

# **Alternatives and Mitigation for Border Security Infrastructure in Areas of Critical Ecological Concern**

## *Outcomes and Recommendations of the Border Ecological Workshop II*

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**Kim Vacariu**  
Southwest Director  
Wildlands Project  
[kim@wildlandsproject.org](mailto:kim@wildlandsproject.org)  
(505) 557-0155

**Jenny Neeley**  
Southwest Representative  
Defenders of Wildlife  
[jneeley@defenders.org](mailto:jneeley@defenders.org)  
(520) 623-9653

# ALTERNATIVES AND MITIGATION FOR BORDER SECURITY INFRASTRUCTURE IN AREAS OF CRITICAL ECOLOGICAL CONCERN

## *Recommendations of the Border Ecological Workshop II*

### **Report Prepared by:**

Kim Vacariu, Wildlands Project

Jenny Neeley, Defenders of Wildlife

### **INTRODUCTION**

The status of existing and proposed border security infrastructure and activities has changed dramatically since the first Border Ecological Symposium was sponsored by the Wildlands Project and Defenders of Wildlife in March, 2005. That symposium resulted in the publication and distribution of a white paper, *Ecological Considerations for Border Security Operations*<sup>1</sup>, and called for continuing diligence on the parts of its participants in assisting agencies involved in infrastructure planning, construction, and security operations to include mitigation strategies that would protect biodiversity in the borderlands.

During the eighteen months since that symposium first drew attention to the need for protection of borderlands habitats and wildlife, new infrastructure has been put in place, new security techniques and equipment have been initiated, manpower and vehicle numbers have increased, and new border enforcement legislation authorizing the construction of hundreds of miles of new double-layer pedestrian fencing has been passed by the U.S. House and Senate and signed by the President..

Some aspects of border security, however, have remained constant – the continued daily flow of thousands of migrants onto U.S. public lands, and the serious impacts on wildlife and wildlands that both illegal immigration and border enforcement activities are causing to those resources.

Due to the increases in existing and proposed security activities and infrastructure along the U.S.-Mexico border, the continuing cross-border surge of immigrants into Arizona, and the potential for these activities to permanently damage important habitat used by endangered species and other wildlife, the need to reconvene the key stakeholders involved in the first symposium became evident. As a result, a second “Border Ecological Workshop,” organized and sponsored by the Wildlands Project and Defenders of Wildlife, was held on October 18, 2006 in Tucson, AZ to continue the process of elevating the importance of ecological concerns in the border security planning process.

### **WORKSHOP GOALS**

The primary goals of the workshop were to:

1. Identify critical cross-border wildlife corridors in southern Arizona and New Mexico and identify “indicator” species of concern found in those corridor areas;

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<sup>1</sup> This report can be viewed at: [http://www.twp.org/files/pdf/BESReportFinal\\_22aug05.pdf](http://www.twp.org/files/pdf/BESReportFinal_22aug05.pdf)

2. Develop recommendations for alternatives, mitigation, and protection of those corridors and resources.

It was the stated expectation of all workshop participants that the report would represent the next step in building sensitivity to the ecological threats posed by immigration and border security activities, and result in reasonable on-the-ground efforts to protect cross-border wildlife corridors in Arizona and New Mexico.

This expectation was qualified with an overarching assumption agreed upon by all workshop participants that maintaining national security is a primary consideration in determining alternatives and mitigations for proposed border security infrastructure, and that the most realistic solution to the problem of ecological damage caused by immigration and other border security activities is the reform of immigration policies that result in the channeling of immigrants through legal ports of entry rather than through ecologically critical borderlands areas.

### **PARTICIPANTS**

Agencies, organizations and institutions represented at the second Border Ecological Workshop included:

- |   |   |
|---|---|
| s Arizona Game and Fish Department            | s Philadelphia Zoo                                |
| s Arizona State Parks                         | s San Bernardino National Wildlife Refuge         |
| s Bureau of Land Management                   | s Sierra Club                                     |
| s Cabeza Prieta National Wildlife Refuge      | s Sky Island Alliance                             |
| s Center for Biological Diversity             | s Southwest Consortium for Environmental Research |
| s Conservation Biology Institute              | s State University of New York                    |
| s Coronado National Forest                    | s The Nature Conservancy                          |
| s Defenders of Wildlife                       | s The Wildlands Project                           |
| s Friends of the Jaguar                       | s Tucson Preparatory School                       |
| s National Parks and Conservation Association | s University of Arizona                           |
| s Organ Pipe Cactus National Monument         | s U.S. Customs and Border Protection (CBP)        |

### **GOAL 1: IDENTIFY CRITICAL CORRIDORS & INDICATOR SPECIES**

#### **Rationale for determining corridors**

A primary resource for workshop participants during the course of the discussions was The Nature Conservancy's "Combined Conservation Site Portfolio for the Five Ecoregions Encompassing Arizona," which identifies the various ecoregions in Arizona and highlights how much and what parts of the landscape are needed to maintain biological diversity in these areas over the long term. [See Appendix A for complete explanation of The Nature Conservancy's ecoregional planning efforts.] Participants' extensive knowledge of conditions and resources on the ground was also heavily relied upon during the discussions.

The areas ultimately chosen by workshop participants as “Critical Cross-Border Corridors” were identified because of their critical importance for a wide-range of terrestrial and avian migratory species. These areas are known to currently serve as cross-border migration corridors as well as portions of home ranges for a wide array of species native to the region, and they also represent important habitat and potential recovery areas for several critically endangered species. The high biological value of these areas has been repeatedly recognized by various state and federal agencies, non-governmental organizations, and research institutions. For example, the Sky Island Wildlands Network, a collaborative effort involving over 200 individuals and a dozen groups and agencies in the US and Mexico, identified the Sky Island region as a “critical landscape linkage.”<sup>2</sup> In addition, Conservation International identified the Madrean Sky Islands, a series of about 40 mountain-tops in southern Arizona and New Mexico as a “biodiversity hotspot.”<sup>3</sup>

Also considered by participants were the considerable resources that have been dedicated to the protection of these areas. The region in general and many of these areas specifically are valued not just for their high biological value, but also because of the considerable economic benefits these areas bring to local and regional communities. For example, a University of Arizona study in 2002 found that nature-oriented visitors to the upper San Pedro River basin spend between \$10 million and \$17 million in the state annually.<sup>4</sup>

Finally, these areas were specifically chosen as the workshop focus because of the imminent threat of a massive double-fencing project which will span across the entire Arizona-Mexico border, as mandated by HR 6061, “The Secure Fence Act.” This bill was signed into law by President Bush on October 26, 2006.

Below is the final list of critical cross-border corridors and a small sampling of “indicator” species found in each these areas. It is important to note that the list below does not represent a comprehensive list of all potential wildlife corridors or ecologically critical areas in the Arizona-Mexico border region and is not meant to dismiss the importance of other areas. Rather it is meant to represent a sampling of areas that are of immediate concern to those participating in the workshop. Below is also a list of other areas of concern identified during the workshop discussions, as well as a more complete list of species that will potentially be impacted by border fence construction in all the identified areas.

### **Identified Critical Cross-Border Corridors**

#### **1. Huachuca/Patagonia Mountain-San Pedro/Santa Cruz River complex**

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<sup>2</sup> *Sky Islands Wildlands Network Conservation Plan*, The Wildlands Project, Sky Island Alliance, et al., September 2000.

<sup>3</sup> <http://www.biodiversityhotspots.org>

<sup>4</sup> “Nature - Oriented Visitors and Their Expenditures: Upper San Pedro River Basin,” Orr, Patricia and Dr. Bonnie Colby, University of Arizona College of Agriculture and Life Sciences, February 2002.

- Indicator species – Black bear, Jaguar, Loach minnow, Vermillion flycatcher;
2. **Baboquivari Mountain complex**  
Indicator species – Cactus ferruginous pygmy-owl, Chiricahua leopard frog, Jaguar, Masked bobwhite quail;
  3. **Peloncillo Mountain complex**  
Indicator species – American bison, Jaguar, Black bear, Mexican grey wolf;
  4. **Pajarita Mountain/Atascosa Mountain/Sycamore Canyon complex**  
Indicator species – Chiricahua leopard frog, Elegant trogon, Jaguar, Sonoran chub

### **Other Areas of Concern**

Other areas were also identified and discussed for their high biological value in the Arizona-Mexico borderlands region:

#### **Mountain ranges:**

- s Ajo Mountains
- s Chirichaua/Pedregosa Mountains

#### **Riparian areas:**

- s Colorado River
- s San Bernardino River
- s Rio Magdalena
- s Quitobaquito Springs
- s San Pedro River
- s Santa Cruz River (upper and lower)

#### **Grasslands**

- s San Rafael Valley
- s Altar Valley
- s Sulphur Springs Valley
- s San Bernardino Valley

### **Border species of concern**

The threatened, endangered and candidate species listed below were identified by the Center for Biological Diversity as being potentially impacted by border wall construction. The list of other potentially impacted species was a product of brainstorming sessions during the workshop. For a complete list of species in the Arizona-Mexico border region, please see the “Apache Highland South Ecosystem” and “Sonoran Desert Ecosystem” sections in the Arizona Game and Fish’s “Comprehensive Wildlife Conservation Strategy.”<sup>5</sup>

#### **Federally listed or candidate species:**

- |                             |                         |
|-----------------------------|-------------------------|
| s Jaguar                    | s Sonoran Pronghorn     |
| s Flat-tailed horned lizard | s Masked bobwhite quail |

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<sup>5</sup> This information can be viewed at: [http://www.azgfd.gov/w\\_c/cwcs.shtml](http://www.azgfd.gov/w_c/cwcs.shtml)

- s Cactus ferruginous pygmy-owl
- s Chiricahua leopard frog
- s Lesser long-nosed bat
- s Mexican spotted owl
- s Sonora chub
- s Gila topminnow
- s Huachuca springsnail
- s Huachuca water umbel
- s Ocelot
- s Sonoran tiger salamander

**Other potentially impacted species:**

- s Yaqui topminnow
- s Quitobaquito springsnail
- s Quitobaquito pupfish
- s Sonoran night-blooming cactus
- s Mexican rosy boa
- s Black bear
- s Mountain lion
- s Bobcat
- s Desert bighorn
- s Coatimundi
- s White-tailed deer
- s Ringtail cat
- s Elegant trogon
- s Mexican brown opossum
- s Mexican brown snake
- s Sonoran green toad
- s American bison
- s Mexican grey wolf
- s Mule deer
- s Jaguarundi
- s Gila monster
- s Desert tortoise
- s Mexican leafcutter ant

**GOAL 2: RECOMMENDATIONS**

When developing alternatives to security infrastructure in cross-border corridors, several considerations were acknowledged by the participants. These considerations included identification of the intended audience, which was determined to be regional and national lawmakers, agencies, the media, and the general public. The significant information gaps that exist and were identified at the 2005 Border Ecological Symposium were also acknowledged, as was the need for bi-national collaboration for much of the work that needs to be done in the border region. The impacts that climactic and other cumulative changes will have on the current situation along the U.S.-Mexico border were also raised as an important consideration when discussing alternatives and recommendations. Finally, it was acknowledged that there are biases inherent in the discussions and decisions made by the workshop participants, who did not have available to them the entire universe of information relevant to the discussions regarding cross-border corridors or potential species of concern.

A short list of general threats posed by infrastructure was generated by the group for the purposes of the discussion. These threats include habitat fragmentation; spread of invasive species; wildlife disturbance/noise; increased human activity/presence; alteration of hydrological processes/erosion; and direct wildlife mortality. Also for the purposes of the discussion, the types of infrastructure potentially used by the U.S. Customs and Border Patrol (CBP) were categorized into 3 general types: pedestrian fencing (solid walls) and associated roads; vehicle barriers and associated roads; and virtual fencing (i.e., cameras and sensors) and associated roads.

Below is a list of specific recommendations generated by the group, as well as a list of more general participant recommendations that should be considered when planning additional infrastructure or activities for ecologically sensitive borderlands.

### **Specific Recommendations:**

**1. For the Arizona Western Desert areas:** Continue to support vehicle barrier planning processes that are already underway and/or implemented, including those for the Organ Pipe Cactus National Monument, Cabeza Prieta National Wildlife Refuge, Tohono O’Odham Nation, Buenos Aires National Wildlife Refuge, and the original plans for a vehicle barrier on the Barry M. Goldwater Range. These plans should not be discarded in favor of the reinforced double-layer pedestrian fencing mandated in HR 6061.

**2. For the critical cross-border corridor areas:**

- s Prioritize use of “virtual” high-tech fencing options such as unmanned aerial vehicles, motion-sensors, laser barriers, and infrared cameras;
- s Utilize wildlife friendly vehicle barriers in conjunction with virtual fencing in areas where hard infrastructure is necessary and appropriate;
- s Pedestrian fencing should be implemented only as a last resort, and only if cross border species can be accommodated thru the use of infrastructure gaps in conjunction with other techniques (i.e., virtual fencing) and designed using the best available science;
- s Consider other forms of mitigation for unavoidable impacts (i.e., allocate funds for programmatic habitat protection or other recovery efforts in order to achieve net conservation for impacted species).

**3. For borderland riparian areas:**

- s Maintaining stream flows must be a priority in these areas;
- s Prioritize use of “virtual” high-tech fencing options;
- s Maintain vegetation, keep impacted border corridor as narrow as possible, and limit enforcement footprint to immediate border area to the maximum extent practicable;
- s Employ use of alternate vehicle barrier designs (such as bollard barriers) that are more appropriate for riparian features;
- s Limit ORV use to outside of riparian areas.

### **General recommendations**

- s In general, pedestrian fences are only appropriate directly adjacent to urban areas and should not be utilized in wildlife corridors or other ecologically sensitive areas, unless as a last resort;
- s “Virtual” fencing options and wildlife-friendly vehicle barriers should be utilized first and their effectiveness measured before considering the use of pedestrian fencing
- s Compliance with environmental laws must be a top priority for all agencies;
- s Science needs to inform border security planning in critical ecological regions;
- s Increased collaboration at the beginning of the planning process is needed between land managers, biologists, local jurisdictions, and CBP;
- s Long term monitoring and adaptive management should be utilized at all levels to monitor effectiveness of mitigation efforts and to inform future planning efforts;

- S An internal comprehensive environmental program for CBP similar to that used by the US military should be developed to address environmental issues;
- S Increased environmental education for CBP agents is needed;
- S Increased funding for borderland management agencies is needed;
- S Clearly designated roads to minimize off-road travel routes are needed.

### **NEXT STEPS**

1. Circulate final proceedings document to CBP, local, state and federal decision-makers, local, state and federal agencies, and the interested public thru media outreach;
2. Develop a matrix of species and infrastructure identifying potential impacts to species;
3. Compile comprehensive bibliography listing relevant border region research;
4. Continue to inform and involve potential partners in Mexico.



## **APPENDIX A**

### **“Combined Conservation Site Portfolio for the five Ecoregions Encompassing Arizona; Ranked by Six Biological Values”**

The Nature Conservancy employs a science-based approach – referred to as the ecoregional assessment process – to determine how much and what parts of the landscape are needed to maintain biological diversity over the long term. Ecoregions are large areas of land and water (up to tens of millions of acres) characterized by distinct species, plant communities, and environmental conditions. Arizona is overlapped by five ecoregions. For each ecoregion, dozens of data sets are compiled and evaluated to identify conservation sites of sufficient size and distribution to meet conservation goals established for all native vegetation communities and a representative subset of the ecoregion’s species. The map represents a hypothesis: that if properly managed the aggregate of conservation sites identified will protect the ecoregion’s biological diversity. The data are suitable for assisting local county and state planning efforts in identifying and understanding the most important areas where conservation values should be protected.

This map shows a cross-ecoregional “portfolio” of 391 viable conservation sites. As one way of interpreting this information, the Arizona Chapter looked to six biological variables for each site and assigned these variables weights of influence via the Analytic Hierarchy Process (AHP). The AHP employs a system of pairwise comparisons solved by matrix algebra to produce the weights; it provides a mathematical framework for incorporating expert opinion. In this case, a team of ecologists prescribed that the presence of numerous aquatic-riparian obligates was the most important variable, while the total number of target species per site was the least important. The weights were then multiplied by standardized value for the variables and summed to yield a “biodiversity rank.” These ranks are not meant to dismiss the importance of any single conservation site. However, they do provide an effective way to evaluate the landscape and help sequence conservation actions in tandem with assessments that identify threats to habitat and movement corridors.

“Nature - Oriented Visitors and Their Expenditures: Upper San Pedro River Basin,” Orr, Patricia and Dr. Bonnie Colby, University of Arizona College of Agriculture and Life Sciences, February 2002.