



# SYNTHESIS

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Collaborative Initiatives to  
Conserve and Restore Habitat  
and Wildlife in the Sky Islands

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The Biophilia Foundation

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## List of Acronyms

### PUBLIC AGENCIES, BUREAUS, NONPROFITS, PROGRAMS

|         |   |
|---------|---|
| ALWT    | Arizona Land and Water Trust  |
| AVCA    | Altar Valley Conservation Alliance  |
| AZGFD   | Arizona Game and Fish Department  |
| BIDA    | Biodiversidad y Desarrollo Armonico, A.C.   |
| BLM     | Bureau of Land Management   |
| BOR     | Bureau of Reclamation   |
| BRN     | Borderlands Restoration / Borderlands Restoration Network                               |
| CEDES   | Comisión Estatal de Desarrollo y Ecología del Estado de Sonora                          |
| CICESE  | Centro de Investigación Científica y de Educación Superior de Ensenada, Baja California |
| CLO     | Cuenca Los Ojos, A.C.   |
| CONABIO | Comisión Nacional para el Conocimiento y Uso de la Biodiversidad                        |
| CONANP  | Comisión Nacional de Areas Naturales Protegidas   |
| CWP     | Cienega Watershed Partnership   |
| DLCC    | Desert Landscape Conservation Cooperative   |
| DOD     | Department of Defense   |
| DOI     | Department of the Interior  |
| DOW     | Defenders of Wildlife   |
| ESA     | Endangered Species Act  |
| FMCN    | Fondo Mexicano para la Conservación de la Naturaleza, A.C.                              |
| FS      | U.S. Forest Service   |
| FSA     | U.S. Farm Services Agency   |
| FWS     | U.S. Fish and Wildlife Service  |

|          |   |
|----------|---|
| IMADES   | Instituto del Medio Ambiente y el Desarrollo Sustentable del Estado de Sonora           |
| ISDA     | International Sonoran Desert Alliance   |
| MBG      | Malpai Borderlands Group  |
| MRR      | Manejo de Ranchos Regenerativos, A.C.   |
| NEPA     | National Environmental Protection Act   |
| NGO      | Non-governmental Organization   |
| NJP      | Northern Jaguar Project   |
| NMLC     | New Mexico Land Conservancy   |
| NRCS     | Natural Resource Conservation Service   |
| Profauna | Protección de la Fauna Mexicana, A.C.   |
| REPI     | Readiness and Environmental Protection Integration Program of the Department of Defense |
| SI       | Sonoran Institute   |
| SIA      | Sky Island Alliance   |
| SJV      | Sonoran Joint Venture   |
| TNC      | The Nature Conservancy  |
| USAID    | U.S. Agency for International Development   |
| USGS     | U.S. Geological Survey  |
| WCS      | Wildlife Conservation Society   |
| WMG      | Watershed Management Group  |
| WN       | Wildlands Network   |



# Synthesis of Collaborative Initiatives to Conserve and Restore Habitat and Wildlife in the Sky Islands Region

## Introduction and Background

The Sky Islands Region, also known as the Madrean Archipelago, is an area of 45,000 square miles in southeastern Arizona, southwestern New Mexico, northeastern Sonora, and northwestern Chihuahua. Uniquely rich in abundance and diversity of flora and fauna, the Madrean Sky Islands are the biocultural heart of North America. No place on the continent embodies the rich interplay of diverse ecosystems, species, cultures and communities like the Sky Islands and grasslands of the US-Mexico border region. This region lies at the convergence of several major biogeographic zones, including the Sonoran Desert, Chihuahuan Desert, the Rocky Mountains and Colorado Plateau, and the Sierra Madre Occidental. This is the only place in the world where three deserts converge. It is home to more than 60 isolated mountain ranges that function as habitat islands in a sea of desert and grasslands.

The Sky Islands have been designated one of the world's most urgent conservation priorities due to the region's high biodiversity and high level of threat from climate change, land use conversion, habitat fragmentation, water scarcity, invasive species, and linear infrastructure development (for example, highways, roads and the border wall). The region boasts a tradition of passionate and dedicated conservation action. There are many groups in the region, some with a long history of collaboration. Yet, despite broad collaboration on multiple projects, the region has not yet been successful in bringing together the necessary investment in landscape-scale conservation and restoration.

Building on its many years of investment in conservation and restoration activities in the Sky Islands, the Biophilia Foundation is interested in and committed to developing a bigger and bolder vision and strategy for landscape-scale collaborative conservation aimed at achieving meaningful and lasting conservation and restoration results at scale. To be successful, this conservation

vision and strategy must be undergirded by financial investment targeted toward entities and geographies of greatest potential impact.

One pathway to making the case for greater investment in the region is to identify the priorities that organizations and other entities are working on related to conservation in the Sky Islands. A number of entities have already undertaken spatial conservation prioritization processes or similar activities, which may have resulted in maps, datasets, or other products that would be useful to broader audiences. Examples include the Borderlands Linkages Project and Sanderson et.al.'s (2021) analysis of jaguar habitat suitability.

Another pathway toward the goal is understanding the history of past multi-organization collaboratives in the Sky Islands. Over the years, groups such as the Desert Landscape Conservation Cooperative, Border States Conservation Collaborative, International Sonoran Desert Alliance, and others have joined together to collaborate on shared goals and/or mutually beneficial projects. Understanding the nature, history, goals, and outcomes of these activities will provide a basis for future collaborative initiatives.

## PROJECT GOALS

The goals of this project were threefold, all with the aim of understanding how organizations, agencies and other stakeholders have prioritized work in the Sky Islands:

- Analyze and synthesize multiple entities' spatial priorities in the Sky Islands
- Provide a foundation for future collaborative initiatives that validates and builds on past work
- Provide information that the Biophilia Foundation and other charitable foundations can use to inform future investments in the Sky Islands and make the case for greater financial investment in the region

## Key Actors in the Sky Islands Region

### OVERVIEW OF KEY CONSERVATION/RESTORATION ACTORS

During the course of our research, we documented twenty-eight (28) conservation organizations and entities operating in the Sky Islands region with a focus on private lands conservation and restoration (see Appendix 1: Key Actors). There is both some measure of overlap and complementarity among many of these organizations. We have not included organizations working primarily with public lands and/or focused solely on policy advocacy and educational endeavors. Below are some of our key findings.

### GEOGRAPHIC ACTION AREAS

Most of the key actors we documented are working in one (or more) of six geographies in the Sky Islands: Arizona, New Mexico, Sky Islands Four Corners (portions of US-Mexico border area spanning southeastern Arizona, southwestern New Mexico, northeastern Sonora and northwestern Chihuahua), the San Pedro River Basin, the Santa Cruz River Basin or the Bavispe area of north-central Sonora. In FIGURE 1 below, we summarize geographic focal areas for non-profit organizations implementing conservation and restoration activities on private lands within the Sky Islands region.

**Figure 1. Geographic Focus of Non-profit Organizations in the Sky Islands.**

| Non-Profit Organizations           | Arizona (Other) | New Mexico (Other) | Sky Islands Four Corners | San Pedro RB | Santa Cruz RB | Bavispe (Sonora) |
|------------------------------------|-----------------|--------------------|--------------------------|--------------|---------------|------------------|
| Altar Valley Conservation Alliance |                 |                    |                          |              | ✓             |                  |
| Arizona Land and Water Trust       | ✓               |                    | ✓                        | ✓            | ✓             |                  |



| Non-Profit Organizations                | Arizona (Other) | New Mexico (Other) | Sky Islands Four Corners | San Pedro RB | Santa Cruz RB | Bavispe (Sonora) |
|---|-----------------|--------------------|--------------------------|--------------|---------------|------------------|
| Borderlands Restoration Network         |                 |                    | ✓                        |              | ✓             |                  |
| Cienega Watershed Partnership           |                 |                    |                          |              | ✓             |                  |
| Coalition for Sonoran Desert Protection |                 |                    |                          |              | ✓             |                  |
| Colectivo Sonora Silvestre              |                 |                    |                          |              |               | ✓                |
| Cuenca Los Ojos                         |                 |                    | ✓                        |              |               |                  |
| Deep Dirt Farm, LLC                     |                 |                    |                          |              | ✓             |                  |
| Defenders of Wildlife                   | ✓               | ✓                  |                          |              |               |                  |
| Desert Botanical Gardens                | ✓               |                    |                          |              | ✓             |                  |
| Gila Watershed Partnership of Arizona   | ✓               |                    |                          |              |               |                  |
| Heart of the Gila                       |                 | ✓                  |                          |              |               |                  |
| International Sonoran Desert Alliance   | ✓               |                    |                          |              |               |                  |
| Malpai Borderlands Group                |                 |                    | ✓                        |              |               |                  |
| Manejo de Ranchos Regenerativos, A.C.   |                 |                    | ✓                        |              |               |                  |
| Naturalia, A.C.                         |                 |                    |                          | ✓            |               | ✓                |
| New Mexico Land Conservancy             |                 | ✓                  | ✓                        |              |               |                  |
| Northern Jaguar Project                 |                 |                    |                          |              |               | ✓                |
| Profauna, A.C.                          |                 |                    |                          | ✓            |               | ✓                |
| Rio Grande Return                       |                 | ✓                  |                          |              |               |                  |
| Sky Island Alliance                     |                 |                    | ✓                        |              | ✓             | ✓                |
| Sonoran Institute                       | ✓               |                    |                          |              | ✓             |                  |

| Non-Profit Organizations   | Arizona (Other) | New Mexico (Other) | Sky Islands Four Corners | San Pedro RB | Santa Cruz RB | Bavispe (Sonora) |
|----------------------------|-----------------|--------------------|--------------------------|--------------|---------------|------------------|
| The Nature Conservancy     | ✓               | ✓                  | ✓                        | ✓            | ✓             |                  |
| Tucson Audubon             | ✓               |                    |                          |              | ✓             |                  |
| Watershed Management Group |                 |                    |                          | ✓            | ✓             |                  |
| Wildlands Network          | ✓               | ✓                  | ✓                        |              |               | ✓                |
| Wildlife Corridors, LLC    |                 |                    |                          |              | ✓             |                  |
| <b>Total # of entities</b> | <b>9</b>        | <b>6</b>           | <b>9</b>                 | <b>5</b>     | <b>13</b>     | <b>6</b>         |

## COMMONALITIES AMONG ORGANIZATIONS

- Fifteen (15) organizations have specific water or riparian-related thematic work:  
Altar Valley Conservation Alliance, Arizona Land and Water Trust, Borderlands Restoration Network, Cienega Watershed Partnership, Cuenca Los Ojos, Colectivo Sonora Silvestre, Gila Watershed Partnership of Arizona, Fondo Mexicano, Heart of the Gila, The Nature Conservancy, Rio Grande Return, Sky Island Alliance, Sonoran Institute, Watershed Management Group, Wildlife Corridors, LLC
- Twelve (12) organizations conserve specific species or create protected corridors for wildlife migrations (e.g., jaguar, ocelot, birds, pollinators, black bear, wolf, beaver):  
Coalition for Sonoran Desert Protection, Colectivo Sonora Silvestre, Defenders of Wildlife, Fondo Mexicano, Naturalia, Northern Jaguar Project, Profauna, Sky Island Alliance, Tucson Audubon, Watershed Management Group, Wildlands Network, Wildlife Corridors, LLC

- Seven (7) organizations have strong ecological restoration components to their work (both design and implementation):  
 Borderlands Restoration Network, Cuenca Los Ojos, Desert Botanical Gardens, Rio Grande Return, Sky Island Alliance, Tucson Audubon and Watershed Management Group  
 Each of these organizations has a capability to mobilize its volunteer networks to help implement restoration projects, which can often be labor intensive.
- Three (3) organizations run native plant/seed nurseries to grow and supply materials for restoration activities:  
 Borderlands Restoration Network, Desert Botanical Gardens and Rio Grande Return
- Three (3) organizations have urban habitat restoration programs:  
 Sonoran Institute, Tucson Audubon, and Watershed Management Group
- Fifteen (15) organizations are U.S. non-profit organizations that operate solely within the U.S.:  
 Altar Valley Conservation Alliance, Arizona Land and Water Trust, Ciénega Watershed Partnership, Coalition for Sonoran Desert Protection, Deep Dirt Farm, Defenders of Wildlife, Desert Botanical Gardens, Gila Watershed Partnership of Arizona, Heart of the Gila, Malpai Borderlands Group, New Mexico Land Conservancy, Rio Grande Return, The Nature Conservancy (Arizona), Tucson Audubon, and Wildlife Corridors LLC
- Eight (8) organizations are U.S. non-profit organizations that work in Mexico, either directly or in partnership with Mexican organizations:  
 Borderlands Restoration Network, Cuenca Los Ojos, International Sonoran Desert Alliance, Northern Jaguar Project, Sky Island Alliance, Sonoran Institute, Watershed Management Group and Wildlands Network
- Six (6) organizations are Mexican non-profit organizations that work with private landowners to protect, conserve and restore lands and wildlife:



Colectivo Sonora Silvestre, Cuenca Los Ojos, Fondo Mexicano, Manejo de Ranchos Regenerativos, Naturalia and Proteccion de la Fauna Mexicana (Profauna)

Several partner or collaborate with some of the U.S. non-profit organizations listed in this report.

- Two (2) organizations are land trusts:  
Arizona Land and Water Trust (ALWT) and New Mexico Land Conservancy (NMLC)

While ALWT and NMLC do not implement restoration directly, these entities are included for their work bringing various partners together to help protect and conserve private lands and implement good stewardship practices. Both organizations would be considered important partners in achieving overall goals of conserving and/or restoring land and wildlife habitat in the Sky Islands.

- Three (3) organizations own and manage land as their core strategy to meet their conservation mission and goals:

Cuenca Los Ojos, Northern Jaguar Project, and Wildlife Corridors, LLC  
These are not grouped with the land trusts because they do not accept easements from other organizations or landowners.

- Two (2) organizations were founded and are led by ranchers who wish to protect their lands from development and preserve their ranching heritage:

Altar Valley Conservation Alliance and Malpai Borderlands Group (MBG)  
While membership in these organizations is limited to landowner-ranchers in each of their geographic areas of interest, both entities partner with others to achieve specific goals or address needs around science, planning, monitoring and restoration treatments. MBG also holds and monitors conservation easements for its member ranchers.

## Spatial Prioritization, Planning Outputs and Assessments

The Coalition for Sonoran Desert Protection, Sky Island Alliance (on contract to Bureau of Reclamation/Desert Landscape Conservation Cooperative), The Nature Conservancy and Wildlands Network are the main entities that have invested organizational resources in the last five to ten years in spatial prioritization efforts and ecological and related conservation assessments at a regional or landscape scale.

Below is a summary of the major assessments relative to the goals and objectives of this report. This list is not meant to be exhaustive.

### COALITION FOR SONORAN DESERT PROTECTION

The Coalition for Sonoran Desert Protection is a large and diverse partnership of organizations and entities that came together in the late 1990s to partner with Pima County to develop the Sonoran Desert Conservation Plan.

#### **Sonoran Desert Conservation Plan**

The Sonoran Desert Conservation Plan (SDCP) is Pima County's plan for balancing the conservation and protection of its cultural and natural resource heritage with efforts to maintain an economically vibrant community. The SDCP considered the following elements: critical habitats and biological corridors, riparian areas, mountain parks, historical and cultural preservation, and ranch conservation. This plan was developed in late 1990s but is comprehensive and remains in implementation. Several elected officials within Pima County and the City of Tucson support continued implementation of various plan elements and have referred to the plan in their campaign rhetoric.

*Objective:* Form a viable land management plan for Pima County that balances conservation and economic growth.

*Key conclusions:* A number of conservation priorities were identified including areas managed as core county preserves. Goals were developed for multi-species conservation and riparian and other biological targets.

*Links:*

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

## SKY ISLAND ALLIANCE

### **DLCC / Madrean Conservation Blueprint**

The Sky Island Alliance, under contract to Bureau of Reclamation (BOR) and as a partner in the Desert Landscape Conservation Cooperative (DLCC), led the development of a series of analyses that comprise a landscape conservation blueprint for an area delineated as the Transboundary Madrean Watersheds. This area spans the Sky Islands region of Arizona and New Mexico in the US and Sonora and Chihuahua in Mexico. Findings are documented in a comprehensive report titled Transboundary Madrean Watersheds Landscape Conservation Design Report, June 30, 2020, accompanied by a series of appendices documenting conclusions and recommendations from various thematic workshops (e.g., to develop ecological or socio-economic indicators, review climate change scenarios, etc.). The Transboundary Madrean Watersheds area encompasses 56.1 million acres (22.7 million hectares) and 65 sky island mountains. The process resulted in the Madrean Conservation Blueprint, an open-access geo-spatial tool to support public agencies, institutions and conservation organizations to prioritize conservation efforts.

DLCC is no longer active.

*Objective:* To provide analytical tools and spatially explicit data to develop shared conservation strategies among DLCC partners.

*Key conclusions:* The final report is a comprehensive compilation of maps, tools, research and other related information. A series of broad



recommendations is made based on workshop outputs and data analysis. These include implementation of strategies to enhance wildlife connectivity, coordination of wildlife camera monitoring and data, mitigating invasive species impacts, cultivating place-based connections and stewardship, and convening watershed organizations to collaborate on monitoring, enhancing wildlife corridors and utilizing geospatial data and tools.

*Links:*

- <https://skyislandalliance.org/library/madrealnld/>
- <https://skyislandalliance.org/wp-content/uploads/2020/06/Transboundary-Madreal-Watersheds-LCD-Final-Report-2020.pdf>

### **Sky Islands Springs Inventory and Assessment**

The Sky Island Alliance, with funding support from Bureau of Reclamation (BOR), Desert Landscape Conservation Cooperative (DLCC), Kresge Foundation, National Fish and Wildlife Foundation and the Nina Mason Pulliam Trust, completed an assessment and inventory of Sky Islands springs. The report was completed in 2013; however, it remains relevant and one-of-a-kind.

*Objective:* The purpose of the assessment was to develop baseline information on springs ecosystems in the Sky Island region of southeastern Arizona, southwestern New Mexico, and northern Sonora and Chihuahua, Mexico.

*Key conclusions:* The assessment developed new information on the biological and management status of springs ecosystems in the Sky Islands region. Previously collected information provided from cooperating agencies, along with additional data collected, were made available to the public through a Springs Inventory Database as a central repository of springs data. Furthermore, the assessment contributed to management of springs by the DLCC partnership by developing information on spatial location, temporary attributes, biological, hydrological and geomorphological status of springs and seeps at local and landscape scales.

Data collected includes habitat area, spring type, flow, water quality, flora and fauna. Finally, springs requiring restoration or active management were prioritized and a set of management recommendations provided.

## THE NATURE CONSERVANCY

The Nature Conservancy has completed numerous science-based outputs in an effort to provide decision-support tools to public and private conservation and environmental management entities. Outputs developed or led by the Arizona Chapter are accessible to the public via their data portal at [www.azconservation.org](http://www.azconservation.org).

The most relevant data sets and assessments are summarized here.

### **Draft Plan de Conservacion y Restauracion Ecologica de la Cuenca del Rio Yaqui y Corredor Jaguar (Yaqui Watershed and Jaguar Corridor Conservation and Restoration Action Plan).**

Led by TNC Mexico Program in collaboration with BIDA, CONANP, Naturalia, and with participation of numerous other experts, a series of workshops were held in 2009-2011, supported by data analysis and GIS inputs. These workshops resulted in a proposed plan for the 70,000 square kilometer Yaqui River Basin in Mexico. The northern portion of the Yaqui Basin sits squarely in the Sky Islands region.

*Objective:* Carry out an integrated conservation planning process for the Yaqui Basin, integrating climate change scenarios and adaptation strategies. The plan utilizes TNC's Conservation Planning framework and identifies key conservation targets, threats, strategies and actions to mitigate threats.

*Key conclusions:* This report remains in draft form and was never finalized with an executive summary or a clear set of conclusions and priority actions. There is a set of recommendations and next steps that include filling some research and science gaps that may address remaining questions, expert review of the draft report, developing the executive summary and conclusion and printing and distributing the final plan document.

**Ecoregion-based Conservation Assessment of the Southwestern United States and Northwestern Mexico: A Geodatabase for Six Ecoregions, including the Apache Highlands, Arizona-New Mexico Mountains, Colorado Plateau, Mojave Desert, Sonoran Desert, and Southern Rocky Mountains.**

Staff from several TNC Chapters collaborated on a series of assessments to identify conservation priorities in six ecoregions; portions of three – the Apache Highlands, Arizona-New Mexico Mountains and Sonoran Desert – fall within the Sky Islands region. The assessments were summarized in a May 2006 report.

Objective: Provide a single dataset of conservation priorities across a large multi-state region to help facilitate conservation analyses and problem-solving at multiple scales and across jurisdictional boundaries.

Key conclusions: Six ecoregional assessments were compiled and rolled up into one multi-state, two country assessment, evaluating 238 million acres in total. Thirteen hundred species and 350 native plant communities were analyzed. A proposed network of 100 million acres of lands in which conservation should be given priority if we wish to maintain the region's unique biodiversity. A comprehensive dataset was created and made publicly available for agencies, organizations and land-use planners to guide conservation decision-making.

**Ecological Analysis of Conservation Priorities in the Apache Highlands Ecoregion**

Led by a binational team from TNC and CEDES (then known as IMADES) with technical input from several other entities, this assessment was completed in 2004. Although more than 18 years old, this remains one of the most comprehensive spatial prioritization assessments completed to date for the Sky Islands region and serves as a useful and valuable tool for conservation and other decision-makers.



*Objective:* “Identify a network of conservation areas that, with appropriate management, would ensure the long-term persistence of the ecoregion’s biological diversity.”

*Key conclusions:* A network consisting of 90 areas comprising 12.5 million acres (5 million hectares), representing 40% of the Apache Highlands ecoregion was proposed. The Apache Highlands encompasses the entire Sky Islands region along with areas of central Arizona bounded by the Mogollon Rim. In addition to terrestrial habitat areas<sup>1</sup> with an average of 17 conservation targets<sup>2</sup> in each area, the network captured 2,118 miles of perennial streams, with aquatic or riparian conservation targets occurring in 77% of conservation areas recommended. Additionally, factors such as species richness, as well as uniqueness or irreplaceability of each of the 90 conservation areas recommended were considered. Eight conservation areas were ranked as especially high priority. Two connect the U.S.-Mexico border area: Huachuca Mountains Grassland Valley Complex and Sierra San Luis/Peloncillo Mountains. Another high-ranking area relevant to the Sky Islands region is the Chiricahua Mountains complex.

The report makes one major recommendation: replicate efforts such as Pima County’s Sonoran Desert Conservation Plan throughout the ecoregion before conservation issues reach crisis proportions.

## WILDLANDS NETWORK

### Ecological Integrity Assessment of the Sky Islands Border Region

A collaboration between WCS (lead) and WN, this is one of the most recent and up-to-date prioritization efforts bringing together biodiversity indicators, ecological integrity metrics and climate adaptation elements into a decision-support tool to select conservation solutions (examples include selecting for

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<sup>1</sup> Terrestrial habitat areas include forests, deserts, grasslands and wetlands.

<sup>2</sup> The Nature Conservancy defines a conservation target as a group of organisms and ecological systems that comprehensively represent the ecoregion’s biological diversity. Targets can include plant communities, wildlife species and/or ecological processes.

conservation of 10% to 50% of high ecological integrity areas in 10% increments, such as to meet the Campaign for Nature 30x30 goals or E.O. Wilson's Half Earth goals, select for areas that provide habitat connectivity for specific migratory species such as jaguar or Mexican wolf, etc.) for the Sky Islands region. This assessment was completed in 2021. A write-up for publication is currently in progress therefore the data and report are not yet available publicly. In the interim, requests for access to the data can be made to Paul Elsen, Laura Paulson or Juan Carlos Bravo.

### Linkages Design

WN completed a Linkages Design assessment in collaboration with Arizona Department of Transportation (ADOT) aimed at addressing connectivity between isolated mountain ranges of Arizona, specifically how connectivity is related to transportation corridors with very specific pinch points. A report is not currently available.

### **Final Inform on the Project: Identification of Priority Areas for Conservation, Corridors and Buffer Zones in the Northern Sierra Madre Occidental,**

The Wildlands Network (then known as Wildlands Project) coordinated an assessment of priority conservation areas for Arizona, New Mexico and northern Mexico in 1999. The organization contracted Naturalia, A.C. and Rurik List, who is currently a faculty member of the Autonomous Metropolitan University of Mexico, for help with the Mexico portion of the assessment in the states of Sonora and Chihuahua. Wildlands Network staff have been unsuccessful in locating the full report. The Mexico report, Final Inform on the Project: Identification of Priority Areas for Conservation, Corridors and Buffer Zones in the Northern Sierra Madre Occidental, November 1999, has been reviewed and summarized here.

*Objective:* Identify priority areas to include in a proposed network of conservation reserves in the northern Sierra Madre Occidental and adjacent lowlands of Chihuahua and Sonora.

*Key conclusions:* Based on an objective of protecting the highest number of native species within a matrix of natural areas, the authors propose a focus on large size areas or areas that are close to one another. Priorities identified are Sierra del Nido and Janos, both large areas that include several smaller sites of close proximity to each other. A proposal to establish a Sierra Madre Occidental Biological Corridor is also outlined.

## OTHER EFFORTS OF NOTE

- Altar Valley Conservation Alliance: The AVCA developed an Altar Valley Watershed Plan.
- The Nature Conservancy: In 2007, TNC Mexico Program brought together diverse conservation actors to develop the Chihuahuan Desert Grasslands Conservation Strategy (ECOPAD). A state-level action plan was later created to address priorities in Chihuahua.
- National Fish and Wildlife Foundation (NFWF): More than a decade ago, the NFWF, with input from public and non-profit conservation entities, developed a 10-year Sky Island Grasslands Business Plan that aimed to make significant financial investment in Sky Island conservation during a 10-year period. NFWF closed its Sky Islands Grasslands program after about five years.
- Wildlife Conservation Society, along with other conservation scientists, completed a Jaguar Habitat Suitability Assessment in 2015 and 2021. The 2015 assessment contributed to the FWS Recovery Plan for Jaguar. The 2021 assessment builds on the original assessment and extends that suitable habitat for jaguar to central Arizona and New Mexico.

## Collaborative Initiatives

Our research indicates there have been eight collaborative efforts initiated over the last several years; five are currently active.

### CURRENT EFFORTS (ACTIVE)

#### **Altar Valley Watershed Working Group (NGO; Rancher-led)**

*Purpose:* This is a working group connected with and convened by the Altar Valley Conservation Alliance and facilitated by Southwest Decision Resources, a consultancy focused on facilitation and collaboration. The purpose of the group is to bring together diverse partners to align resources, research and priority projects to improve the health of the Altar Valley Watershed west of Tucson, Arizona.

*Participants:* Altar Valley Conservation Alliance, Arizona Department of Forestry and Fire Management, Arizona Game and Fish Department, BKW Farms, Buenos Aires National Wildlife Refuge, Bureau of Land Management, Friends of Buenos Aires National Wildlife Refuge, JE Fuller, National Resources Conservation Service, Oregon State University, Pima County Natural Resources, Parks and Recreation, Pima County Regional Flood Control District, Quiet Creek, Robinett Rangeland Resources, Southwest Decision Resources, The Nature Conservancy, University of Arizona, US Fish and Wildlife Service, US Forest Service, Watershed Management Group.

*Key outputs:* Altar Valley Watershed Conservation Plan (draft completed in March 2021 with refinements in progress)

*Limitations/Challenges:* Sustained funding, and staffing and time to ensure plan development and its implementation continue to progress, even when grant funding ends.

*Links:*

- <https://sites.google.com/view/altar-valley-wwg/home>

### **Borderlands Linkages (NGO-led)**

*Purpose:* Created in 2019 with seed funding from Biophilia Foundation, the purpose of Borderlands Linkages is to promote and strengthen collaboration between border area organizations working on wildlife conservation and monitoring, mainly borderlands cats (jaguar and ocelot). A goal of protecting and maintaining movement corridors for jaguars provides the umbrella framework for collaboration.

*Participants:* Borderlands Restoration Network, Cuenca Los Ojos, Nature & Culture International, Northern Jaguar Project; Profauna, A.C., Rancho El Aribabi, Sky Island Alliance, Wildlands Network

*Key outputs:* A monitoring protocol for jaguar. In progress: a joint outreach effort to advance identification of parcels. There is some interest in building an incentives toolbox for landowners.

*Limitations:* Obtaining sustained funding from additional sources, expanding the network while retaining cohesiveness, logistics of reaching and sustaining the monitoring capacity that can provide Sonora-wide population density estimates for jaguars.

### **Fort Huachuca Sentinel Landscapes Restoration Partnership (DoD-led)**

*Purpose:* Established in 2015 by the Department of Defense, the primary goal of this effort is to use collaborative, community-driven strategies to tackle issues such as water conservation, agricultural viability, wildlife habitat restoration and military mission protection. Geographic areas include Ft. Huachuca area of influence; San Pedro watershed, Coronado National Forest, Las Cienegas National Conservation Area, Patagonia-Sonoita Creek.

*Participants:* Federal: US Army, FSA, USFS, NRCS, REPI, BLM, USFWS, USGS. State: Arizona Department of Agriculture, Arizona Department of Emergency and Military Affairs, Arizona Department of Environmental Quality, Arizona Department of Forestry and Fire Management, Arizona Department of Water



Resources, Arizona Game and Fish Department, Arizona State Lands Department, University of Arizona Cooperative Extension. Local: Cienega Watershed Partnership, City of Sierra Vista, Cochise County, Fort Huachuca, Hereford Natural Resource Conservation District, Huachuca City, Santa Cruz County, Santa Cruz Natural Resource Conservation District. Private: Arizona Antelope Foundation, Arizona Land and Water Trust, Borderlands Restoration Network, Desert Landscape Conservation Cooperative, Malpai Borderlands Group, National Audubon Society, National Fish and Wildlife Foundation, Pheasants Forever, Sky Island Alliance, The Nature Conservancy, Trust for Public Land.

*Key outputs:* Landscape Strategic Plan; maps; fact sheets on various topics (water, riparian habitat, etc.)

*Limitations:* Driven by Department of Defense/Fort Huachuca priorities and funding which include sustainability and growth of the Sierra Vista area in support of the Fort's operations, staff and their families. Subject to federal government administrative priorities and budgeting process.

*Links:*

- <https://sentinellandscapes.org/landscapes/fort-huachuca/>

### **Las Cienegas National Conservation Area Collaborative Adaptive Management Partnership (BLM-led)**

*Purpose:* Numerous organizations and public agencies came together over twenty years ago to protect more than 45,000 acres of rolling grasslands and woodlands in southeastern Arizona as a Bureau of Land Management (BLM) managed area called the Las Cienegas National Conservation Area (LCNCA). The BLM completed a Resource Management Plan for public lands within LCNCA and the Sonoita Valley Acquisition Planning District in 2003. The Plan prescribes an adaptive management approach for these lands and resources. The purpose of this group effort is to collaboratively implement the 2003 BLM Resource Management Plan for LCNCA.

*Participants:* Led by BLM and Southwest Decision Resources, this collaboration involves numerous agencies, conservation organizations and private landowner lessees. NGOs involved include The Nature Conservancy, Sky Island Alliance, Watershed Management Group. Agencies include BLM, AZGFD, Pima County Natural Resources Department and FWS.

*Key outputs:* Management Plan and several other documents, including monitoring assessments and status reports for species and habitats.

*Limitations:* This is a collaboration that has been ongoing for at least a decade. Principal constraints are related to the realities of implementing any kind of conservation, restoration, monitoring and research on public lands. These can include both funding and regulatory constraints, including compliance with NEPA, ESA and other permitting processes and clearance; many of these take time to obtain. Additionally, while collaborators are focused on implementing the 2003 Management Plan, which has remained in place since that date, priorities for specific management actions, monitoring and research prescribed in the plan may shift with changing federal administrations and/or reduced resource capacity to fully implement.

*Links:*

- <https://sites.google.com/site/lcncaadaptivemanagement>

### **Sky Islands Restoration Collaborative**

*Purpose:* The Sky Island Restoration Cooperative is a regional collaboration that connects agencies, organizations, and individuals.

*Participants:* Participants include government agencies, nonprofit organizations, private landowners, ranchers, students, volunteers, scientists, and restoration practitioners.

*Key outputs:* The collaborative maintains a listserv and serves as an umbrella for research and volunteer activities.

*Limitations:* Limitations are unknown. Lack of dedicated staff and/or funding may affect capacity.

### **Sonoran Joint Venture (FWS-led)**

*Purpose:* Established 1999, the Sonoran Joint Venture (SJV) is a partnership of diverse organizations and individuals from the southwestern United States and northwestern Mexico that share a common commitment to bird conservation within the region. SJV geographic focus includes California, Arizona, Sonora and portions of New Mexico and Sinaloa. The SJV Management Board maintains leadership, resources, and support to accomplish strategic organizational goals and objectives. The SJV is sponsored and funded by the US Fish and Wildlife Service.

*Participants:* The Management Board comprises binational representatives from each state in the SJV region. Members of the board include representatives from federal and state agencies, corporations, and non-profit conservation organizations, as well as private citizens interested in the conservation of birds and their habitats within the boundaries of the SJV. Current Management Board membership includes representatives from the following entities: Arizona Game and Fish Department, Northern Arizona University, CONABIO, USDA Forest Service International Program; FWS Region 2, Pronatura Noroeste, LightHawk, CICESE, CONANP, Wildcoast, Point Blue Conservation Science, River Partners, Audubon Southwest, NPS, California Department of Fish and Wildlife, BLM, Prescott College Kino Bay Center for Cultural and Ecological Studies, Grupo de Ecología y Conservación de Islas, A.C., USGS, Bird Conservancy of the Rockies, San Diego Zoo Institute for Conservation Research.

*Key outputs:* SJV has completed a Strategic Plan as well as a Bird Conservation Plan and Waterfowl Management Supplement; all three of these are dated between 2005-2007 and have not been updated. Decisions regarding projects, research focus and the SJV grants program are based on priorities identified in these plans.

*Limitations:* Subject to DOI-FWS priorities and budget allocations. This SJV has been successful and stable for a number of years, despite changing administrations and budget allocations.

*Links:*

- <https://sonoranjv.org>

## HISTORICAL EFFORTS (INACTIVE)

### **Border States Conservation Collaborative**

Created in 2019 at the 44th Annual Symposium of the Desert Tortoise Council organized by the Turtle Conservancy, the Border States Conservation Collaborative was formed as an informal working group of diverse actors from the US and Mexico.

*Purpose:* The purpose was to create and implement a bold collective vision for private lands conservation.

*Participants:* Borderlands Restoration Network, Cuenca Los Ojos, Defenders of Wildlife, Desert Tortoise Council, Diamond A Ranch Animas Foundation, Fondo Mexicano para la Conservación de la Naturaleza, A.C., Global Wildlife Conservation, International Union for Conservation of Nature Tortoise and Freshwater Turtle Specialist Group, Malpai Borderlands Group, Nature and Culture International, Northern Jaguar Project, Rancho El Aribabi, Rancho El Uno, Sky Island Alliance, The Nature Conservancy, Turner Endangered Species Fund, Turtle Conservancy, Universidad Juárez del Estado de Durango, University of Queretaro, and Wildlands Network.

*Key outputs:* None.

*Limitations:* There has been minimal or no follow up after the 2019 meeting. Mercy Vaughn, who coordinated the initial meeting, is no longer affiliated with the Turtle Conservancy. Other limitations are unknown.

### **Desert Landscape Conservation Cooperative (DLCC)**

The Desert Landscape Conservation Cooperative was an initiative of the DOI and BOR, similar to the Joint Venture concept developed by FWS to improve

conservation of birds and bird habitat in North America. Multiple LCCs were formed throughout the United States.

*Purpose:* Through collaborative partnerships, the Desert LCC sought to provide scientific and technical support, coordination, and communication to resource managers and the broader Desert LCC community to address climate change and other landscape-scale ecosystem stressors.

*Participants:* The Bureau of Reclamation (BOR) and the Fish and Wildlife Service (FWS) were co-leads, as well as partners, in the effort to establish the Desert LCC. The partnership was initiated between BOR, the FWS, the U.S Geological Survey (USGS), other federal agencies, states, tribes, non-government organizations (NGOs), universities, and other entities.

*Key outputs:* Madrean Watersheds Assessment, Design and Blueprint.

*Limitations:* The Desert LCC was structured as a joint venture with federal funding administered by the Bureau of Reclamation. As such, it was subject to political and congressional and/or agency funding priorities. The Desert LCC was defunded during the Trump Administration. While in operation, there were challenges with directing or sharing resources with Mexico because Mexico is not included in the BOR's mandate.

### **Northwest Mexico Private Lands Conservation Network (coordinated by The Nature Conservancy)**

In the early 2000s, The Nature Conservancy's Mexico Program embarked on a nationwide private lands conservation initiative, with the goal of transferring tools, strengthening policy and legislation and building local land trust capacity. Several longstanding and nascent conservation organizations in northwestern Mexico came together to collaborate, share lessons and move specific actions forward aimed at creating favorable conditions and incentives for conservation of private lands.

*Purpose:* Share lessons learned, develop guidelines and standards for private lands conservation and improve enabling conditions through law projects and conservation incentives in northwest Mexico.

*Participants:* Biodiversidad y Desarrollo Armonico, A.C., Naturalia, A.C., Niparaja, A.C., Pronatura Noroeste, A.C., Terra Peninsular, A.C., and The Nature Conservancy.

*Key outputs:* Private Lands Conservation Tools booklet for Landowners; Incentives for Private Lands Conservation booklet (Guia de Incentivos).

*Limitations:* Early efforts were funded by USAID and private foundations. In 2009, there was a shift in TNC priorities coupled with a lack of funding availability to support continued efforts. Resource Legacy Fund built on the initial effort for a time, to address a specific interest in protecting coastal lands from development.

### **Northwest Mexico Private Lands Conservation Network (second, distinct effort)**

In 2011 a small group of organizations, some of whom owned conservation lands, came together to create a vision for large-landscape connectivity for wildlife, such as jaguars, wolves and other endangered species. This effort was organized collectively with a series of three meetings.

*Purpose:* Establish an organized network of landowners who voluntarily abide by a set of land management guidelines that foster environmentally responsible and sustainable resource management to assure the long-term health of landscapes and wildlife populations.

*Participants:* Wildlands Network, Northern Jaguar Project, Naturalia AC, Cuenca Los Ojos, Nature and Culture International, and Defenders of Wildlife.

*Key outputs:* A list of priority collaborative actions to be undertaken to achieve their vision.

*Limitations:* Unknown.

## Data Portals

Research discovered seven data portals, described in Figure 2. All are active.

Figure 2. Data Portals serving the Sky Islands Region

| Name and Website   | Purpose  | Participants  | Outputs   |
|--|--|---|---|
| Borderlands Avian Data Center<br><a href="http://borderlandsbirds.org">borderlandsbirds.org</a>  | Platform for data-driven conservation and management planning. Makes scientific data and analyses available to habitat managers, conservation practitioners, scientists and the public.  | Sonoran Joint Venture, Arizona Game and Fish Department, Pronatura Noroeste and Point Blue Conservation Science. Numerous other entities are involved in working groups for specific bird species.  | Linked to outputs generated by partners. There are links to data sets, mapped bird observations and other tools on this platform. |
| Climate Adaptation Knowledge Exchange (CAKE)<br><a href="http://ecoadapt.org">ecoadapt.org</a>   | Knowledge sharing platform featuring high-quality climate change adaptation case studies, tools and resources spanning all phases of the adaptation process (assessment, planning, implementation, evaluation and monitoring. Also lists events and trainings. | Platform is managed by EcoAdapt. No partners or funding support is listed on the CAKE website, however, there is an extensive list of EcoAdapt's partner organizations on its website. This list can be found here: <a href="http://www.ecoadapt.org/partners">http://www.ecoadapt.org/partners</a> | Various reports, assessments and case studies related to climate adaptation can be found here, broken down by US region.          |
| DataBasin<br><a href="http://databasin.org">databasin.org</a>  | A science-based open access mapping and analysis platform that supports learning, research and sustainable environmental stewardship.  | Open access with registration and creation of a user profile.   | N/A   |
| Madrean Biodiversity Assessment (MABA) aka Madrean Discovery Expeditions<br><a href="http://madreandiscovery.org">madreandiscovery.org</a> | To inventory, catalog and document the biodiversity of the Sky Islands region and make information available to the public.  | Sky Island Alliance (lead) with support and assistance from numerous researchers, including Dr. Tom van Devender.   | MABA Data Portal, Flora and Fauna Database.   |



| Name and Website   | Purpose   | Participants                   | Outputs   |
|--|---|--------------------------------|---|
| SEINet Arizona-New Mexico Chapter.<br><a href="http://swbiodiversity.org">swbiodiversity.org</a> | Gateway to distribute data resources of interest to the environmental research community within Arizona and New Mexico.   | N/A                            | N/A   |
| TNC – Arizona Conservation Science<br><a href="http://azconservation.org">azconservation.org</a> | Make available to the public various reports, assessments, data sets and maps created by TNC Arizona’s scientists. Includes a search function for maps and GIS data sets. | N/A                            | Various reports, assessments, analyses, GIS data sets and maps. |
| Wild Sonora<br><a href="http://wildsonora.com">wildsonora.com</a>                                | Platform to share stories, media, maps, discussions, and data about the natural landscape, animals and plants of Sonoran, Madrean and Sky Island regions.                 | Open access with registration. | N/A   |

## Conclusions

### SPATIAL PRIORITIZATION AND PLANNING

Comprehensive review of spatial prioritization outputs and planning documents outlined in this report, especially those developed by the Coalition for Sonoran Desert Protection, Sky Island Alliance, The Nature Conservancy and Wildlands Network, indicates these outputs are still relevant today. While each entity has its specific organizational mission, vision and programmatic strengths, their planning efforts are comprehensive, use the best available science (including a set of well-defined and widely accepted conservation targets) and nearly always consider priorities identified by public agencies and/or other organizations. Thus, there is a general consensus on conservation priorities established in these plans.

The NFWF Sky Island Grasslands Business Plan, collaboratively developed in 2009 with input of several public and non-profit conservation entities, is also still relevant today. The priorities identified in the plan reflect results or recommendations of previous spatial analyses and planning efforts, including several that were outlined in this report. While some strategies and actions may need to be updated as a result of reviewing and/or updating conservation threats, the spatial priorities and conservation targets are still valid and important. Several organizations continue implementing some version of strategies and actions proposed in the plan, despite NFWF closing its program prematurely.

Additional science and resource-heavy spatial prioritization assessments may not be the best use of resources at this time. Rather, a worthwhile, less time consuming and costly exercise may be as simple as overlaying into a GIS existing data sets and shape files generated for the assessments outlined in this report to create a map of collective priorities. This will 1) help to visually understand collective thinking, top tier priorities for conservation and restoration action, and investment by conservation entities; and 2) potentially guide or inform funding priorities and grant making.

## COLLABORATION

Over the last decade or more, there have been several Sky Island-focused collaborative efforts related to conservation and restoration on private lands. Of the five active collaborative efforts, three are federal agency-led with budgets and personnel (part-time or full-time) in a coordinating role. These are primarily set up to seek public input to management or strategic plan design. Sometimes opportunities to partner on a broad range of implementation activities are made available. The common elements of success for the two non-profit led efforts are: 1) paid staff person in a coordinating role; 2) grant funding to cover minimal participant expenses and sometimes pilot projects; and 3) keeping the number of collaborative activities or outputs small, narrowly focused and realistic.

The three federal agency-led efforts are limited in that the agencies have a specific mandate and use these efforts as a forum for public input and communication and sometimes to distribute grant funding to benefit agency priorities. There is little potential for expanding or pivoting these. Borderlands Linkages stands out as having gained momentum over the last three years with a very specific focus. It is also noted that the Northwest Mexico Private Lands Conservation Network and the Border States Conservation Collaborative had very similar interests. There is still a need to effectively address the long-term stewardship and restoration of private lands, particularly on the Mexico side of the border. Revitalizing a private lands conservation and restoration network or collaborative could be especially impactful if it were appropriately supported with resources. Many of the organizations that participate in Borderlands Linkages also have private lands conservation and restoration programmatic areas; however, there are some organizations that do not participate in Borderlands Linkages due to the narrow focus on jaguar and ocelot conservation and monitoring.

## RECOMMENDATIONS

1. Create a map of “collective” spatial priorities for the Sky Islands region and validate it with Coalition for Sonoran Desert Protection, SIA, TNC and WN. This could be done through a virtual consultation or folded into another format if there are additional needs for collaborative planning or broader learning/knowledge exchanges.

2. Explore with NFWF the possibility to re-establish the Sky Island Grasslands Program under a new or modified public-private funding model.
3. Explore opportunities to build on and expand existing collaborations such as Borderlands Linkages and/or create a new private lands conservation and restoration collaborative.
4. Provide information and training about the different Sky Islands-related data portals available to conservation entities.

## Appendices

Table 1. Key Actors

Table 2. Collaborative Initiatives

## Appendix 1: Key Actors

The following table includes key conservation and restoration actors in the Sky Islands region.

| Name and Location of Entity  | Mission  | Program Areas / Interests   |
|--|--|---|
| <u><a href="#">Altar Valley Conservation Alliance (AVCA) - Tucson, Arizona</a></u><br><u><a href="http://altarvalleyconservation.org">altarvalleyconservation.org</a></u>  | The AVCA is a watershed-based collaborative conservation organization founded in 1995, whose mission is to conserve the Altar Valley for future generations. The AVCA works through a strongly collaborative, science-based, community driven and integrated approach to conserve, promote and sustain the valley. | Soil and water conservation, fire management, habitat and native species conservation/protection, improvement of ranching and farming practices, diversification of income, community resiliency.   |
| <u><a href="#">Arizona Land and Water Trust (ALWT) - Tucson, Arizona</a></u><br><u><a href="http://alwt.org">alwt.org</a></u>  | Arizona Land and Water Trust is a 501(c)3 that works closely with local, state and federal agencies, as well as private landowners and land trusts, to protect Arizona's vanishing landscapes, wildlife habitat and the waters to sustain them.  | Programs focused on land and water protection, including private landowner incentives, conservation easements and stewardship agreements. Also serves as trusted broker, bringing together diverse partners to leverage multiple resources and interests to implement conservation. |
| <u><a href="#">Borderlands Restoration Network (BRN) - Patagonia, Arizona</a></u><br><u><a href="http://borderlandsrestoration.org">borderlandsrestoration.org</a></u>   | Borderland Restoration Network's mission is to grow a restorative economy by rebuilding healthy ecosystems, restoring habitat for plants and wildlife, and reconnecting our border communities to the land through shared learning.  | Youth education, native plant nursery, quail and jaguar habitat restoration, creation of borderlands wildlife preserves.  |
| <u><a href="#">Centro de Colaboración para la Ciencia y Cultura S.C.; Colectivo Sonora Silvestre - Hermosillo, Sonora</a></u><br><u><a href="http://cenko.org/colectivosonorasilvestre">cenko.org/colectivosonorasilvestre</a></u> | Colectivo Sonora Silvestre was founded in 2018 by a group of biologists passionate about the conservation and restoration of ecosystems. This later became the Centro de Colaboración para la Ciencia y Cultura (Center of Collaboration for Science and Culture).   | Ecological restoration and education. Colectivo Sonora Silvestre — The objective of Colectivo is to establish collaborative projects that allow the progress of society and ecosystems towards the sustainability of productive processes and natural resources.                    |

|   |   |  |
|---|---|--|
| <u>Cienega Watershed Partnership (CWP) - Vail, Arizona</u><br><a href="http://cienega.org">cienega.org</a>                              | <u>The Cienega Watershed Partnership (CWP) is a nonprofit organization founded to support stewardship initiatives in the Cienega Watershed region of Southeastern Arizona. The Cienega watershed will be a healthy ecosystem enjoyed by future generations. The Cienega Watershed Partnership and its partner organizations will serve as a model for a collaborative and unified approach to land conservation and for active stewardship on the part of stakeholders.</u>   | Education (Youth Engaged Stewardship program), science (state of the watershed assessments) conservation and restoration (arroyo restoration, FROG project) and heritage programs (oral history programs, shared history of the watershed curriculum). |
| <u>Coalition for Sonoran Desert Protection — Ajo, Arizona</u><br><a href="http://sonorandesert.org">sonorandesert.org</a>               | The Coalition's mission is to protect the biodiversity of the Sonoran Desert in southern Arizona through science-based advocacy, education, and collaboration.  | Implementation of the Sonoran Desert Conservation Plan. Working on three habitat conservation plans for areas within Pima County. Engages in policy advocacy and outreach.   |
| <u>Cuenca Los Ojos (CLO) - Douglas, Arizona</u><br><a href="http://cuencalosojos.org">cuencalosojos.org</a>                             | The mission of CLO is to protect and restore the biodiversity of the borderlands region.  |  |
| <u>Deep Dirt Farm, L.L.C. - Patagonia, Arizona</u><br><a href="https://deepdirt.earth/institute/">https://deepdirt.earth/institute/</a> | Serves as a permaculture/arid lands restoration demonstration site in Patagonia, Arizona.   | Primary demonstration site for BRN.  |
| <u>Defenders of Wildlife (DOW) - Santa Fe, New Mexico and Tucson, Arizona</u><br><a href="http://defenders.org">defenders.org</a>       | Defenders of Wildlife is dedicated to the protection of all native animals and plants in their natural communities.   | Jaguar; other endangered animal and plant species; doesn't do ecological work but has potential for collaboration on fundraising, planning and volunteer recruitment.  |
| <u>Desert Botanical Gardens (DBG) - Phoenix, Arizona</u><br><a href="http://dbg.org">dbg.org</a>  | Description of Research and Conservation Program Area: Since 1939, Desert Botanical Garden has served as a global leader in the research and conservation of desert plants and their habitats. Today, Research & Conservation staff at the Garden collaborates with academic, research and conservation groups across seven countries and four continents. The work being done is leading to the discoveries of new plant species, conservation of threatened and endangered species and identifying emerging threats such as climate change to invasive species to the desert habitats throughout the world. | In Arizona, DBG is working on research and habitat restoration projects in several sites in the Sky Islands, including Canelo Hills, Las Cienegas NCA, Sonoran Desert National Monument, Tumamoc Hill, Coronado National Forest, Chiricahua Mountains. |



|  |  |  |
|--|--|--|
| <u>Fondo Mexicano para la Conservación de la Naturaleza, A.C. (FMCN) - Mexico City</u><br><a href="http://fmcn.org.mx">fmcn.org.mx</a> | To conserve Mexico's natural heritage by connecting across sectors and delivering strategic financial and technical resources.   | Conservation (marine, grasslands, watersheds), sustainable management (mainly regenerative ranching initiative), finance. Not many projects in Sonora, although FMCN does support CLO.   |
| <u>Gila Watershed Partnership of Arizona - Safford, Arizona.</u><br><a href="http://gwpaz.org">gwpaz.org</a>                           | To engage the community in improving the water quality and ecosystem condition of the Upper Gila Watershed, Arizona, through education and economic opportunity.   | GWP is a boots-on-the-ground, field-based conservation organization. We confront issues in the Upper Gila Watershed that include polluted rivers, soil erosion, invasive weeds, loss of habitat, drought, fire, and flooding. We work with diverse partners to implement projects that direct resources to the root of these issues, while employing and purchasing locally to benefit the economy and community. All of our work includes opportunities for public participation and education through outreach, internships, volunteerism, and public information. |
| <u>Heart of the Gila - Silver City, NM</u><br><a href="http://heartofthgila.org">heartofthgila.org</a>                                 | Created in 2017 following the deaths of Ella Jaz Kirk and two of her high school friends while conducting aerial research on post-fire conditions in the Gila National Forest of New Mexico, Heart of the Gila seeks to conserve our watersheds and educate children, adults and decision makers about the ecological, social, economic and cultural values of rivers in New Mexico and the bioregions of the greater Southwest.   | Program areas include Education, Advocacy, Stewardship and Conservation. Current projects include river clean-ups, invasive species eradication, habitat restoration, trail maintenance, increasing pollinator habitat, educating the public about native plants and training and maintaining a team of citizen scientists monitoring Monarch Butterfly populations and migration patterns in southwest New Mexico.  |
| <u>International Sonoran Desert Alliance (ISDA) - Ajo, Arizona</u><br><a href="http://isdanet.org">isdanet.org</a>                     | Founded in 1993, the ISDA is a comprehensive community development non-profit that is committed to growing resilient and sustainable Sonoran Desert communities where the natural environment and a rich cultural heritage are held in the highest regard. It designs and implements environmental, cultural, real estate and business development projects intended to preserve and enrich the environment, culture and economy of the Sonoran Desert. Works with diverse communities, with emphasis on Oodham peoples. | <u>Environment</u> : Quito Baquito Springs, Organ Pipe/Pinacate, SD Biosphere, Alto Golfo, Home Energy Efficiency; Tri-national Sonoran Desert Symposium, Geotourism.<br><u>Culture</u> : Curley School, Public Art, Artisans<br><u>Economy</u> : Community learning and apprenticeship programs, with focus on Ajo.   |

|  |  |  |
|--|--|--|
| <u>Malpai Borderlands Group (MBG) - Douglas, Arizona</u><br><a href="http://malpaiborderlandsgroup.org">malpaiborderlandsgroup.org</a>                                     | The mission of Malpai Borderlands Group is to restore and maintain the natural processes that create and protect a healthy, unfragmented landscape to support a diverse, flourishing community of human, plant and animal life in our borderlands region.  | An alliance of ranchers in southeastern Arizona and southwestern New Mexico who work to preserve open space and the ranching way of life by purchasing and stewarding conservation easements, implementing restoration actions, conducting science and monitoring and public outreach. |
| <u>Manejo de Ranchos Regenerativos, A.C. (MRR) - Chihuahua, Mexico.</u><br><a href="http://manejoderanchosregenerativos.com">manejoderanchosregenerativos.com</a>          | Disseminate and promote information, tools or practices that encourage producers to create strategies that regenerate soil fertility, the quality of food produced, the profitability of agricultural activity, the quality of family life and sustainable development.  | Workshops and rancher exchanges to share best practices on grazing management, animal husbandry, diversified income streams.   |
| <u>Naturalia A.C. - Mexico City HQ; main program is out of Hermosillo</u><br><a href="http://naturalia.org.mx">naturalia.org.mx</a>  | Founded in 1990 with the objective to protect and conserve ecosystems and wildlife.  | Education; wildlife monitoring; creation of private reserves; reforestation; experience in planning, organization and implementation of restoration work.  |
| <u>New Mexico Land Conservancy (NMLC) - Santa Fe, New Mexico</u><br><a href="http://nmlandconservancy.org">nmlandconservancy.org</a>                                       | The goal of New Mexico Land Conservancy is to preserve New Mexico's unique and diverse land heritage for conservation purposes and the benefit of local communities, the public and future generations.  | Strategic priorities include private lands conservation, landowner education and capacity building. Most of its work focuses on conservation acquisition, easements and landowner stewardship.   |
| <u>Northern Jaguar Project (NJP) - Tucson, Arizona</u><br><a href="http://northernjaguarproject.org">northernjaguarproject.org</a>   | The mission of the Northern Jaguar Project is to preserve and recover the world's northernmost population of the jaguar, its unique natural habitats and native wildlife under its protection as a flagship, keystone and umbrella species.  | Partners with Asociacion de Conservacion del Norte, A.C., a Mexican landholding entity, in managing the Northern Jaguar Reserve in central Sonora. The NJR is not really part of the Sky Islands, but collaborates with Borderlands Linkages.  |
| <u>Protección de la Fauna Mexicana, A.C. (Profauna) - Saltillo Coahuila HQ; Sonora Program based in Hermosillo</u><br><a href="http://profauna.org.mx">profauna.org.mx</a> | Participate in the conservation, supervision and technical assistance in any area related to natural resources, from flora and fauna to the environment, through various activities in coordination with different agencies, other associations, people and international organizations, with the sole purpose of safeguarding natural resources | Northern Mexico (activities in Sonora and Chihuahua); environmental education, technical assistance with wildlife management, capacity building with ranchers; sustainable grazing; conservation planning, ecological and species restoration.   |
| <u>Rio Grande Return - Santa Fe, New Mexico</u><br><a href="http://riograndereturn.com">riograndereturn.com</a>  | Rio Grande Return is a 501(c)3 non-profit organization that was started in 2007 to help protect New Mexico's rivers, streams, springs, seeps, and the unique habitats and diverse wildlife they support.   | Presently has two restoration-focused programs: (1) Stream/wetland restoration program and (2) Ag to upland and native seed sourcing program.  |

|   |   |   |
|---|---|---|
| <u><a href="#">Sky Island Alliance (SIA) - Tucson, Arizona</a></u><br><u><a href="#">skyislandalliance.org</a></u>                  | To protect the diversity of life and lands in the Sky Island region.  | Building restoration funding sources, studying restoration needs for water sources (especially springs) and habitat, planning restoration activities with public land partners (US Forest Service primarily), and collecting pre-restoration monitoring data on springs and the wildlife community. <sup>[11]</sup> <sub>SEP</sub>  |
| <u><a href="#">Sonoran Institute (SI) - Tucson, Arizona</a></u><br><u><a href="#">sonoraninstitute.org</a></u>                      | The Sonoran Institute's mission is to connect people and communities with the natural resources that nourish and sustain them.                            | Colorado River Delta; Santa Cruz River Basin; produces annual "Living River" report in collaboration with City of Tucson for the Santa Cruz Basin; is important collaborator in Colorado River Delta, Mexico.   |
| <u><a href="#">The Nature Conservancy (TNC) - Tucson, Arizona and Santa Fe, New Mexico</a></u><br><u><a href="#">nature.org</a></u> | The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends.  | Relevant programs within the Arizona, New Mexico and Mexico Business Units: Private lands preserve network in Arizona; restoration activities and partnerships in the Las Cienegas NCA, MBG area, San Pedro Watershed, U.S., Gila and Rio Grande Watersheds, NM, owns Los Fresnos Ranch on border in Sonora, Mexico. Provides science assessments, inputs and management tools for grasslands, desert and riparian areas. |
| <u><a href="#">Tucson Audubon - Tucson, Arizona</a></u><br><u><a href="#">tucsonaudubon.org</a></u>                                 | Tucson Audubon's mission is to inspire people to enjoy and protect birds through recreation, education, conservation and restoration of the environment.  | Program areas include bird monitoring, protecting and restoring bird habitat in Arizona's Important Bird Areas, education and outreach, community science initiatives.  |
| <u><a href="#">Watershed Management Group (WMG) - Tucson, Arizona</a></u><br><u><a href="#">watershedmg.org</a></u>                 | Watershed Management Group (WMG) develops community-based solutions to ensure the long-term prosperity of people and health of the environment.           | Binational Santa Cruz and San Pedro River Basins. Addresses urban and rural sustainability issues, including watershed health, habitat restoration, restoring ecological flow to rivers and streams, green infrastructure, water policy.  |
| <u><a href="#">Wildlands Network (WN) - Salt Lake City, Utah</a></u><br><u><a href="#">wildlandsnetwork.org</a></u>                 | Wildlands Network works to reconnect, restore and rewild North America so that life—in all its diversity— can thrive.                                     | Connect, maintain wildlife corridors and habitat on public and private lands; mapping and modeling connectivity. Has been very involved in border wall impact mapping and monitoring.   |
| <u><a href="#">Wildlife Corridors, L.L.C. - Patagonia, Arizona</a></u><br><u><a href="#">borderlandsrestoration.org</a></u>         | Wildlife Corridors, L.L.C., seeks to facilitate novel public-private partnerships to protect open land, improve habitat and facilitate wildlife movement. | Purchase and protection of private lands that complement/enhance public lands.  |

## Appendix 2: Collaborative Initiatives

The following table lists collaborative initiatives in the Sky Islands region.

| Name  | History  | Purpose  | Participants   | Key Outputs   |
|---|--|--|--|---|
| <b>Altar Valley Watershed Working Group</b> | This is a working group connected with the Altar Valley Conservation Alliance. | Bring together diverse partners to align resources, research and priority projects to improve the health of the Altar Valley Watershed west of Tucson, Arizona.          | Convened by Altar Valley Conservation Alliance and facilitated by Southwest Decision Resources. Participants include: AVCA, Arizona Department of Forestry and Fire Management, Arizona Game and Fish Department, BKW Farms, Buenos Aires National Wildlife Refuge, Bureau of Land Management, Friends of Buenos Aires National Wildlife Refuge, JE Fuller, National Resources Conservation Service, Oregon State University, Pima County Natural Resources, Parks and Recreation, Pima County Regional Flood Control District, Quiet Creek, Robinett Rangeland Resources, Southwest Decision Resources, The Nature Conservancy, University of Arizona, US Fish and Wildlife Service, US Forest Service, Watershed Management Group. | Altar Valley Watershed Conservation Plan (Draft completed).   |
| <b>Borderlands Linkages</b>                 | Created in 2019 with seed funding from Biophilia Foundation.                   | Promote and strengthen collaboration between border area organizations working on wildlife conservation and monitoring, mainly cats (jaguar and ocelot). Detonator role. | Borderlands Restoration Network, Cuenca Los Ojos, Nature & Culture International, Northern Jaguar Project, Profauna, A.C., Rancho El Aribabi, Sky Island Alliance and Wildlands Network.   | Monitoring protocol for jaguar; joint outreach effort to identify private lands for wildlife monitoring and habitat conservation. |

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| <b>Fort Huachuca Sentinel Landscapes Restoration Partnership</b>                              | Established in 2015 by the Department of Defense.   | The primary goal of this effort is to use collaborative, community-driven strategies to address water conservation, agricultural viability, habitat restoration and military mission protection in the Ft. Huachuca area of influence. | <b>Federal:</b> US Army, FSA, USFS, NRCS, REPI, BLM, USFWS, USGS. <b>State:</b> Arizona Department of Agriculture, Arizona Department of Emergency and Military Affairs, Arizona Department of Environmental Quality, Arizona Department of Forestry and Fire Management, Arizona Department of Water Resources, Arizona Game and Fish Department, Arizona State Lands Department, University of Arizona Cooperative Extension. <b>Local:</b> Cienega Watershed Partnership, City of Sierra Vista, Cochise County, Fort Huachuca, Hereford Natural Resource Conservation District, Huachuca City, Santa Cruz County, Santa Cruz Natural Resource Conservation District. <b>Private:</b> Arizona Antelope Foundation, Arizona Land and Water Trust, Borderlands Restoration, Desert Landscape Conservation Cooperative, Malpai Borderlands Group, National Audubon Society, National Fish and Wildlife Foundation, Pheasants Forever, Sky Island Alliance, The Nature Conservancy, Trust for Public Land. | Landscape Strategic Plan; maps, fact sheets on various topics.  |
| <b>Las Cienegas National Conservation Area Collaborative Adaptive Management Partnership.</b> | Numerous organizations and public agencies came together over twenty years ago to protect more than 45,000 acres of rolling grasslands and woodlands in southeastern as a BLM-managed area. | The purpose of this group is to collaboratively implement the 2003 BLM Resource Management Plan for Las Cienegas National Conservation Area.   | This collaboration involves numerous agencies, conservation organizations and private landowner lessees. NGO's involved include The Nature Conservancy, Sky Island Alliance, Watershed Management Group. Agencies include BLM, AZGFD, Pima County Natural Resources Department and FWS.  | Management Plan and several other documents, including monitoring assessment and status reports for species and habitats. |

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| <b>Sonoran Joint Venture</b> | <p>Established in 1999 by the US Fish and Wildlife Service, the Sonoran Joint Venture is a partnership of diverse organizations and individuals from the southwestern US and northwestern Mexico that share a common commitment to bird conservation within the region.</p> | <p>The SJV promotes bird and bird habitat conservation in the binational region comprising Arizona, Sonora, Baja California and California.</p> | <p>Current Management Board membership includes representatives from the following entities: <i>Arizona Game and Fish Department, Northern Arizona University, CONABIO, USDA Forest Service International Program; FWS Region 2, Pronatura Noroeste, LightHawk, CICESE, CONANP, Wildcoast, Point Blue Conservation Science, River Partners, Audubon Southwest, NPS, California Department of Fish and Wildlife, BLM, Prescott College Kino Bay Center for Cultural and Ecological Studies, Grupo de Ecología y Conservación de Islas, A.C., USGS, Bird Conservancy of the Rockies, San Diego Zoo Institute for Conservation Research.</i></p> | <p>Strategic Plan; Bird Conservation and Waterfowl Management Supplements.</p> |
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