MEMORANDUM

Date: January 17, 2014

To: The Honorable Chair and Members
Pima County Board of Supervisors

From: C.H. Huckelberry
County Administrator

Re: **Visual Understanding of the Adverse Impacts of the Rosemont Mining Proposal**

As you know, the federal Environmental Impact Statement for the Rosemont Mine proposal is quite complex. It covers a full range of issues, including air, water, safety, transportation, flooding, biology, and other concerns. There is almost too much information to grasp the whole of this proposed mine. Likewise, the County's comments and review of the document are extensive. The points and counterpoints are being offered by project proponents, as well as opponents.

Providing the public a clear and adequate understanding of the proposal is difficult given its complexity. One clearly understandable impact relates to the sheer size of the disturbance area and its impact on the Coronado National Forest.

If it is built, the Rosemont Mine will essentially isolate and cut off 13,095 acres of the Santa Rita Ecosystem Management Unit (Santa Rita Unit) of the Coronado National Forest, thereby degrading the value of five percent of Forest's holdings in the unit. This will make it extremely difficult to sustain biodiversity in the northern section of the Santa Rita Mountains because movement of plant and animal individuals and genes across the Rosemont mine and associated infrastructure will be compromised by the land disturbance and associated activities from the mine. The report attached to this memorandum discusses the impacts on the integrity of the Northern Santa Rita Mountains for wildlife in greater detail.

The Coronado National Forest was established by Congress in 1908 and preserved huge blocks of mountain and piedmont systems in the Sonoran Desert. Over the years, as the human population has grown, the value of these large, undeveloped areas has played a critical role in maintaining biodiversity and ecosystem function in our region. Ecosystems operate best when they are in large, intact units with connectivity among them. More recently, conservation attention in the Sky Island region—in which the Coronado National Forest is embedded—has focused on maintaining or improving mountain-to-mountain connections to help ensure the maintenance of biodiversity. The focus on connectivity has been recognized by the Arizona Game and Fish Department, which undertook an extensive effort in 2006 to map wildlife movement corridors in southern Arizona.

Through our land-use and conservation planning work, we have come to understand a great deal about the interrelationship of the built environment with the long-term sustainability of viable ecosystems and environments. We spent years working with federal and state partners in developing the Sonoran Desert Conservation Plan; a plan that transcends jurisdictional boundaries and deal with ecosystems at the level of whole landscapes and watersheds. As a consequence, the Board of Supervisors adopted mitigation requirements for certain isolated disturbances to ecosystems called the Conservation Lands System (CLS) guidelines. An important focus of the CLS was on preserving areas of high biodiversity, such as occurs on the site of the Rosemont Mine and the area north of the Service road.

The attached Figure 1 illustrates these impacts to large land-use reserves. Figure 2 places these impacts on a measurable and understandable scale. It is for this reason we have called for an acre-based mitigation approach. If the Rosemont Mine proposal was governed by the Sonoran Desert Conservation Plan, the amount of mitigation lands required for the proposed area of disturbance identified in the Final EIS would be almost 13,000 acres based on the mitigation ratios associated with the CLS. For this reason, we have steadfastly opposed the mining operations, since Rosemont has neither provided nor acknowledged such a large acre-based mitigation approach. Instead, only 3,300 acres have been offered inside Pima County, and another 1,200 outside it.

The mitigation for the Rosemont Mine is, unfortunately, being considered in silos of regulatory responsibilities. For example, the Arizona Department of Environmental Quality, through federal delegation, regulates impacts to air and water quality; the US Army Corps of Engineers regulates discharge of dredge or fill to Waters of the United States; the US Fish and Wildlife Services and Arizona Game and Fish Department cover certain impacts to flora or fauna; and the US Forest Service regulates surface activities on the Forest. Hence, the regulatory environment consists of a series of often isolated governmental regulatory silos. Such is the unfortunate reality.

Considering the enormous geographic scale of the Rosemont Mine and how it effectively severs biological connection in the northern Santa Rita Mountains, it becomes clear that a more holistic approach to regulation and mitigation of mining activities is necessary. If the impacts were considered in their aggregate, rather than in the present regulatory silos, it is clear that significant land conservation is necessary to offset the regional scale impacts of the Rosemont Mine.

CHH/anc

Attachments

c: Jim Upchurch, Forest Supervisor, Coronado National Forest
Colonel Kimberly Colloton, Los Angeles District Engineer, US Army Corps of Engineers
Jared Blumenfeld, Region IX Administrator, US Environmental Protection Agency
Henry Darwin, Director, Arizona Department of Environmental Quality
Larry Voyles, Director, Arizona Game and Fish Department

Impacts of the Rosemont Mine and Management Area 16 on the Integrity of the Northern Santa Rita Mountains for Wildlife

January 16, 2014

Brian Powell
Julia Fonseca
Pima County Office of Sustainability and Conservation

Summary

The proposed Rosemont Mine is located near to the north end of the Santa Rita Mountains. Its position on the landscape and in geographic relationship with other areas of the Coronado National Forest within the Santa Rita Mountains raise additional concerns for the mine's impacts on wildlife populations, which have not been fully analyzed . Further, the Forest Service's proposal to designate a new management area (known as Management Area 16) that surrounds the footprint of the Preferred Alternative could open the site to additional mine-related development that would further isolate the north portion of the Forest for wildlife and put the inter-mountain movement of some species at risk. This report looks at the results of the Barrel Alternative and designation of Management Area 16 on wildlife movement into and out of this isolated area north of the mine. The report also highlights the threats that these actions will have on Pima County's conservation investments in the Cienega Valley.

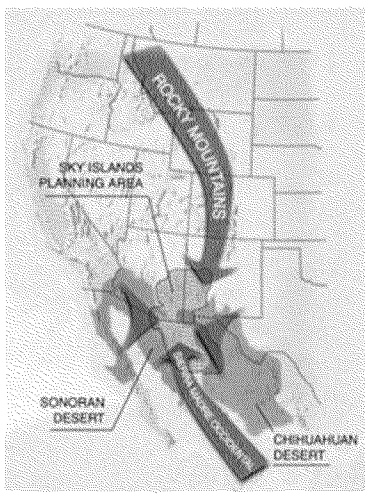

Figure 1. Southeastern Arizona is at the confluence of 4 major biogeographic provinces of North America, which is a key reason for its high biodiversity. Image from the Sky Islands Alliance.

Landscape Fragmentation and Connectivity in the Sky Island Region

Pima County is blessed with being at the heart of one of the most biologically diverse areas of North America. Two main factors are responsible for this biodiversity. First, the County is located at the crossroads of four major biogeographic provinces (i.e., areas with similar plants and animals) of North America, where influences from the Rocky Mountains, Sierra Madre, and the Sonoran, Chihuahuan, and Mojave deserts come together (Fig. 1). The second main factor is the elevational gradients of our area, from low-elevation deserts to mountains peaks. In southern Arizona and far western New Mexico, this area is known as the Sky Islands: forested ranges separated by vast expanses of desert and grassland plains.

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The region's principal Sky Islands are, from west to east: Santa Catalina, Santa Rita, Rincon, Huachuca, Galiuro, Pinaleño, and Chiricahua mountains (Fig. 2). Historically, many of the region's animals and plants would move unimpeded among these and other mountain ranges by way of the valleys that separate them. All animals move across the landscape to acquire the resources necessary for survival: food, water, protective cover, and mates. Species such as mountain lions, black bears, and deer can roam over vast expanses, whereas smaller animals such as lizards, frogs, and rodents move across much smaller areas.

The last 150 years or so of human population growth and infrastructure has fragmented the region's landscape (Fig. 3), which has had consequences for wildlife species and the habitats on which they depend. Where once species roamed freely, habitats have been divided into smaller, disconnected areas by roads, urbanization, and other barriers. Habitat loss and fragmentation is the leading cause of decline of most species.

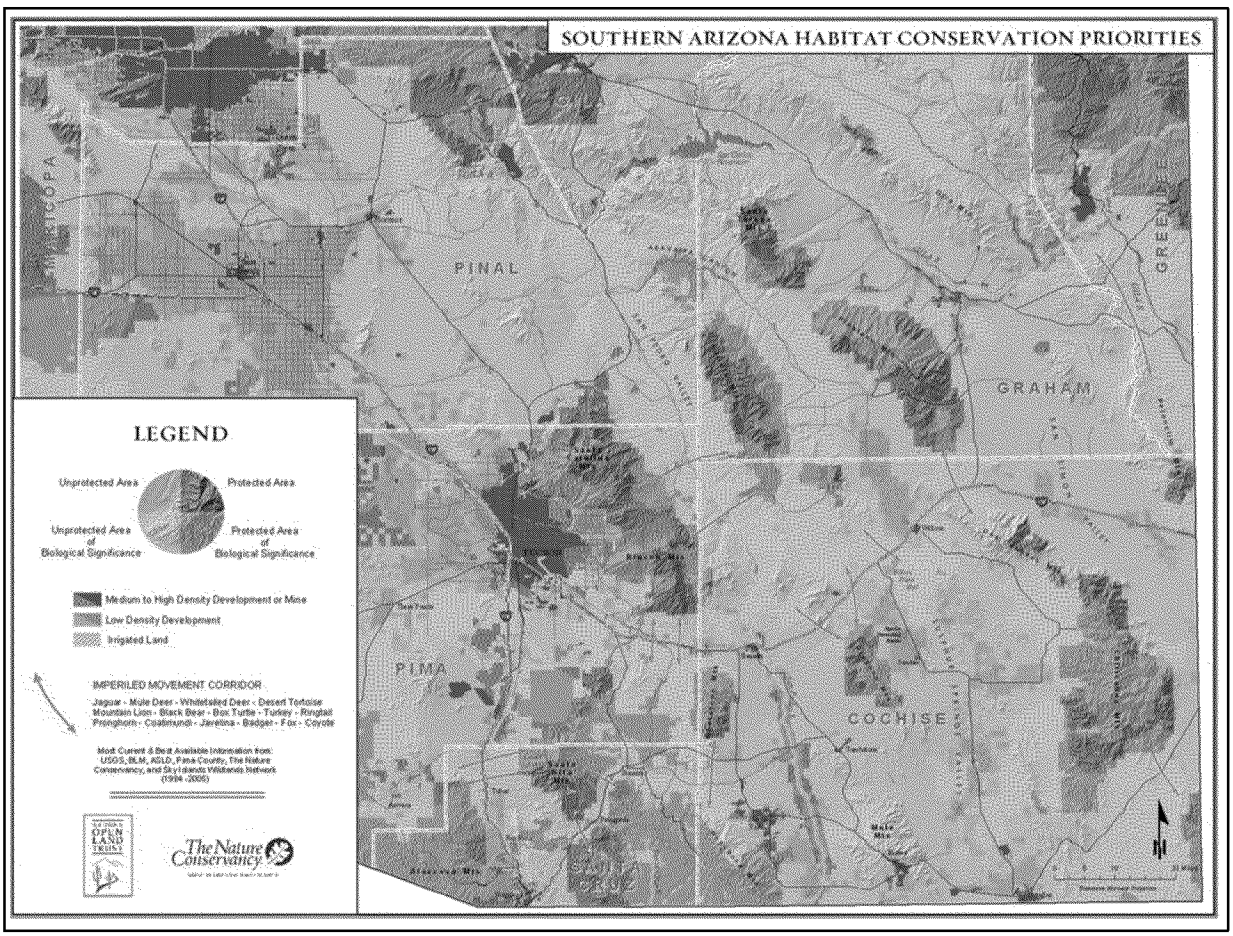

Figure 2. The Sky Island Region of southeastern Arizona showing major linkages among ranges. Note the importance of the Santa Rita Mountains for maintaining connection to the Rincon, Santa Catalina, and onto the Galiuro mountains. Primary figure from Arizona Land and Water Trust and the Nature Conservancy of Arizona.

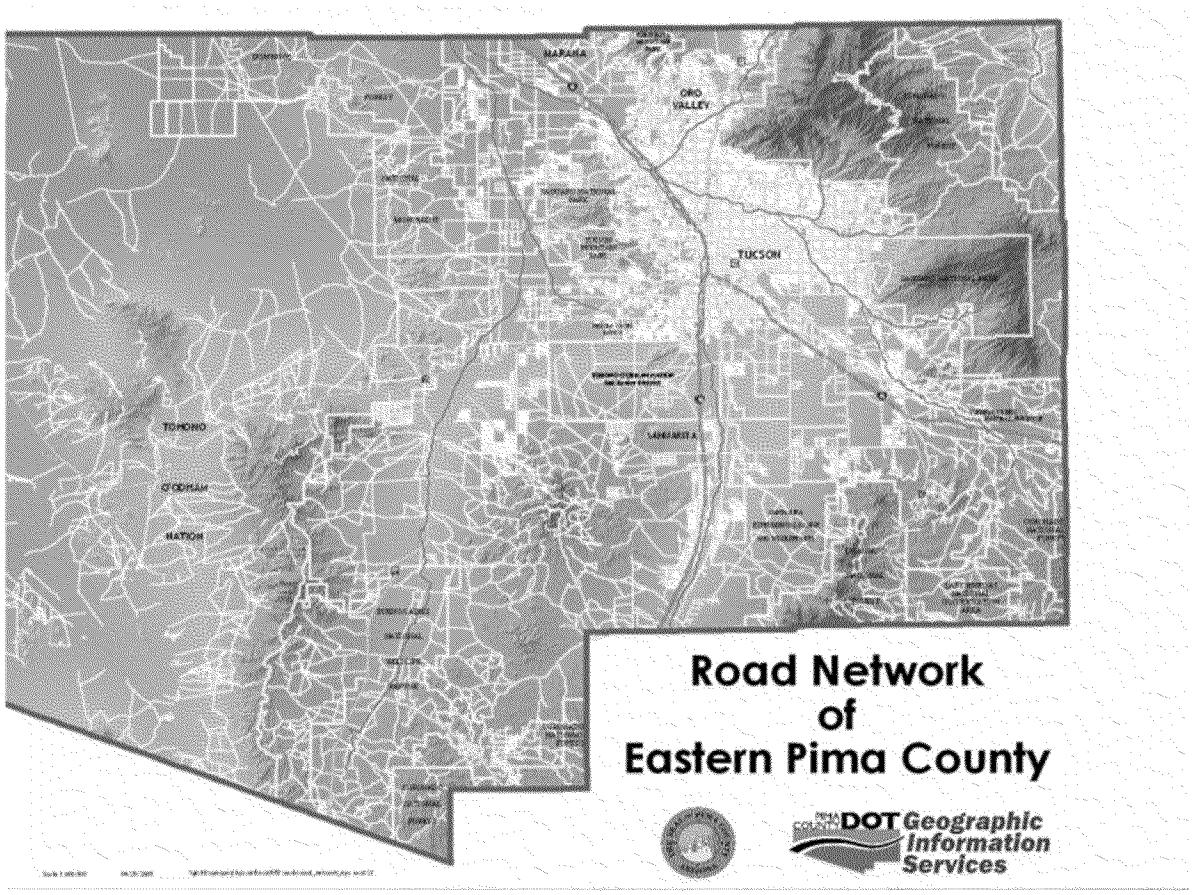

Figure 3. Roads in eastern Pima County. Depending on road traffic use, roads can be a major barrier to animal movement

The loss of biodiversity due to habitat loss and fragmentation in Pima County has long been recognized and plans are being development and carried out to mitigate for these impacts. Most notable among them is the Sonoran Desert Conservation Plan (SDCP), which incorporates a biological goal related to protection of biodiversity:

> *To ensure the long-term survival of the full spectrum of plants and animals that are indigenous to Pima County through maintaining or improving the habitat conditions and ecosystem functions necessary for their survival.*

The tools used by the County to advance the SDCP—namely zoning and land acquisition—were developed in large part to complement the existing lands that were protected and/or remain as open space and which provide habitat and facilitate species' movement. In this way, the lands bought and leased by Pima County took into account the needs of species to move across the landscape.

More recently, there have other planning efforts in Pima County that have focused on understanding and protecting wildlife linkages and wildlife corridors in Pima County (Beier et.

al. 2007), including a series of workshops that resulted in the identification of major wildlife corridors in Pima County (Figure 4; Arizona Game and Fish Department 2012). The results show the importance of key areas for wildlife movement, such as the north end of the Santa Rita Mountains.

Impacts of the Rosemont Mine and Management Area 16 on Wildlife Movement and Habitat

The Forest Service's Final Environmental Impact Statement (FEIS) acknowledges—to some degree—that wildlife habitat and movement will be impacted by the Rosemont Mine (Table 129 of the FEIS). However, the Service has not considered the mine and associated infrastructure impacts on the portion of the Santa Rita Ecosystem Management Unit (EMU) north of the mine (Fig. 4). This area, which is approximately 13,000 acres in size, is mostly wild backcountry, with few roads or even human trails, and much of it rugged (U. S. Forest Service 2013b). The most prominent feature of this area is the 6,200 foot Mt. Fagan, but the area also contains grasslands, woodlands, and oak forests as well as a high density of the springs and intermittent streams that undoubtedly sustain important populations of wildlife.

The FEIS contains language related to a new management area (Management Area 16) around the footprint of the Barrel (Preferred) Alternative (Fig. 4). Creation of the Management Area not only makes the Barrel Alternative consistent with the Forest Plan, but it would make it easier to locate future mining activities in an area that is thousands of acres larger than what is needed for the Barrel Alternative. Management Area 16 provisions would deem future mining activities compatible while eliminating the current requirement for maintenance of wildlife habitat (USFS 2013b). Future requests of mining-related activity would most likely originate from one or more of Rosemont's three other patented mining claim resource areas (Fig. 4) and/or expansion of the Rosemont operation being considered in the FEIS. These activities are not just theoretical. In the FEIS (U. S. Forest Service 2013a), Rosemont states their intention to buy out the Forest Service land at Broadtop Butte and do further exploration and development of Broadtop, Copper World and Peach-Elgin. The Forest Service has not analyzed the potential impacts that these combined impacts will have on species or ecosystem functions and services of this isolated area of the Forest to the north.

Because these impacts have not been fully analyzed by the Forest Service, Pima County undertook an analysis using Southwestern ReGAP data for southern Arizona. We chose ReGAP because of its availability and widespread use as a proxy for wildlife habitat (U. S. Geological Survey 2005; Boykin et. al. 2007), which was our focus. Because of the large number of vegetation type classifications, we combined all vegetation types into their dominant community type: Forest/Woodland, Grassland/Desert Scrub, Developed, and Other. We then mapped these results, which are found in Figure 5.

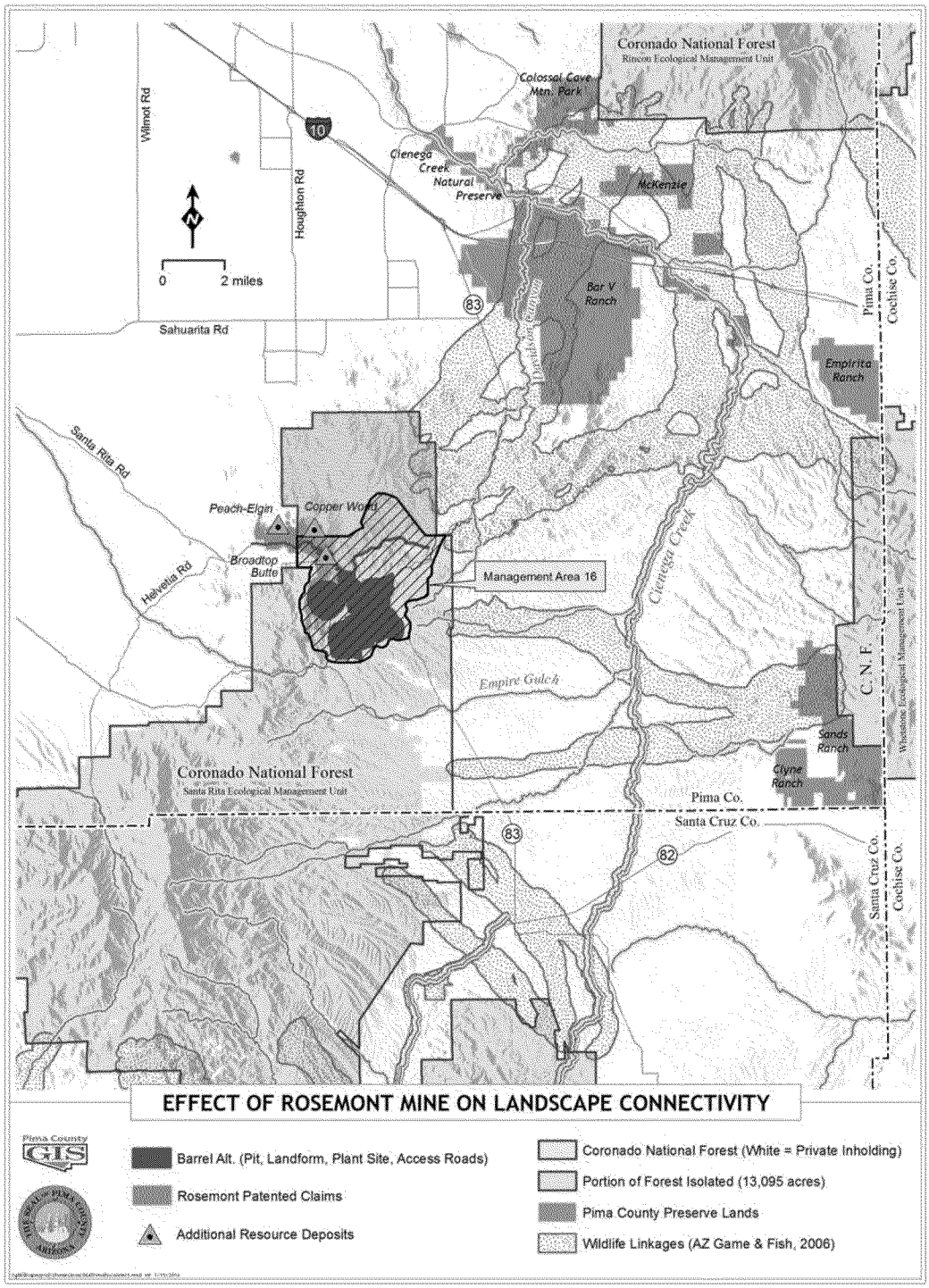

Figure 4. Location of the proposed Rosemont Mine, associated patented mining claims, and Management Area 16 in relationship to wildlife linkages and the rest of the Coronado National Forest's Santa Rita Ecosystem Management Area. Activities associated with these mining activities have not been analyzed as they relate to wildlife populations in the portion of the Coronado National Forest that will be isolated (purple) or on the effects of wildlife movement (via linkages) among the Whetstone, Santa Rita, and Rincon mountains.

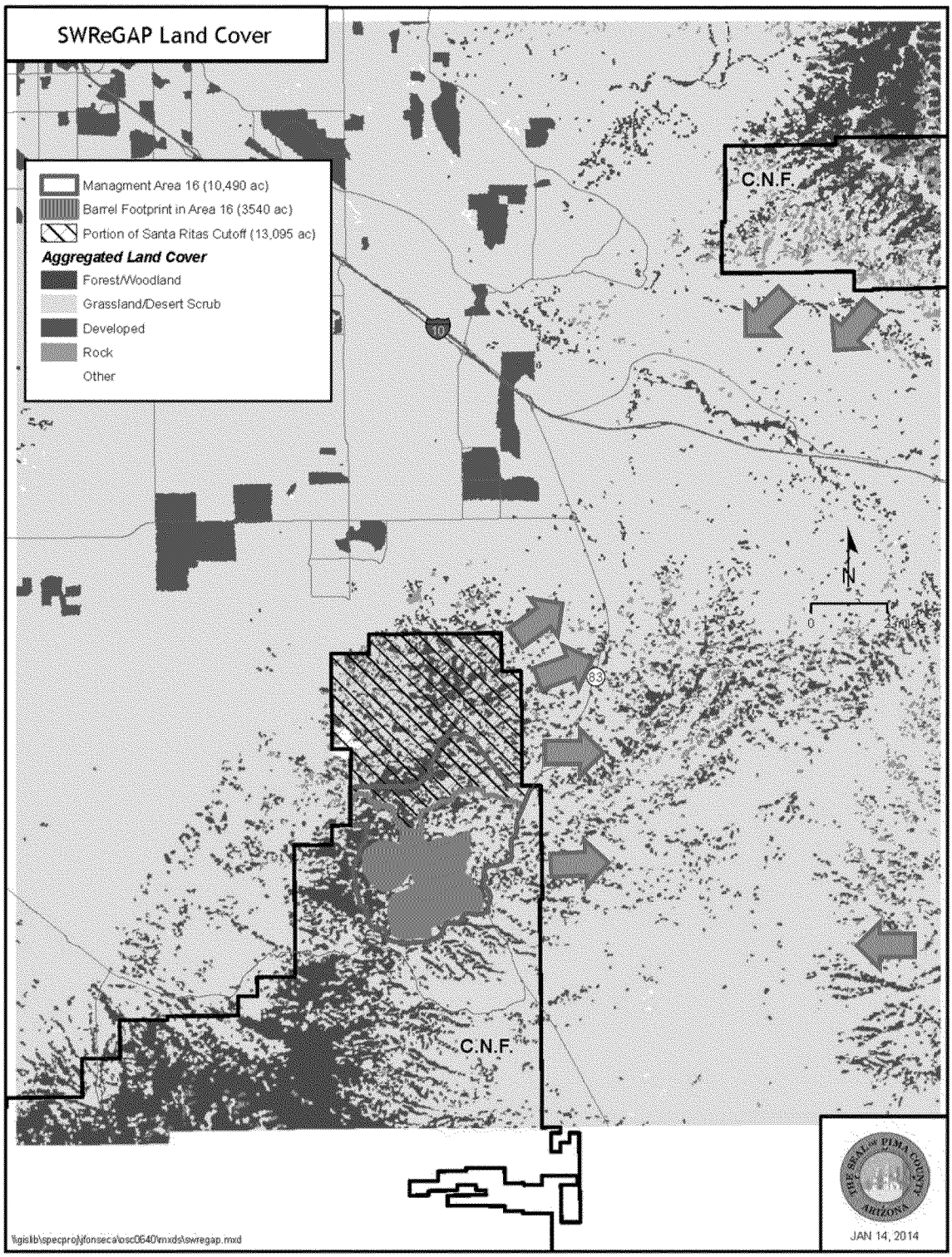

Figure 5. Land cover, by major vegetation community type, showing the similarity between the areas of the Coronado National Forest (C.N.F.) south and north of the proposed Rosemont Mine. This will impact wildlife populations north of the mine and Management Area 16 and potentially affect wildlife movement to and from the Rincon Mountains. These factors were not considered in the Final Environmental Impact Statement.

This figure shows the similarity of the major vegetation types between areas south of the mine (and Management Area 16) and the isolated area to the north. We can then infer, with a reasonable amount of confidence, that the current situation is one of similarity of dominant vegetation communities equating to a robust exchange of individuals and populations in this area. However, if the mine begins operation, this northern area will become isolated from the habitat to the south, thereby slowing or shutting down this exchange. This can lead to all types of problems for these wildlife communities, such as loss of fitness and population declines (Rapport et. al. 1998). These and other factors have not been analyzed in the FEIS. Should additional actions occur in Management Area 16, this will further the loss and fragmentation of habitat in the area.

Impacts to wildlife populations will likely not be restricted to this large area at the northern end of the Santa Rita EMU. For dozens of highly mobile, terrestrial species such as mountain lion, bobcat, deer, and javelina, the loss of access to those northern lands could jeopardize their ability to utilize wildlife corridors (see Fig. 4). This is because the area of the Forest north of the mine and Management Area 16 likely plays an oversize role in facilitating movement of species between the Santa Rita Mountains and the Rincon/Catalina mountain complex to the north. The pockets of woodland and desert scrub would help facilitate these movements (see Fig. 5).

A likely place of movement for species that come out of that northern area of the Santa Rita EMU is Bar-V Ranch, which was acquired by Pima County in 2005. A recent investigation by Pima County staff found that there are many potentially wildlife-friendly underpasses under Interstate 10 on the Bar-V Ranch (Powell and Fonseca 2013, unpublished data; Fig. 6). These concrete underpasses, along with the areas under bridges over Cienega Creek and Davidson Canyon, provide critical pathways to facilitate movement across the I-10.

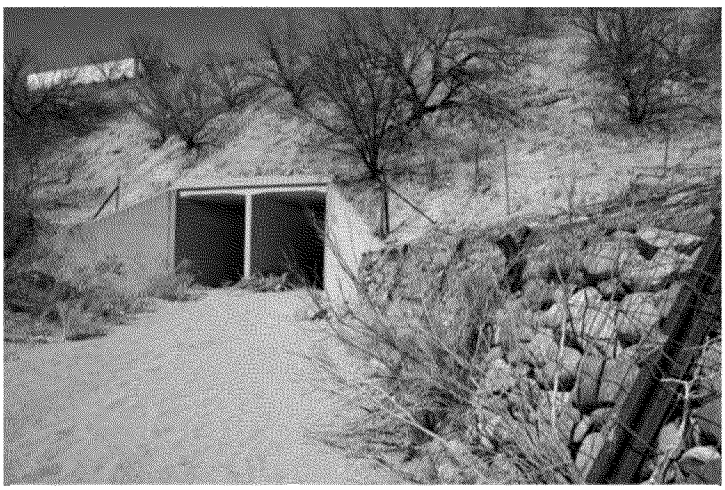

Figure 6. Concrete underpasses such as this one under I-10 at Bar-V Ranch can facilitate movement of wildlife from one side of the highway to the other. Interstate 10 is the single most significant barrier to wildlife movement between the Santa Rita and Rincon mountains, making the presence of these underpasses critical.

Summary

Pima County, through our investments in land and other SDCP elements, has played an active role in mitigating the loss and fragmentation of wildlife habitat in eastern Pima County. A look at our land holding in Figure 4 shows that we own/lease key pieces of land that can help facilitate movement of wildlife among the Santa Rita, Whetstone, and Rincon mountains. We have long recognized the critical

role that other land-based conservation partners, in particular the U.S. Forest Service, plays in maintaining the biodiversity of our region and in helping to continue to achieve the SDCP biological goal. Indeed, Pima County plays a key conservation role in Pima County by filling in the missing pieces of the conservation puzzle. The biological, ecological, and social benefits of our land conservation actions are many, but a key role of our acquisitions and set asides is to facilitate movement of terrestrial wildlife among major blocks of protected areas, such as the Forest Service manages.

Pima County takes this linkage role very seriously and we would hope that our conservation partners would adopt the same conservation ethic. Yet the Forest Service's decision to move forward with approving the Rosemont Mine, designate Management Area 16, and not look at the broader implications of these actions on their own lands and on the regional linkage network, is cause for concern. These actions diminish Pima County's investment in the Cienega watershed.

Acknowledgements

Mike List (Pima County IT) produced Figure 2, 4, and 5.

Literature Cited

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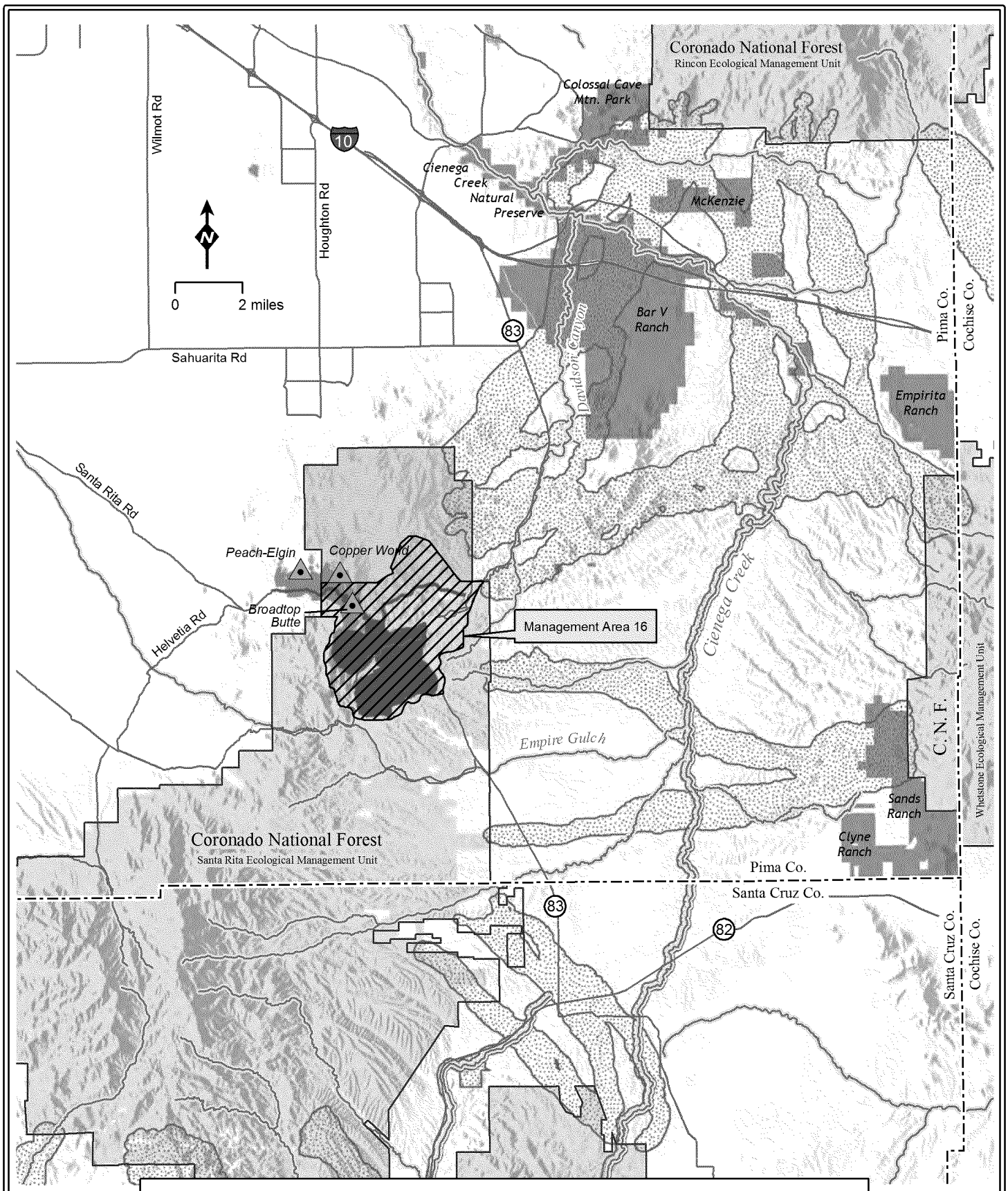
FIGURE 1



EFFECT OF ROSEMONT MINE ON LANDSCAPE CONNECTIVITY

Pima County GIS

Barrel Alt. (Pit, Landform, Plant Site, Access Roads)

Rosemont Patented Claims

Additional Resource Deposits

Coronado National Forest (White = Private Inholding)

Portion of Forest Isolated (13,095 acres)

Pima County Preserve Lands

Wildlife Linkages (AZ Game & Fish, 2006)

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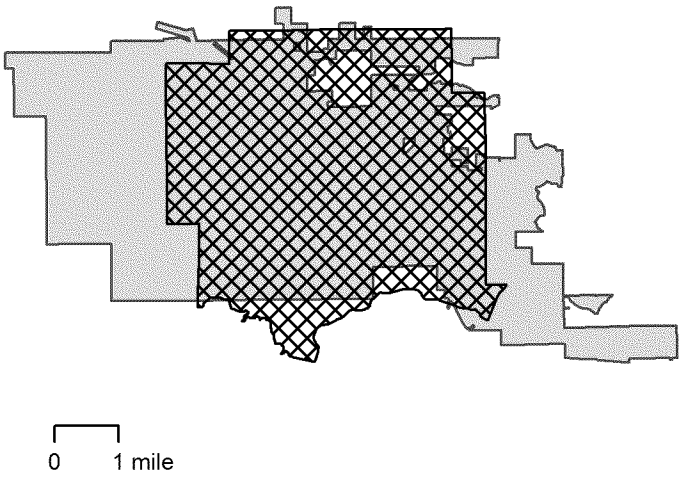
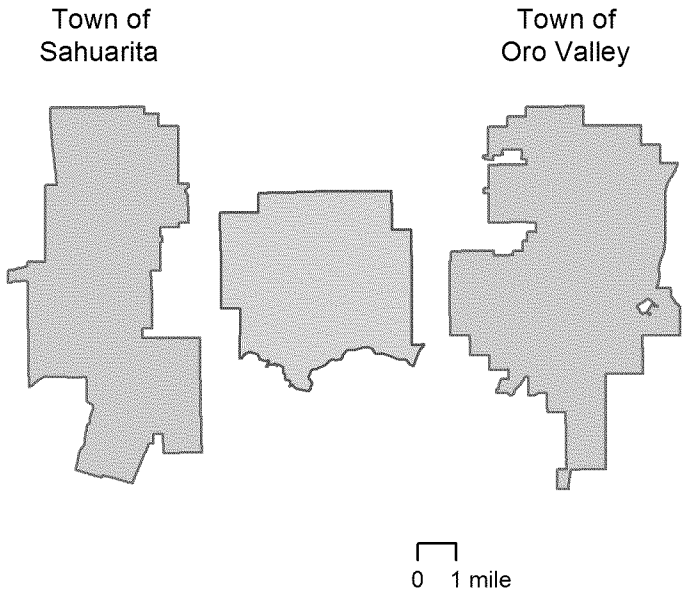
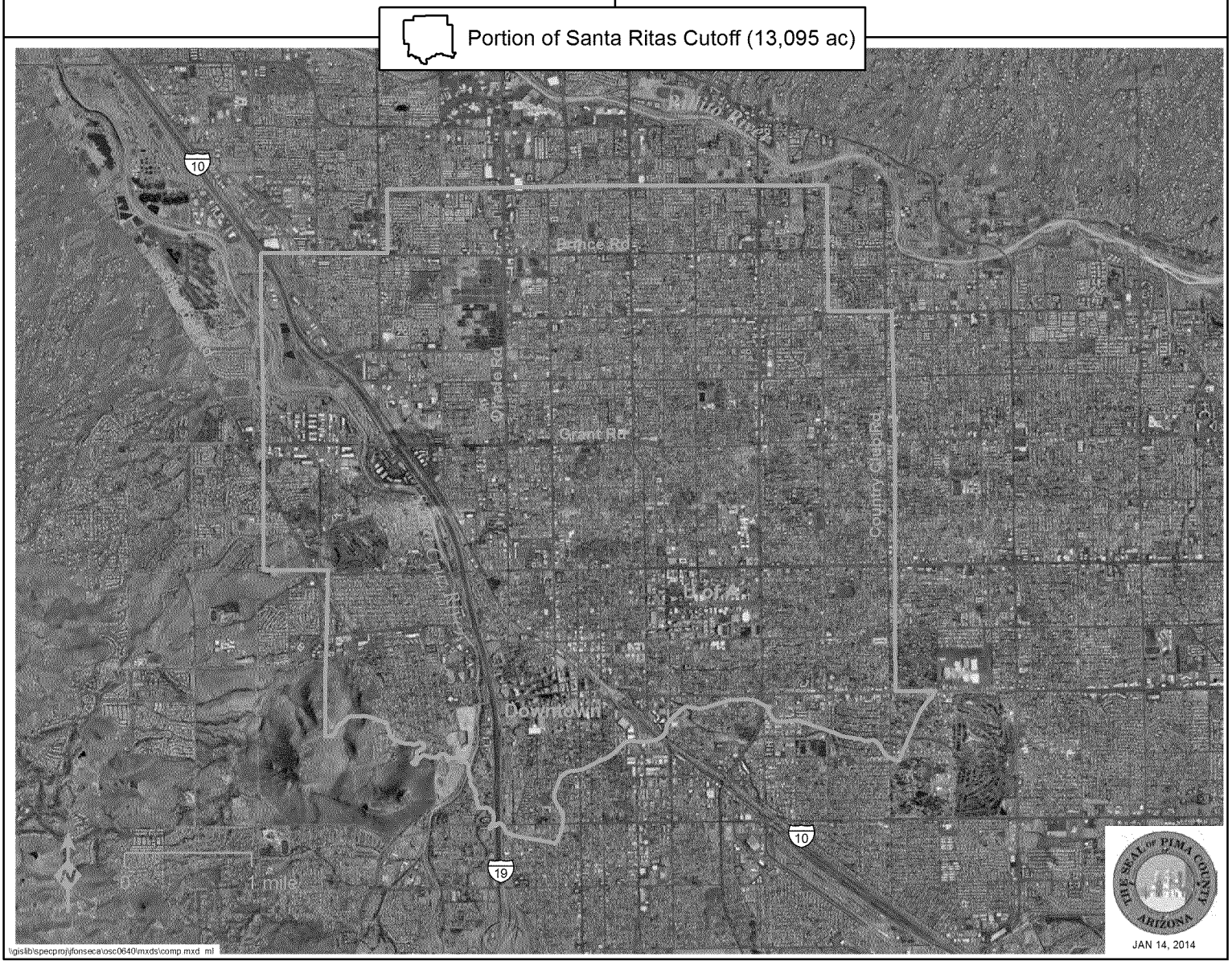
FIGURE 2

COMPARISON OF SANTA RITA MOUNTAINS ISOLATE WITH TUCSON AREA FEATURES