5-4 Quitobaquito pond and dam post-2022 reconstruction (Nov. 2022). Teresa DeKoker, photographer

Figure 5-5 Newly constructed sediment trap pool (Nov. 2022). Teresa DeKoker, photographer

Figure 5-6 Sediment trap pool constructed in Spring 2022 (Nov. 2022). Teresa DeKoker, photographer

Figure 5-7 Bench along trail from Twin Peaks Campground (Nov. 2022). Teresa DeKoker, photographer

Table 5-2 Plants for pond, spring, and channel restoration*

Plant Family	Plant Family Common Name	Scientific Name	Common Name	O'odham Name	Habitat P=pond S=seeps/ Springs A=alkaline flats W=washes	Traditional Uses	Notes
MAGNOLIDS (Terrestrial flowering plants, often scented from ethereal oils; cotyledons 2, floral parts generally spirally arranged in 3s.)							
Saururaceae	Lizard-tail Family	*Anemopsis californica*	yerba mansa		S	medicine	Growing around certain seeps/springs. Consider planting around new section of concrete channel.
EUDICOTS (Flowering plants, cotyledons 2, floral parts generally in 4s or 5s)							
Asteraceae	Aster Family	*Prenanthella exigua*	brightwhite				
Asteraceae	Aster Family	*Trixis californica var. californica*	California threefold		A,W		
Fabaceae	Pea Family	*Phaseolus filiformis*	slimjim bean	ban bavĭ	P, W		
Gentianaceae	Gentian Family	*Centaurium calycosum*	Arizona centaury		P, W		
Gentianaceae	Gentian Family	*Eustoma exaltatum*	catchfly prairie gentian		P, S		
Loasaceae	Loasa Family	*Mentzelia involucrata*	whitebract blazingstar		P		
Salicaceae	Willow Family	*Populus fremontii*	Fremont cottonwood	'auppa	P	Wood/shelter	Naturalized. Only one female plant remains at the pond.
Salicaceae	Willow Family	*Salix gooddingii*	Goodding's willow		P	Chewing gum	Only a few left at the pond.
Scrophulariaceae	Figwort Family	*Veronica peregrina*	Necklace-weed		P	Foundation material for baskets	
MONOCOTS (Flowering plants, 1 cotyledon, leaf veins generally parallel, floral parts generally in 3s)							
Cyperaceae	Sedge Family	*Cyperus laevigatus*	smooth flatsedge		P, S		
Cyperaceae	Sedge Family	*Cyperus squarrosus*	dwarf sedge, bearded flatsedge		P, S		Reported from 1980 as abundant in moist soil near the pond but it

Plant Family	**Plant Family Common Name**	**Scientific Name**	**Common Name**	**O'odham Name**	**Habitat** P=pond S=seeps/ Springs A=alkaline flats W=washes	**Traditional Uses**	**Notes**
							has not been documented since this time (Felger et al. 1992). No herbarium vouchers from ORPI have been located.
Juncaceae	Rush Family	*Juncus cooperi*	Cooper's rush		P, S		
Najadaceae	Water-nymph Family	*Najas marina*	spiny naiad		P, S		
Poaceae	Grass Family	*Poa annua*	annual bluegrass		P, S		
Ruppiaceae	Ditch-grass family	*Ruppia maritima*	ditch-grass		P		
Zannichelliaceae	Horned pondweed Family	*Zannichellia palustris*	horned pondweed		P		

Plant species recommended here are based on several sources including Felger (2018) and communication with ORPI botanist, Jeanne Taylor (2022).

Zone 2: Wilderness

While the entirety of Quitobaquito resides in a designated wilderness area, some areas receive a greater amount of human use than others. This zone encompasses the vast majority of the Quitobaquito landscape, which receives little visible impact from people and does not need specific treatment requirements due to its natural, cultural, or visitor needs. The majority of the Quitobaquito landscape is a matrix of wilderness with desert scrub vegetation (Figure 5-8).

Treatment recommendations for the wilderness zone include:

- Preserve and protect natural and cultural resources.
- As resources are available, inventory, monitor, and analyze water resources, water quality, plant, and endangered wildlife species and species of concern.
- Discourage the development of social trails, including regular presence of NPS staff to enforce rules/regulations related to visitor use of the site.
- Assess the need for small-scale installations such as picnic table and benches, which may have been installed without compliance with the Wilderness Act.
- Ensure that all new projects, including new installations such as waysides, comply with the Wilderness Act.

Figure 5-8 Wilderness zone with desert scrub vegetation (Nov. 2021). Teresa DeKoker, photographer

Zone 3: Perennial Springs

The springs support unique and, in some cases, sensitive and rare plant and animal species. The springs are the main source of water supply to the pond, so maintaining flow rates is vital for maintaining pond water levels (Figure 5-9).

Treatment recommendations for the springs include:

- Continue flow rate monitoring.
- Continue monitoring of plant and animal species, particularly endangered species, and species of conservation concern.
- Control erosion in the vicinity around springs.
- Direct foot traffic to established formal trails to minimize impacts to plant communities, including regular enforcement of such rules/regulations.
- Manage encroaching vegetation to maximize spring output.

Figure 5-9 North spring (Nov. 2022). Teresa DeKoker, photographer

Zone 4a: Visitor Parking

The parking lot and roads receive the most human impact at Quitobaquito (Figure 5-10). This is the first point of contact that visitors have with this landscape. As such, it is an ideal location for interpretive signage and visitor amenities such as a restroom and picnic table, because it is an area of previous ground disturbance and it is located outside of the Wilderness boundary. Planning and impact studies are already underway for a restroom at the parking lot.

Treatment recommendations the visitor parking area include:

- Create interpretive signage and/or digital guide/smart phone app to orient visitors to the history, culture, and nature of Quitobaquito.
- Post signs to inform visitors of site rules important to conserving the natural and cultural resources of this site.
- Mitigate stormwater runoff from compacted parking areas.
- Consider adding picnic tables and small shade ramada or O'odham *watto* as a visitor amenity near the designated public parking lot.
- Evaluate parking needs and establish more defined parking spaces.
- Install visitor restroom facilities.
- Refrain from expanding the parking area beyond the existing footprint and leave the surface unpaved and permeable.

Figure 5-10 Visitor parking area (April 2023). Teresa DeKoker, photographer

Zone 4B: NPS Staging Area

This zone is a large area that has been heavily impacted by vehicle traffic and construction activities in the location that was once the historic Orozco homestead. It is used as a staging area for NPS projects. It is not well defined and vehicles and heavy equipment have impacted the surrounding vegetation. The area currently houses plants which were salvaged from the pond prior to the spring 2022 pond reconstruction in a series of small above ground pools (Figure 5-11).

Treatment recommendations for the maintenance parking area include:

- Define vehicular parking areas and limit circulation outside of the designed road and parking areas.
- Define the boundaries of the NPS staging area and limit activities to essential uses only, consider shrinking the area of use, and restoring and revegetating areas no longer needed for staging.
- Re-vegetate areas that were impacted by vehicles and maintenance.

Figure 5-11 NPS maintenance parking with temporary plant salvage pools (Nov. 2022).
Teresa DeKoker, photographer

Zone 5a: Entrance, Pond, and Spring Trails

This zone includes established trails from the entrance at the visitor parking lot, the trail around the pond, as well as a trail to the southern spring (Figure 5-12).

Treatment recommendations for the pond and spring trails include:

- Clearly define the trail to the spring so that it has a clear ending point to reduce social trail formation above spring.
- Maintain trail to pond to ensure accessibility.
- Repair trails upon evidence of erosion.

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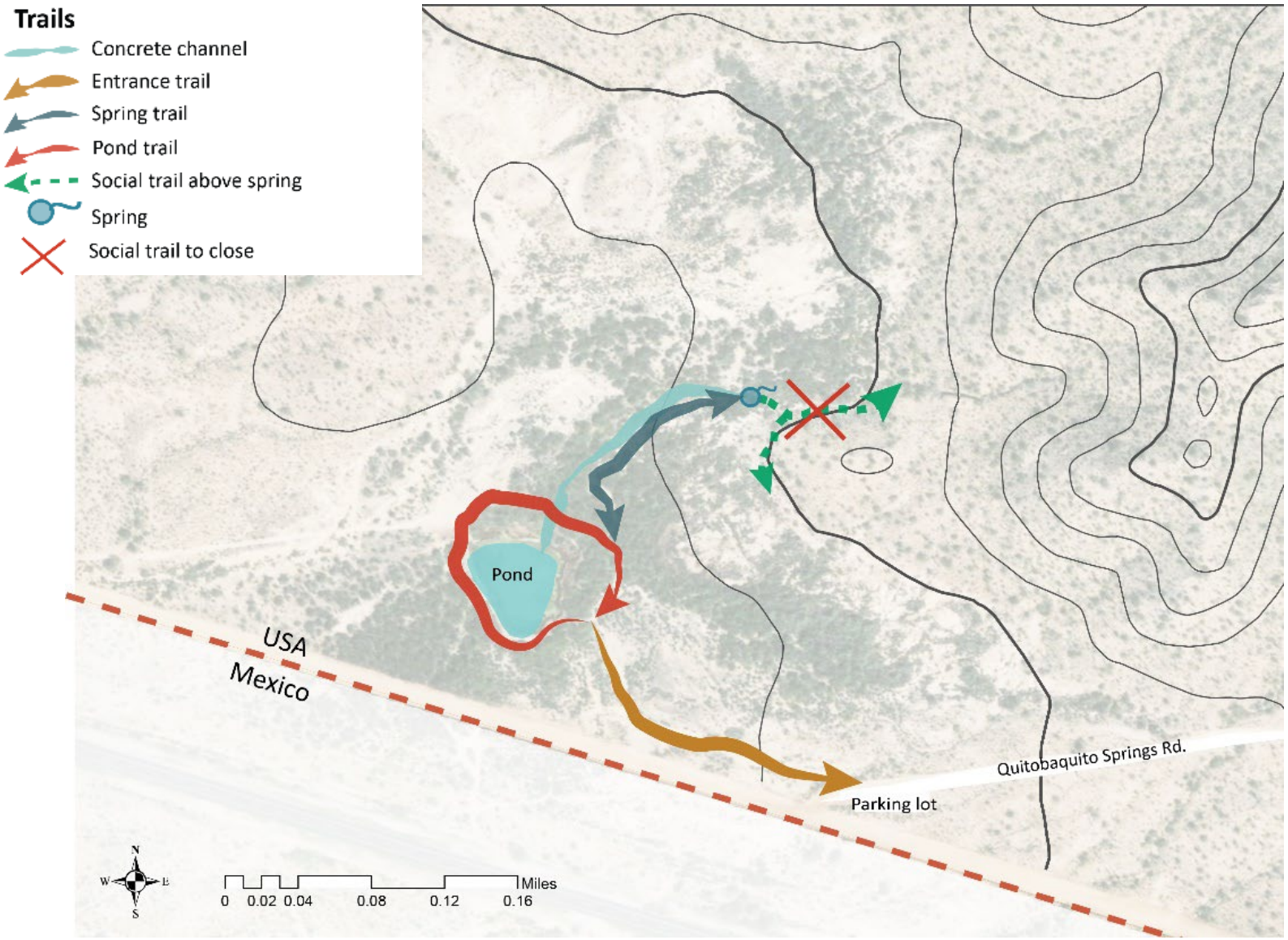

Figure 5-12 Pond and spring trails (Zone 5)
(Solid lines are formal trails, dashed lines are social trails)

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Zone 5b: Social Trails

This zone includes user created social trails. These trails stem from the end of the spring trail where visitors continue past the spring and traverse along the hill (Figure 5-13). This trail crosses over an archeological site.

Treatment recommendations for the social trails include:

- Close social trails above springs to reduce resource damage if feasible.

Figure 5-13 Social trail above south spring (April 2023). Teresa DeKoker, photographer

Zone 6: Historic Agricultural Fields and Orchard

This zone encompasses the historic site of the agricultural field and orchard. Remnant irrigation ditches and stumps of pomegranate trees represent the scant traces of this zone's cultivated past (Figure 5-14). It is now a densely vegetated mesquite bosque. Tribal members have expressed their desire for the replanting of fruit trees in the historic orchard area. This would require adequate pond water levels to ensure enough water for irrigation in addition to continual maintenance of fruit trees. The tribes suggested a work/study program at Quitobaquito with O'odham youth who could maintain the orchard. There is an opportunity to combine these efforts but would require planning as well as the removal of some existing vegetation and the creation of a water diversion system to ensure proper watering of the fruit trees.

Treatment recommendations for the historic agricultural field and orchard include:

- Assess the feasibility of orchard rehabilitation. A feasibility study should consider the required water budget to maintain an orchard, the impact of water removal from the pond on the pond water level, and possible approaches to manage tree health and to harvest the fruit.
- Consult with the Arizona State Historic Preservation Office about the appropriateness of orchard rehabilitation.
- Continue dialogue with tribes regarding orchard.
- Explore ways to interpret this zone to the public.

Figure 5-14 Remnant irrigation channel with stumps of dead pomegranate trees (Nov. 2021). Teresa DeKoker, photographer

Zone 7: Historic Trails

This zone consists of remnants of the historic trails. These are significant features in the landscape that represent an important part of the cultural history of Quitobaquito.

Treatment recommendations for the historic trails include:

- Preserve in place but continue to monitor trail condition and treat, as necessary.
- Interpret the historic trails, including their use for local and regional transportation, trade, and pilgrimage though signage at the parking area and/or a digital app.

Zone 8: Concrete Channel

This concrete lined channel running from the pond to the spring has served an important ecological function to carry water to the pond and to create pockets of habitat for Quitobaquito pupfish and Sonoyta mud turtles. It is a meandering channel with side pools created for turtle and pupfish habitat. Although most of the channel is meandering, there is a long straight section as it enters the pond (Figure 5-15).

Treatment recommendations for the concrete channel include:

- Ensure that there is enough water entering the pond by monitoring flow and clearing vegetation and sediment.
- Revegetate the newly created straight portion of concrete channel to allow it to regain a more natural appearance.
- Continue to maintain channels to support pupfish and turtles as needed.
- Redirect foot traffic and install closure signs/gates to discourage visitors from walking on the concrete channel.

Figure 5-15 Straight portion of concrete channel (Nov. 2022). Teresa DeKoker, photographer

Zone 9a: Road Corridor

This zone consists of Quitobaquito Springs road and a portion of South Puerto Blanco Drive (Figure 5-16).

Treatment recommendations for the road corridor include:

- Continue management of noxious weeds.
- Continue maintenance and repair of roads to ensure access.
- Continue maintenance of encroaching plant material to ensure visibility.
- Ensure that road maintenance does not widen the road.

Zone 9b: NPS Maintenance Road

This zone contains the maintenance road that leads to the NPS equipment staging area (Figure 5-16).

Treatment recommendations for the road corridor include:

- Continue management of noxious weeds.
- Monitor and maintain to prevent erosion.
- Ensure that road maintenance does not widen the road.

Figure 5-16 Maintenance road (Nov. 2021). Teresa DeKoker, photographer

Zone 10: Border Maintenance Road and Ditches

The border maintenance road and corresponding drainage ditches run along the border wall. These are recently added features that were put into place with the construction of the border wall in 2021. The road is utilized and maintained by U.S. Customs and Border Patrol officers but is sometimes used by government contractors and visitors (Figure 5-17). In its current state, the drainage ditch is deeply eroded in places (Figure 5-18) and noxious weeds such as tamarisk are growing in the newly disturbed ground (Figure 5-19).

Treatment recommendations for the border maintenance road and ditches are the responsibility of the Department of Homeland Security. The NPS can recommend to the DHS that it:

- Maintain roads to preserve the natural environment and road infrastructure.
- Make repairs to the infrastructure based on analysis of current erosion issues and hydrologic systems of the area. Make sure repairs address the complexity of the location and resources and do not further impact natural and cultural resources.
- Take an ecological approach to managing stormwater such as a drainage system that works naturally with landscape drainage patterns, especially in the vicinity of Aguajita Wash where the existing drainage culvert is already filling with silt and debris before crossing under the border wall.
- Consider creating alternatives to the drainage ditch, such as installing a bioswale vegetated with native plants, to replace to reduce erosion and allow stormwater to infiltrate and recharge groundwater on site.
- Make repairs at the drainage pipe outflow to reduce erosion.

Figure 5-17 Border infrastructure road (Nov. 2021). Teresa DeKoker, photographer

Figure 5-18 Border infrastructure road and drainage ditch (Nov. 2022). Teresa DeKoker, photographer

Figure 5-19 Tamarisk growing in drainage ditch (Nov. 2022). Teresa DeKoker, photographer

Zone 11: Aguajita Spring

Aguajita Spring is a culturally and ecologically important area of the Quitobaquito landscape. There are archeological sites associated with this spring (Rankin 1995). The spring and lower Aguajita Wash also support plants that are found nowhere else in ORPI, such as the smoketree (*Psorothamnus spinosus*) (Figure 5-20) and desert caper (*Atamisquea emarginata*) (Figures 5-20 and 5-21). In fact, it is the one of the only known locations of desert caper in the United States, along with a small population adjacent to the pond. This rare plant relies on shallow groundwater resources and mesquite trees that are present in this zone. In its current state, water from the spring no longer reaches the ground surface; however, it continues to saturate the ground just below the surface.

The newly constructed border infrastructure road and corresponding drainage ditch and culverts border the spring (Figure 5-22). During the construction of the border wall infrastructure, the construction crew encountered saturated ground while digging near the spring, indicating that the border wall infrastructure such as the road and ditch are encroaching on the spring (Jeanne Taylor, personal communication, March 9, 2022).

Treatment recommendations for Aguajita Spring include:

- Consider creating vegetated bioswale to replace the drainage ditch in places to reduce erosion and allow stormwater to infiltrate and recharge groundwater on site.
- Comprehensively document archeological sites in and around spring and wash
- Carry out restoration activities along unauthorized vehicle route that was created and used during border wall construction just west of wash, with focus on documentation and restoration of impacted archeological resources and restoring natural hydrology.

Figure 5-20 Smoketree at southern end of Aguajita Wash adjacent Aguajita Spring (Nov. 2022). Teresa DeKoker, photographer

Figure 5-21 Desert caper at southern end of Aguajita Wash adjacent to Aguajita Spring (Nov. 2022). Teresa DeKoker, photographer

Figure 5-22 Drainage at southern end of Aguajita Wash adjacent to Aguajita Spring (Nov. 2022). Teresa DeKoker, photographer

Zone 12: Cemetery

This zone contains historic O'odham burial sites. The cemetery is a sacred site and is visited by the O'odham people for ceremonies and prayer. Grave sites are preserved and protected by the NPS. Visitation by the general public is highly discouraged as this zone is extremely sensitive. The NPS does not disclose the location to the public.

Treatment recommendations include:

- Maintain the cemetery's integrity.
    - Protect from visitor impacts.
    - Conduct periodic preservation maintenance.
- Continue to support access to the cemetery by tribes.
- Continue tribal consultation regarding maintenance of the cemetery.

SUMMARY

The Quitobaquito cultural landscape is a diverse collection of landscape characteristics and features which contribute to its significance and values. The challenge for NPS is to balance its approach to the preservation of landscape values for natural, cultural, and recreation values. Preservation and management of the landscape will need to remain flexible to respond to changing climactic conditions, threats to the landscape from external factors and resources. Coordination of all activities at Quitobaquito is essential so that preservation of one resource

does not negatively impact another. Prior management guidance documents should be updated to reflect changing conditions and NPS activities. With continuous monitoring and treatment of Quitobaquito as a cultural landscape, Quitobaquito will continue to provide important habitat for wildlife and plants, opportunities for recreation and a connection to past and present traditional cultural activities of the O'odham.

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