Defining Site Boundaries: A Case Study at University Indian Ruin, AZ BB:9:33(ASM)

by

Sharlot Hart
2015

A Thesis Submitted to the Faculty of the

SCHOOL OF ANTHROPOLOGY

In Partial Fulfillment of the Requirements

For the Degree of

MASTER OF ARTS

In the Graduate College

THE UNIVERSITY OF ARIZONA

2015

STATEMENT BY AUTHOR

This thesis has been submitted in partial fulfillment of requirements for an advanced degree at the University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this thesis are allowable without special permission, provided that an accurate acknowledgement of the source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the copyright holder.

SIGNED: Sharlot M. D. Hart

APPROVAL BY THESIS DIRECTOR

This thesis has been approved on the date shown below:

_____ 12/1/2015

T. J. Ferguson Date
Professor of Anthropology

ACKNOWLEDGEMENTS

Many, many people helped bring this project to fruition. The staff at the Pima County Office of Sustainability and Conservation, and especially my internship coordinator, Roger Anyon, gave me essential guidance. The staff at Desert Archaeology, Inc., were invaluable partners. My fellowship with the Paul D. Coverdell Peace Corps Fellows facilitated funding, as well as provided an opportunity for fun outreach during field work. Much gratitude goes out to my thesis committee: T. J. Ferguson, Mark Elson, and Suzanne Fish.

My thanks also go out to the individuals who helped physically in the field as well as to those who provided support in myriad other ways. These people include, but are certainly not limited to:

William Soland, Paul Fish, Ian Milliken, Courtney Rose, James Heidke, Tyler Theriot, Arthur Vokes, Lauren Kingston, Brian Silverstein, Amy Schott, Ariel Hart, Ben Bellorado, Brian Harmon, Cannon Daughtrey, Erika Heacock, Evan Giomi, François Lanoë, Kathryn Turney, Kayla Worthey, Lauren Startzman, Leslie Aragon, Lewis Borck, Mario Battaglia, Muriel Hart, Richard Higgins, Samantha Fladd, Stephanie Hart, Veronica Furlong, Aurora Sartori, Beth Frailey, Brian Sabri, Georgia Ehlers, Kate Lankford, Katie McCracken, Nicole Mathwich, Stacy Ryan, Dorothy Soland, Jo Anne Jenkins, Susan Benaron, Donald Jay Stanforth and George Itule.

Contents

List of Figures

ABSTRACT

University Indian Ruin (UIR), which sits in the eastern Tucson Basin, is a prime example of a Classic Period Hohokam platform mound archaeological site. The University of Arizona owns 13 acres of this site, and it is listed on the National Register of Historic Places using this acreage as its site boundary. However, multiple investigations have shown that the site is not fully contained within that boundary. This work seeks to answers to two questions about the UIR site. The first is to further investigate to duration of occupation at UIR, beyond the Classic Period. The second is to systematically investigate the extent of UIR into the surrounding residential community. Results include a new, proposed boundary for management by Pima County and the State of Arizona. How archaeologists define a site boundary is also investigated.

CHAPTER 1. INTRODUCTION AND BACKGROUND

University Indian Ruin (UIR), AZ BB:9:33(ASM), is one of the most significant Classic Period (A.D. 1150 to 1450) Hohokam sites in the Tucson Basin. The portion owned by the University of Arizona (UA) is listed on the National Register of Historic Places as the University Indian Ruin Archaeological Research District. UIR is one of only a few known platform mound sites situated away from the Santa Cruz River; Marana Mound in the northern Tucson Basin is the next closest such platform mound community. My research suggests that UIR is also the largest Classic period site in the eastern Tucson Basin. The main 5.26 ha (13 acres) of the site is owned by the UA, however, archaeological research in the 1930s by Dr. Byron Cummings and Dr. Emil Haury indicated that the site boundary of UIR extends beyond this 5.26 ha parcel; the actual limits of the site have never been systematically investigated (Fish and Fish 2009; Milliken et al. 2012).

Research into site boundary identification was proposed in the 2010 University of Arizona UIR Field School Research Design, under "Evaluation of Former Site Extent" (Fish and Fish 2009). That research design outlined methods of public outreach to the residents of the neighborhood surrounding the thirteen acres of UIR owned by the University of Arizona (UA). To implement that research Paul and Suzanne Fish along with others, including Kingston (2013), worked with local residents who volunteered to share information about artifacts they had collected on their property. Kingston's thesis documented data and provenience information about these private collections.

The research presented in this thesis expands the UA UIR Field School methodology by employing systematic survey and site boundary test excavations outside that portion of the UIR site owned by the University of Arizona. Thus, throughout this thesis the portion of UIR owned

by the UA will be referred to by its National Register designation, the UIR Archaeological Research District, while the greater extent of the UIR site will be referred to simply as UIR. The concept of "site" is also investigated. For the majority of this thesis the Oxford English Dictionary's first and second definitions of "site" will be followed. Those are a "place or portion occupied by some specific thing" and "the situation or position of a place, town, building, etc., esp. with reference to the surrounding district or locality" (Oxford University Press 2015). These two definitions are not mutually exclusive, and both require further context for full definition of the term site. Thus, I use site to mean a management boundary and also to mean a locality of use.

My work was performed in collaboration with the Pima County Office of Sustainability and Conservation, and was thus focused on Pima County lands within rights-of-way (ROWs) in the vicinity of the UIR Archaeological Research District. In addition, some research was conducted on private land parcels within the Indian Ridge Estates, a historic property listed on the National Register as the Indian Ridge Historic District. My research provides systematic data that enables a more precise definition of the maximum spatial extent of UIR. Systematic site boundary identification provides the basis for a revised site boundary for UIR, and furthers our understanding of the occupational duration of the site. This information is useful in the management and interpretation of this important historic property.

Project Location and Environment

The project area is located in the eastern Tucson Basin, near the junction of present-day Tanque Verde and Sabino Canyon roads (Figure 1.1). The UIR Archaeological Research District is bordered on the west by the Tucson Country Club and Country Club Estates, and on the north, east, and south by Indian Ridge Estates. These neighborhoods were built between 1955 and 1964. The UIR Archaeological Research District, the surrounding residential neighborhoods, and

Figure 1.1 Location of University Indian Ruin Archaeological Research District property within the Indian Ridge Historic District.

the Tucson Country Club sit between Tanque Verde Wash to the north and Pantano Wash to the south and west, just east of the confluence that forms the Rillito River.

The project area is situated in the Sonoran Desert, within the lower bajada of the Basin and Range province. Its legal provenience is T13S, R15E, Section 31, Arizona, Gila and Salt River Baseline. This area was historically farm and ranch land. In 1934 the University of Arizona (UA) acquired 2.56 ha (6.3 acres) as a donation from Mrs. Dorothy Knipe, with the provision that UIR would be used for archaeological research and training of students (Cummings 1934; Thompson 2015). Subsequent purchases increased the size of the university-owned property to the current 5.26 ha.

In 1955, the Lusk Corporation commenced development of the Indian Ridge Terrace residential subdivision to the east and south of the UA property. The neighborhood surrounding the UIR Archaeological Research District was added to the National Register of Historic Places as the Indian Ridge Historic District in 2010, as an example of a mid-twentieth century modern planned community (Indian Ridge Historic District 2014). Two years later the 5.26 ha owned by the University of Arizona was added to the National Register of Historic Places as the University Indian Ruin Archeological Research District (Milliken et al. 2012).

Sediments in the area consist primarily of alluvially deposited sands, silts, and gravels emanating from downslope movement off of the north-trending bajada and from overbank flow from Tanque Verde and Pantano washes. Tanque Verde Wash drains the higher elevations of the Santa Catalina and Rincon Mountains, while Pantano Wash (via Rincon Creek) drains the Rincon Mountains. The two washes join to form the larger Rillito River approximately 3 km west of UIR. Although both Tanque Verde and Pantano washes today only flow seasonally, and primarily in the winter, archaeological investigations and historic documents indicate that they

were perennial streams until about the turn of the twentieth century (Ciolek-Torrello and Homburg 1990:83).

Previous Research

Early excavations by Cummings and Haury, more recent cultural resource management investigations, and anecdotal evidence from Indian Ridge residents indicate that the full extent of UIR is not contained within the UIR Archaeological Research District. Figure 1.2 shows the location of 1930s excavations in what is today a residential area to the east of the university-owned property. In an excavation conducted for a gas line project, Jones (2006) documented four Rincon Red-on-brown sherds, a palette, and two pit houses approximately 30 m outside of the northwestern boundary of the UIR Archaeological Research District. These archaeological remains were tentatively dated to the Sedentary or Classic Periods. The UIR Archaeological Research District is usually associated with the Classic Period (A.D. 1150 to 1450), and so Jones' research could indicate that the site contains an earlier component.

To investigate the question about site extent posed in the University of Arizona UIR Field School research design, Kingston (2013) explored information received from neighborhood residents with a grant-funded public outreach program in 2012 and 2013. Kingston's data were limited as they were based on information volunteered by a sample of landowners. While she describes a general boundary of "about square kilometer, centered on the" District, in the absence of systematic investigations her results are inconclusive (Kingston 2013:43). In their research design, Fish and Fish (2009:10) noted that "[t]he 2009 and 2010 outreach to neighborhood residents must be considered only an initial effort to document the extent of" UIR. Kingston (2013:44) concluded that, "public outreach activities produced evidence of a settlement larger than 13 acres and with a component pre-dating the Classic period core."

Figure 1.2. Locations of previously excavated architectural features at UIR. From Fish and Fish (2009:Figure 1).

Specifically, Kingston documented the presence of Rincon Red-on-brown pottery (A.D. 950 to 1150) on the private property of Mike Flores located just north of the UIR Archaeological Research District (Kingston 2013:39). Kingston created a map (Figure 1.3) noting all the residential parcels within the Indian Ridge neighborhood where archaeological artifacts were documented. Public outreach and this documentation of residential parcels started in 2009, before Kingston's project, and continued through her research. Documentation was conducted by herself, Paul Fish, Suzanne Fish, Barbara Mills, Mark Elson, Todd Pitezel, and T. J. Ferguson.

The Pre-Classic and Classic Hohokam Periods

There is evidence for human occupation of the Tucson Basin as long as 13,000 years ago (Milliken et al. 2012). To date the features excavated at the UIR Archaeological Research District date to the Classic period of the Hohokam occupation, A.D. 1150 to 1450 (Fish and Fish 2007; Hayden 1957, Milliken et al. 2012). However, recent investigations have revealed minimal quantities of Pre-Classic sherds from survey (n = 10) and excavation (n = 7) contexts. These 17 sherds were found in two adjacent units, in the northeastern quadrant of the UIR Archaeological Research District. As noted, investigations outside of the District also indicate that UIR includes a Pre-Classic period component, with a Sedentary period occupation now recorded in several areas north of the site (Jones 2006; Kingston 2013).

Pre-Classic Period

The Pre-Classic period is divided into the Pioneer (A.D. 500 to 750), Colonial (A.D. 750 to 950) and the Sedentary (A.D. 950 to 1150) periods. As Howell and Copperstone (2014:14) observe: "Ball courts and cremation burials, with a distinctive assemblage of mortuary offerings" mark the Colonial period, as well as "an expansion of settlement throughout the Tucson area, largely because the Santa Cruz River was recovering from a period of entrenchment that in turn

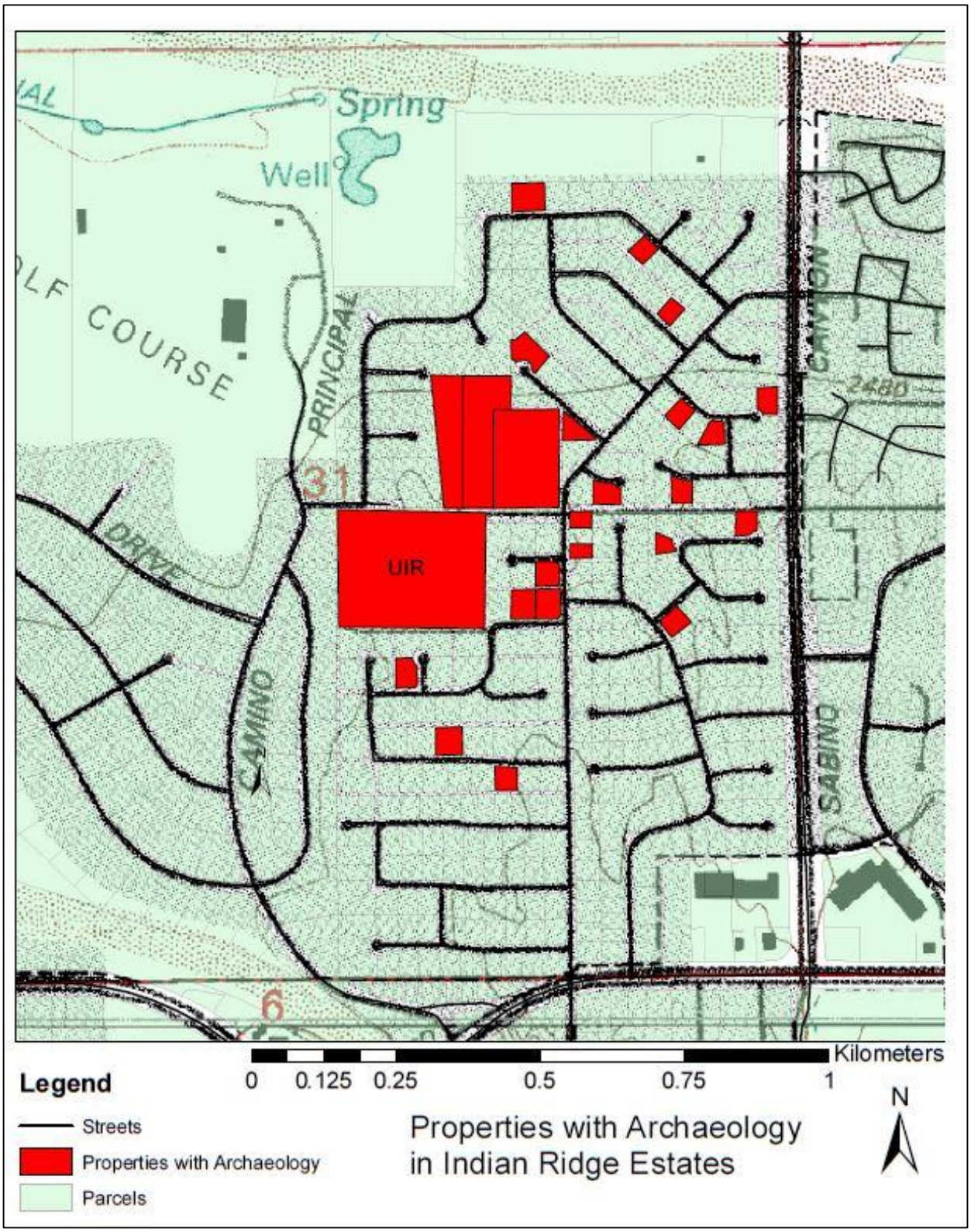

Figure 1.3. Public Outreach Results. Red denotes parcels within Indian Ridge Historic District with documented archaeological materials. From: Kingston (2013:Figure 2.1).

allowed for increased floodwater farming." Pre-Classic settlements consisted of villages arranged into a series of pit house courtyard groups. These groups consisted of anywhere from two to six pit structures clustered around a central, open courtyard. Courtyard groups are believed to represent the domain of a nuclear or extended family; the pit structures were used for both habitation and storage, with communal activities occurring in the courtyard (Wilcox et al. 1981). Diagnostic ceramics include Cañada del Oro and Rillito Red-on-brown and many show decorations with zoomorphic and anthropomorphic elements. Corn was the primary subsistence crop, much of it grown through irrigation agriculture.

The Sedentary period (A.D. 950 to 1150) with its Early, Middle and Late Rincon phases, represents a time of expansion. Villages grew larger, and settlements included farmsteads and field houses that were located along secondary drainages. This pattern indicates a functional differentiation of site types (Doelle and Wallace 1986, 1991). Howell and Copperstone (2014:14) note that,

> Ceramics took on increasingly geometric, abstract designs (that may nevertheless have also been representational), and vessel forms began displaying the distinctive Gila shoulder, which was formed by the sides of a vessel sloping downward sharply from the neck to create a low shoulder near the base. The unique Hohokam cremation complex continued, but inhumation began to be practiced again after virtually disappearing during the Colonial period. Copper bells, imported from western Mexico, appeared for the first time during the Sedentary. Etched shell also appeared at this time.

During the Late Rincon phase (A.D. 1100 to 1150), the Santa Cruz River became entrenched and non-floodwater farming intensified; irrigation also expanded in the Phoenix Basin. Early platform mounds started to appear in the Phoenix Basin, and widespread trade was evident (Fish and Fish 2007).

Classic Period

The Classic period is divided into the Tanque Verde phase (A.D. 1150 to 1300) and the Tucson phase (A.D. 1300 to 1450). Characteristics of the Tanque Verde phase include Tanque Verde Red-on-brown pottery and the initial transition from semi-subterranean pit structures to above-ground adobe dwellings. Some of these adobe dwellings were also built in residential compounds behind 2 m high adobe walls. Public architecture shifted from the ball court to platform mounds (Fish and Fish 2007), and inhumation burial became common, although cremation burial was still the standard mortuary practice.

The Tucson phase (A.D. 1300 to 1450) is marked by population aggregation, with fewer but larger villages, and an expansion of adobe architecture and platform mounds (Fish and Fish 2007). Locally-made Salado polychrome ceramics, perhaps indicative of an ideological or religious change, are incorporated into the ceramic assemblage (Crown 1991). Migrant groups from the northern pueblo area and from the San Pedro River Valley to the east are also believed to have joined the local population, particularly in the northeastern Tucson Basin. Inhumation and cremation burial continued from the Tanque Verde phase, with inhumation becoming the preferred practice. Howell and Copperstone (2014:15) observe, "Freestanding structures declined, and architecture became oriented toward contiguous room blocks with more substantial walls. Cemeteries, which had previously been related to discrete house clusters, now became

held in common with multiple clusters (Crown 1991:151). Great houses, notably at Casa Grande and Pueblo Grande, appeared at this time."

CHAPTER 2. RESEARCH THEMES AND METHODS

Systematic site boundary Identification Testing (Bilsbarrow 2003) provides an established technique for revising the boundary of UIR and increasing our understanding of the occupational duration of UIR. The Pima County rights-of-way that were investigated for this thesis are situated within the Indian Ridge Estates, where residential development has impacted the ground surface for decades. Systematic site boundary identification will aid Pima County in management decisions regarding cultural resources within County rights-of-way, and encourage greater community support and care for UIR, especially that portion of the site that lies outside the UIR Archaeological Research District. Figure 2.1 shows my inferred boundary of the UIR site (in red) based on Kingston's (2013) community outreach findings. To obtain this boundary I drew a polygon in ArcGIS around the residential parcels that Kingston reported as containing archaeological evidence (see Figure 1.3).

Project Specific Research Issues

What is the Overall Spatial Extent of the UIR site?

Currently, the boundary of UIR is defined in AZSITE using the UA property boundaries on the north, west, and south sides. To the east, the site boundary extends 30 m beyond the UA property boundaries to encompass the areas excavated by Haury in the 1930s (see Figure 1.2). As discussed, the actual archaeological extent of the site was not known prior to my research. Accurately determining the extent of the site has been a persistent goal of researchers at UIR (Kingston 2013; Milliken et al. 2012:3).

Introductory texts and primers for archaeology tend to define a site as a geographical place that contains evidence of human activity. For instance, Renfrew and Bahn (2015:342) define a site as "A distinct spatial clustering of artifacts, features, structures, and organic and

Figure 2.1. Map of Indian Ridge Estates with survey boundary line, my inferred site boundary and University Indian Ruin Archaeological Research District marked.

environmental remains – the residue of human activity." Similarly, Sutton and Yohe (2006:405) define a site as "a geographic locality where there is some evidence of past human activity, such as artifacts or features." There are two operational problems with definitions like these. First, where is the boundary of this human activity, or, put another way, where does the artifact density drop enough to draw a boundary? Second, how do we identify site features that are associated with little to no material culture, but which were essential components of daily life, such as village plazas or contiguous resource collection areas?

State officials often provide a definition of a site for those working in archaeology, and that guidance differs considerably between states. The *Revised Site Definition Policy of Arizona* promulgated by the Arizona State Museum defines a site as being 50 years old and encompassing either: (1) 30 artifacts of one class occurring within an area with a diameter of 15 m; (2) 20 artifacts of at least two classes in that same area; (3) one feature with artifacts; or (4) two features with no artifacts (Fish 1995:1–2). This provides Arizona archaeologists with guidance on thresholds for physical evidence of human activity. However, this definition provides only a discretionary answer to the first operational problem, and fails to answer the second question posed above. The research issue of addressing the overall spatial extent of UIR entails answering a more basic question: what are archaeologists doing when they define site boundaries?

Duration of Occupation

The duration of occupation at UIR needs further research. Jones (2006) found two pit houses pre-dating the Classic period on the periphery of the UIR Archaeological Research District, as well as four Rincon Red-on-brown sherds and a palette. Kingston (2013) documented a significant number of Pre-Classic ceramics on private property directly north of the UIR

Archaeological Research District, and recent analysis of sherds from the UIR Field School reveal some Pre-Classic sherds on the northeast of the UIR Archaeological Research District. These finds indicate there was a Pre-Classic (A.D. 500 to 1150) occupation at UIR. Questions about the chronology of occupation at UIR can be answered by analyzing diagnostic pottery sherds.

Hayden (1957) asserts that the rooms that he and Cummings excavated date to the Classic period (A.D. 1150 to 1450). However, Wetherill, who worked with Cummings in the 1930s, reportedly uncovered a Majolica bowl (Hayden 1957; Milliken et al. 2012). Unfortunately, this artifact is not present in the ASM collections so it is not possible to verify its typological classification. Majolica ceramics date to the early seventeenth century A.D. and later, and were produced in Spain and Mexico (Milliken et al. 2012). Kingston (2013) also documented a proto-historic (post-A.D. 1500 or 1600) Sobaipuri point from a neighbor, and indicates that similar lithics have been found during field school investigations in the UIR Archaeological Research District. This raises multiple possibilities including occupation of UIR extending both before and after the Classic period. Whether this occupation is continuous or exposes multiple reuse events is unclear.

Principal Methods of Investigation

This project entailed archival research, archaeological survey, and test pit excavation. A Class I literature search and non-collection Class III survey of Pima County lands necessarily precedes and informs the sampling strategy for excavating test pits. Test pits provided a control for surface survey, as well as my inferred boundary which was in turn based on Kingston's (2013) research. Testing took place within Pima County rights-of-way, in the heavily disturbed context of a twentieth-century residential community constructed on top of nineteenth-century agricultural land. The Arizona State Historic Preservation Office identifies shovel test pits as

Identification Testing and states that "[i]n Arizona, Identification Testing is most often used to identify site boundaries in areas obscured or disturbed by modern activities such as agricultural tilling and asphalt-paving" (Bilsbarrow 2003:2). These methods provide the information needed to determine the maximum extent of UIR.

To comply with Arizona standards for survey projects, and to document previous archaeological research within 1.6 km (1 mile) of UIR, I performed a Class I records search using the Pima County and AZSITE cultural resource inventory databases (accessed July 19, 2014). This search radius satisfies Arizona state standards. Furthermore, investigations at the Marana Mound site indicate that the maximum diameter of a major platform mound site is 1.6 km. Thus, a 1.6 km radius should provide information on all known material culture that could conceivably be part of the UIR platform mound site. The search radius was centered in the middle of the UIR site polygon given in the AZSITE System. The results of this search are presented in Table 2.1 and Table 2.2. Historical photographs, including aerial photographs were also examined, as were historic maps of the area. These documents helped inform where I placed test pits.

As indicated above, this records search informs on the extent of UIR. The Country Club Estates II survey (Levstik 2005) that led to Jones' (2006) findings north of UIR, found no archaeological evidence to the west of the current boundary. Of special interest on the eastern edge of Sabino Canyon Road, is the Tack Room Site, AZ BB:9:303(ASM). Jones' (1996) placement of this Pre-classic site's boundary along Sabino Canyon Road creates a polygon that could be described as a semi-circle. This type of polygon could indicate that the road encounters the site, and that the Tack Room Site continues or continued across the road to the west. This, in turn, could indicate a potential overlap in site boundary between the Tack Room Site and UIR.

Table 2.1. Archaeological Sites within 1.6 km of University Indian Ruin.

Site Number (ASM)	Site Name	Temporal Placement	Recorder	Date
AZ BB:9:43	N/A	AD 200–1500	Johnson	1964
AZ BB:9:58	Vista del Rio Site	AD 200–1300	Urban	1982
AZ BB:9:90	N/A	AD 200–1300	Cummings & Rottman	1979
AZ BB:9:101	N/A	AD 200–1300	Huckell	1981
AZ BB:9:141	Mesquite Creek Site	AD 200–1300	Dart	1984
AZ BB:9:303	The Tack Room Site	AD 950–1100 and AD 1950–present	Jones	1996
AZ BB:9:304	Otis's site	AD 950–1100	Jones	1996
AZ BB:9:305	The G. R. McGregor site	AD 200–1500	Jones	1996
AZ BB:9:316	N/A	Unknown	Lenhart	1997
AZ BB:9:317	N/A	AD 1000–1300	Lenhart	1997
AZ BB:9:318	N/A	12,000 BC – AD 1500	Lenhart	1997
AZ BB:9:356	The University Ditch Site	AD 1700–1950	Kurota	2000
AZ BB:13:128	N/A	AD 200–1500 and AD 1500–1950	Urban; Rubble	1980; 2003
AZ BB:13:144	Tucson Magnetic Observatory	AD 1900–1950	Huckell	1981
AZ BB:13:393	N/A	12,000 BC – AD 1500	Seymour	N/A
AZ BB:13:715	Udall Dump	AD 1900–1950	Ruble	2003

Table 2.2. Archaeological Surveys Conducted within 1.6 km of University Indian Ruin.

ASM Project No.	Project Name	Recording Institution
1979-31	Pima County Bridge Survey	Arizona State Museum CRMD
1979-51	TEP 138 kV Survey, NE Substation to E Loop Substation Through Snyder Substation	Arizona State Museum CRMD
1980-162	Survey Near Magnetic Observatory	Arizona State Museum
1980-227	ROW Along Grant/Kolb Road	Arizona State Museum
1980-228	Reconstruction/Widening of Grant Road, Sahuara to Wilmot Road	
1980-8	USC and GS Magnetic Observatory/Tanque Verde Estates Subdivision	Arizona State Museum
1981-103	Desert Anchor Townhomes	Arizona State Museum
1982-148	Sahuaro Village, Grant and Sahuaro	Arizona State Museum
1984-70	Cella Barr Associates Between Cloud Road and Tanque Verde Creek, Tucson	Institute for American Research
1986-168	Archaeological Clearance Survey for a Reclaimed Water Pipeline in North-Central Tucson	Arizona State Museum CRMD
1987-211	Pantano Wash: Speedway to Tanque Verde	Institute for American Research
1989-142	Archaeological Survey of 4 Acres for a Proposed Thomas-Davis Medical Center in Pima County	Cultural and Environmental Services

ASM Project No.	Project Name	Recording Institution
1989-164	Sabino Canyon Road and River Road, W. O. 4MSCRD	Institute for American Research
1989-84	Tanque Verde Linear Park Cultural Resources Survey	Statistical Research, Inc.
1991-85	Archaeological Survey of Lot at Southeast Corner of Dos Hombres Road and Camino Perdido	Desert Archaeology, Inc.
1992-215	Pantano Cloud 'C' Zone Survey	Desert Archaeology, Inc.
1992-42	Sabino Canyon Road Survey	Cultural and Environmental Systems
1993-246	TANQUE VERDE: PIMA TO CAMINO PRINCIPAL	Desert Archaeology, Inc.
1995-326	Udall Park Survey	Desert Archaeology, Inc.
1996-406	Hope-Jones Commercial Archaeological Survey	Professional Archaeological Services of Tucson
1996-69	Colonia Verde Plaza Survey	Aztlan Archaeology, Inc.
1996-86	Vactor Ranch	Old Pueblo Archaeology Center
1997-101	Rancho Espero	Professional Archaeological Services of Tucson
1997-25	Archaeological Survey of Udall Park Entrance at Sabino Canyon	Desert Archaeology, Inc.
1997-29	Well Connections and Meadows Reclaimed Mains Project	Desert Archaeology, Inc.
1997-323	Northeast Main Survey	Desert Archaeology, Inc.
1998-386	Udall Transit Center Survey	Desert Archaeology, Inc.
2001-502	Tanque Verde Wash Survey	Aztlan Archaeology, Inc.
2001-646	Speedway/Pantano Wash	Professional Archaeological Services of Tucson
2002-277	River Road and Millard Drive Cell Tower Survey	SWCA Environmental Consultants
2002-366	Vincent Mullins Landfill Survey	Desert Archaeology, Inc.
2003-191	Udall Park Survey	Desert Archaeology, Inc.
2004-655	Country Club Estates	Tierra Right of Way Services, Ltd.
2005-1095	Tanque Verde- Paseo Rancho Esperanza Survey	Desert Archaeology, Inc.
2005-141	Country Club Estates II	Tierra Right of Way Services, Ltd.
2006-397	Southeast Quadrant Main Addendum Survey	Desert Archaeology, Inc.
2006-761	A Class III Cultural Resources Survey of 15 Acres at Cloud and Sabino Canyon Roads	WestLand
2007-45	City of Tucson 06 58	SWCA Environmental Consultants
2008-368	Sabino Canyon Survey	Tierra Right of Way Services, Ltd.
2008-607	An archaeological survey for RTA Sidewalk Package 2	SWCA Environmental Consultants
2009-69	Store 1493 Survey	Tierra Right of Way Services, Ltd.
2010-520	Pantano Wash Stabilization Class III Survey	WestLand
2011-407	Pantano Wash Permanent Bank Stabilization Phase II Cultural Resources Inventory	William Self, Associates
2013-367	N/A	N/A
BLM-16-12	Highway R/W A-9738	BLM – Phoenix Field Office

Class III Survey

A Class III pedestrian survey was conducted under Arizona Antiquities Act Permit No. 2014-003bl, held by the Pima County Office of Sustainability and Conservation. This survey complied with the standards for conducted surveys promulgated by the Arizona State Historic Preservation Office, the Arizona State Museum, and the Arizona State Land Department (2009). These agencies list an intensive, 100 percent survey as the standard for a Class III survey. The SHPO standards stipulate that pedestrian surveys "on unobstructed open land" should be conducted in transects of no more than 20 m spacing (Arizona State Historic Preservation Office et al. 2009:7). In paved sections of the Pima County rights-of-way, I surveyed transects in unpaved areas along both sides of the road. In unpaved sections of the rights-of-way, the entire road, including the sides and the road center, was surveyed. However, in a few areas overgrown vegetation precluded passage through the right-of-way (about 200 meters total) and so 99 percent coverage of the rights-of-way was achieved. Whenever possible, undisturbed areas (including undisturbed areas just outside of the right-of-way), arroyo cuts, and rodent burrows, were examined for historic and precolumbian cultural remains. During the pedestrian survey, no artifacts were collected. Artifact scatters and isolated occurrences were mapped, and diagnostic artifacts were described and photographed in the field. This field work took place between September 30 and October 11, 2014.

Identification Testing

Identification Testing was conducted as part of an Addendum Discovery Plan to the University of Arizona Archaeological Field School Arizona Antiquities Act Permit No. 2009-136ps. This permit is held by Paul and Suzanne Fish to conduct the UIR Field School. The literature search and pedestrian survey informed where hand-dug test units were located in areas

with and without surface artifacts. Testing did not occur in open roadways, and caution tape was used to indicate safety issues for neighborhood residents. No test pits were left open overnight, reducing associated hazards. A Pima County Department of Transportation Right-of-Way Use Permit was obtained and Arizona Blue Stake (now Arizona 811) was contacted prior to testing.

Thirteen 1 m by 1 m test pits were dug in the Pima County rights-of-way surrounding the UIR Archaeological Research District. Test pits were excavated in arbitrary 10 cm levels. Each test pit was excavated to sterile soil. All fill was screened through ¼-inch mesh screens. All cultural materials were collected for subsequent analysis and curation at the Arizona State Museum.

All artifacts, cultural features and indicators of stratification were recorded daily. Recording took place using UA UIR Field School forms. Test pits and archaeological features were photographed, and plan and profile views were hand mapped when soil strata or cultural features were present. This field work took place between October 24 and November 30, 2014.

Mapping

Maps of the surface artifact scatters and shovel test pits were produced in ArcGIS to consolidate all features and document the extent of the UIR site (see Chapter 5). The datum used is NAD 1983 HARN Arizona State Plane. The spatial data collected was tied into the main UIR site datum, located on top of the platform mound excavated by Hayden (1957). Test pits were recorded and mapped using both optical and GPS technology, courtesy of Mark Elson and Tyler Theriot of Desert Archaeology, Inc. Desert Archaeology's precision mapping equipment includes a Topcon GTS-300 Series 5-second total station and two Sokkia sub-centimeter real-time kinematic L1/L2 GPS systems. With this survey-grade GPS, the project thus collected autonomous, static, and real-time kinematic data for rigorous post-processing of the geodetics.

The survey-precision system used Microsurvey Fieldgenius data collection software combined with a customized data collection application designed by Desert Archaeology, Inc. specifically for archaeological mapping. Collection of standardized spatial and attribute data in the field was then integrated into ESRI's ArcMap, desktop cartographic software, to produce accurate geographical maps showing the maximum site extent and the presence or absence of subsurface material culture.

Identification and Analysis

I analyzed the artifacts recovered during the test excavations at the School of Anthropology's Southwest Laboratory and Arizona State Museum's Borderlands Laboratory in consultation with experts from the University of Arizona, including Nicole Mathwich, Leslie Aragon, Stacy Ryan, Erika Heacock, Arthur Vokes, Suzanne Fish, Paul Fish, and Mark Elson. James Heidke from Desert Archaeology, Inc., also aided in identification of some sherds. Chapter 4 presents the results of this analysis. No human burials were encountered during this project.

CHAPTER 3. THEORETICAL APPROACHES TO THE SITE CONCEPT

The manner in which archaeologists define a site boundary is related to their personal inclinations and theoretical perspectives. When it comes to defining site boundaries, colloquial interactions among archaeologists define some colleagues as "lumpers" and others as "splitters." State guidance on defining site boundaries varies greatly, and how each lumper or splitter sees the blank spaces between the artifact scatters and architectural features in their study area plays a large role in how sites get delineated. Surprisingly, theoretical approaches to defining site boundaries have not been widely discussed.

The archaeological literature does not include much explicit use of theoretical concepts of deconstruction, as introduced by Derrida, which involves the analysis of text and its meaning. According to Culler (1981:131) "deconstruction is not a theory that defines meaning in order to tell you how to find it" but is instead "a critical undoing of the hierarchical oppositions on which theories depend" and "demonstrates the difficulties of any theory that would define meaning in a univocal way: as what an author intends, what conventions determine, what a reader experiences." Following deconstruction, any founding concept-word, like archaeological "site," ought to be inverted in multiple ways at multiple times, before site boundaries are even discussed.

While not explicitly referencing deconstruction, there have been a few attempts in the archaeological literature to analyze the site concept, notably by Dunnell (1992) and Ebert (1992). These archaeologists called for "siteless" survey and distributional archaeology. These non-site survey approaches provided testing grounds for varied methodologies. They constituted reflexive thought on a basic unit of archaeological observation, interrogating how a site is defined. I use the basic tenets of deconstruction to explore the central questions for defining a site boundary at

University Indian Ruin: What is a site? Is it an artifact scatter? Is a site a single home? Is a site an entire settlement?

Previous Approaches to the Site Concept in Tucson

Previous approaches to site definition in the Tucson Basin do not necessarily assess the physical boundary of an archaeological site. However, concepts of associated social units and the idea of blurred edges of sites within a larger community of practice are better understood through the work of Rice (1987b) and Fish and Fish (2000).

The Marana Community, a 5,180 ha area located in the northern Tucson Basin, is a composite of many Hohokam Classic period sites, including a platform mound site. This well-studied community is useful for comparison with UIR because it contains a platform mound site that was also built away from the Santa Cruz River in the greater Tucson Basin. Rice (1987b:250), following Sahlins, attempted to classify the composite of Marana Community sites as representing a chiefdom: "a ranked association of kin groups with an institutionalized basis for ascribing political leadership." He believed that although his project did not encompass the Marana Mound Site (AZ AA:12:251 [ASM]), evidence from residences at other sites showed that they were outlying architecture associated with a greater community and "that the economy and society was organized in a manner consistent with the operation of such an elite" (Rice 1987b:253). The jump to chiefdom status was not as easy for Fish and Fish (2000:267), as they cited a "paucity of evidence clearly differentiating platform mound officiants or other prominent community leaders." In presenting data on the Marana Mound Site, Fish and Fish (2000:269) specified that "[m]ultiple lines of evidence distinguish the mound site and its residents as a whole from the occupants of other community settlements. Internal differentiation within the mound site, on the other hand, is much less evident."

The central question for University Indian Ruin still exists: where does the site end? No systematic work has ever been undertaken to specifically look at extent of UIR, for either management boundary purposes or interpretation of a contiguous use area. While the 5.3 ha administrative boundary of the UIR Archaeological Research District contains more than one architectural locus, the District does not encompass the entire site, let alone a large settlement of greater cooperative use as was investigated in the Marana Community research.

Archaeological Deconstruction of the "Site" Concept

When Derrida and deconstruction are mentioned in the archaeological literature, the context is generally a brief comment on post-processualism's ties to post-structuralism and deconstruction. For instance Hodder (1991:9) referenced Derrida, along with Foucault, Barthes, and others, as representing non-hermeneutic options that "suspend meaning within chains of signifiers, and emphasize the openness of interpretations within our dependence on language."

Bapty and Yates did an excellent job of historicizing post-processualism, which they also strongly equated with post-structuralism. Bapty and Yates (1990:6) referred back to deconstruction, arguing that, "it is with Derrida that any introduction attempting to frame post-structuralism finds, if not its actual beginning, at least its most convenient one." Bapty and Yates (1990:10–11) succinctly summarized deconstruction by saying that for Derrida "[t]he point is to isolate those aspects of the text which have permitted it to be used and read historically in a particular way…" For Derrida (1981:43), though, this is not enough: a new, third term must be found to leave "room for a solution in the form of speculative dialectics."

That point is precisely what Dunnell (1992) and Dunnell and Dancey (1983) argued when they proposed a siteless survey methodology that sought to throw out the site concept altogether, and focus instead on recording every individual artifact to identify clusters that denote activity

areas. The necessity of siteless survey relies on the prerequisite notion that "site" as a term is neither adequate nor useful in archaeological ontology, methodologies, and theory. To explicate this point, Dunnell (1992) lays out the history of the term in archaeology and its meaning. Then—although he does not call it so—he deconstructs the term and suggests a new methodology that would necessarily bring along new ontologies.

Dunnell (1992:21) stated that the idea of a site "is, as usually depicted in introductory tests, a basic, if not the basic unit of archaeology." Dunnell believes that based on its archaeological significance, the concept of site "is now used as a tool for conceptualizing the archaeological record." He goes on to unwaveringly argue that "[i]ts use is warranted neither as a unit of observation nor as a unit of analysis" (Dunnell 1992:22). Cabak, Sassaman and Gillam (1998:35) agreed in part, emphasizing that, "the archaeological record is more continuous than sites allow, and all parts of the distribution have significance to studies of human land use." Ebert (1992:14) also advocated for a siteless archaeological recording system, with non-bounded reliance on surface survey, saying that, "it should be clear that what we can learn from sealed sites is seriously limited. Essentially, they can offer us a collection of stories about what a few people did at instants in the past." Ebert (1992:11) opined that the surface record "is a single entity, within which the nature and locations of physical artifacts and features must be assumed to be potentially related. Again, the archaeologist dealing with the surface archaeological record is relieved—this time of having to try to link one bounded place to another."

Dunnell (1992:22) set up his argument by pointing out that the term was mechanically adopted in English "simply as a generic term," and that it "was a place where something else, be it artifacts or monuments or a combination of the two, occurred." Further, Dunnell (1992:26, emphasis in original) observed that the term's use "as units of observation, association, counting,

and interpretation *necessarily* asserts their reality and archaeological relevance." He wholeheartedly disagreed with this reality and significance, rejecting site's hierarchical dominance.

According to Dunnell, because the English term "site" means the location of a town or village, the modern connotation of archaeological site was built out of a nineteenth century understanding of architectural monuments as important archaeological places. Dunnell (1992:22) stated: "more or less dense clusters of artifacts that could be supposed reasonably to represent former settlements are plainly implied." Introductory texts, like those referenced in Chapter 2 (Renfrew and Bahn 2015; Sutton and Yohe 2006), reflect this implicit connotation, and most neglect any conversation regarding how the neophyte archaeologist should delimit the boundaries of a site. One exception to this is Banning's (2002) textbook *Archaeological Survey*, in which he discussed advocacy for and pushback to distributional archaeology. He goes so far as to lay out various survey models for archaeological students, which are at times conflicting.

Dunnell, though, truly wants to investigate the dominant power that site has obtained as an archaeological term, rejects that notion, expose the dependency of site on archaeologists' own careless adoption and use, and invert the hierarchy. Dunnell (1992:24) started by looking at Binford's assertion that, "site is no longer a place distinguished by artifacts; rather, site is comprised by the artifacts themselves and their spatial relations." In Dunnell's view, however, this definition still treated site as a unit of measurement; for Dunnell, the problems with the site concept are far reaching, incorporating ontological, epistemological, and theoretical issues. Admitting, though, that archaeologists do need some unit of measurement, Dunnell described the siteless survey model (Dunnell and Dancey 1983). This model used the artifact as the basic unit of measurement in survey, with high-density areas being called nodes or clusters. Rather than

looking for sites on a survey, each artifact is recorded and only later when back in the lab are these clusters truly identified as such. Dunnell (1992:34) contended that:

> It is important to recognize that this is a fundamentally different conception of the nature of archaeological reality than that which spawned the site notion. It is not a view that can be reached by breaking down sites into smaller and smaller constituent elements. It proceeds in the other direction, building up to, rather than dividing, spatial aggregates of interpretive significance.

Thus, while the contemporary definition of site includes location as one of its properties, Dunnell looks to invert the hierarchy, and make high-density clusters a property of a location.

Additional Thoughts on Deconstructing the Site Concept

Dunnell and others who advocated siteless survey (e.g., Cabak et al. 1998; Ebert 1992) have thus done away with many operational issues concerning bounding sites by deconstructing the entire site concept. They answered the question "What are we as archaeologists doing when we define site boundaries?" with a resounding admonition that we delimit past behavior blindly. In so doing, however, they fell into the same trap. As Derrida (1997 [1967]:41) reminds us: "Operating necessarily from the inside, borrowing all the strategic and economic resources of subversion from the old structure, borrowing them structurally, that is to say without being able to isolate their elements and atoms, the enterprise of deconstruction always in a certain way falls prey to its own work." Dunnell (1992) fell prey when he created a system in which clusters are substituted for sites.

Banning (2002:12) noted that, "the debate over the appropriate way to survey archaeological distributions resolves into differences in research goals and perception of archaeological phenomena." On the point of site's historicity, Dunnell did a thorough job of teasing out the path that site took to its place of quotidian honor in archaeological work. The term truly has become ingrained in archaeological parlance as a unit of measurement or observation; and taken either way, it does not wholly function. Thus, Dunnell has done archaeological theory a great service by bringing attention to the difficulties of defining archaeological site in any univocal way.

The real deconstruction of site concept is to be found in the recognition that what archaeologists do has very little to do with the bounds that past peoples put on their own sites. A site today has real implications for the people who live in it. They know the boundaries—they know whether they pay the tax rate for Tucson or for Marana, Arizona. They know what school district their children should attend. They know this, whether there are material objects demarcating the boundary (e.g., roadside signs), or not. An archaeological site most likely held similar reality for its inhabitants; however, this is not the reality that archaeologists delimit when they define a site boundary. Instead, we bound an area that has significance for us, a reality for *our* needs today. Those needs are twofold: (1) for comparison in research, and (2) for managerial purposes.

Regarding the first need, that of research, the definition of a site as a unit of measurement does not truly matter: neither the threshold for defining the center, nor the bounding density decline are inherently flawed. What matters is that a hierarchical ontology is used, and that we as archaeologists recognize it. Wittgenstein (1969:2) called the natural human use of hierarchical ontologies and context a language game, that is played everywhere, arguing that "[w]hether a

proposition can turn out false after all depends on what I make count as determinants for that proposition." Advising wariness of uncritical acceptance of *the* language game, Culler (1981:131) took this further, admonishing that the context and determinants could always change: "It is always possible, though, that redescription will alter rules or place an utterance in a different language game." For research, comparisons of cultures based on comparisons of sites, all depend on the parameters of the research design. As Culler (1982:134) reported, "Meaning is produced by a process of grafting, and speech acts, both serious and nonserious, are grafts." As the individual archaeologist defines each new archaeological site, they graft the term site; the meaning could then shift for the discipline, stay the same for archaeologists, or morph in any number of permutations, and this is where unambiguous dialogue should take place.

The second need relating to cultural resource management, however, is more stringent in its requirements of the power that site wields. Just as individually recording artifacts would be too cumbersome for many research projects, recording too many sites due to low definitional thresholds would create a burden on cultural resource managers. Cabak, Sassaman and Gillam (1998:22) disagreed with Dunnell about the operational usefulness of site, recognizing that the "site concept serves well the needs of CRM because it compartmentalizes and delimits the significant from the insignificant." No matter if a site is a pueblo or a lithic scatter, *sites* need to be managed and monitored; paperwork—including site maps—needs to be completed. In the world of hard-won grants and compliance-driven archaeology, the money is just not there—in academia or in the CRM world—to pay field technicians to point plot every artifact. Cabak, Sassaman, and Gillam (1998:36) addressed financial practicality without giving a definitive answer, believing that "future efforts will no doubt be much more timely and cost effective." It is doubtful that this effectiveness can be demonstrated.

Thus, the definition of a site for epistemological purposes must remain at the top of the hierarchy. If this is because site has been in that position for so long as to become entrenched, so be it. Culler (1981:129, emphasis added) pointed out "that discourse is historical and *meaning historically determined, both in principle and in practice*." The site model may not be the best methodology for every research question. Siteless survey may work for questions and areas regarding limited and dispersed artifact counts, such as Paleoindian sites, but some concept of it is necessary for our historically determined archaeological system today. Further, overturning the hierarchy would be too costly at a time when social science and archaeology can hardly afford it, especially in the capitalististic, pay-for-service CRM world.

Conclusions

The complete picture of past behavior cannot be reflected by management-based, artifact count threshold site definitions. However, regional and landscape archaeology can still be conducted using the current, discretionary concepts of sites. Those who practice archaeology as a science of mobile populations may still use distributional archaeology methods. Investigations like those at the Marana Community will continue. A robust picture of the past only starts to emerge when archaeologists discuss their preconceived notions of site and begin to analyze those notions and the sites themselves. Banning's (1992) admonition regarding the issues dissolving into different research goals and "perception of archaeological phenomena" is just another deconstruction of the archaeological term site, including Dunnell's viewpoint. The key to defining sites is remembering that continuing debate is needed. As Bapty and Yates (1990:4) stated, "Whether or not they are successful in attempting to develop a subversive and reflexively self-conscious style is not as important as the fact that these questions are raised and discussed, and that the writing of the past, its forms and features, becomes the subject for debate." An

understanding that discretionary site definition is the language game we play, and that constant recontextualization of the "site" concept, is necessary. We need to encourage all archaeologists, from principal investigators and crew chiefs—who actually make the call on site boundaries—to neophyte students, to continue to discuss their assumptions and the illusion of a singular site, vociferously.

CHAPTER 4. RESULTS OF SURVEY AND TEST EXCAVATIONS

I performed the work summarized in this thesis as an intern for the Pima County Office of Sustainability and Conservation. Thus, archaeological survey and test excavations to investigate questions of site extent were conducted specifically for managerial purposes. The Arizona State Standards for defining a site were used as a minimum count of cultural material remains—albeit with the recognition that this is a discretionary definition. Duration of occupation was also investigated. With assistance from 26 volunteers, I surveyed streets and alleyways and conducted test excavations. Survey surrounding University Indian Ruin was completed between September 30 and October 11, 2014, and excavated test units in the Indian Ridge Historic District between October 24 and November 29, 2014.

Survey

Seven and a half person days of non-collection, pedestrian survey were completed for all Pima County rights-of-way within the project area. In paved sections of the Pima County rights-of-way, we surveyed transects in unpaved areas along both sides of the road. In unpaved sections of the rights-of-way, the entire road, including the sides and the road center, were surveyed. Spacing was at most 19 m, and more often 12.5 m, all below the 20 m spacing required by the Arizona State Historic Preservation Office et al. (2009:7). Figure 4.1 shows the location of isolated artifacts, and clusters. Artifact clusters, depicted in light blue ovals, bordered the 5.26 ha owned by the University of Arizona, indicating that the archaeological site continues outside of the National Register boundary of the UIR Archaeological Research District. Isolated artifacts correlated well with the inferred boundary based on data from Kingston (2013) shown in red.

While most Hohokam artifacts identified on survey were flaked stone or plain ware ceramics, there were multiple Tanque Verde Red-on-brown sherds. One Rincon Red-on-brown

Figure 4.1. Survey results, as well as Test pit locations in Indian Ridge Historic District, based on survey results and inferred boundary.

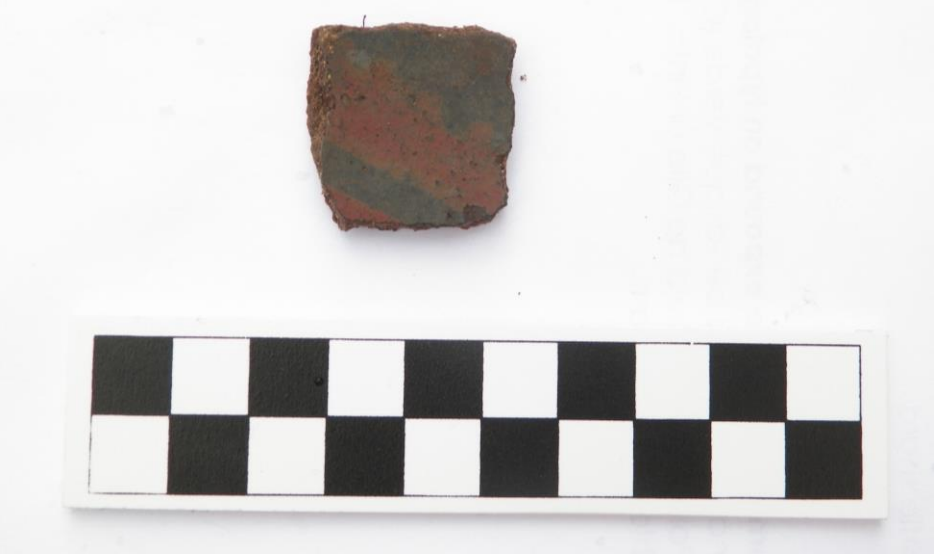

Figure 4.2. Rincon Red-on-brown sherd located during survey to the south of the UIR Archaeological Research District.

sherd was also identified during survey along the approach road to the UIR Archaeological District, and another was located south of the District (Figure 4.2).

Excavation

Based upon my inferred boundary and survey results, I excavated nine test pits within Pima County rights-of-way, and four test pits on private land, all within the Indian Ridge Historic District (Figure 4.1). The test pits were strategically placed to investigate areas both inside and outside of the inferred boundary. The test pits radiated outward from UIR Archaeological Research District to the south, east and northeast. All test pits were 1 m by 1 m in size, and excavated to sterile soil (except Test Pit 7 which was backfilled before we reached sterile soil due to the presence of an unmarked cable). Eight of the 13 test pits were no deeper than three arbitrary levels, dug in 10 cm increments. The deepest test pit was seven levels. The number of levels and artifacts recovered in each test pit are tabulated in Table 4.1. The ceramics recovered during test excavations (Table 4.2 and Figure 4.3) provide information about the duration of occupation of University Indian Ruin. A group of donated sherds was included in the

analysis, even though it was not systematically collected, because the collection provides context to interpret Test Pit 8 and address the project's research questions (Table 4.3). Results for flaked stone, faunal bone, and historic glass are presented in appendices.

Table 4.1. Excavation Results by Test Pit

Test Pit	No. Levels	No. Ceramics	No. Lithics	No. Faunal Bone	No. Historic Glass	Historic Metal	Other
1	7	1	3	0	0	X	Anthrocite
2	3	8	6	0	0	X	N/A
3	4	159	23	3	4	X	Shell; Charcoal
4	4	8	8	13	12	X	Charcoal
5	3	39	36	0	52	X	N/A
6	3	2	0	0	1	0	Charcoal
7	2	21	2	0	0	0	Shell; Charcoal
8	3	4	3	0	0	0	N/A
9	4	48	5	0	0	0	N/A
10	5	4	0	0	0	0	N/A
11	2	1	0	0	0	0	N/A
12	2	0	0	0	27	0	N/A
13	2	0	0	0	8	0	N/A

Table 4.2. Ceramic types by excavation test unit and level (n = 56).

Test Pit	Level	Indet. Red/ Brown	Tanque Verde Red/Brown	Rincon Red/Brown	Indet. Decorated	Indet. Poly-chrome	Corrugated
2	1	-	-	-	-	1	-
2	3	1	-	-	-	-	-
3	1	11	1	-	1	-	1
3	2	16	-	-	-	1	-
3	3	2	2	-	2	-	-
4	1	-	-	-	2	-	-
5	1	1	-	-	-	-	-
5	2	6	-	-	-	-	-
5	3	-	-	1	-	-	-
8	2	1	-	-	-	-	-
9	1	2	-	1	-	-	-
9	2	1	-	1	-	-	-
9	3	1	-	-	-	-	-
Totals:		**42**	**3**	**3**	**5**	**2**	1

Table 4.3. Counts for the Analyzed Sample of Donated Sherds (n = 132, of total 1056 donated sherds).

Plain	Indet. Red/ Brown	Rillito Red/Brown	Rincon Red/Brown	Tanque Verde Red/Brown	Sacaton Red/Buff	Corrugated
92	19	2	12	5	1	1

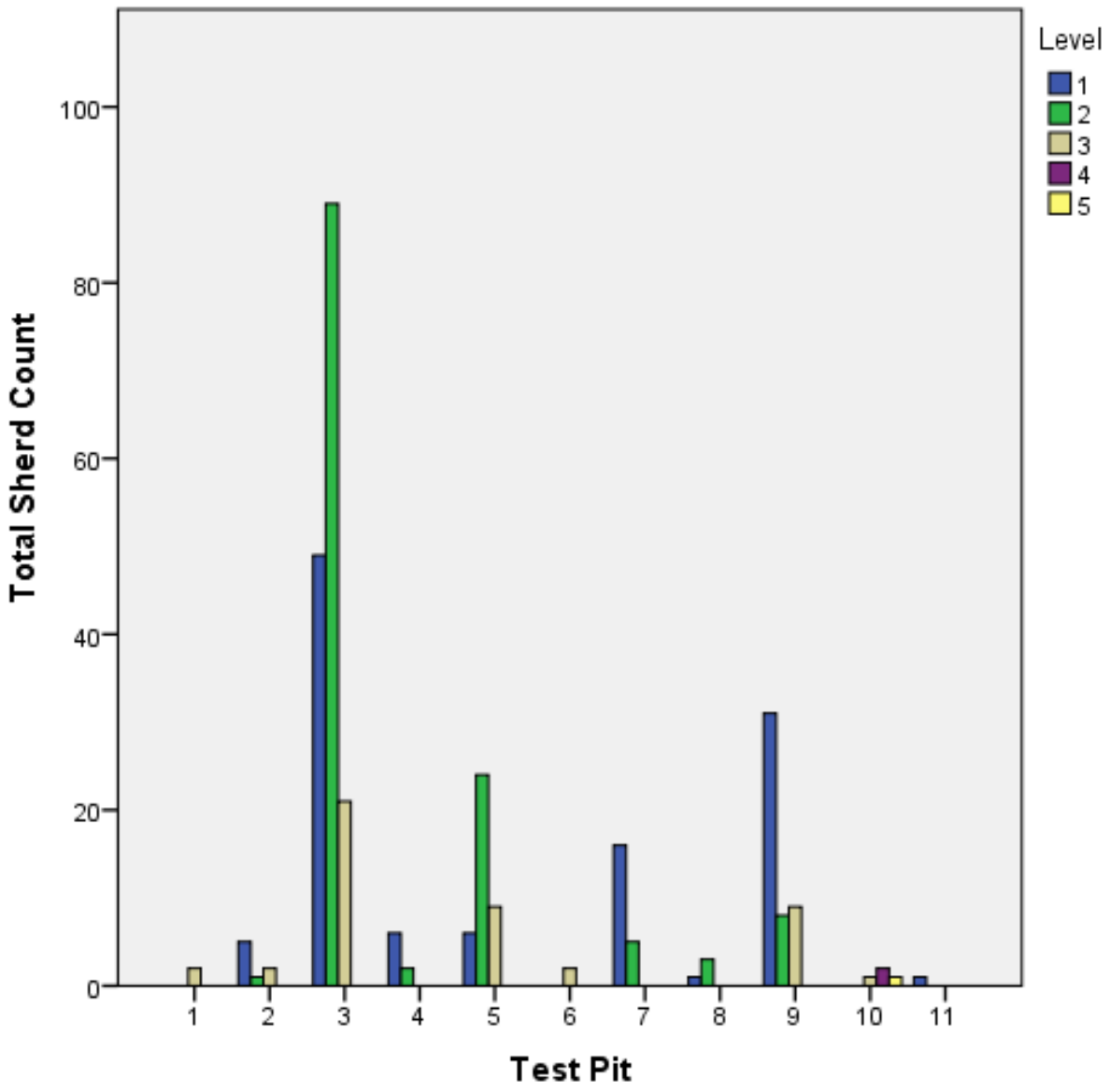

Figure 4.3. Total counts of sherds by level.

Survey and excavation for this project provide a basis for delineating a new UIR site boundary for inclusion in the AZSITE System. Figure 4.4 visually summarizes the results of my research. I refer to test pits that met the Arizona State Standards for defining sites to be "positive" (as contributing to the overall site boundary), when there were 30 or more artifacts of one kind, 20 or more artifacts of two or more kinds, or a feature or architecture in an area of 15 m diameter (Fish 1995:1–2). The Arizona standards, as discussed in Chapter 2, are written for survey methodology. For this analysis the entire test pit is taken into account, and since each test pit was only 1 m^2 in surface area, the greatest number of levels for any of the test pits keeps the total area under the defined standard. A circle of land with 15 m diameter has an area 176.7 m^2, while the deepest test pit thus had an area of 7 m^2. Applying the survey standard to excavation data is both discretionary and inexact as test pits represent volume and not area. However, this number is sufficiently high to verify that substantial remains exist in the test pits. A "negative" test pit was defined as lacking the threshold of artifact density. All of the positive test pits were within my inferred UIR site boundary, while negative test pits were found both inside and outside the inferred boundary.

Test pit results were also analyzed statistically. By figuring the mean and standard deviations of the total number of precolumbian artifacts (sherds and lithics) per test pit, groupings of results show natural breaks in the quantities of artifacts (Figure 4.5). Test Pit 3 was removed from statistical analysis because it had 182 artifacts and this is more than twice as many artifacts as recovered from other test pits. I thus considered Test Pit 3 as an outlier. The mean for the remaining 12 test pits is 16.58, with a standard deviation of 23.743 (including Test Pit 3 gave a standard deviation of 51.201, showing much

Figure 4.4 Map of the project area, with numbered test units categorized as positively or negatively contributing to the pre-A.D. 1450 UIR site, and a new proposed boundary for UIR.

Table 4.4 Summary of test pits believed to contribute to the site boundary for pre-A.D. 1450 remains.

Test Pit	Approximate distance from UIR Archaeological Research District	Meets AZ state standards	Standard deviation of mean for total artifacts (excludes TP3)	Contributing
1	404 m southeast	No	1st	No
2	495 m northeast	Yes	1st[1]	Yes
3	25 m south	Yes	Excluded[2]	Yes
4	820 m northeast	No	1st	No
5	223 m east	Yes	3rd	Yes
6	326 m east	No	1st	No
7	409 m east	Yes	1st	Yes
8	520 m east	No	1st	No
9	200 m south	Yes	2nd[1]	Yes
10	331 m southeast	No	1st	No
11	480 m south	No	1st	No
12	340 m south	No	1st	No
13	591 m northeast	No	1st	No

[1]Test pits indicated architecture.
[2]Test Pit 3 was excluded from statistical analysis as an outlier with 182 pre-A.D. 1450artifacts, more than double the next highest.

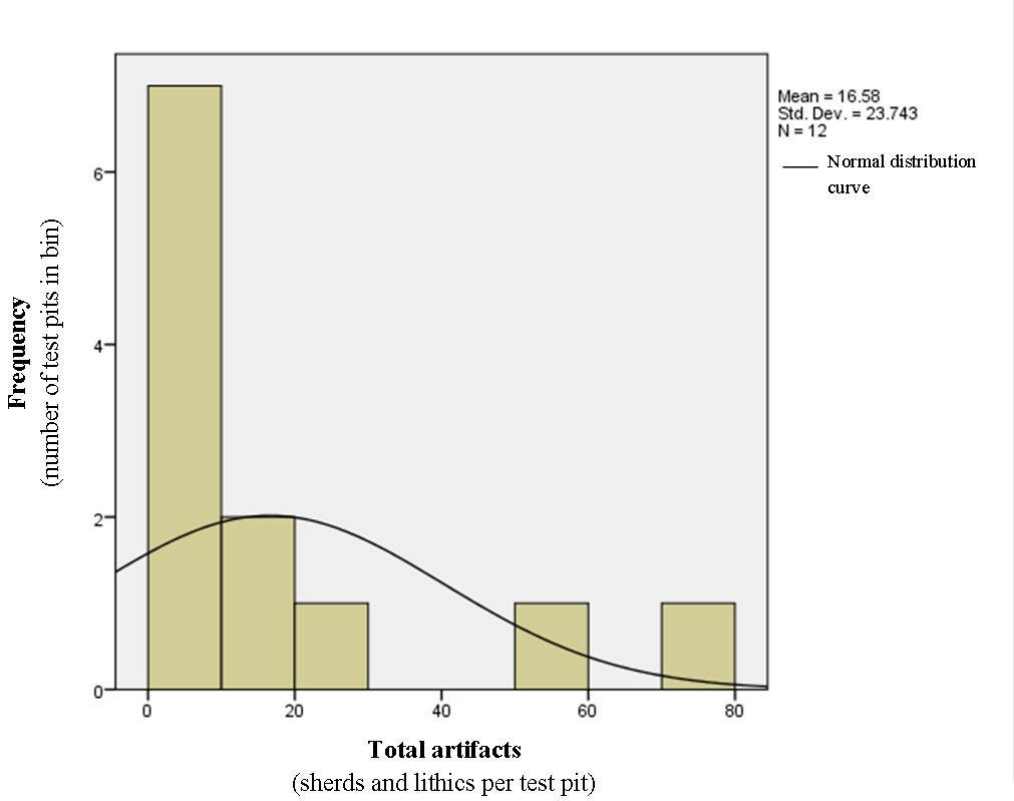

Figure 4.5 Histogram of pre-A.D. 1450 artifact distribution. Test Pit 3 is excluded from data set.

higher variance in the data). Test pits 1, 2, 4, 6, 7, 8, 10, 11, 12, and 13 all fall within one standard deviation of the mean. Only Test Pit 7 falls above the mean within the first standard deviation. The test pits visually group in these categories on Figure 4.5. Test Pit 9 falls within the 2nd standard deviation, and Test Pit 5 falls within the 3rd standard deviation. As the first standard deviation below the mean includes two test pits with no artifacts, and two test pits with less than five artifacts, it is thus categorized as being negative for remains contributing to the pre-A.D. 1450 UIR site. The first standard deviation above the mean, as well as the second and third standard deviations are categorized as contributing.

Tables 4.1 through Table 4.3 provide the quantitative results of excavation for each test pit, while Table 4.4 provides a summary of the evaluation for each. This evaluation is based on binary results according to adherence to the AZ state standards for a site, as described above, as well as the statistical analysis for standard deviations. Test pits are individually described below.

Excavation Results by Test Pit

Test Pit 1

Test Pit 1 was located on private, residential land, outside of my inferred boundary. This is one of two test pits placed on the southeast of the inferred boundary. Metal was recovered from Level 1. Anthracite coal was found in the first two layers, possibly from a stove or grill used in the 1960s. One sherd and three lithics were recovered from subsequent layers. This test pit was negative for contributing remains.

Test Pit 2

Test Pit 2 was located on private, residential land, to the northeast of the UIR Research District. The specific test pit location was chosen as the homeowner indicated that charcoal was often exposed in this area. While few artifacts and no charcoal were recovered from this test pit,

burned daub construction material was found in the first level, and an earthen floor was exposed in the second level between 13 cm and 17 cm below the surface. A post-hole was uncovered in the floor. One plain ware sherd was found on the floor surface. Five other sherds were recovered from Level 1, and two from Level 3 (below the floor). Although falling below the mean, and being in the first standard deviation, this test pit was positive for contributing remains due to the presence of architecture with associated artifacts.

Test Pit 3

Test Pit 3 was located about 25 m south of the UIR Research District boundary. It was placed in an unused, unusually wide alleyway between two houses that backed onto the UA property. This test pit included 49 sherds in Level 1, 89 sherds in Level 2, and 21 sherds in Level 3. Other artifacts included obsidian (Level 1) and Lavicardium shell (Level 3). Charcoal was recovered from all four levels. Glass and metal were also recovered from Levels 1 and 2. This test pit was positive for contributing remains.

Test Pit 4

Test Pit 4 was the farthest test pit from the UIR Archaeological Research District, located about 820 m to the northeast of the District. Excavated on Pima County right-of-way property, it bordered the edge of the Indian Ridge neighborhood, and property owned by the Girl Scouts to the north. This area is thus on the northern side of the bajada as it slopes down to the Tanque Verde Wash. Ceramic sherds were recovered from Levels 1 (6 sherds) and 2 (2 sherds). Glass and metal were both recovered from Levels 1, 2, and 4. Bone was recovered from Levels 2, 3, and 4, and charcoal was recovered from Level 2. As this test pit only had eight sherds in two levels, and all bone fragments could possibly be associated with the historic artifacts, this test pit was categorized as negative for contributing remains regarding this project.

Test Pits 5 through 8

Test Pits 5 through 8 were placed in a line directly east of the UIR Research District. The right-of-way chosen for these test units had previously been used for routine ingress and egress to Sabino Canyon Road. Indeed, it is still currently coded as a roadway with extra width for utilities by Pima County. Due to its use as a vehicle roadway, the soil was compacted and eroded. The roadbed routinely sits between 10 cm and 20 cm lower than the residential parcels to the south and north. Further, the right-of-way is bisected by a wash that provides drainage through the community, running into Tanque Verde Wash to the north. This drainage prevents vehicular traffic for the full length of the right-of-way, although residents to the east of the wash still use the right-of-way for ingress and egress. Test Pits 5 and 6 were located to the west of the drainage, and Test Pits 7 and 8 were located to the east of the drainage.

Test Pit 5 revealed six ceramic sherds in Level 1, 24 sherds in Level 2, and nine sherds in Level 3. Glass was found in all three levels, and metal was recovered in Level 3. Despite the obvious soil turbation, this test pit contained more than 20 sherds and lithics in Level 2, in addition to artifacts in other levels. It also falls within the 3rd standard deviation above the mean. This test pit was positive for contributing remains.

Test Pit 6 contained charcoal and glass in Level 1, charcoal in Level 2, and two sherds in Level 3. This test pit was negative for contributing remains.

Test Pit 7 revealed promising results in the first two layers, including 16 sherds in Level 1, and two lithics and five sherds in Level 2. Also recovered in Level 2 was a shell fragment identified as *Crassostrea* sp. This genus is commonly known as an oyster, and they only occur in prehistoric contexts in very low frequencies. Therefore, this specimen is likely historic. The species of this genus could not be confirmed and occurs in different regions (Erika Heacock and Arthur Vokes, personal communication 2015). No other historic artifacts were recovered.

However, midway through the second layer a cable cord was encountered, and the test pit was thus backfilled with no further excavation. Despite the obvious subsurface disturbance due to the presence of the cable and shell, this test pit was positive for contributing remains, based on more than 20 artifacts of two or more classes, and being above the mean in the first standard deviation.

Test Pit 8 was the easternmost excavation, about 520 m from the UIR Archaeological District, and 50 m west of Sabino Canyon Road. This test pit did not reveal contributing artifacts; only four sherds in two levels were recovered. This test pit was therefore categorized as negative. However, the owners of the residential property directly to the south of this unit donated two boxes of artifacts for use this research project and for curation at ASM. This collection included 1,056 sherds and 14 lithics. A random sample (n = 132) of these sherds were separated during the washing process; data for this sample are provided in Table 4.3. The land-owners reported recovering all the artifacts on the western side of their own property, during multiple, small excavations (e.g., when planting trees). These sherds were donated to the Arizona State Museum as part of the project.

Test Pit 9

This test pit was located in a right-of-way about 200 m to the south of the UIR Research District. Test pit 9 contained 31 ceramic sherds in Level 1, eight in Level 2, and nine in Level 3. No historic artifacts were recovered. Adobe melt was encountered in Level 2, including a pit dug into the adobe melt. The owner of the residential parcel about 5 m south of this test pit showed the crew artifacts that he had collected while constructing a play set and a new block wall for his yard. These artifacts included ceramic sherds, a spindle whorl, and a broken axe (Figure 4.6). Due to the presence of adobe remains indicating architecture, more than 30 sherds, and being in the 2nd standard deviation, this unit was categorized as positive for contributing remains.

Test Pit 10

Test Pit 10 was located on private land, just inside of the inferred boundary. This is one of two units placed on the southeast of the inferred boundary. At the bottom of Level 2 a hard caliche layer was encountered, with a straight east-west edge. Subsequent levels were dug as a 1 m by 0.5 m unit outside of the caliche. The straight edge indicated previous sub-surface construction. As artifacts were only encountered in Levels 3 through 5, and even then at insubstantial amounts (1 and 2 sherds each), this test pit was negative for contributing remains regarding this project. No historic artifacts were recovered. However, this unit was located in the front yard of a residential property, and previous ground disturbance occurred at a depth of 20 cm. I returned to this residence in April of 2015 at the owner's behest as new digging to replace a waterline in the backyard had exposed plain ware sherds and a recent tortoise bone (Figure 4.7).

Test Pit 11

This test pit, about 480 m from the UIR Archaeological Research District, was the southernmost excavation unit. It was located in an alley, although not in a Pima County right-of-way. Permission to excavate the test pit was obtained from the land owners of the residential property to the north of this unit. One sherd in Level 1 and no historic artifacts were recovered from this unit. This test pit was negative for any contributing remains.

Test Pit 12

This test pit was located in an alley about 340 m south of the UIR Archaeological Research District. The soil was largely fill and gravel. As this test pit had no sherds or lithics, it was negative for contributing remains for this project. It contained 27 pieces of glass in the first level, consisting of shards from variously colored bottles.

Figure 4.6. A selection of artifacts including an axe and spindle whorl from the neighbor directly to the south of Test Pit 9.

Figure 4.7. Sherds and tortoise bone from backyard of the residence that hosted Test Pit 10.

Test Pit 13

This test pit was located on a northeast trajectory from UIR. It was located in a right-of-way, near a power pole, in compacted soil where two rights-of-way intersect. Only historic artifacts, consisting of 8 pieces of glass in Level 1, were recovered from this unit. This test pit was thus negative for contributing remains as regards this project.

Ceramic Data Related to Construction of Indian Ridge Estates

I was interested in determining if construction of the Indian Ridge Estates impacted the subsurface archaeological record. Unfortunately, records of the exact nature of construction during the Indian Ridge development are scanty. Sub-surface movement of artifacts can happen in many ways, and in this residential area some concern remains regarding depth of soil disturbance during the 1950s and 1960s housing construction. I took weights, sizes, and counts of sherds to investigate the extent of subsurface disturbance. Three size categories were used: Size 1 indicates sherds that are larger than 1 inch; Size 2 indicates sherds that are 1 inch to 0.5 inches across; and Size 3 indicates sherds that are less than 0.5 inches. Sorting was accomplished via appropriately sized sieves. Each size class was sorted into plain and decorated sherds.Sherds in the plain and decorated size classes of each level were weighed together after sorting.

I posited that if sherds in the surface layer (Level 1 for each test pit) are smaller and more numerous than sherds in deeper levels, then post-depositional surface activities (e.g., walking by tourists and archaeologists, rain turbulence) have impacted surface artifacts and not subsurface artifacts. If sherds in deeper levels are smaller and more numerous than sherds from the surface layer, then subsurface disturbance by construction crews (e.g., digging for house foundations) may be indicated. A null hypothesis of no relation between sherd size, weight or count and test

pits level is indicated for this project if descriptive statistics do not indicate a variation between level and sherd size.

Descriptive statistics of mean weight by size class for each level do not indicate any correlation (Figure 4.8). Indeed, these descriptive statistics only indicate the obvious: bigger sherds weigh more on average. I thus ran a Chi-square test to analyze correlation of sherd counts by level (Table 4.5). If positive, this test would show a significant result if disturbance activities had broken up larger sherds (Size Class 1) and increased the total number of sherds in each level that was disturbed. Total counts were not included to avoid autocorrelation. Levels 4 and 5 were removed from the analysis due to small numbers and insufficient data. The Chi-square value is 2.08 with 4 degrees of freedom and a p value of 0.721. These statistics indicate no clear relationship between level and counts of sherds in any of the size classes, and a null hypothesis is thus indicated.

I also ran an ANOVA test because it investigates nominal and ordinal categories, such as the nominal levels of my test pits. I ran the ANOVA on size class by level because this was the finest level of data collected regarding sherd size or weight. Sherds for each level were separated into three size classes, counted, and weighed. Table 4.6 provides the results for the ANOVA test. As expected there were no significant correlations between count or weight for any size class and level, and the null hypothesis is supported. I cannot make any statistically significant inferences about how subsurface deposits were affected by construction of the Indian Ridge Historic District during the 1950s and 1960s.

Aggregating the data for all levels disregards the location of each test pit. Subsurface disturbance can be a localized event, and thus analysis of each individual test pit would need to be done for fully accurate results. Unfortunately, low sherd counts make this analysis unlikely to

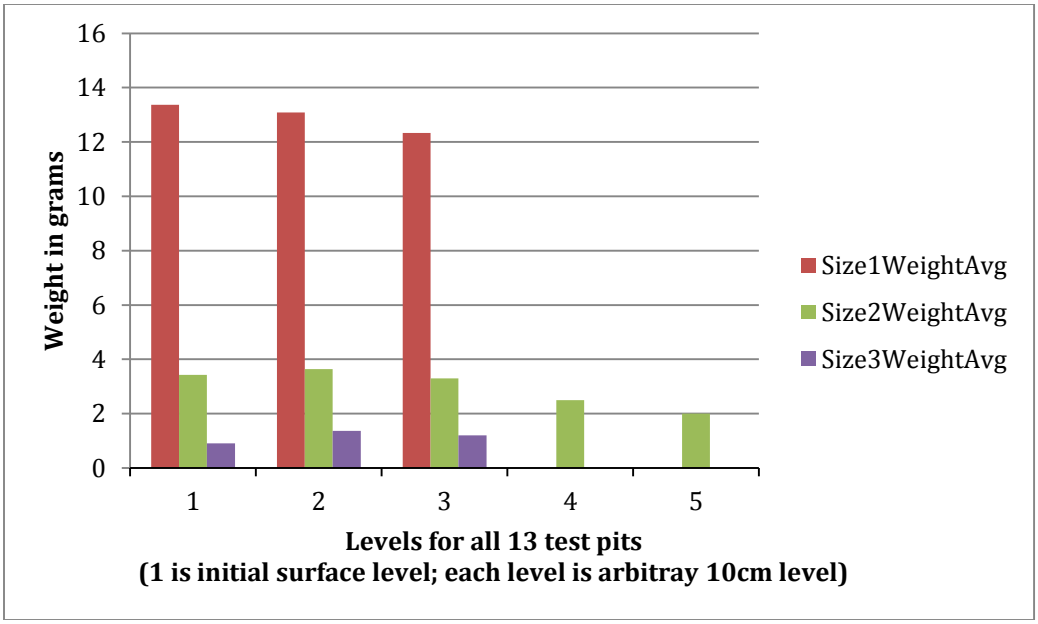

Figure 4.8. Mean weights for the three size classes of sherds by level and test pit.

Table 4.5. Chi Square Test for Sherd Counts in Size Class by Level.

	Size Class 1	**Size Class 2**	**Size Class 3**	
Level 1	9	80	26	**115**
Level 2	7	99	26	**132**
Level 3	4	30	12	**46**
	20	**209**	**64**	**293**

Table 4.6. ANOVA Test for Sherd Counts and Weights by Size Class and Level.

		Sum of Squares	df	Mean Square	F	Sig.
Size 1 Count	Between Groups	2.744	4	.686	.490	.743
	Within Groups	26.589	19	1.399		
	Total	29.333	23			
Size 2 Count	Between Groups	461.048	4	115.262	.475	.753
	Within Groups	4608.286	19	242.541		
	Total	5069.333	23			
Size 3 Count	Between Groups	30.976	4	7.744	.316	.864
	Within Groups	466.357	19	24.545		
	Total	497.333	23			
1 Weight	Between Groups	490.119	4	122.530	.492	.741
	Within Groups	4729.214	19	248.906		
	Total	5219.333	23			
2 Weight	Between Groups	6726.173	4	1681.543	.503	.734
	Within Groups	63525.786	19	3343.462		
	Total	70251.958	23			
3 Weight	Between Groups	42.786	4	10.696	.334	.852
	Within Groups	609.214	19	32.064		
	Total	652.000	23			

yield significant results. Another consideration is association of ceramics with architecture or features in each test pit. Test Pits 5 and 9 were excavated in or near architectural features, while the rest were not associated with architecture.

Given these issues, and the unknown disturbance in the project area, Test Pit 5 and Test Pit 9 were compared with a unit that was excavated in the UIR Archaeological Research District during the University of Arizona Archaeological Field School. Unit 68 was chosen as it was located in an area of the District known to have little subsurface disturbance; because it was located near (5.6 m), but not directly associated with, known architecture (a room block); and because its volume mirrored that of this project's test pits. Unit 68 measured 2 m by 0.5 m (the same volume per 10 cm level as a 1 m by 1 m unit) and was excavated in three 10 cm arbitrary levels; Test Pit 5 also had three levels, and Test Pit 9 had four levels. I ran ANOVA tests for Unit 68 against Test Pits 5 and 9 (Table 4.7 and Table 4.8) because Test Pit 9 was close to architecture, as indicated by the presence of adobe melt, while Test Pit 5's association with architecture is unknown (although ground disturbance seemed to be likely due to the presence of gravelly fill and historic artifacts). In addition, both test pits have some of the highest sherd counts.

Results for Test Pit 5 and Unit 68 again show no correlation or significant difference. However, Test Pit 9 and Unit 68 did show a significant difference ($p < 0.05$) when Size 1 weights were compared. It is possible that this is due to the lack of any Size 1 sherds in Test Pit 9's third level. However, if that were the case, we could expect a significant difference in the Size 1 count category. As the ANOVA is an omnibus test, it does not indicate which level provided the difference in this weight category. A lack of significant differences for multiple size and weight categories still indicates a null hypothesis return for these ANOVA tests. That is,

Table 4.7. ANOVA results for size and weight by level, for Test Pit 5 and Unit 68.

		Sum of Squares	df	Mean Square	F	Sig.
Size 1 Count	Between Groups	60.333	2	30.167	.127	.886
	Within Groups	714.500	3	238.167		
	Total	774.833	5			
Size 2 Count	Between Groups	2552.333	2	1276.167	.504	.647
	Within Groups	7589.000	3	2529.667		
	Total	10141.333	5			
Size 3 Count	Between Groups	4.333	2	2.167	.188	.837
	Within Groups	34.500	3	11.500		
	Total	38.833	5			
1 Weight	Between Groups	44.333	2	22.167	.065	.938
	Within Groups	1025.000	3	341.667		
	Total	1069.333	5			
2 Weight	Between Groups	40826.333	2	20413.167	.473	.663
	Within Groups	129357.000	3	43119.000		
	Total	170183.333	5			
3 Weight	Between Groups	6811.000	2	3405.500	.420	.691
	Within Groups	24350.500	3	8116.833		
	Total	31161.500	5			

Table 4.8. ANOVA results for size and weight by level, for Test Pit 9 and Unit 68.

		Sum of Squares	df	Mean Square	F	Sig.
Size 1 Count	Between Groups	114.333	2	57.167	.283	.772
	Within Groups	607.000	3	202.333		
	Total	721.333	5			
Size 2 Count	Between Groups	3090.333	2	1545.167	.681	.570
	Within Groups	6805.000	3	2268.333		
	Total	9895.333	5			
Size 3 Count	Between Groups	37.000	2	18.500	5.286	.104
	Within Groups	10.500	3	3.500		
	Total	47.500	5			
1 Weight	Between Groups	1854.333	2	927.167	12.473	.035
	Within Groups	223.000	3	74.333		
	Total	2077.333	5			
2 Weight	Between Groups	50402.333	2	25201.167	.651	.582
	Within Groups	116055.000	3	38685.000		
	Total	166457.333	5			
3 Weight	Between Groups	7813.000	2	3906.500	.495	.652
	Within Groups	23665.000	3	7888.333		
	Total	31478.000	5			

even when comparing the project's test pits against an excavation unit known to be in an area not disturbed by the 1950s and 1960s construction, we cannot make any conclusions about subsurface disturbance based solely on sherd sizes or counts.

Conclusion

Unfortunately, the applied statistical tests were inconclusive in providing a direct, measurable indicator for subsurface movement of artifacts. However, results from the survey and excavation provide a picture, although not a fully clear one, of the extent of UIR. For instance, Test Pits 5 and 7 indicate the potential for nearby architecture, despite the evidence of subsurface disturbance. Although results from Test Pit 7 were positive, it is clear from the subsurface disturbance that I chose poor locations for Test Pits 7 and 8. This portion of the alley was used as an entrance road for decades, and is still used as routine ingress and egress for some neighbors, resulting in loss of road surface.

The donated sherds from the residence south of Test Pit 8 also help to indicate the poor placement of that unit. They shed light on just how discretionary a site boundary can be: without knowledge of those sherds, I may have drawn the eastern edge of the proposed UIR boundary to the west of Sabino Canyon Road, rather abutting the boundary to it. I do not believe that distances greater than 15 m between the test pits or surface results indicate a break in the site; the serendipitous combination of being given this large collection from so near to a poorly placed test pit shows just how difficult defining a site boundary based on material remains, discretionary or not, can be.

As for the western edge of my proposed site boundary, it is flush with the project boundary. The western project boundary was chosen as it is believed from previous research that material culture from UIR does not spread past the current western edge of the UIR

Archaeological Research District. Levstik (2005) found no archaeological remains to the west of the District during survey of the Country Club Estates. Further, UIR field school survey results show that artifact density within the thirteen acres drops significantly towards the western boundary, indicating the site's demarcation (Mark Elson, personal communication 2015). Thus, while no new evidence regarding the western edge was added from my research, my proposed placement is appropriate for management and research needs.

CHAPTER 5. CONCLUSIONS

Multiple Components

One of the two questions posed in my research concerned the duration of occupation at UIR. Survey revealed minimal Rincon Red-on-brown pottery, both to the north and south of the delineated UIR Archaeological Research District. This ceramic type is indicative of an occupation in the Sedentary period (A.D. 950 to 1150), an occupation earlier than that of the Classic period usually ascribed to the UIR Archaeological Research District. While Test Pit 8 was negative for substantial remains, the private residence directly south of the test pit provided a multitude of ceramic sherds. An analysis of a random, 12.5 percent sample (132 of 1056 total sherds) of the donated sherds was performed. This size sample was chosen because the range of total ceramics from the positive, non-architecture, excavated test pits was between 21 and 159 total ceramics. This sample of 132 thus provided a number of sherds commensurate with those recovered from the systematic excavation for comparison. The analysis of the donated sample revealed greater amounts of Rincon Red-on-brown (n = 12) than Tanque Verde Red-on-brown (n = 5) decorated pottery. In addition two Rillito Red-on-brown sherds were identified. While these sherds were not systematically collected, the presence of ceramics from the Colonial (Rillito Red-on brown), Sedentary (Rincon Red-on-brown) and Classic periods (Tanque Verde Red-on-Brown) indicate a longer occupation at UIR than a solely Classic period occupation. This confirms and expands previous research (Jones 2006; Kingston 2013). The remains that were recovered on the east side of the project area (Test Pits 5 and 7) combined with the donated sherds certainly indicate that the eastern portion of Indian Ridge Estates was used more extensively pre-A.D. 1150. This presence of Pre-Classic sherds to the east of the UIR Archaeological Research District is certainly in much greater quantities than those found to the

south. However, remains in both areas expand previous knowledge of the spread of any Pre-Classic occupation. Whether this occupation was continuous with the Classic Period (A.D. 1150 to 1450) use is unclear.

While the donated sherds came from the eastern extent of the project area, the indication of a Hohokam occupation from A.D. 950 to 1450 is supported for the breadth of the project area. Rincon Red-on-brown sherds were reported by Jones (2006) and Kingston (2013) to the north of the UIR Archaeological Research District. To the south, the current project's survey found two Rincon Red-on-brown sherds. This Pre-Classic ceramic type was also recovered from Test Pits 5 and 9 (n = 3).

For the purposes of defining a new boundary for UIR, archaeological remains from the Sedentary and Classic periods are considered multiple components of the UIR site. Evidence of Historic period occupation is not included, because that occupation is ongoing, and the Indian Ridge Estates has been designated as a Historic District in the National Register of Historic Places.

A New Boundary

Figure 4.4 shows a new, proposed boundary for the UIR site based on the research presented in this thesis. This boundary reflects the positive results from survey and excavation. While this provides a valid boundary for management and research purposes, this discretionary delimitation does not reflect the full extent of Hohokam land usage at UIR prior to A.D. 1450. The limitations of my data warrant discussion. For example, the negative data from Test Pit 10 (placed in a residential front yard) necessarily excluded this residence, making an oblique angle in the boundary. As discussed above, placement of Test Pit 10 was not ideal, and sherds were easily recovered from a sewer line trench in the property's back yard. Similarly, Test Pit 13 was

negative, as well as being over 125 m from the closest surface finds during survey. It was located in an area that slopes down to Tanque Verde Wash, and was likely a flood plain; possibly the evidence of past human activity has been washed away. Thus, Test Pit 13 has been excluded from the new boundary, again making an angle. Although Test Pit 8 yielded negative results, I included it within the new proposed site boundary because it was placed in an area that was probably impacted by post-Hohokam-deposition and erosion, and due to the multitude of donated artifacts (primarily sherds) previously discussed. While the artifacts donated from the private residence were not scientifically excavated, they provide substantial evidence supporting the finding that the UIR site extends to Sabino Canyon Road.

It is unlikely that the Hohokam who resided at University Indian Ruin would have given the exact same polygon that I have proposed (see Figure 4.4) as their "site" boundary. As discussed in Chapter 3, the boundary that archaeologists define is one created for their purposes of research and management today. "Site" brings with it many ingrained contexts for archaeologists and for the public. There are many different ways of looking at sites, including siteless archaeology and landscape archaeology. The site boundary which I propose does not reflect a greater land use by the Hohokam, an idea which begs further linguistic investigation, and could be investigated by these other methods. It is instead, based on architecture and material culture representative of a core habitation area. For research and managerial purposes today, this proposed UIR boundary allows for efficient preservation and cultural resource management of the University Indian Ruin.

Further, it is possible that previously documented sites directly east of Sabino Canyon Road were part of the same site. Specifically, the Tack Room Site's western boundary is contiguous with my proposed eastern boundary for UIR. However, these areas do not need to be

added to a new UIR site definition. This is because they are already managed by appropriate land management agencies, and archaeologists know that they exist, and can make informed observations and comparisons in future research.

Future Research

Archaeological evidence that the Hohokam duration of occupation at UIR includes dates from A.D. 750 to 1450, rather than just A.D. 1150 to 1450, could have an impact on our archaeological understanding of the shift from the Sedenary period to the Classic period in the Hohokam sequence. Previous research indicated the existence of Hohokam primary villages during the Pre-Classic era (e.g. Elson and Cook 2011; Kingston 2013). Around the Pre-Classic to Classic period transition, Hohokam people moved from primary villages to near-by areas, where they created new platform mound sites. The Hardy Site, AZ BB:9:40 (ASM), has been suggested as the primary village from which UIR drew its Classic period population (Kingston 2013). The duration of occupation at UIR deserves further investigation.

Future investigations should include research into the spread of temporally assigned artifacts, primarily decorated ceramics. For example, most of the 5.6 ha of the UIR Archaeological Research District do not include evidence of Pre-Classic occupation. Mapping of the distribution of artifacts assigned to each Hohokam period throughout my project area, as well as within the District, and with sites from the 1.6 km area search, could shed light on whether or not the duration of occupation was continuous.

APPENDIX A – LITHIC DATA

Lithics were analyzed by Stacy Ryan and Sharlot Hart. Codes for Material, Cortex and Flake Type:

	Material	Cortex	Flake Type
1	Quartz/Quartzite	Cortical >80%	Normal
2	Obsidian	Partial Cortical	Bifacial Retouch
3	Volcanic	None <10%	Broken
4	Cryptocrystaline		Angular
5	Metamorphic		Bifacial Thinning Flake

Test Pit	PD	Material	Cortex	Flake type	Use Modification	Max. length (mm)	Weight (g)	Typology
TP2	202	3	3	1	N/A	41.5	13	Complete flake
TP2	202	3	3	1	N/A	34	8	Flake Fragment
TP2	203	3	2	1	N/A	38.5	4	Complete flake
TP2	203	3	3	1	N/A	30	3	Flake Fragment
TP2	203	3	2	4	Polish (Possible)	43	26	Shatter
TP2	203	3	3	1	N/A	16	<1	Flake Fragment
TP7	702	3	3	1	N/A	25.5	3	Flake Fragment
TP7	702	3	2	1	N/A	39	15	Complete flake
TP8	803	3	1	1	N/A	17.5	<1	Complete flake
TP8	802	4	3	4	N/A	13.5	<1	Shatter
TP8	802	3	3	4	N/A	12.5	<1	Debitage
TP5	501	5	2	4	N/A	106.5	406	Core
TP5	501	5	2	4	N/A	54.5	37	Debitage
TP5	501	5	2	4	N/A	40	15	Debitage
TP5	501	5	2	4	N/A	27.5	5	Debitage
TP5	501	5	2	4	N/A	17	<1	Debitage
TP5	503	4	3	1	N/A	19	<1	Flake Fragment
TP5	503	3	2	1	N/A	30	5	Flake Fragment
TP5	503	3	2	1	N/A	16	<1	Flake Fragment
TP5	503	5	2	1	N/A	18	<1	Flake Fragment
TP5	503	3	2	1	N/A	64.5	49	Complete flake
TP5	503	3	2	1	N/A	36	7	Complete flake
TP5	503	3	3	1	N/A	9	<1	Complete flake
TP5	501	1	1	4	N/A	53	120	Core
TP5	501	4	3	1	N/A	28.5	5	Shatter
TP5	501	3	2	1	N/A	29	5	Flake Fragment
TP5	501	3	2	1	N/A	16	<1	Shatter
TP5	501	3	2	1	N/A	22	<1	Flake Fragment
TP5	501	3	2	1	N/A	18	<1	Flake Fragment

Test Pit	PD	Material	Cortex	Flake type	Use Modification	Max. length (mm)	Weight (g)	Typology
TP5	501	3	2	1	N/A	17	<1	Flake Fragment
TP5	501	5	2	1	N/A	23.5	<1	Flake Fragment
TP5	501	3	3	1	N/A	15	<1	Flake Fragment
TP5	501	3	3	1	N/A	38.5	7	Flake Fragment
TP5	501	3	2	4	N/A	47	38	Core fragment
TP5	501	3	2	1	N/A	19	4	Flake Fragment
TP5	502	3	3	1	N/A	45	30	Complete flake
TP5	502	3	3	1	N/A	26	5	Flake Fragment
TP5	502	3	2	1	N/A	29	4	Shatter
TP5	502	3	2	1	N/A	27	<1	Shatter
TP5	502	3	2	1	N/A	31.5	7	Flake Fragment
TP5	502	3	2	1	N/A	31	<1	Flake Fragment
TP5	502	3	3	1	N/A	30	3	Flake Fragment
TP5	502	3	2	4	N/A	85	81	Shatter
TP5	502	4	3	4	N/A	13	<1	Shatter
TP5	502	4	3	4	N/A	18	<1	Shatter
TP5	502	3	2	1	N/A	12.5	<1	Complete flake
TP5	502	3	2	1	N/A	15	<1	Flake Fragment
TP1	105	4	3	2	Retouch-Bifacial	17.5	<1	Biface
TP1	102	3	2	1	N/A	42.5	9	Complete flake
TP1	102	3	3	1	N/A	15	<1	Flake Fragment
TP9	901	3	2	1	N/A	24.5	3	Flake Fragment
TP9	901	3	2	1	N/A	33.5	6	Complete flake
TP9	901	3	2	1	N/A	24	3	Complete flake
TP9	901	3	1	1	N/A	22	<1	Complete flake
TP9	901	3	3	1	N/A	31	3	Complete flake
TP3	304	3	3	1	N/A	25	3	Flake Fragment
TP3	301	2	2	1	N/A	22	4	Core fragment
TP3	302	3	2	1	N/A	84	94	Complete flake
TP3	302	3	2	1	N/A	36	7	Complete flake
TP3	302	3	2	1	N/A	37	6	Complete flake
TP3	302	3	2	1	N/A	30	5	Partial flake
TP3	302	3	2	1	N/A	41	13	Complete flake
TP3	302	3	2	1	N/A	23	<1	Complete flake
TP3	302	3	2	1	N/A	24	3	Complete flake
TP3	302	3	3	1	N/A	22	<1	Flake Fragment
TP3	302	3	2	1	N/A	15	<1	Flake Fragment
TP3	302	3	2	1	N/A	26	<1	Flake Fragment
TP3	302	3	2	1	N/A	31	<1	Flake Fragment
TP3	302	3	2	1	N/A	34	3	Flake Fragment
TP3	301	3	2	1	N/A	55.5	27	Complete flake

Test Pit	PD	Material	Cortex	Flake type	Use Modification	Max. length (mm)	Weight (g)	Typology
TP3	301	3	2	1	N/A	56	40	Complete flake
TP3	301	3	2	1	N/A	33.5	10	Flake Fragment
TP3	301	3	2	1	N/A	14	<1	Flake Fragment
TP3	301	4	3	1	N/A	18	<1	Flake Fragment
TP3	303	3	2	1	N/A	50.5	40	Complete flake
TP3	303	3	2	1	N/A	18.5	<1	Shatter
TP3	303	3	2	1	N/A	36	11	Complete flake
TP3	303	3	3	1	N/A	26	<1	Flake Fragment
TP4	402	3	3	1	N/A	15	<1	Flake Fragment
TP4	401	3	2	1	N/A	24	5	Shatter
TP4	401	3	2	1	N/A	42	17	Complete flake
TP4	401	3	2	1	N/A	26	5	Complete flake
TP4	401	3	3	1	N/A	20	<1	Complete flake
TP4	401	4	2	1	N/A	13	<1	Flake Fragment
TP4	401	3	2	1	N/A	21	<1	Flake Fragment
TP4	401	3	2	1	N/A	20	<1	Flake Fragment

APPENDIX B –FAUNAL DATA

Faunal remains were analyzed by Nicole Mathwich and Sharlot Hart.

Test Pit	PD	Taxon	NISP	Elem	PRTN	Fused	Weight (G)	Comments
TP3	302	*Lepus* sp.	1	Innominate	Acetabulum with parts of illium and ischium	Completely	2.18	2 mending pieces
TP3	302	*Lepus californicus*	1	Humerus	Distal 1/2	Completely	8.87	2 mending pieces
TP3	302	Unident. mammal, small	1	Long bone fragment	Fragment	0	0.43	
TP3	302	*Lepus* sp.	1	Fifth metatarsal	Proximal 1/2	Completely	0.44	
TP4	403	*Sylvilagus* sp.	1	Innominate	Acetabulum with part of ischium	Completely	0.23	
TP4	403	Unident. mammal, size unknown	1	indeterminate bone	Fragment	0	0.18	
TP4	402	Unident. mammal, medium	9	indeterminate bone	Fragment	0	1.76	
TP4	404	Unident. mammal, medium	2	indeterminate bone	Fragment	0	0.25	

APPENDIX C – HISTORIC GLASS DATA

Historic glass was analyzed by Sharlot Hart.

Test Pit	PD	No. Pieces	Colors	Comments
TP3	301	4	Clear	
TP4	401	3	Clear	
TP4	402	8	Clear	Red and yellow label reading "FPA"
TP4	404	1	Clear	
TP5	501	13	Clear, Green, Brown	
TP5	502	4	Clear, Red, Green	
TP5	503	35	Clear, emerald, aqua, red/brown	
TP6	601	1	Clear	
TP12	1201	27	Clear, emerald	
TP13	1301	8	Black	

REFERENCES CITED

Anschuetz, Kurt F., Richard H. Wilshusen, and Cherie L. Scheick
2001 An Archaeology of Landscapes: Perspectives and Directions. *Journal of Archaeological Research* 9(2):157–211.

Arizona State Historic Preservation Office, the Arizona State Museum, and the Arizona State Land Department
2009 Arizona Reporting Standards for Cultural Resources. Revised. AZ SHPO, Phoenix.

Banning, E. B.
2002 *Archaeological Survey*. Kluwer Academic/Plenum Publishers, New York.

Bapty, Ian, and Timothy Yates
1990 Introduction: Archaeology and Post-structuralism. In *Archaeology after Structuralism*, edited by Ian Bapty and Timothy Yates, pp. 1–32. Routledge, London.

Bilsbarrow, Matthew H.
2003 SHPO Position on the Roles of Archaeological Testing. SHPO Guidance Point No. 2. Arizona State Historic Preservation Office, Phoenix.

Cabak, Melanie A., Kenneth E. Sassaman, and J. Christopher Gillam.
1998 Distributional Archaeology in the Southeast: An Early Archaic Example from the Aiken Plateau, South Carolina. *Southeastern Archaeology* 17(1):22–38.

Ciolek-Torrello, Richard S., and Jeffrey A. Homburg
1990 *Cultural Resources Surveys and Overviews of the Rillito River Drainage Area, Pima County, Arizona.* Technical Series No. 20. Statistical Research, Inc., Tucson.

Crown, Patricia L.
1991 The Hohokam: Current Views of Prehistory and the Regional System. In *Chaco and Hohokam: Prehistoric Regional Systems in the American Southwest*, edited by P. L. Crown and W. James Judge, pp. 135-158. School of American Research Press, Santa Fe.

Culler, Jonathan
1982 *On Deconstruction: Theory and Criticism after Structuralism*. Cornell University Press, Cornell.

Cummings, Byron
1934 Letter from Cummings to University of Arizona President Shantz. Manuscript on file, UIR Correspondence – 1934-1944, Archives A-165, Arizona State Museum Archives, Tucson.

Derrida, Jacques
1981 [1972] *Positions*. Translated by Alan Bass. The University of Chicago Press, Chicago.

1997 [1967] *Of Grammatology*. Translated by Gayatri Chakravorty Spivak. The Johns Hopkins University Press, Baltimore.

Doelle, William H., and Henry D. Wallace
1986 *Hohokam Settlement Patterns in the San Xavier Project Area, Southern Tucson Basin.* Technical Report 84–6. Institute for American Research, Tucson.

1991 The Changing Role of the Tucson Basin in the Hohokam Regional System. In *Exploring the Hohokam: Prehistoric Desert Peoples of the American Southwest*, edited by George J. Gummerman, pp. 279–345. Amerind Foundation New World Studies Series 1. University of New Mexico Press, Albuquerque.

Dunnell, Robert C.
1992 The Notion Site. In *Space, Time, and Archaeological Landscapes*, edited by Jacqueline Rossignol and LuAnn Wandsnider, pp. 21–41. Plenum Press, New York.

Dunnell, Robert C, and William S. Dancey
1983 The Siteless Survey: A Regional Scale Data Collection Strategy. In *Advances in Archaeological Method and Theory*, vol. 4, edited by Michael B . Schiffer, pp. 267–287. Academic Press, New York.

Ebert, James I.
1992 *Distributional Archaeology*. University of New Mexico Press, Albuquerque.

Elson, Mark D., and Patricia Cook
2011 Archaeological Investigations of the Northwest Locus of the Tanque Verde Wash Site, AZ BB:13:68 (ASM). In *The Tanque Verde Wash Site Revisited: Archaeological Excavations in the Northwest Locus*, edited by M. D. Elson and P. Cook, pp. 1-17. Technical Report No. 2007-01. Desert Archaeology, Inc., Tucson.

Fish, Paul
1995 Revised Site Definition Policy. Arizona State Museum, Tucson.

Fish, Paul R., and Suzanne K. Fish
2000 The Marana Mound Site: Patterns of Social Differentiation In *The Early Classic Period. In The Hohokam Village Revisited*, edited by David E. Doyel, Paul R. Fish, and Suzanne K. Fish, pp. 245–276. Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science, Glenwood Springs, CO.

2011 Excavations at University Indian Ruin. Electronic document, http://www.statemuseum.arizona.edu/research/university_indian_ruin.shtml, accessed September 21, 2014

Fish, Suzanne K., and Paul R. Fish
2007 *The Hohokam Millennium*. School of Advanced Research, Santa Fe, New Mexico.

2009 University of Arizona Archaeological Field School Spring, 2010. Project Design. School of Anthropology, University of Arizona, Tucson.

Hayden, Julian D.
1957 *Excavations, 1940, at the University Indian Ruin*, Tucson. Technical Series No. 5. Southwestern Monuments Association, Globe, Arizona.

Hodder, Ian.
1991 Interpretive Archaeology and Its Role. *American Antiquity* 56(1):7–18.

Howell, Joseph, and Chance Copperstone
2014 *A Class III Cultural Resources Inventory Survey of 10.14 Miles (16.14 km) for the North Rillito Interceptor Rehabilitation Project, in Tucson, Pima County, Arizona*. Tierra Archaeological Report No. 2013–130. Tierra Right of Way Services, Tucson.

Indian Ridge Historic District
2014 Home. Electronic document, http://www.indianridgehistoricdistrict.org/, accessed May 6, 2014.

Jones, Jeffery
2006 *Archaeological Monitoring, Testing, and Data Recovery Investigations near the Northwestern Periphery of University Indian Ruin, AZ BB:9:33(ASM), in Pima County, Arizona*. Tierra Archaeological Report No. 2005-89. Tierra Right of Way Services, Tucson.

Kingston, Lauren M.
2013 *Exploring the Community of University Indian Ruin*. Master's thesis, Department of Anthropology, University of Arizona, Tucson. ProQuest, electronic document.

Levstik, Jennifer
2005 *A Class III Cultural Resources Assessment Survey of Right-of-Way Segments within the Country Club Estates and Indian Ridge Estates Property near Tucson, Pima County, Arizona*. Tierra Archaeological Report No. 2005-11. Tierra Right of Way Services, Tucson.

Milliken, Ian, Maggie Evancho, Theodore Gatchell, John Logan, Anna Martin, Enid Messerli, A.J. Vonarx, Tyler Theriot, Mark Elson, and T. J. Ferguson
2012 National Register Nomination Form for University Indian Ruin Archaeological Research District.

Oxford University Press
2015 Site, n.2. In *OED Online*. Electronic document, http://www.oed.com/view/Entry/180472, accessed November 10, 2015.

Renfrew, C., and P. Bahn
2015 *Archaeology Essentials: Theories Methods Practice*. 3rd Ed. Thames & Hudson, New York.

Rice, Glen
1987a Investigations at a Classic Period Community Complex. In *Studies in the Hohokam Community of Marana,* edited by Glen E. Rice, pp. 1–22. Arizona State University, Tempe.

1987b The Marana Community Complex: An Twelfth Century Hohokam Chiefdom. In *Studies in the Hohokam Community of Marana*, edited by Glen E. Rice, pp. 249–253. Arizona State University, Tempe.

Sutton, Mark Q. and Robert M. Yohe
2006 *Archeology: The Science of the Human Past*. 2nd Ed. Pearson Education, Upper Saddle River, NJ.

Thomas, Julian
2001 Archaeologies of Place and Landscape. In *Archaeological Theory Today*, edited by Ian Hodder, pp. 165–186. Polity Press, Cambridge.

Thompson, Raymond H.
2015 The University Indian Ruin. *Glyphs* 65(12):9–12.

Wilcox, David R., T. Randall McGuire, and Charles Sternberg
1981 Snaketown Revisited. Archaeological Series 155. Arizona State Museum, Tucson.

Wittgenstein, Ludwig
1969 *On Certainty*. Translated by Denis Paul and G. E. M. Anscombe. Harper Torchbooks, New York.

Zedeño, Nieves M.
1997 Landscapes, Land Use, and the History of Territory Formation: An Example from the Puebloan Southwest. *Journal of Archaeological Method and Theory* 4(1): 67–103.

Zedeño, Nieves M., and Brenda J. Bowser
2009 *The Archaeology of Meaningful Places*. University of Utah Press, Salt Lake City.