



# Altar Valley Watershed Vision and Framework for 21st Century Collaborative Conservation

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*Produced by the Altar Valley Science Advisory Board and Altar Valley Conservation Alliance Partners  
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## **A CALL TO ACTION**

*THE ALTAR VALLEY WATERSHED FRAMEWORK FOR 21ST CENTURY COLLABORATIVE CONSERVATION  
IS BOTH INSPIRED BY AND INFORMED BY THE PREVIOUS TWO DECADES OF WORK.  
DOZENS OF ORGANIZATIONS AND THOUSANDS OF PEOPLE HAVE CONTRIBUTED.  
WE ARE PROUD TO BE ONE OF MANY COLLABORATIVE GROUPS TAKING ROOT IN THE WESTERN STATES.  
IT IS OUR HOPE THAT THIS DOCUMENT REMAINS CLOSE AT HAND.  
USE IT TO EXPLAIN AND PORTRAY CONSERVATION PRIORITIES IN THE ALTAR VALLEY.  
ATTACH IT TO GRANT APPLICATIONS OR LETTERS.  
READ IT OFTEN, MARK IT UP, MAKE IT BETTER, AND TALK ABOUT IT WITH COLLEAGUES NEAR AND FAR.  
MOST OF ALL, BE PROUD OF THIS BEAUTIFUL WATERSHED LANDSCAPE AND ITS PEOPLE  
WHETHER IT BE YOUR HOME, YOUR WORKPLACE, OR YOUR RESPONSIBILITY.*

## **A Vision for Conservation of the Altar Valley**

Our long-term goal for the Altar Valley watershed is to protect it as a working landscape, unfragmented by development, and which retains ecosystem and watershed function within the historical range of resources and variability. This landscape provides habitat for native wildlife and plant species as well as grass, water, and other resources to support an economically viable ranching economy. We will accomplish this through a broad-based collaborative effort among willing landowners, government agencies, non-governmental organizations, scientists, conservationists, and other partners. We will seek opportunities to engage youth and celebrate the history and culture of the valley.

## **Document Purpose**

The *Altar Valley Watershed Framework for 21st Century Collaborative Conservation* (Framework) will guide and inspire partners on a host of stewardship activities in the 620,000 acre Sonoran semi-desert grassland, desert scrub, and mountainous working landscape southwest of Tucson, Arizona. The Framework provides an overall set of goals and guidelines; it is not a legal or regulatory document that binds any party.



## Importance of the Altar Valley

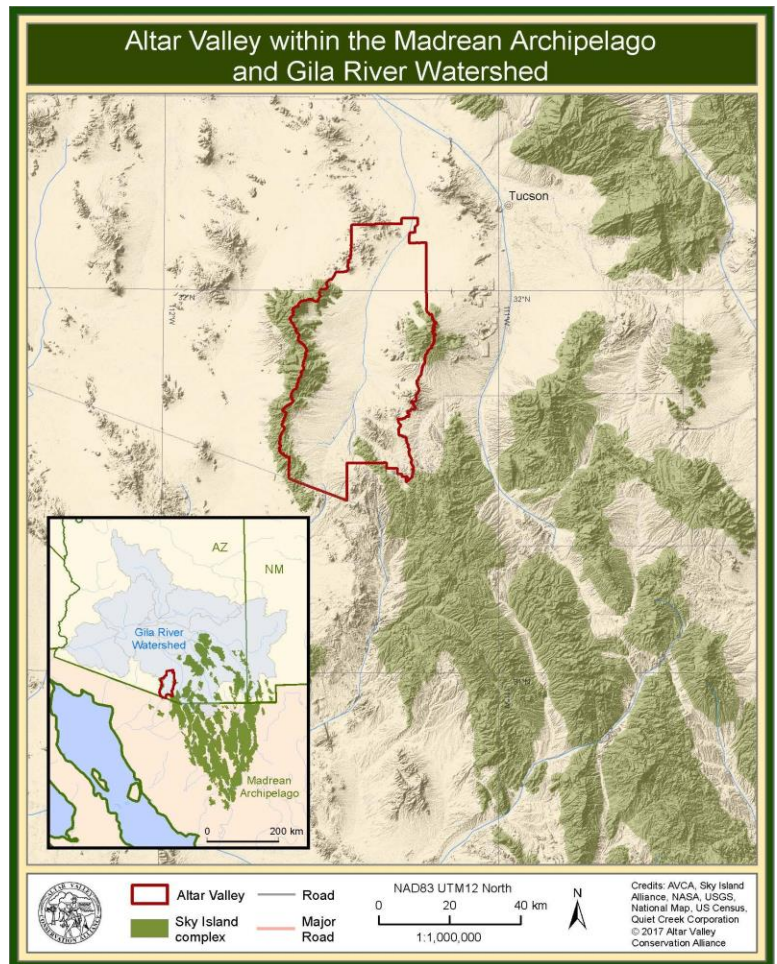
The Altar Valley watershed forms the western edge of one of the world's biologically diverse "hotspots", known as the Madrean Archipelago, where an abundance of species from the mountains and deserts of the United States blend with tropical species from Mexico. The Madrean Archipelago includes over 15,000 square miles of Arizona's border region and stretches towards the Sierra Madre in Mexico, where it encompasses an additional 27,000 square miles. The extraordinary richness of plants and animals of the Altar Valley reflect this diverse and globally important eco-region. Economically, the Altar Valley Watershed is a productive contributor to the agricultural economy of present-day Arizona. The existence of economically viable working ranches within the context of an unfragmented, natural landscape so close to a major metropolitan center make the Altar Valley a vibrant example of how natural and economic systems can coexist and sustain each other. This is a working landscape and as such is a model for the new west.

## Historical Perspective

Prior to the 20th century, lightning-ignited fire occurred frequently on a roughly 12-15 year cycle. These regular fires maintained a productive grassland ecosystem, restricted large woody vegetation like mesquite to prominent drainages, and supported a diverse mosaic of vegetation in the mountains (Bahre 1985 and Kaib 1998). The valley bottom, what is now known as the Altar Wash, was a broad flat floodplain characterized by sacaton grass. Altar Valley rancher John King recalls his grandfather saying that a man could walk a horse in front of a monsoon flood and the water would slowly spread and seep through the sacaton grass for days (Sayre 2002).

Human habitation and use of much of the Altar Valley watershed is relatively recent, the Arivaca area being the exception. The convergence of two streams and springs supported a cienega or marsh, creating an "oasis" within the semiarid landscape of the Altar Valley that attracted Native American seasonal use (Sayre 2002). Early Spanish exploration also focused on the Arivaca area, beginning with Father Eusebio Francisco Kino, who placed Arivaca on a map of the region in 1695. Juan Bautista de Anza recorded observations of the Arivaca Cienega in 1774. The Arivaca area was utilized intermittently by Spanish and then Mexican ranchers since Father Kino introduced livestock to the area. The absence of perennial water elsewhere in the watershed limited permanent settlement. However, there is a long history of people traveling through the valley and stopping to gather seasonal resources, particularly close to the mountains, for thousands of years (Sayre 2002). People of the Tohono O'odham Nation continued these patterns into the early 20th century, and to this day consider the Altar Valley an important cultural place.

The Western US cattle boom of the post-Civil War era arrived late to the Altar Valley, again due to the absence of perennial water. In the 1880s, prominent businessman and freighter Don Pedro Aguirre, who lived in Arivaca, began to develop artificial water sources in the southern, and upstream, end of the Altar Valley (Sayre 2002). Sayre estimated that Aguirre stocked "roughly 80 to 130 animal units per section [whereas] today the norm is ten to twelve." Extreme drought in 1891-93 resulted in rangeland deterioration (Sayre 2002). This drought likely provided impetus for construction of deep wells, which enabled people to homestead at the base of the mountains as well as in open parts of the valley, where some wells produced enough water to support irrigated agriculture. Drought struck again between 1898 and 1904. The combination of high stocking rates, wagon road ruts, and prolonged drought followed by intense rainfall resulted in severe erosion



and the down-cutting of Altar Wash. The valley's water table plummeted and the sacaton floodplain withered in all areas of the valley except Arivaca Creek. In addition, early- to mid-20th century land managers suppressed fire, removing a critical function of grassland ecology. The combined effects of late 19th/early 20th century stocking rates, management practices, and drought cycles brought great changes to the valley that remain in evidence today.



Throughout the 20th century, however, conservation practices evolved throughout the Altar Valley. Rangeland science helped ranchers and land managers address the effects of turn-of-the-century overstocking and drought patterns, as well as localized erosion and the encroachment of mesquite and other woody vegetation. Research conducted by University of Arizona (UA) and U.S. Soil Conservation Service (now Natural Resources Conservation Service) rangeland scientists provided locally-relevant data to guide ranchers in making improvements such as cross-fencing, water development, and brush clearing suitable to the watershed's elevation, soil types and rainfall patterns. Management interventions that are considered controversial now, such as planting hardy, drought-tolerant grasses not native to the area (such as Lehmann love grass) reflected state-of-the-art rangeland science at the time. Beginning in the early 1980's, many Altar Valley ranchers adopted regular monitoring of

rangeland conditions. The combination of conservation practices, application of research, and repeated rangeland monitoring promoted critical conservation objectives such as productive and sustainable ranching and small-scale farming, open space maintenance for wildlife, and watershed function.

Despite advances in rangeland management and greatly improved rangeland condition throughout the Altar Valley, the watershed became a hot spot of anti-grazing politics when the federal government purchased the Buenos Aires Ranch in 1985 to protect the endangered masked bobwhite quail. "The creation of the Buenos Aires [National Wildlife] Refuge was a surpassing symbolic victory for environmentalists who were agitated by the historical damage and political power of ranching in the West" (Sayre 2002). Conflict was the norm, and rancher - refuge relations were not neighborly. However, by the early 1990s, ranchers from the Altar Valley were leaders of the Arizona Common Ground Roundtable discussions of the early 1990s, in which ranchers and environmentalists sought agreement over basic management objectives. In addition, watershed-based organizations like the Malpai Borderlands Group (MBG) began to emerge as a means of pulling interests together to work towards common goals. Inspired by the MBG, Altar Valley ranchers organized the Altar Valley Conservation Alliance (AVCA) in 1995, gaining 501(c) 3 not-for-profit status in 2000.

As AVCA began to focus discussions and projects on basic elements of habitat conservation (soil, water and vegetation), partnerships amongst different people and organization grew stronger. Increasingly AVCA promoted a focus on watershed-wide management concerns and collaborative conservation projects involving many public and private organizations. Adoption of the *Altar Valley Fire Management Plan* (NRCS 2008) was a major milestone. Most recently, Pima County has acquired deeded land and accompanying leases of approximately 100,000 acres of Altar Valley land for species and habitat conservation associated with the county's Multi-Species Conservation Plan (MSCP) (This land is your land, Pima County, 2016). The ranch properties are managed by ranchers to provide on-site stewardship and continued sustainable economic productivity in the valley.



## Management setting

Land ownership today is a mosaic of private, Federal, state, and county lands. The Buenos Aires National Wildlife Refuge occupies about one-third of the watershed, and another third is owned or leased by Pima County, as a major component of its Sonoran Desert Conservation Plan. Most conservation projects involve numerous partners and require approval of county, state or federal agencies, depending on the project's location and scope. Since the 1980s and 1990s, the jurisdictional complexity of this landscape impeded large-scale conservation work, such as use of prescribed fire, and these constraints were compounded by the complex challenges of implementing the Federal Endangered Species Act. AVCA's emergence as a non-profit collaborative conservation group encouraged agricultural operators, land management agencies, and scientists to work together to address these challenges. Today AVCA is an endowed organization with professional staff, and is continuing to take a lead role in focusing attention on watershed-wide management concerns and facilitating collaborative conservation projects.

## Accomplishments to Date

The past two decades of collaboration have been as rich and complex as the landscape itself. Notable accomplishments include:

- Altar Valley Watershed Resource Assessment (2000),
- Palo Alto Pima Pineapple Cactus Mitigation Bank Stewardship (2002),
- Altar Valley Fire Management Plan (2008) and semi-annual fire coordination meetings,
- Major National Fish and Wildlife Foundation grants (2010 and 2013) to plan and implement prescribed fire and watershed projects and four grants from Freeport-McMoRan Charitable Giving for watershed projects, and over-all recipient or partner in over 20 grants or Agreements totaling more than \$4 million dollars,
- Formation of an AVCA Science Advisory Board,
- Installation and monitoring of the Elkhorn / Las Delicias Demonstration Project (ongoing since 2012),
- Completion of Phase I of the Northern Altar Watershed Area (NAWA) restoration project,
- Completion of a 5-year Cooperative Conservation Agreement with Pima County,
- Formation of an Altar Valley collection within the Rangelands West / Global Rangelands database,
- Advocacy and monitoring of the Sierrita Pipeline (ongoing since 2012),
- Formation of Watershed Working Group (2016) & *Altar Wash Restoration Conceptual Evaluation of Alternative Methods* (2017),
- Development of a Geographic Information System database (2017) that will be available to partners via [altarvalleyconservation.org](http://altarvalleyconservation.org) in 2018.

AVCA and partners participate in periodic workshops, community meetings, and work sessions to maintain communication, help solve problems, and work together to advance conservation outcomes. Critically, no ranches have been sold to real estate speculators or developers, thereby maintaining the possibility for future generations to continue agricultural and ecological stewardship of the watershed as a large working landscape unfragmented by exurban development.

## COLLABORATIVE CONSERVATION - PRINCIPLES AND GOALS

### Principles

Inspired by the successes of these past twenty years and motivated by the challenges and opportunities, landowners and partners in the valley are eager to continue this important, ongoing work and seek additional resources to expand these efforts. Experience has shown that successful watershed management work includes the following key principles:

- Develop broad watershed framework goals that both reflect and expand on individual organization's goals.
- Work collaboratively with willing landowners and partners.
- Work across agency jurisdictions and land ownership boundaries.
- Utilize best available science and encourage research that informs management actions and enables progress towards conservation and economic goals.
- Respect different organizational mandates and constraints.

## Goals

**Collaborative conservation success** in the Altar Valley Watershed integrates watershed productivity, human community wellbeing and ongoing outreach and education. **Watershed productivity** is best supported by sustaining a landscape in which soil, water and vegetation management enhances both wildlife and livestock forage and shelter needs. **Community wellbeing** is enhanced by sustainable economic enterprise, celebration and respect for history and culture, youth engagement, and effective collaboration among all stakeholders. **Outreach and education** in a collaborative conservation setting is active and ongoing, and involves science, research, person to person contacts and adaptive management.



## Watershed Planning Foundation

This Framework strives to look at the Altar Valley as an integrated, holistic ecosystem that supports native species and economic vitality. Watershed health is the key organizing theme and focus for planning and actions. Comprehensive watershed conservation and watershed function enhancements are frequently the focus of actions aimed at enhancing ecosystem function and enhance native flora and fauna populations. Changes in watershed health and function over the past 100 years have been a major ecological stressor and can be visually tracked over time. Based on work in the valley and elsewhere, there is toolkit of strategies, techniques and actions that can repair areas of excessive erosion and increase vegetation cover. While projects are often generated site-specific issues, AVCA seeks to strategically link local actions to broader spatial scales. The following points are high-level methodologies or outcomes generated by the various conservation partners in the Valley.

### What does WATERSHED PRODUCTIVITY look like in the Altar Valley?

#### *The Altar Valley landscape remains unfragmented for wildlife, natural processes, and economic viability.*

- Large ranches remain open, such that they are not subdivided for residential or commercial development.
- Development is contained to the existing communities of Three Points/Robles Junction, Arivaca and Sasabe.
- Existing highway corridors (Sasabe Hwy and Arivaca/Amado Hwy) remain scenic.
- Dark skies prevail, creating a favorable environment for Kitt Peak National Observatory.
- Restoration of Sierrita Pipeline is successful.

#### *Native plant density and diversity are sustained or enhanced.*

- Up-to-date Coordinated Resource Management Plans and annual rangeland monitoring inform management and livestock stocking rates.
- There are increasing similarity trends between current and potential ecological site condition as defined by NRCS, adapted where appropriate, to recognize the role of some non-native species (such as Lehmann lovegrass) in providing surface soil stability.
- The balance between density of woody species (such as mesquite) and herbaceous species shifts towards herbaceous species, where appropriate.

*The ecological site is a basic mapping unit used in rangeland inventory. An ecological site is a distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community. The differentiation of sites is based upon physiographic features, soils, climatic factors, and native vegetation.*

#### *Watershed productivity is maximized to sustain or enhance natural and economic systems.*

- Perennial grass cover increases and bare ground decreases.
- Water infiltration and soil and biological material deposition increase, and water runoff and soil erosion decrease.
- Watershed treatments reduce the erosive effects of sudden heavy water flows, such as head cuts, and seek to reconnect channels with their floodplains.
- Unnecessary roads are closed; and necessary roads have drainage structures, stable arroyo crossings and width appropriate to use.
- Trails, roads, dikes and other features that interrupt natural water drainage patterns are modified to remove or lessen their impact.
- Activities support advancement of groundwater protection within the Tucson Active Management Area and mitigate downstream flooding.

***Wildlife populations are sustained or enhanced.***

- Habitat enhancement practices reflect general wildlife needs as well as those of individual species (especially threatened and endangered species).
- Support the implementation and outcomes of the Pima County Multi-species Conservation Plan and biological goals of the Sonoran Desert Conservation Plan.
- Rangeland waters (stock ponds, drinkers, waterlines) continue to be widely available and maintained and include, where appropriate, wildlife escape ramps.
- Hunting, managed by the Arizona Game and Fish Department, is encouraged as a sustainable opportunity that enhances public awareness of the value of conserving the Altar Valley watershed. Continued emphasis is placed on hunter education to respect private property and to cause no harm to non-target wildlife, management infrastructure or domestic animals.

**What does COMMUNITY WELLBEING look like in the Altar Valley?**

***Agricultural oriented economic prosperity supports long term stewardship of land and resources.***

- Diverse ages and family generations are involved in businesses, with mentoring available for young people.
  - Historic and new agricultural economic activities continue, such as scientifically-informed livestock production, small farms, beekeeping, and guest ranching.
  - The local and regional infrastructure supports agriculture through services such as livestock auctions, processing facilities, tack and feed stores, veterinary offices, and on-site rangeland education and research.



***Agricultural operators and partner organizations experience both management stability and flexibility.***

- Leases and management agreements are stable and long-term in nature.
- Plans and projects, guided by shared goals, reach across ownership and/or management boundaries.
- Agricultural operations remain agricultural through ownership changes.

***People outside the Altar Valley perceive the area as a critical part of regional conservation and open space priorities.***

- There is institutional and financial support to tackle cooperative conservation projects with broad private and public sector value, as well as payment for public benefits supplied by private landowners (e.g., public access, mitigation banks, conservation easements, and carbon credits).
- Altar Valley is widely recognized as a place for successful collaborative conservation.

***Culture and history are respected and celebrated.***

- Historic and prehistoric information is collected, mapped and archived.
- There is broad understanding of the Valley's history and accumulated knowledge of land-use management.
- People and governing organizations of the neighboring Tohono O'odham Nation are engaged.

**What does OUTREACH AND EDUCATION look like in the Altar Valley?**

***Partner work occurs via a combination of regularly scheduled events, ad-hoc project team meetings, and email/phone communication -- with administrative and facilitation services to support activity.***

- People treat one another with respect, even when they disagree.
- Partners commit critical resources of time, expertise, tools, and money.

- Individuals are inspired to do their best work.
- Events are conducted professionally, with productive agendas and ground-rules.
- Basics like safety, business and legal integrity, respect and environmental compliance are embodied in all work.
- Partner organizations designate a liaison to AVCA and these liaisons work together to manage watershed wide collaboration; and a wide variety of people serve on project teams.

***The use of best available science informs regular management and new projects undertaken by private and public entities.***

- There is a continuous flow between data collection, policy decisions, and resource management, based upon empirical observation of what happens on the land.
- People communicate often, both in the field and via other methods, to observe, plan and implement projects, and monitor results.
- Monitoring and future evaluation and maintenance is designed into projects whenever possible.
- Research needs and accomplishments are actively discussed and documented.
- Creativity is encouraged.



***Conservation program elements are widely discussed with information readily available.***

- Completed and planned projects are inventoried and mapped, with information available in a project database maintained by AVCA as well as Geographic Information System (GIS) data layers maintained by partners.
- Data suitable for general public access is available in GIS format; and sensitive data is handled appropriately.
- Partners place information in the Global Rangelands Altar Valley collection, managed by the University of Arizona.
- Entities that do not routinely do business in the Altar Valley are aware of locally supported collaborative conservation goals and the role of AVCA in working towards these goals, and seek to work positively toward advancing the objectives outlined in this Framework.

***Researchers, educators and students are active in the Altar Valley.***

- Experiential and on-site education takes place often, to serve both academic and on-the-job practical needs.
- Targeted research occurs and researchers have information and support necessary to work in the Altar Valley.

## PARTNER ORGANIZATIONS

Altar Valley Conservation Alliance
Altar Valley School District
Altar Valley Science Advisory Board
Arivaca Water Education Task Force
Arizona Department of Environmental Quality
Arizona Department of Forestry & Fire Management
Arizona Game and Fish Department
Arizona Land and Water Trust
Arizona State Land Department
City of Tucson Water Department
Friends of the Buenos Aires National Wildlife Refuge
Pima County Natural Resources Parks and Recreation
Pima County Office of Sustainability and Conservation
Pima County Regional Flood Control District
Pima Natural Resources Conservation District
Quiet Creek Remote Sensing and Geospatial Analysis
Quivira Coalition
Sky Island Alliance
Sonoran Institute
Southwest Decision Resources
The Nature Conservancy
UA College of Agriculture and Life Science
UA Tierra Seca Club
US Border Patrol
US Bureau of Land Management
US Forest Service
US Natural Resources Conservation Service
USDA Agricultural Research Station, Southwest Watershed Research Center

## LITERATURE CITED

- Bahre, C.J. 1985. Wildfire in southeastern Arizona between 1859 and 1890. *Desert Plants* 7: 190-194.
- Kaib, J.M. 1998. Fire history in riparian canyon pine-oak forests and the intervening desert grasslands of the Southwest Borderlands: a dendroecological, historical, and cultural inquiry. Masters thesis. School of Renewable Natural Resources, University of Arizona, Tucson.
- Pima County, 2016. *This Land is Your Land-40 Years of Voter-supported Conservation*, Pima County, Arizona
- Sayre, Nathan. 2002. *Ranching, endangered species, and urbanization of the Southwest: species of capital*. Tucson: University of Arizona Press.

## IMPORTANCE MANAGEMENT GUIDANCE PERTAINING TO ALTAR VALLEY WATERSHED

- Altar Valley Conservation Alliance. 2001. *Altar Valley Conservation Alliance Watershed Resource Assessment Task 11. Watershed Action Plan and Final Report*. Prepared by the AVCA for the Arizona Water Protection Fund Commission. 9 pp.
- Altar Valley Conservation Alliance. 2017. *Altar Valley Conservation Alliance Strategic Plan 2017*.
- JE Fuller Hydrology & Geomorphology, Inc., Tucson, Arizona. *Altar Wash Restoration Conceptual Evaluation of Alternative Methods*, 2017.
- Natural Resources Conservation Service. 2008. *Altar Valley Fire Management Plan*.
- Pima County, Arizona. Maeveen Marie Behan Conservation Lands System (CLS), 2001.
- Pima County, Arizona. Multi-species Conservation Plan (MSCP), 2016.