



**ENVIRONMENTALLY SENSITIVE LANDS MAPPING:  
SW CORNER OF MOORE RD + LA CANADA | Parcel 21949003A**

DECEMBER 26, 2022

**Prepared For**

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## INTRODUCTION

The 35.37 acre +/- site (parcel 21949003A) at the southwest corner of La Cañada and Moore Roads within unincorporated Pima County is proposed for annexation into Oro Valley with subsequent rezoning. The potential developer, Insight Homes, developed the La Cañada Ridge neighborhood directly south of the project site.

The parcels to the north, east, and south of the site are within the Town of Oro Valley limits. Current site zoning is SR (Suburban Ranch), intended for low-density single-family residences with a minimum lot size of one hundred forty-four thousand square feet.

Refer to the Regional Overview Map, and Project Area Map, pg. 2-3.

As part of the annexation and rezoning process, the Town of Oro Valley Environmentally Sensitive Lands (ESL) map will be amended to add any resource areas determined on the site. Wilder Landscape Architects (Wilder) was contracted by Insight Homes to provide ESL mapping.

Per the Town of Oro Valley (TOV) Zoning Code, Section 27.10.D, Environmentally Sensitive Lands Conservation System, *ESL represents an interconnected system of resource conservation. The components of the system include seven (7) distinct categories for the purpose of conserving resources as open space.*

*Key and essential biological resources are included in four (4) ESL categories:*

- a. Major wildlife linkage;*
- b. Critical resource;*
- c. Core resource; and*
- d. Resource management.*

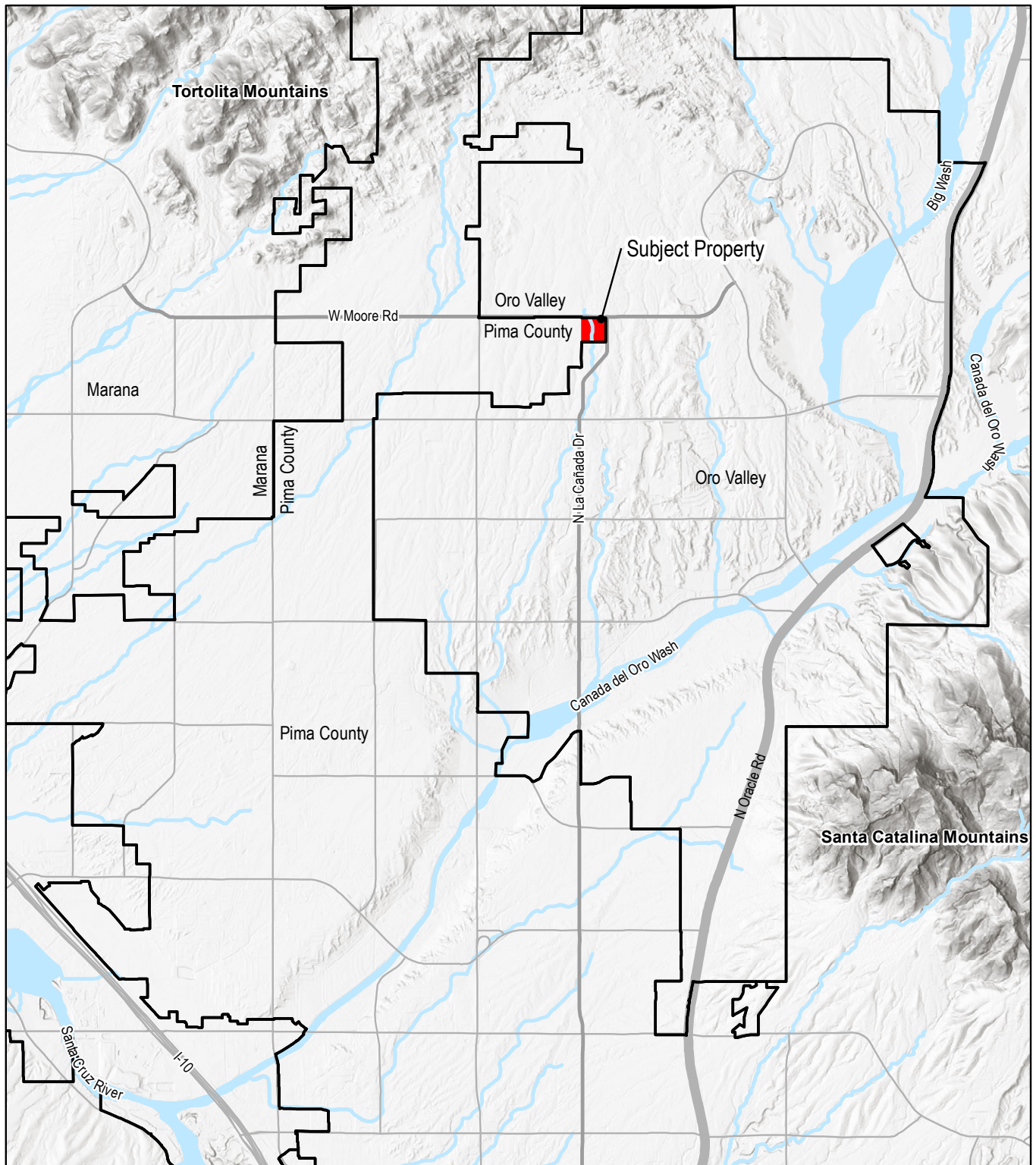
*Environmentally sensitive resource categories that are non-biologically based include:*

- e. Cultural resources;*
- f. Scenic resources; and*
- g. Hillside areas.*

This report looks at each of the seven categories in relationship to the project site.



## REGIONAL OVERVIEW MAP

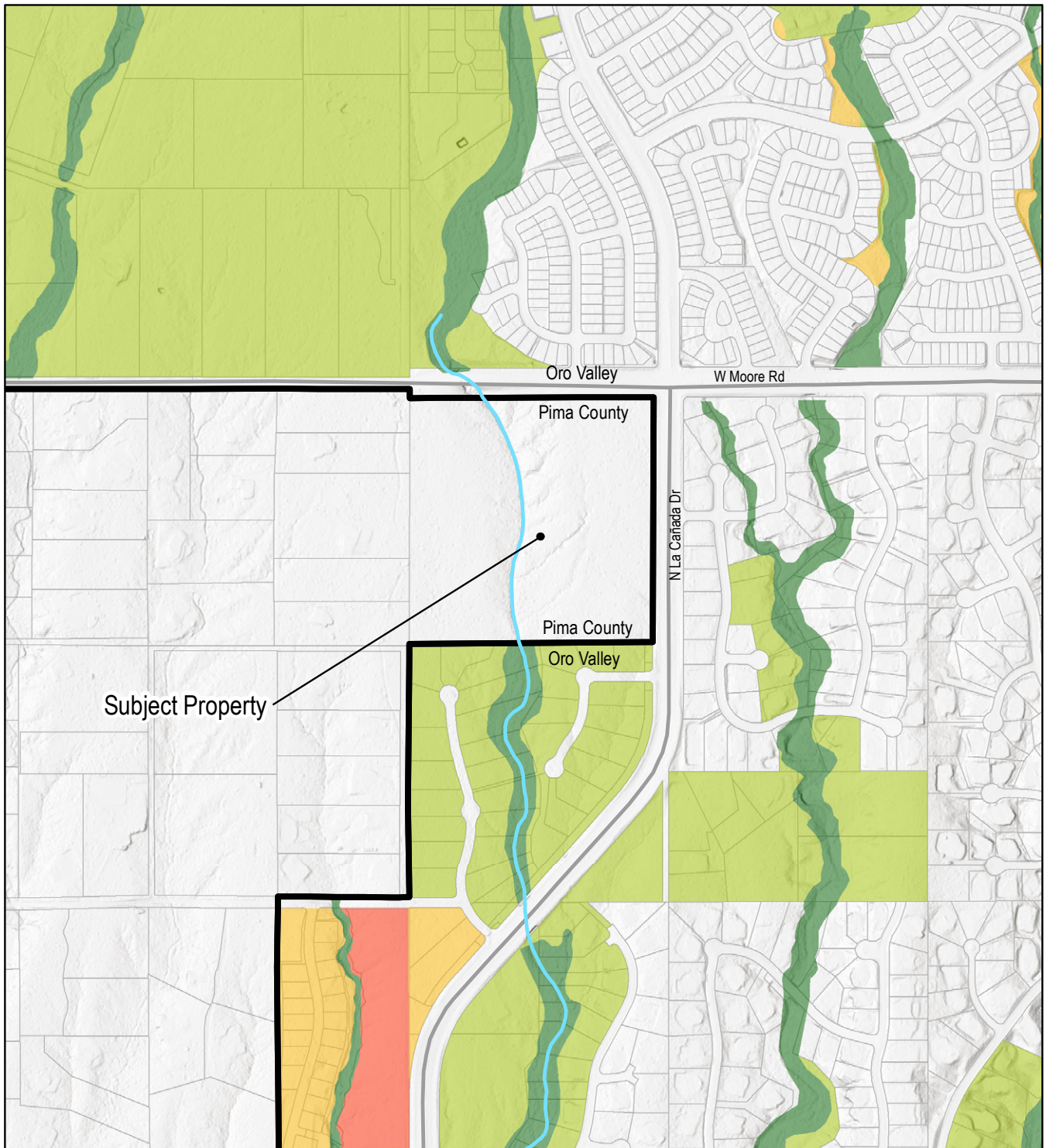


## Regional Map - Legend

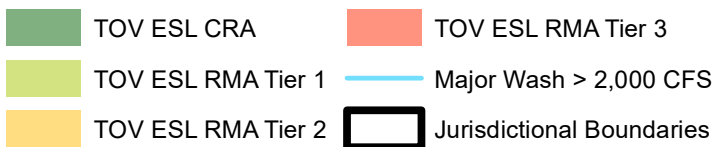
|                                                                                                               |                                                                                                             |
|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
|  Jurisdictional Boundaries |  Major Wash > 10,000 CFS |
|  Streets                   |  Major Wash > 2,000 CFS  |



## PROJECT AREA MAP



## Project Area - Legend





## BIOLOGICAL RESOURCES

Wilder (with RECON Environmental as a consultant) addressed the biological resource sections of the ESL requirements. Team members are RECON Senior Wildlife Biologist / Environmental Planner Susy Morales, GIS specialist / landscape designer Ben Wilder (Wilder) and registered Landscape Architect Jennifer Patton (Wilder). All evaluative work and mapping of resources was completed in accordance with applicable Town of Oro Valley ESL requirements in Section 27.10 and Addendum G.

### a. Major Wildlife Linkage (MWL) Category

Not applicable. TOV defines the MWLs as large mammal corridors / landscape linkages between public preserves and open spaces.

### b. Critical Resource Area

CRA mapping (inclusive of wildlife assessment, vegetative volume fieldwork and boundary mapping) was conducted in December of 2022. The watercourse through the project site meets the criteria for designation as a Critical Resource Area Riparian Area/Minor Wildlife Linkage based on the Total Vegetation Volume (TVV) measurements, presence of minor wildlife linkages, and the watercourse characteristics.

Refer to the CRA Characteristics and Mapping section of this report for detailed information.

### c. Core Resource Area

Not applicable.

### d. Resource Management Area

The project site outside of the CRA area meets the criteria for Management Area (RMA) Tier 1. Refer to the ESL Mapping Report (Dec. 20, 2022) provided by RECON Environmental (Appendix A). The report Assessment Results (report p. 4) are as follows:

*“The remainder of the study area (upland portions) meet the criteria for Resource Management Area (RMA) Tier 1 based on the following:*

- The study area is located within the Pima County MMBCLS Multiple Use Management Area category.*
- The study area has modeled potential habitat for more than three priority vulnerable species as listed in the MSCP (see Table 1).*
- The study area wildlife linkage connects open space and RMA Tier 1 (66 percent open space) areas north of Moore Road with RMA Tier 1 areas to the south.”*



Mesquite and thornscrub species (hackberry, wolfberry, and greythorn) are relatively dense along the watercourse.

## NON-BIOLOGICALLY BASED RESOURCES

### e. Cultural

A Class III cultural resources survey was conducted in 2021 by MCA Consulting (Joseph Howell and Michael Cook). Fieldwork was done on Dec 28-29, 2021. The Report date is January 3, 2022. This report is included as Appendix B.

The report summary (report p. 9, Comments) is as follows:

*"No new or previously recorded sites, structures, buildings, or districts are present in the Project Area. The isolates documented in the Project Area do not meet the ASM definition of an archaeological site. They have been thoroughly documented, and they lack further research potential. Accordingly, the isolated cultural resources documented during this project are recommended ineligible for inclusion on the National Register of Historic Places (NRHP). MCA recommends a finding of No Historic Properties Affected. No further archaeological investigations are recommended."*

### f. Scenic Resources

The project site is  $\frac{3}{4}$ -mile from Tangerine, making the area technically within the Tangerine Road Corridor Overlay District (TRCOD). However, given that there is no visibility to the project site, the Town of Oro Valley has approved a waiver on the visual analysis requirements of the TRCOD.

### g. Hillside Areas

Town of Oro Valley Zoning Code, Section 27.10.D.3.g, Hillside Area Category, The Hillside Area requirements apply to:

- Sloped areas of fifteen percent (15%) and greater where the sloped area is greater than one hundred fifty (150) feet in length and no less than fifty (50) feet wide and greater than seven and one-half (7 1/2) feet vertically.*
- Sloped areas of fifteen percent (15%) and greater contiguous to any area defined in subsection D.3.g.ii.a of this section.*
- Ridges, as defined in Chapter 31, with an elevation change of twenty-five (25) feet or more.*

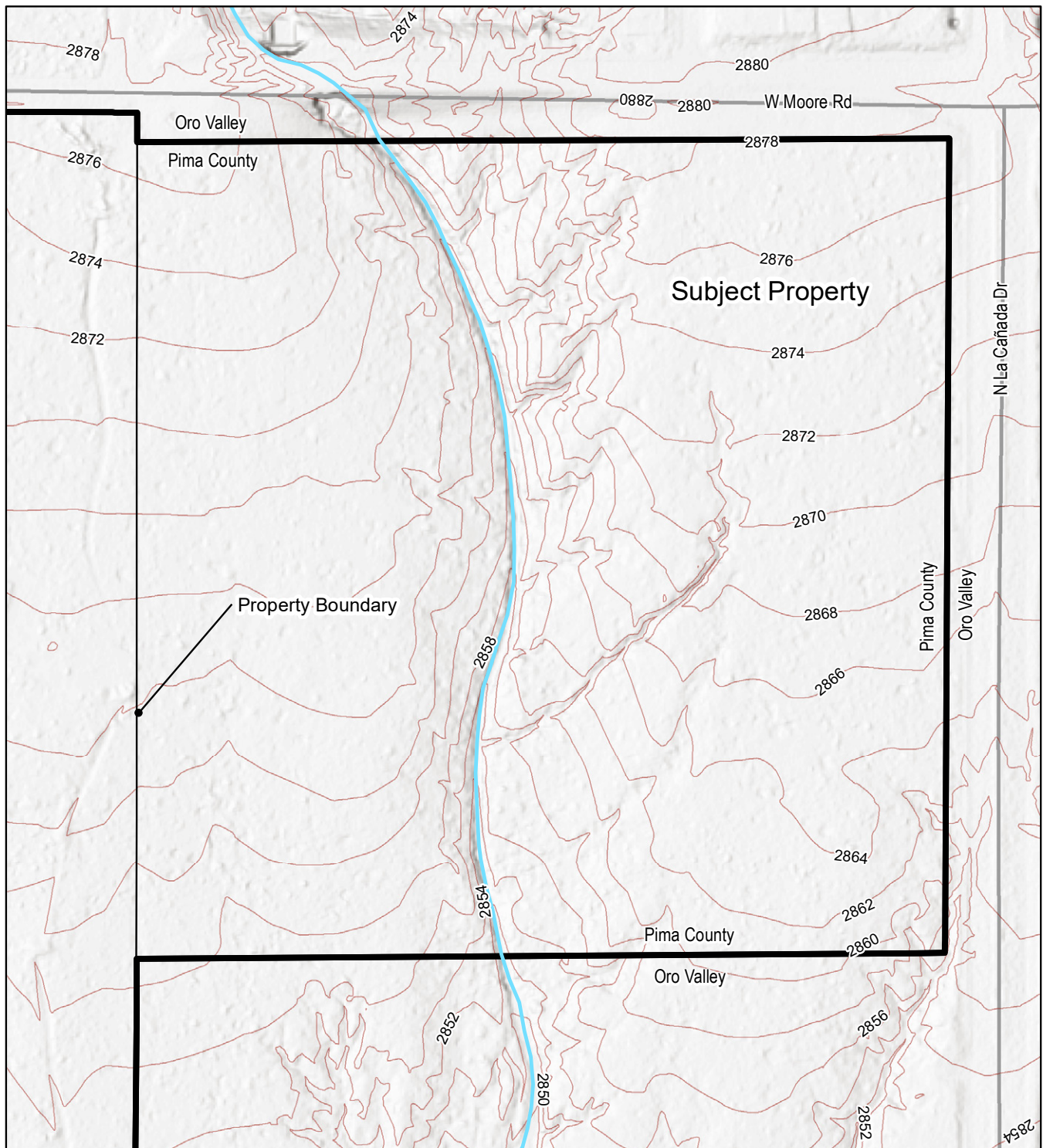
There are no areas within the project limits that meet the above code requirements. Refer to Project Site Topography Map, p. 6.



View looking south from the north side of Moore Rd. The watercourse flows under Moore and enters the project site. Wildlife tracks heading under Moore Rd. are abundant.



## PROJECT SITE TOPOGRAPHY



## Project Site Topography - Legend

- Major Wash > 2,000 CFS
- Jurisdictional Boundaries
- PAG 2-foot Contours

0 150 300 450 Feet





View looking south from Moore Rd, east of drainage culverts. Classic palo verde saguaro forest is on the left, xeroriparian vegetation (denser trees, heavy with mesquite and acacia) is evident in the background on the right.

## CRA CHARACTERISTICS AND MAPPING

RECON Senior Wildlife Biologist / Environmental Planner Susy Morales, GIS specialist / landscape designer Ben Wilder (Wilder) and registered Landscape Architect Jennifer Patton (Wilder) conducted a site visit and collected transects on December 16, 2022. All evaluative work and mapping of resources was completed in accordance with applicable Town of Oro Valley ESL requirements in Section 27.10 and Addendum G.

The watercourse through the project site meets the criteria for designation as a Critical Resource Area Riparian Area/Minor Wildlife Linkage based on the Total Vegetation Volume (TVV) measurements, presence of minor wildlife linkages, and the watercourse characteristics. This section, as well as Appendix A, ESL Mapping Letter, detail the findings.

CRA boundary mapping was completed by Wilder and is shown on the Project Site Map, p. 13. Boundary mapping was based on the criteria from both the Town of Oro Valley Zoning Code Addendum G: ESL Resource Science Specifications and Definitions as well as Section 2.3.1 of the Pima County Regional Flood Control District Technical Procedure 116: Quantitative Methods for Regulated Riparian Habitat Boundary Modifications and On-Site Vegetation Surveys. These methods are outlined under the CRA Boundary Mapping section of this report.

### General Site Conditions

The project site is undeveloped. Prior to the heavy off-road vehicle use occurring sometime post 2021, the site was relatively undisturbed. The site slopes from the north to the south, with an elevation of 2878' along the northeastern boundary, falling to 2852' at the southern edge where the watercourse exits the site.



The unnamed watercourse is a tributary of the Cañada del Oro Wash, which it joins approximately four miles south of the site. Pima County Riparian Habitat Mapping depicts the area around and inclusive of the watercourse as Xeroriparian B regulated riparian habitat. Xeroriparian B habitat is defined as moderately dense, with a Total Vegetative Volume less than or equal to  $0.856 \text{ m}^3/\text{m}^2$  and greater than  $0.675 \text{ m}^3/\text{m}^2$ .

The watercourse enters the project site at the northern edge through culverts underneath Moore Rd. The watercourse flows in a single channel, with no braiding. Incising of the channel is more pronounced at the northern end.

Trails / Off Road Vehicle Use: Prior to the 2015 aerial imagery, the site is relatively undisturbed. In 2015, the path, in use today, west of the watercourse has been established. Between the 2021 and 2022 aerial images significant off-road vehicle use occurred over much of the site.

Rilling: There is significant rilling within the site (deep channels flowing into the watercourse) which is unusual. In review of Pima County aerial imagery, W. Moore Road was a dirt road in 2002. In 2005, Moore Road was widened and paved. The right of way north the of the project site was entirely graded, except for a few trees at the NW end. Stabilization of this area (a slope from the roadway edge to the northern project boundary) was not successfully achieved. Over the years since the Moore Road construction, it appears that this area has been used as a construction staging area. In 2011 it appears to have been re-cleared. With no established vegetation on this slope to slow the flow of water and encourage infiltration, the flow of water into the project site has increased. It appears that the additional water flow has been a factor in the deep (several feet) rilling that flows into the site's central drainage course.



View looking west along Moore Rd. The project site is to the left, at the base of the slope.

### Vegetation within the Project Site

The project site is within the Sonoran palo verde-mixed cacti-mixed scrub series of the Arizona Upland Subdivision of the Sonoran Desertscrub biotic community (Turner and Brown 1994). This community is characterized by an overstory of paloverde trees and saguaro cacti, with a relatively dense scrubby understory.

The xeroriparian area that runs through the center of the site from north to south is defined by the presence of velvet mesquite (*Prosopis velutina*), whitethorn acacia (*Vachellia constricta*), blue palo verde (*Parkinsonia florida*), and catclaw acacia (*Senegalia greggii*). Foothill palo verde (*Parkinsonia microphylla*), the dominant tree species on site, is found in smaller numbers (but larger size specimens) along the wash.

Shrubs are relatively thick along the watercourse. Dominant xeroriparian shrubs include desert hackberry (*Celtis pallida*), Warnock's snakewood (*Condalia warnockii*), wolfberry (*Lycium sp.*) and graythorn (*Ziziphus obtusifolia*). Common sub-shrubs are burroweed (*Isocoma tenuisecta*), canyon bursage (*Ambrosia ambrosoides*), triangleleaf bursage (*Ambrosia deltoidea*), globemallow (*Sphaeralcea ambigua*), Wright's desertpeony (*Acourtia wrightii*), rough menodora (*Menodora scabra*) and abutilon (*Abutilon sp.*).

Shrubs and sub-shrubs present in smaller numbers are Mormon tea (*Ephedra sp.*), fourwing saltbush (*Atriplex canescens*), odora (*Porophyllum gracile*), snakeweed (*Gutierrezia sarothrae*), paperflower (*Psilostrophe cooperi*), brittlebush (*Encelia farinosa*), desert zinnia (*Zinnia acerosa*) and brickellbush (*Brickellia sp.*).

Dominant cacti within the xeroriparian area are barrel cacti (*Ferocactus wislizeni*), Christmas cholla (*Cylindropuntia leptocaulis*), pincushion cacti (*Mammillaria sp.*), and prickly pear (*Opuntia engelmannii*).

Grasses carpet a large amount of the xeroriparian ground surface. Most common is the annual six-weeks needle grama (*Bouteloua aristidoides*) followed by bush muhly (*Muhlenbergia porteri*). Fluff grass (*Dasyochloa pulchella*) and purple threeawn (*Aristida purpurea*) are also present.

Outside of the xeroriparian area, the dominant tree is foothill palo verde (*Parkinsonia microphylla*). Common shrubs include cheesebush, (*Ambrosia salsola*), range ratany (*Krameria parvifolia*), triangleleaf bursage (*Ambrosia deltoidea*) and creosote (*Larrea tridentata*). Mormon tea (*Ephedra sp.*), Warnock's snakewood (*Condalia warnockii*) and trixis (*Trixis californica*) are also present.

Dominant cacti outside of the xeroriparian area include saguaro (*Carnegiea gigantea*), chainfruit cholla (*Cylindropuntia fulgida*), staghorn cholla (*Cylindropuntia versicolor*), buckhorn cholla (*Cylindropuntia acanthocarpa*), Christmas cholla (*Cylindropuntia leptocaulis*), barrel cacti (*Ferocactus wislizenii*), pincushion cacti (*Mammillaria sp.*), and hedgehog (*Echinocereus sp.*).

### Invasive Plant Species

The site is relatively free of invasive plant species, with the exception of soft feather pappusgrass (*Enneapogon cenchroides*) which is found throughout the site. Like buffelgrass, this grass is native to Africa, and displaces native vegetation; it is also a fire fuel source. Buffelgrass (*Pennisetum ciliare*) is present at the north end of the site within the rock outfall of the culverts that run underneath Moore Rd. This should be treated and eradicated to prevent seeds and plants from establishing downstream. Continual monitoring for invasive species, and removal, is recommended.

### Wildlife within the Project Site

A variety of mammal tracks within and near the watercourse, along with numerous coyote and rodent dens, were observed on the site. Refer to the ESL Mapping Report (Dec. 20, 2022) provided by RECON Environmental (Appendix A) for wildlife habitat descriptions and assessments.



## Riparian Classification Vegetation Survey and Survey Methods

### Vegetative Volume

Mapping of vegetation volume was conducted in accordance with the Pima County Regional Flood Control District Technical Procedure 116: Quantitative Methods for Regulated Riparian Habitat Boundary Modifications and On-Site Vegetation Surveys. Mapping was performed in December of 2022. Many of the plants (especially the dominant trees species – velvet mesquite, acacias, and blue palo verde) along the watercourse are deciduous, so did not have leaves. Vegetation volume measurements would have been higher had trees been leafed out.

Six transects were conducted along the watercourse on December 16, 2022. Locations were selected prior to the site visit based on equal distribution along the length of the wash. The southernmost transect was re-positioned in the field as the original location was too dense to transit. The transect locations are shown on the Project Site Map, p. 13.

TVV (Total Vegetative Volume) sampling was conducted at 1-meter intervals along each of the six 25-meter transects. At each interval, the vegetative volume was measured starting from the ground surface and reaching to the top of the plant canopy. Vegetative volume data sheets are included as Appendix D.

TVV results: The total mean TVV measurement for the six transects is  $0.919 \text{ m}^3/\text{m}^2$  – well above the TOV minimum  $0.500 \text{ m}^3/\text{m}^2$  threshold for xeroriparian (refer to TOV Addendum G, ESL Resource Science Specifications and Definitions). The TVV Table, this page, contains the six transect results. Other xeroriparian indicators include the distinct water course channel and evidence of sediment and vegetative debris deposition, as well as the presence of xeroriparian tree species (and absence of mesoriparian species) – all factors that indicate flow as well as sediment and nutrient transport.

Belt transects were conducted within the established TVV transects. For each belt transect, information of plant density and diversity was recorded. Refer to the Vegetation Density Datasheet, p. 11, for density tables.

- Plant Diversity: all species present along the transect and within 1 meter on either side (2-meter width x 25-meter length) are recorded.
- Plant Density: all woody perennials, whether alive, dead, or dormant, that are rooted within the 2-meter width x 25-meter transect, are counted.

| Total Vegetation Volume, SW Corner La Canada & Moore, Pima County, Arizona, December 2022 |                                                     |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Transect Number                                                                           | Total Vegetation Volume ( $\text{m}^3/\text{m}^2$ ) |
| 1                                                                                         | 0.948                                               |
| 2                                                                                         | 1.308                                               |
| 3                                                                                         | 0.82                                                |
| 4                                                                                         | 0.608                                               |
| 5                                                                                         | 0.704                                               |
| 6                                                                                         | 1.128                                               |
| <b>Total Mean</b>                                                                         | <b>0.919</b>                                        |

| VEGETATION DENSITY DATASHEET (BELT TRANSECTS) |                      |            |    |    |   |    |   |               |                      |
|-----------------------------------------------|----------------------|------------|----|----|---|----|---|---------------|----------------------|
| PLANT SPECIES                                 |                      | TRANSECT # |    |    |   |    |   |               |                      |
| Botanical Name                                | Common Name          | 1          | 2  | 3  | 4 | 5  | 6 | Total Density | Average Density / AC |
| <b>TREES</b>                                  |                      |            |    |    |   |    |   |               |                      |
| <i>Parkinsonia florida</i>                    | blue palo verde      | 1          | 2  | 1  |   |    |   | 4             | 54.0                 |
| <i>Parkinsonia microphylla</i>                | foothill palo verde  |            |    |    | 1 |    |   | 1             | 13.5                 |
| <i>Prosopis velutina</i>                      | mesquite             | 1          |    | 1  |   |    |   | 2             | 27.0                 |
| <i>Senegalia greggii</i>                      | cactclaw acacia      |            |    |    | 1 |    |   | 1             | 13.5                 |
| <i>Vachellia constricta</i>                   | whitethorn acacia    | 1          | 7  | 4  | 4 | 3  | 2 | 21            | 283.3                |
| <b>SHRUBS / SUB-SHRUBS</b>                    |                      |            |    |    |   |    |   |               |                      |
| <i>Abutilon sp.</i>                           | abutilon             |            |    | 15 |   |    |   | 15            | 202.3                |
| <i>Acourtia wrightii</i>                      | Wright's desertpeony |            |    | 1  | 2 | 9  |   | 12            | 161.9                |
| <i>Ambrosia ambrosoides</i>                   | canyon bursage       | 7          | 1  |    | 6 |    |   | 14            | 188.9                |
| <i>Ambrosia deltoidea</i>                     | triangleleaf bursage |            | 3  |    |   | 11 | 2 | 16            | 215.8                |
| <i>Ambrosia salsola</i>                       | cheesebush           |            |    |    | 2 |    |   | 2             | 27.0                 |
| <i>Atriplex canescens</i>                     | fourwing saltbush    |            | 1  |    |   |    |   | 1             | 13.5                 |
| <i>Brickellia sp.</i>                         | brickellbush         |            |    |    |   |    | 1 | 1             | 13.5                 |
| <i>Celtis pallida</i>                         | desert hackberry     | 1          | 1  | 2  |   | 3  | 1 | 8             | 107.9                |
| <i>Condalia warnockii</i>                     | condalia             |            | 1  | 1  |   | 5  |   | 7             | 94.4                 |
| <i>Encelia farinosa</i>                       | brittlebush          |            |    |    |   |    | 1 | 1             | 13.5                 |
| <i>Ephedra sp.</i>                            | Mormon tea           |            |    | 2  |   |    |   | 2             | 27.0                 |
| <i>Gutierrezia sarothrae</i>                  | snakeweed            |            | 1  |    |   |    |   | 1             | 13.5                 |
| <i>Isocoma tenuisecta</i>                     | burroweed            |            | 11 |    |   | 6  |   | 17            | 229.3                |
| <i>Lycium sp</i>                              | wolfberry            |            |    |    | 2 |    |   | 2             | 27.0                 |
| <i>Menodora scabra</i>                        | rough menodora       |            | 5  |    |   |    |   | 5             | 67.4                 |
| <i>Porophyllum gracile</i>                    | odora                |            | 1  |    | 1 |    |   | 2             | 27.0                 |
| <i>Psilostrophe cooperi</i>                   | paperflower          |            |    |    |   | 2  |   | 2             | 27.0                 |
| <i>Sphaeralcea sp.</i>                        | globemallow          | 5          |    | 4  | 1 |    | 2 | 12            | 161.9                |
| <i>Zinnia acerosa</i>                         | desert zinnia        |            |    |    |   | 2  |   | 2             | 27.0                 |
| <i>Ziziphus obtusifolia</i>                   | graythorn            |            |    |    | 1 |    | 1 | 2             | 27.0                 |
| <b>CACTI</b>                                  |                      |            |    |    |   |    |   |               |                      |
| <i>Cylindropuntia leptocaulis</i>             | Christmas cholla     |            | 2  | 5  |   |    |   | 7             | 94.4                 |
| <i>Echinocereus engelmannii</i>               | Engelmann's hedgehog |            |    |    | 1 |    | 1 | 2             | 27.0                 |
| <i>Ferocactus wislizenii</i>                  | fishhook barrel      |            | 1  | 1  |   | 1  |   | 3             | 40.5                 |
| <i>Mammillaria grahamii</i>                   | pincushion           | 2          | 2  | 1  |   | 3  |   | 8             | 107.9                |
| <i>Opuntia engelmannii</i>                    | prickly pear         | 1          |    |    | 4 | 3  | 2 | 10            | 134.9                |
| <b>OTHER / GRASSES</b>                        |                      |            |    |    |   |    |   |               |                      |
| <i>Aristida purpurea</i>                      | purple threeawn      |            |    |    |   | 2  |   | 2             | 27.0                 |
| <i>Maurandya antirrhiniflora</i>              | snapdragon vine      |            | 1  |    |   |    |   | 1             | 13.5                 |
| <i>Muhlenbergia porteri</i>                   | bush muhly           | 1          | 1  |    |   | 1  |   | 3             | 40.5                 |



### CRA Boundary Mapping

CRA mapping was conducted during the site visit in accordance with TOV Addendum G, ESL Resource Science Specifications and Definitions, as well as Section 2.3.1 of the Pima County Regional Flood Control District Technical Procedure 116: Quantitative Methods for Regulated Riparian Habitat Boundary Modifications and On-Site Vegetation Surveys (PC Section 2.3.1). The boundary was field-mapped with GPS and then smoothed.

The CRA boundary was delineated based on the following:

- Addendum G.1.b, *“The lateral riparian boundary is a contiguous line along the canopy margins of the predominant overstory vegetation species parallel to a riparian area, where the lateral distance between canopy margins of individuals of the predominant plant species is less than two times the height of the tallest individuals. Where the distance between canopy margins parallel to the channel are greater than two times the height of the tallest individuals, the boundary is considered to be the top of bank of the channel.”*
- PC Section 2.3.1, *“The boundaries of homogenous riparian habitat units will be field verified and mapped on current aerial photographs, rectified to the proposed project’s engineering and planning base maps. Mapping should be based upon 1”=200’ aerial photographs and the basis and rationale for the delineation of the riparian from upland habitat clearly articulated. When the transition of riparian and upland areas is gradual, the line shall be drawn at the point where the habitat is clearly upland based upon factors such as species composition, vegetation density, and topography.”*

Mapped CRA is shown on the Project Site Map, p. 13. The CRA is defined by the density of vegetation (including distance between tree canopies), the higher presence of xeroriparian species such as mesquite and thornscrub, and the absence / lower density of plant species typical of the upland habitat. Refer to Vegetation within the Project Site, p. 9, for detailed plant species presence. It should be noted that the xeroriparian plant species are more abundant in riparian areas, but not restricted to these areas. These riparian facultative species are also found outside of the riparian area, but in lower numbers.

### Additional CRA criteria

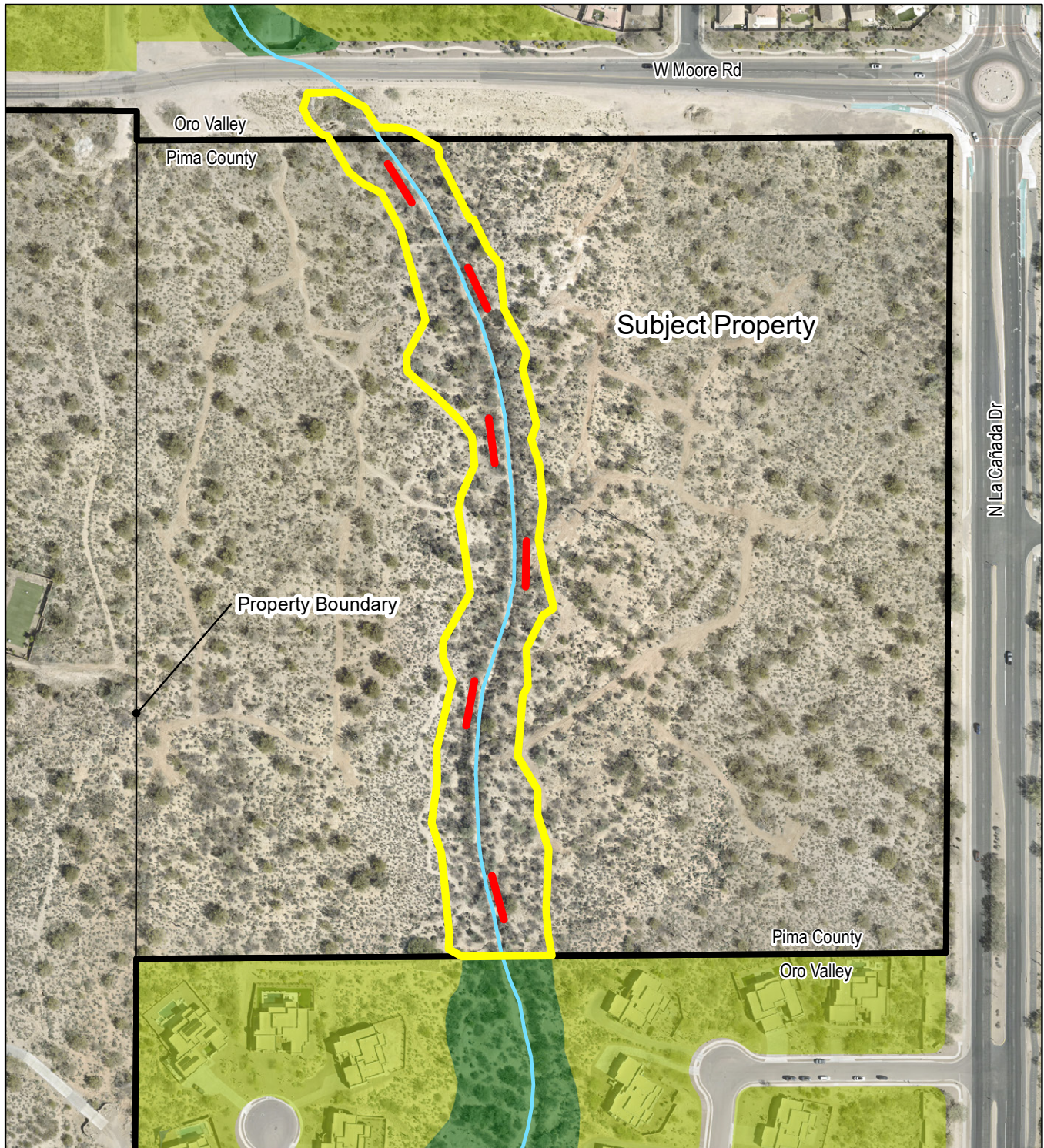
There are no rock outcrop / boulder formations meeting the Town criteria (D.3.b.iii.b), *“Rock outcrops and boulders are comprised of exposed bedrock formations and boulder piles and scatters with a minimum size of one hundred (100) square feet as measured horizontally, and a minimum of ten (10) vertical feet.”*

The site does not contain any Distinct Habitat Resources as defined in Town criteria D.3.b.iii.c:

1. *Natural caves, crevices, or mine shafts with a minimum cavity area of two hundred twenty (220) cubic feet (approximately six (6) feet by six (6) feet by six (6) feet). Excavations or test pits are not included.*
2. *Groundwater seeps, whether intermittent or perennial.*



## PROJECT SITE MAP WITH MAPPED CRA BOUNDARY + TRANSECT LOCATIONS



## Project Site - Legend

- Transect Location
- CRA - Mapped
- Jurisdictional Boundaries
- TOV ESL CRA
- TOV ESL RMA Tier 1
- Major Wash > 2,000 CFS

0 150 300 450  
Feet



Aerial Date: May 19, 2022  
Source: PimaMaps

DECEMBER 26, 2022





View looking north up the watercourse from the southern project site boundary.



View looking south down the watercourse from Moore Rd (just north of the northern site boundary).



## REFERENCES

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## APPENDIX A: ESL MAPPING LETTER





*An Employee-Owned Company*

December 20, 2022

Ms. Jennifer Patton  
Principal  
Wilder Landscape Architects  
2738 E. Adams Street  
Tucson, AZ 85716

Reference: Oro Valley Environmentally Sensitive Lands Mapping for the 35-Acre Property at North La Cañada and West Moore Road (RECON Number 10273)

Dear Ms. Patton:

RECON Environmental, Inc. (RECON) assisted Wilder Landscape Architects to evaluate and map an approximately 35-acre property (study area) for Environmentally Sensitive Lands for annexation by the Town of Oro Valley. The study area is located west of the intersection of north La Cañada Road and West Moore Road in Pima County, Arizona. RECON evaluated the study area for wildlife habitat, wildlife corridors, Pima County Maeveen Marie Behan Conservation Lands System (MMBCLS), Pima County Multi-Species Conservation Plan resources, and Town of Oro Valley's Environmentally Sensitive Lands (ESL) resources (Zoning Code Section 27.10).

### **Wildlife Habitat and Corridors within the Study Area**

The study area was assessed searching for signs of wildlife presence, foraging, and travel within the study area. Tracts, scat, dens, burrows, and evidence of foraging were noted. Mammal species identified using the area include javelina (*Tayassu tajacu*), mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), desert cottontail (*Sylvilagus audubonii*), desert woodrat (*Neotoma lepida*), also known as pack rats, round-tail ground squirrel (*Xerospermophilus tereticaudus*), Harris's antelope squirrel (*Ammospermophilus harrisi*), kangaroo rats (*Dipodomys* spp.), and desert mice (*Perognathus* spp.).

A variety of bird species were found within the study area, including Gambel's quail (*Callipepla gambelii*), white winged dove (*Zenaida asiatica*), mourning dove (*Zenaida macroura*), phainopepla (*Phainopepla nitens*), Gila woodpecker (*Melanerpes uropygialis*), ladder-backed woodpecker (*Picoides scalaris*), common raven (*Corvus corax*), cactus wren (*Campylorhynchus brunneicapillus*), house sparrow (*Passer domesticus*), hummingbirds (likely Costa's or Anna's [*Calypte* spp.]), verdin (*Auriparus flaviceps*), curve-billed thrasher (*Toxostoma curvirostre*), black-tailed gnatcatcher (*Polioptila melanura*), house finch (*Carpodacus mexicanus*), and Cooper's hawk (*Accipiter cooperii*).

Although no reptiles (snakes, amphibians, and lizards) were observed during the site visit due to the temperature range, habitat for these species occurs throughout the study area and a variety of snakes and lizards are likely to occur. Adjacent to the riparian area/wash, two potential Sonoran Desert tortoise (*Gopherus morafkai*) burrows were observed.

Wildlife habitat features within the study area include diverse native vegetation used for nesting, foraging, and roosting, with higher density vegetation found along the riparian area/wash located in the central portion. Several coyote dens were found adjacent to the riparian area/wash (Attachment 1: Photographs 1-3). Several javelina bed down areas were also found under trees adjacent to the riparian area/wash (Attachment 1: Photographs 4 and 5). A variety of tracks were found within the riparian area/wash sandy bottom, including javelina, coyote, deer, and bobcat

(Attachment 1: Photo 6) indicating extensive use of the area for wildlife movement between habitats. Wildlife tracks (primarily coyote and javelina) were also found throughout the study area.

In addition, wildlife tracks were found outside and within culverts located at the north end of the study area. Wildlife tracks were also found within the culvert leading to the study area that passes under Moore Road.

### Pima County Maeveen Marie Behan Conservation Lands System

The study area is located within the Pima County MMBCLS, which identifies locations of priority biological resources and provides policy guidelines for the conservation of these resources. The study area is mapped under the Multiple Use Management Area category (Pima County 2022), defined below:

**Multiple Use Management Areas** are those areas where biological values are significant, but do not attain the level associated with Biological Core Management Areas. They support populations of vulnerable species, connect large blocks of contiguous habitat and biological reserves, and support high value potential habitat for three or more priority vulnerable species.

*Landscape conservation objective: 66<sup>2</sup>/3% undisturbed natural open space.*

### Pima County Multi-Species Conservation Plan

The study area is located within the Pima County Planning Area for the Multi-Species Conservation Plan (MSCP), specifically within the Tortolita Fan Subarea. Species covered under the MSCP with modeled potential habitat/potential for occurrence are shown in Table 1 below.

| Table 1<br>MSCP Listed Species Habitat Models and Potential for Occurrence |                                            |                                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Species<br>(Common Name/Scientific Name)                                   | Habitat Model                              | Potential for Occurrence                                                                                                                                                                                                                    |
| <b>Birds</b>                                                               |                                            |                                                                                                                                                                                                                                             |
| Abert's towhee<br>( <i>Melospiza aberti</i> )                              | Low                                        | Potential habitat within riparian area/wash in central portion of study area.                                                                                                                                                               |
| Arizona Bell's vireo<br>( <i>Vireo bellii arizonae</i> )                   | Medium to Low                              | Potential habitat within riparian area/wash in central portion of study area.                                                                                                                                                               |
| Cactus ferruginous pygmy owl<br>( <i>Glaucidium brasilianum cactorum</i> ) | High (uplands)<br>Low (riparian area/wash) | Potential habitat based on presence of multiple large saguaros with cavities in upland areas. Study area located within Zone 1 for pygmy owl surveys. Study area is located within the Priority 1 Priority Conservation Area for pygmy owl. |
| Rufous-winged sparrow<br>( <i>Aimophila carpalis</i> )                     | Medium to Low                              | Potential habitat primarily within upland portions of study area. The study area is located within the Priority Conservation Area for this species.                                                                                         |
| Swainson's hawk<br>( <i>Buteo swainsoni</i> )                              | Medium to Low                              | Potential habitat primarily within upland portions of study area.                                                                                                                                                                           |
| Western burrowing owl<br>( <i>Athene cunicularia hypugaea</i> )            | Medium to Low                              | Potential habitat primarily within upland portions of study area.                                                                                                                                                                           |



| Table 1<br>MSCP Listed Species Habitat Models and Potential for Occurrence     |                       |                                                                                                                                                            |
|--------------------------------------------------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Species<br>(Common Name/Scientific Name)                                       | Habitat Model         | Potential for Occurrence                                                                                                                                   |
| <b>Mammals</b>                                                                 |                       |                                                                                                                                                            |
| California leaf-nosed bat<br>( <i>Macrotus californicus</i> )                  | High to Medium        | High potential within central portion and medium potential within remainder of study area.                                                                 |
| Lesser long-nosed bat<br>( <i>Leptonycteris yerbabuenae</i> )                  | High to Medium        | High potential within central portion and medium potential within remainder of study area.                                                                 |
| Merriam's mouse<br>( <i>Peromyscus merriami</i> )                              | Medium                | Study area is potential habitat for this species.                                                                                                          |
| Mexican long-tongued bat<br>( <i>Choeronycteris mexicana</i> )                 | Medium to Low         | Medium potential within central portion and low potential within remainder of study area.                                                                  |
| Pale Townsend's big-eared bat<br>( <i>Corynorhinus townsendii pallascens</i> ) | High, Medium, and Low | Primarily low potential habitat, with medium within central portions and a small area of high potential habitat along a portion of the riparian area/wash. |
| Western red bat<br>( <i>Lasiurus blossevillei</i> )                            | Low                   | Minimal potential habitat within study area.                                                                                                               |
| Western yellow bat<br>( <i>Lasiurus xanthinus</i> )                            | Medium to Low         | Medium potential within riparian area/wash and low potential within remainder of study area.                                                               |
| <b>Reptiles</b>                                                                |                       |                                                                                                                                                            |
| Tucson shovel-nosed snake<br>( <i>Chionactis occipitalis klauberi</i> )        | Medium to Low         | Medium potential within riparian area/wash and low potential within remainder of study area.                                                               |
| <b>Plants</b>                                                                  |                       |                                                                                                                                                            |
| Tumamoc globeberry<br>( <i>Tumamoca macdougalii</i> )                          | Medium to Low         | Medium potential within central portion and low potential within remainder of study area.                                                                  |
| SOURCE: Pima County 2020.                                                      |                       |                                                                                                                                                            |

## Wildlife Habitat Assessment Results

### Zoning Code

As detailed in the ESL Zoning Code 27.10 D.1 (Town of Oro Valley 2019), the ESL represents an interconnected system of resource conservation. The components of the system include seven distinct categories for the purpose of conserving resources as open space. Key and essential biological resources are included in four ESL categories:

- Major wildlife linkage;
- Critical resource;
- Core resources; and
- Resource management.

As detailed in ESL Zoning Code 27.10 D.3.b, the critical resource area open space category includes the following environmentally sensitive resources:

- Riparian areas and minor wildlife linkages
- Major rock outcrops and boulders
- Distinctive habitat resource

Riparian areas occur in association with a spring, cienega, lake, water course, river, stream, creek, wash, arroyo, or other body of water, either surface or subsurface, or any channel having banks and beds through which water flows, at least periodically.

Minor wildlife linkages are composed of upland areas and degraded riparian areas. Degraded areas include hardened drainage ways and constricting drainage structures. These minor links are important in maintaining connectivity within the open space system identified in the ESL.

### **Assessment Results**

The riparian area/wash portion of the study area meets the criteria for designation as a Critical Resource Area Riparian Area/Minor Wildlife Linkage based on the following:

- The study area includes a wash/drainage channel having banks and beds through which water flows periodically.
- The wash/drainage is connected in the north and south to an ESL mapped Critical Resource Area wash (Attachment 2: Town of Oro Valley ESL Sensitive Lands map).
- Evidence of wildlife use through the wash/drainage area, including use of culverts under Moore Road to the north.

The remainder of the study area (upland portions) meet the criteria for Resource Management Area (RMA) Tier 1 based on the following:

- The study area is located within the Pima County MMBCLS Multiple Use Management Area category.
- The study area has modeled potential habitat for more than three priority vulnerable species as listed in the MSCP (see Table 1).
- The study area wildlife linkage connects open space and RMA Tier 1 (66 percent open space) areas north of Moore Road with RMA Tier 1 areas to the south.

Thank you for the opportunity to conduct this ESL mapping project. Please contact us if you have any questions or need any additional information.

Sincerely,



Susy Morales  
Senior Wildlife Biologist/Environmental Planner

SMM:sh

Attachments

## References Cited

### Pima County

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### Town of Oro Valley

- 2019 Oro Valley Zoning Code 27.10: Environmentally Sensitive Lands. Ordinance (O)19-06, passed July 31, 2019. 90 pp.



## ATTACHMENTS

## ATTACHMENT 1

Photographs



PHOTOGRAPH 1  
Coyote Den (1) Found within the Study Area



PHOTOGRAPH 2  
Coyote Den (2) Found within the Study Area





PHOTOGRAPH 3  
Coyote Den (3) Found  
within the Study Area



PHOTOGRAPH 4  
Javelina Bed Down Area (1) Found  
within the Study Area





PHOTOGRAPH 5  
Javelina Bed Down Area (2) Found within  
the Study Area

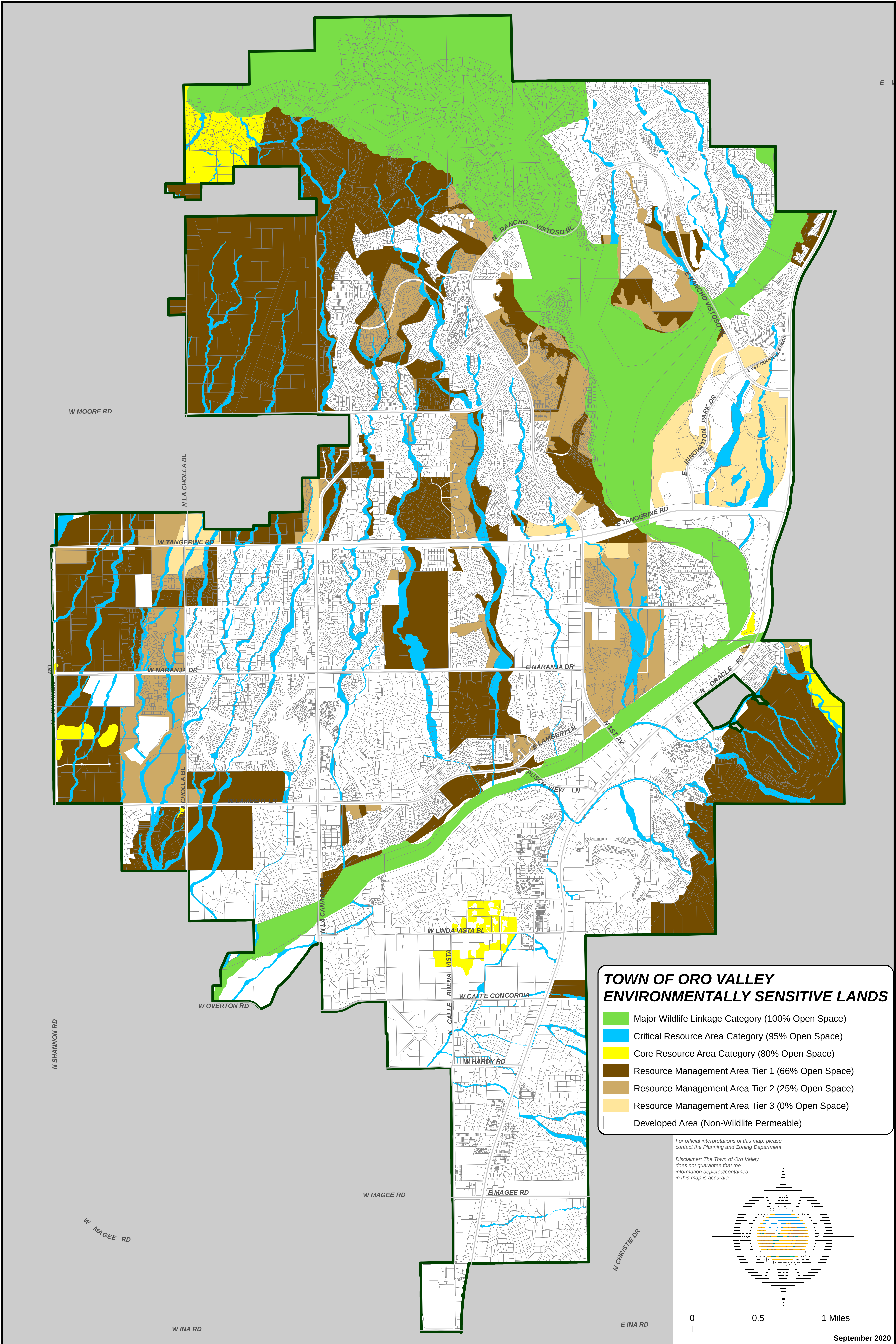


PHOTOGRAPH 6  
Riparian Area/Wash Wildlife Tracks Found within  
the Study Area

## **ATTACHMENT 2**

Town of Oro Valley ESL Sensitive Lands Map



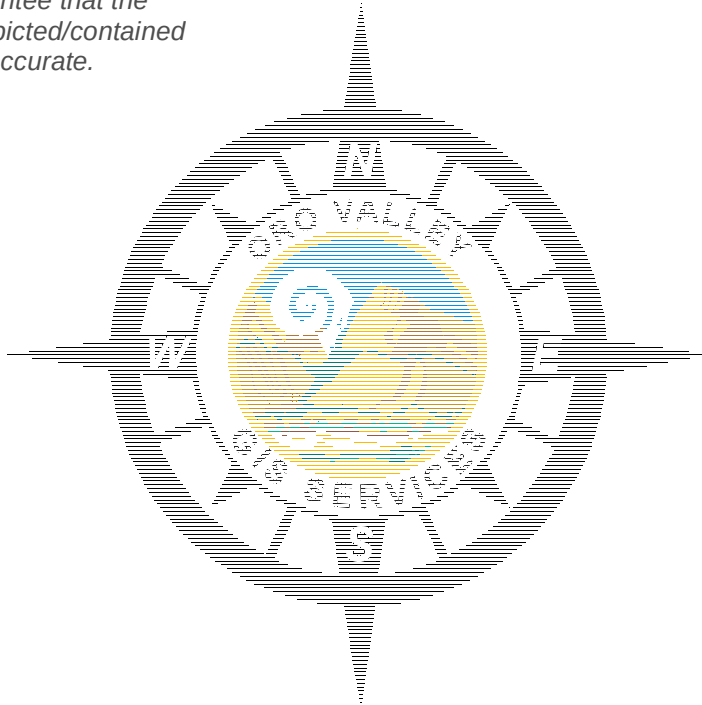


**TOWN OF ORO VALLEY  
ENVIRONMENTALLY SENSITIVE LANDS**

- Major Wildlife Linkage Category (100% Open Space)
- Critical Resource Area Category (95% Open Space)
- Core Resource Area Category (80% Open Space)
- Resource Management Area Tier 1 (66% Open Space)
- Resource Management Area Tier 2 (25% Open Space)
- Resource Management Area Tier 3 (0% Open Space)
- Developed Area (Non-Wildlife Permeable)

For official interpretations of this map, please contact the Planning and Zoning Department.

Disclaimer: The Town of Oro Valley does not guarantee that the information depicted/contained in this map is accurate.



0 0.5 1 Miles



## APPENDIX B: ESL CULTURAL RESOURCES REPORT

A CLASS III CULTURAL RESOURCES SURVEY  
ACROSS 36.4 ACRES OF PRIVATE LAND,  
PARCEL 219-49-003A, PIMA COUNTY, ARIZONA

Prepared for:  
**Bowers Environmental**

Prepared and submitted by:  
**MCA Consulting**  
Joseph Howell and Michael Cook  
12190 North Tall Grass Drive  
Oro Valley, Arizona 85755

January 3, 2022  
MCA Cultural Resources Report No. 2021.058





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**1. REPORT TITLE**

**1a. Report Title:** A Class III Cultural Resources Survey Across 36.4 Acres of Private Land, Parcel 219-49-003A, Pima County, Arizona

**1b. Report Authors:** Joseph Howell, Michael Cook

**1c. Report Date:** January 3, 2022 **1d. Report No.:** MCA 2021.058

**2. PROJECT REGISTRATION/PERMITS**

**2a. ASM Accession Number:** N/A

**2b. AAA Permit Number:** N/A

**2c. ASLD Permit Application Number:** N/A

**2d. Other Permit Numbers:** N/A

**3. ORGANIZATION/CONSULTING FIRM**

**3a. Name:** MCA Consulting

**3b. Internal Project Number:** MCA 2021.058

**3c. Internal Project Name:** Moore Road and La Canada Class III

**3d. Contact Name:** Michael Cook

**3e. Contact Address:** 12190 N. Tall Grass Dr., Oro Valley, Arizona 85755

**3f. Contact Phone:** (520) 203-4902

**3g. Contact Email:** mike@mca-arizona.com

**4. SPONSOR/LEAD AGENCY**

**4a. Sponsor:** Bowers Environmental on behalf of private developer

**4b. Lead Agency:** Pima County Office of Cultural Resources and Historic Preservation

**4c. Agency Project Number:** N/A

**4d. Agency Project Name:** N/A

**4e. Funding Source:** Private

**4f. Other Involved Agencies:** N/A

**4g. Applicable Regulations:** Arizona Antiquities Act, A.R.S. §41-841 *et seq.*, and all implementing rules; Pima County Board of Supervisors Policy C 3.17 and Pima County Board of Supervisors Resolution 1983-104

**5. DESCRIPTION OF PROJECT OR UNDERTAKING:** Residential development

**6. PROJECT AREA:** The Project Area consists of one rectangular 36.4-acre parcel.

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**7. PROJECT LOCATION**

**7a. Address:** Parcel 219-49-003A

**7b. Route:** N/A

**7c. Mileposts Limits:** N/A

**7d. Nearest City:** Oro Valley, Arizona

**7e. County:** Pima

**7f. Project Locator UTM:** 500438 Easting; 358862 Northing

**7g. NAD** 83

**7h. Zone:** 12

**7i. Baseline & Meridian:** G&SRB&M

**7j. USGS Quadrangle:** *Oro Valley, Arizona*

**7k. Legal Description:** NW  $\frac{1}{4}$  of the NW  $\frac{1}{4}$  of Section 35, Township 11 South, Range 13 East

**8. SURVEY AREA**

**8a. Total Acres:** 36.4

**8b. Survey Area.**

| 1. Land Jurisdiction | 2. Total Acres Surveyed | 3. Total Acres Not Surveyed | 4. Justification for Areas Not Surveyed |
|----------------------|-------------------------|-----------------------------|-----------------------------------------|
| Private              | 36.4                    | 0                           | N/A                                     |

**9. ENVIRONMENTAL CONTEXTS**

**9a. Landform:** Alluvial fan

**9b. Elevation:** 2,870 feet amsl

**9c. Surrounding Topographic Features:** The Project Area is dominated by the Tortolita Mountains to the northwest, and by the Santa Catalina Mountains to the east.

**9d. Nearest Drainage:** A prominent but unnamed drainage runs through the center of the surveyed parcel.

**9e. Local Geology:** The Project Area spans two geological units, the Quaternary surficial deposits, undivided unit (unconsolidated to strongly consolidated alluvial and eolian deposits that include coarse, poorly sorted alluvial fan and terrace deposits on middle and upper piedmonts and along large drainages; sand, silt and clay on alluvial plains and playas; and wind-blown sand deposits); and the Pliocene to middle Miocene deposits unit (moderately to strongly consolidated conglomerate and sandstone deposited in basins during and after late Tertiary faulting. Includes lesser amounts of mudstone, siltstone, limestone, and gypsum. These deposits are generally light gray or tan. They commonly form high rounded hills and ridges in modern basins, and locally form prominent bluffs. Deposits of this unit are widely exposed in the dissected basins of southeastern and central Arizona).



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**9f. Vegetation:** The Project Area is within the Arizona Upland Subdivision, Semidesert Grassland biotic community (Brown 1994). Vegetation within the Project Area is consistent with plants typically found in this biotic community and includes mesquite, palo verde, cholla, prickly pear, catclaw, barrel cactus, datura, and annual grasses.

**9g. Soils/Deposition:** Soils in the Project Area include Hayhook-Sahuarita complex, 1 to 5 percent slopes; and Palos Verdes-Jaynes complex, 2 to 8 percent slopes (Natural Resources Conservation Service 2021). Soils observed during field survey consisted of loosely compacted sandy loam.

**9h. Buried Deposits:** Not likely

**9i. Justification:** Low potential for subsurface cultural deposits in Project Area.

**10. BUILT ENVIRONMENT:** Modern, paved roads (West Moore Road and La Canada Drive) run along the north and east Project Area boundaries. Barbed wire fencing runs along the western edge of the Project Area. An informal walking trail trends approximately north-south along the west side of a large drainage near the center of the Project Area. Modern residential houses are south of the Project Area.



**Photo 1.** Project Area overview; view to north.

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**11. INVENTORY CLASS COMPLETED**

**11a. Class I Inventory:** ☒

**11b. Class I Search Radius:** ☒ 1 mile ☐ ½ mile

**11b. Researcher:** Joseph Howell

**11c. Class II Survey:** ☐

**11d. Sampling Strategy:** N/A

**11e. Class III Inventory:** ☒

**12. BACKGROUND RESEARCH SOURCES**

**12a. AZSITE:** ☒

**12b. ASM Archaeological Records Office:** ☐

**12c. SHPO Inventories and/or SHPO Library:** ☐

**12d. NRHP Database:** ☒

**12e. ADOT Portal:** ☐

**12f. Land-Managing Agency Files:** N/A

**12g. Tribal Cultural Resources Files:** N/A

**12h. Local Government Websites:** N/A

**12i. GLO Maps:** No historical structures or cultural features intersect the Project Area on the original General Land Office (GLO) plat encompassing the Project Area (Bureau of Land Management 2021a; GLO 1924).

**12j. Original Land Patents:** Historic land patent records for Section 35 of Township 11 South, Range 13 East were reviewed. The review indicated that the northern half of Section 35 was claimed under Patent No. 1050397, filed by William J. Hedgepeth, and dated October 12, 1931. This claim also encompassed portions of Section 26, immediately to the north. (Bureau of Land Management 2021b).

**12k. USGS Topographic Maps:** The Class I Study Area is covered by several historic USGS maps (USGS 2021). No historic features intersect the Project Area. However, some historic road features were adjacent or near the Project Area boundaries.

| Map Name | Scale     | Date                                | Cultural Features                                              |
|----------|-----------|-------------------------------------|----------------------------------------------------------------|
| Tucson   | 1:125,000 | 1904 (1957 edition)                 | No features depicted.                                          |
| Tucson   | 1:125,000 | 1905 (1905 and subsequent editions) | No features depicted.                                          |
| Tucson   | 1:250,000 | 1956 (1967                          | An unimproved dirt road borders the Project Area on the north. |



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| Map Name     | Scale     | Date                                     | Cultural Features                                                                                                                                                                                             |
|--------------|-----------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |           | edition)                                 |                                                                                                                                                                                                               |
| Mount Lemmon | 1:62,500  | 1957 (1959 and subsequent editions)      | An unimproved dirt road borders the Project Area on the north; Tangerine Road borders Section 35 on the south; a stock tank or similar water retention feature appears in the northwest corner of Section 36. |
| Tucson       | 1:250,000 | 1958 (1958 edition)                      | An unimproved dirt road borders the Project Area on the north; a corral is depicted just east of the stock tank in Section 36.                                                                                |
| Tucson       | 1:250,000 | 1959 (1959 edition)                      | An unimproved dirt road borders the Project Area on the north; a corral is depicted just east of the stock tank in Section 36.                                                                                |
| Tucson       | 1:250,000 | 1962 (1962 edition); 1964 (1964 edition) | An unimproved dirt road borders the Project Area on the north; the corral and stock tank are not depicted on these maps.                                                                                      |

**12l. Arizona Department of Water Resources (ADWR) Register:** No wells are recorded within the Project Area. Numerous wells are located within the Class I Study Area, but only one is greater than 50 years of age (Registration No. 55-639929, construction completed December, 1970) (ADWR 2021).

**12m. Historical Mining Records:** No historical mining features or claims have been documented in the Project Area (Mineral Resource Data System 2021; Arizona Geological Survey 2021).

### 13. BACKGROUND RESEARCH RESULTS

**13a. Previous Surveys Adjacent to the Project Area.** The Project Area has not been previously surveyed. Four previous survey projects have been conducted adjacent to the Project Area.

| 1. Project No. | 2. Project Name                                                  | 3. Author | 4. Year |
|----------------|------------------------------------------------------------------|-----------|---------|
| 2010-399.ASM   | La Canada Moore Road                                             | Granger   | 2009    |
| 2013-123.ASM   | Kingair Road Cultural Resources Survey (P.A.S.T. Project 041652) | Stephen   | 2004    |
| 2003-568.ASM   | Oro Valley Effluent Pipeline Survey and Monitoring               | Wegener   | 2005    |
| 2018-454.ASM   | TOV Northwest Recharge, Recovery, and Delivery System            | Stone     | 2019    |

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**13b. Previously Recorded Cultural Resources Within Class I Study Area.** No previously recorded sites have been documented within the Project Area. Fourteen sites have been documented within the Class I Study Area.

| 1. Site Number/Name                  | 2. Affiliation                           | 3. Site Type                            | 4. Eligibility Status           | 5. Associated Reference(s) |
|--------------------------------------|------------------------------------------|-----------------------------------------|---------------------------------|----------------------------|
| AZ BB:9:180(ASM)                     | Hohokam, Ceramic period (A.D. 200-1500)  | Artifact scatter                        | Not evaluated                   | Craig and Wallace 1987     |
| AZ BB:9:181(ASM)                     | Hohokam, Ceramic period (A.D. 200-1500)  | Artifact scatter with possible features | Not evaluated                   | Craig and Wallace 1987     |
| AZ BB:9:182(ASM)                     | Hohokam, Ceramic period (A.D. 200-1500)  | Artifact scatter                        | Not evaluated                   | Craig and Wallace 1987     |
| AZ BB:9:183(ASM)                     | Hohokam, Ceramic period (A.D. 200-1500)  | Artifact scatter with features          | Not evaluated                   | Craig and Wallace 1987     |
| AZ BB:9:184(ASM)                     | Hohokam, Ceramic period (A.D. 200-1500)  | Artifact scatter                        | Not evaluated                   | Craig and Wallace 1987     |
| AZ BB:9:185(ASM)                     | Hohokam, Ceramic period (A.D. 200-1500)  | Artifact scatter                        | Not evaluated                   | Craig and Wallace 1987     |
| AZ BB:9:188(ASM)                     | Hohokam Sedentary period (A.D. 950-1100) | Artifact scatter with feature           | Not evaluated                   | Craig and Wallace 1987     |
| AZ AA:12:779(ASM)                    | Hohokam, Ceramic period (A.D. 200-1500)  | Artifact scatter                        | Not evaluated                   | Swartz 1995                |
| AZ BB:9:299(ASM)                     | Hohokam, Ceramic period (A.D. 200-1500)  | Artifact scatter                        | Not evaluated                   | Swartz 1995                |
| AZ BB:9:392(ASM)                     | Hohokam, Ceramic period (A.D. 200-1500)  | Artifact scatter with feature           | Not evaluated                   | Stephen 2004               |
| AZ BB:9:414(ASM)                     | Hohokam Classic period (A.D. 1100-1450)  | Artifact scatter                        | Recommended eligible (recorder) | Cook and Harrison 2007     |
| AZ A:12:1122(ASM)/<br>Tangerine Road | Historic period (A.D. 1500-1950)         | Feature                                 | Not evaluated                   | Deaver 2013                |
| AZ BB:9:174(ASM)                     | Hohokam, Ceramic period (A.D. 200-1500)  | Artifact scatter with features          | Not evaluated                   | Craig and Wallace 1987     |
| <i>Newly Recorded Site</i>           |                                          |                                         |                                 |                            |
| AZ BB:9:359(ASM)                     | -                                        | -                                       | -                               | Stephen 2001               |



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SURVEY REPORT SUMMARY FORM**

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**13c. Historic Buildings/Districts/Neighborhoods.**

A review of NRHP properties indicates there are no listed historic properties within the review area. The nearest listed property is Steam Pump Ranch, about 3.2 miles southeast of the Project Area (National Park Service 2020).

**14. CULTURAL CONTEXTS**

**14a. Prehistoric Culture:** Archaic, Hohokam

**14b. Protohistoric Culture:** Spanish, A.D. 1452 to 1700s

**14c. Indigenous Historic Culture:** Apache, O'odham

**14d. Euro-American Culture:** Historic, 1870s to 1971

**15. FIELD SURVEY PERSONNEL**

**15a. Principal Investigator:** Michael Cook

**15b. Field Supervisor:** Michael Cook

**15c. Crew:** N/A

**15d. Fieldwork Date:** December 28<sup>th</sup> and 29<sup>th</sup>, 2021

**16. SURVEY METHODS**

**16a. Transect Intervals:** 20 m apart

**16b. Coverage (%):** 100

**16c. Site Recording Criteria:** Revised Site Definition Policy, Arizona State Museum (Fish 1995)

**16d. Ground Surface Visibility:** 85%

**16e. Observed Disturbances:** An informal walking trail trends approximately north-south along the west side of a large drainage near the center of the Project Area.

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**17. FIELD SURVEY RESULTS**

**17a. No Cultural Resources Identified:** ☐

**17b. Isolated Occurrences (IOs) Only:** ☒

**17c. Number of IOs Recorded:** 12

| 1. IO | 2. Description                                         | 3. Date Range               | 4. UTM's |          |
|-------|--------------------------------------------------------|-----------------------------|----------|----------|
|       |                                                        |                             | NAD 1983 |          |
|       |                                                        |                             | Easting  | Northing |
| IO-1  | 1 plainware body sherd; 1 red-on-brown ware body sherd | Prehistoric, Ceramic period | 500446   | 3588690  |
| IO-2  | 2 plainware body sherds                                | Prehistoric, Ceramic period | 500454   | 3588673  |
| IO-3  | 1 plainware body sherd                                 | Prehistoric, Ceramic period | 500544   | 3588696  |
| IO-4  | 1 plainware body sherd                                 | Prehistoric, Ceramic period | 500550   | 3588638  |
| IO-5  | 1 plainware body sherd                                 | Prehistoric, Ceramic period | 500569   | 3588658  |
| IO-6  | 1 plainware body sherd                                 | Prehistoric, Ceramic period | 500562   | 3588706  |
| IO-7  | 2 plainware body sherds                                | Prehistoric, Ceramic period | 500578   | 3588719  |
| IO-8  | 1 plainware body sherd                                 | Prehistoric, Ceramic period | 500666   | 3588643  |
| IO-9  | 1 core, multidirectional, rhyolite, 5-cm-diameter      | Prehistoric                 | 500721   | 3588751  |
| IO-10 | 1 plainware body sherd                                 | Prehistoric, Ceramic period | 500733   | 3588853  |
| IO-11 | 5 plainware body sherds, within 10-meter-area          | Prehistoric, Ceramic period | 500714   | 3588879  |
| IO-12 | 1 core, multidirectional, basalt, 6-cm-diameter        | Prehistoric                 | 500711   | 3588891  |

**18. COMMENTS:** No new or previously recorded sites, structures, buildings, or districts are present in the Project Area. The isolates documented in the Project Area do not meet the ASM definition of an archaeological site. They have been thoroughly documented, and they lack further research potential. Accordingly, the isolated cultural resources documented during this project are recommended ineligible for inclusion on the National Register of Historic Places (NRHP). MCA recommends a finding of **No Historic Properties Affected**. No further archaeological investigations are recommended.

**SECTION 19. ATTACHMENTS**

**19a.** Project location map: ☒

**19b.** Land jurisdiction map: ☒

**19c.** Background research map, previous sites and surveys: ☒

**19d.** Historical General Land Office plat map (GLO 1924): ☒

**19e.** Results of field survey: ☒

**19f.** References: ☒

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**SECTION 20. CONSULTANT CERTIFICATION**

I certify the information provided herein has been reviewed for content and accuracy and all work meets applicable agency standards.



**Signature**

January 3, 2022

**Date**

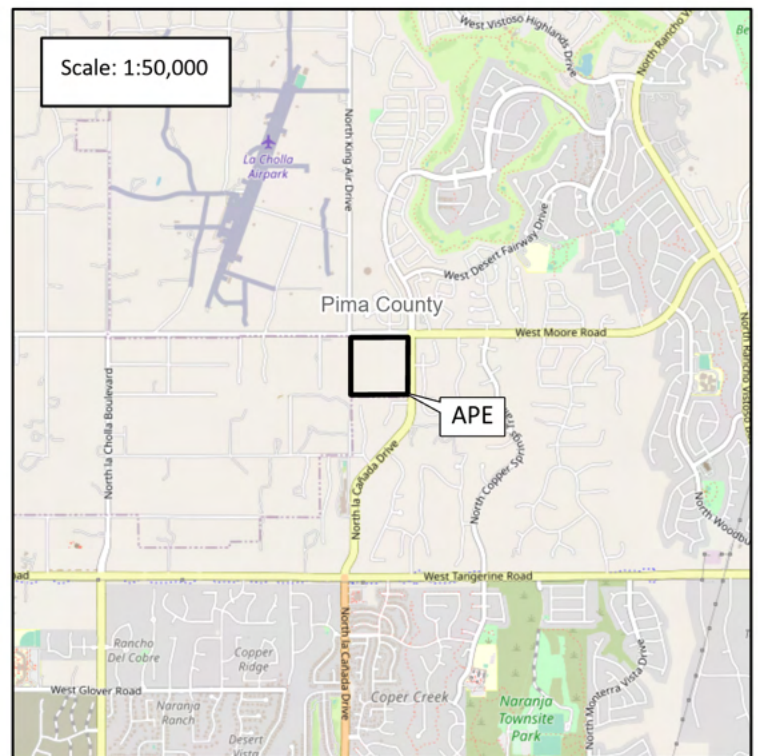
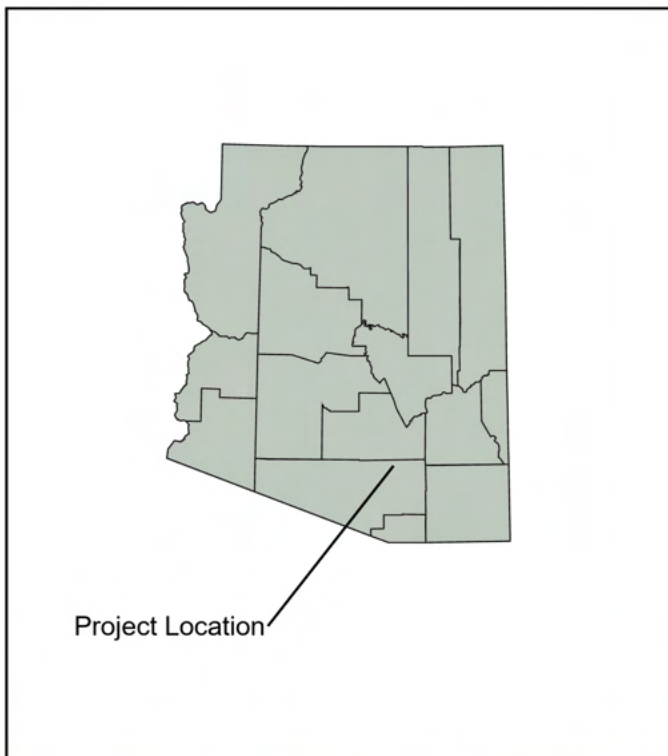
Owner, Principal Investigator

**Title**

**SECTION 21. DISCOVERY CLAUSE**

In the event previously unreported cultural resources are encountered during ground disturbing activities, all work must immediately cease within 30 meters (100 feet) until a qualified archaeologist has documented the discovery and evaluated its eligibility for the Arizona or National Register of Historic Places in consultation with the lead agency, the SHPO, and Tribes, as appropriate. Work must not resume in this area without approval of the lead agency. If human remains are encountered during ground-disturbing activities, all work must immediately cease within 30 meters (100 feet) of the discovery and the area must be secured. The Arizona State Museum, lead agency, SHPO, and appropriate Tribes must be notified of the discovery. All discoveries will be treated in accordance with NAGPRA (Public Law 101-601; 25 U.S.C. 3001-3013) or Arizona Revised Statutes (A.R.S. § 41-844 and A.R.S. § 41-865), as appropriate, and work must not resume in this area without authorization from ASM and the lead agency.



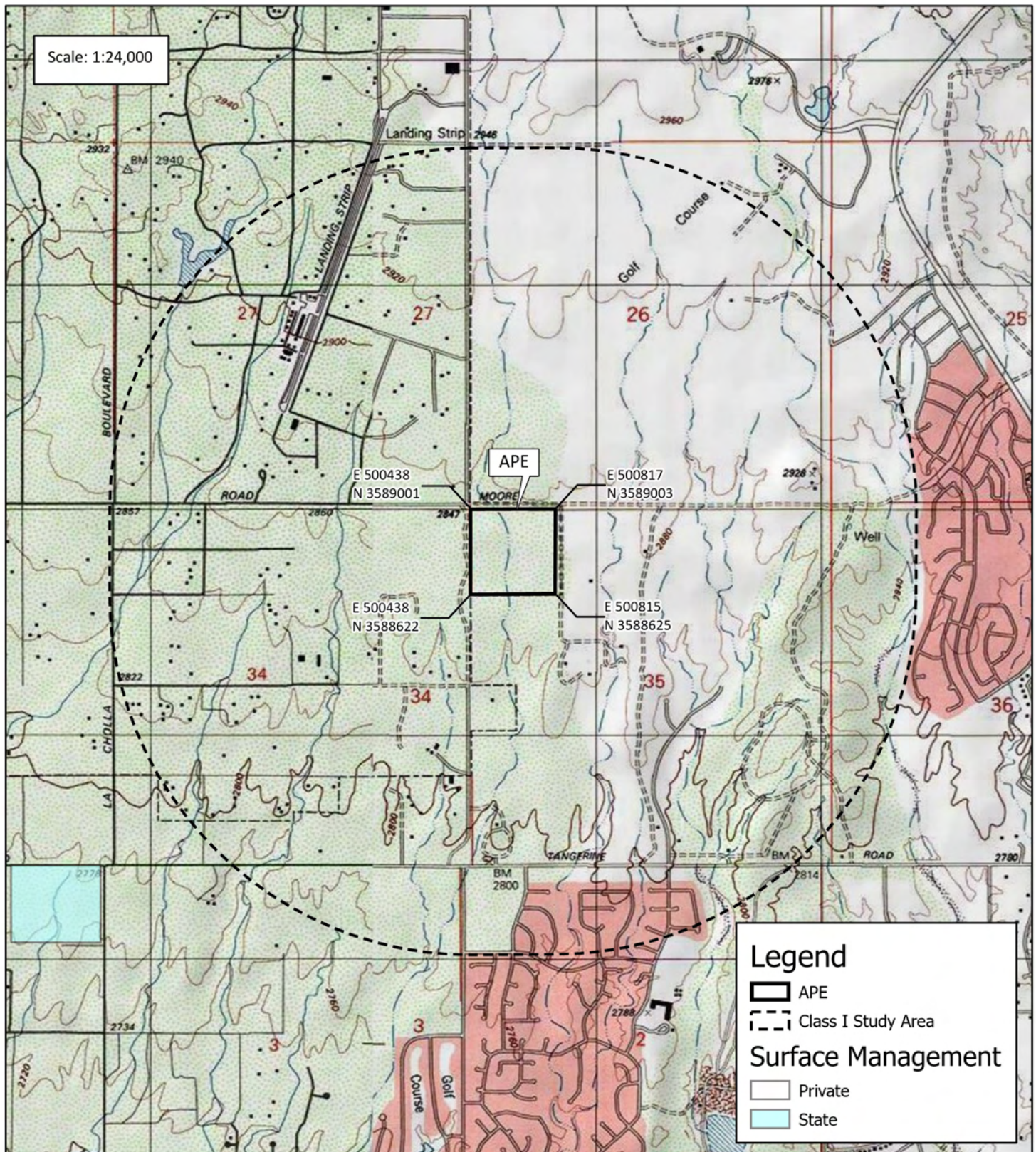


T11S, R13E, Portion of Section 35  
 Oro Valley, Arizona USGS Quadrangle  
 Pima County, Arizona  
 NAD 1983, Z12

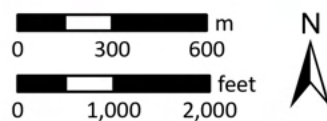


Attachment 19a. Project location map.



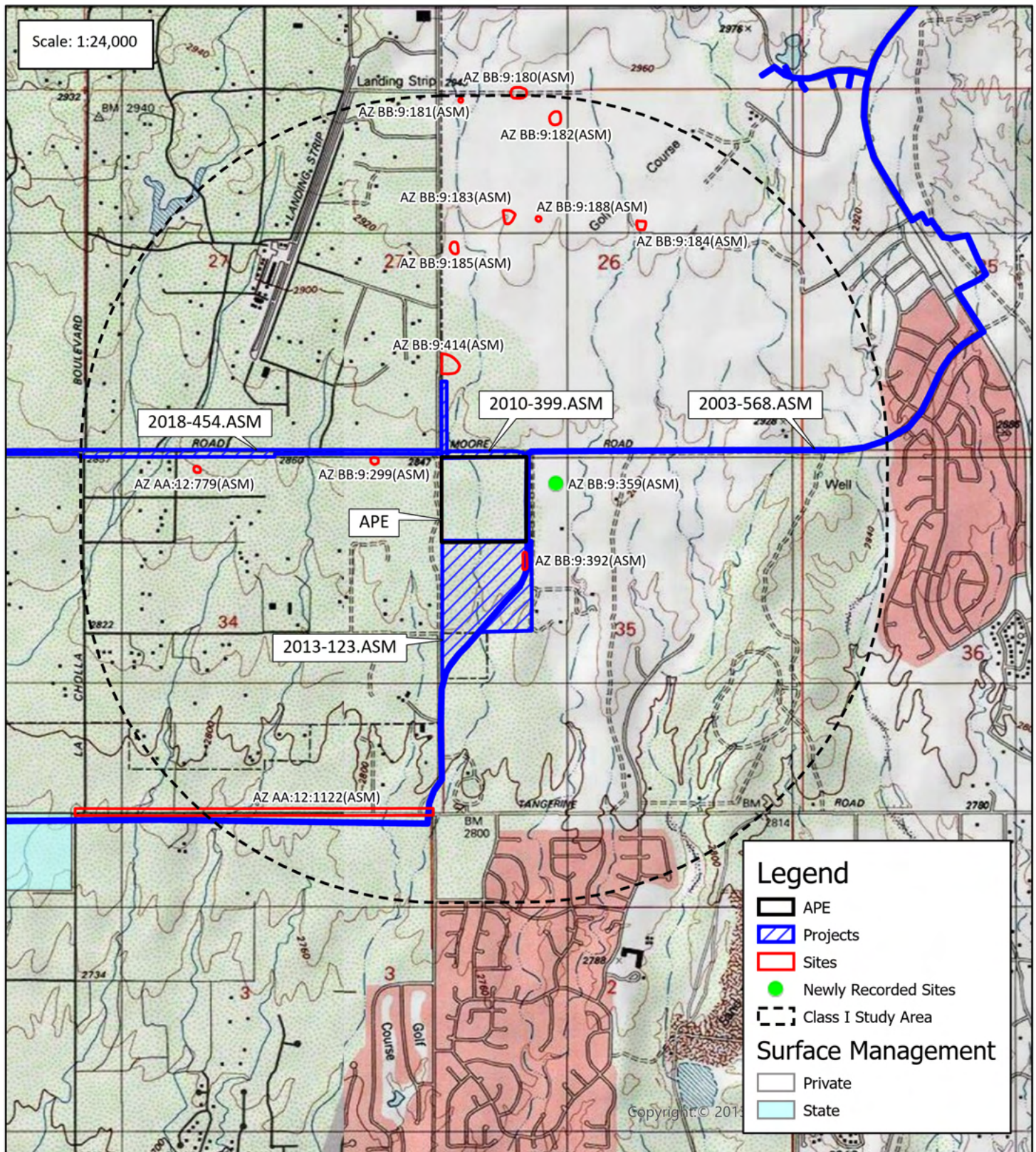


T11S, R13E, Portion of Section 35  
 Oro Valley, Arizona USGS Quadrangle  
 Pima County, Arizona  
 Surface Management: BLM 2019  
 NAD 1983, Z12

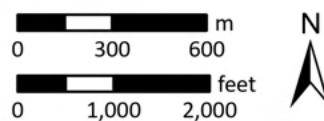


Attachment 19b. Land jurisdiction map.



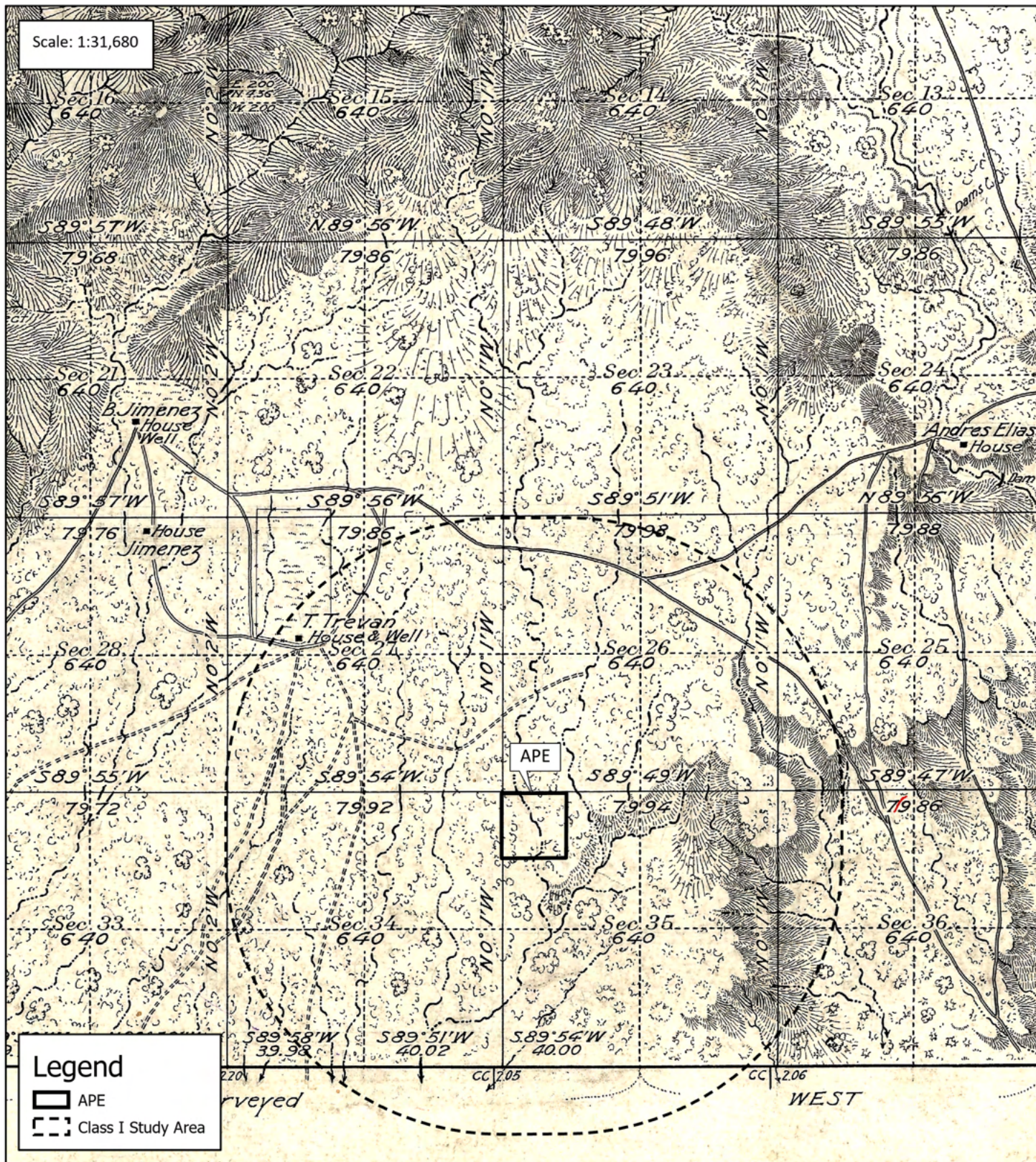


T11S, R13E, Portion of Section 35  
 Oro Valley, Arizona USGS Quadrangle  
 Pima County, Arizona  
 Surface Management: BLM 2019  
 NAD 1983, Z12



Attachment 19c. Background research map, previous sites and surveys.





GLO Plat for Township 11 South, Range 13 East  
Pima County, Arizona







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**Attachment 19f. References:**

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<http://data.azgs.az.gov/geologic-map-of-arizona/>, accessed December 27, 2021.

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National Park Service

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## APPENDIX C: VEGETATIVE VOLUME TRANSECT PHOTOS





PHOTO 1: TRANSECT 1, LOOKING SOUTH



PHOTO 2: TRANSECT 1, LOOKING NORTH





PHOTO 3: TRANSECT 2, LOOKING SOUTH



PHOTO 4: TRANSECT 2, LOOKING NORTH





PHOTO 5: TRANSECT 3, LOOKING SOUTH



PHOTO 6: TRANSECT 3, LOOKING NORTH





PHOTO 7: TRANSECT 4, LOOKING SOUTH



PHOTO 8: TRANSECT 4, LOOKING NORTH





PHOTO 9: TRANSECT 5, LOOKING SOUTH



PHOTO 10: TRANSECT 5, LOOKING NORTH





PHOTO 11: TRANSECT 6, LOOKING SOUTH



PHOTO 12: TRANSECT 6, LOOKING NORTH



## APPENDIX D: VEGETATIVE VOLUME DATA SHEETS

# VEGETATION VOLUME DATA SHEET

Location: SW Corner La Canada & Moore  
Pima County, AZ

Transect No. 1

Date: December 16, 2022

Personnel:

Susy Morales, RECON  
Jennifer Patton, Wilder  
Ben Wilder, Wilder

| Vertical<br>cubic<br>meters | Horizontal Transect Samples (# of cubic decimeters containing vegetation within each vertical meter) |   |    |    |    |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----------------------------|------------------------------------------------------------------------------------------------------|---|----|----|----|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                             | 1                                                                                                    | 2 | 3  | 4  | 5  | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 1                           | 1                                                                                                    |   | 4  | 3  |    |   |   |   |   |    | 6  |    |    | 3  | 4  | 9  | 5  | 2  | 1  |    | 1  | 1  |    |    | 3  |
| 2                           |                                                                                                      | 1 | 8  | 7  | 8  |   |   |   |   |    | 9  | 4  |    |    |    | 7  |    |    | 5  | 6  | 2  |    |    |    |    |
| 3                           | 1                                                                                                    |   | 4  | 4  | 6  |   |   |   |   | 5  | 3  | 2  | 5  | 1  |    |    |    |    | 9  | 10 | 1  |    |    |    |    |
| 4                           | 1                                                                                                    |   |    |    |    |   |   | 3 | 6 | 5  | 4  | 1  | 6  | 8  |    |    |    | 3  | 3  | 3  |    |    |    |    |    |
| 5                           |                                                                                                      |   |    |    |    |   |   |   |   | 3  | 8  | 2  | 6  | 6  | 2  |    |    |    |    |    |    |    |    |    |    |
| 6                           |                                                                                                      |   |    |    |    |   |   |   |   | 7  | 3  | 1  | 4  |    | 1  |    |    |    |    |    |    |    |    |    |    |
| 7                           |                                                                                                      |   |    |    |    |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 8                           |                                                                                                      |   |    |    |    |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 9                           |                                                                                                      |   |    |    |    |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10                          |                                                                                                      |   |    |    |    |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Total                       | 3                                                                                                    | 1 | 16 | 14 | 14 | 0 | 0 | 3 | 6 | 20 | 33 | 10 | 21 | 18 | 7  | 16 | 5  | 5  | 18 | 19 | 4  | 1  | 0  | 0  | 3  |

TVV = 0.948

Photos : 1, 2



# VEGETATION VOLUME DATA SHEET

Location: SW Corner La Canada & Moore  
Pima County, AZ

Transect No. 2

Date: December 16, 2022

Personnel:

Susy Morales, RECON  
Jennifer Patton, Wilder  
Ben Wilder, Wilder

| Vertical<br>cubic<br>meters | Horizontal Transect Samples (# of cubic decimeters containing vegetation within each vertical meter) |    |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----------------------------|------------------------------------------------------------------------------------------------------|----|---|----|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                             | 1                                                                                                    | 2  | 3 | 4  | 5 | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 1                           | 9                                                                                                    | 4  | 3 | 6  | 5 | 4  | 10 | 7  | 2  | 6  | 3  |    | 1  | 1  |    | 4  | 8  | 3  | 3  | 1  | 1  | 3  | 4  | 6  | 4  |
| 2                           | 4                                                                                                    | 8  | 2 | 9  | 4 | 3  | 1  | 6  | 8  | 6  |    |    | 2  |    |    | 8  | 7  | 7  | 6  |    | 5  | 3  | 6  | 2  |    |
| 3                           | 2                                                                                                    | 4  | 3 |    |   |    |    | 8  | 4  | 6  |    |    |    |    |    | 2  | 8  | 10 | 7  | 5  | 10 | 1  | 4  | 3  |    |
| 4                           |                                                                                                      | 1  |   |    |   | 6  | 7  | 5  | 7  | 5  |    |    |    |    |    | 1  | 7  | 1  | 4  |    |    |    |    |    |    |
| 5                           |                                                                                                      |    |   |    |   |    | 2  | 4  | 2  |    |    |    |    |    |    |    |    |    | 3  |    |    |    |    |    |    |
| 6                           |                                                                                                      |    |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 7                           |                                                                                                      |    |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 8                           |                                                                                                      |    |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 9                           |                                                                                                      |    |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10                          |                                                                                                      |    |   |    |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Total                       | 15                                                                                                   | 17 | 8 | 15 | 9 | 13 | 20 | 30 | 23 | 23 | 3  | 0  | 3  | 1  | 0  | 15 | 30 | 21 | 23 | 6  | 16 | 7  | 14 | 11 | 4  |

TVV = 1.308

Photos : 3, 4

# VEGETATION VOLUME DATA SHEET

Location: SW Corner La Canada & Moore  
Pima County, AZ

Transect No. 3

Date: December 16, 2022

Personnel:

Susy Morales, RECON  
Jennifer Patton, Wilder  
Ben Wilder, Wilder

| Vertical<br>cubic<br>meters | Horizontal Transect Samples (# of cubic decimeters containing vegetation within each vertical meter) |   |    |    |    |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----------------------------|------------------------------------------------------------------------------------------------------|---|----|----|----|----|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                             | 1                                                                                                    | 2 | 3  | 4  | 5  | 6  | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 1                           | 2                                                                                                    | 4 | 6  | 4  | 1  | 3  | 5 | 2 | 2 | 2  | 1  | 7  | 5  | 1  |    | 5  | 7  | 6  | 6  | 1  | 4  | 6  | 1  | 1  |    |
| 2                           | 3                                                                                                    | 1 | 3  | 9  | 9  | 4  | 2 |   |   | 2  | 5  | 9  | 1  | 4  |    |    | 5  |    |    | 2  |    |    |    |    |    |
| 3                           |                                                                                                      |   | 2  | 2  | 8  |    |   |   |   | 2  | 7  | 6  | 10 | 6  |    |    |    |    |    |    |    |    |    |    | 2  |
| 4                           |                                                                                                      |   |    |    | 4  | 5  |   |   |   |    | 2  | 5  | 3  |    |    |    |    |    |    |    |    |    |    |    |    |
| 5                           |                                                                                                      |   |    |    |    |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 6                           |                                                                                                      |   |    |    |    |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 7                           |                                                                                                      |   |    |    |    |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 8                           |                                                                                                      |   |    |    |    |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 9                           |                                                                                                      |   |    |    |    |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10                          |                                                                                                      |   |    |    |    |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Total                       | 5                                                                                                    | 5 | 11 | 15 | 22 | 12 | 7 | 2 | 2 | 6  | 15 | 27 | 19 | 11 | 0  | 5  | 12 | 6  | 6  | 3  | 4  | 6  | 1  | 1  | 2  |

TVV = 0.820

Photos : 5, 6



# VEGETATION VOLUME DATA SHEET

Location: SW Corner La Canada & Moore  
Pima County, AZ

Transect No. 4

Date: December 16, 2022

Personnel:

Susy Morales, RECON  
Jennifer Patton, Wilder  
Ben Wilder, Wilder

| Vertical<br>cubic<br>meters | Horizontal Transect Samples (# of cubic decimeters containing vegetation within each vertical meter) |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----------------------------|------------------------------------------------------------------------------------------------------|----|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                             | 1                                                                                                    | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 1                           | 6                                                                                                    | 10 | 7 |   |   |   |   |   | 2 | 3  | 8  | 8  | 1  | 2  | 1  |    |    |    | 1  | 2  | 4  | 2  | 5  | 6  | 3  |
| 2                           | 1                                                                                                    |    |   |   |   |   |   |   |   | 2  | 6  | 3  |    |    |    |    |    |    |    |    |    |    | 6  | 2  |    |
| 3                           | 7                                                                                                    | 3  |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 10 |
| 4                           | 6                                                                                                    | 1  |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 9  |    | 4  | 7  |
| 5                           | 1                                                                                                    |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 5  |    | 5  | 3  |
| 6                           |                                                                                                      |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 7                           |                                                                                                      |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 8                           |                                                                                                      |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 9                           |                                                                                                      |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10                          |                                                                                                      |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Total                       | 21                                                                                                   | 14 | 7 | 0 | 0 | 0 | 0 | 0 | 2 | 5  | 14 | 11 | 1  | 2  | 1  | 0  | 0  | 0  | 1  | 2  | 4  | 16 | 11 | 17 | 23 |

TVV = 0.608

Photos : 7, 8

# VEGETATION VOLUME DATA SHEET

Location: SW Corner La Canada & Moore  
Pima County, AZ

Transect No. 5

Date: December 16, 2022

Personnel:

Susy Morales, RECON  
Jennifer Patton, Wilder  
Ben Wilder, Wilder

| Vertical<br>cubic<br>meters | Horizontal Transect Samples (# of cubic decimeters containing vegetation within each vertical meter) |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----------------------------|------------------------------------------------------------------------------------------------------|----|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                             | 1                                                                                                    | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 1                           | 7                                                                                                    | 9  | 7 | 1 | 2 | 9 | 1 |   | 1 |    | 2  |    | 5  | 8  | 8  | 10 | 8  | 8  | 4  | 7  |    | 4  | 3  | 7  | 1  |
| 2                           | 6                                                                                                    | 7  |   |   |   |   | 1 |   |   |    |    |    |    | 2  | 8  | 3  | 9  |    | 6  |    |    | 4  | 2  | 8  | 7  |
| 3                           |                                                                                                      |    |   |   |   |   |   |   |   |    |    |    |    | 1  |    |    |    |    |    |    |    |    |    |    |    |
| 4                           |                                                                                                      |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 5                           |                                                                                                      |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 6                           |                                                                                                      |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 7                           |                                                                                                      |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 8                           |                                                                                                      |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 9                           |                                                                                                      |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10                          |                                                                                                      |    |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Total                       | 13                                                                                                   | 16 | 7 | 1 | 2 | 9 | 2 | 0 | 1 | 0  | 2  | 0  | 5  | 11 | 16 | 13 | 17 | 8  | 10 | 7  | 0  | 8  | 5  | 15 | 8  |

TVV = 0.704

Photos : 9, 10



# VEGETATION VOLUME DATA SHEET

Location: SW Corner La Canada & Moore  
Pima County, AZ

Transect No. 6

Date: December 16, 2022

Personnel:

Susy Morales, RECON  
Jennifer Patton, Wilder  
Ben Wilder, Wilder

| Vertical<br>cubic<br>meters | Horizontal Transect Samples (# of cubic decimeters containing vegetation within each vertical meter) |   |   |   |   |   |    |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|-----------------------------|------------------------------------------------------------------------------------------------------|---|---|---|---|---|----|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|                             | 1                                                                                                    | 2 | 3 | 4 | 5 | 6 | 7  | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 1                           | 3                                                                                                    |   |   |   | 1 | 1 | 1  | 1 |   | 3  | 1  | 9  | 5  | 3  | 5  |    |    | 2  | 3  | 2  | 5  | 8  | 1  |    | 5  |
| 2                           |                                                                                                      |   |   |   |   | 4 | 3  | 1 | 4 | 6  | 7  | 5  | 8  |    |    |    | 2  | 6  | 8  | 6  | 3  | 1  |    |    | 1  |
| 3                           |                                                                                                      |   |   |   |   |   | 6  | 5 |   |    | 4  | 7  | 2  | 4  | 2  | 9  | 5  | 2  | 10 | 6  |    |    | 2  |    |    |
| 4                           |                                                                                                      |   |   |   |   |   | 1  | 2 |   |    |    |    | 3  | 6  | 7  | 10 | 8  | 6  | 10 | 6  |    |    |    |    |    |
| 5                           |                                                                                                      |   |   |   |   |   |    |   |   |    |    |    |    | 3  |    | 5  | 7  | 2  | 6  | 7  |    |    |    |    |    |
| 6                           |                                                                                                      |   |   |   |   |   |    |   |   |    |    |    |    |    |    |    |    | 5  |    |    |    |    |    |    |    |
| 7                           |                                                                                                      |   |   |   |   |   |    |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 8                           |                                                                                                      |   |   |   |   |   |    |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 9                           |                                                                                                      |   |   |   |   |   |    |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 10                          |                                                                                                      |   |   |   |   |   |    |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Total                       | 3                                                                                                    | 0 | 0 | 0 | 1 | 5 | 11 | 9 | 4 | 9  | 12 | 21 | 18 | 16 | 14 | 24 | 22 | 23 | 37 | 27 | 8  | 9  | 3  | 0  | 6  |

TVV = 1.128

Photos : 11, 12