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# MEMORANDUM

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Date: November 17, 2015

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

From: C.H. Huckelberry  
County Administrator 

Re: **Recognition for the Sonoran Desert Conservation Plan**

The Arizona-Sonora Desert Museum recently featured the Sonoran Desert Conservation Plan in the latest edition of *Sonorensis*, a publication that is mailed to 20,000 members in southern Arizona and elsewhere.

In the attached article, Pima County staff describes how the "flap over an owl" became the nationally recognized and award-winning Sonoran Desert Conservation Plan. The article features photographs by County staff from a variety of natural area conservation lands around Tucson, including the County's Rancho Seco, Six Bar Ranch, and Tucson Mountain Park.

The article also refers to the forthcoming federal permit, known as the Multi-species Conservation Plan (MSCP) Section 10 Permit that will be issued to Pima County because of our natural area and ranch conservation efforts. We expect the long-awaited federal permit decision in early 2016. County staff is supporting the federal process by providing information that will assist the US Fish and Wildlife Service in completing their Biological Opinion, a necessary step before the permit can be issued.

The *Sonorensis* article about Pima County's conservation efforts and successful accomplishments is included in this issue that focuses on species and ecosystems in need of conservation attention. The articles, some of which are about species that occur in Pima County (e.g., the monarch butterfly, jaguar, native frogs, and the Mexican gartersnake), place our actions within the broader Sonoran Desert ecosystem and remind us of the importance of conservation partnerships with others.

Pima County's Sonoran Desert Conservation Plan serves as a model and inspiration to many who seek to balance growth and development with conservation. In light of the numerous threats to species and ecosystems in the region and greater Southwest, the Board of Supervisors' ongoing leadership and vision remain critical to its continued success.

CHH/mjk

c: John Bernal, Deputy County Administrator for Public Works  
Nanette Slusser, Assistant County Administrator for Public Works  
Linda Mayro, Director, Sustainability and Conservation  
Julia Fonseca, Environmental Planning Manager, Sustainability and Conservation

**Sonorensis**

ARIZONA-SONORA DESERT MUSEUM

2015

SAVING SPECIES  
CONSERVING

*Life*





FROM AN **Owl Flap**  
TO LANDSCAPE CONSERVATION:  
**The Sonoran Desert Conservation Plan**

In 1997, the U. S. Fish and Wildlife Service listed the cactus ferruginous pygmy owl (*Glaucidium brasilianum cactorum*) as an endangered species under the Endangered Species Act. That listing, and the uncertainty surrounding its impact on development activities, sent shockwaves through the development community in Pima County. This kind of reaction was not unique, because when a species is added to the federal endangered species list, a typical response is for the government to develop regulations and guidelines specific to the species of interest, and the subsequent restrictions have historically prevented or severely impacted many residential or commercial development opportunities. Yet the story of Pima County's response is not typical.

Pima County recognized that because our region is a "hotspot" of biological diversity, it needed to take a more creative and comprehensive approach, one that accommodated both the county's economic foundation and the health of the natural environment that supports wildlife, tourism, and quality of life for its residents. As early as the 1970s, widespread public concern over the loss of open space to development had already led to tensions between those who were pro-development and those who were seeking to save certain areas from environmental loss. Development interests prevailed most of the time. By 1997, it was clear that high biodiversity and rapid growth would lead to further listings, and knowing that its citizens were demanding a proactive approach to natural resource conservation, Pima County embarked on an environmental planning process unprecedented for a local government in the United States at that time. This new plan, which became known as the

Sonoran Desert Conservation Plan (SDCP), aimed to balance conservation needs of species while providing a stable set of regulations for development interests. Acting on behalf of the Pima County Board of Supervisors, the late Dr. Maeveen Marie Behan led a vigorous community dialogue to address the conservation needs of the tiny owl; she also facilitated dialogue embracing growth issues, wildlife and ecosystem functional characteristics, cultural values, and the constraints of water resources.

In response, the bipartisan board indicated their willingness to use emerging scientific information to guide land-use decisions for the protection of sensitive habitats for a range of plants, invertebrates, and wildlife, including the pygmy owl. Yet economic concerns were critical, and they wanted to know how to maintain the tax base while also placing value on the "natural capital" that ultimately supports the economy. In response, Pima County completed an economic analysis, which showed the densest development had the greatest benefits to the tax base and used the least amount of land, while, by contrast, some types of low-density development in more remote areas were proving expensive to maintain and were more harmful to species that were—or were likely to be—listed under the

Endangered Species Act (ESA). Behan oversaw the production of over 200 individual studies by scientists and experts in subjects as diverse as invasive species, water quality, and taxation. The process also included more than 600 public meetings to educate and gain input from the public.

The Sonoran Desert Conservation Plan was officially approved by the board in 2001. Its adoption provided a foundation for a new, more holistic approach for how the county addresses a range of resources such as critical habitats and biological corridors, riparian areas, mountain parks, and historical, ranch, and cultural preservation.

Despite the county's efforts to address the specific needs of individual species, the pygmy owl provides an important lesson for the limits of the county's actions and influence. Since 1999, populations of the owl in Pima County have declined significantly. They currently occur in very low numbers in the Altar Valley and on the Tohono O'odham Nation, but are now absent from northwest Tucson and Marana, which was the center of controversy for the owl. The cause of the owl's decline in Arizona is not known for certain, although a long-term study by Aaron Fleisch, research specialist at the University of Arizona's School of Natural Resources and the Environment, of the closest core

population of owls in northern Sonora, Mexico, shows the recent drought has negatively affected that population. The owl was removed from protection under the ESA in 2007 due to a re-evaluation by the USFWS. Yet the owl remains at risk—in part due to buffelgrass invasion and associated fires, and in part due to loss of suitable habitat.

Page 22: Cactus ferruginous pygmy owl (*Glaucidium brasilianum cactorum*).  
Below: Sonoran desert tortoise (*Gopherus agassizii*).  
Bottom: Rancho Seco.



**Brian Powell**  
and **Julia Fonseca**,  
Pima County Office  
of Sustainability and Conservation

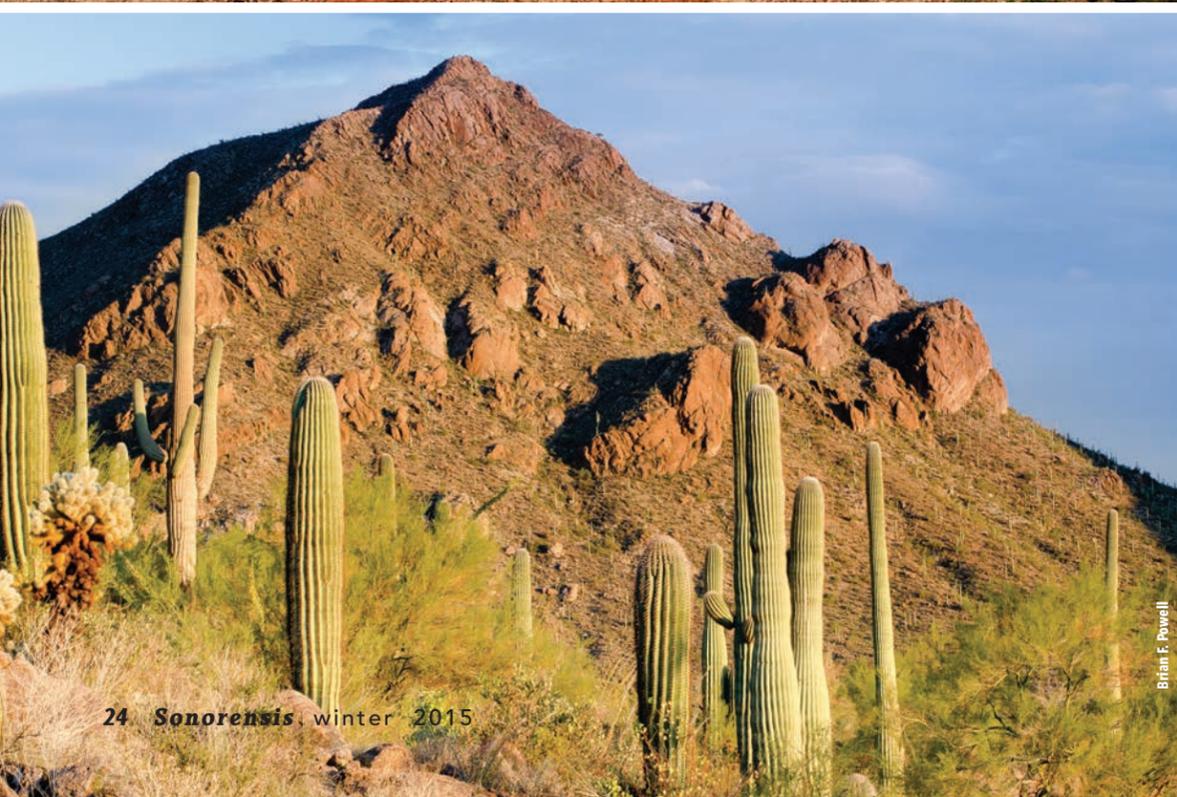
Aaron Fleisch

Jeff Humphrey/USFWS

Brian F. Powell



Brian F. Powell



Brian F. Powell

#### CONSERVING LAND, CONSERVING ECOSYSTEMS

Pima County has long placed an emphasis on land acquisition for the protection of species and ecosystem function. In the 1980s and '90s, the county acquired conservation lands to protect Cienega Creek, one of the last perennial streams in Pima County and home to towering cottonwood and willow riparian forests and threatened and endangered species such as the Gila topminnow, yellow-billed cuckoo, and Mexican garter snake.

While these early acquisitions were important steps, it was the voter-approved 2004 bonds that initiated a new era for Pima County. Those bonds helped to steer what was a booming housing market away from treasured places such as the Canoa Ranch, Painted Hills, and Tumamoc Hill. The bond money also established a ranch conservation program to preserve working landscapes in the Altar, San Pedro, and Cienega Valleys, including the A-7 and Six Bar (San Pedro River Valley) and the Rancho Seco and Diamond Bell (Altar Valley). Collectively, these lands harbor representative habitat of all the species covered by the Multi-Species Conservation Plan.

#### MULTI-SPECIES CONSERVATION PLAN

The conservation actions by Pima County have positioned it to receive a special permit recognizing voter-approved land acquisitions as mitigation for future impacts to threatened and endangered species habitat. This permit, issued by the Fish and Wildlife Service (USFWS), will allow the county and a portion of its regulated development community to lawfully harm or destroy (known as “take”) threatened and endangered species and their habitat, provided the take is the result of otherwise lawful activities and provided that Pima County continues to rely on the adopted conservation measures to avoid, minimize, and mitigate the proposed impacts. After considerable public review and input, the permit, also known as the Multi-Species Conservation Plan (MSCP), is close to being finalized by the USFWS.

The County’s MSCP permit addresses 44 species, including the Tumamoc globeberry, lesser long-nosed bat, Merriam’s mouse, burrowing owl, yellow-billed cuckoo, Gila topminnow, Sonoran Desert tortoise, northern Mexican garter snake, and dozens of other plants and animals (see chart, next page). Nine species on the permit are currently listed as threatened or endangered under the ESA, and an additional three species are candidates or have been petitioned for listing. The remaining species are included based on their potential to be listed during the permit’s 30-year period.

Top left: Six Bar Ranch. Left: Tucson Mountain Park.

A required element of the MSCP will be mitigation, which compensates for the loss of habitat in one area in exchange for protection of land elsewhere. Under the MSCP, the amount of conservation land needed to compensate for takings varies depending on the location of the disturbance and its relative biological importance as gauged by a Conservation Land System map (see sidebar page 26). For example, for land in a Biological Core Area, five acres of land will be preserved in exchange for every one acre of land disturbed. The MSCP permit will assure long-term protection of county-owned parks and conservation lands that are used as mitigation lands. Pima County will incrementally protect these lands using legal instruments such as conservation easements and covenants. Legal protection would have the benefit of protecting these parks and natural areas from being sold or re-purposed to other uses in the future.

#### BACK TO THE FUTURE

Ten years have passed since the original bond-funded land acquisitions, and Pima County has—or soon will have—approximately 71,000 acres of deeded land for the purpose of long-term conservation under the ESA, in addition to holding grazing leases on approximately 124,000 acres of State and Federal lands. These conservation commitments are joined with other open-space lands such as Tucson Mountain Park to create a total of over 240,000 acres of county-managed preserves. If Pima County voters approved the natural open space question in the November bond election, the bond funds will be used to purchase additional lands that will provide the county with all of the MSCP’s anticipated mitigation needs for the permit.

The government of Pima County has long recognized that residents of the greater Sonoran Desert Region take pride in its natural beauty and diversity; they are hallmarks of our sense of place and community. The MSCP component of the Sonoran Desert Conservation Plan is the just latest of the county’s many initiatives to promote more sustainable economic growth in tandem with conservation of our natural and cultural treasures.

#### SUGGESTED RESOURCES

See: [http://webcms.pima.gov/government/sustainability\\_and\\_conservation/conservation\\_science/the\\_sonoran\\_desert\\_conservation\\_plan/](http://webcms.pima.gov/government/sustainability_and_conservation/conservation_science/the_sonoran_desert_conservation_plan/)

Top right: Cienega Creek Natural Preserve. Right: Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*).

#### SPECIES COVERED UNDER THE MULTI-SPECIES CONSERVATION PLAN

- Pima pineapple cactus**, *Coryphantha scheeri* var. *robustispina*
- Needle-spined pineapple cactus**, *Echinomastus erectocentrus* var. *erectocentrus*
- Huachuca water umbel**, *Lilaeopsis schaffneriana recurve*
- Tumamoc globeberry**, *Tumamoca macdougalii*
- Mexican long-tongued bat**, *Choeronycteris mexicana*
- Western red bat**, *Lasiurus blossevillii*
- Western yellow bat**, *Lasiurus xanthinus*
- Lesser long-nosed bat**, *Leptonycteris curasoae yerbabuena*
- California leaf-nosed bat**, *Macrotus californicus*
- Pale Townsend’s big-eared bat**, *Plecotus townsendii pallescens*
- Merriam’s mouse**, *Peromyscus merriami*
- Western burrowing owl**, *Athene cunicularia hypugaea*
- Cactus ferruginous pygmy-owl**, *Glaucidium brasilianum cactorum*
- Rufous-winged sparrow**, *Aimophila carpalis*
- Swainson’s hawk**, *Buteo swainsoni*
- Yellow-billed cuckoo**, *Coccyzus americanus*
- Southwestern willow flycatcher**, *Empidonax traillii extimus*
- Abert’s towhee**, *Melospiza aberti*
- Bell’s vireo**, *Vireo bellii arizonae*
- Longfin dace**, *Agosia chrysogaster*
- Desert sucker**, *Catostomus darki*
- Sonora sucker**, *Catostomus insignis*
- Gila chub**, *Gila intermedia*
- Gila topminnow**, *Poeciliopsis occidentalis occidentalis*
- Chiricahua leopard frog**, *Lithobates chiricahuensis*
- Lowland leopard frog**, *Lithobates yavapaiensis*
- Desert box turtle**, *Terrapene ornata luteola*
- Sonoran desert tortoise**, *Gopherus morafkai*
- Tucson shovel-nosed snake**, *Chionactis occipitalis klauberi*
- Northern Mexican garter snake**, *Thamnophis eques megalops*
- Giant spotted whiptail**, *Aspidoscelis stictogramma*
- Ground snake (valley form)**, *Sonora semiannulata*
- San Xavier talus snail**, *Sonorella eremita*
- Talus snail (11 species)**, *Sonorella* spp.



Terry Hendricks



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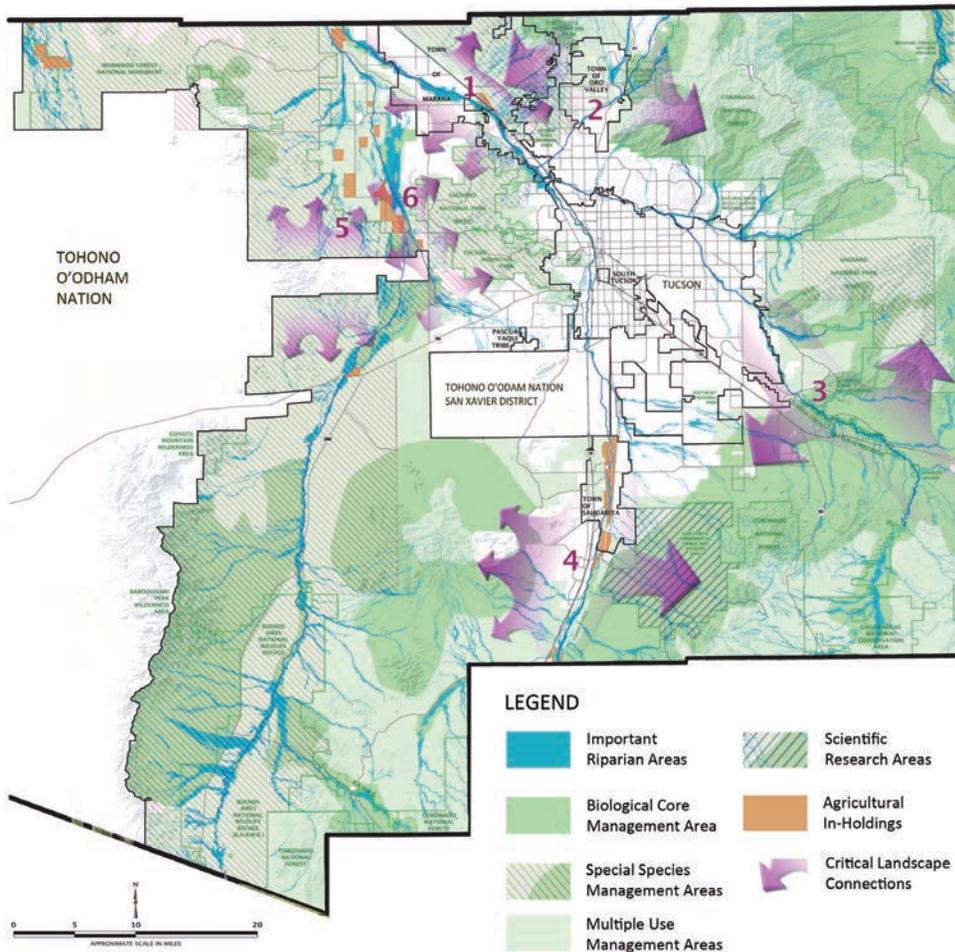
THE MAEVEEN  
MARIE BEHAN  
CONSERVATION  
LAND SYSTEM MAP

Pima County adopted the Conservation Land System (CLS) map in 2001. It is the culmination of a detailed analysis by local scientists of the county's rich biological resources and their threats. The CLS map integrates these elements to characterize land according to its relative biological importance, and it's a map with powerful implications. It is applied to rezoning decisions by the County Board of Supervisors, which can require developers to set aside between 66 and 95 percent of land as undeveloped open space, depending on its location within the CLS. In addition, the CLS map has influenced investments in regional roadways and sewage treatment. It has also been used to guide acquisitions made with voter-approved bonds for habitat protection. Pima County is unusual, if not unique, in using an explicit biological foundation for making discretionary land-use decisions.

THE MAEVEEN MARIE BEHAN CONSERVATION LAND SYSTEM PRIORITY BIOLOGICAL RESOURCES OF THE SONORAN DESERT CONSERVATION PLAN

The map on this page shows Pima County east of the greater Tohono O'odham Nation. For a full view of the map, including all of Pima County, as well as definitions of the key resource assignments, see the map link at <http://webcms.pima.gov/cms/one.aspx?portalId=169&pageId=53493>.

The Critical Landscape Connections noted are: (1) across the I-10/Santa Cruz River corridors in the northwest; (2) between the Catalina and Tortolita Mountains; (3) across the I-10 corridor along Cienega Creek in the east; (4) across the I-19 and Santa Cruz River corridors in southern Pima County; (5) across the Garcia strip extension of the Tohono O'odham Nation; and (6) across the Central Arizona Project canal in Avra Valley. Critical Landscape Connections are broadly defined as areas that provide connectivity for movement of native biological resources but which also contain potential or existing barriers that tend to isolate major conservation areas.



PLANTS

Spurred by the Association of Zoos and Aquariums's SAFE (Saving Animals From Extinction) program, we have focused on charismatic animals at risk in this *Sonorensis*, but the loss of species in the plant kingdom is equally critical. Plant communities are intricately woven in, and essential to, the lives of all animals; they translate the sun into consumable nutrients (food), provide shelter, and root and replenish the soil.

Although it is unclear if a few plant species of the Sonoran Desert that have been presumed extinct actually are gone forever, in Arizona 14 plants are listed as endangered, another 7 threatened—from Welsh's milkweed and Canelo Hill's ladies tresses to the Arizona cliffrose. Across the Sonoran Desert Region there are undoubtedly more.

You can see several endangered plants on ASDM grounds, including the Pima pineapple cactus, Kearny's blue star, Huachuca water umbel, and Nichol's Turk's head, Arizona hedgehog, and Acuña cactuses. ASDM also partners with public agencies on conservation programs for some endangered species. One of the target species for Pima County's Sonoran Desert Conservation Plan, the Pima pineapple cactus is being grown out at the Desert Museum for distribution. It has been crowded out of its range out by urbanization, mining, overgrazing, and competition with native grasses. As a riparian obligate, Huachuca water umbel populations diminish as our rivers dry. The Desert Museum has 27 clones of the water umbel in reserve for the US Fish and Wildlife Service in the event wild populations disappear. We are currently partnering in research on the pollination of Kearny's blue star. Pima County also has a native plant nursery where they grow out targeted plant species for conversation lands.

As with animals, the protection of individual species is problematic since their survival is deeply entangled with the whole ecological community. It is also logistically complex, and the use of cultivated populations in green houses and gardens is only effective in limited situations. It is conservation of lands and connectivity that will prevent the collapse of both species and, eventually, whole ecosystems. Saving endangered plants in habitat will be to our benefit and to the benefit of all the other two, four, six, eight, or multi-legged residents of the Sonoran Desert Region—pollinators, herbivores, carnivores, and omnivores alike!!

If you want to learn more or get involved, several other organizations work to encourage the appreciation of native plants and/or the protection of plants at risk in this region: the Arizona Native Plant Society, US Fish and Wildlife Service, The Nature Conservancy, Center for Biological Diversity, Tucson Cactus and Succulent Society, and regional botanical gardens.

ASDM Botany Staff