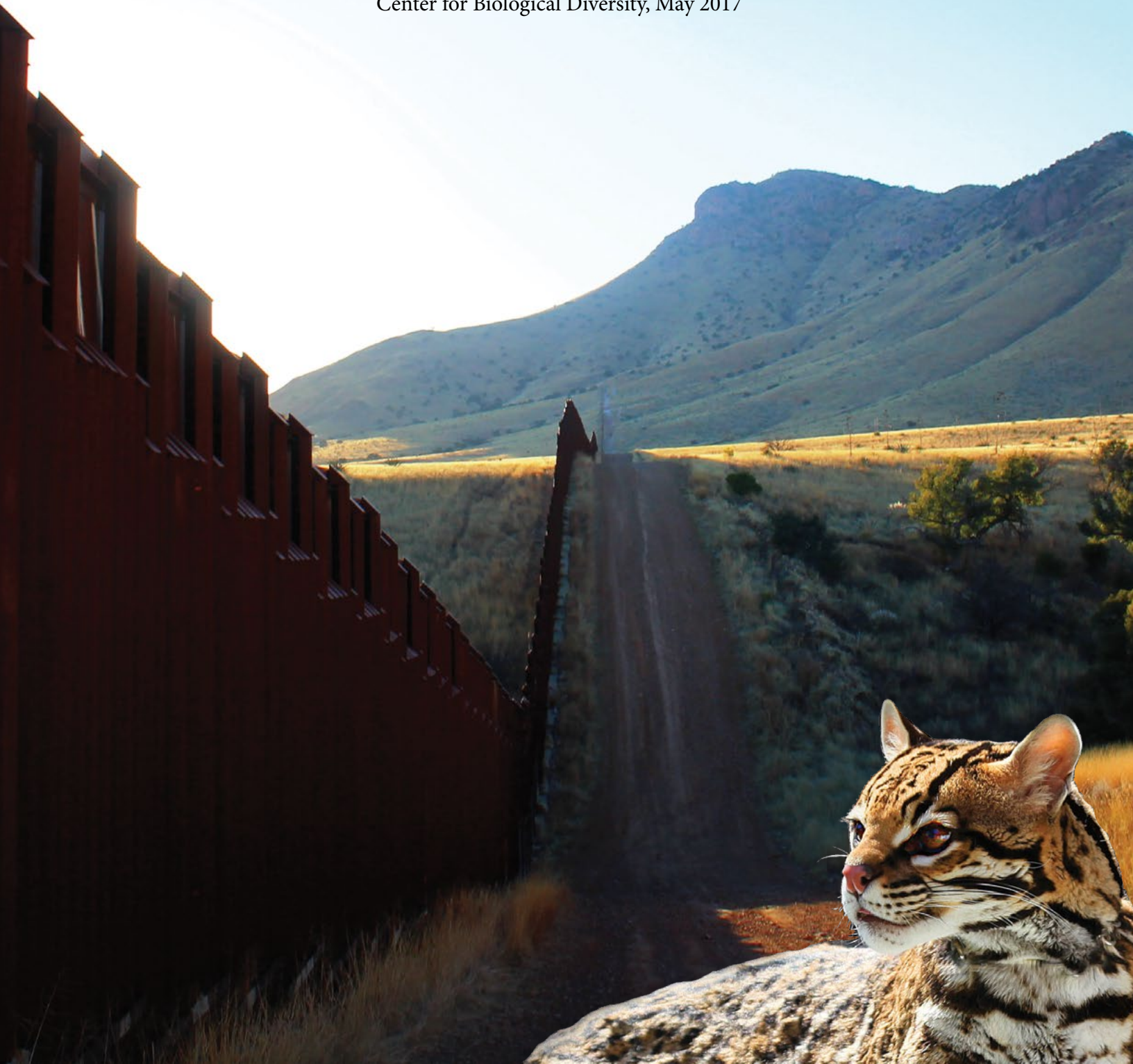


# A WALL IN THE WILD

## THE DISASTROUS IMPACTS OF TRUMP'S BORDER WALL ON WILDLIFE

Noah Greenwald, Brian Segee, Tierra Curry and Curt Bradley  
Center for Biological Diversity, May 2017



## EXECUTIVE SUMMARY

**T**rump's border wall will be a deathblow to already endangered animals on both sides of the U.S.-Mexico border. This report examines the impacts of construction of that wall on threatened and endangered species along the entirety of the nearly 2,000 miles of the border between the United States and Mexico. The wall and concurrent border-enforcement activities are a serious human-rights disaster, but the wall will also have severe impacts on wildlife and the environment, leading to direct and indirect habitat destruction. A wall will block movement of many wildlife species, precluding genetic exchange, population rescue and movement of species in response to climate change. This may very well lead to the extinction of the jaguar, ocelot, cactus ferruginous pygmy owl and other species in the United States.

To assess the impacts of the wall on imperiled species, we identified all species protected as threatened or endangered under the Endangered Species Act, or under consideration for such protection by the U.S. Fish and Wildlife Service ("candidates"), that have ranges near or crossing the border. We also determined whether any of these species have designated "critical habitat" on the border in the United States. Finally, we reviewed available literature on the impacts of the existing border wall.

We found that the border wall will have disastrous impacts on our most vulnerable wildlife, including:

- ❖ 93 threatened, endangered and candidate species would potentially be affected by construction of a wall and related infrastructure spanning the entirety of the border, including jaguars, Mexican gray wolves and Quino checkerspot butterflies.
- ❖ The wall would degrade and destroy critical habitat for 25 species, including a total of 2,134,792 acres that occur within 50 miles of the border. Species with critical habitat on the border include the jaguar, arroyo toad and Peninsular bighorn sheep.
- ❖ Studies on portions of the border wall that have already been constructed demonstrate that the wall precludes movement of some wildlife. For example, the cactus ferruginous pygmy owl tends to fly low over the ground and avoids open areas, so the border wall will isolate U.S. birds from those in Mexico. This is true for many other species as well.

These results reflect a first look at the consequences of construction of more than 1,200 miles of border wall and associated infrastructure and enforcement on imperiled species. A more thorough analysis of Trump's border wall is badly needed, but adequate federal studies will not occur because the REAL ID Act of 2005 gave the secretary of Homeland Security the power to waive environmental and other laws to expedite construction of the border wall. Under President George W. Bush, then-Secretary Michael Chertoff utilized this authority five times to waive the National Environmental Policy Act, Endangered Species Act and other laws to construct the nearly 700 miles of wall and other barriers that have been constructed to date. Past challenges to REAL ID waivers have proven unsuccessful.

Even so, the Center for Biological Diversity and a broad coalition of environmental, human and civil-rights organizations, as well as borderland private property owners and elected officials, are preparing new and vigorous legal challenges in case the Trump administration attempts to once again rely on REAL ID Act waivers and dispense with the rule of law regarding border wall construction. In addition, the Center has already teamed up with Rep. Raúl Grijalva (D-Ariz.), ranking member on the House Natural Resources Committee, to sue the Trump administration and require the Department of Homeland Security to conduct a full environmental review of the border wall and the broader Homeland Security border enforcement program.

**See pages 13-16 for profiles of six species threatened by the wall: jaguar, ocelot, Mexican gray wolf, Sonoran pronghorn, cactus ferruginous pygmy owl and Quino checkerspot butterfly.**



## INTRODUCTION

**O**n Jan. 25, 2017, Trump issued an executive order calling for construction of a wall along the entirety of the nearly 2,000-mile border between the United States and Mexico. The wall will no doubt deepen divisions between the two countries and, in combination with increased militarization of the border, lead to untold suffering for those seeking a better life and harm to the many communities along the border. The wall will also have serious impacts on numerous threatened and endangered species and other wildlife.

The borderlands are one of the most biologically rich areas in North America (McCallum et al. 2014). More than 700 migratory species of birds, mammals and insects use the borderlands during their annual migrations (EPA 1996). Many subtropical and tropical species such as the jaguar, ocelot, and gray hawk reach their northern range extent in the borderlands. Likewise many northern species, such as the black bear and black-tailed prairie dog, reach their southern range extent in the region. Others, such as the Sonoran pronghorn, are found only near the border.

To date 353 miles of border wall, impassable by pedestrians and vehicles, and roughly 300 miles of barriers that block vehicles but not pedestrians, have been constructed. These barriers affect wildlife less severely but are not without negative impacts. Trump's proposal to construct a physical barrier to human traffic across the entirety of the border would entail a massive increase in the length of the border wall with concurrent impacts on wildlife. It will cut through Buenos Aires, Cabeza Prieta and several other national wildlife refuges, as well as Organ Pipe Cactus National Monument and Big Bend National Park. Many other

areas that provide important habitat and movement corridors for wildlife would also be impacted. It will result in thousands of acres of direct habitat destruction, impact thousands more through indirect disturbance from roads, lights and noise and serve as a barrier to movement of plants and animals.

To assess the scope of impacts to wildlife from construction of a wall across the entirety of the border, we identified all species protected as threatened or endangered under the Endangered Species Act or candidates for such protection that occur in the area of impact for the border wall.<sup>1</sup> We also reviewed all available literature on the impacts of the border wall on wildlife. These analyses show that construction of a border wall will have devastating results for our most sensitive wildlife species.

## IMPACTS OF BORDER CONSTRUCTION TO DATE

Since the early 1990s, the U.S. government's border-control efforts have been driven by a "prevention through deterrence" strategy — the concept that increased personnel and infrastructure will discourage undocumented immigration. This strategy was first implemented in heavily populated border areas such as San Diego and El Paso and shifted immigrants, drug trafficking and other unlawful activities to more remote and less populated areas, causing extensive environmental damage and social disruption to borderlands communities. Invariably increased border enforcement efforts have then shifted to those more remote areas, further intensifying the impacts on the borderlands environment and communities. Many of these more remote locations are protected areas of federal, state or private land containing essential habitat for some of the most imperiled species of fish, wildlife and plants in North America.



Photo © Tomas Castelazo, [www.tomascastelazo.com](http://www.tomascastelazo.com) / Wikimedia Commons

As part of this prevention-through-deterrence strategy, hundreds of miles of border walls have been constructed since the early 1990s, requiring billions of dollars in federal appropriations. Border-wall construction accelerated greatly during the George W. Bush administration after Congress passed legislation known as the “Secure Fence Act,” which originally mandated more than 800 miles of border wall construction. In total, Homeland Security has installed 353 miles of primary border wall (“pedestrian fencing”), as well as 36 miles of secondary border walls behind the primary wall and 14 miles of tertiary border walls behind the secondary border walls (CRS 2016).

In addition, approximately 300 miles of “vehicle barriers” have been installed on the southern border. Although the deployment of vehicle barriers can result in environmental impacts, primarily from associated road construction, they pose far less risk to wildlife populations than border walls. Vehicle barriers are made of steel, are 4 to 6 feet in height, and do not block the migrations of most wildlife species or cause or exacerbate flooding along the borderlands.

Border wall installation and associated construction of roads threatens the biological integrity of the borderlands and all of the unique and diverse ecosystems and plant and wildlife assemblages within that broader region through direct habitat destruction and fragmentation and creation of barriers between wildlife populations. That in turn precludes essential movement and gene flow while facilitating increased vehicular traffic and human disturbance in previously undisturbed areas (ACE 2001).<sup>2</sup>

Although there have been few studies on the impacts of the border wall on wildlife to date, the ones that have been conducted demonstrate that many species have been impacted by existing border wall construction and that many more will be if Trump’s wall is built. Moya (2007), reporting on the results of a specialist panel, raised concerns about habitat fragmentation, lost habitat, the wall as a barrier to dispersal leading to loss of genetic interchange, spread of invasive and noxious weeds and light and noise pollution related to the wall, identifying pronghorn, the American bison, bighorn sheep, jaguar, Mexican gray wolf, ocelot, American black bear, black-tailed prairie dog, North American porcupine, American badger, swift fox, Montezuma quail, wild turkey, “various species of fish in border rivers and creeks” and “other medium and small species distributed in valleys and other sites along the border” as all being at risk from these impacts.

McCain and Childs (2008) used cameras to monitor the presence of two jaguars and possibly a third in Arizona, determining that these male jaguars were in fact residents of the United States and leading the authors to “stress the fragmentation consequences of the proposed United States–Mexico border fence to the northernmost jaguar population, and particularly to jaguars in the United States.”

Flesch et al. (2010) examined the potential impacts of the border wall on two species, the cactus ferruginous pygmy owl and bighorn sheep, finding that both species are negatively impacted by existing barriers and leading the authors to conclude “connectivity for other



Jaguar photographed in the Santa Rita Mountains near Tucson, Ariz., October 22, 2013, courtesy USFWS

species with similar movement abilities and spatial distributions may be affected by border development.”

Likewise, Lasky et al. (2011) evaluated the impacts of the existing border wall and other barriers on amphibians, reptiles and mammals. They identified 56 species that have likely been affected by existing border walls, including five that have been identified as being at risk of extinction by the International Union for Conservation of Nature or at least one of the two nations — arroyo toad, California red-legged frog, black-spotted newt, Pacific pond turtle and jaguarundi. Lasky et al. (2011) also expressed concern that further construction of border wall had the potential to greatly increase the number of species at risk, particularly in California, the Madrean archipelago (“Sky Island” ranges) and the Gulf Coast, all regions that are rich with biological diversity.

Finally McCallum et al. (2014) used camera traps to compare movements of people and wildlife between areas with and without border walls in existing protected areas of Arizona, finding that both pumas and coatis were found in higher numbers in areas without walls. The authors, however, found no difference in number of people detected between the two treatments, suggesting that barriers are not effective at deterring migrants, but do affect wildlife populations.

Further impacts of existing border construction on wildlife or the environment as a whole have not been catalogued in large part because Congress has unwisely vested the Homeland Security secretary with the

power to waive otherwise applicable laws in order to ensure the expeditious construction of border walls.<sup>3</sup> During the George W. Bush administration, Homeland Security Secretary Michael Chertoff published five “notices of determination” in the Federal Register that he was invoking the REAL ID waiver authority, exempting more than 35 laws that would have otherwise applied to approximately 550 miles of border wall and vehicle barrier construction.<sup>4</sup>

In all five of these determinations, Secretary Chertoff waived application of NEPA.<sup>5</sup> Due to these waivers, quantified information regarding impacts of border wall and associated road construction are lacking, as well as post-decision monitoring and mitigation requirements that would have also applied. Under the Obama administration, U.S. Customs and Border Patrol prepared some “Environmental Stewardship Plans” prior to construction and “Environmental Stewardship Summary Reports” after construction for border infrastructure projects that provided limited information. These reports, however, are not sufficient to compile a more comprehensive and accurate estimate of border wall and associated infrastructure quantified impacts on wildlife.

The border walls that exist today were largely constructed prior to the Obama administration. During President Obama’s two terms, Homeland Security did not propose extensive new wall construction, though construction begun under Bush’s second term did continue. That has dramatically changed under the Trump administration.



March 14, 2009, Naval Mobile Construction Battalions construct a concrete-lined drainage ditch and a 10 foot-high wall along the U.S. and Mexico border in Douglas, Ariz.

Within days of taking office, Trump issued an executive order directing the Homeland Security secretary to “secure the southern border of the United States through the immediate construction of a physical wall on the southern border,” (Sec. 2(a)) and defining “wall” to mean “a contiguous, physical wall or other similarly secure, contiguous, and impassable physical barrier.” (Sec. 3 (e)).<sup>6</sup>

Completion of a wall running the length of the border would thus require new construction along approximately 1,283 miles of border. Moreover, the executive order could be interpreted to require replacement of the existing 300 miles of vehicle fencing, which are passable to humans. In fact even the existing “single layer” bollard and mesh fencing could arguably be characterized as “passable” (if someone had an 11-foot ladder for a 10-foot fence) under the order’s definition, requiring new construction along the vast

majority of the border. Indeed Trump has consistently described his “great wall” as a solid concrete edifice as high as 55 feet.

## **THREATENED, ENDANGERED AND CANDIDATE SPECIES AFFECTED BY BORDER WALL**

We identified all threatened, endangered and candidate species that would likely be affected by construction of a complete border wall utilizing a database maintained by the U.S. Fish and Wildlife Service identifying protected species by county. We initially included all species found in one of the counties along the border, but then refined this list through careful examination of each species’ reported range in listing rules or species accounts available at NatureServe.org. We excluded any species that did not have a range that abutted the border or did not occur in both the United States and Mexico in proximity to the border. We also identified any



Mexican spotted owl by Aaron Maizlish, CC-BY-NC

designated critical habitats for these species occurring on the border.

The U.S. Fish and Wildlife Service defines candidate species as those warranting protection as threatened or endangered, but for which the agency lacks resources to provide such protection. We included any candidate species found along the border since they have already been determined to be at risk. In a small number of cases, we also included species that are under consideration for protection as threatened or endangered, meaning a petition has been submitted to have them considered for protection and the agency has made an initial finding that they may warrant protection. Finally we included the golden and bald eagle, which are both protected under the Golden and Bald Eagle protection Act.

Many of the cross-border imperiled species we identified may not be affected directly by construction of the wall itself, but rather by associated infrastructure, such as roads, structures and traffic associated with enforcement and building the wall. In analyzing impacts of border enforcement in 2001, the U.S. Army Corps of Engineers used a 50-mile wide area starting at the wall (ACE 2001). We used this distance to identify potentially affected species and impacts to critical habitat. In the vast majority of cases, the species we identified as potentially being affected by Trump's wall and associated activities occur much closer than 50 miles or on the border.

In total we identified 93 imperiled species that would likely be affected by construction of a border wall, including 57 endangered species, 24 threatened species, three species proposed for endangered status, three candidate species, four species under review for

protection and two species of concern (golden and bald eagle) (Table 1). All but five of these species have populations on both sides of the border, meaning construction of the wall will divide the species and potentially limit gene flow.

Twenty-five threatened or endangered species have designated critical habitat on the border, including 10 where all of their habitat is within 50 miles of the border and three where a majority is within this distance (Table 2, Figure 1). Under the Endangered Species Act, federal agencies like the Department of Homeland Security would normally be required to ensure their actions, including construction of the border wall, did not destroy or adversely modify critical habitat for these 25 species, but because of the possibility of another REAL ID Act waiver, this may not happen. If this should occur, there should be real concern for the survival of these species.

## CONCLUSIONS

Our report documents that a minimum of 93 species at risk of extinction will be further imperiled by construction of Trump's border wall, including impacts to critical habitat for 25 of these species. The purpose of the border wall is to keep people seeking work and a better life in the United States from crossing the border, a purpose at which it is unlikely to be effective, but it also has the unintended consequence of acting as a barrier to wildlife. If the wall is constructed, it will in all likelihood contribute to the loss of the jaguar, ocelot, cactus ferruginous pygmy owl and other species in the United States and divide cross-border species like bighorn sheep, Mexican gray wolves and most of the other 93 species that occur on both sides of the border. Should this occur it will be an unmitigated disaster for both people and wildlife.

Table 1. Endangered, threatened and candidate species likely to be affected by construction of Trump's border wall.

| <b>Common</b>                   | <b>Scientific</b>  | <b>Status</b>       | <b>Cross-border</b> | <b>State</b>              |
|---------------------------------|--|---------------------|---------------------|---------------------------|
| Acuña cactus                    | <i>Echinomastus erectocentrus</i> var. <i>acunensis</i>  | Endangered          | Yes                 | Arizona                   |
| arroyo toad                     | <i>Anaxyrus californicus</i>                             | Endangered          | Yes                 | California                |
| ashy dogweed                    | <i>Thymophylla tephroleuca</i>                           | Endangered          | Unknown             | Texas                     |
| bald eagle                      | <i>Haliaeetus leucocephalus</i>                          | Recovered           | Yes                 | Texas, Arizona            |
| Bartram stonecrop               | <i>Graptopetalum bartramii</i>                           | Under Review        | Yes                 | Arizona                   |
| beardless chinchweed            | <i>Pectis imberbis</i>                                   | Under Review        | Yes                 | Arizona                   |
| beautiful shiner                | <i>Cyprinella formosa</i>                                | Threatened          | Yes                 | Arizona, New Mexico       |
| Big Bend gambusia               | <i>Gambusia gaigei</i>                                   | Endangered          | Yes                 | Texas                     |
| black-capped vireo              | <i>Vireo atricapilla</i>                                 | Endangered          | Yes                 | Texas                     |
| bunched cory cactus             | <i>Coryphantha ramillosa</i>                             | Threatened          | Yes                 | Texas                     |
| cactus ferruginous pygmy owl    | <i>Glaucidium brasilianum cactorum</i>                   | Under Review        | Yes                 | Arizona                   |
| California condor               | <i>Gymnogyps californianus</i>                           | Endangered          | Yes                 | Arizona, Utah, California |
| California least tern           | <i>Sterna antillarum browni</i>                          | Endangered          | Yes                 | Arizona, California       |
| California Orcutt grass         | <i>Orcuttia californica</i>                              | Endangered          | Yes                 | California                |
| Chiricahua leopard frog         | <i>Rana chiricahuensis</i>                               | Threatened          | Yes                 | Arizona, New Mexico       |
| Chisos Mountain hedgehog cactus | <i>Echinocereus chisoensis</i> var. <i>chisoensis</i>    | Threatened          | No                  | Texas                     |
| Coastal California gnatcatcher  | <i>Poliptila californica californica</i>                 | Threatened          | Yes                 | California                |
| Cochise pincushion cactus       | <i>Coryphantha robbinsiorum</i>                          | Threatened          | Yes                 | Arizona                   |
| Del Mar manzanita               | <i>Arctostaphylos glandulosa</i> ssp. <i>Crassifolia</i> | Endangered          | Yes                 | California                |
| Devils River minnow             | <i>Dionda diaboli</i>                                    | Threatened          | Yes                 | Texas                     |
| Gila chub                       | <i>Gila intermedia</i>                                   | Endangered          | Yes                 | Arizona                   |
| Gila topminnow (incl. Yaqui)    | <i>Poeciliopsis occidentalis</i>                         | Endangered          | Yes                 | Arizona, New Mexico       |
| golden eagle                    | <i>Aquila chrysaetos</i>                                 | Species of Concern  | Yes                 | Texas                     |
| Guadalupe fescue                | <i>Festuca ligulata</i>                                  | Proposed Endangered | Yes                 | Texas                     |
| Gulf Coast jaguarundi           | <i>Herpailurus (=Felis) yagouaroundi cacomitli</i>       | Endangered          | Yes                 | Texas                     |



|                                     |   |            |     |                            |
|-------------------------------------|---|------------|-----|----------------------------|
| Hermes copper butterfly             | <i>Lycaena hermes</i>                                 | Candidate  | Yes | California                 |
| Hinckley oak                        | <i>Quercus hinckleyi</i>                              | Threatened | Yes | Texas                      |
| Huachuca water-umbel                | <i>Lilaeopsis schaffneriana</i> var. <i>recurva</i>   | Endangered | Yes | Arizona                    |
| jaguar                              | <i>Panthera onca</i>                                  | Endangered | Yes | Arizona, New Mexico        |
| Kearney's blue-star                 | <i>Amsonia kearneyana</i>                             | Endangered | Yes | Arizona                    |
| Laguna Mountains skipper            | <i>Pyrgus ruralis lagunae</i>                         | Endangered | Yes | California                 |
| least Bell's vireo                  | <i>Vireo bellii pusillus</i>                          | Endangered | Yes | California                 |
| least tern                          | <i>Sterna antillarum</i>                              | Endangered | Yes | Texas, New Mexico          |
| leatherback sea turtle              | <i>Dermochelys coriacea</i>                           | Endangered | Yes | California, Texas          |
| lesser long-nosed bat               | <i>Leptonycteris curasoae yerbabuena</i>              | Endangered | Yes | Arizona, New Mexico        |
| light-footed clapper rail           | <i>Rallus longirostris levipes</i>                    | Endangered | Yes | California                 |
| Lloyd's mariposa cactus             | <i>Echinomastus mariposensis</i>                      | Threatened | Yes | Texas                      |
| loach minnow                        | <i>Tiaroga cobitis</i>                                | Endangered | Yes | Arizona, New Mexico        |
| loggerhead sea turtle               | <i>Caretta caretta</i>                                | Endangered | Yes | California, Texas          |
| masked bobwhite (quail)             | <i>Colinus virginianus ridgwayi</i>                   | Endangered | Yes | Arizona                    |
| Mexican flannel-bush                | <i>Fremontodendron mexicanum</i>                      | Endangered | Yes | California                 |
| Mexican long-nosed bat              | <i>Leptonycteris nivalis</i>                          | Endangered | Yes | New Mexico, Texas          |
| Mexican spotted owl                 | <i>Strix occidentalis lucida</i>                      | Threatened | Yes | Arizona, New Mexico, Texas |
| Mexican gray wolf                   | <i>Canis lupus baileyi</i>                            | Endangered | Yes | New Mexico                 |
| narrow-headed gartersnake           | <i>Thamnophis rufipunctatus</i>                       | Threatened | Yes | New Mexico                 |
| Nellie cory cactus                  | <i>Coryphantha minima</i>                             | Endangered | No  | Texas                      |
| New Mexican ridge-nosed rattlesnake | <i>Crotalus willardi obscurus</i>                     | Threatened | Yes | Arizona, New Mexico        |
| Nichol's Turk's head cactus         | <i>Echinocactus horizontalis</i> var. <i>nicholii</i> | Endangered | Yes | Arizona                    |
| northern aplomado falcon            | <i>Falco femoralis septentrionalis</i>                | Endangered | Yes | Arizona, New Mexico, Texas |
| northern Mexican gartersnake        | <i>Thamnophis eques megalops</i>                      | Threatened | Yes | Arizona, New Mexico        |
| ocelot                              | <i>Leopardus (=Felis) pardalis</i>                    | Endangered | Yes | Arizona, Texas             |
| Otay Mesa-mint                      | <i>Pogogyne nudiuscula</i>                            | Endangered | Yes | California                 |

|                                |   |                     |     |  |
|--------------------------------|---|---------------------|-----|--|
| Otay tarplant                  | <i>Deinandra</i> (=Hemizonia) <i>conjugens</i>          | Threatened          | Yes | California                             |
| Pacific pocket mouse           | <i>Perognathus longimembris pacificus</i>               | Endangered          | Yes | California                             |
| Peirson's milk-vetch           | <i>Astragalus magdalenae</i> var. <i>peirsonii</i>      | Threatened          | Yes | California                             |
| Peninsular big-horn sheep      | <i>Ovis canadensis nelsoni</i>                          | Endangered          | Yes | California                             |
| Pima pineapple cactus          | <i>Coryphantha scheeri</i> var. <i>robustispina</i>     | Endangered          | Yes | Arizona                                |
| piping plover                  | <i>Charadrius melodus</i>                               | Threatened          | Yes | Texas                                  |
| Quino checker-spot butterfly   | <i>Euphydryas editha quino</i> (=E. e. <i>wrighti</i> ) | Endangered          | Yes | California                             |
| Quitobaquito pupfish           | <i>cyprinodon eremus</i>                                | Endangered          | Yes | Arizona                                |
| razorback sucker               | <i>Xyrauchen texanus</i>                                | Endangered          | Yes | California, Arizona                    |
| red-crowned parrot             | <i>Amazona viridigenalis</i>                            | Candidate           | Yes | Texas                                  |
| Rio Grande silvery Minnow      | <i>Hybognathus amarus</i>                               | Endangered          | Yes | New Mexico                             |
| Riverside fairy shrimp         | <i>Streptocephalus woottoni</i>                         | Endangered          | Yes | California                             |
| salt marsh bird's-beak         | <i>Cordylanthus maritimus</i> ssp. <i>Maritimus</i>     | Endangered          | Yes | California                             |
| San Bernardino springsnail     | <i>Pyrgulopsis bernardina</i>                           | Threatened          | Yes | Arizona                                |
| San Diego ambrosia             | <i>Ambrosia pumila</i>                                  | Endangered          | Yes | California                             |
| San Diego button-celery        | <i>Eryngium aristulatum</i> var. <i>parishii</i>        | Endangered          | Yes | California                             |
| San Diego fairy shrimp         | <i>Branchinecta sandiegonensis</i>                      | Endangered          | Yes | California                             |
| San Diego thorn-mint           | <i>Acanthomintha ilicifolia</i>                         | Threatened          | Yes | California                             |
| Sonora chub                    | <i>Gila ditaenia</i>                                    | Threatened          | Yes | Arizona                                |
| Sonoran prong-horn             | <i>Antilocapra americana sonoriensis</i>                | Endangered          | Yes | Arizona                                |
| Sonoran talussnail             | <i>Sonorella magdalenensis</i>                          | Under Review        | Yes | Arizona                                |
| Sonora tiger salamander        | <i>Ambystoma tigrinum stebbinsi</i>                     | Endangered          | Yes | Arizona                                |
| Sonoyta mud turtle             | <i>Kinosternon sonoriense longifemorale</i>             | Proposed Endangered | Yes | Arizona                                |
| South Texas ambrosia           | <i>Ambrosia cheiranthifolia</i>                         | Endangered          | Yes | Texas                                  |
| southwestern willow flycatcher | <i>Empidonax traillii extimus</i>                       | Endangered          | Yes | Arizona, California, New Mexico, Texas |
| spikedace                      | <i>Meda fulgida</i>                                     | Endangered          | Yes | Arizona, New Mexico                    |

|                                     |  |                     |     |                            |
|-------------------------------------|--|---------------------|-----|----------------------------|
| spreading navarretia                | <i>Navarretia fossalis</i>                         | Threatened          | Yes | California                 |
| star cactus                         | <i>Astrophytum asterias</i>                        | Endangered          | Yes | Texas                      |
| Southern California steelhead trout | <i>Oncorhynchus</i> (=Salmo) <i>mykiss</i> pop. 10 | Endangered          | Yes | California                 |
| Terlingua Creek cat's-eye           | <i>Cryptantha crassipes</i>                        | Endangered          | No  | Texas                      |
| Texas ayenia                        | <i>Ayenia limitaris</i>                            | Endangered          | Yes | Texas                      |
| Texas hornshell                     | <i>Popenaias popeii</i>                            | Proposed Endangered | Yes | Texas                      |
| Texas snowbells                     | <i>Styrax texanus</i>                              | Endangered          | No  | Texas                      |
| Walker's manioc                     | <i>Manihot walkerae</i>                            | Endangered          | Yes | Texas                      |
| western snowy plover                | <i>Charadrius alexandrinus nivosus</i>             | Threatened          | Yes | California                 |
| willow monardella                   | <i>Monardella viminea</i>                          | Endangered          | Yes | California                 |
| Wright's marsh thistle              | <i>Cirsium wrightii</i>                            | Candidate           | Yes | Arizona                    |
| Yaqui catfish                       | <i>Ictalurus pricei</i>                            | Threatened          | Yes | Arizona                    |
| Yaqui chub                          | <i>Gila purpurea</i>                               | Endangered          | Yes | Arizona                    |
| yellow-billed Cuckoo                | <i>Coccyzus americanus</i>                         | Threatened          | Yes | Arizona, New Mexico, Texas |
| Yuma clapper rail                   | <i>Rallus longirostris yumanensis</i>              | Endangered          | Yes | Arizona, California        |
| Zapata bladder-pod                  | <i>Lesquerella thamnophila</i>                     | Endangered          | Yes | Texas                      |

Table 2. Species with critical habitat along the border, including acres within 50 miles of the border.

| <b>Common Name</b>                 | <b>Scientific Name</b>                                  | <b>Total Acres</b> | <b>Acres within 50 miles</b> | <b>Percent within 50 miles</b> |
|------------------------------------|---|--------------------|------------------------------|--------------------------------|
| arroyo toad                        | <i>Anaxyrus californicus</i>                            | 98424.2            | 45806.4                      | 46.5%                          |
| beautiful shiner                   | <i>Cyprinella formosa</i>                               | 10.3               | 10.3                         | 100.0%                         |
| Peninsular big-horn sheep          | <i>Ovis canadensis nelsoni</i>                          | 377419.9           | 237485.9                     | 62.9%                          |
| Chiricahua leopard frog            | <i>Rana chiricahuensis</i>                              | 31757.0            | 15473.1                      | 48.7%                          |
| Coastal California gnatcatcher     | <i>Polioptila californica californica</i>               | 372668.2           | 66468.0                      | 17.8%                          |
| desert pupfish                     | <i>Cyprinodon macularius</i>                            | 778.8              | 778.8                        | 100.0%                         |
| Huachuca water-umbel               | <i>Lilaeopsis schaffneriana</i> var. <i>recurva</i>     | 661.3              | 661.3                        | 100.0%                         |
| jaguar                             | <i>Panthera onca</i>                                    | 764206.2           | 764206.2                     | 100.0%                         |
| least Bell's vireo                 | <i>Vireo bellii pusillus</i>                            | 36987.7            | 4704.9                       | 12.7%                          |
| Mexican spotted owl                | <i>Strix occidentalis lucida</i>                        | 9869983.0          | 412749.1                     | 4.2%                           |
| northern Mexican gartersnake       | <i>Thamnophis eques megalops</i>                        | 421352.1           | 311412.5                     | 73.9%                          |
| Otay tarplant                      | <i>Deinandra</i> (=Hemizonia) <i>conjugens</i>          | 6332.7             | 6332.7                       | 100.0%                         |
| Peirson's milk-vetch               | <i>Astragalus magdalenae</i> var. <i>peirsonii</i>      | 12104.9            | 12104.9                      | 100.0%                         |
| piping Plover                      | <i>Charadrius melodus</i>                               | 383010.0           | 102026.4                     | 26.6%                          |
| Quino checker-spot butterfly       | <i>Euphydryas editha quino</i> (=E. e. <i>wrighti</i> ) | 62174.2            | 40133.5                      | 64.6%                          |
| riverside fairy shrimp             | <i>Streptocephalus woottoni</i>                         | 2986.0             | 935.1                        | 31.3%                          |
| San Bernardino springsnail         | <i>Pyrgulopsis bernardina</i>                           | 1.7                | 1.7                          | 100.0%                         |
| San Diego fairy shrimp             | <i>Branchinecta sandiegonensis</i>                      | 13154.6            | 5363.0                       | 40.8%                          |
| Sonora chub                        | <i>Gila ditaenia</i>                                    | 47.1               | 47.1                         | 100.0%                         |
| spreading Navarretia               | <i>Navarretia fossalis</i>                              | 6725.5             | 1067.9                       | 15.9%                          |
| western snowy plover (Pacific DPS) | <i>Charadrius nivosus nivosus</i> (Pacific DPS)         | 25022.5            | 346.9                        | 1.4%                           |
| Yaqui catfish                      | <i>Ictalurus pricei</i>                                 | 10.3               | 10.3                         | 100.0%                         |
| Yaqui chub                         | <i>Gila purpurea</i>                                    | 10.3               | 10.3                         | 100.0%                         |
| western yellow-billed cuckoo       | <i>Coccyzus americanus</i> (Western DPS)                | 549849.2           | 102076.4                     | 18.6%                          |
| Zapata bladder-pod                 | <i>Lesquerella thamnophila</i>                          | 5348.9             | 5348.9                       | 100.0%                         |

Figure 1. Designated critical habitat for 25 species potentially affected by Trump's border wall and associated infrastructure and enforcement.





Jaguar photographed by Border Patrol motion-detection camera in the Huachuca Mountains near Sierra Vista, Ariz., on January 17, 2017

# SPOTLIGHT SPECIES:

## JAGUAR

Stretching from 5 to 8 feet long and weighing up to 300 pounds, jaguars are the largest cat native to North America. Though often thought of as jungle denizens, these agile predators once ranged north to Monterey Bay, Calif., and east to the southeastern United States before they were hunted to near extirpation. They are now protected as endangered in both the United States and Mexico.

One of the goals identified by the U.S. Fish and Wildlife Service in the jaguar’s recovery plan is to provide for natural jaguar dispersal between the two countries. At least seven jaguars have been documented dispersing north to Arizona in the past two decades. The construction of the border wall would cut off the northward dispersal from Sonora and kill any hope of our biggest cat’s recovery in its U.S. range.

Three jaguars have been documented in southern Arizona in recent years. Students at Felizardo Valencia Middle School in Tucson named one jaguar that roamed the Santa Rita Mountains until a year or so ago “El Jefe,” which is Spanish for “The Boss,” and students at Hiaki High School on the Pascua Yaqui Reservation named the jaguar currently in the Huachuca Mountains “Yo’oko Nahsuareo” which translates to “Jaguar Warrior.” The third jaguar in the Dos Cabezas Mountains doesn’t have an official name yet. The border wall would separate these pioneering males from potential mates and doom future reproduction prospects in Arizona.

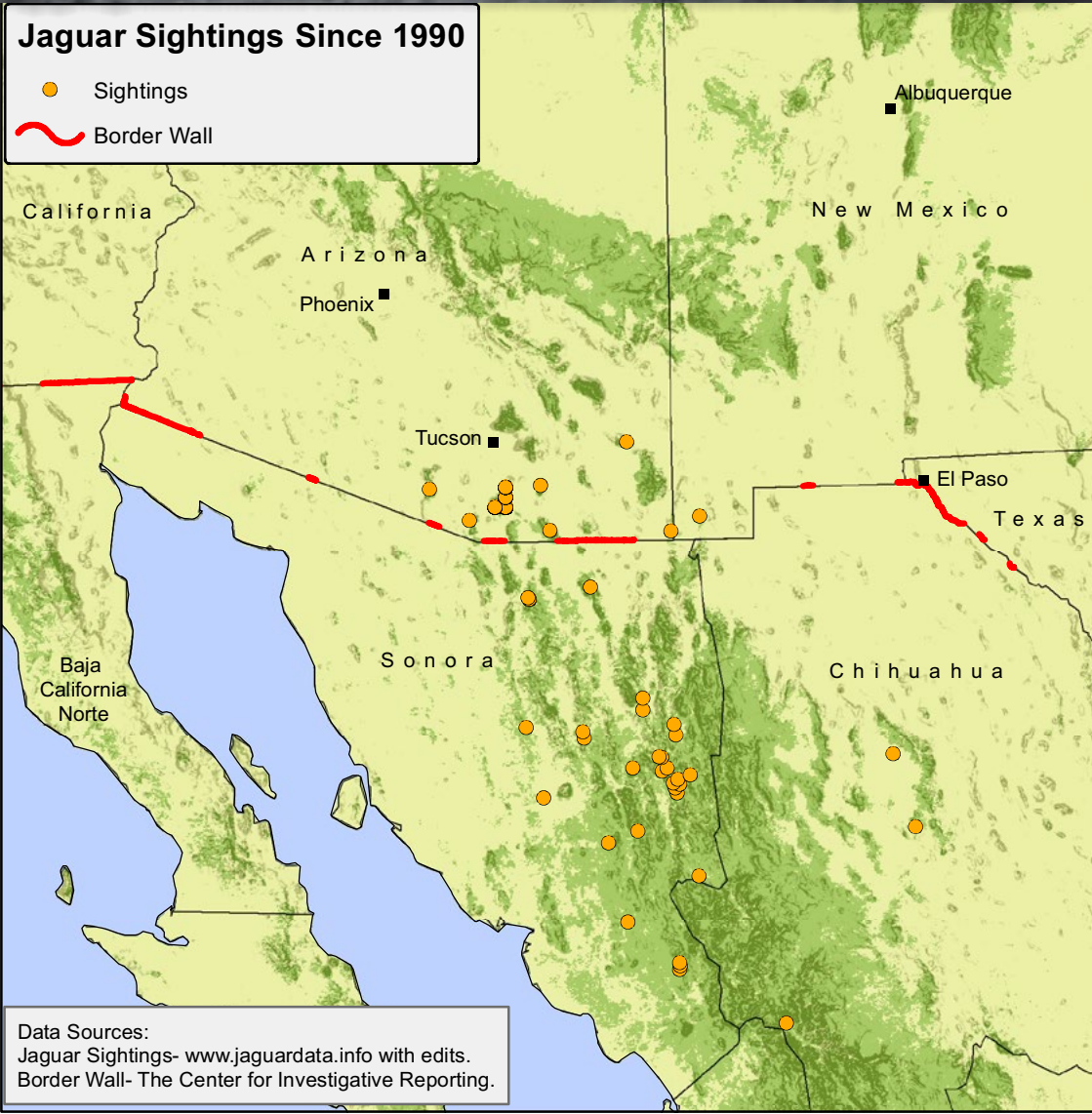


Figure 2. Verified jaguar locations since 1990 compared to existing border walls



Ocelot by Jitze Couperus, CC-BY

## OCELOT

Ocelots are secretive nocturnal cats that weigh only 30 pounds. They have two black stripes on their cheeks, longitudinal stripes on their necks and a cinnamon or grey background color. The word “ocelot” is from the Aztec word “tlalocelot,” which means “field tiger.” Adept predators, ocelots hunt small animals including birds, mammals, and even rattlesnakes. The cats declined because they were hunted for their beautiful coats and lost habitat to agriculture and development.

Now protected as endangered in the United States and Mexico, ocelots are making a stealthy comeback. Between 50 and 100 of the cats now live in the Rio Grande Valley in Texas, and five have been seen in Arizona since 2009, the first time they have been documented in the state since the 1960s. In 2011 a female with a kitten was spotted less than 30 miles south of the Mexico border, indicating that reproduction in Arizona could be on the near horizon. Reproducing ocelot populations are already established in several counties in Texas.

One of the important recovery actions identified for the ocelot by the U.S. Fish and Wildlife Service is the reconnection of viable populations of ocelots in the borderlands between Texas and Tamaulipas and between Arizona and Sonora. For ocelots to be considered recovered, the Service has developed a criterion of 1,000 ocelots in an interconnected, naturally dispersing metapopulation across the border of Arizona and Sonora and 1,200 ocelots in an interconnected populations between Texas and Tamaulipas. If the border wall is built, meeting these goals would become impossible.

## MEXICAN GRAY WOLF

The Mexican gray wolf is the smallest gray wolf subspecies in North America and one of the rarest and most endangered mammals on the continent. The wolves live in packs of four to nine animals, and alpha pairs mate for life. Mexican gray wolves were once found throughout southwestern Texas, southern New Mexico and southeastern Arizona, ranging south to central Mexico, but they were hunted to near extinction by the U.S. government to protect the livestock industry. By the early 1930s, Mexican gray wolves had been eliminated from the United States, and for several decades the government maintained a hunter on the border to kill wolves migrating north from Mexico.



Mexican gray wolf by Eric Kilby, CC-BY-SA

After being protected under the Endangered Species Act in 1976, the few surviving wolves were taken into a captive-breeding program in 1981, and wolves were reintroduced into the wild in 1998. As of 2017 there are



Sonoran pronghorn courtesy Jim Atkinson / USFWS

113 Mexican gray wolves in the wild in eastern Arizona and western New Mexico. There is a bi-national recovery plan and effort to produce wolves for reintroduction, and Mexico began reintroducing wolves in 2011, leading to a population of around 35 wolves in the wild in northern Mexico.

The objective of the recovery plan for the wolf is to reestablish a viable, self-sustaining population of at least 100 Mexican wolves in a 5,000-square-mile area of the wolf's historic range. A border wall would separate the northern and southern populations, prevent much-needed genetic exchange and limit the recovery of the wolf in both countries.

## **SONORAN PRONGHORN**

Capable of running 60 miles per hour, pronghorns are the fastest land mammals in North America. Vast herds once roamed the continent, but now the Sonoran pronghorn survives only in northwestern Sonora, Mexico and southwestern Arizona. Though its common name is “pronghorn antelope,” pronghorn are not actually antelopes; their closest living relatives are giraffes. Pronghorn are different from all other hoofed animals because their branched, hollow horns are made from hair, like the permanent horns of sheep, but are shed each year like the solid horns of deer. At 3 feet tall and 100 pounds, they are the size of goats. They have excellent vision and eyes nearly as large as those of an elephant, which allow them to easily detect predators.

Due to historic hunting and habitat degradation, the Sonoran pronghorn population has declined to fewer than 1,000 animals in the United States and Mexico combined. Pronghorn require immense open areas and must travel long distances in search of food and water in the harsh desert environment, a task made ever more difficult by drought and climate change. They are also particularly sensitive to disturbance from human activities.

One of the proposed recovery goals for Sonoran pronghorn is to ensure adequate quantity, quality and connectivity of habitat to support populations. The proposed border wall would limit their ability to travel freely in search of food and water and would permanently cut off the species' northern and southern populations, preventing dispersal and gene flow that are essential to their survival and recovery.

## **CACTUS FERRUGINOUS PYGMY OWL**

Pygmy owls are less than 7 inches tall and weigh only 2.5 ounces, but these fierce little owls nest in cactuses and prey on mammals, birds and reptiles. They were once very common in the Sonoran Desert, but since 1993, no more than 41 pygmy owls have been found in Arizona in any year. The owls are more abundant in Sonora, Mexico, but they are also in decline there, with their population having fallen 26 percent since 2000, putting the owl at heightened risk of extinction in both countries.

In response to a 1992 petition from the Center for Biological Diversity, the pygmy owl was protected as an endangered species in Arizona from 1997

Cactus ferruginous pygmy owl by Sky Jacobs







Quino checkerspot courtesy Andrew Fisher, USFWS volunteer biologist

to 2006, until developers won a lawsuit on a technicality, stripping the owls of protection. Conservationists filed a new petition in 2007, followed by a lawsuit, and in 2017 a court ordered the U.S. Fish and Wildlife Service to make a new decision on the owl's protection.

The tiny owls have never been more endangered than they are right now, because the border wall would inhibit their dispersal between Sonora and Arizona. Vegetation gaps limit their movements, and the owls are low fliers, rarely flying higher than 4.5 feet from the ground; a study found that less than a quarter of their flights exceed heights of 13 feet. The proposed border wall would be prohibitive, at 18 to 30 feet tall. For the cactus ferruginous pygmy owl to survive and recover, the owls must be able to disperse freely between populations in Mexico and the United States.

## QUINO CHECKERSPOT

The Quino checkerspot is a tiny, fast-flying butterfly with a wingspan of just 1.5 inches. Its rounded wings are a complex checkered pattern of vibrant red-orange, black and cream. Caterpillars may go through an astonishing seven molts prior to pupation, awaking from and re-entering dormancy depending on rainfall and the availability of host vegetation. Typically there is only one generation of adults per year, with a flight period from late February through May.

The Quino checkerspot was once a quite common butterfly, ranging from the Santa Monica Mountains to Baja California, Mexico. More than 75 percent of its range has been lost to development and its population has declined by more than 95 percent. Today it is found only in southwestern Riverside and southern San Diego counties and in Mexico.

These small butterflies are threatened by the border wall for several reasons. They tend to avoid flying over objects taller than 6 to 8 feet, so the wall would likely separate U.S. populations from those in Mexico, threatening the future viability of the butterfly in both countries. Because the butterfly has declined so drastically, the size and connectivity of all surviving populations are critically important from a genetic standpoint. Border wall construction would also harm native vegetation and spread invasive species, threatening the host plants the butterfly needs to reproduce.

June 7, 2007, a U.S. Army specialist welds a steel wall along the U.S.-Mexico border.



## REFERENCES

- ACE. 2001. U.S. Army Corps of Engineers. Supplemental Programmatic Environmental Impact Statement for INS and JTF-6 Activities. Fort Worth District. June 2001.
- Congressional Research Service. 2016. Border Security: Immigration Enforcement Between Ports of Entry.
- Environmental Protection Agency. 1996. U.S.-Mexico Border XXI Program: Framework Document.
- Flesch, A.D., C.W. Epps, J.W. Cain, III, M. Clark, P.R. Krausman, and J.R. Morgart. 2010. Potential effects of the United States-Mexico border fence on wildlife. *Conservation Biology*, 24, 171–181.
- Lasky, J.R., W. Jetz, and T.H. Keitt. 2011. Conservation biogeography of the U.S.-Mexico border: a transcontinental risk assessment of barriers to animal dispersal. *Diversity and Distributions*, 1–15
- McCain, E.B., and J.L. Childs. 2008. Evident of resident jaguars (*Panthera onca*) in the southwestern United States and the implications for conservation. *Journal of Mammalogy*, 89(1):1–10.
- McCallum J.W., J.M. Rowcliffe, I.C. Cuthill. 2014. Conservation on International Boundaries: The Impact of Security Barriers on Selected Terrestrial Mammals in Four Protected Areas in Arizona, USA. *PLoS ONE* 9(4): e93679. doi:10.1371/journal.pone.0093679
- Moya, H. 2007. Possible impacts of border fence construction and operation on fauna. In: *A barrier to our shared environment, the border fence between the United States and Mexico*, A. Cordova and C.A. de la Parra (eds.). Secretariat of Environment and Natural Resources National Institute of Ecology El Colegio de la Frontera Norte
- Southwest Consortium for Environmental Research & Policy.

## (ENDNOTES)

- <sup>1</sup> In analyzing the impacts of border activities in 2001, the U.S. Army Corps of Engineers defined the action area as 50 miles of the border to capture impacts of the full range of border activities, including construction of walls.
- <sup>2</sup> In addition, border walls have caused extensive flooding in several areas, including Organ Pipe Cactus National Monument and the city of Nogales.
- <sup>3</sup> Since 2001 border wall and barrier construction has been driven by newly enacted legislation, including the REAL ID Act of 2005 (P.L. 109-13, div. B), the Secure Fence Act of 2006 (P.L. 109-367), and the Consolidated Appropriations Act, 2008 (P.L. 110-161, div. E). Collectively, these laws direct DHS to construct “not less than 700 miles” of border fencing (not necessarily walls). 8 U.S.C. § 1103 note
- <sup>4</sup> The five waivers are i) San Diego (70 Fed. Reg. 55,622)(Sept. 22, 2005); ii) Barry M. Goldwater Range, Arizona (72 Fed. Reg. 2,535) (Jan. 19, 2007); iii) San Pedro Riparian National Conservation Area (administered by U.S. Bureau of Land Management), Arizona (72 Fed. Reg. 60,870)(Oct. 26, 2007); iv) Hidalgo County, Texas (73 Fed. Reg. 19,077)(April 3, 2008); and v) >450 miles in Texas, New Mexico, Arizona, and California (73 Fed. Reg. 18,293)(April 3, 2008).
- <sup>5</sup> In addition to NEPA, DHS Secretary Chertoff waived application of the ESA, Clean Water Act (33 U.S.C. § 1251 et seq.), National Historic Preservation Act (Pub. L. 89-665), Migratory Bird Treaty Act (16 U.S.C. § 703 et seq.), Clean Air Act (42 U.S.C. § 7401 et seq.), Archeological Resources Protection Act (16 U.S.C. 470aa et seq.), Safe Drinking Water Act (42 U.S.C. § 300f et seq.), Wild and Scenic Rivers Act (16 U.S.C. § 1281 et seq.), Wilderness Act (16 U.S.C. § 1131 et seq.), National Forest Management Act (16 U.S.C. § 1600 et seq.), Native American Graves Protection and Repatriation Act (42 U.S.C. § 2000bb), and American Religious Freedom Act (42 U.S.C. § 1996), as well as numerous additional laws.
- <sup>6</sup> Executive Order on “Border Security and Immigration Enforcement Improvements” (Jan. 25, 2017).