

**ROSEMONT COPPER PROJECT: CONSERVATION MEASURES
PROVIDED BY CLEAN WATER ACT SECTION 404 MITIGATION**

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1. INTRODUCTION

WestLand Resources, Inc. (WestLand) was retained by Rosemont Copper Company (Rosemont) to prepare a series of technical memorandums to supplement the Biological Assessment for the Rosemont Copper Project (Project). This memorandum summarizes proposed Clean Water Act (CWA) Section 404 mitigation measures described in the Rosemont Habitat Mitigation and Monitoring Plan (HMMP) that would benefit special status species listed under the Endangered Species Act (ESA). *Figure 1* displays a

Project location map with a view of southern Arizona illustrating the proximity of the mitigation lands to the Project.

Per the U.S. Environmental Protection Agency's (EPA) "Final Rule for Compensatory Mitigation for Losses of Aquatic Resources" (33 C.F.R. Parts 325 and 332 and 40 C.F.R. Part 320; published in 73 Fed. Reg. 19594-19705), otherwise known as the 2008 Mitigation Rule, CWA Section 404 compensatory mitigation projects may also be used to provide compensatory mitigation under the ESA or for Habitat Conservation Plans as long as the project includes appropriate compensation required by the permit for unavoidable impacts to aquatic resources authorized by that permit and that the mitigation activities are designed such that they holistically address requirements under multiple programs and authorities for the same activity. Proposed CWA Section 404 mitigation measures will directly benefit eight different special status species currently listed under the ESA. Proposed mitigation lands are described in **Section 2** below; beneficial conservation measures realized as part of Rosemont's proposed CWA Section 404 HMMP for the Project are described in **Section 3**.

2. CWA SECTION 404 MITIGATION

2.1. SONOITA CREEK RANCH

Sonoita Creek Ranch is an approximately 1,200-acre privately-owned ranch located about six miles south of Sonoita, Arizona and two miles north of Patagonia, Arizona in Santa Cruz County. The broad floodplain of Sonoita Creek encompasses the western portion of the ranch adjacent to State Route (SR) 82 and the foothills of the Canelo Hills are present in the eastern portion. The eastern boundary of Sonoita Creek Ranch shares a boundary with the Coronado National Forest (CNF); the CNF is also present slightly over one mile west of the ranch.

Nearly six acres of open water in two large ponds, including significant emergent and forested wetland and riparian components, are within the interior of the ranch connected by an earthen-lined canal conveying overflow water from the northern pond to the southern pond. The water is perennially supplied to the ranch by Monkey Spring, a natural spring approximately 0.8 mi north of the ranch on an adjacent privately-owned property. The existing aquatic habitat supported by Monkey Spring on the ranch is effectively functioning as an isolated watershed, hydrologically separated from the watershed of Sonoita Creek and Monkey Canyon to the north and not subject to seasonal flooding.

Approximately 590 acre-ft of certificated water right is appurtenant to the ranch, most of which is currently used to irrigate over 110 acres of agriculture fields. Sonoita Creek Ranch also provides nearly 15 acres of ephemeral drainages, 52 acres of riparian habitat, 320 acre of upland buffer habitat adjacent to riparian habitat, five seasonal ponds, and nearly 700 acres of semi-desert grassland and Madrean evergreen woodland, including mature Arizona white oaks (*Quercus arizonica*), adjacent to the CNF.

2.1.1. Mitigation Measures

Proposed mitigation activities at Sonoita Creek Ranch detailed in the Rosemont HMMP include the following measures shown in **Figure 2**.

- Recording of a conservation easement prohibiting any form of grazing or land use not compatible with maintaining the existing or created aquatic functions and values.
- Initial perimeter fencing of the ranch will immediately preserve and protect the open water and wetlands, ephemeral drainages, seasonal ponds, riparian habitat, upland buffer, and open space on the ranch. Fencing of water crossings will be with swinging flood gates on the larger drainages (Sonoita Creek and Corral Canyon) and breakaway fence on the smaller drainages to deter trespassing and prohibit livestock access. **Figure 3** illustrates the fencing plan of Sonoita Creek Ranch.
- Excess water from Monkey Spring overflowing from the lower pond that is currently used to irrigate agriculture fields will be used to create a perennial drainage feature and adjacent riparian communities in the agriculture fields. The existing concrete-lined irrigation canal in the fields will be removed other than the portions of irrigation canal needed to deliver the water to the location of habitat creation. The fields will be rough graded to reflect a consistent one percent slope. A meandering, earthen-lined channel will be constructed and will be planted with a hydriparian buffer including species such as Fremont cottonwood (*Populus fremontii*), Goodding's willow (*Salix gooddingii*), Arizona walnut (*Juglans major*) and velvet ash (*Fraxinus velutina*) in the wetted perimeter. Other meso- and xeriparian species such as velvet mesquite (*Prosopis velutina*), netleaf hackberry (*Celtis laevigata* var. *reticulata*), and desert willow (*Chilopsis linearis*), which have been observed thriving in other parts of Sonoita Creek Ranch, will be planted in the lower portions of the channel which are subject to a more seasonal surface water regime. The remaining portions of agriculture fields will be seeded with a native seed mix consisting of warm and cool season grasses, forbs, and other woody trees and shrubs forming a large native riparian corridor between Sonoita Creek and the existing water features at Sonoita Creek Ranch fed by Monkey Spring.
- A tilling and mowing plan will maximize the germination and establishment of the native seed mix. Strategic tillings of the fields prior to seasonal monsoon rains would uproot and kill unwanted herbaceous successional species prior to seeding and increase seed bank receptiveness. Mowings would occur for two years after seeding and would be used to initially manage the ratio of woody vegetation to native grasses.
- Rosemont will be responsible to perform maintenance, monitoring, and management activities for Years 1 through 10. In addition, Rosemont will fully fund a Dedicated Account in Year 1 that will be drawn from by a third party (potentially the Arizona Game and Fish Department; AGFD) for management and maintenance of the ranch starting in Year 11. At that time, AGFD will assume all management and maintenance obligations of Sonoita Creek Ranch.

2.2. STATE ROUTE 83 CORRIDOR PARCELS AND DAVIDSON PARCELS

The State Route 83 Corridor Parcels and Davidson Parcels comprise approximately 575 acres in the Davidson Canyon watershed east of the Project, and include ephemeral wash and riparian habitat along over 5,000 ft of Davidson Canyon, over 3,000 ft of Barrel Canyon, and portions of Mulberry Canyon and East Fork of Davidson Canyon (**Figures 1 and 4**). The State Route 83 Corridor Parcels are surrounded by

lands managed by the Arizona State Land Department (ASLD) and the CNF. The Davidson Parcels are surrounded by privately-owned lands. Nearly 16 acres of ephemeral drainages (including three springs), nearly 40 acres of riparian habitat, and nearly 190 acres of upland buffer habitat adjacent to riparian habitat is present on the State Route 83 Corridor and Davidson Parcels.

2.2.1. Mitigation Measures

Proposed mitigation activities at the State Route 83 Corridor Parcels (*Figure 4*) and Davidson Parcels (*Figure 5*) detailed in the Rosemont HMMP will include the following measures.

- Recording of a conservation easement prohibiting certain land uses, including a managed grazing schedule which would promote forage resources for wildlife. Some low impact public use would be allowed on the State Route 83 Corridor Parcels including activities such as hiking, birdwatching, and minor forms of hunting, and these parcels would provide access to other public land blocks.
- Recording of a conservation easement prohibiting certain land use will effectively preserve the drainage features, springs, riparian habitat, and upland buffer habitat along nearly two miles of Davidson and Barrel Canyon increasing the long-term productivity of the upland and riparian habitat in perpetuity while preserving important aquatic habitat within the impacted watershed.

3. SPECIES SPECIFIC CONSERVATION MEASURES OF MITIGATION ACTIVITIES

Proposed CWA Section 404 mitigation activities will provide the following beneficial conservation measures for ESA-listed species.

3.1. JAGUAR AND OCELOT

- Preservation of the habitat on Sonoita Creek Ranch and the recording of a conservation easement excluding grazing will effectively add the ranch to the open space of the bordering CNF forming an extension of the CNF land block. Managing Sonoita Creek Ranch as proposed will provide habitat connectivity and a movement corridor for the endangered jaguar (*Panthera onca*) and the endangered ocelot (*Leopardus pardalis*) between the Canelo Hills/Patagonia Mountains and the Santa Rita Mountains, slightly over a mile away to the west of the ranch in perpetuity. The southern portion of the ranch has been identified by the Arizona Wildlife Linkages Workgroup and the Arizona Missing Linkages Corridor design as a likely corridor between the two CNF land blocks.
- Preservation and maintenance of perennially aquatic habitat and creation of additional aquatic habitat at Sonoita Creek Ranch will provide a reliable watering source for both jaguar and ocelot and their prey base, increasing the overall productivity and utilization of the landscape. The creation of over 110 acres of aquatic and riparian habitat replacing exposed agriculture fields increase the preferable habitat of the ranch for jaguar and ocelot by providing an additional movement corridor and sheltered water source. Precluding grazing by securing and maintaining a

perimeter fence will also increase the habitat productivity and utilization by the prey base of jaguar and ocelot.

3.2. LESSER LONG-NOSED BAT

- Preservation of the habitat on Sonoita Creek Ranch and excluding all grazing will provide enhanced habitat values by increasing production of agaves found on the ranch, providing foraging habitat for the endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*; LLNB).
- Preservation and maintenance of two perennial ponds at Sonoita Creek Ranch with large open water components provide LLNB a reliable water source adjacent to agave foraging habitat.
- Preservation of the habitat on the State Route 83 Corridor and Davidson Parcels under a conservation easement with managed grazing and limited public activities will provide enhanced habitat values by increasing production of agaves found on the parcels, providing foraging habitat for LLNB.

3.3. CHIRICAHUA LEOPARD FROG

- Preservation and maintenance of two perennial ponds, adjacent wetland habitat, and the earthen-lined channel between the ponds on Sonoita Creek Ranch, in addition to the creation of additional aquatic habitat in the agriculture fields, provide habitat refugia opportunities for the threatened Chiricahua leopard frog (*Lithobates chiricahuensis*; CLF). Currently, the pond is being utilized by American bullfrogs (*Lithobates catesbeianus*) and other exotic fish including numerous *Centrarchidae* species, which would hinder CLF establishment. To remove American bullfrogs from the ponds, the ponds would be drained and the undesirable species removed via chemical or mechanical means. Water from Monkey Spring can be diverted around both ponds to avoid disturbance to the habitat while not impacting the created habitat downstream in the agriculture fields. Because water can be easily diverted around both ponds, future efforts to adaptively manage undesirable frog species, if needed, would be possible.
- Sonoita Creek Ranch provides a unique opportunity for reintroduction or establishment of aquatic species including CLF in that it is privately-owned, will be managed in perpetuity by AGFD, and provides certificated water rights. Additionally, the water received from Monkey Spring is effectively isolated from Sonoita Creek receiving runoff only from nearby hills. This greatly reduces, if not eliminates, the threat of damaging floods that would risk the integrity of the existing perennial ponds and the earthen-lined channel linking the two. The other benefit to this effectively closed system is that the risk of unwanted aquatic species establishment resulting from migration via floodwater is reduced. This situation provides an optimal management opportunity increasing the likelihood of successful reintroduction and establishment of aquatic or semi-aquatic species, including CLF.

- The management of Sonoita Creek Ranch by AGFD in perpetuity as funded by Rosemont would provide additional stability in the management of the aquatic habitat to further increase the likelihood of successful reintroduction or establishment of aquatic species, including CLF.

3.4. GILA TOPMINNOW AND GILA CHUB

- Preservation and maintenance of two perennial ponds, adjacent wetland habitat, and the earthen-lined channel between the ponds on Sonoita Creek Ranch provide opportunity for reintroduction of native fish, including the endangered Gila topminnow (*Poeciliopsis occidentalis occidentalis*) and the endangered Gila chub (*Gila intermedia*). As stated in the August 19, 2009 ESA Section 6 Conservation Fund Request by AGFD for Sonoita Creek Ranch, the Gila topminnow has been observed on Sonoita Creek Ranch in the canals fed by Monkey Spring. Currently, the pond is being utilized by exotic fish species (likely stocked by humans for recreational purposes) including numerous Centrarchidae species, precluding reestablishment of either native fish species. To remove exotic fish species from the ponds, the ponds would be drained and the undesirable species removed via chemical or mechanical means. Water from Monkey Spring can be diverted around both ponds to avoid disturbance to the habitat while not impacting the created habitat downstream in the agriculture fields. Because water can be easily diverted around both ponds, future efforts to adaptively manage undesirable fish species, if needed, would be possible. Removal of exotic fish species would presumably allow for the ponds to become occupied by Gila topminnow that were previously observed by AGFD on the ranch or would provide opportunity for reintroduction of Gila topminnow and Gila chub.
- Sonoita Creek Ranch provides a unique opportunity for reintroduction or establishment of aquatic species including the Gila topminnow and Gila chub in that it is privately-owned, will be managed in perpetuity by AGFD, and provides certificated water rights. Additionally, the water received from Monkey Spring is effectively isolated from Sonoita Creek receiving runoff only from nearby hills. This greatly reduces if not eliminates the threat of damaging floods that would risk the integrity of the existing perennial ponds and the earthen-lined channel linking the two. The other benefit to this effectively closed system is that the risk of unwanted aquatic species establishment resulting from migration via floodwater is reduced. This situation provides an optimal management opportunity increasing the likelihood of successful reintroduction and establishment of aquatic or semi-aquatic species, including Gila topminnow and Gila chub.
- Water from Monkey Spring previously used for irrigation of the agriculture fields will be used to maintain the levels of the existing ponds and wetlands on Sonoita Creek Ranch. The proposed habitat creation will only utilize the overflow water. This will provide a very stable and consistent water level in the ponds and in the channel connecting the ponds, providing suitable habitat for the Gila topminnow and Gila chub on an annual and consistent basis.

3.5. HUACHUCA WATER UMBEL

- Preservation and maintenance of two perennial ponds, adjacent wetland habitat, and the earthen-lined channel between the ponds on Sonoita Creek Ranch, in addition to the creation of

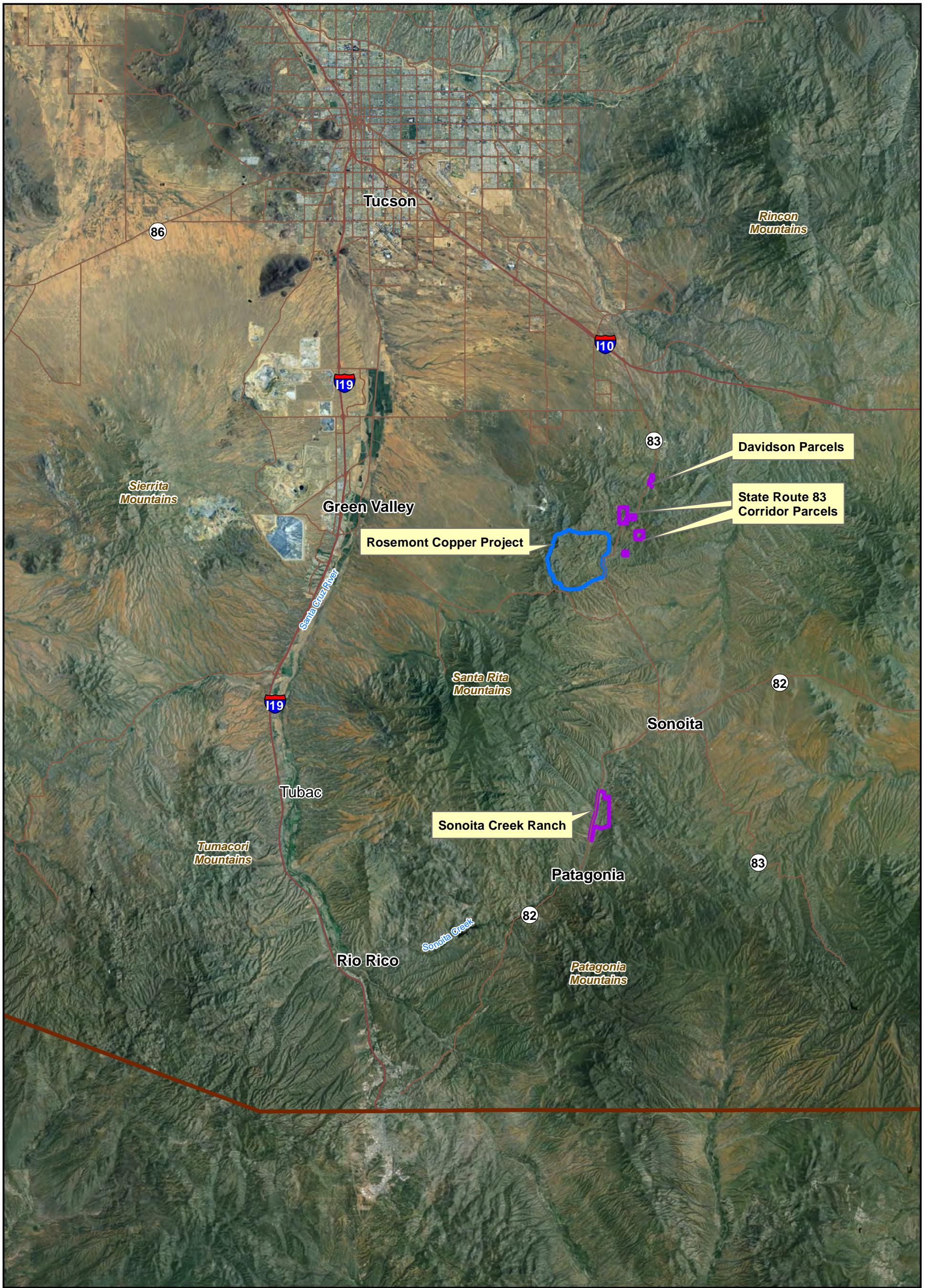
additional aquatic habitat in the agriculture fields provide habitat refugia for the endangered Huachuca water umbel (*Lilaeopsis schaffneriana* spp. *recurva*). Per the 1999 USFWS Designation of Critical Habitat for the Huachuca water umbel, the species prefers watersheds that do not experience scouring floods and areas of moist soils interspersed with other plants at low densities, all of which is provided by preservation and creation of aquatic habitat on Sonoita Creek Ranch. Habitat appears to be provided in the wetted edges of both ponds, the existing wetland and earthen-lined channel areas, and the created habitat. A population of Huachuca water umbel currently exists a few miles north in upper Sonoita Creek as does designated Critical Habitat. The population of Huachuca water umbels which historically occupied the area around Monkey Spring has been extirpated. Preservation of aquatic habitat and management of Sonoita Creek Ranch in perpetuity by AGFD and the unique watershed setting at Sonoita Creek Ranch provides suitable habitat for reestablishment or reintroduction of the Huachuca water umbel.

- On Sonoita Creek Ranch, all water from Monkey Spring previously used for irrigation of the agriculture fields will be used to maintain the levels of the existing ponds and wetlands. The proposed habitat creation will only utilize the overflow water. This will provide a very stable and consistent water level in the ponds and channel connecting the ponds providing suitable habitat for the Huachuca water umbel on an annual and consistent basis.

3.6. MEXICAN SPOTTED OWL

- Preservation and protection of the habitat on Sonoita Creek Ranch and excluding all grazing will protect potential migration and dispersal habitat of the threatened Mexican Spotted Owl (*Strix occidentalis lucida*; MSO) between the Canelo Hills/Patagonia Mountains and the Santa Rita Mountains. The southern portion of the ranch has been identified by the Arizona Wildlife Linkages Workgroup and the Arizona Missing Linkages Corridor design as a likely corridor between the two CNF land blocks. Preservation of the ranch will also benefit general MSO movements along and within habitat patches. Preservation of habitat and excluding grazing will increase overall habitat productivity providing a more preferable habitat including reliable water sources for the MSO prey base.

FIGURES






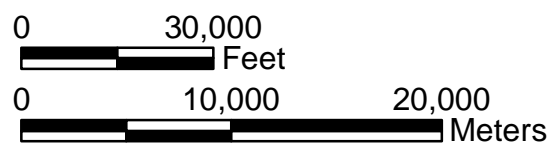
Pima County & Santa Cruz County, Arizona
 ESRI World Imagery

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Legend

-  Parcel Boundary
-  Rosemont Copper Project
-  International Border

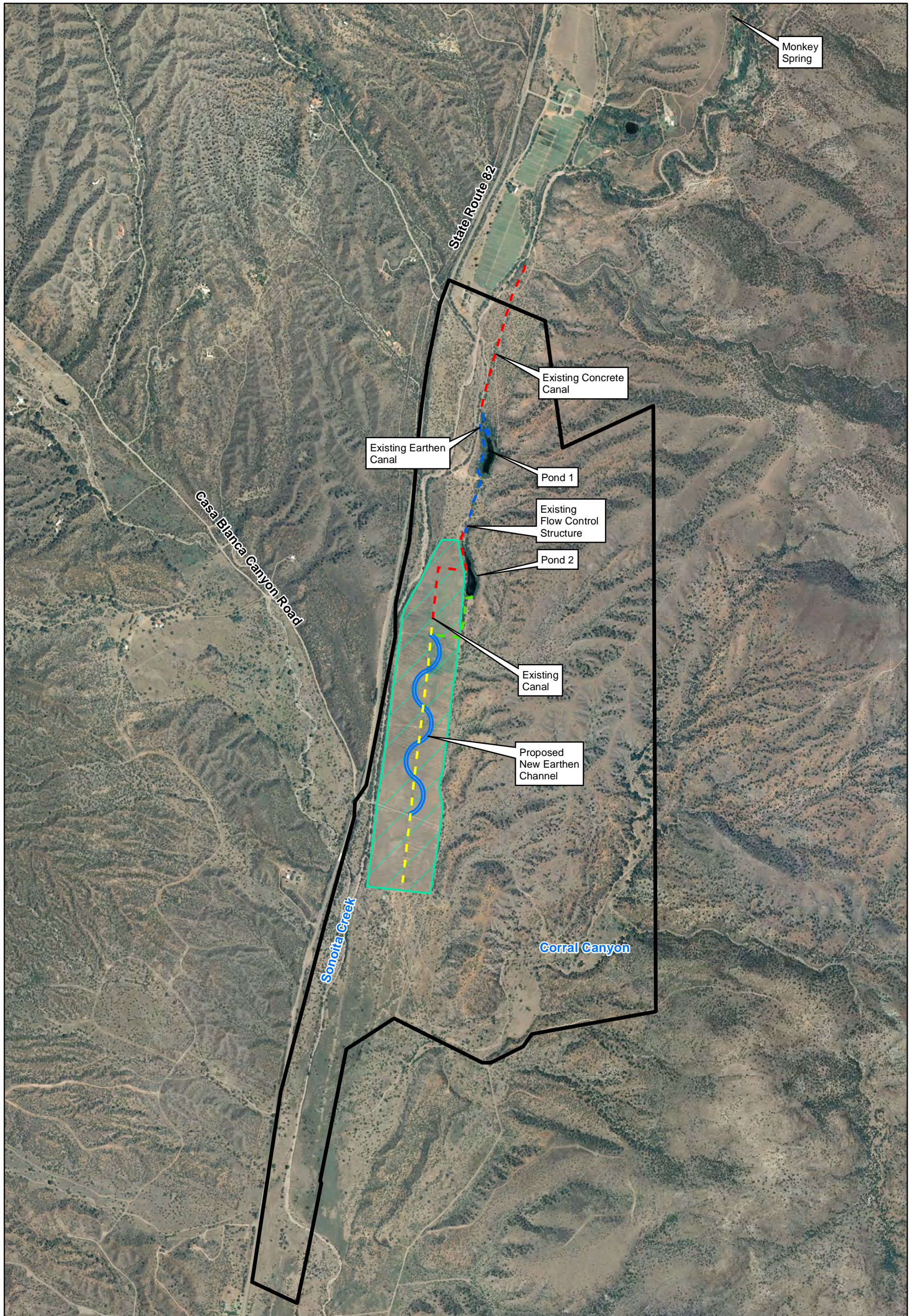


ROSEMONT PROJECT
 CWA Section 404 Mitigation Measures

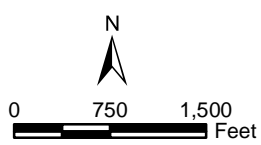
PROJECT LOCATION MAP

Figure 1

PERMIT NO. SPL-2008-00816-MB



T21S, R16E, Portion of Sections 9, 16, 20, 21 & 29
 Santa Cruz County, Arizona
 Photo Source: National Agriculture Imagery Project, 2010

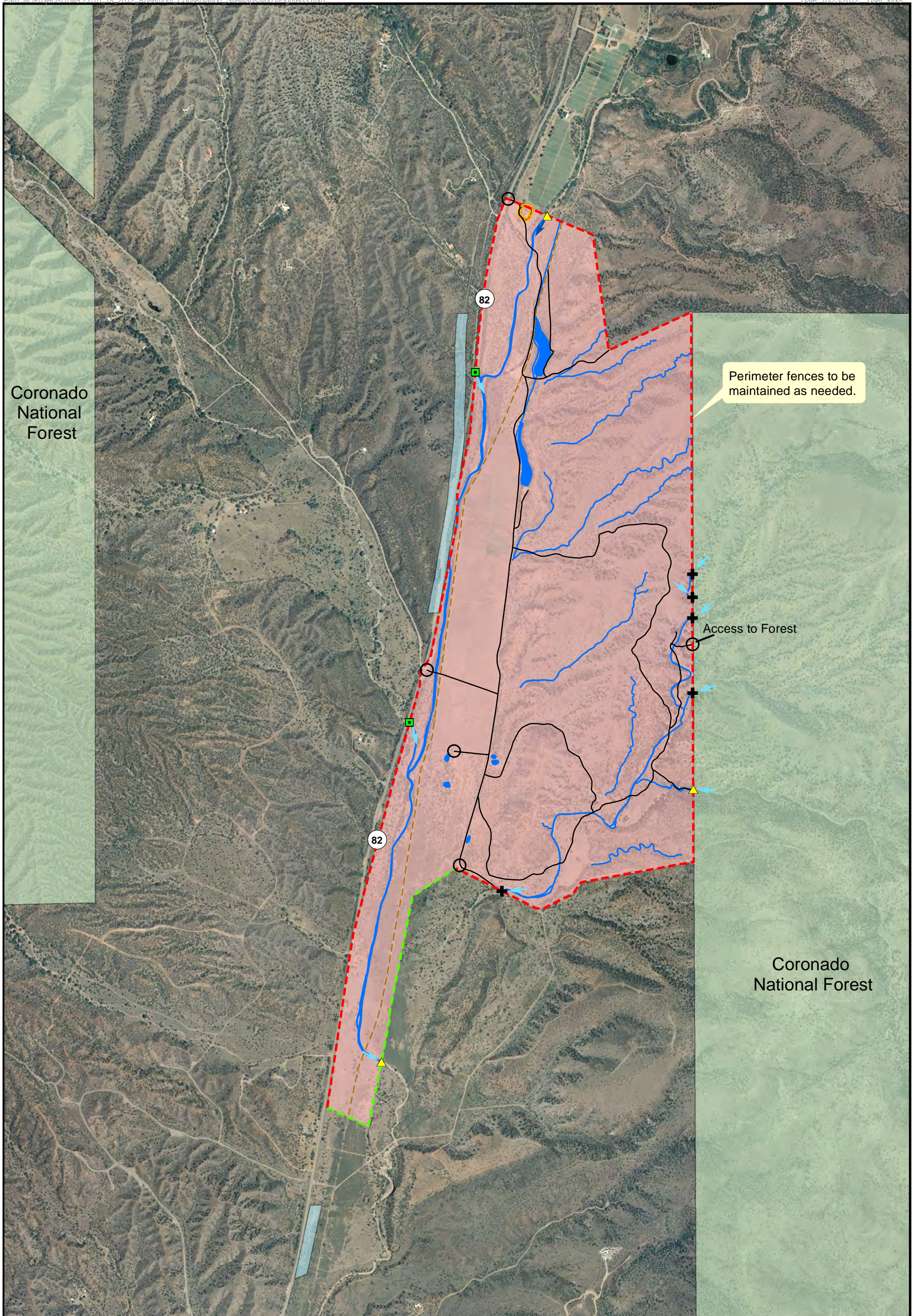


Legend

- Sonoita Creek Ranch
- Proposed Habitat Creation Area
- Concrete-Lined Canal
- Earthen-Lined Canal
- Existing Concrete-Lined Canal to be Removed

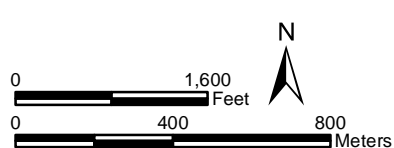
ROSEMONT PROJECT
 CWA Section 404 Mitigation Measures
 SONOITA CREEK RANCH PROPOSED SITE MAP
 Figure 2

PERMIT NO. SPL-2008-00816-MB



T21S, R16E, Portion of Sections 9, 16, 20, 21 & 29
 Santa Cruz County, Arizona
 Photo Source: National Agriculture Imagery Project, 2010

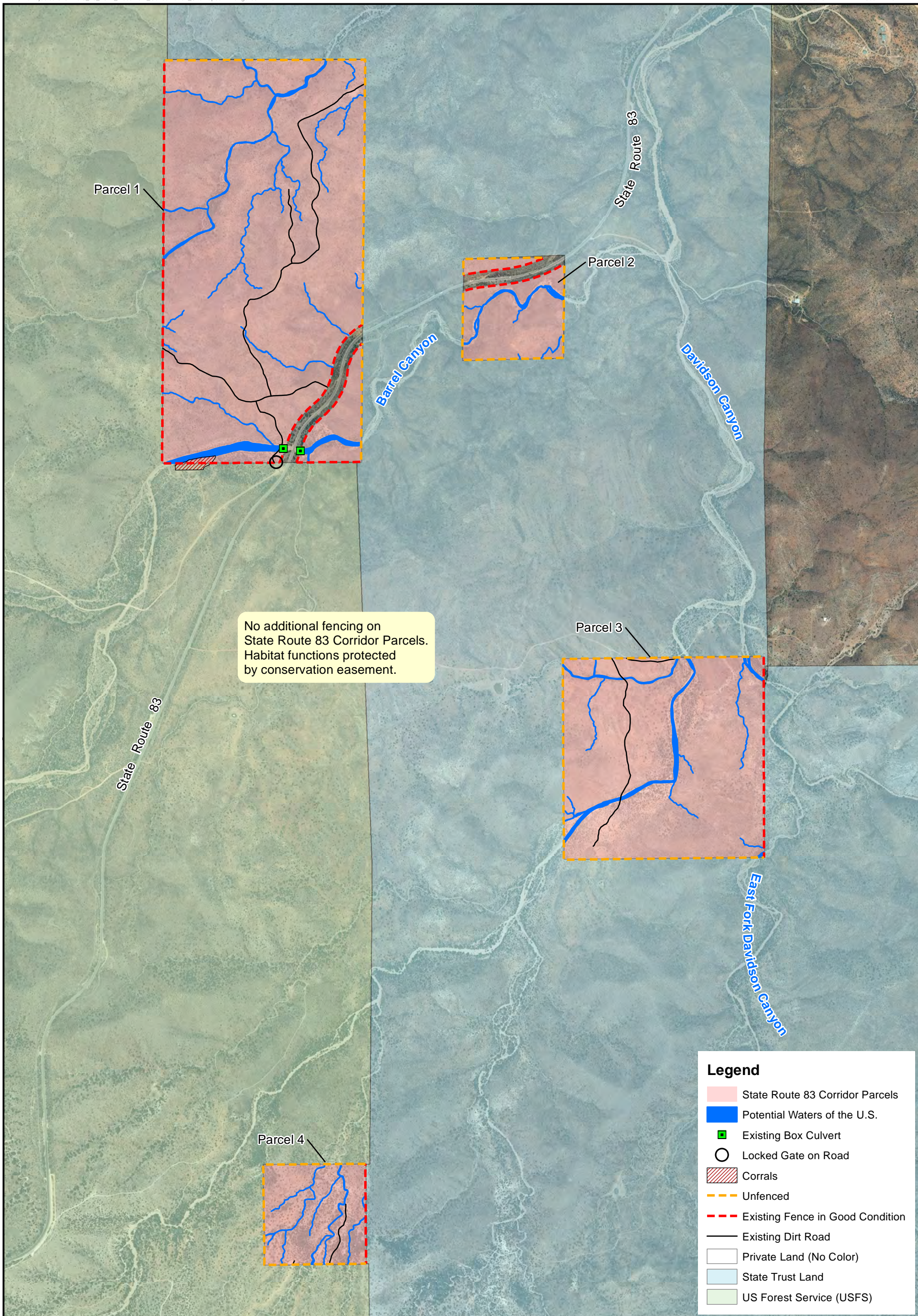
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Legend

- Potential Waters of the U.S.
- ➔ Existing Large Wash and Flow Direction
- Existing Box Culvert
- + Breakaway Fence
- ▲ Swinging Gate
- Existing Gate on Road
- Existing Dirt Road
- - - El Paso Gasline
- - - New Fence to be Constructed
- - - Existing Fence in Good Condition
- Existing Residential Area
- Sonoita Creek Ranch
- Private Land (No Color)
- State Trust Land
- US Forest Service (USFS)

ROSEMONT PROJECT
CWA Section 404 Mitigation Measures
 SONOITA CREEK RANCH FENCING PLAN
 Figure 3
 PERMIT NO. SPL-2008-00816-MB

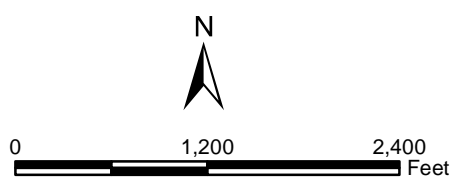


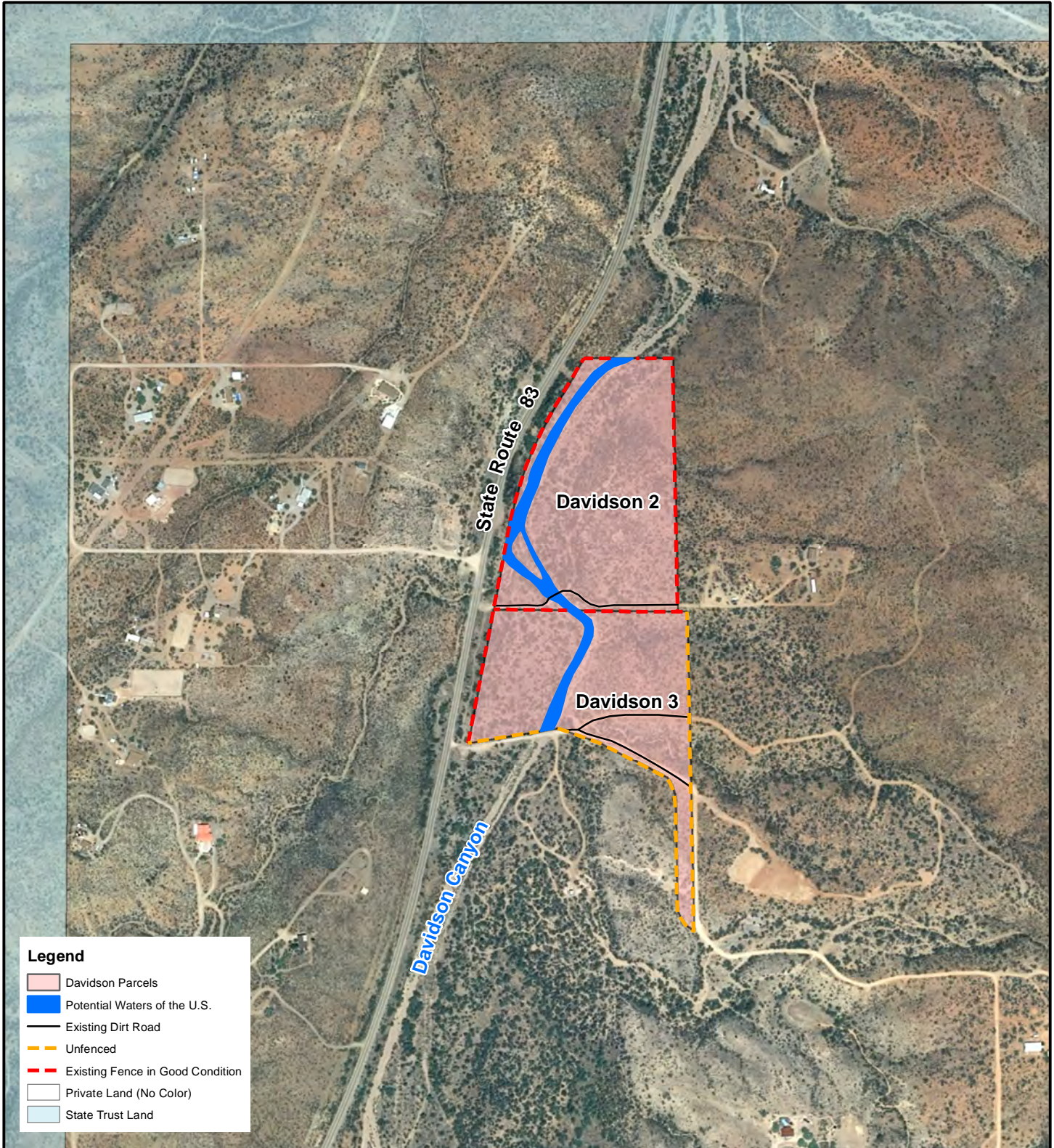
No additional fencing on State Route 83 Corridor Parcels. Habitat functions protected by conservation easement.

- Legend**
- State Route 83 Corridor Parcels
 - Potential Waters of the U.S.
 - Existing Box Culvert
 - Locked Gate on Road
 - Corrals
 - Unfenced
 - Existing Fence in Good Condition
 - Existing Dirt Road
 - Private Land (No Color)
 - State Trust Land
 - US Forest Service (USFS)

T18S, R16E, Portion of Sections 1, 14, 15, 23 & 27
 Pima County, Arizona
 Photo Source: National Agriculture Imagery Project, 2010

NOTE: State Route 83 Parcels will remain unfenced except those portions bordering State Route 83.





Legend

- Davidson Parcels
- Potential Waters of the U.S.
- Existing Dirt Road
- Unfenced
- Existing Fence in Good Condition
- Private Land (No Color)
- State Trust Land

T18S, R16E, Portion of Section 1
 Pima County, Arizona
 Photo Source: National Agriculture Imagery Project, 2010

NOTE: Davidson Parcels will remain unfenced except those portions bordering State Route 83.

ROSEMONT PROJECT
 CWA Section 404 Mitigation Measures

DAVIDSON PARCELS
 Figure 5

PERMIT NO. SPL-2008-00816-MB

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0 600 1,200
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